Pacific Gas and Electric Company

Curt Russell
Topock Site Manager
GT&D Remediation

Topock Compressor Station
145453 National Trails Hwy
Needles, CA 92363

Mailing Address
P.O. Box 337
Needles, CA 92363

760.326.5582
Fax: 760.326.5542
Email: gcr4@pge.com

January 13, 2017

Pamela S. Innis
Topock Remedial Project Manager
CHF Remedial Project Manager
Bureau of Land Management - Arizona State Office
One North Central Avenue, Suite 800
Phoenix, AZ 85004-4427
Office Phone: 602.417.9578
Cell: 303.501.5685

Robert Perdue
Executive Officer
California Regional Water Quality Control Board
Colorado River Basin Region
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260

Subject: **Topock IM-3 Combined Fourth Quarter 2016 Monitoring, Semiannual July – December 2016 and Annual January - December 2016 Operation and Maintenance Report**
PG&E Topock Compressor Station, Needles, California
Interim Measure No. 3 Groundwater Treatment System
(Document ID: PGE20170113A)

Dear Ms. Innis and Mr. Perdue:

Enclosed is the Fourth Quarter 2016 Monitoring, Semiannual July – December 2016 and Annual January – December 2016 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.

The IM-3 groundwater extraction and treatment system has extracted and treated approximately 747,084,717 gallons of water and removed approximately 6,983 pounds of total chromium from August 1, 2005 through December 31, 2016.

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,

Curt Russell
Topock Site Manager

Enclosures:

Topock IM-3 Combined Fourth Quarter 2016 Monitoring, Semiannual July - December 2016, and Annual January - December 2016 Operation and Maintenance Report

cc: Jose Cortez, Colorado River Basin Regional Water Board
Thomas Vandenberg, Colorado River Basin Regional Water Board
Aaron Yue, California Department of Toxic Substances Control

Topock Project Executive Abstract

Document Title:
Topock IM-3 Fourth Quarter 2016 Monitoring, Semiannual July - December 2016 and Annual January – December 2016 Operation and Maintenance Report
Submitting Agency/Authored by: U.S. Department of the Interior and Regional Water Quality Control Board
Final Document? ☒ Yes ☐ No

Date of Document: January 13, 2017
Who Created this Document?: (i.e. PG&E, DTSC, DOI, Other)
PG&E
Document ID Number: PGE20170113A

Priority Status: ☐ HIGH ☐ MED ☒ LOW
Is this time critical? ☐ Yes ☒ No

Type of Document:
☐ Draft ☒ Report ☐ Letter ☐ Memo
☐ Other / Explain:

Action Required:
☒ Information Only ☐ Review & Comment
Return to: _____
By Date:_____
☐ Other / Explain:

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

Is this a Regulatory Requirement?
☒ Yes
☐ No
If no, why is the document needed?

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

Submittal of this report is a compliance requirement of the ARARs for waste discharge as documented in Attachment A to the Letter Agreement issued July 26, 2011.

Other Justification/s:
☐ Permit ☐ Other / Explain:

Brief Summary of attached document:

This report covers the Interim Measure No. 3 (IM-3) groundwater treatment system monitoring activities during the Fourth Quarter 2016 period, and the operation and maintenance activities during the July 1, 2016 to December 31, 2016 semiannual and the January 1, 2016 to December 31, 2016 annual periods. 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.

Written by: PG&E

Recommendations:
This report is for your information only.

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

The Topock IM-3 Fourth Quarter 2016 Monitoring, Semiannual July - December 2016 and Annual January – December 2016 Operation and Maintenance Report is related to the Interim Measure. 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

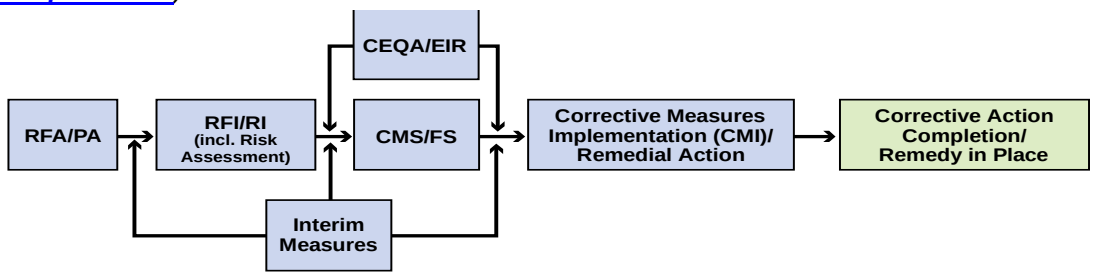
Colorado River Basin Regional Water Quality Control Board (Regional Water Board) to DOI, and the subsequent Letter of Concurrence issued August 18, 2011 from DOI to the Regional Water Board.

Other requirements of this information?

None.

Related Reports and Documents:

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



Legend

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

Combined Fourth Quarter 2016 Monitoring, Semiannual July – December 2016 and Annual January – December 2016 Operation and Maintenance Report Interim Measure No. 3 Groundwater Treatment System

Document ID: PGE20170113A

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

January 13, 2017

CH2M HILL, Inc.
155 Grand Avenue
Suite 800
Oakland, CA 94612

Combined Fourth Quarter 2016 Monitoring, Semiannual July – December 2016, and Annual January – December 2016 Operation and Maintenance Report for Interim Measure No. 3 Groundwater Treatment System

PG&E Topock Compressor Station
Needles, California

Prepared for

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

on behalf of

Pacific Gas and Electric Company

January 13, 2017

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

_____

Dennis Fink, P.E.
Project Engineer

Contents

Tables

Figures

Section Page

Appendixes

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
O&M	operation and maintenance
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

SECTION 1

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 Fourth Quarter 2016 and the operation and maintenance (O&M) activities during the July 1, 2016 to December 31, 2016 semiannual period and the January 1, 2016 to December 31, 2016 annual 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.

SECTION 2

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.

SECTION 3

Description of Activities

The treatment system was initially operated between July 25 and July 28, 2005 for the Waste Discharge Requirement (WDR)-mandated startup phase. Discharge to the injection wells was initiated July 31, 2005 after successfully completing the startup phase in accordance with Order No. R7-2004-0103. Full-time operation of the treatment system commenced in August 2005.

As previously noted, this report describes Fourth Quarter 2016 monitoring activities and the July 1, 2016 through December 31, 2016 (Third and Fourth Quarters) O&M activities related to the IM-3 groundwater treatment system. It also serves as the Annual January – December 2016 O&M Report for IM-3. IM-3 monitoring activities from January 1, 2016 through September 30, 2016 (First, Second and Third Quarters) were presented in the following monitoring and O&M reports:

- Topock IM-3 First Quarter 2016 Monitoring Report, submitted to the DOI and Regional Water Board April 15, 2016
- Topock IM-3 Second Quarter 2016 Monitoring and Semi-annual January 1, 2016 through June 30, 2016 Operation and Maintenance Report, submitted to the DOI and Regional Water Board July 15, 2016
- Topock IM-3 Third Quarter 2016 Monitoring Report, submitted to the DOI and Regional Water Board October 15, 2016

3.1 Groundwater Treatment System

The treatment system was initially operated between July 25 and July 28, 2005 for the 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 Fourth Quarter 2016

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 (that together resulted in approximately 1.17 percent downtime during Fourth Quarter 2016) 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 July 2016 through September 2016 were originally reported in the *Third Quarter 2016 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System, PG&E Topock Compressor Station, Needles, CA*, published October 15, 2016, 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 Fourth Quarter 2016, extraction wells TW-3D, TW-2D 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 operated for a brief time for annual sampling. The operational run time for the IM groundwater extraction system (combined or individual pumping), by month, was approximately:

- 97.9 percent during October 2016
- 99.4 percent during November 2016
- 99.2 percent during December 2016

The Fourth Quarter 2016 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 17,739,943 gallons of extracted groundwater during Fourth Quarter 2016.

In addition to extracted groundwater, during Fourth Quarter 2016 the IM-3 facility treated 2,090 gallons of water generated from the groundwater monitoring program and 37,800 gallons of injection well development water.

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 17,761,570 gallons of treatment system effluent during Fourth Quarter 2016. 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 73,743 gallons of RO concentrate during Fourth Quarter 2016. 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. Four sludge containers were shipped offsite from the IM-3 facility during Fourth Quarter 2016. The shipment dates and approximate weights are provided in Section 5.3.

3.3 Sampling and Analytical Procedures

With the exception of pH, samples were collected at the designated sampling locations and placed directly into containers provided by Truesdail Laboratories, Inc. (Truesdail) or ASSET Laboratories (ASSET). 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 Truesdail or ASSET via courier under chain-of-custody documentation. The laboratories confirmed the samples were received in chilled condition upon arrival.

Truesdail is certified by the California Department of Health Services (Certification No. 1237) under the State of California's Environmental Laboratory Accreditation Program. ASSET is certified by the California Department of Health Services (Certification No. 2676) 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 Fourth Quarter 2016 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 Measure 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.

SECTION 4

Analytical Results

The analytical results and laboratory reports for the IM-3 groundwater treatment system monitoring program were previously reported for the First, Second and Third Quarters of 2016:

- The January 1, 2016 through March 31, 2016 results were included in the First Quarter 2016 Monitoring Report submitted to the DOI and Regional Water Board on April 15, 2016.
- The April 1, 2016 through June 30, 2016 results were included in the Second Quarter 2016 Monitoring Report submitted to the DOI and Regional Water Board on July 15, 2016.
- The July 1, 2016 through September 30, 2016 results were included in the Third Quarter 2016 Monitoring Report submitted to the DOI and Regional Water Board on October 15, 2016.

Laboratory reports for samples collected in Fourth Quarter 2016 were prepared by certified analytical laboratories, and are presented in Appendix D. The Fourth Quarter 2016 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 results are presented in Table 7.

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

SECTION 5

Semiannual Operation and Maintenance

This section includes the Semiannual Operation and Maintenance Report for the IM-3 groundwater treatment system for the period July 1, 2016 through December 31, 2016.

All O&M 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. O&M records are also archived using maintenance software. The subsections below summarize the O&M 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	Location ID Where Flowmeter is Installed	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[a]	FIT-100	6A022116000	9/20/2014	7/8/2015
Injection well IW-03	FIT-1203	6C037316000	1/15/2016	3/1/2016
Injection well IW-02	FIT-1202	7700F216000	3/22/2014	4/14/2015
Combined IW-02 and IW-03	FIT-700	L200EO16000	2/5/2016	10/6/2016
Reverse osmosis concentrate	FIT-701	6A022016000	9/19/2014	7/8/2015

Notes:

[a] TW-2S is a backup extraction well only operated for brief testing and sampling periods since October 2005.

5.2 Volumes of Groundwater Treated

Data regarding daily volumes of groundwater treated between July 1, 2016 and December 31, 2016 are provided in Appendix B. The daily volumes of groundwater treated from January 1, 2016 through June 30, 2016 were reported in the Second Quarter 2016 Monitoring Report and Semiannual January 1- June 30, 2016 Operation and Maintenance Report submitted on July 15, 2016.

Approximately 34,662,266 gallons of groundwater were extracted and treated between July 1, 2016 and December 31, 2016. Treatment of this water at the IM-3 facility is being performed in accordance with the conditions of ARARs.

Additionally, approximately 2,510 gallons of well purge water (generated during well development, monitoring well sampling, and/or aquifer testing), as well as 37,800 gallons of injection well re-development water, were treated at the IM-3 facility during the July 1, 2016 through December 31, 2016 semiannual period.

A total of approximately 34,683,809 gallons of treated groundwater were injected back into the Alluvial Aquifer between July 1, 2016 and December 31, 2016.

5.3 Residual Solids Generated (Sludge)

During the July 1, 2016 through December 31, 2016 reporting period, eleven 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 July 1, 2016 through December 31, 2016 reporting period is provided below.

Date Sludge Bin Removed from Site	Approximate Quantity from Waste Manifests (cubic yards)	Type of Shipment
07/14/2016	8	Non-RCRA hazardous waste
07/14/2016	8	Non-RCRA hazardous waste
08/01/2016	8	Non-RCRA hazardous waste
08/01/2016	8	Non-RCRA hazardous waste
09/21/2016	8	Non-RCRA hazardous waste
09/21/2016	8	Non-RCRA hazardous waste
09/22/2016	8	Non-RCRA hazardous waste
11/16/2016	8	Non-RCRA hazardous waste
11/16/2016	8	Non-RCRA hazardous waste
12/08/2016	8	Non-RCRA hazardous waste
12/08/2016	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 July 1, 2016 through December 31, 2016, approximately 190,374 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 July 1, 2016 through December 31, 2016 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 July 1, 2016 through December 31, 2016 semiannual reporting period.

Activities during the Third and Fourth Quarters 2016 included one extended shutdown: the extraction well system was offline from 4:18 a.m. on August 7, 2016 to 2:48 p.m. on August 10, 2016, from 3:50 p.m. on August 10, 2016 to 6:58 a.m. on August 11, 2016, and from 8:44 a.m. to 2:10 p.m. on August 11, 2016 for semiannual scheduled maintenance. Extraction system downtime was 4 days, 7 hours, and 4 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 July 1, 2016 through December 31, 2016 semiannual period.

SECTION 6

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.

SECTION 7

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: January 13, 2017

Tables

Table 1. Sampling Station Descriptions

Fourth Quarter 2016 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Sample Station	Sample ID[a]	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 Figures 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

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

Table 2. Flow Monitoring Results

Fourth Quarter 2016 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Parameter	System Influent[a,b] (gpm)	System Effluent[b] (gpm)	Reverse Osmosis Concentrate[b] (gpm)
October 2016 Average Monthly Flowrate	131.99	133.27	0.44
November 2016 Average Monthly Flowrate	134.73	131.78	0.45
December 2016 Average Monthly Flowrate	135.03	137.09	0.78

Notes:

gpm: gallons per minute

[a] Extraction wells TW-3D, TW-2D and PE-1 were operated during the Fourth Quarter 2016. Extraction well TW-2S was operated for a brief time for annual sampling.

[b] The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during the Fourth Quarter 2016 is approximately 0.54 percent.

Table 3. Sample Collection Dates

Fourth Quarter 2016 Monitoring Report for Interim Measure No. 3 Groundwater Treatment System

Parameter	Sample Collection Dates	Results
Influent	October 4, 2016 November 1, 2016 December 6, 2016	See Table 4
Effluent	October 4, 2016 November 1, 2016 December 6, 2016	See Table 5
Reverse Osmosis Concentrate	October 4, 2016	See Table 6
Sludge[a]	Composite sample sent to lab October 4, 2016	See Table 7

Note:

[a] 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 [a]
Fourth Quarter 2016 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Monthly						Quarterly															
Analytes		TDS	Turbidity	Specific Conductance	Field pH [c]	Chromium	Hexavalent Chromium	Aluminium	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate/Nitrite (as N)	Sulfate	Iron	Zinc
Units [b]		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
MDL		50.0	0.100	0.100	---	0.0960	6.60	2.70	0.0111	0.160	0.0250	0.350	0.0380	0.260	0.0870	0.180	0.0560	0.190	0.0400	0.110	3.30	1.80	0.270
Sample ID	**Date**																						
SC-100B-WDR-546	**10/4/2016**	**4500**	**0.240**	**7700**	**7.0**	**630**	**600**	**ND (50.0)**	**ND (0.0500)J**	**ND (2.50)**	**3.10**	**31.0**	**1.10**	**ND (1.00)**	**2.40**	**ND (5.00)**	**15.0**	**27.0**	**ND (1.00)**	**3.00**	**510**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	5.00	20.0	50.0	0.0500	2.50	0.100	5.00	0.100	1.00	0.500	5.00	0.500	2.50	1.00	0.250	25.0	20.0	10.0
SC-100B-WDR-547	**11/1/2016**	**4100**	**0.340**	**7100**	**7.3**	**500**	**480**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**36.0**	**---**	**---**	**---**	**---**	**---**	**---**
RL		50.0	0.100	0.100	---	5.00	20.0	---	---	---	---	---	---	---	---	---	0.500	---	---	---	---	---	---
SC-100B-WDR-548	**12/6/2016**	**4100**	**0.420**	**6800**	**7.4**	**470**	**500**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**24.0**	**---**	**---**	**---**	**---**	**---**	**---**
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

[a] 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).

[b] Units reported in this table are those units required in the ARARs.

[c] 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[a]
Fourth Quarter 2016 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Effluent Limits[b]	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**																					
Analytes		TDS	Turbidity	Specific Conductance	Field pH[e]	Chromium	Hexavalent Chromium	Aluminium	Ammonia (as N)	Antimony	Arsenic	Barium	Boron	Copper	Fluoride	Lead	Manganese	Molybdenum	Nickel	Nitrate/Nitrite (as N)	Sulfate	Iron	Zinc
Units[c]		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
MDL[d]		50.0	0.100	0.100	---	0.0190	0.0660	2.70	0.0111	0.0310	0.0250	0.0700	0.0380	0.260	0.0870	0.0370	0.0560	0.0390	0.0400	0.110	3.30	1.80	0.270
Sample ID	**Date**																						
SC-700B-WDR-546	**10/4/2016**	**4000**	**0.270**	**7200**	**7.3**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.0500)J**	**ND (0.500)**	**ND (0.100)**	**19.0**	**1.10**	**ND (1.00)**	**2.10**	**ND (5.00)**	**5.50**	**22.0**	**1.20**	**2.90**	**460**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.0500	0.500	0.100	1.00	0.100	1.00	0.500	5.00	0.500	0.500	1.00	0.250	25.0	20.0	10.0
SC-700B-WDR-547	**11/1/2016**	**4200**	**0.210**	**7200**	**7.1**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**0.0527**	**ND (0.500)**	**ND (0.100)**	**18.0**	**1.10**	**ND (1.00)**	**2.10**	**ND (1.00)**	**16.0**	**22.0**	**2.40**	**2.60**	**480**	**ND (20.0)**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.0500	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-548	**12/6/2016**	**4200**	**0.260**	**7200**	**7.0**	**ND (1.00)**	**ND (0.200)**	**ND (50.0)**	**ND (0.0500)**	**ND (0.500)**	**ND (0.100)**	**23.0**	**1.10**	**ND (1.00)**	**2.00**	**ND (5.00)**	**5.00**	**22.0**	**1.40**	**2.90**	**470**	**21.0**	**ND (10.0)**
RL		50.0	0.100	0.100	---	1.00	0.200	50.0	0.0500	0.500	0.100	1.00	0.100	1.00	0.500	5.00	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

a 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).

b 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.

c Units reported in this table are those units required in the ARARs.

d 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.

e 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 [a]
Fourth Quarter 2016 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Quarterly																				
Analytes		TDS	Specific Conductance	Field [c] pH	Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Units [b]		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
MDL		500	0.100	---	0.000096	0.0016	0.00079	0.00062	0.0017	0.0011	0.0012	0.00013	0.0066	0.350	0.00092	0.00097	0.000087	0.00099	0.00069	0.0015	0.00074	0.00011	0.0067
Sample ID	**Date**																						
SC-701-WDR-546	**10/4/2016**	**42000**	**59000**	**7.8**	**ND (0.0050)**	**ND (0.0050)**	**ND (0.0120)**	**ND (0.0025)**	**0.200 J**	**ND (0.0120)**	**ND (0.0120)**	**ND (0.0025)**	**ND (0.0250)J**	**20.0**	**ND (0.0250)J**	**0.230 J**	**ND (0.00020)**	**ND (0.0250)**	**0.0390**	**ND (0.0120)J**	**ND (0.0120)**	**ND (0.0050)**	**ND (0.250)J**
RL		500	0.100	---	0.0050	0.0050	0.0120	0.0025	0.0250	0.0120	0.0120	0.0025	0.0250	2.00	0.0250	0.0120	0.00020	0.0250	0.0120	0.0120	0.0120	0.0050	0.250

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

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

[b] Units reported in this table are those units required in the ARARs.

[c] 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[a]
Fourth Quarter 2016 Monitoring Report for Interim Measure No.3 Groundwater Treatment System

Sampling Frequency		Quarterly																	
Analytes		Chromium	Hexavalent Chromium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Cobalt	Copper	Fluoride	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Units[b]		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		0.0860	0.0870	0.390	0.460	0.0900	0.0810	0.0770	0.0770	0.0850	0.150	0.0850	0.0750	0.0260	0.0890	0.330	0.0870	0.350	0.0780	0.130
Sample ID	Date																			
Phase Separator-546-Sludge	**10/4/2016**	**3000 J**	**28.0 J**	**34.0**	**19.0**	**56.0**	**ND (2.10)**	**5.20 J**	**5.00 J**	**160 J**	**28.0**	**ND (2.10)J**	**6.20 J**	**ND (0.210)**	**33.0**	**ND (2.10)J**	**ND (2.10)J**	**4.40 J**	**18.0 J**	**33.0 J**
RL		2.10	0.850	4.30	2.10	2.10	2.10	2.10	2.10	4.30	4.30	2.10	2.10	0.210	2.10	2.10	2.10	4.30	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 killogram
mg/L = milligrams per liter
MDL = method detection limit
ND = parameter not detected at the listed reporting limit
RL = project reporting limit

[a] Sampling location for all sludge samples is the sludge collection bin (see attached P&ID TP-PR-10-10-06).

[b] Units reported in this table are those units required in the ARARs.

[c] 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
Fourth Quarter 2016 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-546	Ryan Phelps	10/4/2016	12:38:00 PM	ASSET	EPA 120.1	SC	10/5/2016	Lilia Ramit
					ASSET	EPA 200.7	AL	10/7/2016	Claire Ignacio
					ASSET	EPA 200.7	B	10/7/2016	Claire Ignacio
					ASSET	EPA 200.7	FE	10/7/2016	Claire Ignacio
					ASSET	EPA 200.8	AS	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	BA	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	CR	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	CU	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	MN	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	MO	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	NI	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	PB	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	SB	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/13/2016	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/5/2016	Ria Abes
					ASSET	EPA 300.0	FL	10/5/2016	Ria Abes
					ASSET	EPA 300.0	SO4	10/5/2016	Ria Abes
					Field	HACH	PH	10/4/2016	G. Gloria
					ASSET	SM 2540C	TDS	10/5/2016	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/12/2016	Ryan Balilu
					ASSET	SM2130B	TRB	10/5/2016	Lilia Ramit
					TLI	SM4500NH3D	NH3N	10/17/2016	Ryan Balilu
SC-100B	SC-100B-WDR-547	Ryan Phelps	11/1/2016	12:12:00 PM	ASSET	EPA 120.1	SC	11/2/2016	Lilia Ramit
					ASSET	EPA 200.8	CR	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	MN	11/4/2016	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/2/2016	Ria Abes
					Field	HACH	PH	11/1/2016	G. Gloria
					ASSET	SM 2540C	TDS	11/2/2016	Lilia Ramit
					ASSET	SM2130B	TRB	11/2/2016	Lilia Ramit
SC-100B	SC-100B-WDR-548	Ryan Phelps	12/6/2016	11:16:00 AM	ASSET	EPA 120.1	SC	12/7/2016	Lilia Ramit
					ASSET	EPA 200.8	CR	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	MN	12/10/2016	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/7/2016	Ria Abes
					Field	HACH	PH	12/6/2016	Ryan Phelps
					ASSET	SM 2540C	TDS	12/7/2016	Lilia Ramit

TABLE 8

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2016 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-548	Ryan Phelps	12/6/2016	11:16:00 AM	ASSET	SM2130B	TRB	12/7/2016	Lilia Ramit
SC-700B	SC-700B-WDR-546	Ryan Phelps	10/4/2016	12:42:00 PM	ASSET	EPA 120.1	SC	10/5/2016	Lilia Ramit
					ASSET	EPA 200.7	AL	10/7/2016	Claire Ignacio
					ASSET	EPA 200.7	B	10/7/2016	Claire Ignacio
					ASSET	EPA 200.7	FE	10/7/2016	Claire Ignacio
					ASSET	EPA 200.8	AS	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	BA	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	CR	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	CU	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	MN	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	MO	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	NI	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	PB	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	SB	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/13/2016	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/5/2016	Ria Abes
					ASSET	EPA 300.0	FL	10/5/2016	Ria Abes
					ASSET	EPA 300.0	SO4	10/5/2016	Ria Abes
					Field	HACH	PH	10/4/2016	G. Gloria
					ASSET	SM 2540C	TDS	10/5/2016	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	10/12/2016	Ryan Balilu
					ASSET	SM2130B	TRB	10/5/2016	Lilia Ramit
					TLI	SM4500NH3D	NH3N	10/17/2016	Ryan Balilu
SC-700B	SC-700B-WDR-547	Ryan Phelps	11/1/2016	12:10:00 PM	ASSET	EPA 120.1	SC	11/2/2016	Lilia Ramit
					ASSET	EPA 200.7	AL	11/3/2016	Claire Ignacio
					ASSET	EPA 200.7	B	11/4/2016	Claire Ignacio
					ASSET	EPA 200.7	FE	11/3/2016	Claire Ignacio
					ASSET	EPA 200.8	AS	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	BA	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	CR	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	CU	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	MN	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	MO	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	NI	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	PB	11/4/2016	Claire Ignacio

TABLE 8

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2016 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-547	Ryan Phelps	11/1/2016	12:10:00 PM	ASSET	EPA 200.8	SB	11/4/2016	Claire Ignacio
					ASSET	EPA 200.8	ZN	11/4/2016	Claire Ignacio
					ASSET	EPA 218.6	CR6	11/2/2016	Ria Abes
					ASSET	EPA 300.0	FL	11/2/2016	Ria Abes
					ASSET	EPA 300.0	SO4	11/2/2016	Ria Abes
					Field	HACH	PH	11/1/2016	G. Gloria
					ASSET	SM 2540C	TDS	11/2/2016	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	11/13/2016	Ryan Balilu
					ASSET	SM2130B	TRB	11/2/2016	Lilia Ramit
					TLI	SM4500NH3D	NH3N	11/7/2016	Ryan Balilu
SC-700B	SC-700B-WDR-548	Ryan Phelps	12/6/2016	11:21:00 AM	ASSET	EPA 120.1	SC	12/7/2016	Lilia Ramit
					ASSET	EPA 200.7	AL	12/11/2016	Claire Ignacio
					ASSET	EPA 200.7	B	12/12/2016	Claire Ignacio
					ASSET	EPA 200.7	FE	12/11/2016	Claire Ignacio
					ASSET	EPA 200.8	AS	12/12/2016	Claire Ignacio
					ASSET	EPA 200.8	BA	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	CR	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	CU	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	MN	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	MO	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	NI	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	PB	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	SB	12/10/2016	Claire Ignacio
					ASSET	EPA 200.8	ZN	12/10/2016	Claire Ignacio
					ASSET	EPA 218.6	CR6	12/7/2016	Ria Abes
					ASSET	EPA 300.0	FL	12/9/2016	Ria Abes
					ASSET	EPA 300.0	SO4	12/9/2016	Ria Abes
					Field	HACH	PH	12/6/2016	Ryan Phelps
					ASSET	SM 2540C	TDS	12/7/2016	Lilia Ramit
					ASSET	SM 4500-NO3F	NO3NO2N	12/21/2016	Ryan Balilu
					ASSET	SM2130B	TRB	12/7/2016	Lilia Ramit
					TLI	SM4500NH3D	NH3N	12/15/2016	Ryan Balilu
SC-701	SC-701-WDR-546	George Gloria	10/4/2016	12:30:00 PM	Field		PH		
					ASSET	EPA 120.1	SC	10/5/2016	Lilia Ramit
					ASSET	EPA 200.8	AG	10/13/2016	Claire Ignacio

TABLE 8

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2016 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-546	George Gloria	10/4/2016	12:30:00 PM	ASSET	EPA 200.8	AS	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	BA	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	BE	10/17/2016	Claire Ignacio
					ASSET	EPA 200.8	CD	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	CO	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	CR	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	CU	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	MN	10/13/2016	Claire IgnacioClaire Ignacio
					ASSET	EPA 200.8	MO	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	NI	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	PB	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	SB	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	SE	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	TL	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	V	10/13/2016	Claire Ignacio
					ASSET	EPA 200.8	ZN	10/13/2016	Claire Ignacio
					ASSET	EPA 218.6	CR6	10/5/2016	Ria Abes
					ASSET	EPA 245.1	HG	10/18/2016	Claire Ignacio
					ASSET	EPA 300.0	FL	10/5/2016	Ria Abes
					ASSET	SM 2540C	TDS	10/5/2016	Lilia Ramit
Phase Separator	Phase Separator-546-Sludge	George Gloria	10/4/2016	10:30:00 AM	ASSET	EPA 300.0	FL	10/10/2016	Ria Abes
					ASSET	EPA 6010B	AG	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	AS	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	BA	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	BE	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	CD	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	CO	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	CR	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	CU	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	MN	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	MO	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	NI	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	PB	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	SB	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	SE	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	TL	10/6/2016	Claire Ignacio

TABLE 8

Topock IM-3 Waste Discharge Applicable or Relevant and Appropriate Requirements (ARARs)
Monitoring Information
Fourth Quarter 2016 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
Phase Separator	Phase Separator-546-Sludge	George Gloria	10/4/2016	10:30:00 AM	ASSET	EPA 6010B	V	10/6/2016	Claire Ignacio
					ASSET	EPA 6010B	ZN	10/6/2016	Claire Ignacio
					ASSET	EPA 7471A	HG	10/5/2016	Claire Ignacio
					ASSET	SW 7199	CR6	10/11/2016	Quennie Manimtim

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 CaCO3
ALKC = alkalinity, carb as CaCO3
AL = aluminum
Ag = silver
AS = arsenic
B = boron
BA = barium
BE = beryllium
CD = cadmium
CO = cobalt
CR = chromium
CR6 = hexavalent chromium
CU = copper
FE = iron
FETD = iron, dissolved
FL = fluoride
HG = mercury
MN = manganese
MND = manganese, dissolved
MO = molybdenum
MOIST = moisture
NH3N = ammonia (as N)
NI = nickel
NO3NO2N = nitrate/nitrite (as N)
PB = lead
PH = pH
SB = antimony
SC = specific conductance
SE = selenium
SO4 = sulfate
TDS = total dissolved solids
TL = thallium
TLI = Truesdail Laboratories, Inc.
TRB = turbidity
V = vanadium
ZN = zinc

Figures

Parcel No. 650-151-06
Fort Mojave Indian Tribe
(Formerly owned by PG&E)

BLM

East Mesa
Injection Area

CW-4
CW-3
CW-2
CW-1

IW-1
IW-2
IW-3

IM3
Treatment
Plant

Historic Route 66

Park Moabi Rd./National Trails Highway

66

BAT CAVE WASH

Colorado River

MW-20
Bench

TW-02S
TW-03D
TW-02D
MW-20-130
PE-01

BN&SF RAILROAD

INTERSTATE
40

500
550
600

LEGEND

- IM3 Injection Well
- Observation Well Cluster
- Compliance Monitoring Well Cluster
- Exploratory Boring
- Groundwater Monitoring Well
- IM Extraction Well
- IM3 Treatment Facility Pipelines
- IM3 Effluent Pipeline

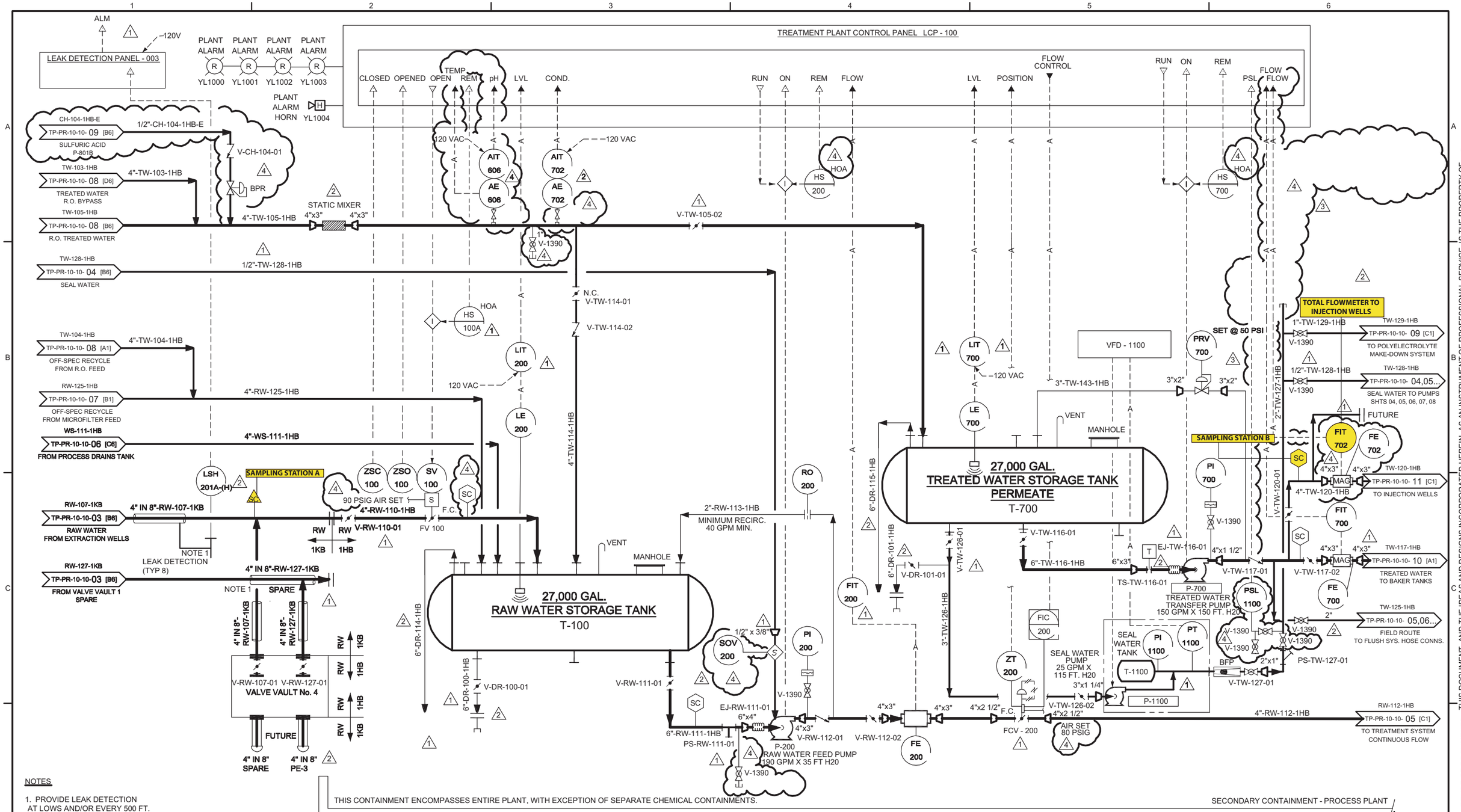
N

0 170 340 680 Feet

California State Plane NAD83 Zone 5 US Feet

FIGURE 1
IM3 PROJECT SITE FEATURES
PG&E TOPOCK COMPRESSOR STATION
NEEDLES, CALIFORNIA

\\ZINFANDEL\PROJ\PACIFICGASELECTRICCO\TOPOCKPROGRAM\GIS\MAPFILES\2010\IM3\IM3_PROJECT_AREA_APRIL10.MXD JLAMANTI 10/8/2010 12:12:30



NOTES

1. PROVIDE LEAK DETECTION AT LOWS AND/OR EVERY 500 FT.

THIS CONTAINMENT ENCOMPASSES ENTIRE PLANT, WITH EXCEPTION OF SEPARATE CHEMICAL CONTAINMENTS.

SECONDARY CONTAINMENT - PROCESS PLANT

NO.	DATE	REVISION	BY	CHK
0	07/28/04	FOR INTERNAL REVIEW	EFC	AJ
0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
3	02/14/05	ADDED RECIRC. LINE AND PRV VALVE TO T-700 - APPROVED FOR CONSTRUCTION	EFC	AJ
4	09/21/05	REVISED PER AS-BUILT CONDITIONS	EFC	AJ

REVISION APPROVAL		REV 4	DATE 09/21/05	PRINT DISTRIBUTION
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE
CIVIL		ELECTRICAL		STATUS
STRUCTURAL		INST & CONTROL		REV.
MECHANICAL		ARCHITECTURAL		CLIENT
PROCESS		ENVIRONMENTAL		FIELD
PIPING		GEN. ARRANG.		INTRA CO.

STATUS	REV	DATE	SDE	PEM
ISSUED				
PRELIMINARY				
FOR REVIEW AND APPROVAL	D	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	4	/ /		

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

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

PROJ NO. 315994

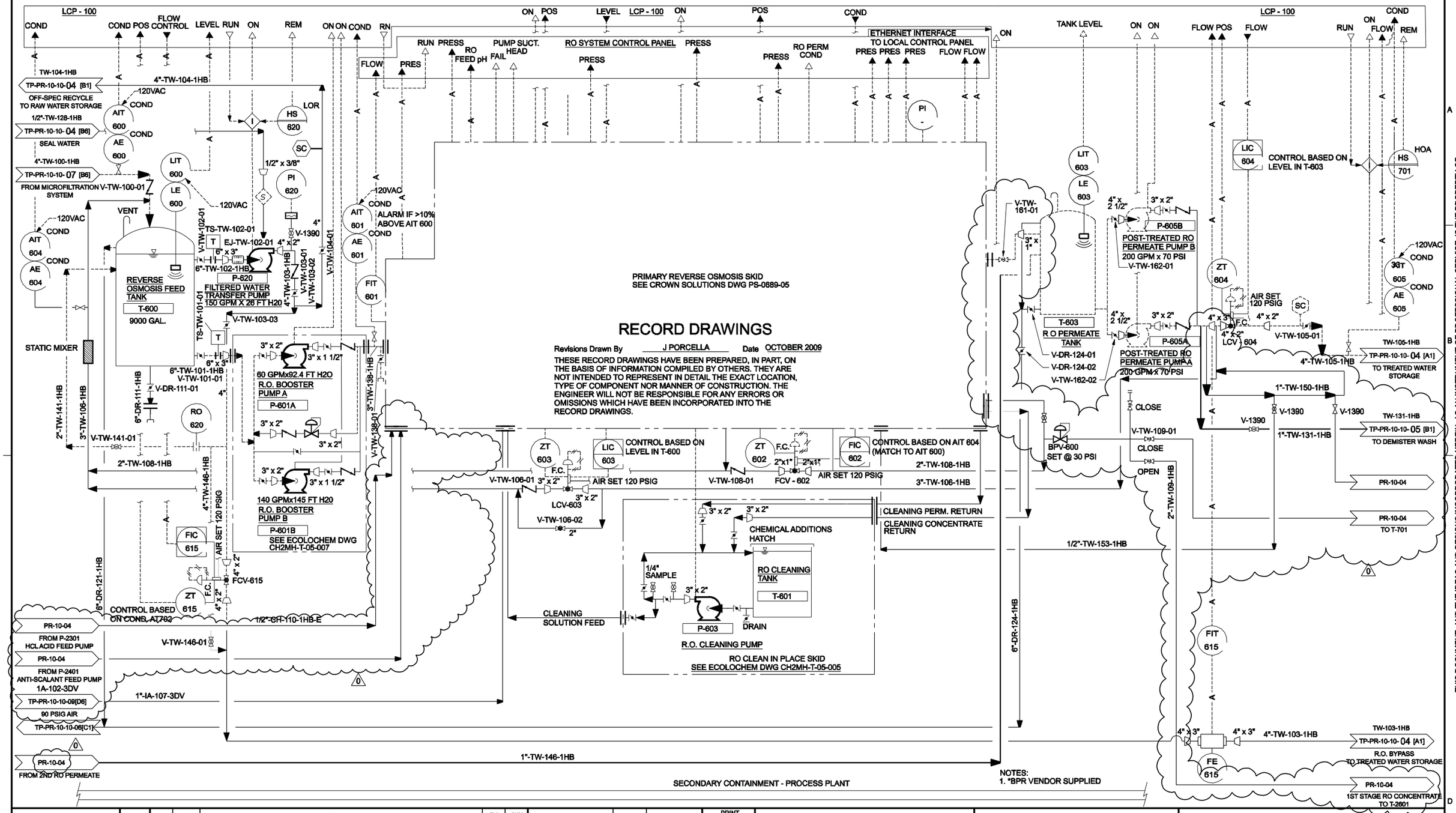
CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
SHEET 04
STORAGE AREA

DWG. NO. TP-PR-10-10-04 REV. 4

BAR IS ONE INCH ON ORIGINAL DRAWING

FILENAME: tppr101004.dwg PLOT DATE: 21-SEP-2005 PLOT TIME:



**
ORIGINALLY STAMPED AND SIGNED BY:
JOHN PORCELLA
CALIFORNIA PE NO. C70145
ON 04-01-2009
**

RESPONSIBLE ENGINEER: John Porcella C70145 Exp. 9-30-10
PE#

NO.	DATE	REVISION	BY	CHK
A	2/12/09	INTERNAL REVIEW		
B	2/12/09	CLIENT REVIEW		
C	4/01/09	FOR REVIEW AND APPROVAL	JR	JP
0	11/17/09	FINAL RECORD ISSUE	JR	JP

REVISION APPROVAL				REV 0	DATE 10/02/09
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE	
CIVIL	SJ	ELECTRICAL	FH	STATUS	
STRUCTURAL		INST & CONTROL	JG	REV.	
MECHANICAL	SJ	ARCHITECTURAL		CLIENT	
PROCESS	DF	ENVIRONMENTAL		FIELD	
PIPING	SJ	GEN. ARRANG.	SJ	INTRA CO.	

PRINT DISTRIBUTION

STATUS	REV	DATE	SDE	PEM
ISSUED				
PRELIMINARY	A	2/12/09	JP	JP
FOR REVIEW AND APPROVAL	C	4/01/09	JP	JP
APPROVED FOR CONSTRUCTION				
REVISED & APPROVED FOR CONSTRUCTION	0	10/02/09	JP	JP

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
PLANT PERFORMANCE IMPROVEMENTS

PROJ NO. 362032

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
REVERSE OSMOSIS SYSTEM
SHEET ONE OF TWO

DWG. NO. PR-10-03 REV. 0

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

FILENAME: PR-10-03.dgn PLOT DATE: 11/19/2009 PLOT TIME: 10:27:54 AM

COND LVL RUN ON FLOW

PR-10-03 — TO SEAL WATER TRUNK LINE

HOA HS 701

1 1/2" TW-154-1HB

PR-10-03 TO PRIMARY RO FROM P-2301 HCl ACID PUMP

LOCATED IN CHEMICAL STORAGE AREA

1/2" CH-112-1HB

HCl ACID TOTE

HYDRO-CHLORIC ACID (HCl) PUMP SKID SEE CROWN DWG PS-0689-03

FROM P-2302 3/8" CH-113-1HB

LOCATED NEAR EXISTING RO

1/2" CH-114-1HB

SECONDARY RO ANTI-SCALANT CHEMICAL DRUM

ANTISCALANT FEED PUMP SKID SEE CROWN DWG PS-0689-04

PRIMARY RO ANTI-SCALANT CHEMICAL DRUM

1/4" CH-115-1HB FROM P-2402

V-1390 NC

PR-10-03 TO PRIMARY RO FROM P-2401 ANTI-SCALANT FEED PUMP

1A-102-3DV TP-PR-10-10-09[06] 90 PSIG AIR

1"-1A-108-3DV

120VAC

AIT 701 COND

AE 701 COND

1 1/2" TW-152-1HB RECYCLE

1ST STAGE RO CONCENTATE PR-10-03

1 1/2"-TW-148-1HB

2"x1 1/2"

V-1390 NO

2" TW-109-1HB

V-1390 NC

T-2601 SECONDARY RO FEED TANK SEE CROWN DWG PS-0689-06

1 1/2" TW-149-1HB

V-1390 NC

P-2701 SECONDARY RO FEED PUMP SEE CROWN DWG PS-0689-07

1 1/2" TW-151-1HB

SECONDARY REVERSE OSMOSIS SKID SEE CROWN SOLUTION DWG: PS-0689-08 (NOTE 3)

1" TW-146-1HB

PERMEATE PR-10-03 TO T-603 TANK

V-1390

LIT 701

LE 701

120VAC

VENT

PI 701

SAMPLING STATION D

SC

PR-10-03 FROM PRIMARY RO

CLOSE

2"x1"

OPEN V-1390

V-DR-112-01

SEAL WATER

RO CONCENTRATE STORAGE TANK 7,200 GAL.

T-701 8000 GAL.

TS-TW-111-01

FIT 701

RD CONCENTRATE FLOWMETER

FE 701

V-1390

SOV 701

S

SEAL WATER TP-PR-10-10-08 [B6]

1/2"x3/8"

6"-DR-112-1HB

V-TW-111-01

T 6"x1 1/2"

EJ-TW-111-01

6"-TW-111-1HB P-107

3"x1" 3"x1" MAG 3"x2"

V-TW-112-01 V-TW-112-03

RO CONCENTRATE TRANSFER PUMP 80 GPM X 85 FT H20

TO TRENCH DRAIN

1" TW-147-1HB

TW-112-1RB TP-PR-10-10 [C1] RO CONCENTRATE

RECORD DRAWINGS

Revisions Drawn By J PORCELLA Date OCTOBER 2009

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

** ORIGINALLY STAMPED AND SIGNED BY: JOHN PORCELLA CALIFORNIA PE NO. C70145 ON 04-01-2009 **

RESPONSIBLE ENGINEER: John Porcella Exp. 9-30-10 C70145 PE #

NO.	DATE	REVISION	BY	CHK
A	2/12/09	INTERNAL REVIEW		
B	2/12/09	CLIENT REVIEW		
C	4/01/09	FOR REVIEW AND APPROVAL	JR	JP
0	11/17/09	FINAL RECORD ISSUE	JR	JP

REVISION APPROVAL		REV 0	DATE 10/02/09
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL	SJ	ELECTRICAL	FH
STRUCTURAL		INST & CONTROL	JG
MECHANICAL	SJ	ARCHITECTURAL	
PROCESS	DF	ENVIRONMENTAL	
PIPING	SJ	GEN. ARRANG.	SJ

PRINT DISTRIBUTION	
DATE	
STATUS	
REV.	
CLIENT	
FIELD	
INTRA CO.	

STATUS	REV	DATE	SDE	PEM
ISSUED				
PRELIMINARY	A	2/12/09	JP	JP
FOR REVIEW AND APPROVAL	C	4/01/09	JP	JP
APPROVED FOR CONSTRUCTION				
REVISED & APPROVED FOR CONSTRUCTION	0	10/02/09	JP	JP

SCALE NONE

PACIFIC GAS & ELECTRIC CO.
TOPOCK COMPRESSOR STATION
INTERIM MEASURE 3
PLANT PERFORMANCE IMPROVEMENTS

PROJ NO. 362032

CH2MHILL

PROCESS AND INSTRUMENTATION DIAGRAM
REVERSE OSMOSIS SYSTEM
SHEET TWO OF TWO

DWG. NO. PR-10-04 REV. 0

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

FILENAME: PR-10-04.dgn PLOT DATE: 11/19/2009 PLOT TIME: 10:28:26 AM

CONTROL PANEL

PLC

REM ON RUN REM ON RUN HI TORQUE REM ON RUN CLOSE OPEN REM REM OPEN OPEN LAH TURB OPEN REM RUN LVL ON REM REM LT ON RUNOPEN LAH RM OPEN REM LAH LAH

HS 400A LOR · HS 400B LOR · HS 400C LOR · HS 401 HOA · HS 402 LOR · HS 404 HOA

CH-109-1HB-E
TP-PR-10-10- 09 [C6]
POLYELECTROLYTE FEED CH-108-1HB-E
1/2"-CH-109-1HB-E
V-CH-109-01

TP-PR-10-10- 09 [C6]
POLYELECTROLYTE FEED
1/2"-CH-108-1HB-E
V-CH-108-01

RW-121-1HB
TP-PR-10-10- 05 [C6]
FROM CHEM REDUCTION AND COAGULATION SYSTEM IA-104-3DV
4"-RW-121-1HB

TP-PR-10-10- 09 [D6]
90 PSIG AIR
1"-IA-104-3DV

M-400-A · M-400-B · M-400-C · CL-400 CLARIFIER · NSH 400 TORQUE · HS 400 HOA · HS 410 HOA · AIT 400 120VAC TURB · SV 400 · ZSC 400 · ZSO 400 · AIR SET 120 PSIG · F. C. · FV - 400 · AE 400 TURB · SV 401 · 120 PSIG AIR SET · PI 401 · PE 401 · LE 402 · M-402 · 4"-WS-102-1HB

ZSC 410 · ZSO 410 · AIR SET 120 PSIG · SV 410 · F. C. · FV - 410 · V-WS-104-01 · 4"-WS-100-1HB

SEE PARKSON DRAWING 10066701-01

6"-DR-107-1HB

1/4" / 1" SLOPE TO PRE-TREATED WATER TANK

6"-RW-122-1HB
RW-122-1HB
TP-PR-10-10- 07 [B1]
MICROFILTRATION SYSTEM

120VAC LIT 402 · SV 404 · 120 PSIG AIR SET · HS 403 HOA · SV 403 · PI 404 · PE 404 · 1/2" · 2" x 1" · V-WS-103-01 · V-WS-103-02 · WS-103-1HB
TP-PR-10-10- 05 [B1]
SLUDGE RECYCLE

4" x 1" · P-404 SLUDGE RECYCLE PUMP 20 GPM X 30 FT. H2O · 2"-WS-103-1HB · V-WS-109-01 · 2"-WS-109-1HB

2"-WS-101-1HB · 2" x 1" · V-WS-101-01 · 4" x 2" · P-401 SLUDGE WITHDRAWAL PUMP 20 GPM X 30 FT. H2O · 6" x 4"

SLUDGE HOLDING TANK 6000 GAL · T-402 · VENT · DECANT · 3% - 5% SOLIDS · 2"-WS-105-1HB · V-WS-105-01 · 2"-WS-107-1HB · V-WS-107-01 · V-WS-108-01 · 4"-WS-108-1HB · P-403 SEPARATOR FEED PUMP 20 GPM X 30 FT. H2O · V-WS-110-01

2" x 1" · 2" x 1" · 2"-WS-106-1HB · V-WS-106-01 · 4"-WS-110-1HB · TRUCK FILL FOR OFF-SITE DISPOSAL

2" V-1790 (TYP 5) · 4" (TYP 5) AIR/SIGHT GAP · 4" · PI 403 · PE 403

TRENCH
TP-PR-10-10- 08 [D6]
R.O. GRAVITY DRAINS

DR-109-1HB
TP-PR-10-10- 07 [C6]
FROM M.F. SYSTEM GRAVITY DRAIN
3"-DR-109-1HB

TRENCH
TP-PR-10-10- 07 [D6]
FROM M.F. SYSTEM PRETREATED WATER TANK

4"-WS-104-1HB

DR-110-1HB
TP-PR-10-10- 07 [C6]
FILTER BACKWASH FROM MICROFILTRATION SYSTEM
4"-DR-110-1HB

TRENCH
TP-PR-10-10- 05 [D6]
GRAVITY DRAIN

TW-128-1HB
TP-PR-10-10- 04 [B6]
SEAL WATER
1/2"-TW-128-1HB

120VAC LIT 900 · LE 900 · 1/2" x 3/8" · VENT · PROCESS DRAIN TANK 5,000 GAL. T-900 · P-900 PROCESS DRAIN PUMP · V-DR-113-01 · 6"-DR-113-1HB · VERTICAL WET PIT 175 GPM x 37 FT. H2O · LSH 900

V-WS-111-02 · V-WS-111-03 · 4"-WS-111-1HB · V-WS-111-01 · PS-WS-111-01 · V-1390 · 1"-DR-106-1HB · V-WS-113-01 · 2"-WS-113-1HB · 4" x 2"

WS-111-1HB
TP-PR-10-10- 04 [B1]
TO RAW WATER STORAGE TANK

LSH 405B · FH-WS-106-01 · LSH 405A · SAMPLING STATION E

UNIT 2 CAKE CAKE · UNIT 1 CAKE CAKE · FH-WS-112-02 · 2"-WS-112-1HB · FH-WS-112-01

LSHH 405 · 480 VAC · LCP - 405 · P-405 PHASE SEPARATOR SUMP PUMP PACKAGE 25 GPM x 25 FT. H2O · PUMPOUT VAULT · PS-405 PHASE SEPARATORS ALTERNATING DURING OPERATION

SECONDARY CONTAINMENT - PROCESS PLANT

T-900A PROCESS SUMP

NOTES:

1. USE PORTABLE SUMP PUMP (OPERATIONS SUPPLIED) FOR PUMP OUT

NO.	DATE	REVISION	BY	CHK
0	07/28/04	FOR INTERNAL REVIEW	EFC	AJ
0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ

REVISION APPROVAL — REV 2 — DATE 01/23/05

DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE
CIVIL		ELECTRICAL		STATUS
STRUCTURAL		INST & CONTROL		REV.
MECHANICAL		ARCHITECTURAL		CLIENT
PROCESS		ENVIRONMENTAL		FIELD
PIPING		GEN. ARRANG.		INTRA CO.

PRINT DISTRIBUTION

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

STATUS	REV	DATE	SDE	PEM
ISSUED				
PRELIMINARY				
FOR REVIEW AND APPROVAL	D	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	2	01/23/05		

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 06
CLARIFICATION AND SLUDGE REMOVAL

DWG. NO. TP-PR-10-10-06 REV. 2

FILENAME: tppr101006.dwg PLOT DATE: 23-JAN-2005 PLOT TIME:

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

CONTROL PANEL LCP-100

WELL TW-3D CONTROL

WELL TW-2S CONTROL

WELL TW-2D CONTROL

WELL PE-1 CONTROL

LEAK DETECTION PANEL - 003

ALM

120V

LSH LVL RUN ON RM PRESS FLOW

LSH LSHH

HOA

HS 102

HS 100

HS 101

HS 103

HOLD

LSH 002

LSHH 002

4" IN 8"-RW-141-1KB

FUTURE

4"-RW-140-1HB

V-RW-140-01

NOTE 1

VALVE VAULT No. 2

4" IN 8"-RW-142-1KB

FUTURE

4"-RW-139-1HB

V-RW-139-01

NOTE 1

3"-RW-138-1HB

V-RW-138-01

3" IN 6"-RW-137-1KB

4"-RW-105-1HB

V-RW-105-05

4" IN 8"-FUTURE

4" IN 8"-RW-135-1KB

LSH 102A

NOTE 1

FI 102

LSH 001

LSHH 001

Well TW-2S Flowmeter

FE 100

FIT 100

PIT 100

PE 100

LT 100

VENT

3"x2"

V-RW-105-02

MAG

3"-RW-105-1HB THROTTLING

V-RW-105-01

V-1390

VALVE VAULT No. 1

LSH 100A

3" IN 6"-RW-104-1KB

NOTE 1

1" V-1390

4" x 3" 4"-RW-105-1HB

EJ-RW-105-01

Well TW-2D Flowmeter

FE 101

FIT 101

PIT 101

PE 101

LT 101

V-RW-102-02

3"-RW-102-1HB THROTTLING

V-RW-102-01

LSH 101A

3" IN 6"-RW-101-1KB

NOTE 1

4" IN 8" RW-127-1KB SPARE

4" IN 8" RW-127-1KB

TP-PR-10-10-04 [C1]

SPARE TO VALVE VAULT 4

NOTES 1 & 2

V-RW-105-06 THROTTLING

V-RW-105-03

V-RW-105-04

4" IN 8" RW-107-1KB

TP-PR-10-10-04 [C1]

TO RAW WATER STORAGE

V-RW-108-02 THROTTLING

Well PE-1 Flowmeter

FE 103

FIT 103

PIT 103

PE 103

LT 103

VENT

3"x2"

MAG

3"-RW-108-1HB

V-RW-130-02

V-RW-130-01

4"-RW-130-1HB

V-RW-108-01

V-1390

LSH

NOTE 1

4" IN 8"-RW-131-1KB

TO BAKER TANKS V-RW-131-01

LSH 103A

4" IN 8"-RW-133-1KB

NOTE 1

4"x3"

V-RW-132-02

PRV 103

PI 103

SET AT 120 PSI

V-1390

3"-RW-132-1HB

3"x2"

V-RW-132-01

WELL VAULT No. 3

LSH 103

LE 103

P-103

EXTRACTION WELL PE-1

40 GPM x 235 FT. H20

Well TW-3D Flowmeter

VENT

LT 102

PI 102

PIT 102

PE 102

FIT 102

FE 102

PRV 102

SET AT 120 PSI

V-1390

3"x2"

3"-RW-134-1HB

V-RW-134-01

MAG

4"x3"

V-RW-134-02

WELL VAULT No. 4

LSH 102

LE 102

P-102

EXTRACTION WELL TW-3D

135 GPM x 248 FT. H20

PI 100

V-1390

3"-RW-103-1HB

V-RW-103-01

V-RW-103-02

WELL VAULT No. 2

LSH 100

LE 100

P-100

EXTRACTION WELL TW-2S

40 GPM x 180 FT. H20

PRV 101

PI 101

SET AT 120 PSI

V-1390

3"-RW-100-1HB

V-RW-100-01

V-RW-100-02

WELL VAULT No. 1

LSH 101

LE 101

P-101

EXTRACTION WELL TW-2D

90 GPM x 245 FT. H20

NOTES

1. PROVIDE LEAK DETECTION AT LOWS AND/OR EVERY 500 FT.
2. INSTALL AIR RELEASE VALVES AT HIGH POINTS.

NO.	DATE	REVISION	BY	CHK
8	12/07/05	REMOVED PE-1 HOLDS	JBW	SDH
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ
3	03/16/05	DELETED NOTES. APPROVED FOR CONSTRUCTION	EFC	AJ
4	07/20/05	RELIEF VALVE SETTINGS. WELL PE-1 LINE TAGS. HOLDS REMOVED. APPROVED FOR CONSTRUCTION	EFC	AJ
5	09/27/05	FINAL RECORD ISSUE	EFC	AJ
6	10/06/05	REVISED FINAL RECORD – ADDED TW-3D	EFC	AJ
7	10/19/05	REVISED AS NOTED	EFC	AJ

REVISION APPROVAL		REV 8 DATE 12/06/05	
DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED
CIVIL	—	ELECTRICAL	—
STRUCTURAL	—	INST & CONTROL	—
MECHANICAL	AJ	ARCHITECTURAL	—
PROCESS	—	ENVIRONMENTAL	—
PIPING	SDH	GEN. ARRANG.	—

PRINT DISTRIBUTION: DATE / STATUS / REV. / CLIENT / FIELD / INTRA CO.

STATUS	REV	DATE	SDE	PEM
PRELIMINARY				
FOR REVIEW AND APPROVAL	D	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	7	12/9/05	AJ for KLM	AJ

SCALE NONE

RESPONSIBLE ENGINEER: Kenneth L. Martins CH4876 Exp. 6-30-06

REGISTERED PROFESSIONAL ENGINEER KENNETH L. MARTINS No. CH4876 CIVIL STATE OF CALIFORNIA

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

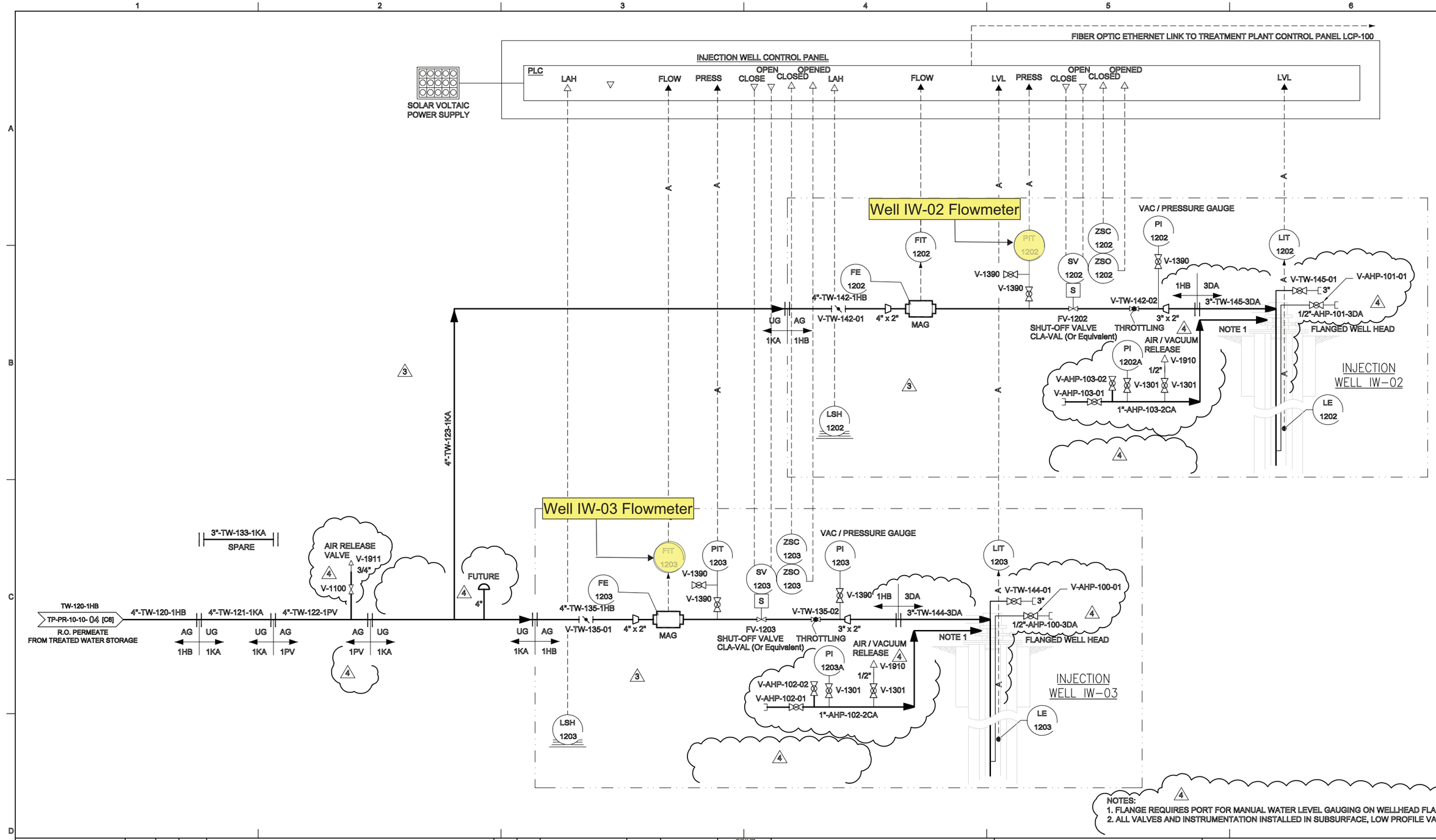
CH2MHILL

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

BAR IS ONE INCH
tppr101003.dwg 12/07/2005 01:06:58 PM

FILENAME: tppr101003.dwg PLOT DATE: 19-OCT-2005 PLOT TIME:



NO.	DATE	REVISION	BY	CHK	REVISION APPROVAL		REV 4	DATE 03/10/05		PRINT DISTRIBUTION	
A	07/28/04	FOR INTERNAL REVIEW	EFC	AJ	DISCIPLINE	REVIEWED	DISCIPLINE	REVIEWED	DATE		
0	09/03/04	APPROVED FOR CONSTRUCTION	EFC	AJ	CIVIL		ELECTRICAL		STATUS		
1	10/13/04	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	STRUCTURAL		INST & CONTROL		REV.		
2	01/23/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	MECHANICAL		ARCHITECTURAL		CLIENT		
3	02/14/05	REVISED AND APPROVED FOR CONSTRUCTION	EFC	AJ	PROCESS		ENVIRONMENTAL		FIELD		
4	03/10/05	REMOVED HOLD AND APPROVED FOR CONSTRUCTION	EFC	AJ	PIPING		GEN. ARRANG.		INTRA CO.		

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

STATUS				
ISSUED	REV	DATE	SDE	PEM
PRELIMINARY				
FOR REVIEW AND APPROVAL	A	07/28/04		
APPROVED FOR CONSTRUCTION	0	09/03/04	KLM	TP
REVISED & APPROVED FOR CONSTRUCTION	4	/ /		

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 11
INJECTION WELLS

DWG. NO. TP-PR-10-10-11 REV. 4

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

FILENAME: tppr101011.dwg PLOT DATE: 10-MAR-2005 PLOT TIME:

Appendix A
Semiannual Operations and Maintenance Log, July 1, 2016 through December 31, 2016

APPENDIX A

Semiannual Operations and Maintenance Log, July 1, 2016 through December 31, 2016

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 here. The times shown are in Pacific Standard Time (PST) to be consistent with other data collected at the site.

July 2016

During July 2016, extraction wells PE-1, TW-3D and TW-2D operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during July 2016. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 98.7 percent during the July 2016 reporting period.

The IM-3 facility treated approximately 6,043,434 gallons of extracted groundwater during July 2016. Two containers of solids from the IM-3 facility were transported offsite during July 2016.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 1.3 percent downtime during July 2016) are summarized below.

- **July 1, 2016 (unplanned):** The extraction well system was offline from 1:40 a.m. to 1:42 a.m. due to issues with the primary RO system. Extraction system downtime was 2 minutes.
- **July 1, 2016 (unplanned):** The extraction well system was offline from 11:56 a.m. to 12:04 p.m. to return to power from the City of Needles. Extraction system downtime was 8 minutes.
- **July 2, 2016 (unplanned):** The extraction well system was offline from 1:56 a.m. to 1:58 a.m. due to loss of power from the City of Needles. Plant was switched to generator power at this time. Extraction system downtime was 2 minutes.
- **July 2, 2016 (unplanned):** The extraction well system was offline from 6:30 a.m. to 6:38 a.m. to return to power from the City of Needles. The power was still out and the plant was returned to generator power at this time. Extraction system downtime was 8 minutes.
- **July 2, 2016 (unplanned):** The extraction well system was offline from 12:36 p.m. to 12:38 p.m. to return to power from the City of Needles. Extraction system downtime was 2 minutes.
- **July 5, 2016 (unplanned):** The extraction well system was offline from 6:00 p.m. to 7:46 p.m. due to an air compressor failure. Extraction system downtime was 1 hour, 46 minutes.
- **July 6, 2016 (planned):** The extraction well system was offline from 7:38 a.m. to 7:58 am, from 8:00 a.m. to 8:14 am, and from 8:18 a.m. to 8:22 a.m. for testing of critical alarms and the leak detection system. Extraction system downtime was 38 minutes.
- **July 6, 2016 (unplanned):** The extraction well system was offline from 9:48 a.m. to 10:58 a.m. to replace the microfilter modules. Extraction system downtime was 1 hour, 10 minutes.

- **July 6, 2016 (planned):** The extraction well system was offline from 1:54 p.m. to 1:56 p.m., 2:06 p.m. to 2:08 p.m., and 2:12 p.m. to 2:18 p.m. for extraction well sampling. Extraction system downtime was 10 minutes.
- **July 18, 2016 (unplanned):** The extraction well system was offline from 12:02 p.m. to 4:04 p.m. to replace the microfilter modules and repair the polymer transfer pump. Extraction system downtime was 4 hours, 2 minutes.
- **July 20, 2016 (unplanned):** The extraction well system was offline from 11:52 a.m. to 12:14 p.m. due to failure of the Clarifier Feed Pump (P-400). Extraction system downtime was 22 minutes.
- **July 26, 2016 (unplanned):** The extraction well system was offline from 10:32 p.m. to 10:36 p.m. and from 10:48 a.m. to 10:52 p.m. due to loss of power from the City of Needles. Plant was switched to generator power at this time. Extraction system downtime was 8 minutes.
- **July 27, 2016 (unplanned):** The extraction well system was offline from 8:56 a.m. to 9:00 a.m. to return to power from the City of Needles. Extraction system downtime was 4 minutes.
- **July 29, 2016 (unplanned):** The extraction well system was offline from 11:48 a.m. to 12:48 p.m. to replace the microfilter modules. Extraction system downtime was 1 hour.
- **July 30, 2016 (unplanned):** The extraction well system was offline from 2:58 a.m. to 3:02 a.m. due to loss of power from the City of Needles. Plant was switched to generator power at this time. Extraction system downtime was 4 minutes.
- **July 30, 2016 (unplanned):** The extraction well system was offline from 12:24 p.m. to 12:26 p.m. to return to power from the City of Needles. Extraction system downtime was 2 minutes.
- **July 30, 2016 (unplanned):** The extraction well system was offline from 12:42 p.m. to 12:48 p.m. due to loss of power from the City of Needles. Plant was switched to generator power at this time. Extraction system downtime was 6 minutes.
- **July 31, 2016 (unplanned):** The extraction well system was offline from 6:24 a.m. to 6:30 a.m. to return to power from the City of Needles. Extraction system downtime was 6 minutes.

August 2016

During August 2016, extraction wells TW-3D and PE-1 operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S and TW-2D were not operated during August 2016. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 83.5 percent during the August 2016 reporting period.

The IM-3 facility treated approximately 5,091,476 gallons of extracted groundwater during August 2016. Two containers of solids from the IM-3 facility were transported offsite during August 2016.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 16.5 percent downtime during August 2016) are summarized below.

- **August 2, 2016 (unplanned):** The extraction well system was offline from 2:24 a.m. to 6.36 a.m. due to loss of power from the City of Needles. Extraction system downtime was 4 hours, 12 minutes.
- **August 2, 2016 (unplanned):** The extraction well system was offline from 11:40 a.m. to 4:24 p.m. and from 6:18 p.m. to 7:40 p.m. to put the plant in recirculation due to low system pH readings. Extraction system downtime was 6 hours, 6 minutes.

- **August 3, 2016 (planned):** The extraction well system was offline from 9:02 a.m. to 9:06 a.m., from 9:10 a.m. to 9:14 a.m., from 9:22 a.m. to 9:32 a.m., from 9:34 a.m. to 9:40 a.m., and from 9:42 a.m. to 9:44 a.m. for testing of critical alarms and the leak detection system. Extraction system downtime was 26 minutes.
- **August 3, 2016 (unplanned):** The extraction well system was offline from 10:24 a.m. to 10:36 a.m. to perform a check of the extraction well vault leak detection systems. Extraction system downtime was 12 minutes.
- **August 3, 2016 (unplanned):** The extraction well system was offline from 7:00 p.m. to 7:20 p.m. due to loss of power from the City of Needles. The plant was switched to generator power at this time. Extraction system downtime was 20 minutes.
- **August 4, 2016 (unplanned):** The extraction well system was offline from 10:24 a.m. to 10:28 a.m. to return to power from the City of Needles. Extraction system downtime was 4 minutes.
- **August 7-11, 2016 (planned):** The extraction well system was offline from 4:18 a.m. on August 7, 2016 to 2:48 p.m. on August 10, 2016, from 3:50 p.m. on August 10, 2016 to 6:58 a.m. on August 11, 2016, and from 8:44 a.m. to 2:10 p.m. on August 11, 2016 for semiannual scheduled maintenance. Extraction system downtime was 4 days, 7 hours, and 4 minutes.
- **August 14, 2016 (unplanned):** The extraction well system was offline from 2:50 p.m. to 3:10 p.m. due to failure of a pump in the ferrous injection system. The pump was adjusted and restarted. Extraction system downtime was 20 minutes.
- **August 15, 2016 (unplanned):** The extraction well system was offline from 2:12 a.m. to 2:34 a.m. due to failure of a pump in the ferrous injection system. The back pressure valve was replaced. Extraction system downtime was 22 minutes.
- **August 15, 2016 (unplanned):** The extraction well system was offline from 11:56 a.m. to 3:20 p.m. to replace the microfilter modules and replace the impeller in the Clarifier Feed Pump (P-400). Extraction system downtime was 3 hours, 24 minutes.
- **August 16, 2016 (unplanned):** The extraction well system was offline from 11:58 a.m. to 2:00 p.m. to replace a seal in the Clarifier Feed Pump (P-400). Extraction system downtime was 2 hours, 2 minutes.
- **August 16, 2016 (unplanned):** The extraction well system was offline from 10:56 p.m. to 10:58 p.m. due to failure of a pump in the ferrous injection system. The pump was adjusted and restarted. Extraction system downtime was 2 minutes.
- **August 25, 2016 (unplanned):** The extraction well system was offline from 12:30 p.m. to 1:28 p.m. to replace the microfilter modules. Extraction system downtime was 58 minutes.
- **August 26, 2016 (unplanned):** The extraction well system was offline from 9:56 p.m. to 10:00 p.m. to switch plant to generator power due to storms in the area. Extraction system downtime was 4 minutes.
- **August 28, 2016 (unplanned):** The extraction well system was offline from 12:14 a.m. to 12:30 a.m. due to loss of power from the City of Needles. Plant was switched to generator power at this time. Extraction system downtime was 16 minutes.
- **August 30, 2016 (unplanned):** The extraction well system was offline from 5:06 p.m. to 5:18 p.m. due to loss of power from the City of Needles. Extraction system downtime was 12 minutes.

- **August 31, 2016 (unplanned):** The extraction well system was offline from 7:56 a.m. to 8:26 a.m. due to a high-level alarm in the Raw Water Storage Tank (T-100). Extraction system downtime was 30 minutes.

September 2016

During September 2016, extraction wells TW-3D and PE-1 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 September 2016. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 99.1 percent during the September 2016 reporting period.

The IM-3 facility treated approximately 5,787,413 gallons of extracted groundwater during September 2016. The IM-3 facility treated 420 gallons of purge water from groundwater sampling activities. Three containers of solids from the IM-3 facility were transported offsite during September 2016.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 0.9 percent downtime during September 2016) are summarized below.

- **September 3, 2016 (unplanned):** The extraction well system was offline from 6:28 a.m. to 6:50 a.m. to replace the Reverse Osmosis system pre-filters. Extraction system downtime was 22 minutes.
- **September 14, 2016 (unplanned):** The extraction well system was offline from 7:54 a.m. to 9:30 a.m. to replace the microfilter modules. Extraction system downtime was 1 hour, 36 minutes.
- **September 16, 2016 (unplanned):** The extraction well system was offline from 3:38 a.m. to 3:40 a.m. due to loss of power from the City of Needles. Extraction system downtime was 2 minutes.
- **September 21, 2016 (unplanned):** The extraction well system was offline from 7:34 a.m. to 9:18 a.m. to replace the microfilter modules. Extraction system downtime was 1 hour, 44 minutes.
- **September 28, 2016 (unplanned):** The extraction well system was offline from 7:10 a.m. to 7:28 a.m. for Needles Power to replace the electrical taps at the transformer. Extraction system downtime was 18 minutes.
- **September 28, 2016 (unplanned):** The extraction well system was offline from 3:36 p.m. to 5:16 p.m. due to a high-level alarm in the Raw Water Storage Tank (T-100). Extraction system downtime was 1 hour, 40 minutes.
- **September 29, 2016 (unplanned):** The extraction well system was offline from 7:04 p.m. to 7:16 p.m. due to a high level alarm in the Raw Water Storage Tank (T-100). Extraction system downtime was 12 minutes.
- **September 30, 2016 (unplanned):** The extraction well system was offline from 6:20 p.m. to 7:02 p.m. due to a high-level alarm in the Raw Water Storage Tank (T-100). Extraction system downtime was 42 minutes.

October 2016

During October 2016, extraction wells TW-3D and PE-1 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 October 2016. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 97.9 percent during the October 2016 reporting period.

The IM-3 facility treated approximately 5,891,923 gallons of extracted groundwater during October 2016. The IM-3 facility treated 520 gallons of purge water and 9,900 gallons of water from injection well backwashing/re-development.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 2.1 percent downtime during October 2016) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **October 1, 2016 (unplanned):** The extraction well system was offline from 9:08 a.m. to 10:14 a.m. to replace the microfilter modules. Extraction system downtime was 1 hour, 6 minutes.
- **October 5, 2016 (unplanned):** The extraction well system was offline from 10:12 a.m. to 10:50 a.m. due to a high level alarm in the Raw Water Storage Tank (T-100) caused by a level management issue from the clean-in-place return. Extraction system downtime was 38 minutes.
- **October 6, 2016 (unplanned):** The extraction well system was offline from 9:36 a.m. to 10:58 a.m. to replace the flow meter in the Treated Water Transfer Pump (P-700). Extraction system downtime was 1 hour, 22 minutes.
- **October 7, 2016 (unplanned):** The extraction well system was offline from 10:26 a.m. to 11:20 a.m. to replace the microfilter modules. Extraction system downtime was 54 minutes.
- **October 17, 2016 (unplanned):** The extraction well system was offline from 11:26 a.m. to 1:24 p.m. to replace the microfilter modules. Extraction system downtime was 1 hour, 58 minutes.
- **October 24, 2016 (unplanned):** The extraction well system was offline from 6:18 p.m. to 6:20 p.m. to switch the plant to generator power due to a nearby storm. Extraction system downtime was 2 minutes.
- **October 25, 2016 (unplanned):** The extraction well system was offline from 3:12 a.m. to 4:20 a.m. to return the plant to power from the City of Needles. Extraction system downtime was 1 hour, 8 minutes.
- **October 29, 2016 (unplanned):** The extraction well system was offline from 6:54 a.m. to 10:54 a.m. to change microfilter modules. Extraction system downtime was 4 hours.
- **October 29, 2016 (unplanned):** The extraction well system was offline from 11:12 a.m. to 11:54 a.m. to address leaks in microfilter module. Extraction system downtime was 42 minutes.
- **October 29, 2016 (unplanned):** The extraction well system was offline from 12:18 p.m. to 12:54 p.m. due to electrical failure shutting down the Filtered Water Transfer Pump (P-620). Extraction system downtime was 36 minutes.
- **October 29, 2016 (unplanned):** The extraction well system was offline from 2:26 p.m. to 2:46 p.m., from 3:18 p.m. to 5:12 p.m., from 5:24 p.m. to 6:14 p.m. and from 7:50 p.m. to 8:00 p.m. to troubleshoot issues with the microfilter modules and replace the valve on the microfilter system. Extraction system downtime totalled 3 hours, 14 minutes.

November 2016

During November 2016, extraction wells TW-3D and PE-1 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 November 2016. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 99.4 percent during the November 2016 reporting period.

The IM-3 facility treated approximately 5,820,348 gallons of extracted groundwater during November 2016. The IM-3 facility treated 27,900 gallons of water from injection well backwashing/ re-development. Two containers of solids from the IM-3 facility were transported offsite during November 2016.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 0.6 percent downtime during November 2016) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **November 2, 2016 (planned):** The extraction well system was offline from 8:14 a.m. to 8:46 a.m. for testing of critical alarms and the leak detection system. Extraction system downtime was 32 minutes.
- **November 7, 2016 (unplanned):** The extraction well system was offline from 7:48 p.m. to 8:16 p.m. to change pre filters on primary reverse osmosis system. Extraction system downtime was 28 minutes.
- **November 10, 2016 (unplanned):** The extraction well system was offline from 10:46 a.m. to 12:12 p.m. to replace the microfilter modules. Extraction system downtime was 1 hour 26 minutes.
- **November 17, 2016 (unplanned):** The extraction well system was offline from 10:25 a.m. to 10:35 a.m. due to a human-machine interface (HMI) server restart. Extraction system downtime was 10 minutes.
- **November 23, 2016 (unplanned):** The extraction well system was offline from 5:56 p.m. to 7:28 p.m. for tank level management issue. Extraction system downtime was 1 hour, 32 minutes.
- **November 28, 2016 (planned):** The extraction well system data were not recorded from 9:08 a.m. to 9:20 a.m., from 11:02 a.m. to 11:14 a.m., and from 11:42 a.m. to 11:56 a.m. due to maintenance on the HMI and supervisory control and data acquisition (SCADA) systems. All records indicate that the extraction wells were running during this time. Extraction well system information was unavailable for 38 minutes.
- **November 30, 2016 (unplanned):** The extraction well system was offline from 11:14 a.m. to 11:38 a.m. to gather extraction well specific capacity and water level measurements for hydrogeologic evaluation. Extraction system downtime was 24 minutes.

December 2016

During December 2016, extraction wells TW-3D and PE-1 operated at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2S and TW-2D were operated briefly on December 13, 2016 for annual groundwater sampling. The operational run time for the IM-3 groundwater extraction system (combined or individual pumping) was 99.2 percent during the December 2016 reporting period.

The IM-3 facility treated approximately 6,027,672 gallons of extracted groundwater during December 2016. The IM-3 facility treated 1,570 gallons of purge water during December 2016. Two containers of solids from the IM-3 facility were transported offsite during December 2016.

Periods of planned and unplanned extraction system down time (that together resulted in approximately 0.8 percent downtime during December 2016) are summarized below. The times shown are in PST to be consistent with other data collected (e.g., water level data) at the site.

- **December 7, 2016 (planned):** The extraction well system was offline from 9:16 a.m. to 9:44 a.m. and again from 9:46 a.m. to 9:48 a.m. due to test critical alarms. Extraction system downtime was 30 minutes.
- **December 9, 2016 (unplanned):** The extraction well system was offline from 4:56 a.m. to 5:22 a.m. to change the pre-filter on the reverse osmosis unit. Extraction system downtime was 26 minutes.
- **December 13, 2016 (planned):** The extraction well system was offline from 10:56 a.m. to 11:04 a.m. and again from 11:08 a.m. to 11:20 a.m. to facilitate quarterly sampling. Extraction system downtime was 20 minutes.
- **December 14, 2016 (unplanned):** The extraction well system was offline from 10:14 a.m. to 1:02 p.m. to replace the microfilter modules and repair the primary reverse osmosis unit. Extraction system downtime was 2 hours, 48 minutes.
- **December 23, 2016 (unplanned):** The extraction well system was offline from 11:48 a.m. to 11:54 p.m. due to a power outage, changed plant over to generator power. Extraction system downtime was 6 minutes.
- **December 30, 2016 (unplanned):** The extraction well system was offline from 9:04 a.m. to 9:30 a.m. due to a blockage requiring maintenance in the 301 Tanks. Extraction system downtime was 34 minutes.
- **December 31, 2016 (unplanned):** The extraction well system was offline from 1:24 p.m. to 2:26 p.m. for managing water levels in the Raw Water Storage tank (T-100). Extraction system downtime was 1 hour, 2 minutes.

Appendix B
Daily Volumes of Groundwater Treated

July 2016 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)
July	1	2016	--	--	187,228	5,457	192,685	0	191,903	191,903	0
July	2	2016	--	--	191,720	0	191,720	0	184,925	184,925	4,001
July	3	2016	--	--	195,561	0	195,561	0	191,351	191,351	0
July	4	2016	--	--	198,019	0	198,019	0	193,849	193,849	3,939
July	5	2016	--	--	183,638	58	183,697	0	187,249	187,249	0
July	6	2016	--	125	180,318	824	181,266	0	177,340	177,340	3,599
July	7	2016	--	--	199,115	0	199,115	0	192,812	192,812	0
July	8	2016	--	--	198,485	0	198,485	0	192,053	192,053	5,643
July	9	2016	--	--	197,945	0	197,945	0	195,802	195,802	0
July	10	2016	--	--	197,790	0	197,790	0	200,703	200,703	3,743
July	11	2016	--	--	197,764	0	197,764	0	198,681	198,681	0
July	12	2016	--	--	197,670	0	197,670	0	191,093	191,093	3,824
July	13	2016	--	--	197,550	0	197,550	0	198,206	198,206	0
July	14	2016	--	--	197,349	0	197,349	0	193,532	193,532	3,955
July	15	2016	--	--	197,171	0	197,171	0	195,727	195,727	3,646
July	16	2016	--	--	197,120	0	197,120	0	192,699	192,699	0
July	17	2016	--	--	197,430	0	197,430	0	192,038	192,038	4,112
July	18	2016	--	--	164,548	0	164,548	0	163,861	163,861	0
July	19	2016	--	--	198,239	0	198,239	0	193,655	193,655	4,004
July	20	2016	--	--	194,868	0	194,868	0	194,325	194,325	0
July	21	2016	--	--	197,474	0	197,474	0	196,264	196,264	4,683
July	22	2016	--	--	196,621	0	196,621	0	192,378	192,378	0
July	23	2016	--	--	195,888	0	195,888	0	192,916	192,916	3,806
July	24	2016	--	--	195,735	0	195,735	0	194,784	194,784	0
July	25	2016	--	--	195,819	0	195,819	0	193,421	193,421	3,816
July	26	2016	--	--	173,205	24,632	197,837	0	191,602	191,602	0
July	27	2016	--	--	158,823	42,782	201,605	0	196,611	196,611	0
July	28	2016	--	--	157,998	42,334	200,332	0	197,533	197,533	4,016
July	29	2016	--	--	149,868	40,337	190,205	0	195,317	195,317	0
July	30	2016	--	--	154,416	43,122	197,539	0	194,558	194,558	0
July	31	2016	--	--	156,128	42,259	198,387	0	200,339	200,339	0
Total Monthly Volumes (gallons)			**0**	**125**	**5,801,504**	**241,805**	**6,043,434**	**0**	**5,967,525**	**5,967,525**	**56,787**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**130.0**	**5.4**	**135.4**	**0.0**	**133.7**	**133.7**	**1.3**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during July 2016 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction well TW-2S was not operated during July 2016.

b. Effluent was discharged into injection well IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during July 2016 is approximately 0.32 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.

August 2016 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)
August	1	2016	--	--	182,770	14,191	196,961	0	205,337	205,337	0
August	2	2016	--	--	112,472	0	112,472	57,482	53,093	110,575	1,186
August	3	2016	--	--	188,961	1,220	190,182	194,200	980	195,181	2,801
August	4	2016	--	--	199,665	0	199,665	197,065	0	197,065	4,001
August	5	2016	--	--	198,368	0	198,368	196,726	0	196,726	0
August	6	2016	--	--	196,725	0	196,725	189,229	0	189,229	3,841
August	7	2016	--	--	35,247	0	35,247	56,713	0	56,713	0
August	8	2016	--	--	0	0	0	0	0	0	0
August	9	2016	--	--	0	0	0	0	0	0	0
August	10	2016	--	--	8,409	0	8,409	0	0	0	3,823
August	11	2016	--	--	94,836	0	94,836	84,134	0	84,134	0
August	12	2016	--	--	196,449	0	196,449	198,039	0	198,039	3,971
August	13	2016	--	--	195,828	0	195,828	194,000	0	194,000	1,241
August	14	2016	--	--	192,860	0	192,860	193,091	0	193,091	2,731
August	15	2016	--	--	164,778	0	164,778	166,321	0	166,321	4,276
August	16	2016	--	--	162,689	17,055	179,745	188,139	0	188,139	3,810
August	17	2016	--	--	155,527	42,489	198,016	200,189	0	200,189	0
August	18	2016	--	--	156,035	42,537	198,572	200,852	0	200,852	0
August	19	2016	--	--	155,643	41,785	197,428	198,630	0	198,630	0
August	20	2016	--	--	155,081	41,824	196,905	198,155	0	198,155	0
August	21	2016	--	--	155,281	41,642	196,923	198,265	0	198,265	0
August	22	2016	--	--	155,903	41,586	197,489	198,909	0	198,909	0
August	23	2016	--	--	155,708	41,491	197,198	196,907	0	196,907	0
August	24	2016	--	--	155,365	41,319	196,684	196,447	0	196,447	0
August	25	2016	--	--	167,516	21,601	189,117	191,470	0	191,470	3,310
August	26	2016	--	--	197,146	0	197,146	199,567	0	199,567	0
August	27	2016	--	--	177,435	20,591	198,026	195,040	0	195,040	4,050
August	28	2016	--	--	154,333	36,651	190,983	195,464	0	195,464	0
August	29	2016	--	--	155,950	36,804	192,754	203,853	0	203,853	0
August	30	2016	--	--	165,136	26,098	191,234	189,768	0	189,768	0
August	31	2016	--	--	190,475	0	190,475	189,469	0	189,469	0
Total Monthly Volumes (gallons)			**0**	**0**	**4,582,592**	**508,884**	**5,091,476**	**4,868,122**	**259,411**	**5,127,532**	**39,042**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**102.7**	**11.4**	**114.1**	**109.1**	**5.8**	**114.9**	**0.9**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during August 2016 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 August 2016.

b. Effluent was discharged into injection wells IW-02 and IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during August 2016 is approximately 1.47 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.

September 2016 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)
September	1	2016	--	--	194,306	0	194,306	195,588	0	195,588	4,053
September	2	2016	--	--	193,803	0	193,803	195,312	0	195,312	3,707
September	3	2016	--	--	190,232	0	190,232	191,553	0	191,553	0
September	4	2016	--	--	193,182	0	193,182	194,903	0	194,903	3,853
September	5	2016	--	--	193,180	0	193,180	195,736	0	195,736	0
September	6	2016	--	--	194,558	0	194,558	190,917	0	190,917	4,151
September	7	2016	--	--	179,147	20,253	199,400	195,138	0	195,138	0
September	8	2016	--	--	156,773	39,072	195,845	194,598	0	194,598	0
September	9	2016	--	--	154,348	39,693	194,040	203,487	0	203,487	0
September	10	2016	--	--	154,097	39,740	193,837	195,484	0	195,484	0
September	11	2016	--	--	154,090	39,685	193,775	197,289	0	197,289	3,775
September	12	2016	--	--	154,133	39,718	193,851	196,420	0	196,420	0
September	13	2016	--	--	154,162	39,510	193,672	194,915	0	194,915	0
September	14	2016	--	--	144,019	36,956	180,975	179,242	0	179,242	0
September	15	2016	--	--	154,237	39,342	193,579	194,114	0	194,114	1,263
September	16	2016	--	--	154,434	38,541	192,975	200,608	0	200,608	0
September	17	2016	--	--	156,354	37,969	194,323	191,425	0	191,425	0
September	18	2016	--	--	158,367	37,563	195,930	198,985	0	198,985	0
September	19	2016	--	--	158,346	37,427	195,773	196,596	0	196,596	0
September	20	2016	--	--	158,282	37,541	195,823	195,405	0	195,405	0
September	21	2016	--	--	146,398	35,581	181,979	184,781	0	184,781	0
September	22	2016	--	--	159,842	36,237	196,079	200,487	0	200,487	0
September	23	2016	--	--	161,601	34,098	195,699	196,424	0	196,424	0
September	24	2016	--	--	161,492	33,747	195,240	198,786	0	198,786	0
September	25	2016	--	--	161,397	33,605	195,002	198,660	0	198,660	0
September	26	2016	--	--	161,362	33,323	194,685	198,138	0	198,138	0
September	27	2016	--	--	161,426	33,221	194,647	191,041	0	191,041	0
September	28	2016	--	--	160,019	18,493	178,512	184,522	0	184,522	0
September	29	2016	--	--	193,231	0	193,231	180,678	0	180,678	0
September	30	2016	--	--	189,283	0	189,283	195,947	0	195,947	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,006,099**	**781,313**	**5,787,413**	**5,827,182**	**0**	**5,827,182**	**20,802**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**115.9**	**18.1**	**134.0**	**134.9**	**0.0**	**134.9**	**0.5**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during September 2016 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 September 2016.

b. Effluent was discharged into injection well IW-02.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during September 2016 is approximately 1.05 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.

October 2016 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)
October	1	2016	--	--	186,029	0	186,029	187,175	0	187,175	3,972
October	2	2016	--	--	195,186	0	195,186	193,678	0	193,678	3,952
October	3	2016	--	--	195,450	0	195,450	199,814	0	199,814	0
October	4	2016	--	--	195,279	208	195,487	187,640	0	187,640	4,042
October	5	2016	--	--	189,951	0	189,951	198,092	1,991	200,083	3,973
October	6	2016	--	--	160,848	19,270	180,118	186,533	0	186,533	0
October	7	2016	--	--	149,665	37,927	187,592	187,796	0	187,796	0
October	8	2016	--	--	155,384	39,411	194,795	195,330	0	195,330	0
October	9	2016	--	--	155,188	39,310	194,499	198,893	0	198,893	0
October	10	2016	--	--	155,174	39,150	194,323	198,784	0	198,784	0
October	11	2016	--	--	155,187	39,101	194,289	197,594	0	197,594	3,686
October	12	2016	--	--	155,306	39,058	194,364	196,742	0	196,742	0
October	13	2016	--	--	155,327	38,959	194,286	194,725	0	194,725	0
October	14	2016	--	--	155,151	38,885	194,035	195,818	0	195,818	0
October	15	2016	--	--	154,951	38,904	193,855	187,550	0	187,550	0
October	16	2016	--	--	154,979	38,903	193,882	201,289	0	201,289	0
October	17	2016	--	--	142,453	35,537	177,991	181,322	0	181,322	0
October	18	2016	--	--	155,381	38,320	193,701	192,651	0	192,651	0
October	19	2016	--	--	155,280	38,186	193,466	194,856	0	194,856	0
October	20	2016	--	--	155,153	38,062	193,215	197,088	0	197,088	0
October	21	2016	--	--	154,925	37,970	192,895	197,741	0	197,741	0
October	22	2016	--	--	154,490	38,069	192,559	196,509	0	196,509	0
October	23	2016	--	--	154,385	38,179	192,564	189,630	0	189,630	0
October	24	2016	--	--	154,772	38,192	192,964	187,023	0	187,023	0
October	25	2016	--	--	147,940	36,193	184,133	194,988	0	194,988	0
October	26	2016	--	--	156,503	37,453	193,956	190,146	1,670	191,816	0
October	27	2016	--	--	157,292	37,217	194,509	195,416	0	195,416	0
October	28	2016	--	--	157,142	37,150	194,293	200,594	0	200,594	0
October	29	2016	--	--	101,176	24,168	125,345	131,644	0	131,644	0
October	30	2016	--	--	158,586	37,643	196,229	190,265	0	190,265	0
October	31	2016	--	--	158,339	37,625	195,964	197,966	0	197,966	0
Total Monthly Volumes (gallons)			**0**	**0**	**4,932,872**	**959,052**	**5,891,923**	**5,945,290**	**3,661**	**5,948,951**	**19,625**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**110.5**	**21.5**	**132.0**	**133.2**	**0.1**	**133.3**	**0.4**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during October 2016 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 October 2016.

b. Effluent was discharged into injection wells IW-02 and IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during October 2016 is approximately 1.3 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.

November 2016 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)
November	1	2016	--	--	158,276	37,605	195,881	203,145	0	203,145	0
November	2	2016	--	--	178,493	12,564	191,056	194,578	0	194,578	0
November	3	2016	--	--	195,532	0	195,532	199,282	0	199,282	0
November	4	2016	--	--	195,866	0	195,866	198,852	0	198,852	0
November	5	2016	--	--	195,991	0	195,991	187,165	0	187,165	4,036
November	6	2016	--	--	196,118	0	196,118	201,914	0	201,914	1,544
November	7	2016	--	--	169,559	22,204	191,764	191,269	0	191,269	2,239
November	8	2016	--	--	152,734	42,310	195,043	196,896	0	196,896	0
November	9	2016	--	--	155,735	38,946	194,681	195,492	0	195,492	0
November	10	2016	--	--	149,588	33,364	182,952	184,488	0	184,488	0
November	11	2016	--	--	147,803	34,540	182,344	126,776	72,138	198,914	0
November	12	2016	--	--	160,270	32,720	192,991	0	195,177	195,177	0
November	13	2016	--	--	158,349	32,808	191,158	143,927	56,131	200,058	0
November	14	2016	--	--	160,462	32,558	193,019	210,149	0	210,149	0
November	15	2016	--	--	160,300	32,469	192,769	210,222	0	210,222	0
November	16	2016	--	--	162,267	32,105	194,372	210,222	0	210,222	0
November	17	2016	--	--	181,671	13,456	195,127	210,222	0	210,222	0
November	18	2016	--	--	195,228	0	195,228	210,222	0	210,222	0
November	19	2016	--	--	195,464	0	195,464	210,222	0	210,222	3,741
November	20	2016	--	--	195,604	0	195,604	210,222	0	210,222	0
November	21	2016	--	--	195,631	0	195,631	210,222	0	210,222	3,863
November	22	2016	--	--	174,953	23,798	198,752	210,222	0	210,222	3,987
November	23	2016	--	--	155,829	30,888	186,718	210,222	0	210,222	0
November	24	2016	--	--	166,649	32,430	199,078	210,222	0	210,222	0
November	25	2016	--	--	166,353	31,997	198,350	210,222	0	210,222	0
November	26	2016	--	--	166,220	31,707	197,927	210,222	0	210,222	0
November	27	2016	--	--	166,142	31,484	197,625	210,222	0	210,222	0
November	28	2016	--	--	161,636	30,614	192,250	80,001	0	80,001	0
November	29	2016	--	--	165,951	31,461	197,413	0	0	0	0
November	30	2016	--	--	178,971	14,673	193,644	0	122,804	122,804	0
Total Monthly Volumes (gallons)			**0**	**0**	**5,163,646**	**656,701**	**5,820,348**	**5,246,821**	**446,250**	**5,693,070**	**19,409**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**119.5**	**15.2**	**134.7**	**121.5**	**10.3**	**131.8**	**0.4**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during November 2016 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 November 2016.

b. Effluent was discharged into injection wells IW-02 and IW-03.

c. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during November 2016 is approximately 1.85 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.

December 2016 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)
December	1	2016	--	--	197,233	0	197,233	0	193,684	193,684	0
December	2	2016	--	--	197,247	0	197,247	0	192,392	192,392	0
December	3	2016	--	--	197,161	0	197,161	0	194,705	194,705	3,706
December	4	2016	--	--	197,141	0	197,141	0	195,688	195,688	3,996
December	5	2016	--	--	196,954	0	196,954	0	197,506	197,506	0
December	6	2016	--	--	172,422	23,756	196,178	0	198,048	198,048	0
December	7	2016	--	--	152,071	39,301	191,373	0	197,429	197,429	0
December	8	2016	--	--	155,132	39,807	194,939	0	188,808	188,808	4,840
December	9	2016	39	--	172,385	19,813	192,238	0	188,642	188,642	0
December	10	2016	--	--	196,766	0	196,766	0	192,597	192,597	0
December	11	2016	--	--	196,893	0	196,893	0	192,921	192,921	0
December	12	2016	--	--	196,987	0	196,987	105,701	97,600	203,300	3,909
December	13	2016	81	87	193,944	45	194,157	204,027	0	204,027	0
December	14	2016	--	--	174,566	0	174,566	175,866	0	175,866	3,949
December	15	2016	--	--	197,911	0	197,911	199,864	0	199,864	0
December	16	2016	--	--	196,802	0	196,802	205,143	114	205,257	3,984
December	17	2016	--	--	195,545	0	195,545	204,867	38	204,905	0
December	18	2016	--	--	195,140	0	195,140	193,870	360	194,230	3,911
December	19	2016	--	--	183,296	13,143	196,439	199,503	0	199,503	0
December	20	2016	--	--	167,466	30,540	198,006	211,065	32	211,097	0
December	21	2016	--	--	165,719	30,073	195,792	193,269	0	193,269	2,586
December	22	2016	--	--	164,961	29,709	194,670	195,752	0	195,752	0
December	23	2016	--	--	162,309	31,024	193,333	195,618	3,562	199,180	0
December	24	2016	--	--	160,819	33,563	194,382	206,147	0	206,147	0
December	25	2016	--	--	160,558	33,250	193,808	203,565	0	203,565	0
December	26	2016	--	--	160,448	33,076	193,524	201,795	0	201,795	0
December	27	2016	--	--	160,484	32,851	193,335	198,008	0	198,008	0
December	28	2016	--	--	172,538	21,202	193,740	199,901	47	199,948	0
December	29	2016	--	--	195,298	0	195,298	200,012	0	200,012	0
December	30	2016	--	--	191,490	0	191,490	196,057	0	196,057	0
December	31	2016	71	--	188,555	0	188,626	195,346	0	195,346	3,829
Total Monthly Volumes (gallons)			**191**	**87**	**5,616,241**	**411,153**	**6,027,672**	**3,885,376**	**2,234,173**	**6,119,549**	**34,709**
Average Pump/Injection Rates (gpm)			**0.0**	**0.0**	**125.8**	**9.2**	**135.0**	**87.0**	**50.0**	**137.1**	**0.8**

NOTES: gpm: gallons per minute RO: Reverse Osmosis

a. Extraction wells TW-3D and PE-1 were operated during December 2016 at a target pump rate of 135 gpm excluding periods of planned and unplanned downtime. Extraction wells TW-2D and TW-2S were operated during December 2016.
Effluent was discharged into injection wells IW-02 and IW-03.

b. The difference between influent flow rate and the sum of the effluent and reverse osmosis concentrate flow rates during December 2016 is approximately 2.1 percent.

c. This percentage difference includes instrument noise in the system, and exceeds the accuracy of the flowmeters. Based on the injection well flowmeter readings, these flowmeters will be removed from service and sent for factory calibration and adjustment. 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 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 (≙ 100%)
Calibrated full scale

Current 4 - 20 mA
Calibrated output

0.9164
Calibration factor

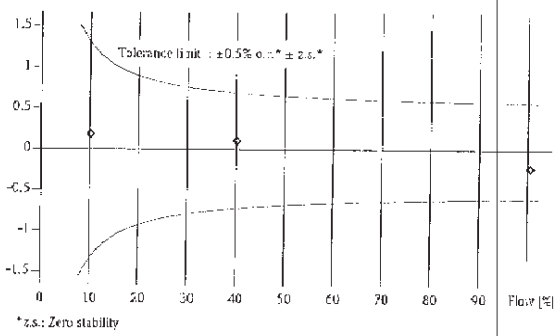
5
Zero point

77 °F
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	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.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).

09-17-2015
Date of calibration

Endress+Hauser Inc.
1C057 Porter Road
La Porte, Texas 77571

Calvin Williams
Operator

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

92009494-1275160

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 (≙ 100%)
Calibrated full scale

Current 4 - 20 mA
Calibrated output

0.9159
Calibration factor

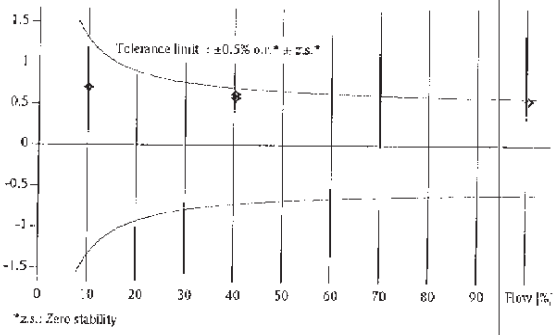
-17
Zero point

76.5 °F
Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ 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.



*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).

09-16-2015
Date of calibration

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

Calvin Williams
Operator

Endress+Hauser

People for Process Automation

Flow Calibration without Adjustment

92010359-1304705

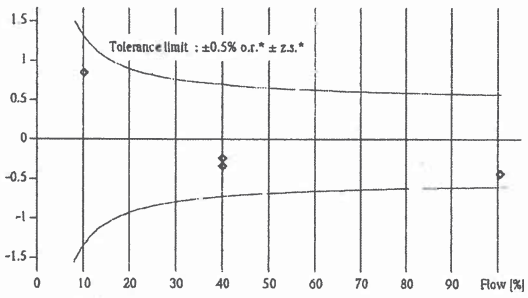
WWRA-017895-F Purchase order number	FCP-7.1.6 US Calibration rig
US-3601533868-100 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1AA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9101 Calibration factor
6C036F16000 Serial N°	-34 Zero point
FIT-1201 Tag N°	70.4 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ 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.



*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).

John Davis

01-15-2016
Date of calibration

John Davis
Operator

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

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

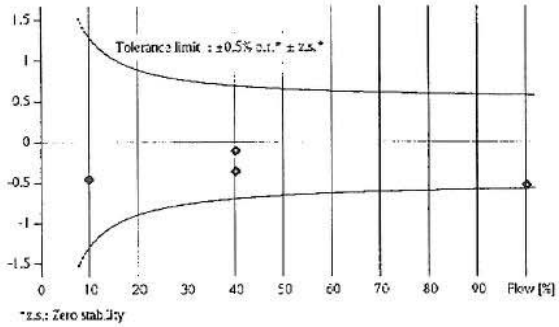
92004350-1275192

4017515743	FCP-8.2 US
Purchase order number	Calibration rig
US-3601525789-100 / Endress+Hauser Inc.	156 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
23P50-AL1A1RA022AW	Current 4 - 20 mA
Order code	Calibrated output
PROMAG 23 P 2"	0.9082
Transmitter/Sensor	Calibration factor
6A022116000	0
Serial N°	Zero point
FIT-102	72.3 °F
Tag N°	Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ 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 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).

09-20-2013
Date of calibration

W. Watkins
Operator

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

Endress+Hauser
People for Process Automation

Flow Calibration with Adjustment

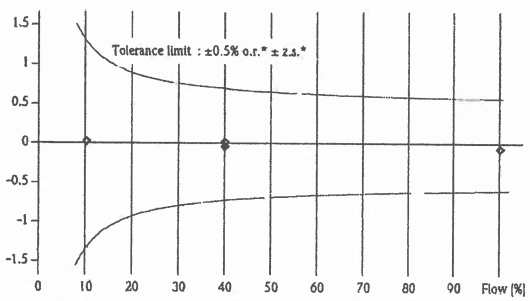
92010358-1304709

WWRA-017895-F Purchase order number	FCP-7.1.6 US Calibration rig
US-3601533868-200 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1AA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9189 Calibration factor
6C037316000 Serial N°	0 Zero point
FIT-1205 Tag N°	70.5 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ 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).

John Davis

01-15-2016
Date of calibration

John Davis
Operator

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

Endress+Hauser
People for Process Automation

Flow Calibration without Adjustment

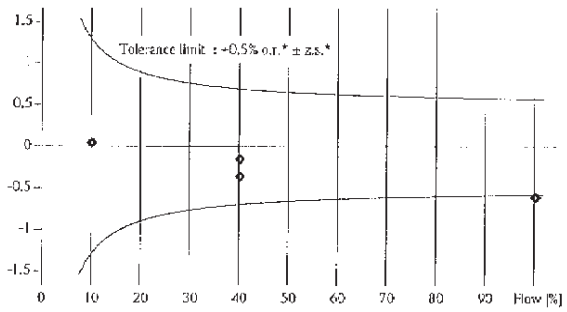
92005412-1385272

4017522194	FCP-8.2 US
Purchase order number	Calibration rig
US-3601527563-100 / Endress+Hauser Inc.	156 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
23P50-AL1A1AA022AW	Current 4 - 20 mA
Order code	Calibrated output
PROMAG 23 P 2"	0.9215
Transmitter/Sensor	Calibration factor
7700F216000	0
Serial N°	Zero point
-	75.4 °F
Tag N°	Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V targ. [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.1	15.699	60.0	15.710	15.717	0.04	5.61
40.2	62.675	60.0	62.718	62.490	-0.36	10.40
40.2	62.681	60.0	62.724	62.627	-0.15	10.42
100.4	156.590	60.0	156.696	155.730	-0.62	19.96
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

*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).

03-22-2014
Date of calibration

W. Watkins
Operator

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

Endress+Hauser

People for Process Automation

Flow Calibration with Adjustment

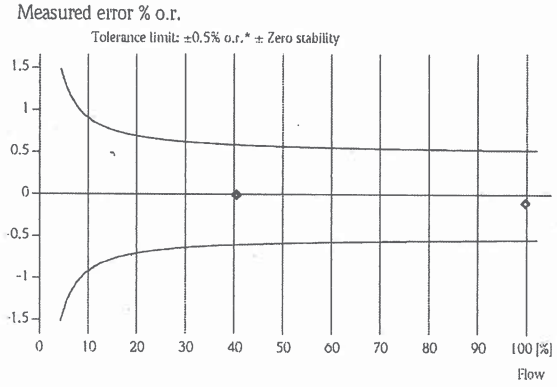
30361270-3757980

3800196517	FCP-8.B
Purchase order number	Calibration rig
US-3005497039-10 / Endress+Hauser Flowtec	398.3621 us.gal/min (≙ 100%)
Order N°/Manufacturer	Calibrated full scale
5P2B80-1CX9/0	Service interface
Order code	Calibrated output
Promag P 200 3"	1.1823
Sensor/Transmitter	Calibration factor
L200E016000	-5
Serial N°	Zero point
-	80.3 °F
Tag N°	Water temperature

Flow [%]	Flow [us.gal/min]	Duration [s]	V target [us.gal]	V meas. [us.gal]	Δ 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)



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).

02-05-2016

Date of calibration

Endress+Hauser Flowtec, Division USA
2330 Endress Place
Greenwood, IN 46143

Travis Burdette

Operator

Certified acc. to
ISO 9001, Reg.-N° 030502.2
ISO 14001, Reg.-N° EMS561046

Endress+Hauser
People for Process Automation

Flow Calibration with Adjustment

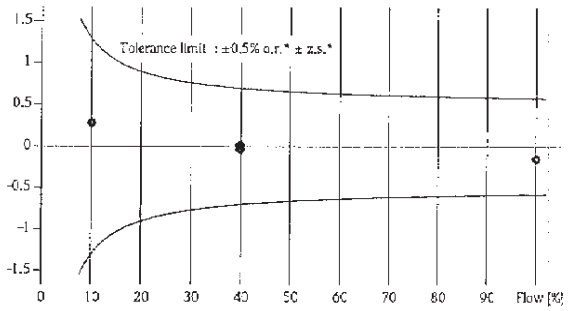
92006682-1275191

WWRA015491F Purchase order number	FCP-7.1.6 US Calibration rig
US-3601529220-100 / Endress+Hauser Inc. Order N°/Manufacturer	155.6102 us.gal/min (≙ 100%) Calibrated full scale
23P50-AL1A1RA022AW Order code	Current 4 - 20 mA Calibrated output
PROMAG 23 P 2" Transmitter/Sensor	0.9193 Calibration factor
6A022016000 Serial N°	0 Zero point
FIT-101 Tag N°	72.7 °F Water temperature

Flow [%]	Flow [us.gal/min]	Duration [sec]	V target [us.gal]	V meas. [us.gal]	Δ o.r.* [%]	Outp.** [mA]
10.0	15.596	60.1	15.612	15.657	0.29	5.61
39.9	62.142	60.1	62.207	62.221	0.02	10.39
40.0	62.171	60.1	62.236	62.217	-0.03	10.39
100.1	155.761	60.1	155.922	155.691	-0.15	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).

09-19-2014
Date of calibration

John Davis
Operator

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

Appendix D
Fourth Quarter 2016
Laboratory Analytical Reports

October 18, 2016

Doug Scott
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (970) 731-0636
FAX: (510) 622-9129

Workorder No.: N021155

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 04, 2016 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 Silbaugh for

Puri Romualdo
Laboratory Director

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

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

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

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 on QC samples N021155-001BMS and N021155-001BMSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 6010B:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes on QC samples N021155-001A-MS and N021155-001A-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Chromium on QC samples N021155-001A-MS and N021155-001A-MSD since the analyte concentration in the sample is disproportionate to the spike level. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Analytical Comments for EPA 7199:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria on QC samples N021155-001A-MS and N021155-001A-MSD since the analyte concentration in the sample is disproportionate to the spike level. Post Spike and Matrix Spike Insoluble met acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET LABORATORIES
"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

ASSET Laboratories

Date: *18-Oct-16*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N021155
Contract No: IM3Plant-ARAR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N021155-001A	Phase Separator-546-Sludge	Soil	10/4/2016 10:30:00 AM	10/4/2016	10/18/2016
N021155-001B	Phase Separator-546-Sludge	Soil	10/4/2016 10:30:00 AM	10/4/2016	10/18/2016

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-546-Sludge
Lab Order:	N021155	**Collection Date:**	10/4/2016 10:30:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N021155-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_161010A**	QC Batch: **R111016**			PrepDate			Analyst: **RAB**
Fluoride	28	0.15	4.3		mg/Kg-dry	2	10/10/2016 05:02 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

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_S

Sample ID **MB-R111016_F**	SampType: **MBLK**	TestCode: **300_S**	Units: **mg/Kg**	Prep Date:	RunNo: **111016**
Client ID: **PBS**	Batch ID: **R111016**	TestNo: **EPA 300.0**		Analysis Date: **10/10/2016**	SeqNo: **2445569**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	1.0									

Sample ID **LCS-R111016_F**	SampType: **LCS**	TestCode: **300_S**	Units: **mg/Kg**	Prep Date:	RunNo: **111016**
Client ID: **LCSS**	Batch ID: **R111016**	TestNo: **EPA 300.0**		Analysis Date: **10/10/2016**	SeqNo: **2445570**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	12.550	1.0	12.50	0	100	90	110				

Sample ID **N021155-001BDUP**	SampType: **DUP**	TestCode: **300_S**	Units: **mg/Kg-dry**	Prep Date:	RunNo: **111016**
Client ID: **ZZZZZZ**	Batch ID: **R111016**	TestNo: **EPA 300.0**		Analysis Date: **10/10/2016**	SeqNo: **2445572**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	27.843	4.3						27.75	0.339	20	

Sample ID **N021155-001BMS**	SampType: **MS**	TestCode: **300_S**	Units: **mg/Kg-dry**	Prep Date:	RunNo: **111016**
Client ID: **ZZZZZZ**	Batch ID: **R111016**	TestNo: **EPA 300.0**		Analysis Date: **10/10/2016**	SeqNo: **2445573**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	48.373	4.3	26.78	27.75	77.0	80	120				S

Sample ID **N021155-001BMSD**	SampType: **MSD**	TestCode: **300_S**	Units: **mg/Kg-dry**	Prep Date:	RunNo: **111016**
Client ID: **ZZZZZZ**	Batch ID: **R111016**	TestNo: **EPA 300.0**		Analysis Date: **10/10/2016**	SeqNo: **2445574**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	48.099	4.3	26.78	27.75	76.0	80	120	48.37	0.568	20	S

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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Lab Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021155-001

Client Sample ID: Phase Separator-546-Sludge
Collection Date: 10/4/2016 10:30:00 AM
Matrix: SOIL

TOTAL METALS BY ICP

EPA 3050B **EPA 6010B**

RunID: **ICP2_161006B** QC Batch: **59870** PrepDate **10/5/2016** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Antimony	34	0.39	4.3		mg/Kg-dry	1	10/6/2016 11:46 AM
Arsenic	19	0.46	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Barium	56	0.090	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Beryllium	ND	0.081	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Cadmium	5.2	0.077	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Chromium	3000	0.086	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Cobalt	5.0	0.077	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Copper	160	0.085	4.3		mg/Kg-dry	1	10/6/2016 11:46 AM
Lead	ND	0.085	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Manganese	550	0.17	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Molybdenum	6.2	0.075	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Nickel	33	0.089	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Selenium	ND	0.33	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Silver	ND	0.087	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Thallium	4.4	0.35	4.3		mg/Kg-dry	1	10/6/2016 11:46 AM
Vanadium	18	0.078	2.1		mg/Kg-dry	1	10/6/2016 11:46 AM
Zinc	33	0.13	2.1		mg/Kg-dry	1	10/6/2016 11:46 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

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID **MB-59870**	SampType: **MBLK**	TestCode: **6010_SPGE**	Units: **mg/Kg**	Prep Date: **10/5/2016**	RunNo: **110968**
Client ID: **PBS**	Batch ID: **59870**	TestNo: **EPA 6010B**	**EPA 3050B**	Analysis Date: **10/6/2016**	SeqNo: **2443090**

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	0.070	1.0									
Nickel	ND	1.0									
Selenium	0.168	1.0									
Silver	ND	1.0									
Thallium	ND	2.0									
Vanadium	ND	1.0									
Zinc	ND	1.0									

Sample ID **LCS-59870**	SampType: **LCS**	TestCode: **6010_SPGE**	Units: **mg/Kg**	Prep Date: **10/5/2016**	RunNo: **110968**
Client ID: **LCSS**	Batch ID: **59870**	TestNo: **EPA 6010B**	**EPA 3050B**	Analysis Date: **10/6/2016**	SeqNo: **2443091**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	25.726	2.0	25.00	0	103	85	115				
Arsenic	25.377	1.0	25.00	0	102	85	115				
Barium	25.686	1.0	25.00	0	103	85	115				
Beryllium	25.542	1.0	25.00	0	102	85	115				
Cadmium	25.036	1.0	25.00	0	100	85	115				
Chromium	25.732	1.0	25.00	0	103	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		

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID	LCS-59870	SampType:	LCS	TestCode:	6010_SPGE	Units:	mg/Kg	Prep Date:	10/5/2016	RunNo:	110968
Client ID:	LCSS	Batch ID:	59870	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/6/2016	SeqNo:	2443091

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cobalt	25.667	1.0	25.00	0	103	85	115				
Copper	25.788	2.0	25.00	0	103	85	115				
Lead	24.923	1.0	25.00	0	99.7	85	115				
Manganese	50.249	1.0	50.00	0	100	85	115				
Molybdenum	25.313	1.0	25.00	0	101	85	115				
Nickel	26.656	1.0	25.00	0	107	85	115				
Selenium	24.722	1.0	25.00	0	98.9	85	115				
Silver	24.371	1.0	25.00	0	97.5	85	115				
Thallium	24.300	2.0	25.00	0	97.2	85	115				
Vanadium	24.125	1.0	25.00	0	96.5	85	115				
Zinc	25.255	1.0	25.00	0	101	85	115				

Sample ID	N021155-001A-MS	SampType:	MS	TestCode:	6010_SPGE	Units:	mg/Kg-dry	Prep Date:	10/5/2016	RunNo:	110968
Client ID:	ZZZZZZ	Batch ID:	59870	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/6/2016	SeqNo:	2443095

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	89.161	4.3	53.37	34.45	103	75	125				
Arsenic	68.927	2.1	53.37	18.71	94.1	75	125				
Barium	109.807	2.1	53.37	55.92	101	75	125				
Beryllium	44.194	2.1	53.37	0	82.8	75	125				
Cadmium	43.746	2.1	53.37	5.247	72.1	75	125				S
Chromium	3711.249	2.1	53.37	3040	1260	75	125				S
Cobalt	45.665	2.1	53.37	5.015	76.2	75	125				
Copper	251.570	4.3	53.37	163.7	165	75	125				S
Lead	33.662	2.1	53.37	0	63.1	75	125				S
Manganese	636.293	2.1	106.7	553.2	77.8	75	125				
Molybdenum	49.123	2.1	53.37	6.247	80.3	75	125				
Nickel	82.200	2.1	53.37	33.13	91.9	75	125				
Selenium	ND	2.1	53.37	0	0	75	125				S
Silver	34.549	2.1	53.37	0	64.7	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
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPGE

Sample ID	N021155-001A-MS	SampType:	MS	TestCode:	6010_SPGE	Units:	mg/Kg-dry	Prep Date:	10/5/2016	RunNo:	110968
Client ID:	ZZZZZZ	Batch ID:	59870	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/6/2016	SeqNo:	2443095

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Thallium	39.629	4.3	53.37	4.378	66.1	75	125				S
Vanadium	60.668	2.1	53.37	18.50	79.0	75	125				
Zinc	76.288	2.1	53.37	33.01	81.1	75	125				

Sample ID	N021155-001A-MSD	SampType:	MSD	TestCode:	6010_SPGE	Units:	mg/Kg-dry	Prep Date:	10/5/2016	RunNo:	110968
Client ID:	ZZZZZZ	Batch ID:	59870	TestNo:	EPA 6010B	EPA 3050B		Analysis Date:	10/6/2016	SeqNo:	2443096

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	89.378	4.3	53.42	34.45	103	75	125	89.16	0.243	20	
Arsenic	69.870	2.1	53.42	18.71	95.8	75	125	68.93	1.36	20	
Barium	109.770	2.1	53.42	55.92	101	75	125	109.8	0.0330	20	
Beryllium	44.228	2.1	53.42	0	82.8	75	125	44.19	0.0776	20	
Cadmium	43.775	2.1	53.42	5.247	72.1	75	125	43.75	0.0653	20	S
Chromium	3717.165	2.1	53.42	3040	1270	75	125	3711	0.159	20	S
Cobalt	45.706	2.1	53.42	5.015	76.2	75	125	45.66	0.0900	20	
Copper	252.055	4.3	53.42	163.7	165	75	125	251.6	0.193	20	S
Lead	33.632	2.1	53.42	0	63.0	75	125	33.66	0.0876	20	S
Manganese	636.613	2.1	106.8	553.2	78.1	75	125	636.3	0.0502	20	
Molybdenum	48.989	2.1	53.42	6.247	80.0	75	125	49.12	0.272	20	
Nickel	81.958	2.1	53.42	33.13	91.4	75	125	82.20	0.294	20	
Selenium	ND	2.1	53.42	0	0	75	125	0	0	20	S
Silver	34.364	2.1	53.42	0	64.3	75	125	34.55	0.537	20	S
Thallium	39.063	4.3	53.42	4.378	64.9	75	125	39.63	1.44	20	S
Vanadium	60.348	2.1	53.42	18.50	78.3	75	125	60.67	0.529	20	
Zinc	76.547	2.1	53.42	33.01	81.5	75	125	76.29	0.339	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		

CLIENT: CH2M HILL
Lab Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021155-001

Client Sample ID: Phase Separator-546-Sludge
Collection Date: 10/4/2016 10:30:00 AM
Matrix: SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
EPA 3060A			**EPA 7199**				
RunID: **NV00922-IC6_161011A**	QC Batch: **59920**			PrepDate **10/10/2016**			Analyst: **QBM**
Hexavalent Chromium	28	0.087	0.85		mg/Kg-dry	2	10/11/2016 01:25 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

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID **MB-59920**	SampType: **MBLK**	TestCode: **7199_S_PGE**	Units: **mg/Kg**	Prep Date: **10/10/2016**	RunNo: **111074**
Client ID: **PBS**	Batch ID: **59920**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/11/2016**	SeqNo: **2448957**

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-59920**	SampType: **LCS**	TestCode: **7199_S_PGE**	Units: **mg/Kg**	Prep Date: **10/10/2016**	RunNo: **111074**
Client ID: **LCSS**	Batch ID: **59920**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/11/2016**	SeqNo: **2448958**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	3.890	0.20	4.000	0	97.3	80	120				

Sample ID **N021155-001AREP**	SampType: **DUP**	TestCode: **7199_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/10/2016**	RunNo: **111074**
Client ID: **ZZZZZZ**	Batch ID: **59920**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/11/2016**	SeqNo: **2448961**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	28.121	0.85						27.80	1.16	20	

Sample ID **N021155-001A-DUP**	SampType: **DUP**	TestCode: **7199_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/10/2016**	RunNo: **111074**
Client ID: **ZZZZZZ**	Batch ID: **59920**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/11/2016**	SeqNo: **2448962**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	29.063	0.85						27.80	4.45	20	

Sample ID **N021155-001A-MS**	SampType: **MS**	TestCode: **7199_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/10/2016**	RunNo: **111074**
Client ID: **ZZZZZZ**	Batch ID: **59920**	TestNo: **EPA 7199**	**EPA 3060A**	Analysis Date: **10/11/2016**	SeqNo: **2448963**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	38.830	0.85	8.511	27.80	130	75	125				S

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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7199_S_PGE

Sample ID	N021155-001APS	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:		RunNo:	111074
Client ID:	ZZZZZZ	Batch ID:	59920	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/11/2016	SeqNo:	2448964

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	44.973	0.85	17.03	27.80	101	75	125				

Sample ID	N021155-001A-MS_I	SampType:	MS	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/10/2016	RunNo:	111074
Client ID:	ZZZZZZ	Batch ID:	59920	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/11/2016	SeqNo:	2448965

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1397.736	21	1439	27.80	95.2	75	125				

Sample ID	N021155-001A-MSD	SampType:	MSD	TestCode:	7199_S_PGE	Units:	mg/Kg-dry	Prep Date:	10/10/2016	RunNo:	111074
Client ID:	ZZZZZZ	Batch ID:	59920	TestNo:	EPA 7199	EPA 3060A		Analysis Date:	10/11/2016	SeqNo:	2448978

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	39.278	0.85	8.538	27.80	134	75	125	38.83	1.15	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		

CLIENT:	CH2M HILL	**Client Sample ID:**	Phase Separator-546-Sludge
Lab Order:	N021155	**Collection Date:**	10/4/2016 10:30:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	SOIL
Lab ID:	N021155-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
EPA 7471A							
RunID: **AA1_161005A**	QC Batch: **59872**				PrepDate **10/5/2016**		Analyst: **CEI**
Mercury	ND	0.026	0.21		mg/Kg-dry	1	10/5/2016 11:42 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

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S_PGE

Sample ID **MB-59872**	SampType: **MBLK**	TestCode: **7471_S_PGE**	Units: **mg/Kg**	Prep Date: **10/5/2016**	RunNo: **110921**
Client ID: **PBS**	Batch ID: **59872**	TestNo: **EPA 7471A**		Analysis Date: **10/5/2016**	SeqNo: **2440865**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID **LCS-59872**	SampType: **LCS**	TestCode: **7471_S_PGE**	Units: **mg/Kg**	Prep Date: **10/5/2016**	RunNo: **110921**
Client ID: **LCSS**	Batch ID: **59872**	TestNo: **EPA 7471A**		Analysis Date: **10/5/2016**	SeqNo: **2440866**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.434	0.10	0.4167	0	104	75	125				

Sample ID **N021155-001A-MS**	SampType: **MS**	TestCode: **7471_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/5/2016**	RunNo: **110921**
Client ID: **ZZZZZZ**	Batch ID: **59872**	TestNo: **EPA 7471A**		Analysis Date: **10/5/2016**	SeqNo: **2440867**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.988	0.21	0.8823	0.1371	96.5	75	125				

Sample ID **N021155-001A-MSD**	SampType: **MSD**	TestCode: **7471_S_PGE**	Units: **mg/Kg-dry**	Prep Date: **10/5/2016**	RunNo: **110921**
Client ID: **ZZZZZZ**	Batch ID: **59872**	TestNo: **EPA 7471A**		Analysis Date: **10/5/2016**	SeqNo: **2440868**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.078	0.21	0.8794	0.1371	107	75	125	0.9885	8.71	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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Lab Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021155-001

Client Sample ID: Phase Separator-546-Sludge
Collection Date: 10/4/2016 10:30:00 AM
Matrix: SOIL

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
PERCENT MOISTURE							
			D2216				
RunID: **WETCHEM_161005B**	QC Batch: **R110919**			PrepDate			Analyst: **LR**
Percent Moisture	53.32	0.1000	0.1000		wt%	1	10/5/2016 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

CLIENT: CH2M HILL
Work Order: N021155
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: PMOIST

Sample ID **MB-R110919**	SampType: **MBLK**	TestCode: **PMOIST**	Units: **wt%**	Prep Date:	RunNo: **110919**
Client ID: **PBS**	Batch ID: **R110919**	TestNo: **D2216**		Analysis Date: **10/5/2016**	SeqNo: **2440848**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	ND	0.1000									

Sample ID **N021155-001ADUP**	SampType: **DUP**	TestCode: **PMOIST**	Units: **wt%**	Prep Date:	RunNo: **110919**
Client ID: **ZZZZZZ**	Batch ID: **R110919**	TestNo: **D2216**		Analysis Date: **10/5/2016**	SeqNo: **2440850**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	54.246	0.1000						53.32	1.73	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		

Chain of Custody Record

COC Number: **546-SLUDGE**

CH2MHILL

Project Name PG&E Topock **Location** PG&E Topock
Task Order **Project** IM3Plant-ARAR-WDR-546-Sludge
Project Number 680375.02.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Doug Scott
Turnaround Time 10 Days
PO Number 680375.02.IM.OP.00

Sample ID	Sample Date/Time	Type	Matrix	# Containers	Preserv	E300_Soil	SW6010B_Soil	SW7199
Phase Separator-546-Sludge N021155 - 01		N	Soil					
FI Title 22, Mercury, Mn		Field Filtered		2	none	✓	✓	
		Field Filtered		3	4°C			✓
		Total Containers:		5				

MS = Matrix Spike SD = Matrix Spike Duplicate

	Signatures	Date/Time
Approved by		10-4-16 10:30
Sampled by		10-4-16 10:30
Relinquished by		10-4-16 13:00
Received by		10/4/16 1800
Relinquished by		10/4/16 1835
Received by		

Shipping Details
Method of Shipment: Lab Courier
On Ice: (yes) / no 2-6°C 1840
Airbill No:
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody
and
Marlon Cartin

Special Instructions:

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:	10/4/2016	Workorder:	N021155
Rep sample Temp (Deg C):	2.6	IR Gun ID:	1
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 ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☐	NA ☑
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☐	NA ☑
16. Were there Non-Conformance issues at login?	Yes ☐	No ☐	NA ☑
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments: Collection date and time was taken from the sample label.

For:

Checklist Completed By: HG 10/5/2016

Reviewed By: 10/5/2016

List of Analysts

ASSET Laboratories Work Order: **N021155**

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

October 28, 2016

Doug Scott
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (970) 731-0636
FAX: (510) 622-9129

Workorder No.: N021157

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on October 04, 2016 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.

This is an amended report. Please disregard all previous documentation that corresponds to the page(s) enclosed.

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 Liburdi for

Puri Romualdo
Laboratory Director

ASSET Laboratories **Date:** *28-Oct-16*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N021157

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Samples were received intact with proper chain of custody documentation.

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

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

Samples were analyzed within method holding time.

Subcontracted Analyses:

Ammonia was subcontracted to Truesdail- Irvine,CA.

Analytical Comments for EPA 200.8:

Dilution was necessary on some analytes for all samples and QC samples N021157-003C-MS, N021157-003C-MSD, N021186-001B-MS due to associated internal standard not meeting method criteria possibly due to matrix interference. Samples and QC samples were analyzed at 1x, 5x and 25x dilution. Affected analytes for this failed internal standard were reported at dilution that meet internal standard recovery limit.

For reference sample N021157-003 and QC samples N021157-003C-MS, N021157-003C-MSD , all internal standards failed at 1x dilution. At 5x dilution, all internal standards failed except for one internal standard. Analytes associated to the only one passing internal standard were reported. At further dilution of 25x, all internal standards passed therefore, all other analytes were reported at 25x dilution. Post Spike (PS) was also performed at 5x and 25x dilution.Recoveries on PS for most of the analytes are within criteria except for some. Like Copper for example, the post spike at 5x dilution is recovered at 97.8 % however, its internal standard is recovered low at 63% therefore, it is not reportable at 5x dilution. 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 Molybdenum on QC samples N021157-003C-MS and N021157-003C-MSD since the analyte concentration in the sample is disproportionate to the spike level. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET LABORATORIES
"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, 680375.02.IM.OP.00
Lab Order:	N021157

CASE NARRATIVE

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes on QC samples N021157-003C-MS and N021157-003C-MSD possibly due to matrix interference. . The associated Laboratory Control Sample (LCS) recovery was acceptable.

RPD for Matrix Spike(MS) and Matrix Spike Duplicate(MSD) is outside criteria for some analytes ; however, the analytical batch was validated by the Laboratory Control Sample (LCS).

Analytical Comments for EPA 218.6:

Dilution was necessary for sample N021157-003 due to matrix spike not meeting peak retention time criteria possibly due to matrix interference. Matrix spike was analyzed with dilution and retention time met method criteria. Sample was reported at dilution that meet matrix spike recovery limit and the detected peak within retention time window.

Analytical Comments for EPA 245.1:

RPD for Matrix Spike(MS) and Matrix Spike Duplicate(MSD) is outside criteria however, recovery on both met acceptance criteria. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET LABORATORIES
"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

ASSET Laboratories

Date: *19-Oct-16*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N021157
Contract No: IM3Plant-ARAR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N021157-001A	SC-100B-WDR-546	Water	10/4/2016 11:38:00 AM	10/4/2016	10/19/2016
N021157-001B	SC-100B-WDR-546	Water	10/4/2016 11:38:00 AM	10/4/2016	10/19/2016
N021157-001C	SC-100B-WDR-546	Water	10/4/2016 11:38:00 AM	10/4/2016	10/19/2016
N021157-001D	SC-100B-WDR-546	Water	10/4/2016 11:38:00 AM	10/4/2016	10/19/2016
N021157-001E	SC-100B-WDR-546	Water	10/4/2016 11:38:00 AM	10/4/2016	10/19/2016
N021157-002A	SC-700B-WDR-546	Water	10/4/2016 11:42:00 AM	10/4/2016	10/19/2016
N021157-002B	SC-700B-WDR-546	Water	10/4/2016 11:42:00 AM	10/4/2016	10/19/2016
N021157-002C	SC-700B-WDR-546	Water	10/4/2016 11:42:00 AM	10/4/2016	10/19/2016
N021157-002D	SC-700B-WDR-546	Water	10/4/2016 11:42:00 AM	10/4/2016	10/19/2016
N021157-002E	SC-700B-WDR-546	Water	10/4/2016 11:42:00 AM	10/4/2016	10/19/2016
N021157-003A	SC-701-WDR-546	Water	10/4/2016 11:30:00 AM	10/4/2016	10/19/2016
N021157-003B	SC-701-WDR-546	Water	10/4/2016 11:30:00 AM	10/4/2016	10/19/2016
N021157-003C	SC-701-WDR-546	Water	10/4/2016 11:30:00 AM	10/4/2016	10/19/2016

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-001

Client Sample ID: SC-100B-WDR-546
Collection Date: 10/4/2016 11:38:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **WETCHEM_161005E**	QC Batch: **R110925**			PrepDate			Analyst: **LR**
Specific Conductance	7700	0.10	0.10		umhos/cm	1	10/5/2016 11:30 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-002

Client Sample ID: SC-700B-WDR-546
Collection Date: 10/4/2016 11:42:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **WETCHEM_161005E**	QC Batch: **R110925**			PrepDate			Analyst: **LR**
Specific Conductance	7200	0.10	0.10		umhos/cm	1	10/5/2016 11:30 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-003

Client Sample ID: SC-701-WDR-546
Collection Date: 10/4/2016 11:30:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **WETCHEM_161005E**	QC Batch: **R110925**			PrepDate			Analyst: **LR**
Specific Conductance	59000	0.10	0.10		umhos/cm	1	10/5/2016 11:30 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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID	**N021157-003BDUP**	SampType:	**DUP**	TestCode:	**120.1_WPGE**	Units:	**umhos/cm**	Prep Date:		RunNo:	**110925**
Client ID:	**ZZZZZZ**	Batch ID:	**R110925**	TestNo:	**EPA 120.1**			Analysis Date:	**10/5/2016**	SeqNo:	**2440915**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	59000.000	0.10						58900	0.170	10	

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		

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-001

Client Sample ID: SC-100B-WDR-546
Collection Date: 10/4/2016 11:38:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **WETCHEM_161005G**	QC Batch: **59874**				PrepDate	**10/5/2016**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4500	50	50		mg/L	1	10/5/2016 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-002

Client Sample ID: SC-700B-WDR-546
Collection Date: 10/4/2016 11:42:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **WETCHEM_161005G**	QC Batch: **59874**				PrepDate	**10/5/2016**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4000	50	50		mg/L	1	10/5/2016 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-003

Client Sample ID: SC-701-WDR-546
Collection Date: 10/4/2016 11:30:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **WETCHEM_161005G**	QC Batch: **59874**				PrepDate	**10/5/2016**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	42000	500	500		mg/L	1	10/5/2016 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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID	**LCS-59874**	SampType:	**LCS**	TestCode:	**160.1_2540C**	Units:	**mg/L**	Prep Date:	**10/5/2016**	RunNo:	**110948**
Client ID:	**LCSW**	Batch ID:	**59874**	TestNo:	**SM2540C**			Analysis Date:	**10/5/2016**	SeqNo:	**2442210**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	966.000	10	1000	0	96.6	80	120				

Sample ID	**MB-59874**	SampType:	**MBLK**	TestCode:	**160.1_2540C**	Units:	**mg/L**	Prep Date:	**10/5/2016**	RunNo:	**110948**
Client ID:	**PBW**	Batch ID:	**59874**	TestNo:	**SM2540C**			Analysis Date:	**10/5/2016**	SeqNo:	**2442211**

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	**N021157-003BDUP**	SampType:	**DUP**	TestCode:	**160.1_2540C**	Units:	**mg/L**	Prep Date:	**10/5/2016**	RunNo:	**110948**
Client ID:	**ZZZZZZ**	Batch ID:	**59874**	TestNo:	**SM2540C**			Analysis Date:	**10/5/2016**	SeqNo:	**2442217**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	44200.000	500						42400	4.16	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		

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-001

Client Sample ID: SC-100B-WDR-546
Collection Date: 10/4/2016 11:38:00 AM
Matrix: WATER

TOTAL METALS BY ICP

EPA 200.7

RunID: **NV00922-ICP2_161007C** QC Batch: **59885** PrepDate **10/6/2016** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Aluminum	ND	2.7	50		µg/L	1	10/7/2016 10:47 AM
Boron	1100	38	100		µg/L	1	10/7/2016 10:47 AM
Iron	ND	1.8	20		µg/L	1	10/7/2016 10:47 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-002

Client Sample ID: SC-700B-WDR-546
Collection Date: 10/4/2016 11:42:00 AM
Matrix: WATER

TOTAL METALS BY ICP

EPA 200.7

RunID: **NV00922-ICP2_161007C** QC Batch: **59885** PrepDate **10/6/2016** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Aluminum	ND	2.7	50		µg/L	1	10/7/2016 11:28 AM
Boron	1100	38	100		µg/L	1	10/7/2016 11:28 AM
Iron	ND	1.8	20		µg/L	1	10/7/2016 11:28 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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-59885**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/6/2016**	RunNo: **111000**
Client ID: **PBW**	Batch ID: **59885**	TestNo: **EPA 200.7**		Analysis Date: **10/7/2016**	SeqNo: **2444467**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	2.901	50									
Boron	ND	100									
Iron	ND	20									

Sample ID **LCS1-59885**	SampType: **LCS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/6/2016**	RunNo: **111000**
Client ID: **LCSW**	Batch ID: **59885**	TestNo: **EPA 200.7**		Analysis Date: **10/7/2016**	SeqNo: **2444468**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10602.789	50	10000	0	106	85	115				
Boron	5281.556	100	5000	0	106	85	115				
Iron	104.667	20	100.0	0	105	85	115				

Sample ID **N021157-001E-MS1**	SampType: **MS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/6/2016**	RunNo: **111000**
Client ID: **ZZZZZZ**	Batch ID: **59885**	TestNo: **EPA 200.7**		Analysis Date: **10/7/2016**	SeqNo: **2444472**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10941.222	50	10000	0	109	75	125				
Boron	6606.871	100	5000	1081	111	75	125				
Iron	94.645	20	100.0	0	94.6	75	125				

Sample ID **N021157-001E-MSD**	SampType: **MSD**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **10/6/2016**	RunNo: **111000**
Client ID: **ZZZZZZ**	Batch ID: **59885**	TestNo: **EPA 200.7**		Analysis Date: **10/7/2016**	SeqNo: **2444473**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10956.041	50	10000	0	110	75	125	10940	0.135	20	
Boron	6604.429	100	5000	1081	110	75	125	6607	0.0370	20	
Iron	94.867	20	100.0	0	94.9	75	125	94.65	0.234	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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-001

Client Sample ID: SC-100B-WDR-546
Collection Date: 10/4/2016 11:38:00 AM
Matrix: WATER

TOTAL METALS BY ICPMS

EPA 200.8

RunID: **NV00922-ICP7_161013D** QC Batch: **59888** PrepDate **10/10/2016** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Antimony	ND	0.16	2.5		µg/L	5	10/13/2016 06:45 PM
Arsenic	3.1	0.025	0.10		µg/L	1	10/13/2016 06:38 PM
Barium	31	0.35	5.0		µg/L	5	10/13/2016 06:45 PM
Copper	ND	0.26	1.0		µg/L	1	10/13/2016 06:38 PM
Lead	ND	0.18	5.0		µg/L	5	10/13/2016 06:45 PM
Manganese	15	0.056	0.50		µg/L	1	10/13/2016 06:38 PM
Molybdenum	27	0.19	2.5		µg/L	5	10/13/2016 06:45 PM
Nickel	ND	0.040	1.0		µg/L	1	10/13/2016 06:38 PM
Zinc	ND	0.27	10		µg/L	1	10/13/2016 06:38 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-002

Client Sample ID: SC-700B-WDR-546
Collection Date: 10/4/2016 11:42:00 AM
Matrix: WATER

TOTAL METALS BY ICPMS

EPA 200.8

RunID: **NV00922-ICP7_161013D** QC Batch: **59888** PrepDate **10/10/2016** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Antimony	ND	0.031	0.50		µg/L	1	10/13/2016 06:50 PM
Arsenic	ND	0.025	0.10		µg/L	1	10/13/2016 06:50 PM
Barium	19	0.070	1.0		µg/L	1	10/13/2016 06:50 PM
Copper	ND	0.26	1.0		µg/L	1	10/13/2016 06:50 PM
Lead	ND	0.18	5.0		µg/L	5	10/13/2016 06:56 PM
Manganese	5.5	0.056	0.50		µg/L	1	10/13/2016 06:50 PM
Molybdenum	22	0.039	0.50		µg/L	1	10/13/2016 06:50 PM
Nickel	1.2	0.040	1.0		µg/L	1	10/13/2016 06:50 PM
Zinc	ND	0.27	10		µg/L	1	10/13/2016 06:50 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-003

Client Sample ID: SC-701-WDR-546
Collection Date: 10/4/2016 11:30:00 AM
Matrix: WATER

TOTAL METALS BY ICPMS

EPA 200.8

RunID: **NV00922-ICP7_161013D** QC Batch: **59888** PrepDate **10/10/2016** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Antimony	ND	0.79	12		µg/L	25	10/13/2016 05:21 PM
Arsenic	ND	0.62	2.5		µg/L	25	10/13/2016 05:21 PM
Barium	200	1.7	25		µg/L	25	10/13/2016 05:21 PM
Beryllium	ND	1.1	12		µg/L	25	10/17/2016 12:04 PM
Cadmium	ND	1.2	12		µg/L	25	10/13/2016 05:21 PM
Cobalt	ND	0.13	2.5		µg/L	5	10/13/2016 05:16 PM
Copper	ND	6.6	25		µg/L	25	10/13/2016 05:21 PM
Lead	ND	0.92	25		µg/L	25	10/13/2016 05:21 PM
Manganese	48	0.28	2.5		µg/L	5	10/13/2016 05:16 PM
Molybdenum	230	0.97	12		µg/L	25	10/13/2016 05:21 PM
Nickel	ND	0.99	25		µg/L	25	10/13/2016 05:21 PM
Selenium	39	0.69	12		µg/L	25	10/13/2016 05:21 PM
Silver	ND	1.5	12		µg/L	25	10/13/2016 05:21 PM
Thallium	ND	0.74	12		µg/L	25	10/13/2016 05:21 PM
Vanadium	ND	0.11	5.0		µg/L	5	10/13/2016 05:16 PM
Zinc	ND	6.7	250		µg/L	25	10/13/2016 05:21 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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-59888**	SampType: **MBLK**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **10/10/2016**	RunNo: **111095**
Client ID: **PBW**	Batch ID: **59888**	TestNo: **EPA 200.8**		Analysis Date: **10/13/2016**	SeqNo: **2450052**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	0.038	0.50									
Arsenic	ND	0.10									
Barium	ND	1.0									
Cadmium	ND	0.50									
Cobalt	ND	0.50									
Copper	ND	1.0									
Lead	ND	1.0									
Manganese	ND	0.50									
Molybdenum	0.123	0.50									
Nickel	ND	1.0									
Selenium	ND	0.50									
Silver	0.238	0.50									
Thallium	ND	0.50									
Vanadium	ND	1.0									
Zinc	ND	10									

Sample ID **LCS-59888**	SampType: **LCS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **10/10/2016**	RunNo: **111095**
Client ID: **LCSW**	Batch ID: **59888**	TestNo: **EPA 200.8**		Analysis Date: **10/13/2016**	SeqNo: **2450053**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.277	0.50	10.00	0	103	85	115				
Arsenic	10.073	0.10	10.00	0	101	85	115				
Barium	104.866	1.0	100.0	0	105	85	115				
Cadmium	10.279	0.50	10.00	0	103	85	115				
Cobalt	9.950	0.50	10.00	0	99.5	85	115				
Copper	10.130	1.0	10.00	0	101	85	115				
Lead	10.027	1.0	10.00	0	100	85	115				
Manganese	104.144	0.50	100.0	0	104	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		

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	LCS-59888	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	LCSW	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450053

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	9.981	0.50	10.00	0	99.8	85	115				
Nickel	10.443	1.0	10.00	0	104	85	115				
Selenium	10.297	0.50	10.00	0	103	85	115				
Silver	9.153	0.50	10.00	0	91.5	85	115				
Thallium	10.064	0.50	10.00	0	101	85	115				
Vanadium	10.714	1.0	10.00	0	107	85	115				
Zinc	102.272	10	100.0	0	102	85	115				

Sample ID	N021157-003C-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450059

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	11.543	12	10.00	0	115	75	125				
Arsenic	11.487	2.5	10.00	0.9009	106	75	125				
Barium	309.645	25	100.0	196.5	113	75	125				
Cadmium	7.636	12	10.00	0	76.4	75	125				
Copper	ND	25	10.00	0	0	75	125				S
Lead	7.424	25	10.00	0	74.2	75	125				S
Molybdenum	251.268	12	10.00	228.7	226	75	125				S
Nickel	28.404	25	10.00	16.53	119	75	125				
Selenium	49.885	12	10.00	38.70	112	75	125				
Silver	7.574	12	10.00	0	75.7	75	125				
Thallium	11.853	12	10.00	2.174	96.8	75	125				
Zinc	35.000	250	100.0	0	35.0	75	125				S

Sample ID	N021157-003C-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450060

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	26.651	12	10.00	0	267	75	125	11.54	79.1	20	SR

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		

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N021157-003C-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450060

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	25.847	2.5	10.00	0.9009	249	75	125	11.49	76.9	20	SR
Barium	226.056	25	100.0	196.5	29.6	75	125	309.6	31.2	20	SR
Cadmium	20.951	12	10.00	0	210	75	125	7.636	93.2	20	SR
Copper	ND	25	10.00	0	0	75	125	0	0	20	S
Lead	24.815	25	10.00	0	248	75	125	7.424	0	20	S
Molybdenum	177.991	12	10.00	228.7	-507	75	125	251.3	34.1	20	SR
Nickel	34.911	25	10.00	16.53	184	75	125	28.40	20.6	20	SR
Selenium	48.323	12	10.00	38.70	96.3	75	125	49.88	3.18	20	
Silver	19.623	12	10.00	0	196	75	125	7.574	88.6	20	SR
Thallium	26.114	12	10.00	2.174	239	75	125	11.85	75.1	20	SR
Zinc	40.935	250	100.0	0	40.9	75	125	35.00	0	20	S

Sample ID	N021157-003C-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450061

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cobalt	8.637	2.5	10.00	0.5757	80.6	75	125				
Manganese	126.898	2.5	100.0	48.38	78.5	75	125				
Vanadium	13.915	5.0	10.00	2.327	116	75	125				

Sample ID	N021157-003C-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450064

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cobalt	8.096	2.5	10.00	0.5757	75.2	75	125	8.637	6.47	20	
Manganese	133.619	2.5	100.0	48.38	85.2	75	125	126.9	5.16	20	
Vanadium	12.841	5.0	10.00	2.327	105	75	125	13.91	8.03	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		

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N021186-001B-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450066

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.074	0.50	10.00	0.05272	100	75	125				
Arsenic	12.783	0.10	10.00	3.028	97.6	75	125				
Barium	122.956	1.0	100.0	21.40	102	75	125				
Cadmium	8.700	0.50	10.00	0	87.0	75	125				
Cobalt	7.946	0.50	10.00	0.05935	78.9	75	125				
Copper	10.801	1.0	10.00	2.146	86.5	75	125				
Molybdenum	28.028	0.50	10.00	17.42	106	75	125				
Nickel	9.905	1.0	10.00	0.7835	91.2	75	125				
Selenium	8.275	0.50	10.00	0.05834	82.2	75	125				
Silver	8.026	0.50	10.00	0	80.3	75	125				
Vanadium	16.232	1.0	10.00	6.547	96.8	75	125				
Zinc	77.992	10	100.0	0	78.0	75	125				

Sample ID	N021186-001B-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111095
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/13/2016	SeqNo:	2450068

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	10.384	5.0	10.00	0	104	75	125				
Manganese	256.010	2.5	100.0	160.0	96.0	75	125				
Thallium	9.055	2.5	10.00	0.9248	81.3	75	125				

Sample ID	MB-59888	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111128
Client ID:	PBW	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/17/2016	SeqNo:	2452190

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	ND	0.50									

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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	LCS-59888	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111128
Client ID:	LCSW	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/17/2016	SeqNo:	2452191

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	9.475	0.50	10.00	0	94.8	85	115				

Sample ID	N021157-003C-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111128
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/17/2016	SeqNo:	2452195

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	10.534	12	10.00	0	105	75	125				

Sample ID	N021157-003C-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	10/10/2016	RunNo:	111128
Client ID:	ZZZZZZ	Batch ID:	59888	TestNo:	EPA 200.8			Analysis Date:	10/17/2016	SeqNo:	2452196

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Beryllium	10.116	12	10.00	0	101	75	125	10.53	0	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		

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-001

Client Sample ID: SC-100B-WDR-546
Collection Date: 10/4/2016 11:38:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **IC7_161005A**	QC Batch: **R110958**			PrepDate			Analyst: **RAB**
Hexavalent Chromium	600	6.6	20		µg/L	100	10/5/2016 11:29 AM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161013D**	QC Batch: **59888**			PrepDate	**10/10/2016**		Analyst: **CEI**
Chromium	630	0.096	5.0		µg/L	5	10/13/2016 06:45 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

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-546
Lab Order:	N021157	**Collection Date:**	10/4/2016 11:42:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021157-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **IC7_161005A**	QC Batch: **R110958**			PrepDate			Analyst: **RAB**
Hexavalent Chromium	ND	0.066	0.20		µg/L	1	10/5/2016 11:57 AM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161013D**	QC Batch: **59888**			PrepDate	**10/10/2016**		Analyst: **CEI**
Chromium	ND	0.019	1.0		µg/L	1	10/13/2016 06:50 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-003

Client Sample ID: SC-701-WDR-546
Collection Date: 10/4/2016 11:30:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **IC7_161005A**	QC Batch: **R110958**			PrepDate			Analyst: **RAB**
Hexavalent Chromium	ND	1.6	5.0		µg/L	25	10/5/2016 06:00 PM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161013D**	QC Batch: **59888**			PrepDate	**10/10/2016**		Analyst: **CEI**
Chromium	ND	0.096	5.0		µg/L	5	10/13/2016 05:16 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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID	**MB-59888**	SampType:	**MBLK**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**10/10/2016**	RunNo:	**111095**
Client ID:	**PBW**	Batch ID:	**59888**	TestNo:	**EPA 200.8**			Analysis Date:	**10/13/2016**	SeqNo:	**2449994**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	ND	1.0									

Sample ID	**LCS-59888**	SampType:	**LCS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**10/10/2016**	RunNo:	**111095**
Client ID:	**LCSW**	Batch ID:	**59888**	TestNo:	**EPA 200.8**			Analysis Date:	**10/13/2016**	SeqNo:	**2449995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.774	1.0	10.00	0	108	85	115				

Sample ID	**N021157-003C-MS**	SampType:	**MS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**10/10/2016**	RunNo:	**111095**
Client ID:	**ZZZZZZ**	Batch ID:	**59888**	TestNo:	**EPA 200.8**			Analysis Date:	**10/13/2016**	SeqNo:	**2450003**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	11.326	5.0	10.00	2.748	85.8	75	125				

Sample ID	**N021157-003C-MSD**	SampType:	**MSD**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**10/10/2016**	RunNo:	**111095**
Client ID:	**ZZZZZZ**	Batch ID:	**59888**	TestNo:	**EPA 200.8**			Analysis Date:	**10/13/2016**	SeqNo:	**2450006**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	11.790	5.0	10.00	2.748	90.4	75	125	11.33	4.02	20	

Sample ID	**N021186-001B-MS**	SampType:	**MS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**10/10/2016**	RunNo:	**111095**
Client ID:	**ZZZZZZ**	Batch ID:	**59888**	TestNo:	**EPA 200.8**			Analysis Date:	**10/13/2016**	SeqNo:	**2450008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.861	1.0	10.00	0.6885	91.7	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		

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	MB-R110958	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958		
Client ID:	PBW	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442428		
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-R110958	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958		
Client ID:	LCSW	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442429		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		5.014	0.20	5.000	0	100	90	110					

Sample ID	N021156-001ADUP	SampType:	DUP	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958		
Client ID:	ZZZZZZ	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442431		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		1.068	0.20						1.080	1.08	20		

Sample ID	N021156-001AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958		
Client ID:	ZZZZZZ	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442432		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		2.080	0.20	1.000	1.080	100	90	110					

Sample ID	N021157-001AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958		
Client ID:	ZZZZZZ	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442434		
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Hexavalent Chromium		1080.210	20	500.0	596.0	96.8	90	110					

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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	N021157-001AMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958
Client ID:	ZZZZZZ	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442435

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1090.390	20	500.0	596.0	98.9	90	110	1080	0.938	20	

Sample ID	N021157-002AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958
Client ID:	ZZZZZZ	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442437

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.018	0.20	1.000	0	102	90	110				

Sample ID	N021157-003AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	110958
Client ID:	ZZZZZZ	Batch ID:	R110958	TestNo:	EPA 218.6			Analysis Date:	10/5/2016	SeqNo:	2442465

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	26.495	5.0	25.00	0	106	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
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-546
Lab Order:	N021157	**Collection Date:**	10/4/2016 11:38:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021157-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **WETCHEM_161005D**	QC Batch: **R110924**			PrepDate			Analyst: **LR**
Turbidity	0.24	0.10	0.10		NTU	1	10/5/2016 11:20 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

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-546
Lab Order:	N021157	**Collection Date:**	10/4/2016 11:42:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021157-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **WETCHEM_161005D**	QC Batch: **R110924**			PrepDate			Analyst: **LR**
Turbidity	0.27	0.10	0.10		NTU	1	10/5/2016 11:20 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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	MB-R110924	SampType:	MBLK	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	110924
Client ID:	PBW	Batch ID:	R110924	TestNo:	SM 2130B			Analysis Date:	10/5/2016	SeqNo:	2440906

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	ND	0.10									

Sample ID	N021157-002BDUP	SampType:	DUP	TestCode:	2130_W	Units:	NTU	Prep Date:		RunNo:	110924
Client ID:	ZZZZZZ	Batch ID:	R110924	TestNo:	SM 2130B			Analysis Date:	10/5/2016	SeqNo:	2440909

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.280	0.10						0.2700	3.64	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		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-546
Lab Order:	N021157	**Collection Date:**	10/4/2016 11:30:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021157-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE							
EPA 245.1							
RunID: **NV00922-AA1_161018C** QC Batch: **59894** PrepDate **10/7/2016** Analyst: **CEI**							
Mercury	ND	0.087	0.20		µg/L	1	10/18/2016 05:01 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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 245.1_W

Sample ID	**MB-59894**	SampType:	**MBLK**	TestCode:	**245.1_W**	Units:	**µg/L**	Prep Date:	**10/7/2016**	RunNo:	**111148**
Client ID:	**PBW**	Batch ID:	**59894**	TestNo:	**EPA 245.1**			Analysis Date:	**10/18/2016**	SeqNo:	**2452519**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.20									

Sample ID	**LCS-59894**	SampType:	**LCS**	TestCode:	**245.1_W**	Units:	**µg/L**	Prep Date:	**10/7/2016**	RunNo:	**111148**
Client ID:	**LCSW**	Batch ID:	**59894**	TestNo:	**EPA 245.1**			Analysis Date:	**10/18/2016**	SeqNo:	**2452520**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.632	0.20	5.000	0	92.6	85	115				

Sample ID	**N021157-003C-MS**	SampType:	**MS**	TestCode:	**245.1_W**	Units:	**µg/L**	Prep Date:	**10/7/2016**	RunNo:	**111148**
Client ID:	**ZZZZZZ**	Batch ID:	**59894**	TestNo:	**EPA 245.1**			Analysis Date:	**10/18/2016**	SeqNo:	**2452521**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	3.996	0.20	5.000	0	79.9	75	125				

Sample ID	**N021157-003C-MSD**	SampType:	**MSD**	TestCode:	**245.1_W**	Units:	**µg/L**	Prep Date:	**10/7/2016**	RunNo:	**111148**
Client ID:	**ZZZZZZ**	Batch ID:	**59894**	TestNo:	**EPA 245.1**			Analysis Date:	**10/18/2016**	SeqNo:	**2452522**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	5.006	0.20	5.000	0	100	75	125	3.996	22.4	20	R

Sample ID	**N021172-001D-MS**	SampType:	**MS**	TestCode:	**245.1_W**	Units:	**µg/L**	Prep Date:	**10/7/2016**	RunNo:	**111148**
Client ID:	**ZZZZZZ**	Batch ID:	**59894**	TestNo:	**EPA 245.1**			Analysis Date:	**10/18/2016**	SeqNo:	**2452525**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	4.365	0.20	5.000	0	87.3	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		

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-001

Client Sample ID: SC-100B-WDR-546
Collection Date: 10/4/2016 11:38:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **IC8_161005A** QC Batch: **R110937** PrepDate							Analyst: **RAB**
Fluoride	2.4	0.087	0.50		mg/L	5	10/5/2016 05:20 PM
ANIONS BY ION CHROMATOGRAPHY							
EPA 300.0							
RunID: **IC8_161005A** QC Batch: **R110937** PrepDate							Analyst: **RAB**
Sulfate	510	3.3	25		mg/L	50	10/5/2016 02:47 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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-002

Client Sample ID: SC-700B-WDR-546
Collection Date: 10/4/2016 11:42:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **IC8_161005A**	QC Batch: **R110937**			PrepDate			Analyst: **RAB**
Fluoride	2.1	0.087	0.50		mg/L	5	10/5/2016 05:51 PM
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **IC8_161005A**	QC Batch: **R110937**			PrepDate			Analyst: **RAB**
Sulfate	460	3.3	25		mg/L	50	10/5/2016 03:03 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

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-701-WDR-546
Lab Order:	N021157	**Collection Date:**	10/4/2016 11:30:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021157-003		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **IC8_161005A**	QC Batch: **R110937**			PrepDate			Analyst: **RAB**
Fluoride	20	0.35	2.0		mg/L	20	10/5/2016 06:37 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		

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID **MB-R110937_F**	SampType: **MBLK**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:	RunNo: **110937**
Client ID: **PBW**	Batch ID: **R110937**	TestNo: **EPA 300.0**		Analysis Date: **10/5/2016**	SeqNo: **2441724**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.10									

Sample ID **LCS-R110937_F**	SampType: **LCS**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:	RunNo: **110937**
Client ID: **LCSW**	Batch ID: **R110937**	TestNo: **EPA 300.0**		Analysis Date: **10/5/2016**	SeqNo: **2441725**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.279	0.10	1.250	0	102	90	110				

Sample ID **N021157-001BDUP**	SampType: **DUP**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:	RunNo: **110937**
Client ID: **ZZZZZZ**	Batch ID: **R110937**	TestNo: **EPA 300.0**		Analysis Date: **10/5/2016**	SeqNo: **2441736**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.386	0.50						2.407	0.876	20	

Sample ID **N021157-002BMS**	SampType: **MS**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:	RunNo: **110937**
Client ID: **ZZZZZZ**	Batch ID: **R110937**	TestNo: **EPA 300.0**		Analysis Date: **10/5/2016**	SeqNo: **2441738**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.329	0.50	6.250	2.142	99.0	80	120				

Sample ID **N021157-002BMSD**	SampType: **MSD**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:	RunNo: **110937**
Client ID: **ZZZZZZ**	Batch ID: **R110937**	TestNo: **EPA 300.0**		Analysis Date: **10/5/2016**	SeqNo: **2441739**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.340	0.50	6.250	2.142	99.2	80	120	8.328	0.132	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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	MB-R110937_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	110937
Client ID:	PBW	Batch ID:	R110937	TestNo:	EPA 300.0			Analysis Date:	10/5/2016	SeqNo:	2441785

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	0.50									

Sample ID	LCS-R110937_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	110937
Client ID:	LCSW	Batch ID:	R110937	TestNo:	EPA 300.0			Analysis Date:	10/5/2016	SeqNo:	2441786

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	4.028	0.50	4.000	0	101	90	110				

Sample ID	N021156-001BMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	110937
Client ID:	ZZZZZZ	Batch ID:	R110937	TestNo:	EPA 300.0			Analysis Date:	10/5/2016	SeqNo:	2441793

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	796.020	50	400.0	384.2	103	80	120				

Sample ID	N021156-001BMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	110937
Client ID:	ZZZZZZ	Batch ID:	R110937	TestNo:	EPA 300.0			Analysis Date:	10/5/2016	SeqNo:	2441794

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	793.640	50	400.0	384.2	102	80	120	796.0	0.299	20	

Sample ID	N021156-002BDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	110937
Client ID:	ZZZZZZ	Batch ID:	R110937	TestNo:	EPA 300.0			Analysis Date:	10/5/2016	SeqNo:	2441797

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	514.400	50						500.3	2.79	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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-001

Client Sample ID: SC-100B-WDR-546
Collection Date: 10/4/2016 11:38:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_161012D**	QC Batch: **R111089**			PrepDate			Analyst: **RB**
Nitrate/Nitrite as N	3.0	0.11	0.25		mg/L	5	10/12/2016

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

CLIENT: CH2M HILL
Lab Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021157-002

Client Sample ID: SC-700B-WDR-546
Collection Date: 10/4/2016 11:42:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_161012D**	QC Batch: **R111089**			PrepDate			Analyst: **RB**
Nitrate/Nitrite as N	2.9	0.11	0.25		mg/L	5	10/12/2016

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

CLIENT: CH2M HILL
Work Order: N021157
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID	**MB-R111089**	SampType:	**MBLK**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**111089**
Client ID:	**PBW**	Batch ID:	**R111089**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2016**	SeqNo:	**2449679**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.025	0.050									

Sample ID	**LCS-R11089**	SampType:	**LCS**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**111089**
Client ID:	**LCSW**	Batch ID:	**R111089**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2016**	SeqNo:	**2449680**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.484	0.050	0.5000	0	96.9	85	115				

Sample ID	**N021156-001CDUP**	SampType:	**DUP**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**111089**
Client ID:	**ZZZZZZ**	Batch ID:	**R111089**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2016**	SeqNo:	**2449682**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.038	0.050						0.04220	0	20	

Sample ID	**N021156-001CMS**	SampType:	**MS**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**111089**
Client ID:	**ZZZZZZ**	Batch ID:	**R111089**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2016**	SeqNo:	**2449683**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.511	0.050	0.5000	0.04220	93.8	75	125				

Sample ID	**N021156-001CMSD**	SampType:	**MSD**	TestCode:	**4500N03F_W**	Units:	**mg/L**	Prep Date:		RunNo:	**111089**
Client ID:	**ZZZZZZ**	Batch ID:	**R111089**	TestNo:	**SM4500-NO3**			Analysis Date:	**10/12/2016**	SeqNo:	**2449684**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.526	0.050	0.5000	0.04220	96.7	75	125	0.5113	2.82	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		

Chain of Custody Record

COC Number: **546**

CH2MHILL

Project Name PG&E Topock **Location** PG&E Topock
Task Order **Project** IM3Plant-ARAR-WDR-546
Project Number 680375.02.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Doug Scott
Turnaround Time 10 Days
PO Number 680375.02.IM.OP.00

Sample ID	Sample Date/Time	Type	Matrix	# Containers	Preserv	E120.1_IM3	E200 methods_IM3	E200.7_E200.8_IM3	E200.8_IM3_Mn	E218.6_IM3	E300.0_IM3	E300.0_IM3_Fl	SM2130_IM3	SM2540C_IM3	SM4500NH3_IM3	SM4500NO3-E_IM3
SC-100B-WDR-546	N021157 - 01	N	Water													
		Field Filtered		1	4°C					✓						
		Field Filtered		1	4°C	✓					✓		✓	✓		
		Field Filtered		1	4°C Lab H2SO4										✓	✓
		Field Filtered		1	4°C			✓								
		Total Containers:		4												
SC-700B-WDR-546	- 02	N	Water													
		Field Filtered		1	4°C					✓						
		Field Filtered		1	4°C	✓					✓		✓	✓		
		Field Filtered		1	4°C Lab H2SO4										✓	✓
		Field Filtered		1	4°C			✓								
		Total Containers:		4												

MS = Matrix Spike **SD = Matrix Spike Duplicate**

	Signatures	Date/Time
Approved by		10-4-16 11:33
Sampled by		10-04-16 11:35
Relinquished by		10-04-16 13:00
Received by		10/4/16 1300
Relinquished by		10/4/16 1451
Received by		

Shipping Details

Method of Shipment: Lab Courier
On Ice: yes / no 2.6°C (104)
Airbill No:
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:

Sample Custody
and
Marlon Cartin

Special Instructions:

Report Copy to
Doug Scott
(970) 731-0636

Chain of Custody Record

COC Number: **546**

CH2MHILL

Project Name PG&E Topock **Location** PG&E Topock
Task Order **Project** IM3Plant-ARAR-WDR-546
Project Number 680375.02.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Doug Scott
Turnaround Time 10 Days
PO Number 680375.02.IM.OP.00

Sample ID	Sample Date/Time	Type	Matrix	# Containers	Preserv	E120.1_IM3	E200 methods_IM3	E200.7_E200.8_IM3	E200.8_IM3_Mn	E218.6_IM3	E300.0_IM3	E300.0_IM3_F1	SM2130_IM3	SM2540C_IM3	SM4500NH3_IM3	SM4500NO3-E_IM3								
SC-701-WDR-546	N021157 - 03	N	Water																					
			Field Filtered	1	4°C	☐	☐	☐	☐	✓	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
			Field Filtered	1	4°C	✓	☐	☐	☐	☐	☐	✓	☐	✓	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
			Field Filtered	1	4°C	☐	✓	☐	✓	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
			Total Containers:		3																			

MS = Matrix Spike **SD = Matrix Spike Duplicate**

	Signatures	Date/Time
Approved by	QM. Qe	10-4-16 11:42
Sampled by	QM. Qe	10-4-16 11:42
Relinquished by	Qm	10-04-16 13:00
Received by		10/4/16 1800
Relinquished by		10/4/16 1830
Received by		

Shipping Details

Method of Shipment: Lab Courier
On Ice: yes / no 2 (RH)
Airbill No:
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:

Sample Custody
and
Marlon Cartin

Special Instructions:

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:	10/4/2016	Workorder:	N021157
Rep sample Temp (Deg C):	2.6	IR Gun ID:	1
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 ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☑	NA ☐
15. Did the bottle labels indicate correct preservatives used?	Yes ☑	No ☐	NA ☐
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments: Samples for Cr +6 were Lab filterd and preserved.
Samples for Metals and, NO3- and Ammonia were Lab preserved.

For:

Checklist Completed By: HG 10/5/2016

Reviewed By: 10/6/2016

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

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler: SIGNED

06-Oct-16

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N021157-001D / SC-100B-WDR-546	Water	10/4/2016 11:38:00 AM	16OZP	1		
N021157-002D / SC-700B-WDR-546	Water	10/4/2016 11:42:00 AM	16OZP	1		

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

Please use PO#:N21157A Please email Invoices and Account Receivable Statements to AssetAP@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. CH2M Hill Samples.

GSO #: 533554177

	Date/Time		Date/Time
Relinquished by:	10/6/2016 17:00	**Received by:**	
Relinquished by:		**Received by:**	

List of Analysts

ASSET Laboratories Work Order: **N021157**

NAME	TEST METHOD
Claire Ignacio	EPA 200.7, EPA 200.8, EPA 245.1
Quennie Manimtim	SM 3500-Cr B
Ryan balilu	SM 4500-NO3F
Lilia Ramit	EPA 120.1, SM 2130B, SM 2540C
Ria Abes	EPA 300.0, EPA 218.6

TRUESDAIL LABORATORIES, INC.
EXCELLENCE IN INDEPENDENT TESTING
Established 1931
3337 MICHELSON DRIVE, SUITE CN 750
IRVINE, CA 92612
(714) 730-6239 • FAX (714) 730-6462
www.truesdail.com

REPORT

Client: **Advanced Technology Laboratories-NV**
3151 W Post Rd
Las Vegas, NV 89118
Attention: Marlon Cartin
Project Name: ATL-NV

Work Order No.: 16J0164
Printed: 10/25/2016

CASE NARRATIVE

Truesdail Laboratories, Inc. is pleased to submit this report summarizing the Ammonia analyses. A summary table for this laboratory number is included in Section 2. Complete laboratory reports, wet chemistry raw data, quality control data and chain of custody forms for sampling period are included in Sections 3 and 4. Analytical raw data are under Section 5.

The samples were received and delivered with the chain of custody on October 7, 2016, intact and in chilled condition. The samples will be kept in a locked refrigerator for 30 days; thereafter will be kept in warm storage for additional 2 months before disposal.

If you have any questions or require additional information, please contact me at (714) 730-6239 ext. 203

SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
N021157-001D/SC-100B-WDR-546	16J0164-01	Water		10/04/2016 11:38	10/07/2016 13:48
N021157-002D/SC-700B-WDR-546	16J0164-02	Water		10/04/2016 11:42	10/07/2016 13:48

DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Shelly Brady
Customer Service Manager

N021157-001D/SC-100B-WDR-546

16J0164-01 (Water)

Analyte	Result	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
Truesdail Laboratories, Inc									
Wet Chemistry									
Ammonia	ND	0.0500	mg/L	1	1610356	10/17/2016 15:51	Alexander Luna	SM 4500-NH3 D M	

N021157-002D/SC-700B-WDR-546

16J0164-02 (Water)

Analyte	Result	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
Truesdail Laboratories, Inc									
Wet Chemistry									
Ammonia	ND	0.0500	mg/L	1	1610356	10/17/2016 15:53	Alexander Luna	SM 4500-NH3 D M	

QUALITY CONTROL

Wet Chemistry

Truesdail Laboratories, Inc

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	% Rec Limits	RPD	RPD Limit	Note
Batch: 1610356 - SM 4500-NH3 D M										
Blank (1610356-BLK1)				Prepared & Analyzed: 10/17/2016						
Ammonia	ND	0.0500	mg/L							
LCS (1610356-BS1)				Prepared & Analyzed: 10/17/2016						
Ammonia	0.364	0.0500	mg/L	0.400		91	90-110			
Duplicate (1610356-DUP1)		**Source: 16J0164-01**		Prepared & Analyzed: 10/17/2016						
Ammonia	0.0398	0.0500	mg/L		0.0422			6	20	
Matrix Spike (1610356-MS1)		**Source: 16J0180-01**		Prepared & Analyzed: 10/17/2016						
Ammonia	0.478	0.0500	mg/L	0.400	0.0928	96	75-125			
Matrix Spike Dup (1610356-MSD1)		**Source: 16J0180-01**		Prepared & Analyzed: 10/17/2016						
Ammonia	0.477	0.0500	mg/L	0.400	0.0928	96	75-125	0.3	20	

ANALYSIS DATA SHEET

Inorganics

Client: **Advanced Technology Laboratories-NV**
Client Sample ID: **N021157-001D/SC-100B-WDR-546**
Lab Sample ID: **16J0164-01**
Project: **ATL-NV**

Date Sampled: 10/04/16 11:38 Matrix: Water

CAS NO.	Analyte	Concentration (mg/L)	MDL	RL	DF	Q	Analyst	Analyzed	Method
7664-41-7	Ammonia	ND	0.0111	0.0500	1		AL	10/17/16 15:51	SM 4500-NH3 D M

ANALYSIS DATA SHEET

Inorganics

Client: **Advanced Technology Laboratories-NV**
Client Sample ID: **N021157-002D/SC-700B-WDR-546**
Lab Sample ID: **16J0164-02**
Project: **ATL-NV**

Date Sampled: 10/04/16 11:42 Matrix: Water

CAS NO.	Analyte	Concentration (mg/L)	MDL	RL	DF	Q	Analyst	Analyzed	Method
7664-41-7	Ammonia	ND	0.0111	0.0500	1		AL	10/17/16 15:53	SM 4500-NH3 D M

METHOD BLANK DATA SHEET

SM 4500-NH3 D M

Client: Advanced Technology Laboratories-NV

Project: ATL-NV
Laboratory ID: 1610356-BLK1

Prepared:	10/17/16 14:10	Preparation:	SM 4500-NH3 D M	Matrix:	Water
Analyzed:	10/17/16 15:36	Instrument:	TL01	File ID:	6J17001-012
Batch:	1610356	Sequence:	6J17001		

CAS NO.	COMPOUND	CONC. (mg/L)	MDL	RL	Q
7664-41-7	Ammonia	ND	0.0111	0.0500	

LCS / LCS DUPLICATE RECOVERY

SM 4500-NH3 D M

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **16J0164**

Matrix:	Water	Prep Method:	SM 4500-NH3 D M
Prep Batch:	1610356	Lab Sample ID:	1610356-BS1

ANALYTE	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC.	QC LIMITS REC.
Ammonia	0.400	0.364	91	90 - 110

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Matrix Spike

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **16J0164**

Matrix: Water
Prep Batch: 1610356

Analysis Method: SM 4500-NH3 D M
Prep Method: SM 4500-NH3 D M
Laboratory ID: 1610356-MS1
Source Sample ID: 16J0180-01

ANALYTE	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC.	QC LIMITS REC.
Ammonia	0.400	0.0928	0.478	96	75 - 125

ANALYTE	SPIKE ADDED (mg/L)	MSD CONCENTRATION (mg/L)	MSD % REC. #	% RPD	QC LIMITS RPD	QC LIMITS REC.
Ammonia	0.400	0.477	96	0.3	20	75 - 125

* Values outside of QC limits

DUPLICATES

N021157-001D/SC-100B-WDR-546

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**

Matrix:	Water	Laboratory ID:	1610356-DUP1
Prep Batch:	1610356	Initial/Final:	50 mL / 50 mL
Prep Method:	SM 4500-NH3 D M	Analysis:	SM 4500-NH3 D M

ANALYTE	SAMPLE CONCENTRATION (mg/L)	DUPLICATE CONCENTRATION (mg/L)	RPD %	Q	CONTROL LIMIT
Ammonia	0.0422	0.0398			20

* Values outside of QC limits

16 J0164

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

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler: SIGNED

06-Oct-16

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N021157-001D / SC-100B-WDR-546	Water	10/4/2016 11:38:00 AM	16OZP	1		
N021157-002D / SC-700B-WDR-546	Water	10/4/2016 11:42:00 AM	16OZP	1		

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

Please use PO#:N21157A Please email Invoices and Account Receivable Statements to AssetAP@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. CH2M Hill Samples.

GSO #: 533554177

	Date/Time		Date/Time
Relinquished by: RJ	10/6/2016 17:00	**Received by:** Michelle Reed	10/7/16 13:48
Relinquished by:		**Received by:**	

9.8°C

Log-in check list
For level III data package

Client: ATL Lab Number: 16J0164

Received Date: 10/7/16

Sample receiving review	Yes	No	N/A	Comment
Was special login form received by login personnel?	X			
Was COC received and signed by client and login personnel?	X			
Were all sampls temperature measured and recorded on COC?	X			
Did you measure and record the pH on all metals samples on COC?	X			
Has sample integrity and analysis discrepancy form been filled out completely?	X			
Were all interacompany yellow forms generated and stamped with " alert level III QC" note?	X			
Have check -in and check out lists been filled out and attached to appropriate form?	X			
Were sample containers labeled with TLI numbers, date, and time sampled?	X			
Did you notify analyst or group leader about short holding time?	X			
Was a copy of COC attached to all yellow intracompany form?	X			
For special clients, have all their samples been logged into the internal COC book?	X			
Were samples locked in fridge or special storage area?		X		
Was temperature recorded in the log book?	X			

Sample receiving Signature: Michelle Reed

WORK ORDER

Printed: 10/7/2016 1:58:43PM

16J0164

Truesdail Laboratories, Inc

Client: Advanced Technology Laboratories-NV
Project: ATL-NV

Project Manager: Shelly Brady
Project Number: [none]

Report To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone: (702) 307-2659
Fax: (702) 307-2691

Invoice To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone :(702) 307-2659
Fax: (702) 307-2691

Date Due: 10/18/2016 16:30 (7 day TAT)
Received By: Michelle Reed
Logged In By: Michelle Reed
Date Received: 10/07/2016 13:48
Date Logged In: 10/07/2016 13:49

Samples Received at: **9.8°C**

Chain of Custody re	Yes	Samples intact?	Yes
Letter (if sent) matc	No	Custody seals (if an	No
Requested analyses	Yes	Analyses within hol	Yes
Samples received in	Yes		

Analysis	Due	TAT	Expires	Comments
16J0164-01 N021157-001D/SC-100B-WDR-546 [Water] Sampled 10/04/2016 11:38 (GMT-08:00) Pacific Time (US &				
Ammonia E	10/18/2016 08:00	7	11/01/2016 11:38	
16J0164-02 N021157-002D/SC-700B-WDR-546 [Water] Sampled 10/04/2016 11:42 (GMT-08:00) Pacific Time (US &				
Ammonia E	10/18/2016 08:00	7	11/01/2016 11:42	

AM
Reviewed By

10/7/16
Date

November 15, 2016

Doug Scott
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (970) 731-0636
FAX: (510) 622-9129

Workorder No.: N021462

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on November 01, 2016 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 Ribucas for

Puri Romualdo
Laboratory Director

TRUESDAIL LABORATORIES, INC.
EXCELLENCE IN INDEPENDENT TESTING
Established 1931
3337 MICHELSON DRIVE, SUITE CN 750
IRVINE, CA 92612
(714) 730-6239 • FAX (714) 730-6462
www.truesdail.com

REPORT

Client: **Advanced Technology Laboratories-NV**
3151 W Post Rd
Las Vegas, NV 89118
Attention: Marlon Cartin
Project Name: ATL-NV

Work Order No.: 16K0078
Printed: 11/23/2016

CASE NARRATIVE

Truesdail Laboratories, Inc. is pleased to submit this report summarizing the Ammonia analyses. A summary table for this laboratory number is included in Section 2. Complete laboratory reports, wet chemistry raw data, quality control data and chain of custody forms for sampling period are included in Sections 3 and 4. Analytical raw data are under Section 5.

The sample was received and delivered with the chain of custody on November 3rd, 2016, intact and in chilled condition. The samples will be kept in a locked refrigerator for 30 days; thereafter will be kept in warm storage for additional 2 months before disposal.

If you have any questions or require additional information, please contact me at (714) 730-6239 ext. 203

SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
N021462 / SC-700B-WDR-547	16K0078-01	Water		11/01/2016 12:40	11/03/2016 09:30

DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Shelly Brady
Customer Service Manager

N021462 / SC-700B-WDR-547

16K0078-01 (Water)

Analyte	Result	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
Truesdail Laboratories, Inc									
Wet Chemistry									
Ammonia	**0.0527**	0.0500	mg/L	1	1611158	11/07/2016 16:12	Alexander Luna	SM 4500-NH3 D M	

QUALITY CONTROL

Wet Chemistry

Truesdail Laboratories, Inc

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	% Rec Limits	RPD	RPD Limit	Note
Batch: 1611158 - SM 4500-NH3 D M										
Blank (1611158-BLK1)				Prepared & Analyzed: 11/7/2016						
Ammonia	ND	0.0500	mg/L							
LCS (1611158-BS1)				Prepared & Analyzed: 11/7/2016						
Ammonia	0.362	0.0500	mg/L	0.400		91	90-110			
Duplicate (1611158-DUP1)		**Source: 16J0444-06**		Prepared & Analyzed: 11/7/2016						
Ammonia	0.334	0.0500	mg/L		0.348			4	20	
Matrix Spike (1611158-MS1)		**Source: 16K0025-02**		Prepared & Analyzed: 11/7/2016						
Ammonia	0.519	0.0500	mg/L	0.400	0.116	101	75-125			
Matrix Spike Dup (1611158-MSD1)		**Source: 16K0025-02**		Prepared & Analyzed: 11/7/2016						
Ammonia	0.519	0.0500	mg/L	0.400	0.116	101	75-125	0.05	20	

ANALYSIS DATA SHEET

Inorganics

Client: **Advanced Technology Laboratories-NV**
Client Sample ID: **N021462 / SC-700B-WDR-547**
Lab Sample ID: **16K0078-01**
Project: **ATL-NV**

Date Sampled: 11/01/16 12:40 Matrix: Water

CAS NO.	Analyte	Concentration (mg/L)	MDL	RL	DF	Q	Analyst	Analyzed	Method
7664-41-7	Ammonia	0.0527	0.0111	0.0500	1		AL	11/07/16 16:12	SM 4500-NH3 D M

METHOD BLANK DATA SHEET

SM 4500-NH3 D M

Client: Advanced Technology Laboratories-NV

Project: ATL-NV
Laboratory ID: 1611158-BLK1

Prepared:	11/07/16 10:14	Preparation:	SM 4500-NH3 D M	Matrix:	Water
Analyzed:	11/07/16 15:59	Instrument:	TL01	File ID:	6K07004-011
Batch:	1611158	Sequence:	6K07004		

CAS NO.	COMPOUND	CONC. (mg/L)	MDL	RL	Q
7664-41-7	Ammonia	ND	0.0111	0.0500	

LCS / LCS DUPLICATE RECOVERY

SM 4500-NH3 D M

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **16K0078**

Matrix:	Water	Prep Method:	SM 4500-NH3 D M
Prep Batch:	1611158	Lab Sample ID:	1611158-BS1

ANALYTE	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC.	QC LIMITS REC.
Ammonia	0.400	0.362	91	90 - 110

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Matrix Spike

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **16K0078**

Matrix: Water
Prep Batch: 1611158

Analysis Method: SM 4500-NH3 D M
Prep Method: SM 4500-NH3 D M
Laboratory ID: 1611158-MS1
Source Sample ID: 16K0025-02

ANALYTE	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC.	QC LIMITS REC.
Ammonia	0.400	0.116	0.519	101	75 - 125

ANALYTE	SPIKE ADDED (mg/L)	MSD CONCENTRATION (mg/L)	MSD % REC. #	% RPD	QC LIMITS RPD	QC LIMITS REC.
Ammonia	0.400	0.519	101	0.05	20	75 - 125

* Values outside of QC limits

DUPLICATES

Duplicate

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**

Matrix:	Water	Laboratory ID:	1611158-DUP1
Prep Batch:	1611158	Initial/Final:	50 mL / 50 mL
Prep Method:	SM 4500-NH3 D M	Analysis:	SM 4500-NH3 D M

ANALYTE	SAMPLE CONCENTRATION (mg/L)	DUPLICATE CONCENTRATION (mg/L)	RPD %	Q	CONTROL LIMIT
Ammonia	0.348	0.334	4		20

* Values outside of QC limits

16K0078

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

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler: SIGNED

02-Nov-16

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N021462-002D / SC-700B-WDR-547	Water	11/1/2016 12:40:00 PM	~~32OZP~~ 16 OZP	1		

ALERT !!
Level IV QC

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

Please use PO#:N21462A Please email Invoices and Account Receivable Statements to AssetAP@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Nomal TAT.

Pease analyze for Ammonia by SM4500. CH2M Hill Sample.

GSO #: 533859723

		Date/Time			Date/Time
Relinquished by:	YJ	11/2/2016 17:00	**Received by:**	Jacqueline Brown	11-3-16 9:30
Relinquished by:			**Received by:**		

3.6°C

Log-in check list
For level III data package

Client: ATL Lab Number: 16K0078

Received Date: 11/3/16

Sample receiving review	Yes	No	N/A	Comment
Was special login form received by login personnel?	X			
Was COC received and signed by client and login personnel?	X			
Were all sampls temperature measured and recorded on COC?	X			
Did you measure and record the pH on all metals samples on COC?	X			
Has sample integrity and analysis discrepancy form been filled out completely?	X			
Were all interacompany yellow forms generated and stamped with " alert level III QC" note?	X			
Have check -in and check out lists been filled out and attached to appropriate form?	X			
Were sample containers labeled with TLI numbers, date, and time sampled?	X			
Did you notify analyst or group leader about short holding time?	X			
Was a copy of COC attached to all yellow intracompany form?	X			
For special clients, have all their samples been logged into the internal COC book?				
Were samples locked in fridge or special storage area?			X	
Was temperature recorded in the log book?	X			
Sample receiving Signature:				

ALERT !!
Level IV QC

WORK ORDER

16K0078

Printed: 11/3/2016 10:24:12AM

Truesdail Laboratories, Inc

Client: Advanced Technology Laboratories-NV
Project: ATL-NV

Project Manager: Shelly Brady
Project Number: [none]

Report To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone: (702) 307-2659
Fax: (702) 307-2691

Invoice To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone :(702) 307-2659
Fax: (702) 307-2691

Date Due: 11/14/2016 16:30 (7 day TAT)

Received By: Jacqueline Brown
Logged In By: Michelle Reed

Date Received: 11/03/2016 09:30
Date Logged In: 11/03/2016 10:19

Samples Received at: 3.6°C

Chain of Custody re	Yes	Samples intact?	Yes
Letter (if sent) matc	No	Custody seals (if an	No
Requested analyses	Yes	Analyses within hol	Yes
Samples received in	Yes		

Analysis	Due	TAT	Expires	Comments
16K0078-01 N021462 / SC-700B-WDR-547 [Water] Sampled 11/01/2016 12:40 (GMT-08:00) Pacific Time (US &				
Ammonia E	11/14/2016 08:00	7	11/29/2016 12:40	

Reviewed By

11-3-16
Date

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N021462

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 Truesdail- Irvine,CA.

ASSET LABORATORIES
"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

ASSET Laboratories

Date: *15-Nov-16*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N021462
Contract No: IM3Plant-ARAR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N021462-001A	SC-100B-WDR-547	Water	11/1/2016 12:12:00 PM	11/1/2016	11/15/2016
N021462-001B	SC-100B-WDR-547	Water	11/1/2016 12:12:00 PM	11/1/2016	11/15/2016
N021462-001C	SC-100B-WDR-547	Water	11/1/2016 12:12:00 PM	11/1/2016	11/15/2016
N021462-002A	SC-700B-WDR-547	Water	11/1/2016 12:10:00 PM	11/1/2016	11/15/2016
N021462-002B	SC-700B-WDR-547	Water	11/1/2016 12:10:00 PM	11/1/2016	11/15/2016
N021462-002C	SC-700B-WDR-547	Water	11/1/2016 12:10:00 PM	11/1/2016	11/15/2016
N021462-002D	SC-700B-WDR-547	Water	11/1/2016 12:10:00 PM	11/1/2016	11/15/2016
N021462-002E	SC-700B-WDR-547	Water	11/1/2016 12:10:00 PM	11/1/2016	11/15/2016

CLIENT: CH2M HILL
Lab Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021462-001

Client Sample ID: SC-100B-WDR-547
Collection Date: 11/1/2016 12:12:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_161102B**	QC Batch: **R111444**			PrepDate			Analyst: **LR**
Specific Conductance	7100	0.10	0.10		umhos/cm	1	11/2/2016 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

CLIENT: CH2M HILL
Lab Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021462-002

Client Sample ID: SC-700B-WDR-547
Collection Date: 11/1/2016 12:10:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_161102B**	QC Batch: **R111444**			PrepDate			Analyst: **LR**
Specific Conductance	7200	0.10	0.10		umhos/cm	1	11/2/2016 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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID	**N021462-002BDUP**	SampType:	**DUP**	TestCode:	**120.1_WPGE**	Units:	**umhos/cm**	Prep Date:		RunNo:	**111444**
Client ID:	**ZZZZZZ**	Batch ID:	**R111444**	TestNo:	**EPA 120.1**			Analysis Date:	**11/2/2016**	SeqNo:	**2466128**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	7150.000	0.10						7170	0.279	10	

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		

CLIENT: CH2M HILL
Lab Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021462-001

Client Sample ID: SC-100B-WDR-547
Collection Date: 11/1/2016 12:12:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_161102D**	QC Batch: **60155**				PrepDate	**11/2/2016**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4100	50	50		mg/L	1	11/2/2016 12:54 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

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-547
Lab Order:	N021462	**Collection Date:**	11/1/2016 12:10:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021462-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_161102D**	QC Batch: **60155**			PrepDate	**11/2/2016**		Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4200	50	50		mg/L	1	11/2/2016 12:54 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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID **MB-60155**	SampType: **MBLK**	TestCode: **160.1_2540C**	Units: **mg/L**	Prep Date: **11/2/2016**	RunNo: **111447**
Client ID: **PBW**	Batch ID: **60155**	TestNo: **SM2540C**		Analysis Date: **11/2/2016**	SeqNo: **2467119**

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 **LCS-60155**	SampType: **LCS**	TestCode: **160.1_2540C**	Units: **mg/L**	Prep Date: **11/2/2016**	RunNo: **111447**
Client ID: **LCSW**	Batch ID: **60155**	TestNo: **SM2540C**		Analysis Date: **11/2/2016**	SeqNo: **2467120**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	975.000	10	1000	0	97.5	80	120				

Sample ID **N021462-001BDUP**	SampType: **DUP**	TestCode: **160.1_2540C**	Units: **mg/L**	Prep Date: **11/2/2016**	RunNo: **111447**
Client ID: **ZZZZZZ**	Batch ID: **60155**	TestNo: **SM2540C**		Analysis Date: **11/2/2016**	SeqNo: **2467125**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	3980.000	50						4075	2.36	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		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-547
Lab Order:	N021462	**Collection Date:**	11/1/2016 12:10:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021462-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_161103A**	QC Batch: **60158**				PrepDate	**11/3/2016**	Analyst: **CEI**
Aluminum	ND	2.7	50		µg/L	1	11/3/2016 07:09 PM
Boron	1100	38	100		µg/L	1	11/4/2016 10:13 AM
Iron	ND	1.8	20		µg/L	1	11/3/2016 07:09 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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-60158**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111490**
Client ID: **PBW**	Batch ID: **60158**	TestNo: **EPA 200.7**		Analysis Date: **11/3/2016**	SeqNo: **2467982**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	3.694	50									
Iron	1.940	20									

Sample ID **LCS-60158**	SampType: **LCS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111490**
Client ID: **LCSW**	Batch ID: **60158**	TestNo: **EPA 200.7**		Analysis Date: **11/3/2016**	SeqNo: **2467983**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10509.299	50	10000	0	105	85	115				
Iron	100.872	20	100.0	0	101	85	115				

Sample ID **N021462-002E-MS**	SampType: **MS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111490**
Client ID: **ZZZZZZ**	Batch ID: **60158**	TestNo: **EPA 200.7**		Analysis Date: **11/3/2016**	SeqNo: **2467987**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10876.806	50	10000	0	109	75	125				
Iron	104.930	20	100.0	7.069	97.9	75	125				

Sample ID **N021462-002E-MSD**	SampType: **MSD**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111490**
Client ID: **ZZZZZZ**	Batch ID: **60158**	TestNo: **EPA 200.7**		Analysis Date: **11/3/2016**	SeqNo: **2467988**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10879.756	50	10000	0	109	75	125	10880	0.0271	20	
Iron	105.308	20	100.0	7.069	98.2	75	125	104.9	0.360	20	

Sample ID **MB-60158**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111495**
Client ID: **PBW**	Batch ID: **60158**	TestNo: **EPA 200.7**		Analysis Date: **11/4/2016**	SeqNo: **2469197**

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
- ND Not Detected at the Reporting Limit
- DO Surrogate Diluted Out
- E Value above quantitation range
- R RPD outside accepted recovery limits

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID	MB-60158	SampType:	MBLK	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111495
Client ID:	PBW	Batch ID:	60158	TestNo:	EPA 200.7			Analysis Date:	11/4/2016	SeqNo:	2469197

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	100									

Sample ID	LCS-60158	SampType:	LCS	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111495
Client ID:	LCSW	Batch ID:	60158	TestNo:	EPA 200.7			Analysis Date:	11/4/2016	SeqNo:	2469198

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	5331.477	100	5000	0	107	85	115				

Sample ID	N021462-002E-MS	SampType:	MS	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111495
Client ID:	ZZZZZZ	Batch ID:	60158	TestNo:	EPA 200.7			Analysis Date:	11/4/2016	SeqNo:	2469202

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	6851.133	100	5000	1055	116	75	125				

Sample ID	N021462-002E-MSD	SampType:	MSD	TestCode:	200.7_WPGE	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111495
Client ID:	ZZZZZZ	Batch ID:	60158	TestNo:	EPA 200.7			Analysis Date:	11/4/2016	SeqNo:	2469203

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	6779.316	100	5000	1055	114	75	125	6851	1.05	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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-547
Lab Order:	N021462	**Collection Date:**	11/1/2016 12:12:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021462-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_161104A** QC Batch: **60146** PrepDate **11/3/2016** Analyst: **CEI**							
Manganese	36	0.056	0.50		µg/L	1	11/4/2016 11:23 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

CLIENT: CH2M HILL
Lab Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021462-002

Client Sample ID: SC-700B-WDR-547
Collection Date: 11/1/2016 12:10:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161104A**	QC Batch: **60146**				PrepDate	**11/3/2016**	Analyst: **CEI**
Antimony	ND	0.031	0.50		µg/L	1	11/4/2016 11:28 AM
Arsenic	ND	0.025	0.10		µg/L	1	11/4/2016 11:28 AM
Barium	18	0.070	1.0		µg/L	1	11/4/2016 11:28 AM
Copper	ND	0.26	1.0		µg/L	1	11/4/2016 11:28 AM
Lead	ND	0.037	1.0		µg/L	1	11/4/2016 11:28 AM
Manganese	16	0.056	0.50		µg/L	1	11/4/2016 11:28 AM
Molybdenum	22	0.039	0.50		µg/L	1	11/4/2016 11:28 AM
Nickel	2.4	0.040	1.0		µg/L	1	11/4/2016 11:28 AM
Zinc	ND	0.27	10		µg/L	1	11/4/2016 03:42 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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-60146**	SampType: **MBLK**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111502**
Client ID: **PBW**	Batch ID: **60146**	TestNo: **EPA 200.8**		Analysis Date: **11/4/2016**	SeqNo: **2468255**

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									

Sample ID **LCS-60146**	SampType: **LCS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111502**
Client ID: **LCSW**	Batch ID: **60146**	TestNo: **EPA 200.8**		Analysis Date: **11/4/2016**	SeqNo: **2468256**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.463	0.50	10.00	0	105	85	115				
Arsenic	9.964	0.10	10.00	0	99.6	85	115				
Barium	104.504	1.0	100.0	0	105	85	115				
Copper	9.992	1.0	10.00	0	99.9	85	115				
Lead	9.867	1.0	10.00	0	98.7	85	115				
Manganese	96.073	0.50	100.0	0	96.1	85	115				
Molybdenum	10.157	0.50	10.00	0	102	85	115				
Nickel	9.972	1.0	10.00	0	99.7	85	115				

Sample ID **N021446-007B-MS**	SampType: **MS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **11/3/2016**	RunNo: **111502**
Client ID: **ZZZZZZ**	Batch ID: **60146**	TestNo: **EPA 200.8**		Analysis Date: **11/4/2016**	SeqNo: **2468263**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.112	0.50	10.00	0.03768	101	75	125				
Arsenic	10.612	0.10	10.00	1.150	94.6	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		

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N021446-007B-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111502
Client ID:	ZZZZZZ	Batch ID:	60146	TestNo:	EPA 200.8			Analysis Date:	11/4/2016	SeqNo:	2468263

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	154.784	1.0	100.0	52.53	102	75	125				
Copper	8.381	1.0	10.00	0	83.8	75	125				
Lead	9.415	1.0	10.00	0	94.1	75	125				
Manganese	94.156	0.50	100.0	0	94.2	75	125				
Molybdenum	13.215	0.50	10.00	2.702	105	75	125				
Nickel	9.298	1.0	10.00	0.6122	86.9	75	125				

Sample ID	N021446-007B-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111502
Client ID:	ZZZZZZ	Batch ID:	60146	TestNo:	EPA 200.8			Analysis Date:	11/4/2016	SeqNo:	2468264

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.140	0.50	10.00	0.03768	101	75	125	10.11	0.281	20	
Arsenic	10.465	0.10	10.00	1.150	93.1	75	125	10.61	1.40	20	
Barium	154.602	1.0	100.0	52.53	102	75	125	154.8	0.118	20	
Copper	8.285	1.0	10.00	0	82.8	75	125	8.381	1.15	20	
Lead	9.324	1.0	10.00	0	93.2	75	125	9.415	0.970	20	
Manganese	93.600	0.50	100.0	0	93.6	75	125	94.16	0.592	20	
Molybdenum	13.205	0.50	10.00	2.702	105	75	125	13.22	0.0773	20	
Nickel	9.269	1.0	10.00	0.6122	86.6	75	125	9.298	0.312	20	

Sample ID	MB-60146	SampType:	MBLK	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111530
Client ID:	PBW	Batch ID:	60146	TestNo:	EPA 200.8			Analysis Date:	11/4/2016	SeqNo:	2469924

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	ND	10									

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		

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	LCS-60146	SampType:	LCS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111530
Client ID:	LCSW	Batch ID:	60146	TestNo:	EPA 200.8			Analysis Date:	11/4/2016	SeqNo:	2469925

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	104.059	10	100.0	0	104	85	115				

Sample ID	N021446-007B-MS	SampType:	MS	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111530
Client ID:	ZZZZZZ	Batch ID:	60146	TestNo:	EPA 200.8			Analysis Date:	11/4/2016	SeqNo:	2469930

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	91.771	10	100.0	0	91.8	75	125				

Sample ID	N021446-007B-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	11/3/2016	RunNo:	111530
Client ID:	ZZZZZZ	Batch ID:	60146	TestNo:	EPA 200.8			Analysis Date:	11/4/2016	SeqNo:	2469931

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Zinc	88.835	10	100.0	0	88.8	75	125	91.77	3.25	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		

CLIENT: CH2M HILL
Lab Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021462-001

Client Sample ID: SC-100B-WDR-547
Collection Date: 11/1/2016 12:12:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_161102A**	QC Batch: **R111471**			PrepDate			Analyst: **RAB**
Hexavalent Chromium	480	6.6	20		µg/L	100	11/2/2016 09:57 AM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161104A**	QC Batch: **60146**			PrepDate	**11/3/2016**		Analyst: **CEI**
Chromium	500	0.096	5.0		µg/L	5	11/4/2016 12:29 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

CLIENT: CH2M HILL
Lab Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021462-002

Client Sample ID: SC-700B-WDR-547
Collection Date: 11/1/2016 12:10:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_161102A**	QC Batch: **R111471**			PrepDate			Analyst: **RAB**
Hexavalent Chromium	ND	0.066	0.20		µg/L	1	11/2/2016 10:26 AM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161104A**	QC Batch: **60146**			PrepDate	**11/3/2016**		Analyst: **CEI**
Chromium	ND	0.019	1.0		µg/L	1	11/4/2016 11:28 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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID	**MB-60146**	SampType:	**MBLK**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**11/3/2016**	RunNo:	**111502**
Client ID:	**PBW**	Batch ID:	**60146**	TestNo:	**EPA 200.8**			Analysis Date:	**11/4/2016**	SeqNo:	**2468294**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	ND	1.0									

Sample ID	**LCS-60146**	SampType:	**LCS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**11/3/2016**	RunNo:	**111502**
Client ID:	**LCSW**	Batch ID:	**60146**	TestNo:	**EPA 200.8**			Analysis Date:	**11/4/2016**	SeqNo:	**2468295**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.709	1.0	10.00	0	97.1	85	115				

Sample ID	**N021446-007B-MS**	SampType:	**MS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**11/3/2016**	RunNo:	**111502**
Client ID:	**ZZZZZZ**	Batch ID:	**60146**	TestNo:	**EPA 200.8**			Analysis Date:	**11/4/2016**	SeqNo:	**2468302**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.193	1.0	10.00	0.8509	93.4	75	125				

Sample ID	**N021446-007B-MSD**	SampType:	**MSD**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**11/3/2016**	RunNo:	**111502**
Client ID:	**ZZZZZZ**	Batch ID:	**60146**	TestNo:	**EPA 200.8**			Analysis Date:	**11/4/2016**	SeqNo:	**2468303**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	10.237	1.0	10.00	0.8509	93.9	75	125	10.19	0.432	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		

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	MB-R111471	SampType:	MBLK	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	111471
Client ID:	PBW	Batch ID:	R111471	TestNo:	EPA 218.6			Analysis Date:	11/2/2016	SeqNo:	2467258

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-R111471	SampType:	LCS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	111471
Client ID:	LCSW	Batch ID:	R111471	TestNo:	EPA 218.6			Analysis Date:	11/2/2016	SeqNo:	2467259

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.151	0.20	5.000	0	103	90	110				

Sample ID	N021462-001AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	111471
Client ID:	ZZZZZZ	Batch ID:	R111471	TestNo:	EPA 218.6			Analysis Date:	11/2/2016	SeqNo:	2467261

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	998.120	20	500.0	483.4	103	90	110				

Sample ID	N021462-001AMSD	SampType:	MSD	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	111471
Client ID:	ZZZZZZ	Batch ID:	R111471	TestNo:	EPA 218.6			Analysis Date:	11/2/2016	SeqNo:	2467262

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	998.030	20	500.0	483.4	103	90	110	998.1	0.00902	20	

Sample ID	N021462-002AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	111471
Client ID:	ZZZZZZ	Batch ID:	R111471	TestNo:	EPA 218.6			Analysis Date:	11/2/2016	SeqNo:	2467264

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.061	0.20	1.000	0	106	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
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **N021466-005ADUP**	SampType: **DUP**	TestCode: **218.6_WU_P**	Units: **µg/L**		Prep Date:				RunNo: **111471**		
Client ID: **ZZZZZZ**	Batch ID: **R111471**	TestNo: **EPA 218.6**			Analysis Date: **11/2/2016**				SeqNo: **2467285**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	0.860	0.20						0.7924	8.17	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		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-547
Lab Order:	N021462	**Collection Date:**	11/1/2016 12:12:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021462-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_161102A**	QC Batch: **R111443**			PrepDate			Analyst: **LR**
Turbidity	0.34	0.10	0.10		NTU	1	11/2/2016 10:40 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

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-547
Lab Order:	N021462	**Collection Date:**	11/1/2016 12:10:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021462-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_161102A**	QC Batch: **R111443**			PrepDate			Analyst: **LR**
Turbidity	0.21	0.10	0.10		NTU	1	11/2/2016 10:40 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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	**MB-R111443**	SampType:	**MBLK**	TestCode:	**2130_W**	Units:	**NTU**	Prep Date:		RunNo:	**111443**
Client ID:	**PBW**	Batch ID:	**R111443**	TestNo:	**SM 2130B**			Analysis Date:	**11/2/2016**	SeqNo:	**2466125**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	ND	0.10									

Sample ID	**N021462-001BDUP**	SampType:	**DUP**	TestCode:	**2130_W**	Units:	**NTU**	Prep Date:		RunNo:	**111443**
Client ID:	**ZZZZZZ**	Batch ID:	**R111443**	TestNo:	**SM 2130B**			Analysis Date:	**11/2/2016**	SeqNo:	**2466130**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.330	0.10						0.3400	2.99	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		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-547
Lab Order:	N021462	**Collection Date:**	11/1/2016 12:10:00 PM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N021462-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_161102A**	QC Batch: **R111460**			PrepDate			Analyst: **RAB**
Fluoride	2.1	0.087	0.50		mg/L	5	11/2/2016 01:33 PM
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_161102A**	QC Batch: **R111460**			PrepDate			Analyst: **RAB**
Sulfate	480	3.3	25		mg/L	50	11/2/2016 03:04 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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	**MB-R111460_F**	SampType:	**MBLK**	TestCode:	**300_W_FPG**	Units:	**mg/L**	Prep Date:		RunNo:	**111460**
Client ID:	**PBW**	Batch ID:	**R111460**	TestNo:	**EPA 300.0**			Analysis Date:	**11/2/2016**	SeqNo:	**2466840**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.10									

Sample ID	**LCS-R111460_F**	SampType:	**LCS**	TestCode:	**300_W_FPG**	Units:	**mg/L**	Prep Date:		RunNo:	**111460**
Client ID:	**LCSW**	Batch ID:	**R111460**	TestNo:	**EPA 300.0**			Analysis Date:	**11/2/2016**	SeqNo:	**2466841**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.210	0.10	1.250	0	96.8	90	110				

Sample ID	**N021462-002BDUP**	SampType:	**DUP**	TestCode:	**300_W_FPG**	Units:	**mg/L**	Prep Date:		RunNo:	**111460**
Client ID:	**ZZZZZZ**	Batch ID:	**R111460**	TestNo:	**EPA 300.0**			Analysis Date:	**11/2/2016**	SeqNo:	**2466845**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.071	0.50						2.090	0.889	20	

Sample ID	**N021462-002BMS**	SampType:	**MS**	TestCode:	**300_W_FPG**	Units:	**mg/L**	Prep Date:		RunNo:	**111460**
Client ID:	**ZZZZZZ**	Batch ID:	**R111460**	TestNo:	**EPA 300.0**			Analysis Date:	**11/2/2016**	SeqNo:	**2466846**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.169	0.50	6.250	2.090	97.3	80	120				

Sample ID	**N021462-002BMSD**	SampType:	**MSD**	TestCode:	**300_W_FPG**	Units:	**mg/L**	Prep Date:		RunNo:	**111460**
Client ID:	**ZZZZZZ**	Batch ID:	**R111460**	TestNo:	**EPA 300.0**			Analysis Date:	**11/2/2016**	SeqNo:	**2466847**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	8.190	0.50	6.250	2.090	97.6	80	120	8.168	0.257	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		

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	MB-R111460_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	111460
Client ID:	PBW	Batch ID:	R111460	TestNo:	EPA 300.0			Analysis Date:	11/2/2016	SeqNo:	2466872

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	0.50									

Sample ID	LCS-R111460_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	111460
Client ID:	LCSW	Batch ID:	R111460	TestNo:	EPA 300.0			Analysis Date:	11/2/2016	SeqNo:	2466873

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.950	0.50	4.000	0	98.8	90	110				

Sample ID	N021462-002BDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	111460
Client ID:	ZZZZZZ	Batch ID:	R111460	TestNo:	EPA 300.0			Analysis Date:	11/2/2016	SeqNo:	2466879

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	472.455	25						475.4	0.618	20	

Sample ID	N021462-002BMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	111460
Client ID:	ZZZZZZ	Batch ID:	R111460	TestNo:	EPA 300.0			Analysis Date:	11/2/2016	SeqNo:	2466880

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	678.335	25	200.0	475.4	101	80	120				

Sample ID	N021462-002BMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	111460
Client ID:	ZZZZZZ	Batch ID:	R111460	TestNo:	EPA 300.0			Analysis Date:	11/2/2016	SeqNo:	2466881

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	675.370	25	200.0	475.4	100	80	120	678.3	0.438	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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Lab Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N021462-002

Client Sample ID: SC-700B-WDR-547
Collection Date: 11/1/2016 12:10:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_161113A**	QC Batch: **R111668**			PrepDate			Analyst: **RB**
Nitrate/Nitrite as N	2.6	0.11	0.25		mg/L	5	11/13/2016

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

CLIENT: CH2M HILL
Work Order: N021462
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R111668**	SampType: **MBLK**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **111668**
Client ID: **PBW**	Batch ID: **R111668**	TestNo: **SM4500-NO3**		Analysis Date: **11/13/2016**	SeqNo: **2477442**

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-R111668**	SampType: **LCS**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **111668**
Client ID: **LCSW**	Batch ID: **R111668**	TestNo: **SM4500-NO3**		Analysis Date: **11/13/2016**	SeqNo: **2477443**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	0.526	0.050	0.5000	0	105	85	115				

Sample ID **N021462-002CDUP**	SampType: **DUP**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **111668**
Client ID: **ZZZZZZ**	Batch ID: **R111668**	TestNo: **SM4500-NO3**		Analysis Date: **11/13/2016**	SeqNo: **2477445**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	2.627	0.25						2.598	1.11	20	

Sample ID **N021462-002CMS**	SampType: **MS**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **111668**
Client ID: **ZZZZZZ**	Batch ID: **R111668**	TestNo: **SM4500-NO3**		Analysis Date: **11/13/2016**	SeqNo: **2477446**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	4.769	0.25	2.500	2.598	86.8	75	125				

Sample ID **N021462-002CMSD**	SampType: **MSD**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **111668**
Client ID: **ZZZZZZ**	Batch ID: **R111668**	TestNo: **SM4500-NO3**		Analysis Date: **11/13/2016**	SeqNo: **2477447**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.252	0.25	2.500	2.598	106	75	125	4.769	9.64	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		

Chain of Custody Record

COC Number: **547**

CH2MHILL

Project Name PG&E Topock **Location** PG&E Topock
Task Order **Project** IM3Plant-ARAR-WDR-547
Project Number 680375.02.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Doug Scott
Turnaround Time 10 Days
PO Number 680375.02.IM.OP.00

Sample ID	Sample Date/Time	Type	Matrix	# Containers	Preserv	E120.1_IM3	E200.7_E200.8_IM3	E200.8_IM3	E218.6_IM3	E300.0_IM3	SM2130_IM3	SM2540C_IM3	SM4500NH3_IM3	SM4500NO3-E_IM3	
SC-100B-WDR-547	11/1/16 @ 12:12	N	Water												N021462 - 01
		Field Filtered		1	4°C				✓						
		Field Filtered		1	4°C	✓					✓	✓			
Total metals: Cr, Mn		Field Filtered		1	4°C			✓							
			Total Containers:	3											
SC-700B-WDR-547	11/1/16 @ 1210	N	Water												- 02
		Field Filtered		1	4°C				✓						
Fl, SO4		Field Filtered		1	4°C	✓				✓	✓	✓			
		Field Filtered		1	4°C Lab H2SO4								✓	✓	
Total metals: Cr, Al, Sb, As, Ba, B, Cu, Pb, Mn Mo, Ni, Fe, Zn		Field Filtered		1	4°C		✓								
			Total Containers:	4											

MS = Matrix Spike **SD = Matrix Spike Duplicate**

	Signatures	Date/Time
Approved by	[signature]	11-1-16 12:18
Sampled by	[signature]	11-1-16 12:18
Relinquished by	[signature]	11-01-16 1600
Received by	M. BARTIN [signature]	11/1/16 @ 1600
Relinquished by	[signature]	
Received by	[signature]	11/1/16 @ 1854

Shipping Details

Method of Shipment: FedEx
On Ice: yes (circled) no 4.3°C
Airbill No: [illegible] 12#2
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:

Sample Custody
and
Marlon Cartin

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:	11/1/2016	Workorder:	N021462
Rep sample Temp (Deg C):	4.3	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 ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☑	NA ☐
15. Did the bottle labels indicate correct preservatives used?	Yes ☑	No ☐	NA ☐
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments: Samples for Hex Cr were Lab filtered and preserved.
Samples for Metals, NO3- and Ammonia were Lab preserved.

For:

Checklist Completed By: MBC 11/2/2016

Reviewed By: 11/2/2016

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

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler: SIGNED

02-Nov-16

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N021462-002D / SC-700B-WDR-547	Water	11/1/2016 12:40:00 PM	~~32OZP~~ 16 OZP	1		

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

Please use PO#:N21462A Please email Invoices and Account Receivable Statements to AssetAP@assetlaboratories.com. For questions, call Marlon at (702)-307-2659. Please e-mail results to reports.lv@assetlaboratories.com by: Nomal TAT.

Pease analyze for Ammonia by SM4500. CH2M Hill Sample.

GSO #: 533859723

		Date/Time		Date/Time
Relinquished by:	YRJ	11/2/2016 17:00	**Received by:**	
Relinquished by:			**Received by:**	

List of Analysts

ASSET Laboratories Work Order: **N021462**

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

December 23, 2016

Doug Scott
CH2M HILL
155 Grand Avenue, Suite 1000
Oakland, CA 94612

TEL: (970) 731-0636
FAX: (510) 622-9129

Workorder No.: N022102

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

Attention: Doug Scott

Enclosed are the results for sample(s) received on December 06, 2016 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 Litucas for

Puri Romualdo
Laboratory Director

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N022102

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:

Ammoniawas subcontracted to Truesdail- Irvine,CA.

Analytical Comments for EPA 200.8:

Dilution was necessary on some analytes for all samples due to associated internal standard not meeting method criteria possibly due to matrix interference. Samples were 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 Chromium on QC samples N022102-001C-MS and N022102-001C-MSD since the analyte concentration in the sample is disproportionate to the spike level. The associated Laboratory Control Sample (LCS) recovery was acceptable.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for Copper on QC samples N022102-001C-MS and N022102-001C-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET LABORATORIES
"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

ASSET Laboratories

Date: *23-Dec-16*

CLIENT: CH2M HILL
Project: PG&E Topock, 680375.02.IM.OP.00
Lab Order: N022102
Contract No: IM3PLANT-AR

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N022102-001A	SC-100B-WDR-548	Water	12/6/2016 11:16:00 AM	12/6/2016	12/23/2016
N022102-001B	SC-100B-WDR-548	Water	12/6/2016 11:16:00 AM	12/6/2016	12/23/2016
N022102-001C	SC-100B-WDR-548	Water	12/6/2016 11:16:00 AM	12/6/2016	12/23/2016
N022102-002A	SC-700B-WDR-548	Water	12/6/2016 11:21:00 AM	12/6/2016	12/23/2016
N022102-002B	SC-700B-WDR-548	Water	12/6/2016 11:21:00 AM	12/6/2016	12/23/2016
N022102-002C	SC-700B-WDR-548	Water	12/6/2016 11:21:00 AM	12/6/2016	12/23/2016
N022102-002D	SC-700B-WDR-548	Water	12/6/2016 11:21:00 AM	12/6/2016	12/23/2016
N022102-002E	SC-700B-WDR-548	Water	12/6/2016 11:21:00 AM	12/6/2016	12/23/2016

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-001

Client Sample ID: SC-100B-WDR-548
Collection Date: 12/6/2016 11:16:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_161207D**	QC Batch: **R112061**			PrepDate			Analyst: **LR**
Specific Conductance	6800	0.10	0.10		umhos/cm	1	12/7/2016 01:30 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

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-002

Client Sample ID: SC-700B-WDR-548
Collection Date: 12/6/2016 11:21:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
SPECIFIC CONDUCTANCE							
			EPA 120.1				
RunID: **NV00922-WC_161207D**	QC Batch: **R112061**			PrepDate			Analyst: **LR**
Specific Conductance	7200	0.10	0.10		umhos/cm	1	12/7/2016 01:30 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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 120.1_WPGE

Sample ID **N022102-001BUP**	SampType: **DUP**	TestCode: **120.1_WPGE**	Units: **umhos/cm**	Prep Date:	RunNo: **112061**
Client ID: **ZZZZZZ**	Batch ID: **R112061**	TestNo: **EPA 120.1**		Analysis Date: **12/7/2016**	SeqNo: **2492411**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	6910.000	0.10						6850	0.872	10	

Sample ID **N022104-010DDUP**	SampType: **DUP**	TestCode: **120.1_WPGE**	Units: **umhos/cm**	Prep Date:	RunNo: **112061**
Client ID: **ZZZZZZ**	Batch ID: **R112061**	TestNo: **EPA 120.1**		Analysis Date: **12/7/2016**	SeqNo: **2492429**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Specific Conductance	15730.000	0.10						15660	0.446	10	

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		

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-001

Client Sample ID: SC-100B-WDR-548
Collection Date: 12/6/2016 11:16:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_161207J**	QC Batch: **60491**				PrepDate	**12/7/2016**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4100	50	50		mg/L	1	12/7/2016 01:10 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

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-002

Client Sample ID: SC-700B-WDR-548
Collection Date: 12/6/2016 11:21:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL FILTERABLE RESIDUE							
			SM2540C				
RunID: **NV00922-WC_161207J**	QC Batch: **60491**				PrepDate	**12/7/2016**	Analyst: **LR**
Total Dissolved Solids (Residue, Filterable)	4200	50	50		mg/L	1	12/7/2016 01:10 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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 160.1_2540C_W

Sample ID **LCS-60491**	SampType: **LCS**	TestCode: **160.1_2540C**	Units: **mg/L**	Prep Date: **12/7/2016**	RunNo: **112068**
Client ID: **LCSW**	Batch ID: **60491**	TestNo: **SM2540C**		Analysis Date: **12/7/2016**	SeqNo: **2492539**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	988.000	10	1000	0	98.8	80	120				

Sample ID **MB-60491**	SampType: **MBLK**	TestCode: **160.1_2540C**	Units: **mg/L**	Prep Date: **12/7/2016**	RunNo: **112068**
Client ID: **PBW**	Batch ID: **60491**	TestNo: **SM2540C**		Analysis Date: **12/7/2016**	SeqNo: **2492540**

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 **N022104-005DDUP**	SampType: **DUP**	TestCode: **160.1_2540C**	Units: **mg/L**	Prep Date: **12/7/2016**	RunNo: **112068**
Client ID: **ZZZZZZ**	Batch ID: **60491**	TestNo: **SM2540C**		Analysis Date: **12/7/2016**	SeqNo: **2492548**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	5290.000	100						5370	1.50	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		

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-002

Client Sample ID: SC-700B-WDR-548
Collection Date: 12/6/2016 11:21:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP							
			EPA 200.7				
RunID: **NV00922-ICP2_161211A**	QC Batch: **60501**				PrepDate	**12/8/2016**	Analyst: **CEI**
Aluminum	ND	2.7	50		µg/L	1	12/11/2016 05:59 AM
Boron	1100	38	100		µg/L	1	12/12/2016 01:36 PM
Iron	21	1.8	20		µg/L	1	12/11/2016 05:59 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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-60501**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112132**
Client ID: **PBW**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/11/2016**	SeqNo: **2497221**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	17.040	50									
Iron	9.192	20									

Sample ID **LCS1-60501**	SampType: **LCS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112132**
Client ID: **LCSW**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/11/2016**	SeqNo: **2497222**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10289.745	50	10000	0	103	85	115				
Iron	110.969	20	100.0	0	111	85	115				

Sample ID **N022102-002E-MS1**	SampType: **MS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112132**
Client ID: **ZZZZZZ**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/11/2016**	SeqNo: **2497226**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10163.215	50	10000	5.428	102	75	125				
Iron	127.798	20	100.0	20.71	107	75	125				

Sample ID **N022102-002E-MSD**	SampType: **MSD**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112132**
Client ID: **ZZZZZZ**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/11/2016**	SeqNo: **2497227**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aluminum	10162.236	50	10000	5.428	102	75	125	10160	0.00963	20	
Iron	125.780	20	100.0	20.71	105	75	125	127.8	1.59	20	

Sample ID **MB-60501**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112176**
Client ID: **PBW**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/12/2016**	SeqNo: **2500078**

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
- DO Surrogate Diluted Out
- Calculations are based on raw values

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.7_WPGEPPB

Sample ID **MB-60501**	SampType: **MBLK**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112176**
Client ID: **PBW**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/12/2016**	SeqNo: **2500078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	100									

Sample ID **LCS1-60501**	SampType: **LCS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112176**
Client ID: **LCSW**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/12/2016**	SeqNo: **2500079**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	5003.016	100	5000	0	100	85	115				

Sample ID **N022102-002E-MS1**	SampType: **MS**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112176**
Client ID: **ZZZZZZ**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/12/2016**	SeqNo: **2500083**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	6095.266	100	5000	1081	100	75	125				

Sample ID **N022102-002E-MSD**	SampType: **MSD**	TestCode: **200.7_WPGE**	Units: **µg/L**	Prep Date: **12/8/2016**	RunNo: **112176**
Client ID: **ZZZZZZ**	Batch ID: **60501**	TestNo: **EPA 200.7**		Analysis Date: **12/12/2016**	SeqNo: **2500084**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	6125.856	100	5000	1081	101	75	125	6095	0.501	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		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-548
Lab Order:	N022102	**Collection Date:**	12/6/2016 11:16:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N022102-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICPMS							
EPA 200.8							
RunID: **NV00922-ICP7_161210C** QC Batch: **60540**					PrepDate **12/9/2016**		Analyst: **CEI**
Manganese	24	0.056	0.50		µg/L	1	12/10/2016 07:54 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

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-002

Client Sample ID: SC-700B-WDR-548
Collection Date: 12/6/2016 11:21:00 AM
Matrix: WATER

TOTAL METALS BY ICPMS

EPA 200.8

RunID: **NV00922-ICP7_161210C** QC Batch: **60540** PrepDate **12/9/2016** Analyst: **CEI**

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
Antimony	ND	0.031	0.50		µg/L	1	12/10/2016 08:22 PM
Arsenic	ND	0.025	0.10		µg/L	1	12/12/2016 02:56 PM
Barium	23	0.070	1.0		µg/L	1	12/10/2016 08:22 PM
Copper	ND	0.26	1.0		µg/L	1	12/10/2016 08:22 PM
Lead	ND	0.18	5.0		µg/L	5	12/10/2016 09:13 PM
Manganese	5.0	0.056	0.50		µg/L	1	12/10/2016 08:22 PM
Molybdenum	22	0.039	0.50		µg/L	1	12/10/2016 08:22 PM
Nickel	1.4	0.040	1.0		µg/L	1	12/10/2016 08:22 PM
Zinc	ND	0.27	10		µg/L	1	12/10/2016 08:22 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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **MB-60540**	SampType: **MBLK**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/9/2016**	RunNo: **112124**
Client ID: **PBW**	Batch ID: **60540**	TestNo: **EPA 200.8**		Analysis Date: **12/10/2016**	SeqNo: **2496454**

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-60540**	SampType: **LCS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/9/2016**	RunNo: **112124**
Client ID: **LCSW**	Batch ID: **60540**	TestNo: **EPA 200.8**		Analysis Date: **12/10/2016**	SeqNo: **2496455**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	9.477	0.50	10.00	0	94.8	85	115				
Arsenic	9.393	0.10	10.00	0	93.9	85	115				
Barium	99.712	1.0	100.0	0	99.7	85	115				
Copper	9.594	1.0	10.00	0	95.9	85	115				
Lead	9.413	1.0	10.00	0	94.1	85	115				
Manganese	94.466	0.50	100.0	0	94.5	85	115				
Molybdenum	9.191	0.50	10.00	0	91.9	85	115				
Nickel	9.626	1.0	10.00	0	96.3	85	115				
Zinc	96.508	10	100.0	0	96.5	85	115				

Sample ID **N022102-001C-MS**	SampType: **MS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/9/2016**	RunNo: **112124**
Client ID: **ZZZZZZ**	Batch ID: **60540**	TestNo: **EPA 200.8**		Analysis Date: **12/10/2016**	SeqNo: **2496459**

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
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID **N022102-001C-MS**	SampType: **MS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/9/2016**	RunNo: **112124**
Client ID: **ZZZZZZ**	Batch ID: **60540**	TestNo: **EPA 200.8**		Analysis Date: **12/10/2016**	SeqNo: **2496459**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.056	0.50	10.00	0.04084	100	75	125				
Arsenic	14.085	0.10	10.00	3.109	110	75	125				
Barium	140.389	1.0	100.0	29.84	111	75	125				
Copper	4.597	1.0	10.00	0	46.0	75	125				S
Manganese	107.239	0.50	100.0	23.95	83.3	75	125				
Molybdenum	33.504	0.50	10.00	22.15	114	75	125				
Nickel	8.875	1.0	10.00	0	88.8	75	125				
Zinc	87.057	10	100.0	0	87.1	75	125				

Sample ID **N022102-001C-MSD**	SampType: **MSD**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/9/2016**	RunNo: **112124**
Client ID: **ZZZZZZ**	Batch ID: **60540**	TestNo: **EPA 200.8**		Analysis Date: **12/10/2016**	SeqNo: **2496460**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	10.087	0.50	10.00	0.04084	100	75	125	10.06	0.307	20	
Arsenic	13.813	0.10	10.00	3.109	107	75	125	14.09	1.95	20	
Barium	140.055	1.0	100.0	29.84	110	75	125	140.4	0.238	20	
Copper	4.716	1.0	10.00	0	47.2	75	125	4.597	2.55	20	S
Manganese	107.940	0.50	100.0	23.95	84.0	75	125	107.2	0.652	20	
Molybdenum	33.324	0.50	10.00	22.15	112	75	125	33.50	0.537	20	
Nickel	8.974	1.0	10.00	0	89.7	75	125	8.875	1.10	20	
Zinc	86.459	10	100.0	0	86.5	75	125	87.06	0.689	20	

Sample ID **N022102-001C-MS**	SampType: **MS**	TestCode: **200.8_W**	Units: **µg/L**	Prep Date: **12/9/2016**	RunNo: **112124**
Client ID: **ZZZZZZ**	Batch ID: **60540**	TestNo: **EPA 200.8**		Analysis Date: **12/10/2016**	SeqNo: **2496468**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	10.161	5.0	10.00	0	102	75	125				

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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W

Sample ID	N022102-001C-MSD	SampType:	MSD	TestCode:	200.8_W	Units:	µg/L	Prep Date:	12/9/2016	RunNo:	112124
Client ID:	ZZZZZZ	Batch ID:	60540	TestNo:	EPA 200.8			Analysis Date:	12/10/2016	SeqNo:	2496469

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	10.195	5.0	10.00	0	102	75	125	10.16	0.335	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		

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-001

Client Sample ID: SC-100B-WDR-548
Collection Date: 12/6/2016 11:16:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_161207A**	QC Batch: **R112027**			PrepDate			Analyst: **RAB**
Hexavalent Chromium	500	6.6	20		µg/L	100	12/7/2016 02:13 PM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161210C**	QC Batch: **60540**			PrepDate	**12/9/2016**		Analyst: **CEI**
Chromium	470	0.096	5.0		µg/L	5	12/10/2016 07:59 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

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-002

Client Sample ID: SC-700B-WDR-548
Collection Date: 12/6/2016 11:21:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
HEXAVALENT CHROMIUM BY IC							
			EPA 218.6				
RunID: **NV00922-IC7_161207A**	QC Batch: **R112027**			PrepDate			Analyst: **RAB**
Hexavalent Chromium	ND	0.066	0.20		µg/L	1	12/7/2016 02:32 PM
TOTAL METALS BY ICPMS							
			EPA 200.8				
RunID: **NV00922-ICP7_161210C**	QC Batch: **60540**			PrepDate	**12/9/2016**		Analyst: **CEI**
Chromium	ND	0.019	1.0		µg/L	1	12/10/2016 08:22 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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 200.8_W_CRPGE

Sample ID	**MB-60540**	SampType:	**MBLK**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**12/9/2016**	RunNo:	**112124**
Client ID:	**PBW**	Batch ID:	**60540**	TestNo:	**EPA 200.8**			Analysis Date:	**12/10/2016**	SeqNo:	**2496352**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	ND	1.0									

Sample ID	**LCS-60540**	SampType:	**LCS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**12/9/2016**	RunNo:	**112124**
Client ID:	**LCSW**	Batch ID:	**60540**	TestNo:	**EPA 200.8**			Analysis Date:	**12/10/2016**	SeqNo:	**2496353**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	9.296	1.0	10.00	0	93.0	85	115				

Sample ID	**N022102-001C-MS**	SampType:	**MS**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**12/9/2016**	RunNo:	**112124**
Client ID:	**ZZZZZZ**	Batch ID:	**60540**	TestNo:	**EPA 200.8**			Analysis Date:	**12/10/2016**	SeqNo:	**2496366**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	472.729	5.0	10.00	472.8	-1.10	75	125				S

Sample ID	**N022102-001C-MSD**	SampType:	**MSD**	TestCode:	**200.8_W_CR**	Units:	**µg/L**	Prep Date:	**12/9/2016**	RunNo:	**112124**
Client ID:	**ZZZZZZ**	Batch ID:	**60540**	TestNo:	**EPA 200.8**			Analysis Date:	**12/10/2016**	SeqNo:	**2496367**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	473.668	5.0	10.00	472.8	8.29	75	125	472.7	0.198	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		

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID **MB-R112027**	SampType: **MBLK**	TestCode: **218.6_WU_P**	Units: **µg/L**	Prep Date:	RunNo: **112027**
Client ID: **PBW**	Batch ID: **R112027**	TestNo: **EPA 218.6**		Analysis Date: **12/7/2016**	SeqNo: **2495773**

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-R112027**	SampType: **LCS**	TestCode: **218.6_WU_P**	Units: **µg/L**	Prep Date:	RunNo: **112027**
Client ID: **LCSW**	Batch ID: **R112027**	TestNo: **EPA 218.6**		Analysis Date: **12/7/2016**	SeqNo: **2495774**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	5.183	0.20	5.000	0	104	90	110				

Sample ID **N022095-001ADUP**	SampType: **DUP**	TestCode: **218.6_WU_P**	Units: **µg/L**	Prep Date:	RunNo: **112027**
Client ID: **ZZZZZZ**	Batch ID: **R112027**	TestNo: **EPA 218.6**		Analysis Date: **12/7/2016**	SeqNo: **2495780**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	2.200	0.20						2.237	1.66	20	

Sample ID **N022095-003AMS**	SampType: **MS**	TestCode: **218.6_WU_P**	Units: **µg/L**	Prep Date:	RunNo: **112027**
Client ID: **ZZZZZZ**	Batch ID: **R112027**	TestNo: **EPA 218.6**		Analysis Date: **12/7/2016**	SeqNo: **2495781**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	2.341	0.20	1.000	1.250	109	90	110				

Sample ID **N022095-003AMSD**	SampType: **MSD**	TestCode: **218.6_WU_P**	Units: **µg/L**	Prep Date:	RunNo: **112027**
Client ID: **ZZZZZZ**	Batch ID: **R112027**	TestNo: **EPA 218.6**		Analysis Date: **12/7/2016**	SeqNo: **2495782**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	2.316	0.20	1.000	1.250	107	90	110	2.341	1.09	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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 218.6_WU_PGE

Sample ID	N022102-001AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	112027
Client ID:	ZZZZZZ	Batch ID:	R112027	TestNo:	EPA 218.6			Analysis Date:	12/7/2016	SeqNo:	2495786

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1007.320	20	500.0	498.4	102	90	110				

Sample ID	N022102-002AMS	SampType:	MS	TestCode:	218.6_WU_P	Units:	µg/L	Prep Date:		RunNo:	112027
Client ID:	ZZZZZZ	Batch ID:	R112027	TestNo:	EPA 218.6			Analysis Date:	12/7/2016	SeqNo:	2495788

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexavalent Chromium	1.117	0.20	1.000	0.07340	104	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
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-100B-WDR-548
Lab Order:	N022102	**Collection Date:**	12/6/2016 11:16:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N022102-001		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_161207H**	QC Batch: **R112065**			PrepDate			Analyst: **LR**
Turbidity	0.42	0.10	0.10		NTU	1	12/7/2016 06:00 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

CLIENT:	CH2M HILL	**Client Sample ID:**	SC-700B-WDR-548
Lab Order:	N022102	**Collection Date:**	12/6/2016 11:21:00 AM
Project:	PG&E Topock, 680375.02.IM.OP.00	**Matrix:**	WATER
Lab ID:	N022102-002		

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TURBIDITY							
			SM 2130B				
RunID: **NV00922-WC_161207H**	QC Batch: **R112065**			PrepDate			Analyst: **LR**
Turbidity	0.26	0.10	0.10		NTU	1	12/7/2016 06:00 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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 2130_W

Sample ID	**MB-R112065**	SampType: **MBLK**	TestCode: **2130_W**	Units: **NTU**	Prep Date:	RunNo: **112065**
Client ID:	**PBW**	Batch ID: **R112065**	TestNo: **SM 2130B**		Analysis Date: **12/7/2016**	SeqNo: **2492474**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	ND	0.10									

Sample ID	**N022102-001BDUP**	SampType: **DUP**	TestCode: **2130_W**	Units: **NTU**	Prep Date:	RunNo: **112065**
Client ID:	**ZZZZZZ**	Batch ID: **R112065**	TestNo: **SM 2130B**		Analysis Date: **12/7/2016**	SeqNo: **2492476**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.430	0.10						0.4200	2.35	30	

Sample ID	**N022102-002BDUP**	SampType: **DUP**	TestCode: **2130_W**	Units: **NTU**	Prep Date:	RunNo: **112065**
Client ID:	**ZZZZZZ**	Batch ID: **R112065**	TestNo: **SM 2130B**		Analysis Date: **12/7/2016**	SeqNo: **2492478**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Turbidity	0.240	0.10						0.2600	8.00	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		

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-002

Client Sample ID: SC-700B-WDR-548
Collection Date: 12/6/2016 11:21:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_161209A**	QC Batch: **R112131**			PrepDate			Analyst: **RAB**
Fluoride	2.0	0.087	0.50		mg/L	5	12/9/2016 10:57 AM
ANIONS BY ION CHROMATOGRAPHY							
			EPA 300.0				
RunID: **NV00922-IC8_161209A**	QC Batch: **R112131**			PrepDate			Analyst: **RAB**
Sulfate	470	3.3	25		mg/L	50	12/9/2016 11:13 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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_FPGE

Sample ID	**LCS-R112131_F**	SampType: **LCS**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:		RunNo: **112131**
Client ID:	**LCSW**	Batch ID: **R112131**	TestNo: **EPA 300.0**		Analysis Date:	**12/9/2016**	SeqNo: **2497558**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	1.266	0.10	1.250	0	101	90	110				

Sample ID	**MB-R112131_F**	SampType: **MBLK**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:		RunNo: **112131**
Client ID:	**PBW**	Batch ID: **R112131**	TestNo: **EPA 300.0**		Analysis Date:	**12/9/2016**	SeqNo: **2497559**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	ND	0.10									

Sample ID	**N022102-002BDUP**	SampType: **DUP**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:		RunNo: **112131**
Client ID:	**ZZZZZZ**	Batch ID: **R112131**	TestNo: **EPA 300.0**		Analysis Date:	**12/9/2016**	SeqNo: **2497565**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	2.057	0.50						2.040	0.830	20	

Sample ID	**N022102-002BMS**	SampType: **MS**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:		RunNo: **112131**
Client ID:	**ZZZZZZ**	Batch ID: **R112131**	TestNo: **EPA 300.0**		Analysis Date:	**12/9/2016**	SeqNo: **2497566**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	7.988	0.50	6.250	2.040	95.2	80	120				

Sample ID	**N022102-002BMSD**	SampType: **MSD**	TestCode: **300_W_FPG**	Units: **mg/L**	Prep Date:		RunNo: **112131**
Client ID:	**ZZZZZZ**	Batch ID: **R112131**	TestNo: **EPA 300.0**		Analysis Date:	**12/9/2016**	SeqNo: **2497567**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoride	7.974	0.50	6.250	2.040	95.0	80	120	7.988	0.175	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		

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	LCS-R112131_SO4	SampType:	LCS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	112131
Client ID:	LCSW	Batch ID:	R112131	TestNo:	EPA 300.0			Analysis Date:	12/9/2016	SeqNo:	2497959

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	3.959	0.50	4.000	0	99.0	90	110				

Sample ID	MB-R112131_SO4	SampType:	MBLK	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	112131
Client ID:	PBW	Batch ID:	R112131	TestNo:	EPA 300.0			Analysis Date:	12/9/2016	SeqNo:	2497960

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	0.50									

Sample ID	N022103-001CMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	112131
Client ID:	ZZZZZZ	Batch ID:	R112131	TestNo:	EPA 300.0			Analysis Date:	12/9/2016	SeqNo:	2497967

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	606.485	25	200.0	380.3	113	80	120				

Sample ID	N022103-001CMSD	SampType:	MSD	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	112131
Client ID:	ZZZZZZ	Batch ID:	R112131	TestNo:	EPA 300.0			Analysis Date:	12/9/2016	SeqNo:	2497968

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	603.035	25	200.0	380.3	111	80	120	606.5	0.570	20	

Sample ID	N022102-002BMS	SampType:	MS	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	112131
Client ID:	ZZZZZZ	Batch ID:	R112131	TestNo:	EPA 300.0			Analysis Date:	12/9/2016	SeqNo:	2497969

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	688.110	25	200.0	466.4	111	80	120				

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

Calculations are based on raw values

- H Holding times for preparation or analysis exceeded
- S Spike/Surrogate outside of limits due to matrix interference

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 300_W_SO4PGE

Sample ID	N022103-002CDUP	SampType:	DUP	TestCode:	300_W_SO4P	Units:	mg/L	Prep Date:		RunNo:	112131
Client ID:	ZZZZZZ	Batch ID:	R112131	TestNo:	EPA 300.0			Analysis Date:	12/9/2016	SeqNo:	2497970

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	521.840	50						518.8	0.580	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		

CLIENT: CH2M HILL
Lab Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00
Lab ID: N022102-002

Client Sample ID: SC-700B-WDR-548
Collection Date: 12/6/2016 11:21:00 AM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
NITRATE/NITRITE-N BY CADMIUM REDUCTION							
			SM4500-NO3F				
RunID: **NV00922-WC_161221B**	QC Batch: **R112400**			PrepDate			Analyst: **RB**
Nitrate/Nitrite as N	2.9	0.11	0.25		mg/L	5	12/21/2016

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

CLIENT: CH2M HILL
Work Order: N022102
Project: PG&E Topock, 680375.02.IM.OP.00

ANALYTICAL QC SUMMARY REPORT

TestCode: 4500N03F_W

Sample ID **MB-R112400**	SampType: **MBLK**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **112400**
Client ID: **PBW**	Batch ID: **R112400**	TestNo: **SM4500-NO3**		Analysis Date: **12/21/2016**	SeqNo: **2512054**

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-R112400**	SampType: **LCS**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **112400**
Client ID: **LCSW**	Batch ID: **R112400**	TestNo: **SM4500-NO3**		Analysis Date: **12/21/2016**	SeqNo: **2512055**

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 **N022102-002CDUP**	SampType: **DUP**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **112400**
Client ID: **ZZZZZZ**	Batch ID: **R112400**	TestNo: **SM4500-NO3**		Analysis Date: **12/21/2016**	SeqNo: **2512057**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	2.885	0.25						2.940	1.89	20	

Sample ID **N022102-002CMS**	SampType: **MS**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **112400**
Client ID: **ZZZZZZ**	Batch ID: **R112400**	TestNo: **SM4500-NO3**		Analysis Date: **12/21/2016**	SeqNo: **2512058**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.015	0.25	2.500	2.940	83.0	75	125				

Sample ID **N022102-002CMSD**	SampType: **MSD**	TestCode: **4500N03F_W**	Units: **mg/L**	Prep Date:	RunNo: **112400**
Client ID: **ZZZZZZ**	Batch ID: **R112400**	TestNo: **SM4500-NO3**		Analysis Date: **12/21/2016**	SeqNo: **2512059**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate/Nitrite as N	5.610	0.25	2.500	2.940	107	75	125	5.014	11.2	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		

N022102

CH2MHILL

CHAIN OF CUSTODY RECORD

Project Name PG&E Topock
Location PG&E Topock
Project Number 680375.02.IM.OP.00
Project Manager Scott O'Donnell
Sample Manager Doug Scott

Task Order
Project IM3PLANT-ARAR-WDR-548
Turnaround Time 10 Days
Shipping Date: 12/2/2016
COC Number: 548

	Container:	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			
	Preservatives:	4°C Lab H2SO4	4°C	4°C	4°C	4°C Lab H2SO4	4°C	4°C	4°C	4°C			
	Filtered:	NA	NA	NA	NA	NA	NA	NA	NA	NA			
	Holding Time:	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
SC-100B-WDR-548	12-6-16 11:16 Water			X	X		X		X	X	N022102-01	3	
SC-700B-WDR-548	12-6-16 11:21 Water	X	X	X	X	X	X	X		X	-02	4	
											TOTAL NUMBER OF CONTAINERS	7	

	Signatures	Date/Time
Approved by		12-6-16 11:00
Sampled by		12-6-16 11:15
Relinquished by		12-6-16 17:45
Received by		12/6/16 @1745
Relinquished by		12/6/16 @ 1945
Received by	Marion Kirtman	12/7/16 7:40 AM

Shipping Details
Method of Shipment: FedEx
On Ice: yes / no 1.2°C
Airbill No: ICE IRR#2
Lab Name: ASSET Laboratories
Lab Phone: (702) 307-2659

ATTN:
Sample Custody
and
Marion Cartin

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:	12/6/2016	Workorder:	N022102
Rep sample Temp (Deg C):	1.8	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 ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☑	NA ☐
15. Did the bottle labels indicate correct preservatives used?	Yes ☑	No ☐	NA ☐
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments: Samples for Hex Cr were Lab filtered and preserved.
Samples for Ammonia, Nitrate/Nitrite and Metals were Lab preserved.

Checklist Completed By: YR 12/8/2016

Reviewed By: 12/10/2016

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

CHAIN-OF-CUSTODY RECORD

QC Level: Level IV

Subcontractor:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler:

08-Dec-16

				Requested Tests		
Sample ID	**Matrix**	**Date Collected**	**Bottle Type**	**SM4500-NH3D**		
N022102-002D / SC-700B-WDR-548	Water	12/6/2016 11:21:00 AM	16OZP	1		

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

Please use PO#:N22102A Please email Invoices and Account Receivable Statements to AssetAP@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. CH2M Hill Sample.

GSO #: 534280277

		Date/Time			Date/Time
Relinquished by:		12/8/2016 17:00	**Received by:**		
Relinquished by:			**Received by:**		

List of Analysts

ASSET Laboratories Work Order: **N022102**

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

TRUESDAIL LABORATORIES, INC.
EXCELLENCE IN INDEPENDENT TESTING

Established 1931

14201 FRANKLIN AVENUE
TUSTIN, CALIFORNIA 92780-7008
(714) 730-6239 · FAX (714) 730-6462
www.truesdail.com

REPORT

Client: **Advanced Technology Laboratories-NV**
3151 W Post Rd
Las Vegas, NV 89118
Attention: Marlon Cartin
Project Name: ATL-NV

Work Order No.: 16L0177
Printed: 12/28/2016

CASE NARRATIVE

Truesdail Laboratories, Inc. is pleased to submit this report summarizing the Ammonia analyses. A summary table for this laboratory number is included in Section 2. Complete laboratory reports, wet chemistry raw data, quality control data and chain of custody forms for sampling period are included in Sections 3 and 4. Analytical raw data are under Section 5.

The sample was received and delivered with the chain of custody on December 9th, 2016, intact and in chilled condition. The samples will be kept in a locked refrigerator for 30 days; thereafter will be kept in warm storage for additional 2 months before disposal.

If you have any questions or require additional information, please contact me at (714) 730-6239 ext. 203

SAMPLE RECEIPT SUMMARY

Sample ID	Laboratory ID	Matrix	Type	Date Sampled	Date Received
N022102-002D / SC6-700B-WDR-548	16L0177-01	Water	Grab	12/06/2016 11:21	12/09/2016 08:30

DEFINITIONS

Symbol	Definition
DF	Dilution Factor
MDL	Method Detection Limit
ND	Not Detected
RL	Reporting Limit

Respectfully yours,

Shelly Brady
Customer Service Manager

N022102-002D / SC6-700B-WDR-548

16L0177-01 (Water)

Analyte	Result	RL	Units	DF	Batch	Analyzed	Analyst	Method	Notes
Truesdail Laboratories, Inc									
Wet Chemistry									
Ammonia	ND	0.0500	mg/L	1	1612301	12/15/2016 15:52	Alexander Luna	SM 4500-NH3 D M	

QUALITY CONTROL

Wet Chemistry

Truesdail Laboratories, Inc

Analyte	Result	RL	Units	Spike Level	Source Result	%REC	% Rec Limits	RPD	RPD Limit	Note
Batch: 1612301 - SM 4500-NH3 D M										
Blank (1612301-BLK1)				Prepared & Analyzed: 12/15/2016						
Ammonia	ND	0.0500	mg/L							
LCS (1612301-BS1)				Prepared & Analyzed: 12/15/2016						
Ammonia	0.385	0.0500	mg/L	0.400		96	90-110			
Duplicate (1612301-DUP1)		**Source: 16L0161-08**		Prepared & Analyzed: 12/15/2016						
Ammonia	1.70	0.250	mg/L		1.65			3	20	
Matrix Spike (1612301-MS1)		**Source: 16L0161-05**		Prepared & Analyzed: 12/15/2016						
Ammonia	0.406	0.0500	mg/L	0.400	0.0294	94	75-125			
Matrix Spike Dup (1612301-MSD1)		**Source: 16L0161-05**		Prepared & Analyzed: 12/15/2016						
Ammonia	0.408	0.0500	mg/L	0.400	0.0294	95	75-125	0.4	20	

ANALYSIS DATA SHEET

Inorganics

Client: **Advanced Technology Laboratories-NV**
Client Sample ID: **N022102-002D / SC6-700B-WDR-548**
Lab Sample ID: **16L0177-01**
Project: **ATL-NV**

Date Sampled: 12/06/16 11:21 Matrix: Water

CAS NO.	Analyte	Concentration (mg/L)	MDL	RL	DF	Q	Analyst	Analyzed	Method
7664-41-7	Ammonia	ND	0.0111	0.0500	1		AL	12/15/16 15:52	SM 4500-NH3 D M

METHOD BLANK DATA SHEET

SM 4500-NH3 D M

Client: Advanced Technology Laboratories-NV

Project: ATL-NV
Laboratory ID: 1612301-BLK1

Prepared:	12/15/16 13:14	Preparation:	SM 4500-NH3 D M	Matrix:	Water
Analyzed:	12/15/16 15:22	Instrument:	TL01	File ID:	6L15003-023
Batch:	1612301	Sequence:	6L15003		

CAS NO.	COMPOUND	CONC. (mg/L)	MDL	RL	Q
7664-41-7	Ammonia	ND	0.0111	0.0500	

LCS / LCS DUPLICATE RECOVERY

SM 4500-NH3 D M

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **16L0177**

Matrix:	Water	Prep Method:	SM 4500-NH3 D M
Prep Batch:	1612301	Lab Sample ID:	1612301-BS1

ANALYTE	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC.	QC LIMITS REC.
Ammonia	0.400	0.385	96	90 - 110

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Matrix Spike

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**
Work Order: **16L0177**

Matrix: Water
Prep Batch: 1612301

Analysis Method: SM 4500-NH3 D M
Prep Method: SM 4500-NH3 D M
Laboratory ID: 1612301-MS1
Source Sample ID: 16L0161-05

ANALYTE	SPIKE ADDED (mg/L)	SAMPLE CONCENTRATION (mg/L)	MS CONCENTRATION (mg/L)	MS % REC.	QC LIMITS REC.
Ammonia	0.400	0.0294	0.406	94	75 - 125

ANALYTE	SPIKE ADDED (mg/L)	MSD CONCENTRATION (mg/L)	MSD % REC. #	% RPD	QC LIMITS RPD	QC LIMITS REC.
Ammonia	0.400	0.408	95	0.4	20	75 - 125

* Values outside of QC limits

DUPLICATES

Duplicate

Client: **Advanced Technology Laboratories-NV**
Project: **ATL-NV**

Matrix:	Water	Laboratory ID:	1612301-DUP1
Prep Batch:	1612301	Initial/Final:	10 mL / 50 mL
Prep Method:	SM 4500-NH3 D M	Analysis:	SM 4500-NH3 D M

ANALYTE	SAMPLE CONCENTRATION (mg/L)	DUPLICATE CONCENTRATION (mg/L)	RPD %	Q	CONTROL LIMIT
Ammonia	1.65	1.70	3		20

* Values outside of QC limits

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

CHAIN-OF-CUSTODY RECORD

1601177

QC Level: Level IV

Subcontractor:

Truesdail
3337 Michelson Drive, Suite CN750
Irvine, CA 92612

TEL: (714) 730-6239
FAX: (714) 730-6462
Acct #:

Field Sampler:

08-Dec-16

Sample ID	Matrix	Date Collected	Bottle Type	Requested Tests		
				SM4500-NH3D		
N022102-002D / SC-700B-WDR-548	Water	12/6/2016 11:21:00 AM	16OZP	1		

ALERT !!
Level IV QC

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

Please use PO#:N22102A Please email Invoices and Account Receivable Statements to AssetAP@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. CH2M Hill Sample.

2.8°C

GSO #: 534280277

		Date/Time			Date/Time
Relinquished by:		12/8/2016	17:00	**Received by:**	12-9-16 8:30
Relinquished by:				**Received by:**	

Log-in check list
For level III data package

Client: ATL Lab Number:

Received Date: 12-9-16

Sample receiving review	Yes	No	N/A	Comment
Was special login form received by login personnel?	X			
Was COC received and signed by client and login personnel?	X			
Were all sampls temperature measured and recorded on COC?	X			
Did you measure and record the pH on all metals samples on COC?	X			
Has sample integrity and analysis discrepancy form been filled out completely?	X			
Were all interacompany yellow forms generated and stamped with " alert level III QC" note?	X			
Have check -in and check out lists been filled out and attached to appropriate form?	X			
Were sample containers labeled with TLI numbers, date, and time sampled?	X			
Did you notify analyst or group leader about short holding time?	X			
Was a copy of COC attached to all yellow intracompany form?	X			
For special clients, have all their samples been logged into the Internal COC book?				
Were samples locked in fridge or special storage area?		X		
Was temperature recorded in the log book?	X			
Sample receiving Signature: J Brown				

WORK ORDER

Printed: 12/9/2016 10:10:35AM

16L0177

Truesdail Laboratories, Inc

Client: Advanced Technology Laboratories-NV
Project: ATL-NV

Project Manager: Shelly Brady
Project Number: [none]

Report To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone: (702) 307-2659
Fax: (702) 307-2691

Invoice To:
Advanced Technology Laboratories-NV
Marlon Cartin
3151 W Post Rd
Las Vegas, NV 89118
Phone :(702) 307-2659
Fax: (702) 307-2691

Date Due: 12/20/2016 16:30 (7 day TAT)

Received By: Jacqueline Brown
Logged In By: Michelle Reed

Date Received: 12/09/2016 08:30
Date Logged In: 12/09/2016 10:04

Samples Received at: 2.8°C

Chain of Custody re	Yes	Samples intact?	Yes
Letter (if sent) matc	No	Custody seals (if an	No
Requested analyses	Yes	Analyses within hol	Yes
Samples received in	Yes		

Analysis	Due	TAT	Expires	Comments
16L0177-01 N022102-002D / SC6-700B-WDR-548 [Water] Sampled 12/06/2016 11:21 (GMT-08:00) Pacific Time (US &				
Ammonia E	12/20/2016 08:00	7	01/03/2017 11:21	

Reviewed By: Brown

Date: 12-9-16

TRUESDAIL LABORATORIES, INC.

Internal Chain of Custody Logbook

Lab Number: 1610177

Client Name: ATL

Storage Temperature:

Bottle I.D.	Analysis	Date Out	Time Out	Date In	Time In	Amount Taken (g or mL)	Printed Name	Signature
	NH3			12-9-16	8:30		J Brown	[signature]
		12/15/16	13:00				Alex Lam	[signature]
				12/15/16	17:00	10ml	Alex Lam	[signature]

Storage Date	Shelf No. For Storage	Printed Name	Initials

Discharge Date	Printed Name	Initials

Bottle I.D.	Analysis	Date Out	Time Out	Date In	Time In	Amount Taken (g or mL)	Printed Name	Signature

Storage Date	Shelf No. For Storage	Printed Name	Initials

Discharge Date	Printed Name	Initials

Bottle I.D.	Analysis	Date Out	Time Out	Date In	Time In	Amount Taken (g or mL)	Printed Name	Signature

Storage Date	Shelf No. For Storage	Printed Name	Initials

Discharge Date	Printed Name	Initials

Bottle I.D.	Analysis	Date Out	Time Out	Date In	Time In	Amount Taken (g or mL)	Printed Name	Signature

Storage Date	Shelf No. For Storage	Printed Name	Initials

Discharge Date	Printed Name	Initials

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-700	12-6-16	11:21	12-6-16	11:25	HQ440D	12-6-16	01:30	-53.83	Ryan Phelps	7.04
	Notes:										
2	SC-100	12-6-16	11:14	12-6-16	11:28	HQ440D	12-6-16	01:30	-53.83	Ryan Phelps	7.41
	Notes:										
3	SC-100B	01-03-17	11:20	01-03-17	11:23	HQ440D	01-03-17	00:30	-53.80	G.GLORIA	7.38
	Notes:										
4	SC-700B	01-03-17	11:40	01-03-17	11:43	HQ440D	01-03-17	00:30	-53.80	G.GLORIA	7.17
	Notes:										
5	SC-701	01-03-17	11:30	01-03-17	11:33	HQ440D	01-03-17	00:30	-53.80	G.GLORIA	7.92
	Notes:										
6											
	Notes:										
7											
	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	11-1-16	12:10	11-1-16	12:15	HQ440D	11-1-16	00:30	-51.25	G. GLORIA	7.19
	Notes:										
2	SC-100B	11-1-16	12:12	11-1-16	12:18	HQ440D	11-1-16	00:30	-51.25	G. GLORIA	7.35
	Notes:										
3											
	Notes:										
4											
	Notes:										
5											
	Notes:										
6											
	Notes:										
7											
	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-701	10-04-16	11:30	10-04-16	11:35	HQ440D	10-03-16	00:30	-53.22	G. GLORIA	7.88
	Notes:										
2	SC-100B	10-04-16	11:39	10-04-16	11:40	HQ440D	10-03-16	00:30	-53.22	G. GLORIA	7.04
	Notes:										
3	SC-700B	10-04-16	11:42	10-04-16	11:45	HQ440D	10-03-16	00:30	-53.22	G. GLORIA	7.30
	Notes:										
4	TW-30	10-04-16	12:30	10-04-16	12:32	HQ440D	10-03-16	00:30	-53.22	G. GLORIA	7.45
	Notes:										
5	PE-1	10-04-16	12:25	10-04-16	12:27	HQ440D	10-03-16	00:30	-53.22	G. GLORIA	7.61
	Notes:										
6											
	Notes:										
7											
	Notes:										

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