THIRD QUARTER 2015
OPERATION AND MAINTENANCE REPORT

MODESTO GROUNDWATER SUPERFUND SITE

MODESTO, CALIFORNIA

Prepared for:

U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Prepared by:

RORE, Inc.
5151 Shoreham Place, Suite 260
San Diego, CA 92122
(858) 404-7393

Prepared Under:
Contract Number: W91238-15-D-0003
Task Order Number 0001

April 2016

THIRD QUARTER 2015
OPERATION AND MAINTENANCE REPORT

MODESTO GROUNDWATER SUPERFUND SITE

MODESTO, CALIFORNIA

April 2016

Contract Number: W91238-15-D-0003
Task Order Number 0001

April 04, 2016

John McGuire
Project Manager
RORE, Inc.

Date

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1-1
1.1 Site History 1-1
1.1.1 Other Nearby PCE Plumes 1-2
1.2 Report Organization 1-3

2.0 DESCRIPTION OF REMEDIAL SYSTEM 2-1
2.1 GWTS 2-1
2.2 SVE System 2-1

3.0 SAMPLING AND MONITORING PROGRAM 3-1
3.1 Site Sampling and Monitoring 3-1
3.1.1 Groundwater Sampling and Monitoring 3-1
3.1.2 Soil Vapor Sampling and Monitoring 3-2
3.2 System Sampling and Monitoring 3-2
3.2.1 Groundwater System Sampling and Monitoring 3-3
3.2.2 Soil Vapor System Sampling and Monitoring 3-3

4.0 PERFORMANCE EVALUATION 4-1
4.1 Site Performance 4-1
4.1.1 Groundwater Monitoring and Sampling Results 4-1
4.1.1.1 PCE 4-2
4.1.1.2 Other VOCs 4-5
4.1.1.3 1,4-Dioxane 4-5
4.1.2 Soil Vapor Sampling Results 4-5
4.1.3 Analysis of Vertical Groundwater Gradients 4-6
4.1.4 Extraction Well Capture Zone Analyses 4-6
4.2 System Performance 4-7
4.2.1 GWTS Results 4-7
4.2.2 SVE System Results 4-8

5.0 RECOMMENDATIONS 5-1
5.1 GWTS – Summary Observations and Recommendations 5-1
5.2 SVE – Summary Observations and Recommendations 5-2

6.0 QUALITY CONTROL SUMMARY REPORT 6-1
6.1 Introduction 6-1
6.2 DQOs 6-2
6.2.1 Precision 6-2
6.2.2 Accuracy 6-3
6.2.3 Representativeness 6-3
6.2.4 Completeness 6-3
6.2.5 Comparability 6-3
6.3 Quality Control Results 6-3
6.3.1 Precision and Accuracy 6-3
6.3.2 Representativeness 6-4
6.3.3 Completeness 6-4
6.3.4 Comparability 6-4
6.4 Summary of Data Reliability 6-4

7.0 REFERENCES 7-1

TABLE OF CONTENTS (Continued)

TABLES

4-1 Vertical Gradients, Third Quarter 2015
4-2 GWTS PCE Sample Results: Third Quarter 2015
4-3 GWTS Uranium Sample Results: Third Quarter 2015
4-4 GWTS Shutdown Summary: Third Quarter 2015
4-5 GWTS Carbon Change-Outs
4-6 GWTS Ion Exchange Resin Change-Outs
4-7 GWTS PCE Vapor Sample Results: Third Quarter 2015
4-8 GWTS Influent and Effluent Results: Third Quarter 2015

FIGURES

1-1 Site Location
1-2 Municipal Well Locations

2-1 Site Layout
2-2 Groundwater Well Locations
2-3 Soil Vapor Well Locations, Halford's Cleaners Area

4-1 Stratigraphic Conceptual Model A-A´
4-2 Stratigraphic Conceptual Model B-B´
4-3 Stratigraphic Conceptual Model C-C´
4-4 Groundwater Elevation Trends
4-5 Groundwater Potentiometric Surface and PCE in A Zone Groundwater, Third Quarter 2015
4-6 Groundwater Potentiometric Surface and PCE in B Zone Groundwater, Third Quarter 2015
4-7 Groundwater Potentiometric Surface and PCE in C Zone Groundwater, Third Quarter 2015
4-8 PCE Composite Plumes A, B, and C Zones, Third Quarter 2015
4-9 Cross-Section A-A´, Third Quarter 2015
4-10 Cross-Section B-B´, Third Quarter 2015
4-11 Soil Vapor Analytical Results, Third Quarter 2015
4-12 A Zone Extraction Well EW-02 Horizontal Capture Analysis, Third Quarter 2015
4-13 Cumulative PCE Mass Removed by the Groundwater Treatment System

APPENDICES

A Treatment System Process and Instrumentation Diagrams
B Laboratory Analytical Data Tables
C Laboratory Data Validation Reports
D System Uptime and Shutdown Tables
E Operation and Maintenance Process Logs and Groundwater/Soil Vapor Sampling Field Data Logs
F Operational History
G Historical Data: Well Construction Details, Groundwater Elevations, Analytical Data, Historical PCE Information, and Mass Removed Data
H Historical PCE Soil Vapor Concentration Trends in Indoor Air, Sub-Slab, and Soil Vapor Monitoring Wells

LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Laboratory Group
ASTM	American Society for Testing and Materials
bgs	below ground surface
BOD	biochemical oxygen demand
City	City of Modesto
cf	cubic feet
CPT	cone penetrometer test
DQO	data quality objective
ELAP	Environmental Laboratory Accreditation Program
EPA	United States Environmental Protection Agency
Eurofins	Eurofins Air Toxics, Inc.
EW	extraction well
FB	field blank
FD	field duplicate
ft/ft	foot per foot
GAC	granular-activated carbon
GEL	GEL Laboratories, LLC
gpm	gallons per minute
GWTS	groundwater treatment system
ID	identification
IX	ion exchange
lbs	pounds
LCS	laboratory control sample
LDC	Laboratory Data Consultants, Inc.
LGAC	liquid-phase granular-activated carbon
MB	method blank
MCL	maximum contaminant level
MDL	method detection limit
msl	mean sea level
MS	matrix spike
MSD	matrix spike duplicate
Municipal Well	City of Modesto Municipal Water Supply Well
MW	monitoring well
MWH	MWH Americas, Inc.
NS	normal sample
O&M	operation and maintenance
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCE	tetrachloroethene

pCi	picocuries
pCi/L	picocuries per liter
PDB	passive diffusion bags
PID	photo ionization detector
P&ID	process and instrumentation diagram
ppbv	parts per billion by volume
PQL	practical quantitation limit
QA	quality assurance
QC	quality control
RPD	relative percent difference
SAP	sampling and analysis plan
scfm	standard cubic feet per minute
SM	standard method
SOP	standard operating procedure
SP	Sample Port
SVE	soil vapor extraction
TB	trip blank
TDS	total dissolved solid
TSS	total suspended solid
URS	URS Group, Inc.
VGAC	vapor-phase granular-activated carbon
VOC	volatile organic compound
µg/L	micrograms per liter
3Q15	third quarter 2015
2Q15	second quarter 2015
1Q15	first quarter 2015
3Q14	third quarter 2014
2Q14	second quarter 2014
1Q14	first quarter 2014
4Q13	fourth quarter 2013
3Q13	third quarter 2013
1Q13	first quarter 2013
4Q12	fourth quarter 2012
3Q12	third quarter 2012
4Q08	fourth quarter 2008

1.0 INTRODUCTION

This *Third Quarter 2015* (3Q15) *Quarterly Operation and Monitoring Report* for the Modesto Groundwater Superfund Site, in Modesto, California, covers the reporting period of 01 July through 1 October 2015, and describes the monitoring and sampling program, summarizes the performance of the systems, and provides results of routine system operations. The remainder of this section provides an overview of the site history and report organization. For readability purposes, all figures and tables are included at the end of the report.

1.1 Site History

The City of Modesto (City) is in Stanislaus County, California, and is approximately 80 miles southeast of Sacramento (Figure 1-1). The Modesto Groundwater Superfund Site is in a commercial area on McHenry Avenue, south of Orangeburg Avenue, behind Halford's Cleaners (941 McHenry Avenue).

In 1984, through routine sampling of water supply wells, the City discovered contamination in its Municipal Water Supply Well (Municipal Well) 11 (Figure 1-2) at the corner of Magnolia and Mensinger Avenues. Laboratory analysis of the Municipal Well 11 sample collected in 1984 indicated tetrachloroethene (PCE) in excess of the federal and state maximum contaminant level (MCL) of 5 micrograms per liter (µg/L). PCE is an industrial solvent commonly used in dry cleaning and was determined to have originated at Halford's Cleaners, approximately 1,000 feet from Municipal Well 11.

Municipal Well 11 was taken out of service by the City in 1984 and was reactivated in April 1987 when levels of PCE and other chlorinated solvents were not detected at concentrations above MCLs. In February 1989, Municipal Well 11 was again taken out of service after PCE concentrations exceeded the MCL a second time. The well remained out of service until May 1991 when the City installed a wellhead granular-activated carbon (GAC) treatment system. The GAC system reduced the PCE concentration to below the MCL before the water entered the public supply system. Municipal Well 11 was returned to service in June 1991 and operated until October 1995, when the City indefinitely deactivated the well due to detections of naturally occurring uranium above the state MCL of 20 picoCuries (pCi) per liter.

The Modesto Groundwater Superfund Site was placed on the United States Environmental Protection Agency (EPA) National Priorities List on 31 March 1989. In December 1989, the EPA's Emergency Response Section collected soil and soil vapor samples in the vicinity of Halford's Cleaners. Fifteen monitoring wells were installed and were sampled from 1992 to 1998. Based on the sample results, the EPA selected the technology for treatment and removal of the contamination. A soil vapor extraction (SVE) system and a groundwater treatment system (GWTS) were installed on 16 May 2000, and 12 June 2000, respectively, to remediate the source area and contain the groundwater contamination plume. The GWTS included extraction well (EW)-01. EW-01 failed in November 2004. It was replaced with a new extraction well (EW-01R), which became operational in August 2006.

Results from a site investigation conducted in 2007 and from a soil vapor rebound test conducted from late November 2006 through January 2007 identified significant vapor mass at the northwestern corner of the Halford's Cleaners building and possibly extending underneath the building (see *Soil Vapor Extraction System Optimization and Enhancement Methods, Modesto Groundwater Superfund Site* [MWH Americas, Inc. (MWH), 2008] for summary results). Initial sub-slab vapor sampling in buildings at and near the source area in February 2008 confirmed that high concentrations of PCE in vapor (up to 20,000 parts per billion by volume) were present under the concrete slab foundation of the Halford's Cleaners building (MWH, 2010a). An SVE optimization plan was implemented in November 2008 by installing and extracting vapor from three SVE wells (SVE-02, SVE-03, and SVE-04). The new wells

were installed within a source area. SVE-01 was taken offline and is monitored in the quarterly sampling program.

The groundwater monitoring well network was expanded in 2008, 2011, and 2013. In 2008, 16 additional groundwater monitoring wells were installed to evaluate the lateral and vertical extents of the groundwater plume. Subsection 2.3 of the *Quarterly Operations and Monitoring Report, Fourth Quarter 2008* (MWH, 2009) describes a dense non-aqueous-phase liquid investigation (none was discovered).

Nine additional wells (MW-21A through MW-29B) were installed in 2011 to help delineate the lateral and vertical extent of the PCE concentrations in groundwater that exceed the MCL. The letter report *Groundwater Monitoring Well Installations, Modesto Groundwater Superfund Site* (URS Group, Inc. [URS], 2011) describes these installations and includes well construction and boring logs.

Eight additional groundwater monitoring wells (MW-30A through MW-35B) were installed between June and August 2013 to define PCE concentrations in the A, B, and C Zones. Nested wells MW-32B and MW-32C and well MW-35B were installed to serve as guard wells for Municipal Wells 6 and 7, respectively (URS, 2013a).

To address the PCE concentrations in groundwater that were migrating farther downgradient, a cone penetrometer test (CPT) investigation was conducted in 2011 to identify an optimal location for an additional interim extraction well (URS, 2012a). An additional CPT investigation was conducted in June 2012 to further define and delineate concentrations detected in the 2011 investigation (URS, 2012b). The area investigated included segments of Griswold Avenue, Hintze Avenue, and private properties adjacent to Griswold Avenue. PCE results from the HydroPunch sample locations indicated that a plume exceeding 1,000 µg/L was present in the A Zone beneath Griswold Avenue from approximately Geer Court to 250 feet east of McHenry Avenue. A new extraction well, EW-02, was installed in the area of high PCE concentrations in groundwater, approximately 300 feet south of Halford's Cleaners and approximately 50 feet north of Griswold Avenue, and brought online in September 2012.

Beginning in July 2012, the operation and maintenance (O&M) responsibility of the groundwater treatment system for the site was transferred from the EPA to the California Department of Toxic Substances Control.

An investigation was performed in June 2015 to determine if 1,4-dioxane had been released from the site. Seven wells were sampled near the source area and downgradient to determine if concentrations had potentially migrated toward operating Municipal Wells 6 and 7. There were no 1,4-dioxane detections at any of the wells sampled.

1.1.1 Other Nearby PCE Plumes

Two other PCE groundwater plumes, herein referred to as the Elwood's and McHenry Village plumes, have been identified within 1 mile of the Halford's Cleaners site. The Elwood's plume (south of the site) is the more significant because of its close proximity to the Halford's plume and the potential for commingling of the groundwater plumes. The source area of the Elwood's plume is approximately 2,100 feet (0.4 mile) south of Halford's Cleaners near the intersection of Morris and McHenry avenues. PCE has been detected at concentrations as high as 11,000 µg/L in samples from nine shallow monitoring wells at this location. The wells were originally installed to monitor a fuels release from a nearby 7-11 convenience store, which has subsequently closed with regard to fuels release cleanup. Elwood's Dry Cleaners was identified as a responsible party for PCE contamination discovered in groundwater samples from the fuels site. PCE was detected at one well at 8,100 µg/L in September 2005 and at 1,500 µg/L in March 2011 (Tetra Tech, 2011). In 2011, three wells were installed between the Halford's

plume (Modesto Groundwater Superfund Site) and the Elwood's plume. The two A Zone wells indicate that the Halford's plume is defined to the south in the A Zone; however, concentrations at the B Zone well exceeded the PCE MCL, indicating that there may be commingling of the Halford's and Elwood's plumes in the B Zone.

The McHenry Village PCE plume is approximately 4,650 feet (0.9 mile) north of Halford's Cleaners, at the intersection of McHenry and Briggsmore avenues. PCE from the McHenry Village site has impacted nearby Municipal Well 21. PCE is being actively remediated at this site and has been monitored in groundwater since approximately 1998 in several monitoring wells, including more recently in seven deeper wells screened in the equivalent to the B Zone hydrostratigraphic interval. Groundwater monitoring data from September 2008 showed that PCE was present at concentrations as high as 64 µg/L in the deepest monitoring wells screened approximately 120 feet below ground surface (bgs). Thus, the vertical extent of the McHenry Village plume was not defined. Water levels from shallow monitoring wells at other cleanup sites in the region confirm the overall southeastern flow direction observed in the A and B Zones at Halford's Cleaners. As such, it appears unlikely that PCE from the McHenry Village plume is affecting areas of the aquifer impacted by the Halford's release 1 mile south (MWH, 2010b).

1.2 Report Organization

This report is organized as follows:

Section 1.0 provides a brief history of the Modesto Groundwater Superfund Site.

Section 2.0 describes the remedial systems.

Section 3.0 describes the sampling and monitoring programs.

Section 4.0 provides performance evaluations for the GWTS and SVE system, including a groundwater capture zone analysis.

Section 5.0 summarizes results and provides recommendations for the GWTS and SVE system operation and maintenance (O&M) programs.

Section 6.0 provides an analytical data quality review.

Section 7.0 lists reference information for documents cited in this report.

Tables and figures are provided at the end of the report. The report is supported with the following appendices, which are provided on a compact disc at the end of the report:

Appendix A provides the treatment system process and instrumentation diagrams (P&IDs) for the GWTS and SVE system.

Appendix B provides laboratory analytical data tables.

Appendix C provides laboratory data validation reports.

Appendix D provides system uptime and shutdown tables.

Appendix E provides O&M process logs and groundwater/soil vapor sampling field data logs.

Appendix F provides operational history, including a brief discussion of the routine and non-routine O&M performed on the GWTS.

Appendix G provides historical data, as follows:

G-1	Well Construction Details
G-2	Groundwater Monitoring Well Table Elevations
G-3	Searchable Historical and Current Analytical Data
G-4	Historical PCE Concentration Trends in Groundwater Monitoring Wells
G-5	PCE Mass Removed by the Groundwater Treatment System

Appendix H provides historical PCE soil vapor concentration trends in indoor air, sub-slab, and soil vapor monitoring wells.

2.0 DESCRIPTION OF REMEDIAL SYSTEM

The Modesto Groundwater Superfund Site GWTS and SVE systems are behind Halford's Cleaners and between an auto parts shop and Season's Lodge (Figure 2-1). The SVE and GWTS process equipment is contained within two metal storage containers in a fenced and locked compound.

2.1 GWTS

The GWTS includes two operable extraction wells (EW-01R and EW-02), an equalization tank, particulate filters, an air stripper, two liquid-phase GAC (LGAC) vessels, one vapor-phase GAC (VGAC) vessel, and two ion exchange (IX) units, as well as piping and control systems. EW-02 operated at approximately 46 gallons per minute (gpm) from September 2012 to July 2013 after it was installed to remove PCE mass that had migrated downgradient of EW-01R. However, PCE concentrations at monitoring wells near EW-01R began increasing and exceeded PCE concentrations near EW-02 in 1Q13; the concentration increase may have occurred because EW-01R was no longer extracting the PCE mass in that portion of the plume after its shutdown in 3Q12 when EW-02 began operating. Therefore, EW-01R was returned to service on 22 July 2014 and has operated in conjunction with EW-02 to increase mass removal. EW-01R and EW-02 operated during the entire 3Q15 quarter. Appendix A includes GWTS P&ID diagrams.

Extracted groundwater is pumped from the equalization tank through the air stripper for primary treatment of PCE. The treated water is then pumped from the air stripper sump through the LGAC vessels to remove remaining PCE concentrations. The VGAC vessel treats the air stream from the air stripper. The IX units are installed in series after the LGAC vessels and treat a slip stream (portion) of the total system flow to remove low levels of naturally occurring uranium from the groundwater before discharge to the City's sewer collection system. Treatment system process and instrumentation diagrams are presented in Appendix A. The design flow rate of the system is 50 gpm.

The components of the GWTS, except the VGAC vessel, are contained in an 8.5- by 8.5- by 20-foot metal storage container. The VGAC vessel is next to the container within the fenced compound. A secondary containment unit is underneath the storage container. Any water draining into the secondary containment is manually pumped to the equalization tank to be treated before discharge to the sewer. Additional information about the GWTS is available in the *Groundwater Treatment System Operation and Maintenance Manual, Modesto Groundwater Superfund Site* (O&M Manual) (URS, 2013b), which details the operating equipment (manufacturers, models, standard settings, inspection frequency, troubleshooting, etc.).

The groundwater monitoring well network consists of 48 wells throughout the site in residential and business communities (Figure 2-2). Table G-1 (Appendix G) includes well construction details.

2.2 SVE System

The SVE system includes three extraction wells (SVE-02, SVE-03, and SVE-04), a blower, a condensate collection drum, air filters, silencers, one 2,000-pound VGAC vessel, conveyance piping, control systems, and an air conditioning unit. Figure 2-3 shows locations of SVE wells, vapor monitoring wells, and the conveyance piping configuration. Appendix A includes SVE system P&ID diagrams.

The three extraction wells in operation (SVE-02, SVE-03, and SVE-04) during 3Q15 are approximately 3 to 5 feet from the northwestern corner of Halford's Cleaners in the alley north of the building, within what is considered to be the source area. Nine monitoring points surrounding the SVE wells (including three offline SVE wells) are sampled quarterly. Samples were collected from all nine monitoring points

and extraction wells on 24 July 2015, 25 August 2015 and 30 September 2015; however, on 30September 2015, only six out of nine vapor monitoring points were successfully sampled due to a high rate of sample container failure.

To allow for continuous, 24-hour operation, the SVE system operating parameters are controlled by the on-site programmable logic controller. The design flow rate of the system is 180 standard cubic feet per minute (scfm). Extracted soil vapor passes through an air-water separator; liquid that accumulates in the condensate collection drum is pumped to the equalization tank in the GWTS for treatment before discharge to the sewer.

The aboveground system components (except the VGAC vessel) are contained with an 8-by 8.5-by 12.75-foot metal storage container. The VGAC vessel is next to the container within the fenced compound. Additional information about the SVE system is available in the *Soil Vapor Extraction System Operation & Maintenance Manual, Modesto Groundwater Superfund Site* (URS, 2013c), which details the operating equipment in the SVE trailer (manufacturers, models, standard settings, inspection frequency, troubleshooting, etc.).

3.0 SAMPLING AND MONITORING PROGRAM

Sampling and monitoring at the Modesto Groundwater Superfund Site is performed in accordance with the *Sampling and Analysis Plan for Long-Term Monitoring, Site Investigations, and Soil Vapor Extractions, Modesto Groundwater Superfund Site* (2013 Sampling and Analysis Plan [SAP]) (URS, 2013d). Tables B-2, B-3, and B-4 (Appendix B) include sample locations and associated analytical test methods, phase (water, vapor, etc.), and sample dates of sampling activity for the second quarter event.

The quarterly sampling program consists of two types of sampling: site sampling (groundwater and soil vapor) and system sampling. EPA manages both site sampling and SVE system sampling. The State of California manages the GWTS sampling program.

3.1 Site Sampling and Monitoring

Site sampling to monitor groundwater includes collecting groundwater samples from the network of 48 groundwater monitoring wells and 2 groundwater extraction wells for analysis by EPA Method E524.2. Site sampling to monitor the vadose zone includes collecting vapor samples from the three SVE wells and nine vapor monitoring locations for analysis by EPA Method TO15. Subsections 3.1.1 and 3.1.2 describe sampling of groundwater and vapor wells, respectively, during 3Q15.

3.1.1 Groundwater Sampling and Monitoring

Blaine Technical Services, Inc. personnel measured depths to groundwater on 16 September 2015, and collected groundwater samples for volatile organic compounds (VOCs) on 01 and 02 October 2015 where they measured depths to groundwater a second time (Appendix E). Depth-to-groundwater measurements and groundwater samples were collected from 48 groundwater monitoring wells and 2 extraction wells to evaluate changes in the depth to water, to evaluate influence of groundwater extraction on the PCE plume, to estimate the extent of contamination, to determine horizontal flow directions, and to determine plume capture (the portion of a groundwater plume that is expected to flow into an extraction well, assuming it continues operating consistently for a period of time).

Groundwater elevations are also used to evaluate potential vertical groundwater flow directions and to develop groundwater elevation contour maps. Groundwater elevations calculated from water levels measured using an electronic water level meter at A, B, and C Zone wells during 3Q15 were contoured using the Inverse Distance Weighted tool in ArcGIS 10.1 and adjusted using professional hydrogeologic judgment.

Groundwater samples were collected using polyethylene based passive diffusion bags (PDB) in 41 of the 48 monitoring wells samples. Groundwater samples in 7 of the 48 monitoring wells samples were collected using Low-Flow (Minimal Drawdown) Groundwater Purging. The samples from the operating extraction wells (EW-02 and EW-01R) were collected from the dedicated EW sample ports (SP). All groundwater samples were analyzed for VOCs using EPA Method E524.2; Table B-2 (Appendix B) presents analytical results from the 3Q15 sampling event.

All groundwater monitoring and sampling during 3Q15 was performed and recorded in in accordance with the procedures described in the 2013 SAP (URS, 2013d), with the following exceptions. Eight groundwater monitoring wells have been added to the monitoring and sampling program detailed in the 2013 SAP. At MW-20C a defective PDB only permitted one of three sample containers to be filled. The depth to groundwater recorded on the well gaging data form for wells MW-22A and MW-23A does not match the value recorded on the corresponding sampling data sheets (Appendix E); for this reason MW-

22A and MW-23A have been excluded from groundwater elevation discussing and contouring. Non-dedicated bladder pumps were used to conduct low-flow groundwater purging at wells MW-3A, MW-4A, MW-17B, MW-20A, MW-25B, MW-32B and MW-35B; non-dedicated sampling equipment was decontaminated in accordance with in the 2013 SAP (URS, 2013d). A photoionization detector (PID) was not deployed during the 3Q15 sampling event to screen the monitoring wells, samples or ambient air quality. Field QC sampling in the form of duplicate samples, field blanks and trip blanks were not collected or submitted with groundwater samples.

Water purged from the groundwater monitoring wells during sampling was transferred through a bag filter into the GWTS equalization tank.

3.1.2 Soil Vapor Sampling and Monitoring

The SVE system was brought back online on 8 April 2015, after being shut down since 13 January 2014 for a rebound study. Additional details on the study results are provided in the SVE Rebound Report of Findings (URS, 2015a). The SVE system required a new moisture separator (MS-1) which was replaced in its entirety prior to restart on April 8, 2015.

Soil vapor samples were collected by RORE, Inc. from the three SVE and nine vapor monitoring wells on 24 July 2015, 25 August 2015 and 30 September 2015 using 400-millilter Summa canisters (Appendix E). SVE and vapor monitoring wells were purged and sampled in accordance with the sampling procedures described in the 2013 SAP (URS, 2013d), with the following exceptions. Samples were not collected from soil vapor monitoring wells DP-01-S, OSVE-10 and OSVE-11 on 30 September 2015 due to failure of the Summa canisters deployed at the respective locations and all supplied backup canisters. A PID was not deployed during the 3Q15 sampling events to screen the sampling points and ambient air quality. All samples were analyzed using EPA Method TO15; Table B-4 (Appendix B) presents analytical results from the 3Q15 sampling event.

Air quality samples were collected by RORE, Inc. from the ten indoor air and sub-slab monitoring points on 24 July 2015, 25 August 2015 and 30 September 2015 using 400-millilter or 6-liter Summa canisters (Appendix E). Indoor air and sub-slab sample analytical results collected during 3Q15 are shown in Table B-4 (Appendix B), included on Figure 4-11, and on Table G-3, which also includes historical data. Appendix H presents time series plots of indoor air, sub-slab, and soil gas data. Indoor air and sub-slab monitoring points were purged and sampled in accordance with the sampling procedures described in the 2013 SAP (URS, 2013d), with the following exceptions. A PID was not deployed during the 3Q15 sampling events to screen the sampling points and ambient air quality. All samples were analyzed using EPA Method TO15 SIM; Table B-4 (Appendix B) presents analytical results from the 3Q15 sampling event.

3.2 System Sampling and Monitoring

Compliance sampling and monitoring of the GWTS system at the Modesto Groundwater Superfund Site were performed in accordance with the City of Modesto 2013 Groundwater Discharge Permit GW0098 (City of Modesto, 2013), and the 2010 SAP (URS, 2010). Compliance samples were collected to satisfy City regulatory requirements, thereby meeting the City's discharge limits to the sewer. All of the treatment system effluent samples collected during the reporting period were analyzed and demonstrate that constituents in the discharge were below maximum allowable limits.

3.2.1 Groundwater System Sampling and Monitoring

Compliance monitoring samples for the GWTS are collected monthly, quarterly and annually from the system influent and effluent as the system is operating. System effluent samples are analyzed monthly for VOCs (Method E524.2), total dissolved solids (TDS) (Standard Method [SM] 2540C), total suspended solids (TSS) (SM2540D), biochemical oxygen demand (BOD) (SM5210B), quarterly for total uranium (American Society for Testing and Material [ASTM] D5174), and annually for bioassay. Performance samples are collected monthly to monitor and assess the performance and efficiency of the air stripper, LGAC, IX media, and VGAC. The GWTS VOC performance monitoring samples (analyzed by Method E524.2) are collected from the carbon influent, carbon mid-bed, and carbon effluent. The GWTS uranium performance monitoring samples are collected from the post carbon/pre-IX, IX mid-bed, and IX effluent and analyzed using Method ASTM D5174. The vapor (airstripper off-gas) performance samples are collected at the VGAC influent and effluent (stack) and analyzed using Method TO15. Figures 1-1 and 1-2 in Appendix A illustrate the sampling port locations for the GWTS. Table B-3 (Appendix B) presents analytical data tables for the 3Q15 sampling event.

3.2.2 Soil Vapor System Sampling and Monitoring

Only system performance samples are collected at the SVE system. Samples are typically collected at the pre-GAC and stack SPs to monitor VGAC usage, or at the SVE inlet to establish the total VOC concentrations (from all three SVE wells) at system start-up prior to air flow temperature, and velocity change. The SVE inlet is the sampling location prior to the dilution air valve and the blower, while the pre-GAC sampling location is between the blower and the VGAC unit. Samples collected are analyzed by EPA Method TO15. Figure 1-3 in Appendix A illustrates the sampling port locations for the SVE system. During 3Q15 monitoring of the SVE system was not performed and performance sampling was not conducted.

This page intentionally left blank

4.0 PERFORMANCE EVALUATION

Subsections 4.1 and 4.2 discuss site and system performance evaluations, respectively, based on current and historical analytical results. The site performance evaluation estimates the current extent of contamination and the hydraulic gradients affecting plume migration directions. System sampling helps evaluate the remedial progress of the GWTS and SVE system.

Section 6.0 provides a summary of the quality assurance (QA) and quality control (QC) results for the samples collected during 3Q15. Appendix B provides a complete set of validated analytical data for groundwater collected during the 3Q15 reporting period. Table B-2 summarizes the sample results from monitoring wells and SVE system performance samples. Table B-3 summarizes results for the groundwater treatment system, including EW-02 and EW-01R (listed as GWTS-INF). Table B-4 summarizes vapor samples results (indoor air, sub-slab, and soil vapor). Appendix C includes the laboratory data validation reports for this reporting period's analytical data.

4.1 Site Performance

Subsection 4.1 provides 3Q15 results of the groundwater and soil vapor well sampling events. Figures 4-1, 4-2, and 4-3 show the stratigraphic conceptual models in the southeast to northwest (Model A-A´), west to east (Model B-B´), and southwest to northeast (Model C-C´) directions, respectively.

Subsection 4.1.2 presents the soil vapor sampling results, Subsection 4.1.3 presents an analysis of vertical groundwater gradients, and Subsection 4.1.4 provides the EW-01R and EW-02 capture zone analysis.

4.1.1 Groundwater Monitoring and Sampling Results

Groundwater elevations have decreased an average of approximately 2.10 feet between 2Q15 and 3Q15. Based on water levels measured on 1 October 2015, groundwater elevations ranged from 39.84 feet mean sea level (msl) at MW-21A to 44.79 feet msl at MW-30A in the A Zone. Groundwater elevations ranged from 39.96 feet msl at MW-19B to 43.99 feet msl at MW-30B in the B Zone, and from 36.22 feet msl at MW-16C to 39.78 feet msl at MW-32C in the C Zone. Groundwater levels recorded at A Zone wells MW-22A and MW-23A in 3Q15 are inconsistent with historic trends and appear to be anomalous; therefore, MW-22A and MW-23A have been excluded from groundwater elevation discussion and potentiometric surface discussion.

Groundwater elevations decreased between 2Q15 and 3Q15 at all A Zone wells; there was an average decrease in the A Zone of 2.05 foot. Depths at the B Zone wells decreased an average of 2.19 foot between 2Q15 and 3Q15. Water elevations at all six C Zone wells decreased by an average of 2.09 feet. Appendix G presents historical and current water level measurements and analytical data.

Figure 4-4 shows groundwater elevations trends at nine A Zone wells. These wells were selected to provide representative groundwater elevations across the A Zone plume. As shown in Figure 4-4, groundwater elevations decreased between 2Q15 and 3Q15. Additionally, historical groundwater elevations for the older wells (MW-10A through MW-15A and MW-20A) indicate that the groundwater table at the site was deeper in 3Q15 than in August 2001 when groundwater measurements began at these wells (Appendix G-2). The deeper water table is likely due to drought conditions that prevail in Central California and over-pumping that have occurred throughout the Central Valley in recent years.

Figures 4-5, 4-6, and 4-7 show potentiometric surface data, groundwater flow directions, and PCE concentration data for the A, B, and C Zones, respectively. Potentiometric contours indicate that groundwater in the A, B, and C Zones flows southeast across the site. In the vicinity of EW-02 and EW-

01R, groundwater flows toward the groundwater surface depression created by the operation of these wells in A Zone (Figure 4-5). In the vicinity of MW-27B and MW-35B, B Zone groundwater flows in a more eastern direction, likely due to the groundwater depression created by the operation of Municipal Well 7 (Figure 4-6). It is RORE's understanding that Municipal Well 7 was in operation at that time.

The average horizontal hydraulic gradient parallel to the direction of regional groundwater flow in the A Zone was approximately 0.00178 foot per foot (ft/ft) to the southeast in 3Q15 (Figure 4-5). The approximate B Zone horizontal hydraulic gradient was 0.00155 ft/ft to the southeast in 3Q15 (Figure 4-6). Groundwater in the C Zone was flowing southwest with a horizontal hydraulic gradient of approximately 0.00153 ft/ft in 3Q15 (Figure 4-7).

In general, the horizontal hydraulic gradient direction in the C Zone has been observed to be more westerly during the second quarters (either southwest or south-southwest) and more easterly during the fourth and first quarters (southeast or south-southeast). The horizontal hydraulic gradient direction was southeast in 3Q15. As discussed in previous groundwater reports for the site, the horizontal hydraulic gradients in this deeper zone are strongly influenced by regional municipal supply well pumping that increases during the spring and summer months (MWH, 2010a). Pumping histories from January 2000 through August 2009 for City supply wells surrounding the site are compiled in Appendix B of the *Groundwater Remediation Optimization Methods*, *Modesto Groundwater Superfund Sites* (MWH, 2010b). Subsequent municipal pumping data is not made available to RORE.

To evaluate the potential hydraulic influence on the extents of PCE plumes from the operation of Municipal Wells 6 and 7, URS installed transducers in six A Zone, five B Zone, and three C Zone monitoring wells between 28 June and 7 December 2011. Evaluation of the data collected using the transducers indicated that municipal well pumping has a greater effect on C Zone water levels than on A or B Zone levels, and pumping at these municipal wells increases the prevailing downward hydraulic gradient between the A Zone and B Zone and between the B Zone and the C Zone. Increases in the downward hydraulic gradient can result in downward migration of PCE beneath portions of the site.

The southern portion of the plume most likely would be influenced by municipal well pumping because Municipal Wells 6 and 7 are southeast and southwest, respectively, of the southern boundary of the plume (Figures 4-6 and 4-7). Additional details on this evaluation are provided in the *Interpretation of Local Groundwater Level Changes and Influences from City of Modesto Municipal Water Supply Wells Nos. 6 and 7 Technical Memorandum* (URS, 2012c). Further evidence that municipal well pumping is influencing plume migration is that PCE concentrations exceeding the MCL were reported in samples collected at MW-16C in 1Q13 through 3Q13 and again in 2Q14, 3Q14, 2Q15 and 3Q15 after having results less than the MCL from 4Q08 to 4Q12. In 3Q15, the PCE concentration at MW-16C is 26 µg/L. Increased PCE concentrations in the C Zone correlate with increased pumping during drier months. Subsection 4.1.1.1 provides details of the PCE reported in the C Zone.

4.1.1.1 PCE

In 3Q15, PCE was detected at concentrations exceeding the 5 µg/L MCL at EW-01R, EW-02, and 19 monitoring wells. PCE concentrations are shown on Figures 4-5, 4-6, and 4-7 for the A, B, and C Zones, respectively, and as composite plumes on Figure 4-8. The distribution of PCE concentrations greater than 5 µg/L in groundwater is illustrated with isoconcentration contour lines (lines of equal concentration). The distribution of PCE concentrations is also illustrated on generalized geologic cross-sections that dissect the site along southeast to northwest (Figure 4-9) and west to east (Figure 4-10) lines. Table B-2 (Appendix B) includes current quarterly groundwater monitoring well analytical results. Figures G-4(a) through G-4(av) (Appendix G-4) show PCE time series plots for monitoring wells MW-01A through MW-35B.

A Zone

As depicted on Figure 4-5, the PCE MCL plume is approximately 1,700 feet long, parallel to the primary hydraulic gradient direction, and approximately 900 feet wide in the east-west, cross-gradient direction. The northwest-southeast axis of the A Zone plume parallels the primary gradient direction.

From 2Q15 to 3Q15, PCE concentrations decreased at nine wells screened in the A Zone, none to less than the PCE MCL. PCE concentrations decreased by approximately 60 percent at MW-04A between 2Q15 and 3Q15 from 35 µg/L to 9.2 µg/L, also PCE concentrations decreased from 110 µg/L to 78 µg/L at EW-02, and from 59 µg/L to 39 µg/L at MW-05A; therefore, the southeastern portion of the plume with concentrations greater than 100 µg/L was eliminated, and northern portion of the plume with concentrations greater than 50 µg/L was decreased in size. PCE concentrations increased at eight wells screened in the A Zone including from 120 µg/L to 130 µg/L at MW-03A and from 3.8 µg/L to 7.7 µg/L at MW-23A; therefore, a second portion of the PCE MCL plume centered on MW-23A is present west of the main PCE MCL plume (Figure 4-5). The dimensions of the main MCL plume remained unchanged between 2Q15 and 3Q15; in 3Q15, the PCE MCL plume is defined. PCE concentrations have fluctuated seasonally at MW-31A and MW-13A from just above to below the MCL, resulting in the PCE plume being undefined during quarters when the PCE results were greater than the MCL. In 3Q15, PCE results at MW-13A (2.0 µg/L) and MW-31A (1.2 µg/L) were less than the MCL; therefore, the western portion of the plume is defined (Figure 4-5).

PCE was detected historically in Municipal Wells 14 and 8, approximately 2,375 feet (0.45 mile) west and 5,320 feet (1.0 mile) west-southwest, respectively, of Halford's Cleaners (Figure 1-2). Municipal Wells 8 and 14 have been offline since 2007 and 2006, respectively (MWH, 2010b); however, the plume may have been drawn toward Municipal Wells 8 or 14 before they were shut down. Municipal Well 17, more than 3,500 feet northwest of the monitoring wells, has remained in consistent operation and may have some hydraulic influence on the plume because it has a 4-foot-long screened interval approximately 25 feet lower than the screened zones of MW-13A, MW-14A, MW-23A, MW-30A, and MW-31A and had an open borehole from 204 to 232 feet bgs at the time of construction. There are no wells positioned to provide data that would indicate whether the hydraulic influence of pumping at Municipal Well 17 is affecting the PCE plume. However, the well is in the opposite direction from the predominant gradient direction and the distance between it and the behavior of water levels in monitoring wells near the plume makes it unlikely that the hydraulic influence is measurable in the Halford's plume area. Municipal Wells 6 and 7, alternatively, are closer to the plume than Municipal Wells 14 and 17 and are still operating. The *Interpretation of Local Groundwater Level Changes and Influences from City of Modesto Municipal Water Supply Wells Nos. 6 and 7 Technical Memorandum* (URS, 2012c) reports that water levels at some A Zone monitoring wells had slight responses when Municipal Wells 6 and 7 were operating. Municipal Well 6 is screened in the A and B Zones and, though Municipal Well 7 is screened below the A Zone (in the B Zone), pumping at Municipal Wells 6 and 7 may be affecting the migration of the A Zone plume.

The sewer line running beneath Griswold Avenue just north of MW-23A could contribute to the PCE detections at MW-23A. Discharges from Halford's Cleaners to the sewer line have been identified as a source of contamination to the subsurface. Sewer lines south of the former Elks Club and west of Halford's Cleaners were sampled during August 1985 (MWH, 2010b). A PCE concentration of 1,040 parts per million was reported in 1985 in a sewer sediment sample collected at the manhole where the north-south sewer line intersects with an east-west sewer line beneath Griswold Avenue. It is possible that PCE flowed down-sewer to that intersection and leaked from the sewer along Griswold Avenue, resulting in the high concentrations exceeding 1,000 µg/L in HydroPunch samples collected along the east-west sewer line with an axis that is nearly perpendicular to the southeast hydraulic gradient of the A Zone (Figure 4-10). Westerly flow and releases along the Griswold Avenue sewer line may account for the PCE concentrations of between 5 and 50 µg/L reported at the wells in previous quarters in the west

portion of the A Zone plume such as MW-23A. The sewer line extends to Enslen Avenue, south on Enslen Avenue, then west on Coldwell Avenue (Figure 4-5).

B Zone

Figure 4-6 depicts the B Zone PCE plume and potentiometric surface contours. In 3Q15, PCE was detected above the MCL at 11 of the 18 B Zone wells. PCE concentrations decreased from greater to less than the PCE MCL between 2Q15 and 3Q15 at one well screened in the B Zone and increased from less than to greater than the PCE MCL at six wells screened in the B Zone; therefore, the plume increased in size between 2Q15 and 3Q15 (Figure 4-6). The concentrations at two of the wells screened in the B Zone MW-17B and MW-24B increased to 52 µg/L and 58 µg/L respectively; therefore, the portion of the plume with concentrations above 50 µg/L increased in size to the south and east (Figure 4-6). The concentrations at five of the wells screened in the B Zone MW-04B, MW-09B, MW-10B, MW-16B and MW-35B increased to above 5 µg/L; therefore, the portion of the plume with concentrations above PCE MCL increased in size to the north, south, and southeast (Figure 4-6). The plume is approximately 2,300 feet long and generally parallel to the predominant gradient direction (northwest/southeast) and has a width of approximately 2,200 feet (Figure 4-6).

Data from the B Zone wells indicate that the hydraulic axis of the plume trends northwest to southeast. The B Zone plume shape likely has been hydraulically influenced by pumping at municipal wells. *The Interpretation of Local Groundwater Level Changes and Influences from City of Modesto Municipal Water Supply Wells Nos. 6 and 7 Technical Memorandum* (URS, 2012c) indicates that water levels at most B Zone monitoring wells had slight responses when Municipal Wells 6 and 7 were operating. The maximum observed water level changes were -0.24 and -0.19 foot at MW-09B and MW-17B, respectively, when pumping at Municipal Well 6 was evaluated and -0.19 and -0.32 foot at MW-16B and MW-19B, respectively, when pumping at Municipal Well 7 was evaluated. Municipal Well 6 is screened in the A and B Zones and Municipal Well 7 is screened in B Zone; therefore, pumping at Municipal Wells 6 and 7 may be hydraulically influencing the B Zone plume.

Prior to 3Q13, the PCE plume in the B Zone was undefined in the northern, western, and southeastern directions. In 3Q13, MW-30B and MW-34B were installed to define the plume in the northern and western directions, respectively, and MW-32B and MW-33B were installed to define the plume in the southeastern direction. PCE concentrations at MW-30B, MW-32B, MW-33B and MW-34B in 3Q15 were less than the MCL (of 5 µg/L) or not detected; therefore, the plume appears to be defined in the northwestern, western and southeastern directions (Figure 4-6). Historically the PCE plume was undefined west of MW-34B because PCE concentrations exceeded the MCL since MW-34B was constructed; the 3Q15 PCE concentration at MW-34B was 4.6 µg/L.

MW-35B was installed as a guard well for Municipal Well 7. PCE concentrations at MW-35B, which exceeded the MCL from 4Q13 to 1Q15, decreased to 2.3 µg/L, less than the MCL, in 2Q15. A potential explanation for the decrease in concentration at MW-35B is less pumping at Municipal Well 7. Pumping rates for Municipal Well 7 are not provided. However, data from nearby site wells indicate that the hydraulic influence from Municipal Well 7 may have been less in 2Q15. PCE concentrations at MW-35B increased to 6.7 µg/L, just above the MCL, in 3Q15, suggesting an increase in pumping at Municipal Well 7. A potential explanation for the fluctuation in concentration at MW-35B is variation in pumping at Municipal Well 7 and Municipal Well 8 has caused an increase in MW-35B. In previous quarters, decreased in PCE concentration at well MW-35B have been tied to higher than average water elevations at B Zone wells near Municipal Well 7. The increase in PCE concentration observed at well MW-35B in 3Q15 combined with the change in water elevations at the wells near Municipal Well 7 (MW-26B and MW-27B) being consistent with average water elevations at B Zone wells possibly indicates that the hydraulic influence from Municipal Well 7 may have been more in 3Q15 than in 2Q15.

C Zone

Figure 4-7 shows groundwater elevation contours and PCE concentration data for the C Zone. The PCE concentration increased from 9.7 to 26 µg/L at MW-16C between 2Q15 and 3Q15; therefore, the PCE MCL plume was being drawn into the C Zone because of hydraulic gradients. Concentrations have been fluctuating above and below the MCL at MW-16C since 1Q13; the 3Q15 concentration of 26 µg/L is the highest that has been detected in this well (Figure G-4[v]).

4.1.1.2 Other VOCs

No additional VOCs were detected above their respective MCLs in 3Q15.

4.1.1.3 1,4-Dioxane

During 2Q15 seven wells were sampled for 1,4-dioxane during 2Q15 to determine if any release had occurred at the Modesto Site (Figure 4-8). There were no 1,4-dioxane detections at any of the wells. Because 1,4-dioxane was not detected at the wells sampled during 2Q15, there was no further investigation for 1,4-dioxane during 3Q15.

4.1.2 Soil Vapor Sampling Results

Samples were collected from three operating SVE wells on 24 July 2015, 25 August 2015 and 30 September 2015. Analytical results listed in Table B-4 (Appendix B) are summarized below and included on Figure 4-11:

- SVE-02 (screened interval 7 to 12 feet bgs): PCE concentration at less than 2.3, 5.1 and 10 parts per billion by volume (ppbv) in 3Q15 (24 July 2015, 25 August 2015 and 30 September 2015 respectively) (range during 2013 was 8.2 to 30 ppbv).

- SVE-03 (screened interval 13 to 23 feet bgs): PCE concentration at less than 2.3, less than 2.4 and 1,400 ppbv in 3Q15 (24 July 2015, 25 August 2015 and 30 September 2015 respectively) (range during 2013 was less than 2.1 to 49 ppbv).

- SVE-04 (screened interval 28 to 38 feet bgs): PCE concentrations at less than 2.3, less than 2.2 and 32 ppbv in 3Q15 (24 July 2015, 25 August 2015 and 30 September 2015 respectively) (range during 2013 was less than 2.0 to 16 ppbv).

Samples were collected from the ten indoor air and sub-slab monitoring points from 23 to 24 July 2015, from 25 to 26 August 2015, and from 30 September 2015 to 01 October 2015. Analytical results listed in Table B-4 (Appendix B) are summarized below and included on Figure 4-11. Indoor air sample results indicate that PCE concentrations increased slowly in 3Q15 (Appendix H). The maximum increase in PCE indoor air concentrations at a single sampling location were at sample location 939-IA-01 (Parts House) on 23 July 2015 from 1.2 (estimated) to 7 micrograms per cubic meter (µg/m^3) and at sample location 941-IA-02 (Halford's Cleaners) on 30 September 2015 from 1.3 to 4.1 µg/m^3. The sub-slab ventilation system is likely assisting in keeping sub-slab concentrations from increasing to a level that indoor air concentrations are minimally affected by vapor intrusion. The increase indicates that operation of the SVE system during prior years has contributed in keeping indoor air concentrations in the acceptable cancer risk range of 1 in one million (2.0 µg/m^3).

Well logs indicate that fine-grained silts make up much of the subsurface deposits near the SVE wells and DP-05A where much of the residual PCE mass is likely to be. This mass seems to be confined to a

relatively small area on the northwest corner of the Halford's Cleaners building near the SVE wells. Indoor air sample results collected during 3Q15 are shown in Table B-4 (Appendix B) and Table G-3, which also includes historical data. Appendix H presents time series plots of indoor air, sub-slab, and soil gas data.

4.1.3 Analysis of Vertical Groundwater Gradients

Vertical hydraulic gradients were calculated using 3Q15 data at one well pair with screens in the A Zone, nine well pairs with screens in the A or B Zones, and six well pairs with screens in the B or C Zones. Wells are chosen to be paired for vertical hydraulic gradient calculation based on their proximity to each other; selected wells are either within the same well cluster (MW-16A/MW-16B and MW-16B/MW-16C), or are located within 10 feet of each other (MW-8A/MW-9B and MW-21A/MW-25B) (Figure 2-2). Table 4-1 summarizes the vertical hydraulic gradients for each well pair for 3Q15. For comparison, Table 4-1 also lists vertical hydraulic gradients calculated for 2Q15 and 1Q15 and the vertical distance between paired well screens. Figures 4-9 and 4-10 also depict the direction of vertical hydraulic gradients between well pairs along cross-sectional planes.

There was a potential for an upward hydraulic gradient between the well pair screened in the A Zone; however, as discussed previously the water level measurement at one of the wells in this pair (MW-22A) is considered anomalous and has been excluded from consideration in 3Q15. There was a potential for a downward hydraulic gradient between eight A Zone-B Zone well pairs, and all six B Zone-C Zone well pairs indicated a potential for a downward hydraulic gradient.

Well pairs MW-16A/MW-16B, MW-16B/MW-16C, and MW-32B/MW-32C all indicate potentials for downward hydraulic gradients from both the A to the B Zone and the B to the C Zone. These downward hydraulic gradients likely are caused by the hydraulic influence of pumping at Municipal Well 6; downward hydraulic gradients from the more contaminated B Zone can contribute to the increase in PCE concentrations at the C Zone well MW-16C discussed in Subsection 4.1.1.1.

The vertical hydraulic gradient calculated using well pair MW-4A/MW-4B indicated the potential for a downward hydraulic gradient in 3Q15; this well pair indicated an upward hydraulic gradient during 2Q15, 1Q15 and 2Q14. The change in vertical hydraulic gradient might explain the apparent downward migration of PCE contaminant between the A and B Zones in 3Q15 (Figure 4-5, 4-6, 4-9 and 4-10).

4.1.4 Extraction Well Capture Zone Analyses

Figures 4-9 and 4-12 show estimated groundwater plume capture from extraction wells EW-01R and EW-02. The flow rates are approximately 24 and 25 gpm, respectively, with a total flow rate of approximately 49 gpm, which does not exceed the maximum flow rate (50 gpm) allowed in the City of Modesto 2013 Groundwater Discharge Permit GW0098 (City of Modesto, 2013).

Two lines of evidence (groundwater elevation contours developed with 3Q15 data and particle tracks developed with the site's groundwater model, MODFLOW) were used to estimate the extent of capture at EW-01R and EW-02 presented on Figure 4-9 and Figure 4-12.

Figure 4-12 shows the estimated combined capture zone as a curved line consisting of the estimated stagnation points near EW-02. The extent of capture in the A Zone estimated with the MODFLOW model's simulation of pumping at approximately 50 gpm at EW-01R and EW-02 is shown as the sweep of groundwater flow lines toward the well based on reverse particle tracking (i.e., particles released at the well and modeled backward to determine their starting points). The downgradient extent of capture is interpreted to extend to approximately 50 feet upgradient of MW-10A.

Figure 4-9 shows the estimated vertical extent of capture by EW-01R and EW-02. The downgradient extent of capture depicted in cross-sectional view is based on both the empirical and modeled lines of evidence. The vertical capture zone extent below the extraction well screens is an estimate based on water level data, modeling, and vertical gradients. Vertical gradients calculated using 3Q15 groundwater elevation data from wells near EW-02 (MW-04A/MW-04B) were downward from the A to the B Zone. The estimated capture zone has been drawn below the bottom of the screened interval of EW-02.

4.2 System Performance

System compliance and performance samples were collected to evaluate the effectiveness of the remedial systems. Water, vapor, and media samples were collected according to requirements in the 2010 SAP (URS, 2010) and the City of Modesto 2013 Groundwater Discharge Permit GW0098 (City of Modesto, 2013). Resin profile sample were collected in July, August and September 2015.

System performance is based on current and historical analytical results. System performance sampling helps evaluate the remedial progress of the GWTS and enables the system operator and engineer to evaluate when a media change-out is necessary. Treatment system effluent samples collected during the reporting period for vapor emissions and sewer discharge were below maximum allowable discharge limits (Table 4-2, 4-7, 4-8).

4.2.1 GWTS Results

During 3Q15, the GWTS operated for approximately 2,203 hours (out of 2,208 hours possible during the quarter), an uptime of approximately 99.8 percent (Appendix D). Table 4-4 presents GWTS shutdown summaries for July, August, and September, respectively. Appendix E provides the O&M process logs, and Appendix F provides history of the O&M performed on the GWTS

The GWTS treated a total of approximately 6.2 million gallons of water and removed approximately 4.2 pounds of PCE during this reporting period. Total gallons treated during the quarter indicate that average discharge to the sewer was approximately 66,883 gallons per day (gpd), less than the 72,000 gpd (average) discharge limit. From August 2001 through 2Q15, the system has treated approximately 269 million gallons of water and has removed approximately 672 pounds of PCE. Figure 4-13 is a graph illustrating the cumulative PCE mass removed by the GWTS since it began operation in August 2001.

Performance samples for the LGAC were collected post air stripper (LGAC inlet), LGAC mid-bed, and LGAC effluent (GWTS effluent) and analyzed for VOCs (Method 524.2). Sample results from 3Q15 do not indicate that a carbon change-out is needed.

Performance samples were also collected and analyzed for uranium (Method D5174) at the IX influent, mid-bed, and IX effluent. During 3Q15, no breakthrough (uranium concentrations in the mid-bed sample) was reported. Therefore, no resin change-outs are scheduled.

Resin change-outs have been performed approximately annually to avoid accumulating high uranium concentrations in the resin and, therefore, avoid disposal of the resin as low-level radioactive waste. However, due to changes in the disposal facility's acceptance criteria, the resin no longer meets the requirements even though the treatment process has not changed. Profile samples of the resin, therefore, have been collected since the resin change out in June 2015 to evaluate when the uranium concentrations exceed the new requirement of 500 milligrams per kilogram. This concentration was exceeded in 3 months; therefore, all subsequent disposal requirements are governed by the resin being listed as low-level radioactive waste. Resin profile sample results are presented in Table B-3. Tables 4-5 and 4-6 identify the change-out dates for treatment media (carbon and resin, respectively) used at the GWTS.

Samples of process vapor are collected at the VGAC inlet and outlet locations to evaluate VGAC performance and contaminant loading. Table 4-7 summarizes vapor PCE results for this reporting period.

The influent vapor PCE (GWTS Pre-GAC) concentrations were 180, 71, and 160 ppbv during July, August, and September, respectively. The effluent vapor PCE (GWTS Stack) concentrations were 4.8, 4.5, and 3.2 ppbv during July, August, and September, respectively. Vapor samples are collected monthly at the VGAC inlet and outlet and analyzed for VOCs (EPA Method TO [toxic organics] 15). Change-outs are evaluated on a monthly basis.

During the 3Q15 reporting period, the GWTS pumped and treated groundwater from both EW-02 and EW-01R; the combined average flow rate for both EW-02 and EW-01R during 3Q15 was 48.4 gpm. The influent PCE concentrations were 94, 77, and 74 µg/L during July, August, and September, respectively. The PCE sewer discharge limit (0.5 µg/L) was met in each month of the quarter, as indicated by effluent sample results in Table 4-2, which summarizes all GWTS PCE results for the system during 3Q15. In addition to VOCs, samples were also analyzed for uranium. The 3Q15 influent uranium concentration was 53.7 pCi/L.; Table 4-3 presents all GWTS uranium sample results for t3Q15. The associated effluent uranium concentration was 11 pCi/L, which is less than the compliance concentration of 20 pCi/L. All other constituent concentrations monitored under the requirements listed in the GWTS O&M Manual were less than discharge limits at the GWTS effluent, SP-07, during each month of the quarter. Table B-3 (Appendix B) provides a summary of treatment system analytical results for 3Q15.

4.2.2 SVE System Results

The SVE system was brought online on 8 April 2015 and operated continuously during 3Q15. During 3Q15, monitoring of the SVE system was not performed and performance sampling was not conducted.

5.0 RECOMMENDATIONS

This section provides a summary of observations and recommendations for the GWTS and SVE system.

5.1 GWTS – Summary Observations and Recommendations

The PCE MCL plume is only partially captured in the A Zone (Figures 4-5, 4-9, and 4-12). Based on 3Q15 data, the extent of the plume is approximately 1,700 feet long, parallel to the primary gradient direction, and approximately 900 feet wide in the east-west, cross-gradient direction (Figure 4-5). In the B Zone, the plume is approximately 2,300 feet long, parallel to the primary gradient direction (northwest/southeast), and approximately 2,200 feet wide in the B Zone (Figure 4-6). PCE was reported at one C Zone well in 3Q15; therefore, a small plume exists in the C Zone centered on MW-16C (Figure-4-7).

Data collected in 3Q15 indicate that the PCE plume is fully defined laterally in the A Zone; however, vertically the PCE plume is undefined in the area of MW-05A/MW-09B. Concentrations at MW-31A and MW-13A have fluctuated above and below the MCL from quarter to quarter (Figures G-4[aq] and G-4[q] [Appendix G]). Concentrations exceeded the MCL in three of four events between 1Q14 and 1Q15 at both MW-13A and MW-31A ranging between 1.6 and 18 µg/L and 1.2 to 8 µg/L, respectively. Therefore, an additional well screened in the A Zone was recommended in reports for those quarters as possibly needed west-southwest of MW-31A to define A Zone concentrations in this direction. However, concentrations at these wells were less than the MCL in 3Q15. Because of decreases to less than the MCL at these and other A Zone wells (MW-12A, MW-14A, and MW-23A), the plume was much smaller than in previous quarters. Therefore, future sample results should be evaluated to determine if a well is needed in this area. From 2Q15 to 3Q15, PCE concentrations decreased at nine wells screened in the A Zone, none to less than the PCE MCL. PCE concentrations decreased by approximately 60 percent at MW-04A between 2Q15 and 3Q15; the southeastern portion of the plume with concentrations greater than 100 µg/L was eliminated, and northern portion of the plume with concentrations greater than 50 µg/L was decreased in size. PCE concentrations increased at eight wells screened in the A Zone including from 3.8 µg/L to 7.7 µg/L at MW-23A; resulting in a second portion of the PCE MCL plume centered on MW-23A is present west of the main PCE MCL plume.

Both EW-01R and EW-02 operated during 3Q15. EW-02 was constructed and placed online in 3Q12, and EW-01R was shut down. While EW-01R was operating before EW-02 was placed online, PCE concentrations at MW-03A (near EW-01R) and MW-04A (near EW-02) were 44 µg/L and 1,200 µg/L, respectively, in 3Q12. After EW-01R was shut down and EW-02 was operated from 3Q12 and 3Q14, concentrations increased at MW-03A to 420 µg/L 2Q14. Concentrations at MW-04A decreased initially to 130 µg/L in 4Q12 after EW-02 was placed online, then increased steadily to a 300 µg/L in 2Q14. Because of the increases at MW-03A, EW-01R was returned to service in 3Q14 and both wells were operated concurrently. Since both EW-01R and EW-02 began being operated in 3Q14, concentrations at both MW-03A and MW-04A have generally decreased. From 2Q15 to 3Q15, PCE concentrations in groundwater have increased from 120 to 130 µg/L at MW-03A and decreased from 35 to 9.2 µg/L at MW-04A.

Because of increases in PCE concentrations from less than to greater than the MCL at 6 wells in the B Zone, the plume exceeding the MCL is larger to the north, south and east than during 2Q15 and undefined in the north (near MW-09B), in the southwest, in the east (near MW-16B) and south (near MW-26B). MW-34B was installed to delineate the western plume extent; however, the PCE result at this well has frequently exceeded the MCL since its installation in 3Q13, indicating that the plume extends west of MW-34B; however, PCE concentrations at well MW-34B were less than the MCL in 3Q15 indicating the plume is defined in the western direction. Wells screened in the B Zone may be needed

west and southwest of MW-34B to define B Zone concentrations in these directions. The PCE concentration at MW-35B (6.7 µg/L), installed as a guard well for Municipal Well 7, was greater than the MCL in 3Q15; Municipal Well 7 should be sampled for PCE to monitor for the potential that concentrations detected at MW-35B have reached it. The vertical gradients near well pair MW-4A/MW-4B indicated the potential for a downward gradient in 3Q15; this and the PCE results in well pair MW-4A/MW-4B suggests downward migration of PCE contaminant between the A and B Zones in 3Q15.

PCE exceeded the MCL in the C Zone at MW-16C in 3Q15. The downward gradients from the A Zone to the B Zone, from the B Zone to the C Zone, and variable concentrations at MW-16C are likely to be influenced by pumping at Municipal Well 6, located approximately 1,500 feet southeast of MW-32C. PCE has never been detected at either MW-32B or MW-32C, which were installed downgradient of MW-16C as guard wells to Municipal Well 6. However, vertical gradients indicate groundwater at MW-32B and MW-32C has the potential for downward flow and plume migration from the B Zone to the C Zone. Therefore, decreasing the flow rates at Municipal Wells 6 and 7 should be considered to reduce the potential for affecting PCE plume migration, and PCE concentrations should continue to be monitored at Municipal Wells 6 and 7 (URS, 2012c).

Additional monitoring wells also may be needed to determine the potential for comingling of the Halford's and Elwood's plumes. Additionally, groundwater extraction wells may be needed to prevent migration of the plume toward downgradient water supply wells. The greatest threat of PCE impacting a municipal well is in the area southwest of MW-35B, where the plume appears to be migrating toward Municipal Well 7. Increased extraction and other remediation alternatives (i.e., in situ treatment) should be evaluated.

During 3Q15, the GWTS operated approximately 99.8 percent of the time, treated more than 6.2 million gallons of contaminated groundwater, and removed approximately 4.2 lbs of PCE. The GWTS was compliant with permit requirements. During 3Q15, the GWTS treated groundwater pumped from both EW-01R and EW-02 with an average flow rate of 48.4 gpm. Each extraction well currently provides about 50 percent of the flow. Continued operation of the GWTS is recommended and will optimize operations to maximize mass removal as appropriate. It is also recommended to continue sampling influent and effluent locations in accordance with the City of Modesto 2013 Groundwater Discharge Permit (City of Modesto, 2013). It is also recommended to evaluate new ways to operate the IX system to reduce disposal costs, which includes allowing the system to operate for longer periods of time between change outs. Continued evaluation of PCE concentrations in extraction wells EW-01R and EW-02 is recommended to establish the best extraction rate for each. Currently, the monitoring program recommends a 50/50 split in the flow between the two extraction wells.

5.2 SVE – Summary Observations and Recommendations

The operation of the SVE system has not remediated the entire PCE mass in the fine-grained soils near Halford's Cleaners after approximately 5 years, possibly indicating that a different method of remediation may be warranted. Monthly sampling should be resumed to determine when the system could be shut down after the startup to maximize mass removal and minimize system operations. The following wells are recommended for sample collection: SVE-02, SVE-03, DP-03B, and DP-05A.

Based on the rebound time at the SVE wells and well DP-05A, pulsed operation is recommended for the SVE system; run for at least 1 month and shut down for 5 months. This schedule will allow for 2 operations per year and save operations costs over that time. Concentrations in the sub-slab and vapor wells tend to increase during the summer and fall; pulsed operation may be best incorporated during these higher recorded PCE concentrations to maximize mass removal. Pulsed operation may not remove the

remaining diffusion limited mass; however, a pulse operation will decrease costs and mitigate sub-slab and indoor air PCE concentrations.

This page intentionally left blank

6.0 QUALITY CONTROL SUMMARY REPORT

6.1 Introduction

This section summarizes QA/QC results for samples collected and data generated during the period of July through September 2015 (3Q15) at the Modesto Groundwater Superfund Site. Sampling activity protocols are provided in the 2010 SAP (URS, 2010) and 2013 SAP (URS, 2013d). Based on the data review, all data collected during this period are of known and acceptable quality in relation to the data quality objectives (DQOs) of this project. All data are considered usable as qualified for the intended purposes.

Between 1 July and 1 October 2015, field samples, field duplicates (FDs), and field QC samples were collected for groundwater and vapor samples. Water samples were collected from the GWTS and existing monitoring wells. Vapor samples were collected from the GWTS and indoor air and sub-slab samples were collected. Table B-1 (Appendix B) lists contaminants of concern at the Modesto Groundwater Superfund Site. Analyses performed include the following:

Site and system sampling and monitoring analyses:

ALS Laboratory Group (ALS) (formerly Columbia Analytical Services)

- TDS by SM2540C: 3 normal samples (NS)
- TSS by SM2540D: 3 NS
- BOD by SM5210B: 3 NS
- VOCs in water by EPA Method E524.2: 13 NS, 1 FD, 3 trip blanks (TBs), and 1 matrix spike/matrix spike duplicates (MS/MSDs)

Eurofins/Air Toxics, Inc. (Eurofins)

- VOCs in air by EPA Method TO15: 6 NS and 1 FD

EPA Region 9 Laboratory

- VOCs in water by EPA Method E524.2: 50 NS and 3 MS/MSDs
- VOCs in air by EPA Method TO15: 47 NS and 5 FDs
- VOCs in air by EPA Method TO15 Selective Ion Monitoring: 15 NS and 3 FD

GEL Laboratories, LLC (GEL)

- Total uranium by Method ASTM D5174: 10 NS, 1 FD and 3 MS/laboratory duplicates
- Uranium by SW6020A: 3 NS

Table B-2 (Long-Term Monitoring Groundwater), Table B-3 (GWTS) and Table B-4 (Indoor Air, Sub-slab, and Soil Vapor) (Appendix B) summarize these sample results.

Analytical chemistry services were provided by the ALS in Kelso, Washington; Eurofins in Folsom, California; EPA Region 9 laboratory in Richmond, California; and GEL in Charleston, South Carolina. All laboratories are certified by the California Department of Health Services through the Environmental Laboratory Accreditation Program (ELAP) to perform hazardous waste analyses. GEL is currently in the process of recertification and has an interim California ELAP certification.

All EPA Region 9 analytical results were validated by Laboratory Data Consultants, Inc. (LDC) in Carlsbad, California, using the criteria established in the SAP, analytical methods, and EPA Region 9 laboratory standard operating procedures (SOPs), as well as the National Functional Guidelines for Superfund Organic Methods Data Review (EPA, 2008). The sample results validated by LDC were validated electronically. All remaining data was reviewed using criteria established in analytical methods and the laboratories SOPs. Appendix C provides data validation reports and qualified data tables. Several data validation flags were used in the validation process. The definitions of these qualifier flags are below:

- U Indicates the compound or analyte was considered not detected due to external contamination.
- UJ Indicates the compound or analyte was analyzed for but not detected at or above the stated limit; the sample detection limit is an estimated value.
- J Indicates the analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
- R QC indicates that the result is not usable; the presence or absence of the compound or analyte cannot be verified or the reported result is compromised as to be unusable.
- J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.
- J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

6.2 DQOs

DQOs are qualitative and quantitative statements that specify the quality of the data required to meet the goals of site investigations and support decisions made in remedial response activities. Data quality was assessed in terms of its precision, accuracy, representativeness, completeness, and comparability (PARCC). These criteria are briefly defined in the following subsections. Field and laboratory QC check results are evaluated against the DQOs, and the quality of the data is assessed according to PARCC parameters. QC sample results that fall outside of these criteria serve to signal the production of unacceptable or biased data that could result in the implementation of corrective action or the qualification of data.

6.2.1 Precision

Precision is a measurement of mutual agreement among individual measurements of the same property, usually under prescribed conditions. Data evaluated to assess precision consist of results from the analysis of FD pairs and MS/MSD samples. The precision measurement is established using the relative percent difference (RPD) between the duplicate sample results, and is expressed as:

$$RPD = \frac{\lfloor X_1 - X_2 \rfloor}{\left[\left(X_1 + X_2 / 2\right)\right]} \times 100$$

Where:

X_1 and X_2 represent the individual concentrations of the target analyte in the two replicate analyses.

6.2.2 Accuracy

Accuracy is defined as the proximity of the mean of a set of results to the true value. Accuracy is assessed through the evaluation of initial and continuing calibration data, as well as laboratory control sample (LCS) recoveries, surrogate standard recoveries, and MS recoveries, which are expressed as a percent recovery according to the following equation:

$$\text{percent recovery} = \frac{(\text{spiked sample conc.} - \text{sample conc.})}{\text{known conc. of spike}} \times 100$$

6.2.3 Representativeness

Representativeness is defined as the degree to which sample data accurately and precisely represent the characteristics of the site, parameter variations at a sampling point, or environmental conditions. Representativeness, in terms of sample integrity for this investigation, was qualitatively evaluated based on the analysis of TB, field blank (FB), and method blank (MB) samples. Additionally, sample collection and handling methods and the cooler receipt forms were reviewed to confirm that samples were received under proper storage conditions.

6.2.4 Completeness

Completeness is defined as the percentage of measurements that are judged to be usable (i.e., which meet project-specific requirements) compared to the total number planned. The requirement for the quantitative assessment of completeness is 90 percent.

6.2.5 Comparability

Data comparability is achieved by using standard analytical methods and reporting limits, and by using standard units of measurements, as specified in the methods. Comparability is a qualitative parameter.

6.3 Quality Control Results

The following subsections summarize the data review process and results in terms of PARCC criteria, as defined in the 2010 SAP (URS, 2010) and 2013 SAP (URS, 2013d). Appendix C provides qualified data based on this review process.

6.3.1 Precision and Accuracy

Precision and accuracy were evaluated based on the results of QC samples collected by the field team and QC samples that originated in the laboratory. The calculated RPD for MS/MSDs and FD pairs provided information on the precision of sampling and analytical procedures. MS/MSD analyses were associated with all samples for this sampling event. All data were reviewed for accuracy based on the surrogate

spike, MS/MSD, and LCS percent recoveries**.** The criteria used for the evaluation are provided in the Quality Assurance Project Plan included in the 2010 SAP (URS, 2010) and 2013 SAP (URS, 2013d). Appendix C provides data validation findings. Tables B-3 and B-4 (Appendix B) provide FD results.

6.3.2 Representativeness

Representativeness was evaluated through the analysis of FB, TB, and MB samples. Additionally, sample collection and handling methods and the cooler receipt forms were reviewed. All sample bottles were received in good condition and the chain-of-custody documents agreed with the sample labels.

TBs are required to accompany each cooler of aqueous samples sent to the laboratory for analysis of VOCs. One TB accompanied each cooler for each of the sampling dates for GWTP samples; however, TBs were inadvertently not collected for the 3Q15 monitoring program. Table B-3 (Appendix B) list TB detections.

MBs are processed through the same analytical procedures as the associated samples. MBs are analyzed with each batch of samples to provide information on contamination originating in the analytical process. MB detections are indicated in the data validation report provided in Appendix C.

6.3.3 Completeness

Completeness is quantitatively defined as the percentage of measurements that are determined useable compared to the total number of measurements planned. Completeness of data was evaluated by ensuring that all analytical requests were met, samples were received in proper condition, and all analyses were performed using the correct method within the appropriate holding times. Overall analytical completeness (96 percent) exceeded the project goal of 90 percent (URS, 2010). Details are provided in the data validation reports in Appendix C.

6.3.4 Comparability

Comparability was evaluated for this sampling event by analyzing all samples according to the specified EPA analytical methods, which use standard units of measurement. Necessary sample dilutions, due to the presence of elevated target compound concentrations, did not affect data usability and comparability. Results for some analytes are reported below the practical quantitation limit (PQL) but above the method detection limit (MDL). The “J” flag has been applied to results reported between the MDL and the PQL. These results were verified to be present, but the reported concentrations could not be verified to be precise or accurate within specifications. There are no specific data quality concerns indicated by QC sample results.

6.4 Summary of Data Reliability

Based on this evaluation, all data collected during this period are of known and acceptable quality in relation to the DQOs of this project. All data are considered usable as qualified for the intended purposes.

7.0 REFERENCES

City of Modesto, 2013. *City of Modesto 2013 Groundwater Discharge Permit GW0098.* June.

EPA, 2008. *National Functional Guidelines for Superfund Organic Methods Data Review.* June.

MWH Americas, Inc. (MWH), 2008. *Soil Vapor Extraction System Optimization and Enhancement Methods, Modesto Groundwater Superfund Site.* June.

MWH, 2009. *Quarterly Operations and Monitoring Report, Fourth Quarter 2008, Modesto Groundwater Superfund Site.* March.

MWH, 2010a. *Quarterly Operations and Monitoring Report, Fourth Quarter 2009, Modesto Groundwater Superfund Site.* February.

MWH, 2010b. *Groundwater Remediation Optimization Methods, Modesto Groundwater Superfund Site.* Final. March.

RORE, 2015a. *Quarterly Operation and Monitoring Report, Groundwater Treatment and Soil Vapor Extraction Remediation Systems, First Quarter 2015*. June.

RORE, 2015b. *Quarterly Operation and Monitoring Report, Groundwater Treatment and Soil Vapor Extraction Remediation Systems, Second Quarter 2015*. December.

Tetra Tech, 2011. *Remedial Investigation of the Former Elwoods and Coit/Gordos Dry Cleaners, Modesto, California.* May.

United States Environmental Protection Agency, 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Review.* EPA-540-R-08-01. June.

URS Group, Inc. (URS), 2010. *Sampling and Analysis Plan, Modesto Groundwater Superfund Site.* March.

URS, 2011. *Letter Report, Groundwater Monitoring Well Installations, Modesto Groundwater Superfund* Site. December.

URS, 2012a. *Interim Extraction Well Installation Work Plan, Modesto Groundwater Superfund Site.* Final. March.

URS, 2012b. *Final Letter Report, Additional CPT/HydroPunch Investigation*, *Modesto Groundwater Superfund Site***.** October 26, 2012.

URS, 2012c. *Interpretation of Local Groundwater Level Changes and Influences from City of Modesto Municipal Water Supply Wells Nos. 6 and 7 Technical Memorandum.* March 21, 2012.

URS, 2013a. *2013 Groundwater Monitoring Well Installations Report, Modesto Groundwater Superfund Site*. October.

URS, 2013b. *Groundwater Treatment System Operation and Maintenance Manual, Modesto Groundwater Superfund Site.* Final. May.

URS, 2013c. *Soil Vapor Extraction System Operation & Maintenance Manual, Modesto Groundwater Superfund Site.* Final. May.

URS, 2013d. *Sampling and Analysis Plan for Long-Term Monitoring, Site Investigation, and Soil Vapor Extraction, Modesto Groundwater Superfund Site.* June.

URS, 2013e. *Soil Vapor Extraction Rebound Testing Work Plan, Modesto Groundwater Superfund Site Work Plan.* Final. September.

URS, 2013f. *Quarterly Operation and Monitoring Report, Groundwater Treatment and Soil Vapor Extraction Remediation Systems, Second Quarter 2014*. August.

URS, 2015a. *January 2015 Indoor Air and Soil Gas Monitoring, Modesto Groundwater Superfund Site.* February.

TABLES

This page intentionally left blank

Table 4-1. Vertical Hydraulic Gradients, Third Quarter 2015

Well No.	Monitoring Zone	Groundwater Elevation (feet msl)	Vertical Well Screen Distance (feet)	3Q15 Vertical Gradient	2Q15 Vertical Gradient	1Q15 Vertical Gradient
MW-21A	A	39.84				
MW-22A	A	44.88	40	0.1260	0.0075	0.0053
MW-04A	A	41.60				
MW-04B	B	41.50	66	-0.0015	0.0023	0.0068
MW-08A	A	42.61				
MW-09B	B	41.82	74	-0.0107	-0.0061	-0.0037
MW-10A	A	41.86				
MW-10B	B	41.41	80.5	-0.0056	0.0005	0.0004
MW-16A	A	40.13				
MW-16B	B	40.07	53	-0.0011	-0.0011	-0.0006
MW-17A	A	41.56				
MW-17B	B	41.08	52	-0.0092	-0.0052	-0.0008
MW-19A	A	40.79				
MW-19B	B	39.96	46	-0.0180	-0.0184	-0.0091
MW-20A	A	40.91				
MW-20B	B	40.46	76	-0.0059	-0.005	-0.0009
MW-21A	A	39.84				
MW-25B	B	40.40	55	0.0102	0.0027	0.0009
MW-30A	A	44.79				
MW-30B	B	43.99	56	-0.0143	-0.0134	-0.0011
MW-04B	B	41.50				
MW-04C	C	37.95	83	-0.0428	-0.0447	0.0068
MW-10B	B	41.41				
MW-10C	C	38.10	67	-0.0494	-0.0626	-0.0049
MW-16B	B	40.07				
MW-16C	C	36.22	97	-0.0397	-0.0296	-0.006
MW-17B	B	41.08				
MW-17C	C	37.04	93	-0.0434	-0.0421	-0.0102
MW-20B	B	40.46				
MW-20C	C	37.44	73	-0.0414	-0.0421	-0.0047
MW-32B	B	40.52				
MW-32C	C	39.78	81	-0.0091	-0.0298	-0.0068

msl = mean sea level
MW = monitoring well
3Q15 = third quarter 2015
2Q15 = second quarter 2015
1Q15 = first quarter 2015
positive gradient = upward
negative gradient = downward

Table 4-2. GWTS PCE Sample Results: Third Quarter 2015

Sample Port	Location	Sample Date	pH	PCE (µg/L)
SP-01	GWTS Influent	7/8/2015	7.39	94
		8/6/2015	7.64	77
		9/1/2015	7.53	74
SP-03	LGAC Influent	7/8/2015	7.88	1.2 (1.2)
		8/6/2015	8.11	1.1
		9/1/2015	7.91	1.0
SP-04	LGAC Mid Bed	7/8/2015	7.83	0.40 J+
		8/6/2015	8.07	0.49 J
		9/1/2015	7.72	0.69
SP-05	LGAC Effluent[a]	7/8/2015	7.72	<0.50
SP-07	GWTS Effluent	7/8/2015	7.73	<0.50
		8/6/2015	7.36	<0.50
		9/1/2015	7.71	<0.50

[a] Also is the ion exchange resin influent.

GWTS = groundwater treatment system
J = estimated concentration
J+ = estimated concentration, potential high bias
LGAC = liquid-phase granular-activated carbon
Mid = middle
PCE = tetrachloroethene
SP = sample port
µg/L = micrograms per liter
< = not detected at or above reported value
( ) = field duplicate result

Table 4-3. GWTS Uranium Sample Results: Third Quarter 2015

Sample Port	Location	Sample Date	Uranium (pCi/L)
SP-01	GWTS Influent	7/8/2015	53.7
SP-05	Ion Exchange Influent	8/6/2015	57.4
		9/1/2015	60.4
SP-06	Ion Exchange Mid Bed	7/8/2015	<1.0
		8/6/2015	<1.0
		9/1/2015	<1.0
SP-07	GWTS Effluent	7/8/2015	11.0
SP-10	Ion Exchange Effluent	7/8/2015	<1.0
		8/6/2015	<1.0
		9/1/2015	<1.0

GWTS = groundwater treatment system
Mid = middle
pCi/L = picoCuries per liter
SP = sample port
< = not detected at or above reported value

Table 4-4. GWTS Shutdown Summary: Third Quarter 2015

Date	Duration, Hours	Reason	
7/8/2015 – 7/8/2015	1.0	Collected IX resin profile sample	
8/11/2015– 8/11/2015	1.7	Collected IX resin profile sample	
8/19/2015– 8/19/2015	1.2	Installed and calibrated new bag filter pressure transmitter	
9/10/2015– 9/10/2015	1.5	Collected IX resin profile sample	
Total	5.4	Hours in quarter: 2,208	Percent operational: 99.8

GWTS = groundwater treatment system
IX = ion exchange

Table 4-5. GWTS Carbon Change-Outs

Vessel ID	Media Type	Resin Change-out Date	Quantity
GAC-1	VGAC	8/19/2010	2,000 lbs
GAC-2	LGAC	12/15/2011	1,000 lbs
GAC-3	LGAC	12/15/2011	1,000 lbs
GAC-1	VGAC	1/9/2013	2,000 lbs
GAC-2	LGAC	1/9/2013	1,000 lbs
GAC-3	LGAC	1/9/2013	1,000 lbs
GAC-2	LGAC	10/10/2013	1,000 lbs
GAC-1	VGAC	12/19/2013	2,000 lbs
GAC-3	LGAC	12/19/2013	1,000 lbs
GAC-2	LGAC	5/22/2014	1,000 lbs
GAC-3	LGAC	11/13/2014	1,000 lbs
GAC-1	VGAC	12/24/2014	2,000 lbs
GAC-2	LGAC	6/3/2015	1,000 lbs

GAC = granular-activated carbon
GWTS = groundwater treatment system
ID = identification
lbs = pounds
LGAC = liquid-phase granular-activated carbon
VGAC = vapor-phase granular-activated carbon

Table 4-6. GWTS Ion Exchange Resin Change-Outs

Vessel ID	Resin Change-out Date	Quantity
IX-1	12/9/2010	30 cf
IX-2	2/24/2011	30 cf
IX-1	12/15/2011	30 cf
IX-2	12/15/2011	30 cf
IX-1	5/17/2012	30 cf
IX-2	7/5/2012	30 cf
IX-1	1/9/2013	30 cf
IX-2	6/13/2013	30 cf
IX-1	12/20/2013	30 cf
IX-2	5/22/2014	30 cf
IX-1	12/24/2014	30 cf
IX-2	6/3/2015	30 cf

cf = cubic feet
GWTS = groundwater treatment system
ID = identification
IX = ion exchange

Table 4-7. GWTS PCE Vapor Sample Results: Third Quarter 2015

Sample Port	Location	Sample Date	PCE (ppbv)
SP-08	GWTS Pre-GAC	7/8/2015	180 (180)
		8/6/2015	71
		9/1/2015	160
SP-09	GWTS Stack	7/8/2015	4.8
		8/6/2015	4.5
		9/1/2015	3.2

GAC = granular-activated carbon
GWTS = groundwater treatment system
PCE = tetrachloroethene
ppbv = parts per billion by volume
SP = sample port
( ) = field duplicate result

Table 4-8. GWTS Influent and Effluent Results: Third Quarter 2015

Sample Identification	Date	pH	Temp ºC	Conductivity µmhos/cm	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	Total U (pCi/L)	PCE (mg/L)	Toluene (mg/L)	TCE (mg/L)	Bioassay
Maximum Allowable Discharge Limit	**--**	**5 - 12**	**60**	**NA**	**NA**	**NA**	**20**	**0.005**	**0.150**	**0.150**	**NA**	**NA**
Compliance Monitoring												
GWTS Influent	7/8/2015	7.39	20.4	1080	NS	NS	NS	53.7	0.094	<0.0005	0.00008J	NS
	8/6/2015	7.64	22.2	1070	NS	NS	NS	NS	0.077	<0.0005	0.00007J	NS
	9/1/2015	7.53	21.3	1090	NS	NS	NS	NS	0.074	<0.0005	0.00007J	NS
GWTS Effluent	7/8/2015	7.73	20.6	1140	663	<5.0	<2.0	11.0	<0.0005	<0.0005	<0.0005	NS
	8/6/2015	7.36	22.8	1070	613	<5.0	<2.0	NS	<0.0005	<0.0005	<0.0005	NS
	9/1/2015	7.71	21.5	1120	648	<5.0	<2.0	NS	<0.0005	<0.0005	<0.0005	NS

mg/L = milligrams per liter
pCi/L = picoCuries per liter
NA = not applicable
NS = not sampled
J = estimated value
< = not detected at or above reported value

This page intentionally left blank

FIGURES

This page intentionally left blank

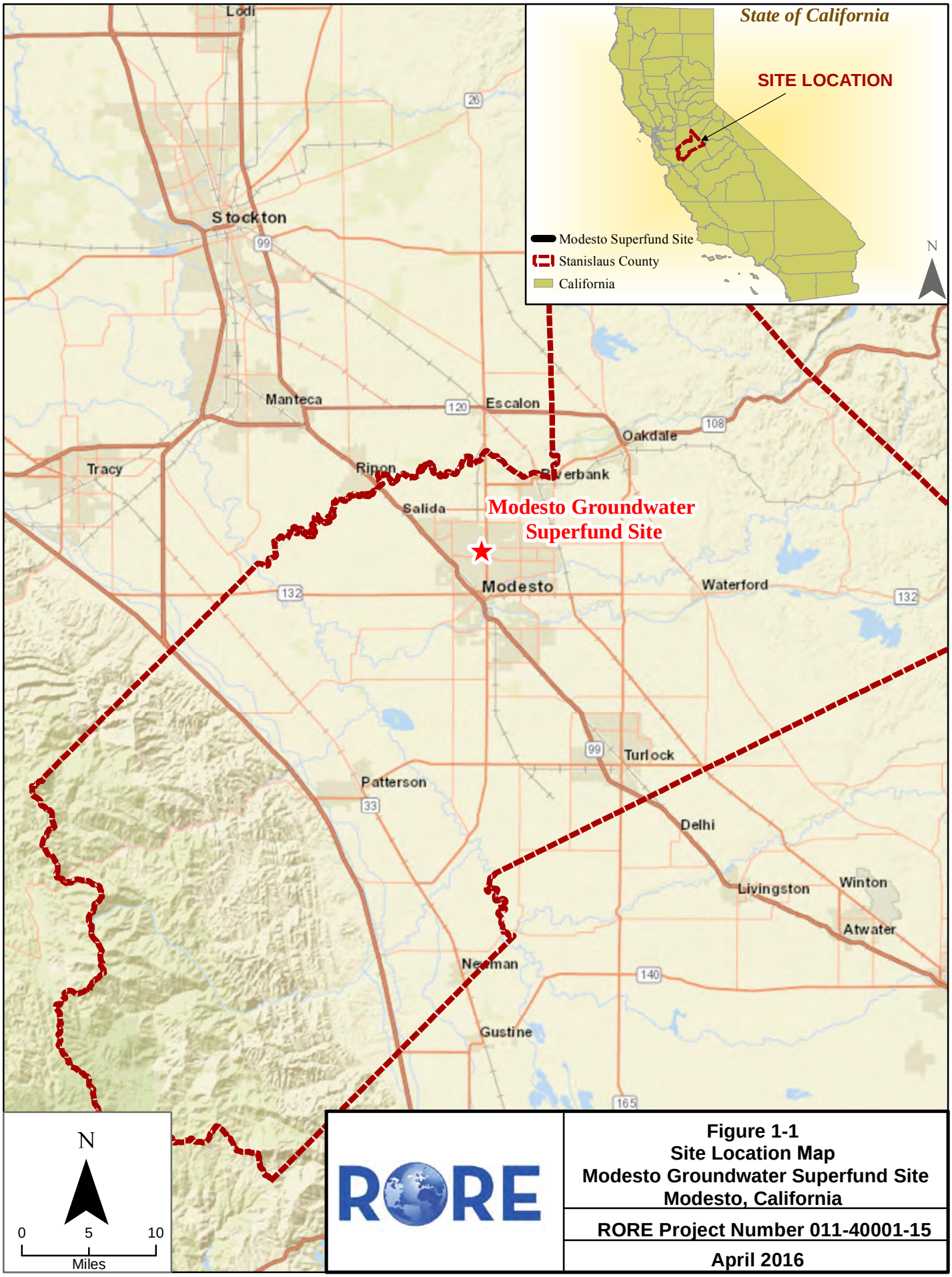


Figure 1-1
Site Location Map
Modesto Groundwater Superfund Site
Modesto, California

RORE Project Number 011-40001-15

April 2016

This page intentionally left blank

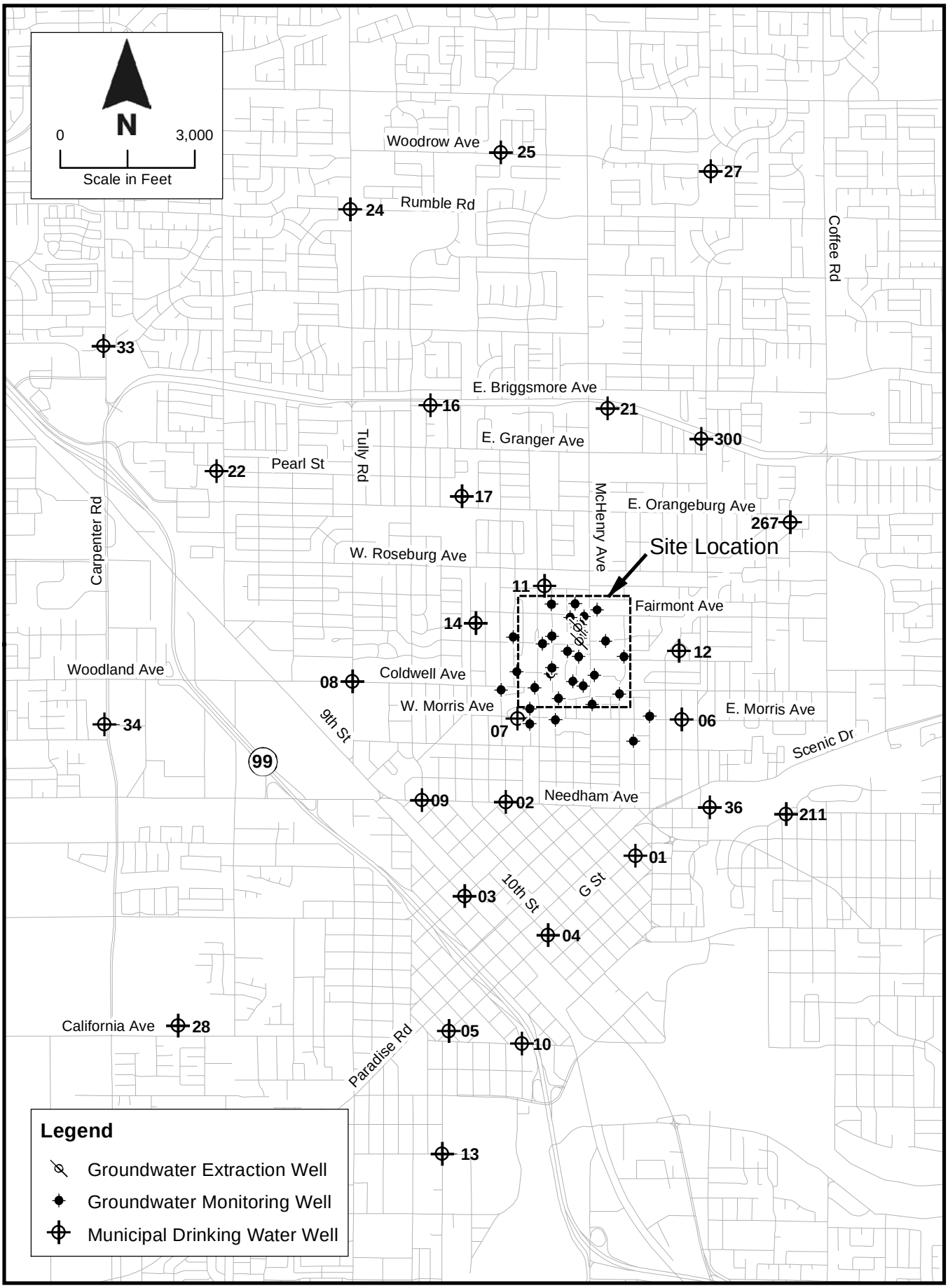
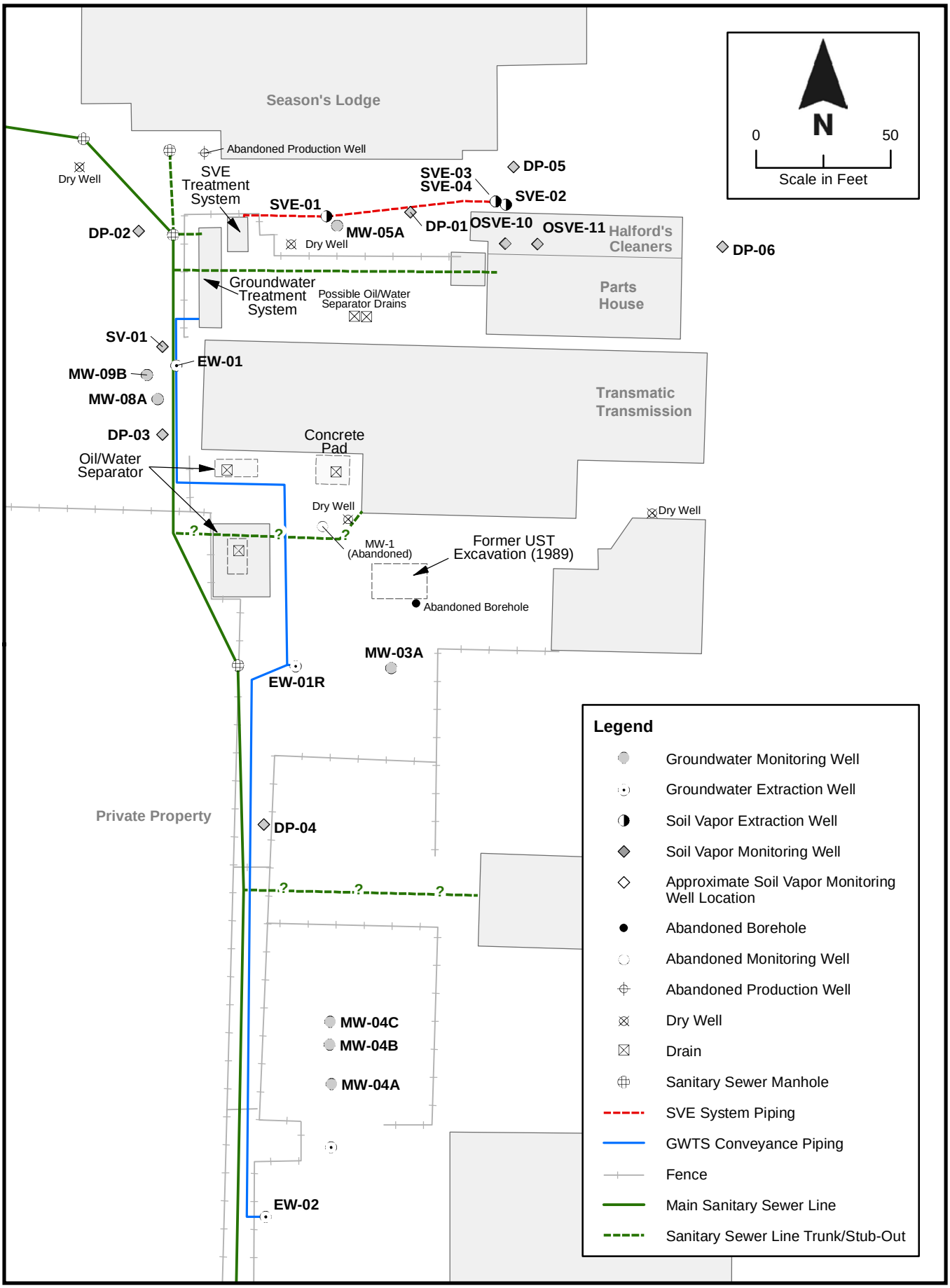


Figure 1-2. Municipal Well Locations Map
Modesto Groundwater Superfund Site

Source: URS 2013d

This page intentionally left blank



Source: URS 2013d

Figure 2-1. Site Layout Map
Modesto Groundwater Superfund Site

This page intentionally left blank

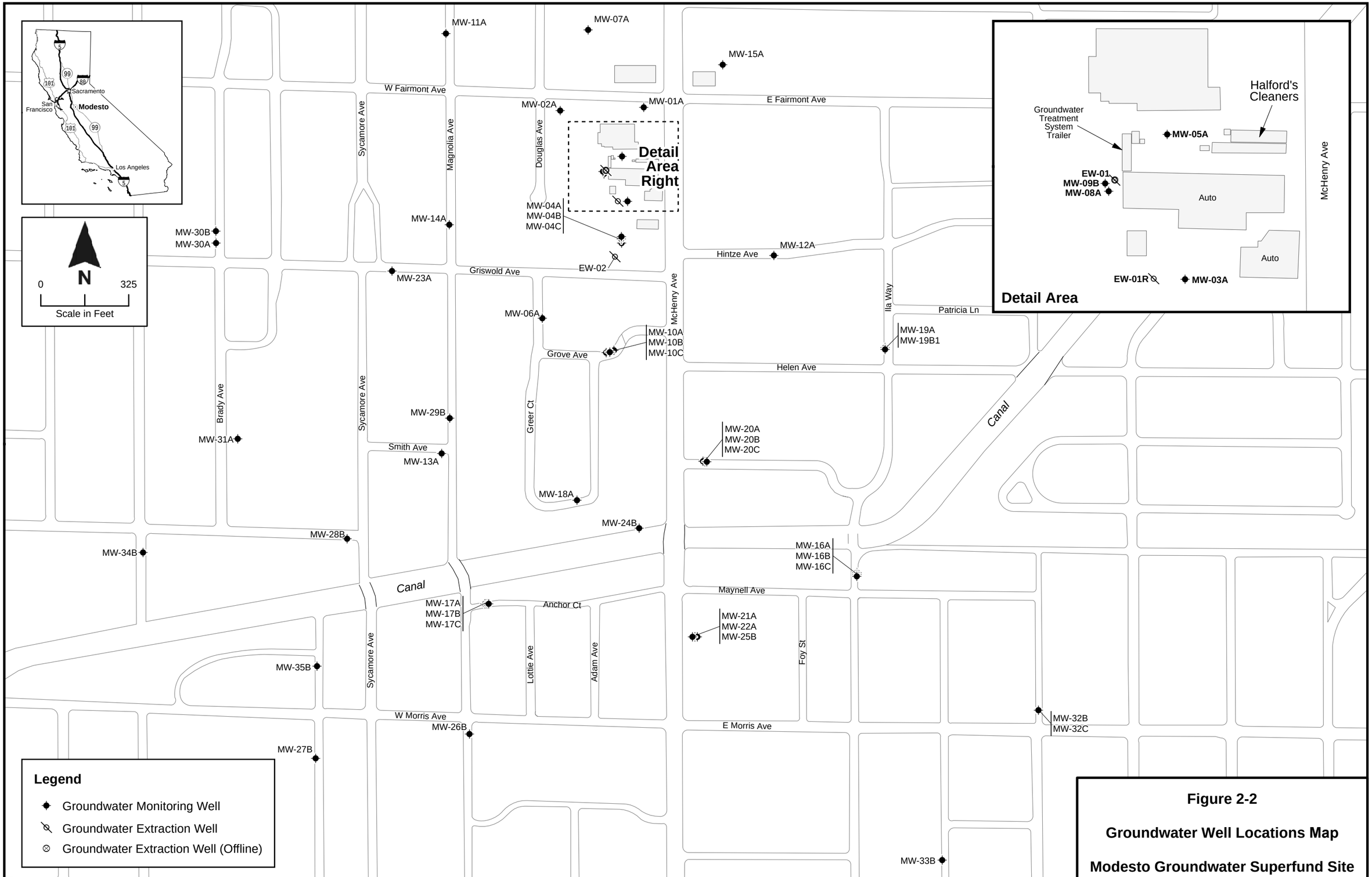


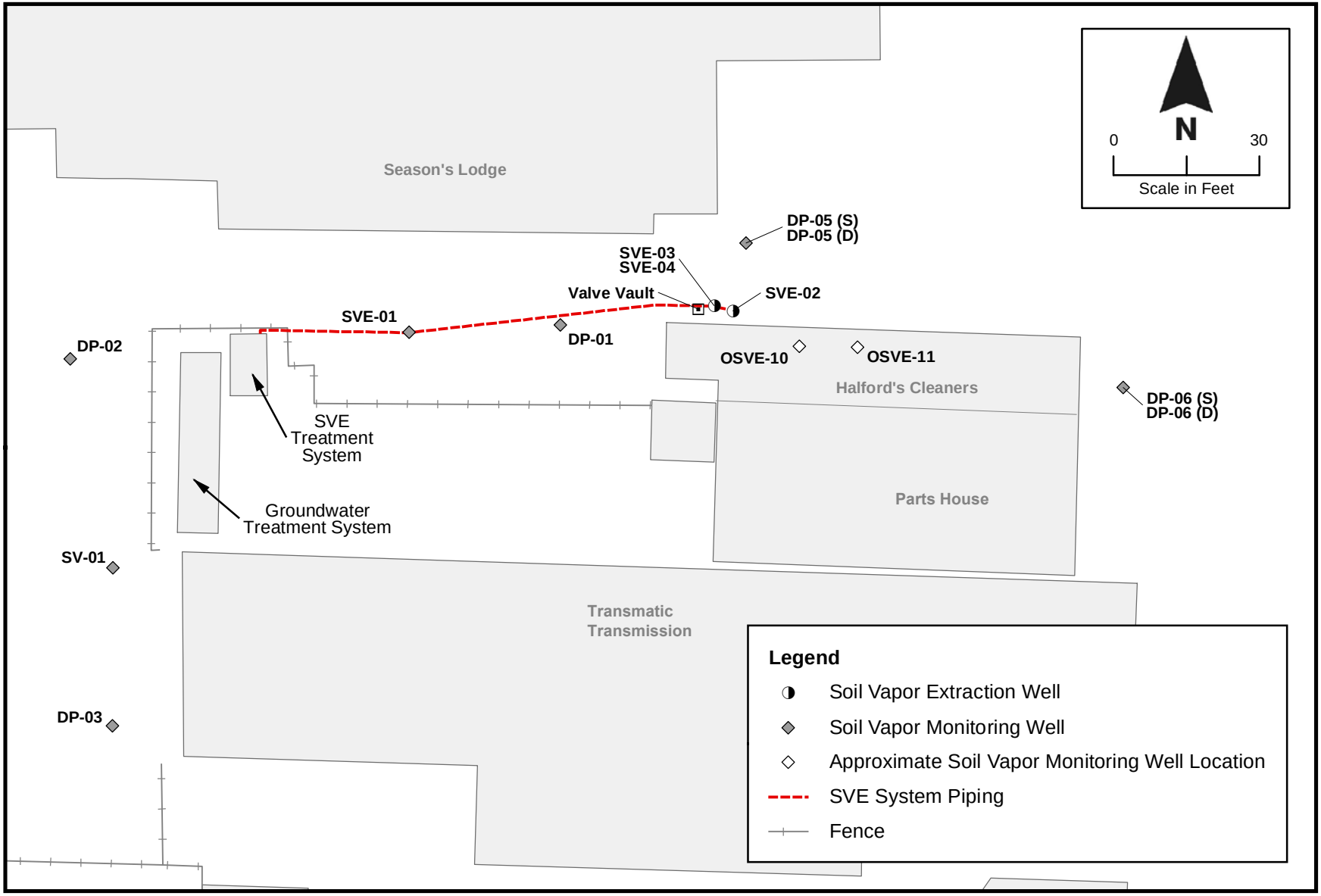
Figure 2-2

Groundwater Well Locations Map

Modesto Groundwater Superfund Site

Source: URS 2013d

This page intentionally left blank



Source: URS 2013d

Figure 2-3. Soil Vapor Well Locations Map - Halford's Cleaners Area
Modesto Groundwater Superfund Site

This page intentionally left blank

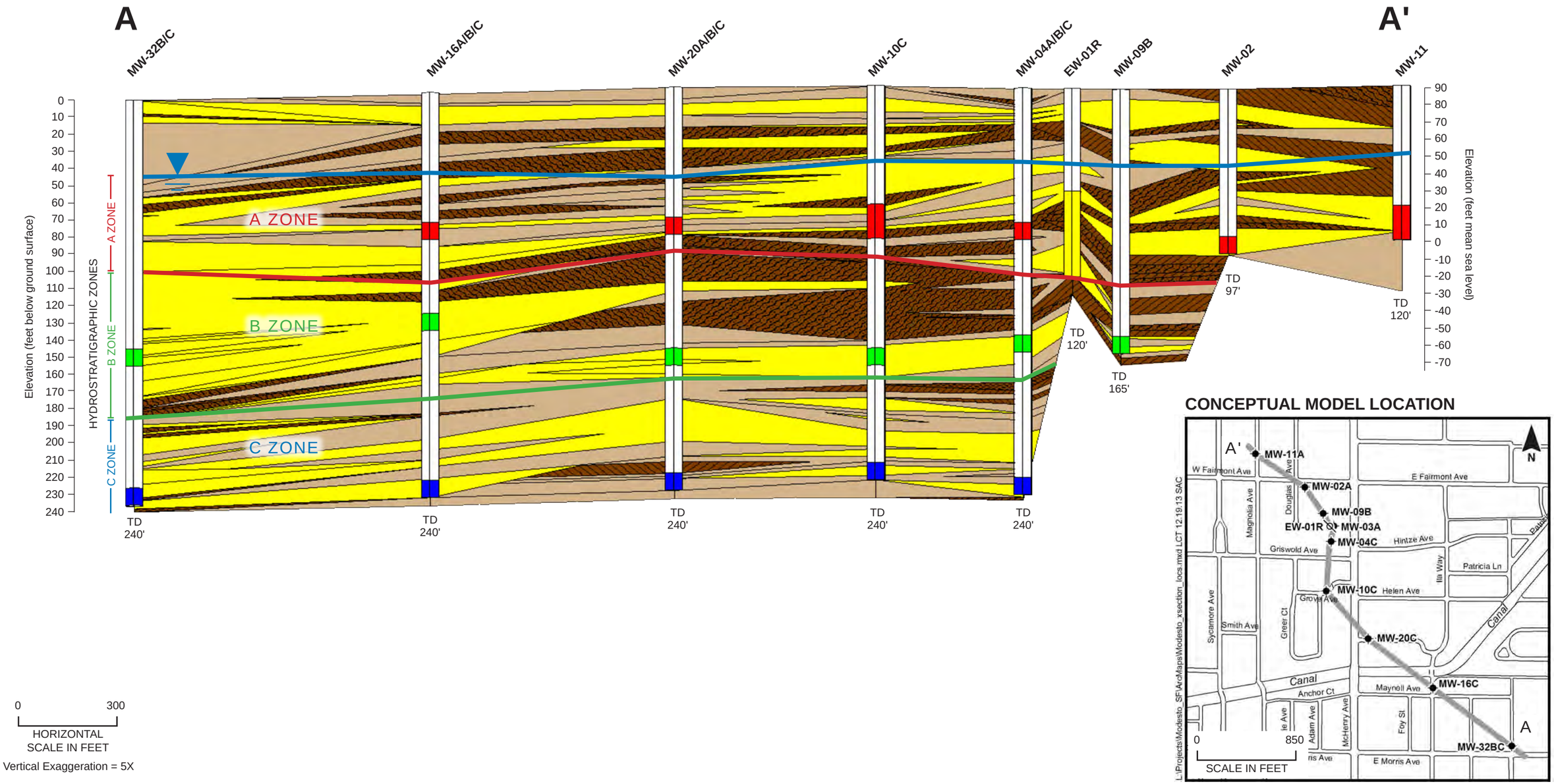
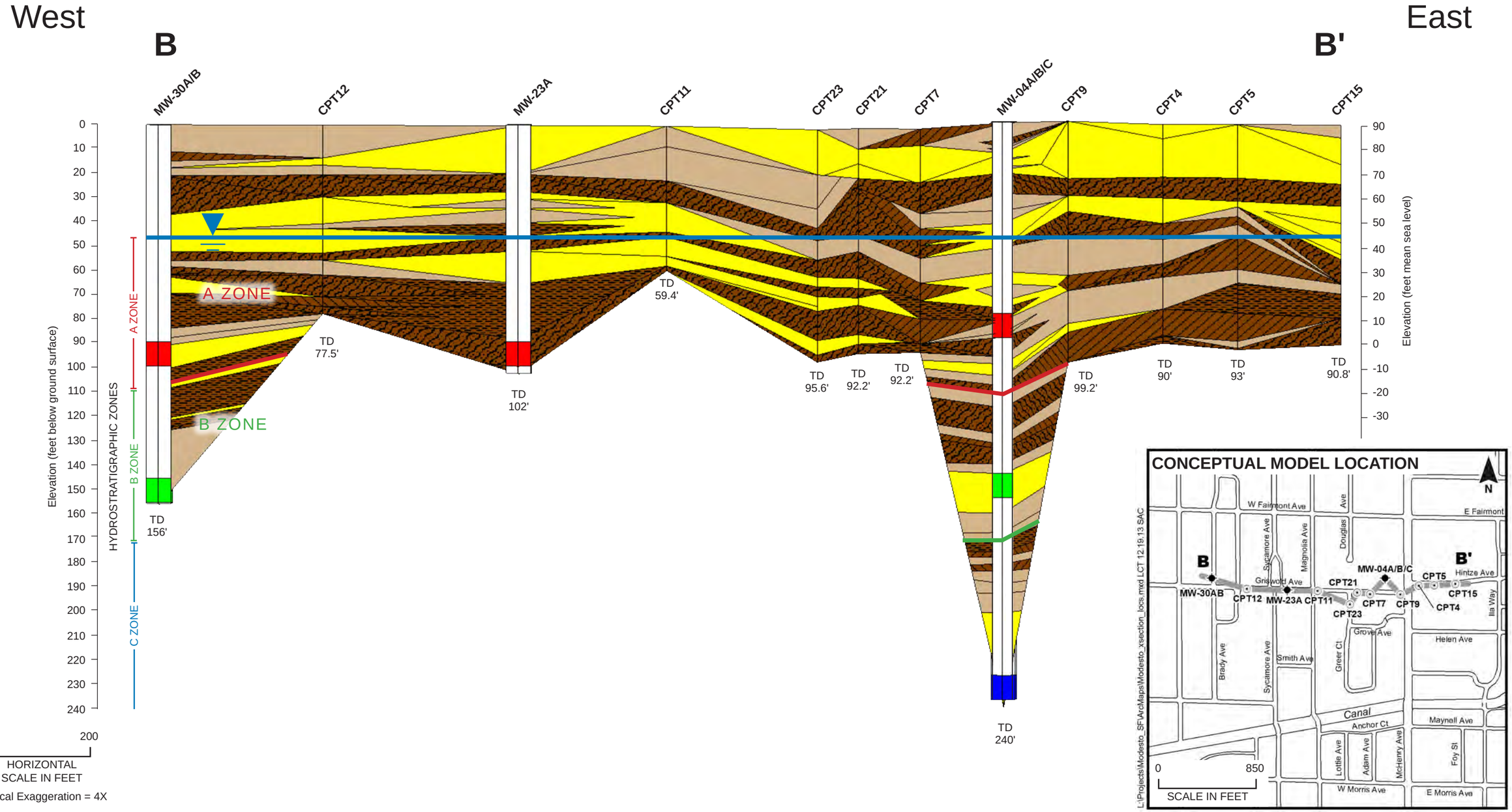


Figure 4-1
Stratigraphic Conceptual Model A-A'
Modesto Groundwater Superfund Site

Source: URS 2013d

This page intentionally left blank



LEGEND

- Gravel, Gravelly Sand, Sand, Sand to Silty Sand
- Silty Sand to Silt
- Clayey Silt to Silty Clay

Approximate Water Table Surface (A Zone)

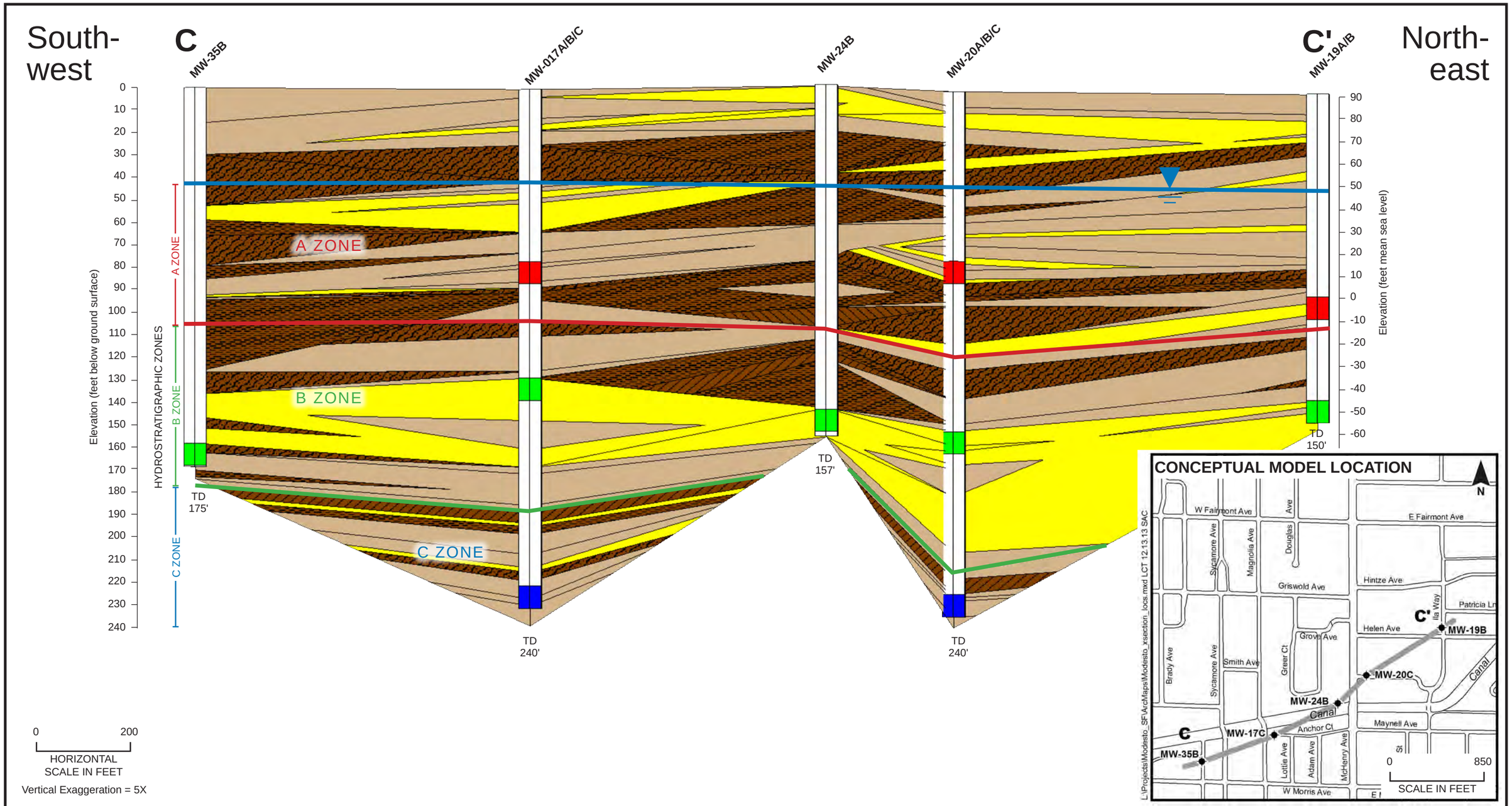
MW-04A/B/C
Groundwater Monitoring Well
- A Zone Screen
- B Zone Screen
- C Zone Screen

URS

Figure 4-2
Stratigraphic Conceptual Model B-B'
Modesto Groundwater Superfund Site

Source: URS 2013d

This page intentionally left blank



LEGEND

- Gravel, Gravelly Sand, Sand, Sand to Silty Sand
- Silty Sand to Silt
- Clayey Silt to Silty Clay

Approximate Water Table Surface (A Zone)

MW-17A/B/C
Groundwater Monitoring Well
- A Zone Screen
- B Zone Screen
- C Zone Screen

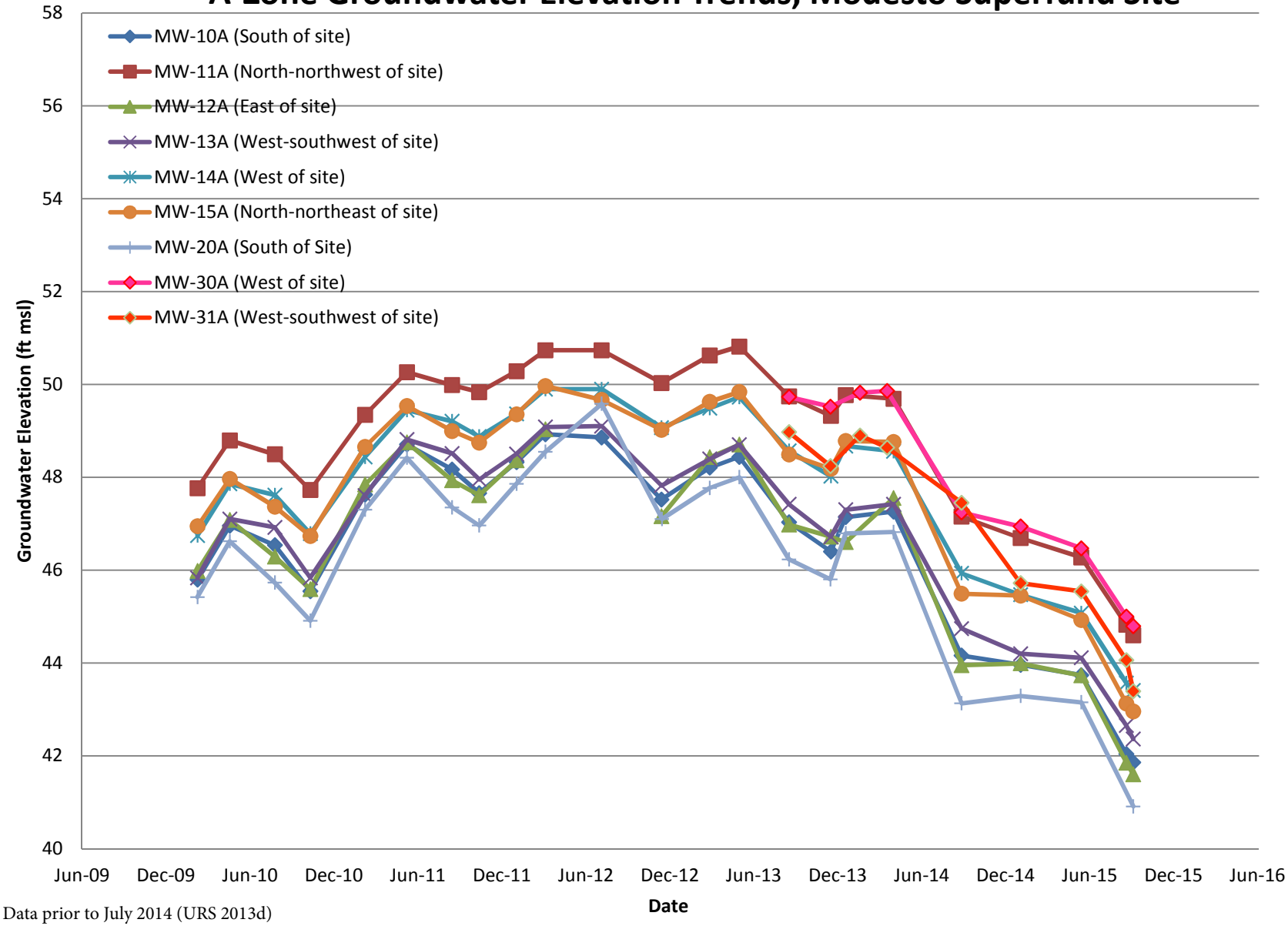
URS

Figure 4-3
Stratigraphic Conceptual Model C-C'
Modesto Groundwater Superfund Site

Source: URS 2013d

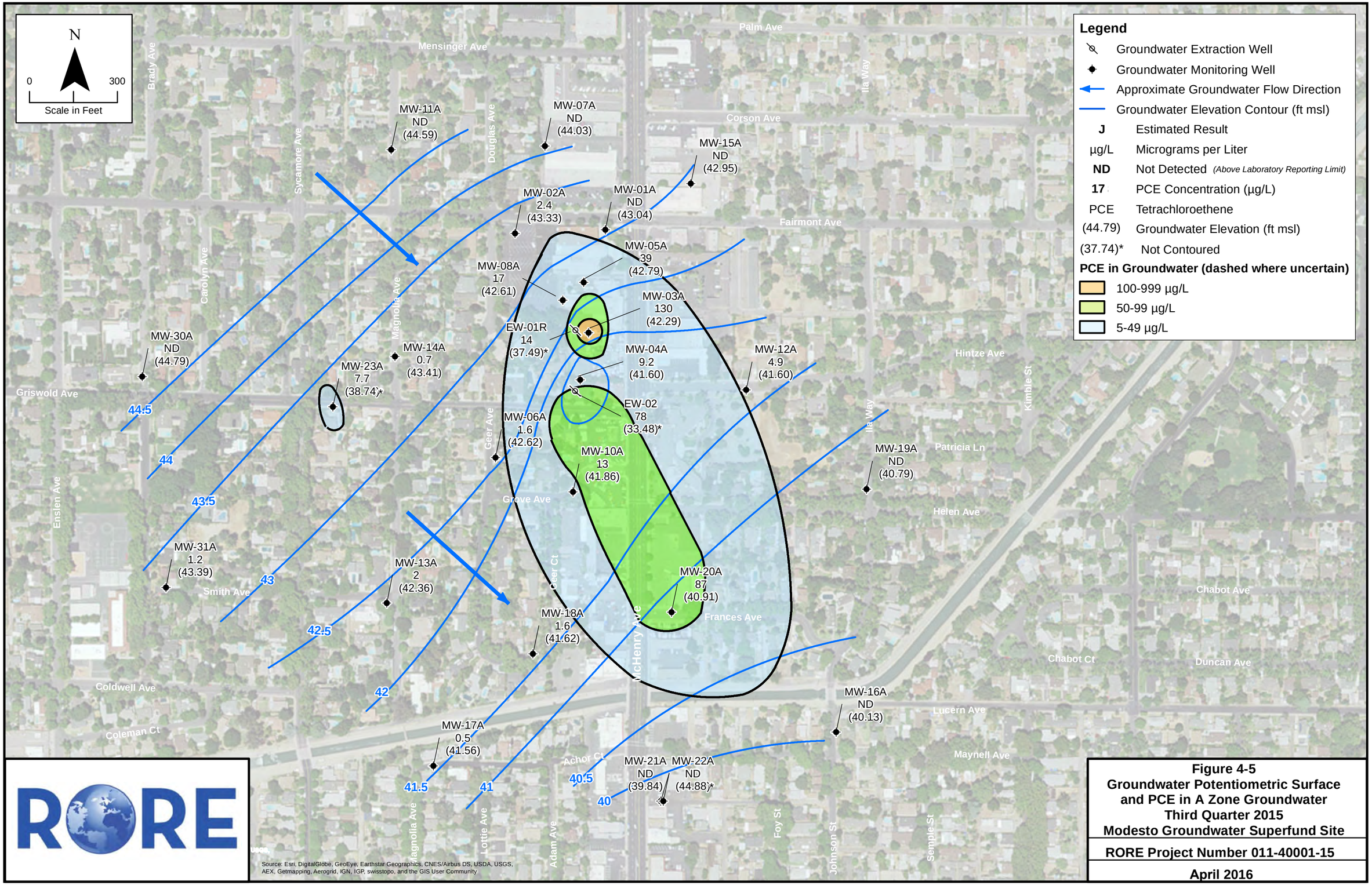
This page intentionally left blank

Figure 4-4
A-Zone Groundwater Elevation Trends, Modesto Superfund Site



Data prior to July 2014 (URS 2013d)

This page intentionally left blank



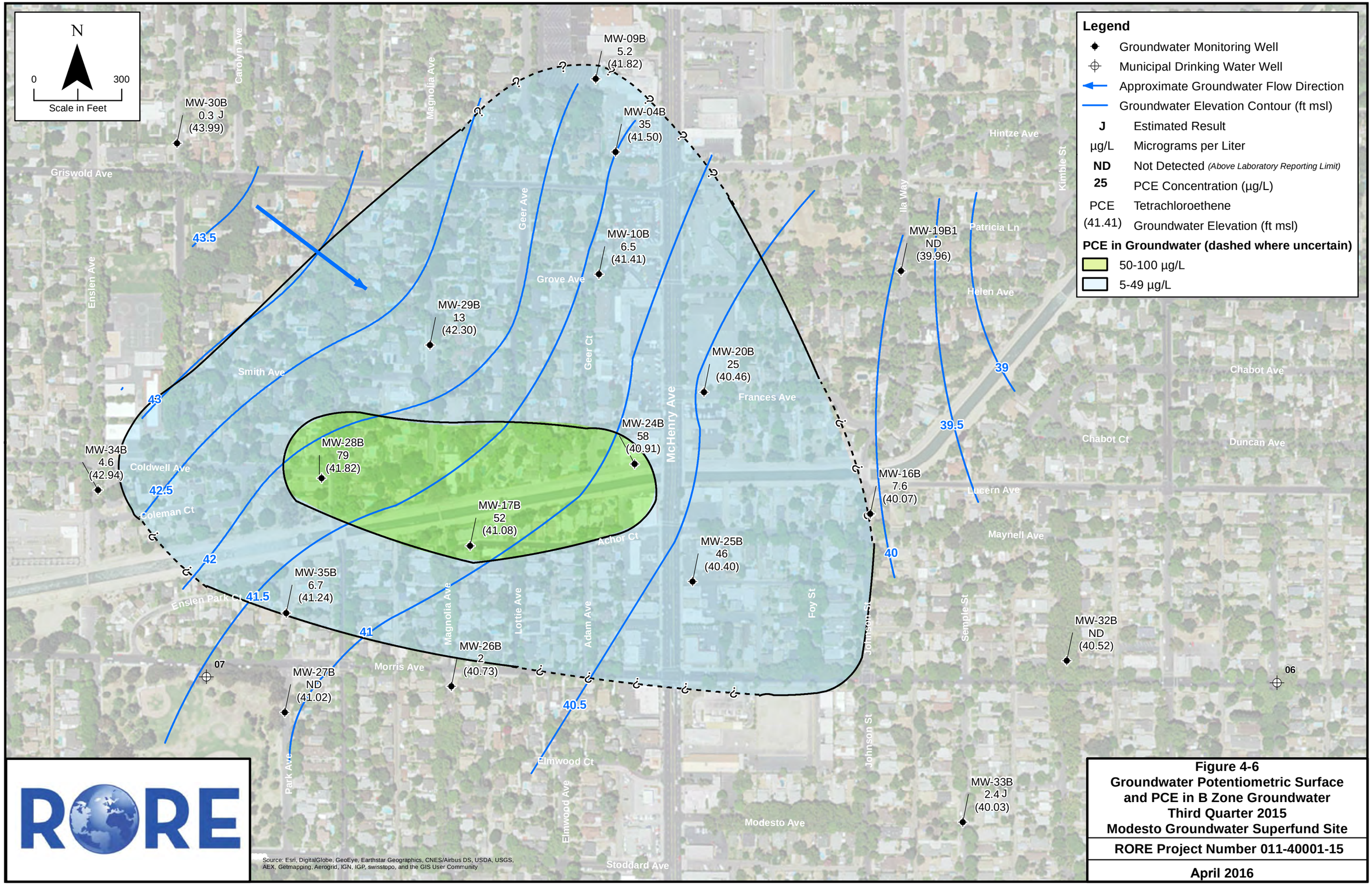
RORE

Figure 4-5
Groundwater Potentiometric Surface and PCE in A Zone Groundwater
Third Quarter 2015
Modesto Groundwater Superfund Site

RORE Project Number 011-40001-15

April 2016

This page intentionally left blank



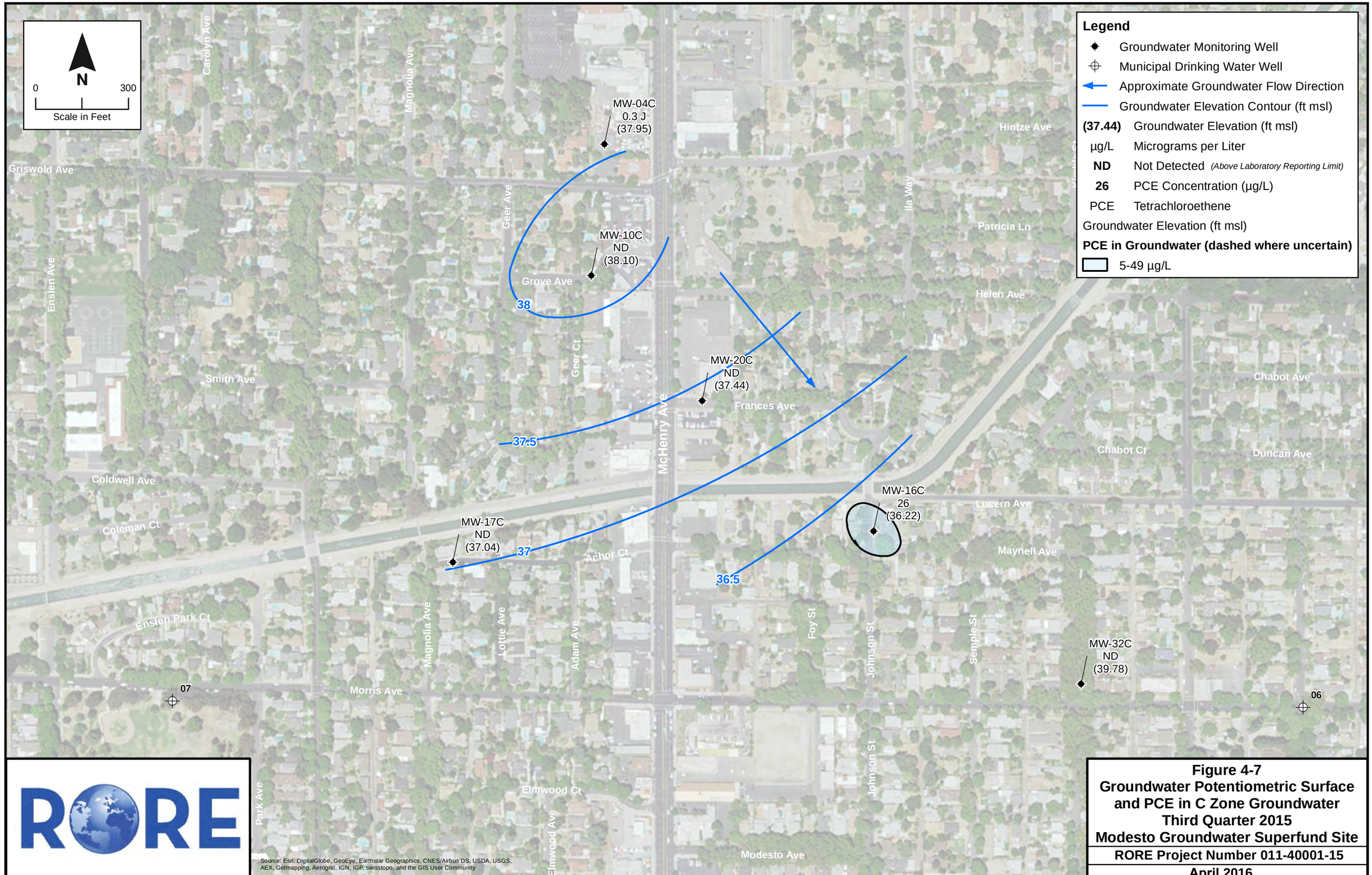
RORE

Figure 4-6
Groundwater Potentiometric Surface and PCE in B Zone Groundwater
Third Quarter 2015
Modesto Groundwater Superfund Site

RORE Project Number 011-40001-15

April 2016

This page intentionally left blank



RORE

Figure 4-7
Groundwater Potentiometric Surface and PCE in C Zone Groundwater
Third Quarter 2015
Modesto Groundwater Superfund Site

RORE Project Number 011-40001-15

April 2016

This page intentionally left blank

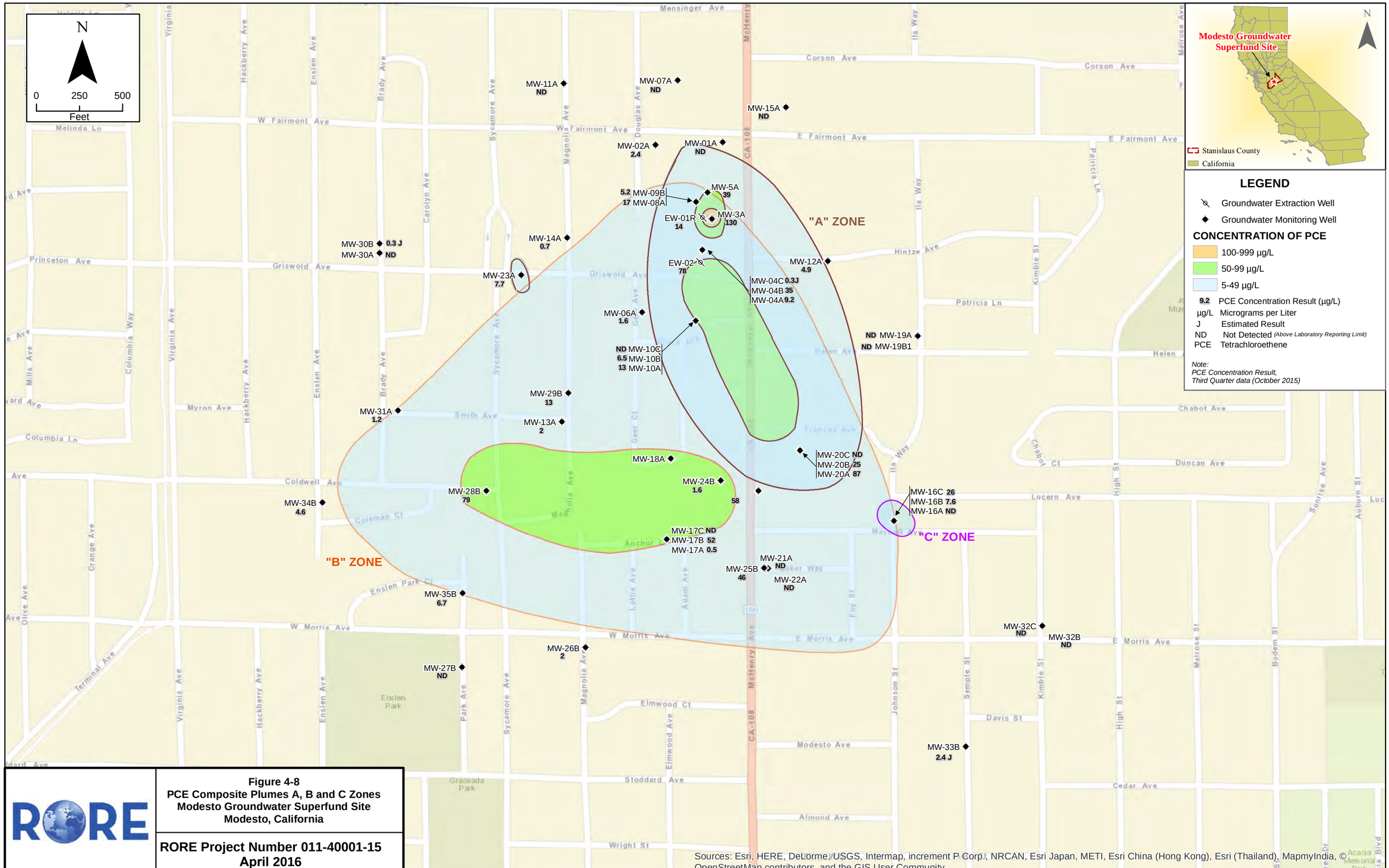
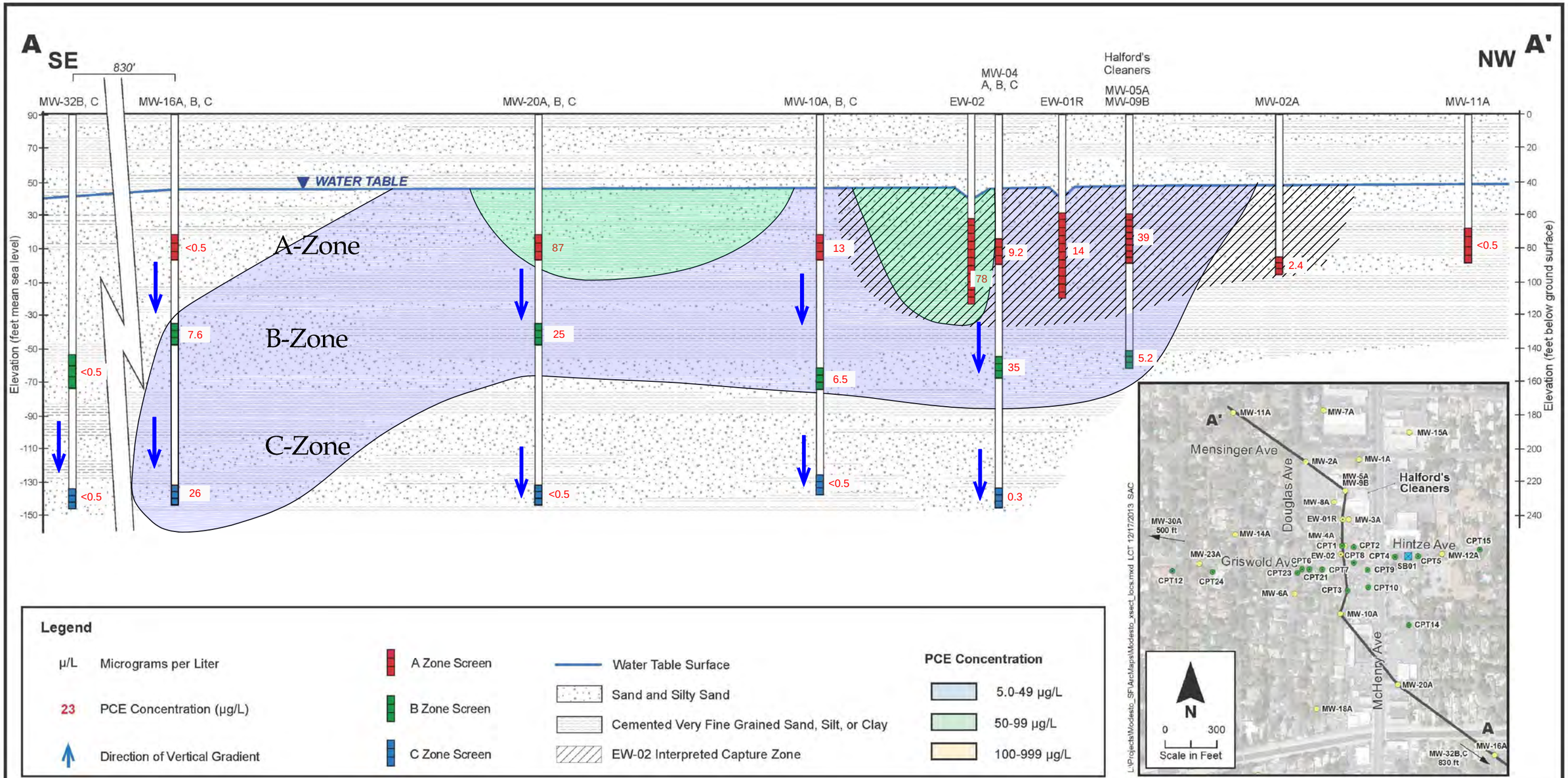


Figure 4-8
PCE Composite Plumes A, B and C Zones
Modesto Groundwater Superfund Site
Modesto, California

RORE Project Number 011-40001-15
April 2016

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

This page intentionally left blank



Lithology source URS 2013d

CROSS SECTION A-A'

THIRD QUARTER 2015
MODESTO GROUNDWATER SUPERFUND SITE
MODESTO, CALIFORNIA

RORE

FIGURE 4-9

PROJECT No.
011-40001-15

April 2016

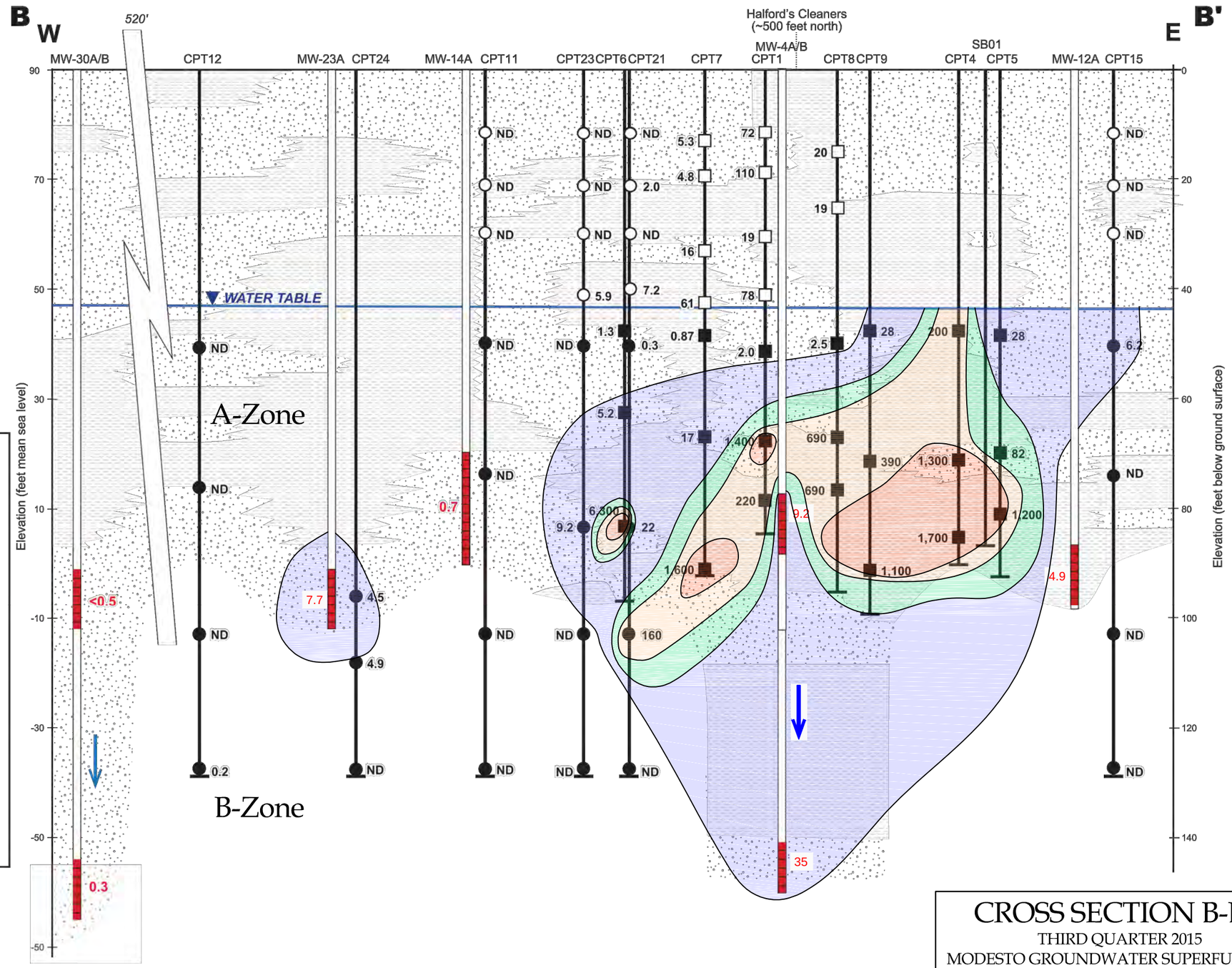
This page intentionally left blank

Legend

- Water Table Surface
- µ/L Micrograms per Liter
- 5.3 □ Soil Vapor Sample PCE Concentration (ppbv) (May/June 2011)
- ND ○ Soil Vapor Sample PCE Concentration (ppbv) (June/July 2012)
- 5.2 ■ Hydropunch Groundwater Sample PCE Concentration (µg/L) (May/June 2011)
- ND ● Hydropunch Groundwater Sample PCE Concentration (µg/L) (June/July 2012)
- 28 Well Screen, PCE Concentration (µg/L)
- Direction of Vertical Gradient
- Sand and Silty Sand
- Cemented Very Fine Grained Sand, Silt, or Clay

PCE Concentration

- 5.0-49 µg/L
- 50-99 µg/L
- 100-999 µg/L
- >1,000 µg/L



CROSS SECTION B-B'

THIRD QUARTER 2015
MODESTO GROUNDWATER SUPERFUND SITE
MODESTO, CALIFORNIA

RORE

FIGURE 4-10
PROJECT No. 011-40001-15
April 2016

Lithology source URS 2013d

This page intentionally left blank

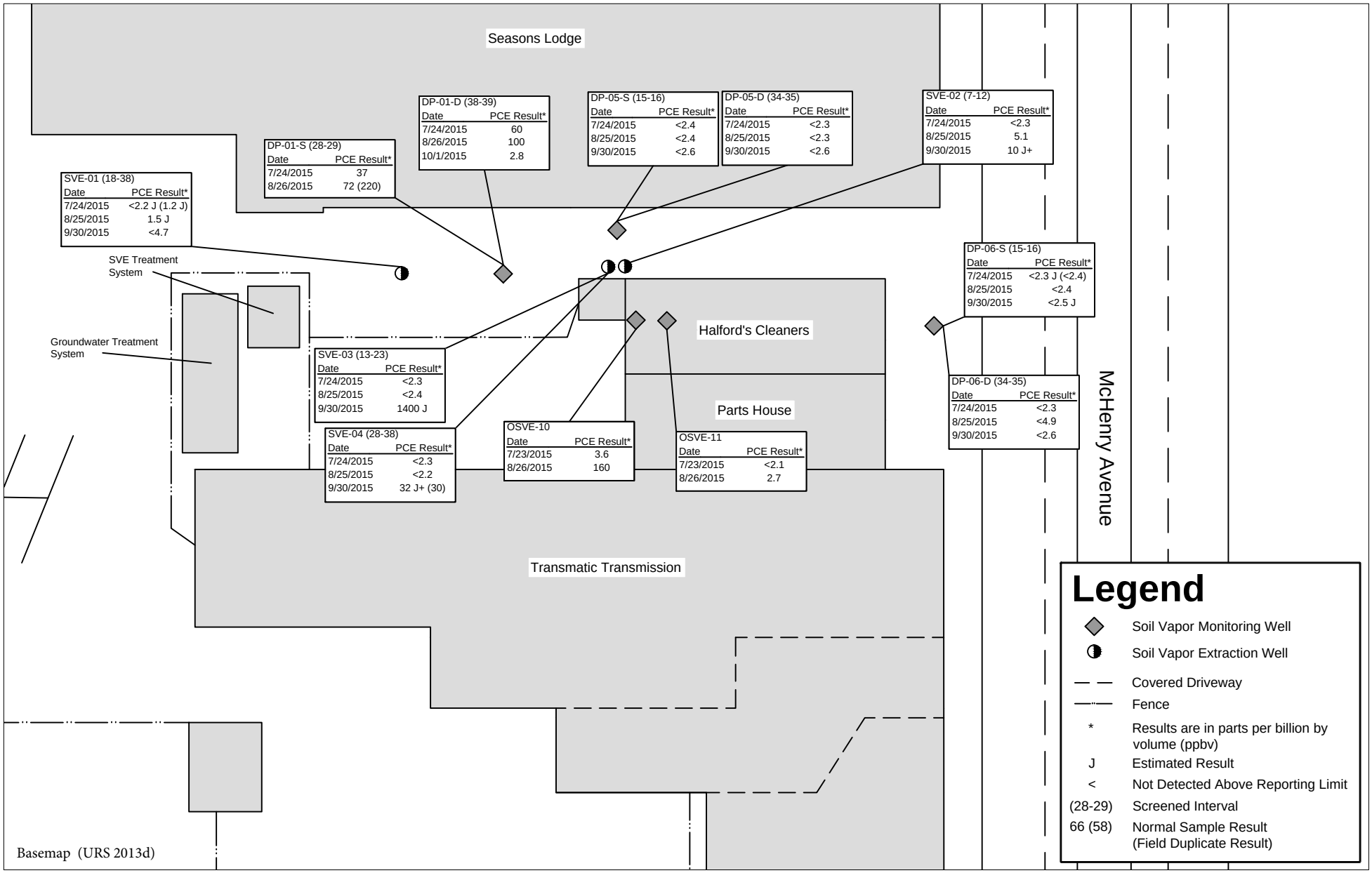
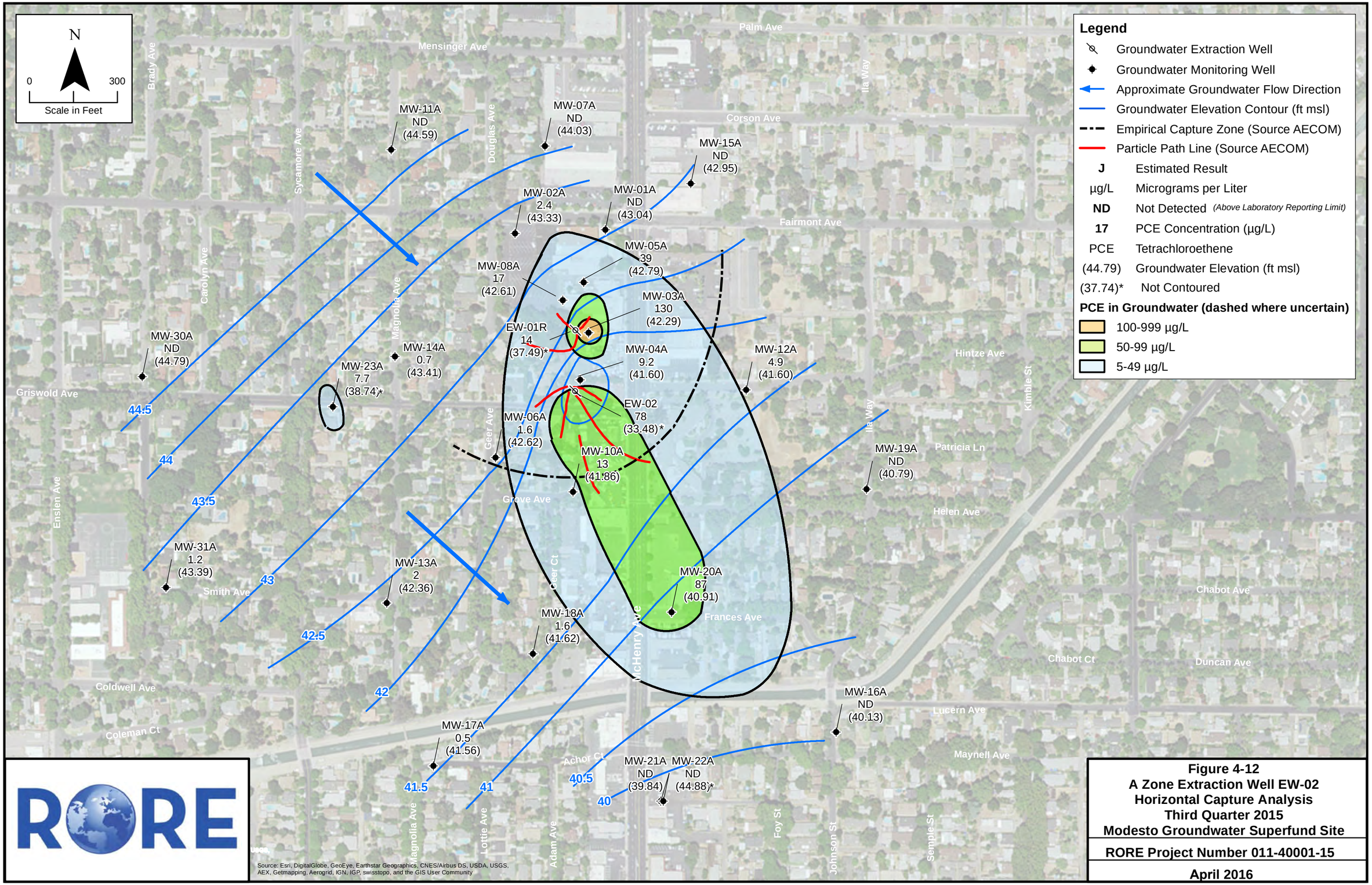


Figure 4-11. Soil Vapor Analytical Results
Third Quarter 2015
Modesto Groundwater Superfund Site

RORE Inc.

April 2016

This page intentionally left blank



RORE

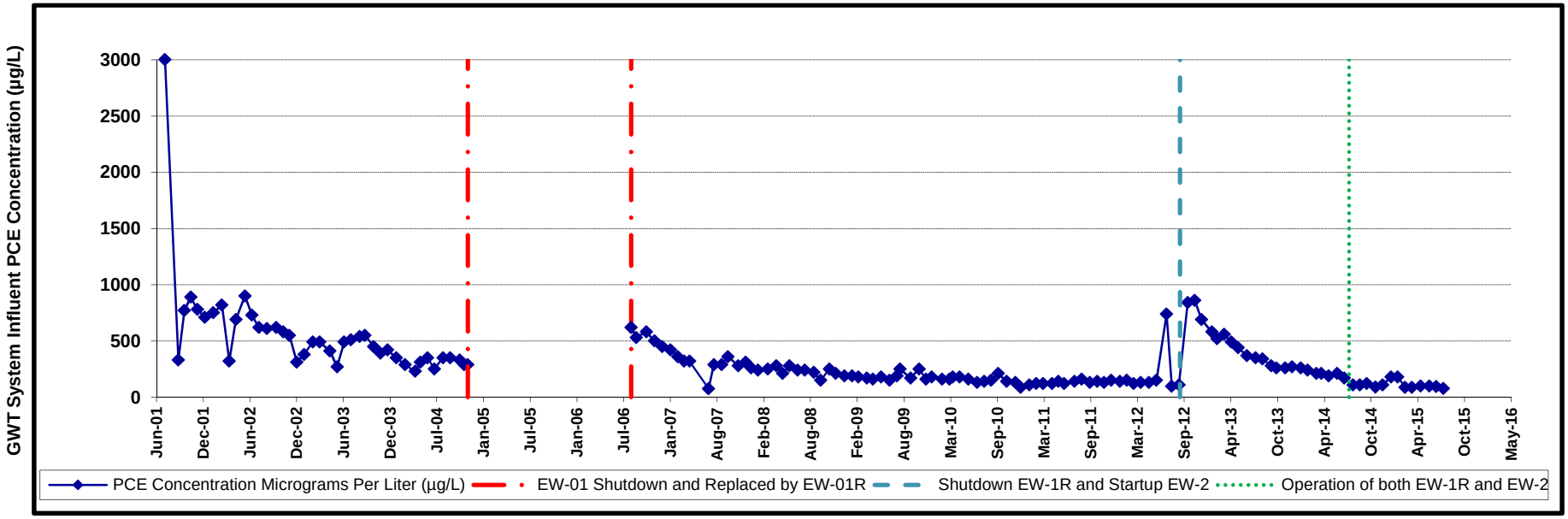
Figure 4-12
A Zone Extraction Well EW-02
Horizontal Capture Analysis
Third Quarter 2015
Modesto Groundwater Superfund Site

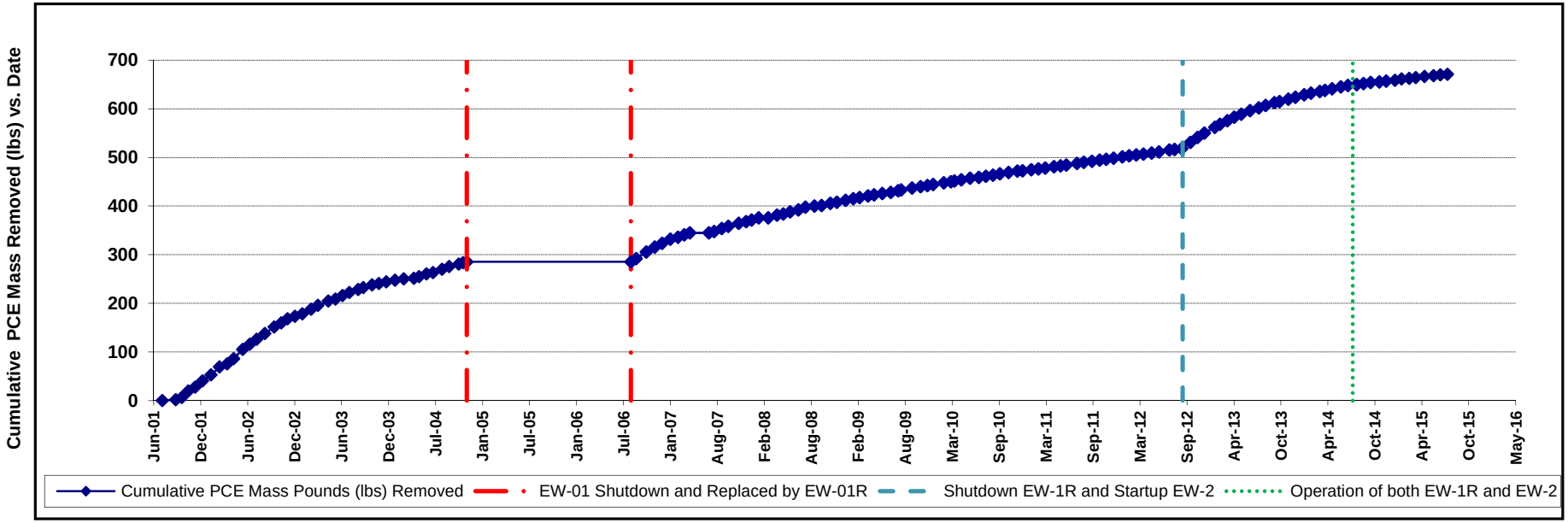
RORE Project Number 011-40001-15

April 2016

This page intentionally left blank

Figure 4-13
Cumulative PCE Mass Removed by the Groundwater Treatment System
Modesto Groundwater Superfund Site



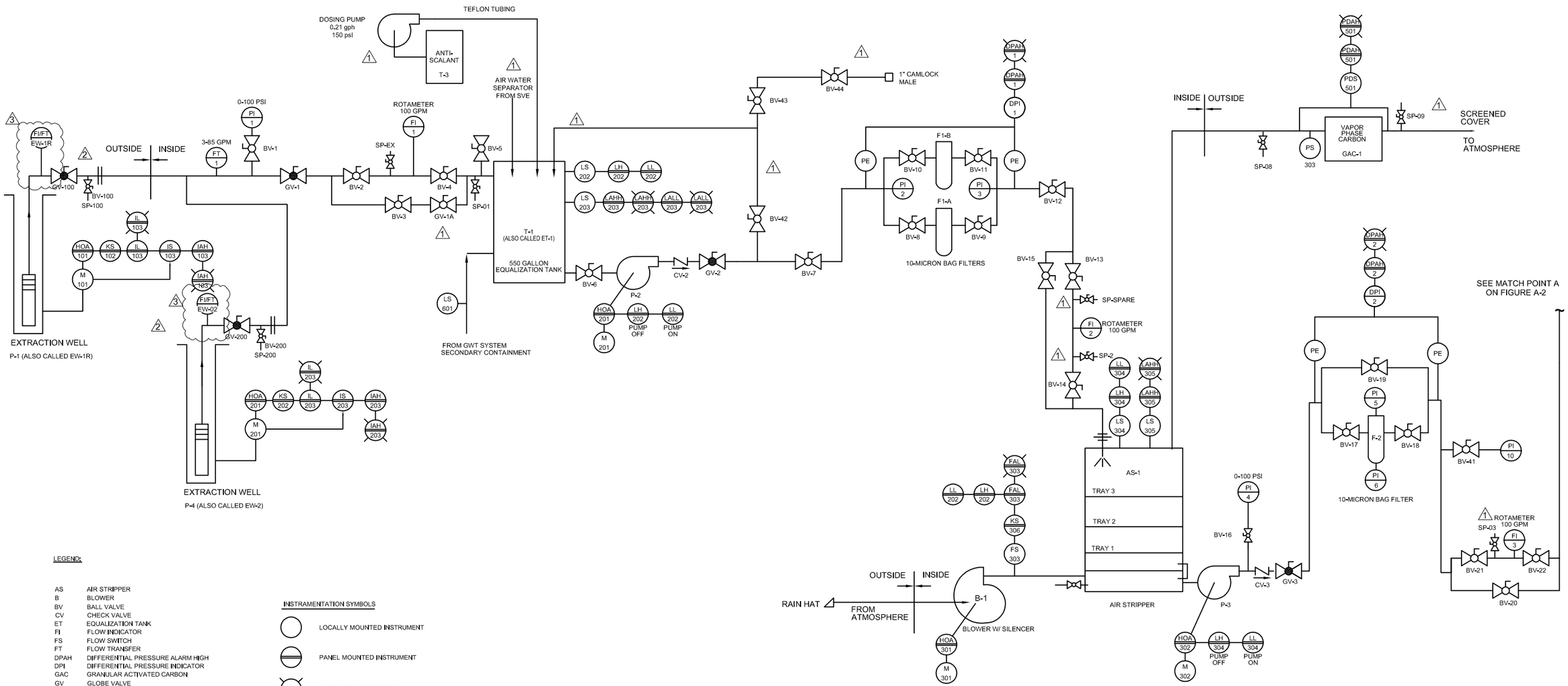


Data Source: URS

This page intentionally left blank

Appendix A

Treatment System Process and Instrumentation Diagrams



LEGEND:

AS	AIR STRIPPER
B	BLOWER
BV	BALL VALVE
CV	CHECK VALVE
ET	EQUALIZATION TANK
FI	FLOW INDICATOR
FS	FLOW SWITCH
FT	FLOW TRANSFER
DPAH	DIFFERENTIAL PRESSURE ALARM HIGH
DPI	DIFFERENTIAL PRESSURE INDICATOR
GAC	GRANULAR ACTIVATED CARBON
GV	GLOBE VALVE
HOA	HAND - OFF - AUTO
IAH	ELECTRICAL CURRENT ALARM HIGH
IEX	ION EXCHANGE
IL	ELECTRICAL CURRENT LOW
IS	ELECTRICAL CURRENT SWITCH
KS	TIME SWITCH
LAHH	LEVEL ALARM HIGH HIGH
LALL	LEVEL ALARM LOW LOW
LH	LEVEL HIGH
LL	LEVEL LOW
LS	LEVEL SWITCHES
M	MOTOR
P	PUMP
PDAH	PRESSURE DIFFERENTIAL ALARM HIGH
PDS	PRESSURE DIFFERENTIAL SWITCHES
PE	PRESSURE ELEMENT
PI	PRESSURE INDICATOR
SP	SAMPLE PORT
T	TANKS

INSTRAMENTATION SYMBOLS

- LOCALLY MOUNTED INSTRUMENT
- PANEL MOUNTED INSTRUMENT
- PANEL MOUNTED LIGHT
- FLANGED GLOBE VALVE
- BALL VALVE
- SAMPLE PORT
- CHECK VALVE
- UNION
- FLANGE

REFERENCES
TITLE

NOTE: REFERENCE
ORIGINAL DESIGN BY
DIVERSIFIED REMEDIATION AND CONTROLS, INC.
ORIGINAL DRAWING REFERENCED FROM
MONTGOMERY WATSON HARZA

AS-BUILTS

DRAWING SCALE

0 1 INCH

IF THIS BAR IS LESS THAN ONE INCH, IT IS A REDUCED PRINT. SCALE REDUCED SHEET ACCORDINGLY.

REVISIONS

NO.	BY.	DATE	DESCRIPTION
1	TM	3/19/10	URS MINOR CHANGES AND UPDATES
2	JAC	8/2011	EW-02 INSTALL AND MINOR CHANGES
3	TM	9/2012	AS-BUILTS

REVISIONS

NO.	BY.	DATE	DESCRIPTION

DRAWING SCALE	AS NOTED	
		DATE
DESIGNED BY:	TM	8/23/2011
DRAWN BY:	RPT	8/23/2011
CHECKED BY:	ET	8/23/2011
APPROVED BY:	RB	8/23/2011

URS
2870 Gateway Oaks Drive, Suite 150
Sacramento, CA 95833
TEL: (916) 679-2000
FAX: (916) 679-2900

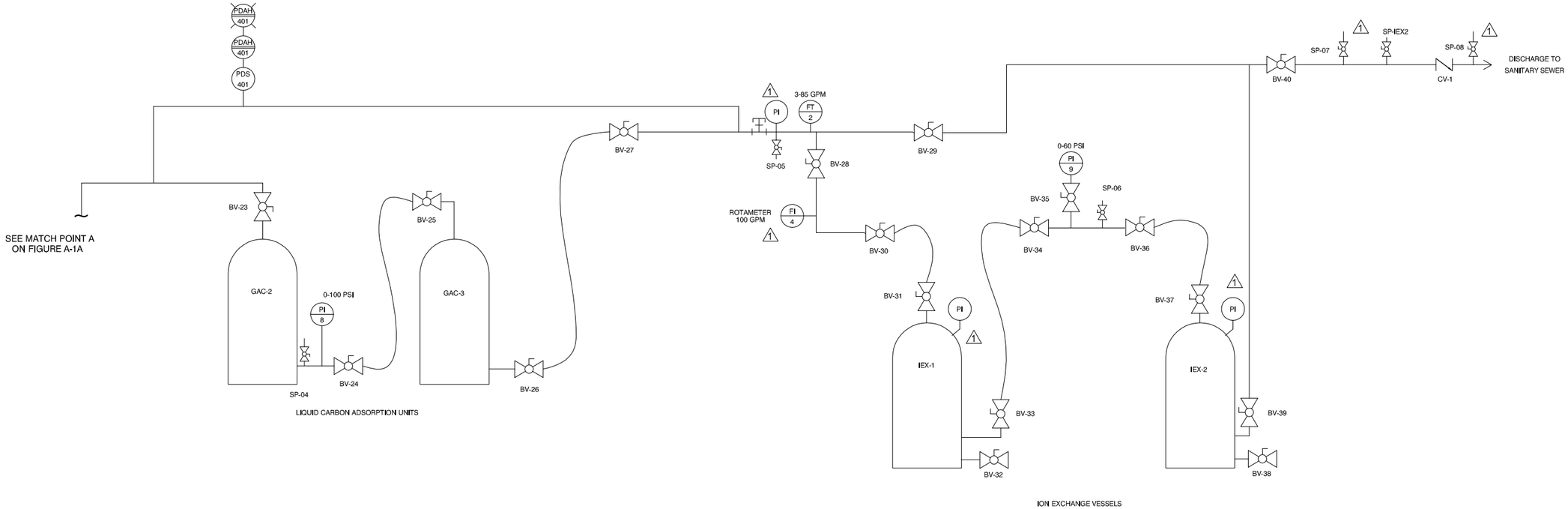
MODESTO SUPERFUND SITE
EW-02 INSTALLATION
MODESTO, CALIFORNIA

GROUNDWATER TREATMENT P&ID

JOB NO. 17326524
CONTRACT/TASK ORDER NO. 03AA14C1
SHEET NO. **1-1**

PLOT BY: DAVID_LARSON – Oct 12, 2012 – 9:03:29am
DRAWING: H:\CADD\Current\Modesto\Superfund Site EW-02 Installation\Drawings\Modesto-EW02_I-1.dwg
IMAGES:

This page intentionally left blank



LEGEND:

AS	AIR STRIPPER
B	BLOWER
BV	BALL VALVE
CV	CHECK VALVE
ET	EQUALIZATION TANK
FI	FLOW INDICATOR
FS	FLOW SWITCH
FT	FLOW TRANSFER
DPAH	DIFFERENTIAL PRESSURE ALARM HIGH
DPI	DIFFERENTIAL PRESSURE INDICATOR
GAC	GRANULAR ACTIVATED CARBON
GV	GLOBE VALVE
HOA	HAND - OFF - AUTO
IAH	ELECTRICAL CURRENT ALARM HIGH
IEX	ION EXCHANGE
IL	ELECTRICAL CURRENT LOW
IS	ELECTRICAL CURRENT SWITCH
KS	TIME SWITCH
LAHH	LEVEL ALARM HIGH HIGH
LH	LEVEL HIGH
LL	LEVEL LOW
LS	LEVEL SWITCHES
M	MOTOR
P	PUMP
PDAH	PRESSURE DIFFERENTIAL ALARM HIGH
PDS	PRESSURE DIFFERENTIAL SWITCHES
PE	PRESSURE ELEMENT
PI	PRESSURE INDICATOR
SP	SAMPLE PORT
T	TANKS

INSTRAMENTATION SYBOLS

- LOCALLY MOUNTED INSTRUMENT
- PANEL MOUNTED INSTRUMENT
- PANEL MOUNTED LIGHT
- BALL VALVE
- SAMPLE PORT
- CHECK VALVE

REFERENCES
TITLE

NOTE: REFERENCE
DESIGN BY
DIVERSIFIED REMEDIATION AND CONTROLS, INC.
ORIGINAL DRAWING REFERENCED FROM
MONTGOMERY WATSON HARZA

DRAWING SCALE AS NOTED

IF SHEET IS LESS THAN 22" X 34", IT IS A REDUCED PRINT. SCALE REDUCED SHEET ACCORDINGLY.

REVISIONS

NO.	BY.	DATE	DESCRIPTION
1	TM	3/19/10	URS MINOR CHANGES AND UPDATES

REVISIONS

NO.	BY.	DATE	DESCRIPTION

DRAWING SCALE	AS NOTED	
		DATE
DESIGNED BY:	TM	03/19/10
DRAWN BY:	RPT	03/19/10
CHECKED BY:		
APPROVED BY:		

URS
2870 Gateway Oaks Drive, Ste. 150
Sacramento, CA 95833-3200
TEL: (916) 679-2000
FAX: (916) 679-2900

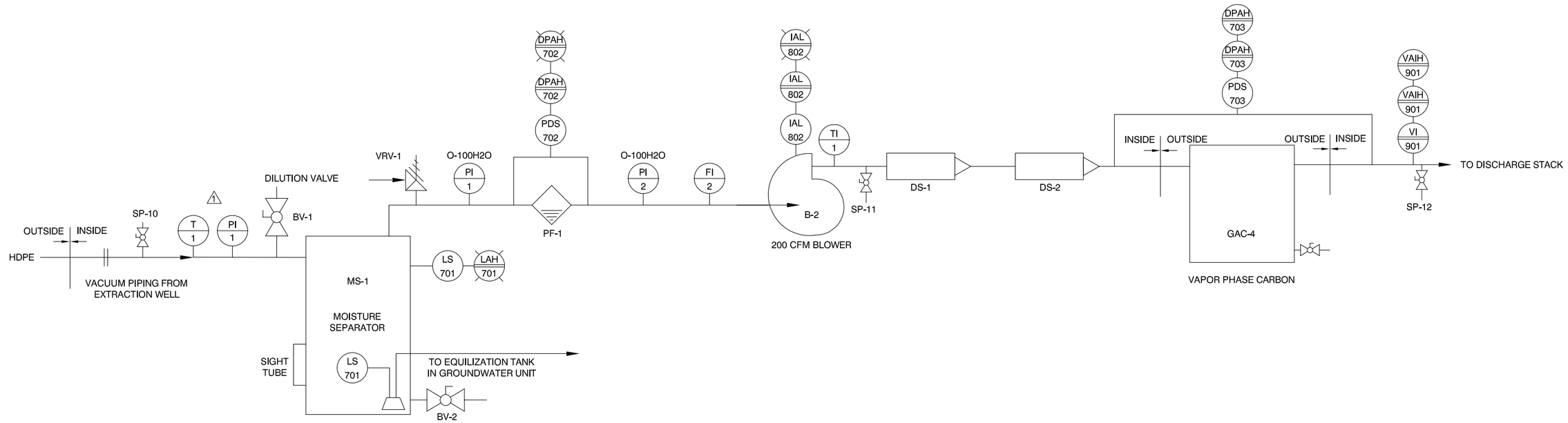
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

GROUNDWATER TREATMENT P&ID

JOB NO.
PROJECT
SHEET NO. **1-2**

PLOT BY: ROBERT_P_TAYLOR – Mar 19, 2010 – 11:38:02am
DRAWING: T:\current–work files\Modesto\drawings\
DRAWING: 031910–Modesto_1–2.dwg

This page intentionally left blank



KEY

A ALARM, ACTIVATED
B BALL, BLOWER
C CARBON, CONTROL
D DISCHARGE, DIFFERENTIAL
F FILTER, FLOW
G GRANULAR
E ELECTRIC CURRENT,
I INDICATOR
L LEVEL, LIGHTING, LOW
M MOTOR, MOISTURE
P PANEL, PARTICULATE, PORT, POWER, PRESSURE R RELIEF
S SAMPLING, SENSOR, SEPARATOR, SILENCER, SWITCH
T TEMPERATURE, TRANSFORMER
V VALVE, VACUUM, VOLATILE ORGANIC COMPOUND

REFERENCES
TITLE

NOTE: REFERENCE
DESIGN BY
DIVERSIFIED REMEDIATION AND CONTROLS, INC.
ORIGINAL DRAWING REFERENCED FROM
MONTGOMERY WATSON HARZA

NOTES:
1. ALL VACUUM PROCESS PIPING IS 4" Ø SCH80 PVC
2. DISCHARGE STACK IS 8" Ø SCH80 PVC

DRAWING SCALE AS NOTED

IF SHEET IS LESS THAN 22" X 34", IT IS A REDUCED PRINT. SCALE REDUCED SHEET ACCORDINGLY.

REVISIONS

NO.	BY.	DATE	DESCRIPTION
1	TM	3/19/10	URS MINOR CHANGES AND UPDATES

REVISIONS

NO.	BY.	DATE	DESCRIPTION

DRAWING SCALE	AS NOTED	
		DATE
DESIGNED BY:	TM	03/19/10
DRAWN BY:	RPT	03/19/10
CHECKED BY:		
APPROVED BY:		

URS
2870 Gateway Oaks Drive, Ste. 150
Sacramento, CA 95833-3200
TEL: (916) 679-2000
FAX: (916) 679-2900

MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

SOIL VAPOR EXTRACTION P&ID

JOB NO.
PROJECT
SHEET NO. **1-3**

PLOT BY: ROBERT_P_TAYLOR – Mar 19, 2010 – 11:38:49am
DRAWING: T:\current–work files\Modesto\drawings\
DRAWING: 031910–Modesto_1–3.dwg

This page intentionally left blank

Appendix B

Laboratory Analytical Data Tables

Table B-1	**Site Contaminants of Concern**
Table B-2	**Results Summary for Long-Term Monitoring, Second Quarter 2015, Modesto Groundwater Superfund Site**
Table B-3	**Results Summary for the Groundwater Treatment System, Second Quarter 2015, Modesto Groundwater Superfund Site**
Table B-4	**Results Summary for Vapor Samples (Indoor Air, Subslab, and Soil Vapor), Second Quarter 2015, Modesto Groundwater Superfund Site**

TABLE B-1

SITE CONTAMINANTS OF CONCERN
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Contaminant of Concern	Discharge Limit
Tetrachloroethene (PCE)	0.5 μg/L
Toluene	15 μg/L
Uranium, total	20 pCi/L
pH	5-12

Notes:
μg/L – micrograms per liter
pCi/L – picoCuries per liter

TABLE B-2. RESULTS SUMMARY FOR LONG-TERM MONITORING
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
EW-01R	EW-01R	WG	E524.2	FN	10/1/2015	Chloroform	4.1	0.5	µg/L	
						Tetrachloroethene	14	0.5	µg/L	
EW-02	EW-02	WG	E524.2	FN	10/1/2015	Chloroform	2.6	0.5	µg/L	
						Tetrachloroethene	78	2.5	µg/L	RE1
MW-01A	MW-01A	WG	E524.2	FN	10/1/2015	Chloroform	0.3	0.5	µg/L	C1, J
MW-02A	MW-02A	WG	E524.2	FN	10/1/2015	Chloroform	2.5	0.5	µg/L	
						Tetrachloroethene	2.4	0.5	µg/L	
MW-03A	MW-03A	WG	E524.2	FN	10/1/2015	Chloroform	0.8	0.5	µg/L	
						Tetrachloroethene	130	5	µg/L	RE1
MW-04A	MW-04A	WG	E524.2	FN	10/1/2015	Chloromethane	1.4	0.5	µg/L	
						cis-1,2-Dichloroethene	0.6	0.5	µg/L	
						Trichloroethene	0.5	0.5	µg/L	
						Tetrachloroethene	9.2	0.5	µg/L	
MW-04B	MW-04B	WG	E524.2	FN	10/1/2015	Acetone	3.5	4	µg/L	C1, J, Q3
						Tetrachloroethene	35	2.5	µg/L	RE1
MW-04C	MW-04C	WG	E524.2	FN	10/1/2015	Acetone	3.5	4	µg/L	C1, J, Q3
						Tetrachloroethene	0.3	0.5	µg/L	C1, J
MW-05A	MW-05A	WG	E524.2	FN	10/1/2015	Chloroform	0.4	0.5	µg/L	C1, J
						Tetrachloroethene	39	2.5	µg/L	RE1
MW-06A	MW-06A	WG	E524.2	FN	10/1/2015	Chloroform	7.7	0.5	µg/L	
						Bromodichloromethane	0.3	0.5	µg/L	C1, J
						Tetrachloroethene	1.6	0.5	µg/L	
MW-07A	MW-07A	WG	E524.2	FN	10/1/2015	Acetone	2.5	4	µg/L	C1, J, Q3
						Chloroform	2.4	0.5	µg/L	
MW-08A	MW-08A	WG	E524.2	FN	10/1/2015	Acetone	3.3	4	µg/L	C1, J, Q3
						Chloroform	5.7	0.5	µg/L	
						Bromodichloromethane	0.3	0.5	µg/L	C1, J
						Tetrachloroethene	17	0.5	µg/L	
MW-09B	MW-09B	WG	E524.2	FN	10/1/2015	Acetone	3.5	4	µg/L	C1, J, Q3
						Tetrachloroethene	5.2	0.5	µg/L	
MW-10A	MW-10A	WG	E524.2	FN	10/2/2015	Acetone	3.5	4	µg/L	C1, J, Q3

TABLE B-2. RESULTS SUMMARY FOR LONG-TERM MONITORING
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
						Chloroform	6.4	0.5	µg/L	
						Bromodichloromethane	0.2	0.5	µg/L	C1, J
						Tetrachloroethene	13	0.5	µg/L	
MW-10B	MW-10B	WG	E524.2	FN	10/2/2015	Acetone	2.9	4	µg/L	C1, J
						Chloroform	0.5	0.5	µg/L	
						Tetrachloroethene	6.5	0.5	µg/L	
MW-10C	MW-10C	WG	E524.2	FN	10/2/2015	Acetone	3.9	4	µg/L	C1, J
MW-11A	MW-11A	WG	E524.2	FN	10/1/2015	Acetone	2.8	4	µg/L	C1, J
						Chloroform	3.3	0.5	µg/L	
MW-12A	MW-12A	WG	E524.2	FN	10/2/2015	Trichlorofluoromethane	0.3	0.5	µg/L	C1, J
						Acetone	3.1	4	µg/L	C1, J
						Chloroform	19	0.5	µg/L	
						Bromodichloromethane	0.8	0.5	µg/L	
						Tetrachloroethene	4.9	0.5	µg/L	
MW-13A	MW-13A	WG	E524.2	FN	10/1/2015	Acetone	3.1	4	µg/L	C1, J
						Chloroform	5.6	0.5	µg/L	
						Bromodichloromethane	0.2	0.5	µg/L	C1, J
						Tetrachloroethene	2	0.5	µg/L	
MW-14A	MW-14A	WG	E524.2	FN	10/1/2015	Acetone	3	4	µg/L	C1, J
						Chloroform	3.1	0.5	µg/L	
						Tetrachloroethene	0.7	0.5	µg/L	
MW-15A	MW-15A	WG	E524.2	FN	10/2/2015	Chloroform	0.6	0.5	µg/L	
						1,2-Dichloroethane	0.2	0.5	µg/L	C1, J
MW-16A	MW-16A	WG	E524.2	FN	10/2/2015	Chloroform	2	0.5	µg/L	
MW-16B	MW-16B	WG	E524.2	FN	10/2/2015	Chloroform	1	0.5	µg/L	
						Tetrachloroethene	7.6	0.5	µg/L	
MW-16C	MW-16C	WG	E524.2	FN	10/2/2015	Acetone	3.4	4	µg/L	C1, J
						Chloroform	3.9	0.5	µg/L	
						Tetrachloroethene	26	1	µg/L	RE1
MW-17A	MW-17A	WG	E524.2	FN	10/1/2015	Chloroform	8.8	0.5	µg/L	
						Bromodichloromethane	0.4	0.5	µg/L	C1, J
						Tetrachloroethene	0.5	0.5	µg/L	

TABLE B-2. RESULTS SUMMARY FOR LONG-TERM MONITORING
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
MW-17B	MW-17B	WG	E524.2	FN	10/1/2015	Chloroform	0.4	0.5	µg/L	C1, J
						Tetrachloroethene	52	2.5	µg/L	RE1
MW-17C	MW-17C	WG	E524.2	FN	10/1/2015	Acetone	4.4	4	µg/L	
MW-18A	MW-18A	WG	E524.2	FN	10/1/2015	Chloroform	5.5	0.5	µg/L	
						Tetrachloroethene	1.6	0.5	µg/L	
MW-19A	MW-19A	WG	E524.2	FN	10/2/2015	Acetone	2.1	4	µg/L	C1, J
						Chloroform	3.3	0.5	µg/L	
MW-19B1	MW-19B1	WG	E524.2	FN	10/2/2015	Acetone	2.5	4	µg/L	C1, J
MW-20A	MW-20A	WG	E524.2	FN	10/1/2015	Dichlorodifluoromethane	2.5	0.5	µg/L	C4, J
						Chloroform	8.8	0.5	µg/L	
						Bromodichloromethane	0.3	0.5	µg/L	C1, J
						Tetrachloroethene	87	2.5	µg/L	RE1
MW-20B	MW-20B	WG	E524.2	FN	10/2/2015	Tetrachloroethene	25	0.5	µg/L	
MW-20C	MW-20C	WG	E524.2	FN	10/2/2015	Acetone	3.8	4	µg/L	C1, J
MW-21A	MW-21A	WG	E524.2	FN	10/2/2015	Chloroform	3.8	0.5	µg/L	
MW-22A	MW-22A	WG	E524.2	FN	10/2/2015	Acetone	4.7	4	µg/L	
						Chloroform	5.3	0.5	µg/L	
MW-23A	MW-23A	WG	E524.2	FN	10/1/2015	Chloroform	1.4	0.5	µg/L	
						Tetrachloroethene	7.7	0.5	µg/L	
MW-24B	MW-24B	WG	E524.2	FN	10/2/2015	Acetone	2.5	4	µg/L	C1, J
						Tetrachloroethene	58	2.5	µg/L	RE1
MW-25B	MW-25B	WG	E524.2	FN	10/1/2015	Tetrachloroethene	46	2.5	µg/L	RE1
MW-26B	MW-26B	WG	E524.2	FN	10/2/2015	Acetone	2	4	µg/L	C1, J
						Tetrachloroethene	2	0.5	µg/L	
MW-27B	MW-27B	WG	E524.2	FN	10/1/2015	Acetone	2.2	4	µg/L	C1, J
MW-28B	MW-28B	WG	E524.2	FN	10/1/2015	Acetone	2.2	4	µg/L	C1, J
						Tetrachloroethene	79	2.5	µg/L	RE1
MW-29B	MW-29B	WG	E524.2	FN	10/1/2015	Chloroform	0.3	0.5	µg/L	C1, J
						Tetrachloroethene	13	0.5	µg/L	
MW-30A	MW-30A	WG	E524.2	FN	10/1/2015	Acetone	2.6	4	µg/L	C1, J
MW-30B	MW-30B	WG	E524.2	FN	10/1/2015	Acetone	2.7	4	µg/L	A1, C1, J
						Chloroform	0.4	0.5	µg/L	A1, C1, J

TABLE B-2. RESULTS SUMMARY FOR LONG-TERM MONITORING
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
						Tetrachloroethene	0.3	0.5	µg/L	A1, C1, J
MW-31A	MW-31A	WG	E524.2	FN	10/1/2015	Acetone	2.3	4	µg/L	C1, J
						Tetrachloroethene	1.2	0.5	µg/L	
MW-32B	MW-32B	WG	E524.2	FN	10/1/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
MW-32C	MW-32C	WG	E524.2	FN	10/2/2015	Acetone	2.1	4	µg/L	C1, J
MW-33B	MW-33B	WG	E524.2	FN	10/2/2015	Acetone	3.3	4	µg/L	A1, C1, J
						Chloroform	1.5	0.5	µg/L	A1, J
						Tetrachloroethene	2.4	0.5	µg/L	A1, J
MW-34B	MW-34B	WG	E524.2	FN	10/1/2015	Acetone	3.4	4	µg/L	C1, J
						Tetrachloroethene	4.6	0.5	µg/L	
MW-35B	MW-35B	WG	E524.2	FN	10/1/2015	Tetrachloroethene	6.7	0.5	µg/L	Q4, J

Matrix
GS = soil gas
WG = groundwater

Sample Type
FN = Field Normal

Units
ppbv = parts per billion by volume
ug/L = micrograms per liter

Qualified Result
J = Analyte concentration considered an estimated value because one or more quality control specifications were not met.
C1 = The reported concentration for this analyte is below the quantitation limit.
C4 = The calibration verification check did not meet % difference criteria for this analyte.
Q3 = The quantitation limit standard did not meet recovery criteria for this analyte.
Q4 = The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte.
A1 = The sample was not properly preserved in the field.
RE1 = Result is from a sample re-analysis.

TABLE B-3. RESULTS SUMMARY FOR THE GROUNDWATER TREATMENT SYSTEM
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
RESIN	RESIN-A-0702	WG	SW6020A	FN	7/8/2015	Uranium	5270000	19300	ug/Kg	
	RESIN-A-0802				8/11/2015	Uranium	6020000	38800	ug/Kg	
	RESIN-A-0902				9/10/2015	Uranium	23600000	99300	ug/Kg	
0000BLANK	MW-301-3Q15	WQ	E524.2	TB	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	MW-302-3Q15				8/6/2015	Toluene	0.98	0.5	µg/L	
	MW-303-3Q15				9/1/2015	Toluene	0.36	0.5	µg/L	J
SP-01	GWTS-INF-0702	WG	D5174	FN	7/8/2015	Uranium	53.7	1	pCi/L	
	GWTS-INF-0702	WG	E524.2	FN	7/8/2015	Bromodichloromethane	0.16	0.5	µg/L	
						Chloroform	4.8	0.5	µg/L	
						Chloromethane	0.03	0.5	µg/L	J
						Tetrachloroethene	94	5	µg/L	
						Trichloroethylene	0.08	0.5	µg/L	J
	GWTS-INF-0801				8/6/2015	Bromodichloromethane	0.16	0.5	µg/L	J
						Chloroform	4.3	0.5	µg/L	
						Chloromethane	0.04	0.5	µg/L	U
						Tetrachloroethene	77	5	µg/L	
						Toluene	0.21	0.5	µg/L	U
						Trichloroethylene	0.07	0.5	µg/L	J
	GWTS-INF-0901				9/1/2015	Bromodichloromethane	0.16	0.5	µg/L	J
						Chloroform	4.4	0.5	µg/L	
						Tetrachloroethene	74	5	µg/L	
						Toluene	0.19	0.5	µg/L	U
						Trichloroethylene	0.07	0.5	µg/L	J
SP-03	CRB INF-0702	WG	E524.2	FN	7/8/2015	Chloroform	0.24	0.5	µg/L	J
						Chloromethane	0.13	0.5	µg/L	J
						Tetrachloroethene	1.2	0.5	µg/L	
	MW-103-NS	WG	E524.2	FD	7/8/2015	Chloroform	0.22	0.5	µg/L	J
						Chloromethane	0.03	0.5	µg/L	J
						Tetrachloroethene	1.2	0.5	µg/L	
	CRB INF-0801	WG	E524.2	FN	8/6/2015	Chloroform	0.21	0.5	µg/L	U
						Chloromethane	0.04	0.5	µg/L	U

TABLE B-3. RESULTS SUMMARY FOR THE GROUNDWATER TREATMENT SYSTEM
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
						Tetrachloroethene	1.1	0.5	µg/L	
						Toluene	0.57	0.5	µg/L	U
	CRB INF-0901				9/1/2015	Chloroform	0.23	0.5	µg/L	J
						Tetrachloroethene	1	0.5	µg/L	
						Toluene	0.27	0.5	µg/L	U
SP-04	CRB Mid-0702	WG	E524.2	FN	7/8/2015	Chloroform	0.39	0.5	µg/L	J+
						Tetrachloroethene	0.4	0.5	µg/L	J+
	CRB Mid-0801				8/6/2015	Chloroform	0.27	0.5	µg/L	U
						Chloromethane	0.03	0.5	µg/L	U
						Tetrachloroethene	0.49	0.5	µg/L	J
						Toluene	0.16	0.5	µg/L	U
	CRB Mid-0901				9/1/2015	Chloroform	0.29	0.5	µg/L	J
						Tetrachloroethene	0.69	0.5	µg/L	
						Toluene	0.19	0.5	µg/L	U
SP-05	CRB EFF-0702	WG	E524.2	FN	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	Pre IEX-0801	WG	D5174	FN	8/6/2015	Uranium	57.4	1	pCi/L	
	Pre IEX-0901				9/1/2015	Uranium	60.4	1	pCi/L	
SP-06	IEX Mid-0702	WG	D5174	FN	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	MW-106-NS	WG	D5174	FD	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	IEX Mid-0801	WG	D5174	FN	8/6/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	IEX Mid-0901				9/1/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
SP-07	EFF-0702	WG	D5174	FN	7/8/2015	Uranium	11	1	pCi/L	
	EFF-0702	WG	E524.2	FN	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	EFF-0702	WG	SM2540C	FN	7/8/2015	Total Dissolved Solids	663	13	mg/L	
	EFF-0702	WG	SM2540D	FN	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	EFF-0702	WG	SM5210B	FN	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	EFF-0801	WG	E524.2	FN	8/6/2015	Chloroform	0.12	0.5	µg/L	U
						Chloromethane	0.05	0.5	µg/L	U
						Toluene	0.17	0.5	µg/L	U
	EFF-0801	WG	SM2540C	FN	8/6/2015	Total Dissolved Solids	613	13	mg/L	
	EFF-0801	WG	SM2540D	FN	8/6/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	EFF-0801	WG	SM5210B	FN	8/6/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				

TABLE B-3. RESULTS SUMMARY FOR THE GROUNDWATER TREATMENT SYSTEM
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
	EFF-0901	WG	E524.2	FN	9/1/2015	Chloroform	0.23	0.5	µg/L	J
	EFF-0901	WG	SM2540C	FN	9/1/2015	Total Dissolved Solids	648	13	mg/L	
	EFF-0901	WG	SM2540D	FN	9/1/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	EFF-0901	WG	SM5210B	FN	9/1/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
SP-08	GWTS Pr GAC-0702	GS	TO15	FN	7/8/2015	Benzene	0.2	1.2	PPBV	J
						Chloroform	11	1.2	PPBV	
						Dichlorodifluoromethane	0.72	1.2	PPBV	J
						Tetrachloroethene	180	1.2	PPBV	
						Toluene	0.18	1.2	PPBV	J
						Trichloroethylene	0.35	1.2	PPBV	J
						Trichlorofluoromethane	0.3	1.2	PPBV	J
	MW-108-NS	GS	TO15	FD	7/8/2015	Chloroform	12	1.2	PPBV	
						Dichlorodifluoromethane	0.73	1.2	PPBV	J
						Tetrachloroethene	180	1.2	PPBV	
						Trichlorofluoromethane	0.36	1.2	PPBV	J
	GWTS Pr GAC-0801	GS	TO15	FN	8/6/2015	1,2,4-Trimethylbenzene	6.2	1.2	PPBV	
						1,3,5-Trimethylbenzene	2.4	1.2	PPBV	
						Benzene	0.57	1.2	PPBV	J
						Chloroform	5.1	1.2	PPBV	
						Dichlorodifluoromethane	0.79	1.2	PPBV	J
						Ethylbenzene	0.25	1.2	PPBV	J
						M,P-Xylenes	2.8	1.2	PPBV	
						O-Xylene	3.2	1.2	PPBV	
						Tetrachloroethene	71	1.2	PPBV	
						Toluene	1.1	1.2	PPBV	J
						Trichloroethylene	0.25	1.2	PPBV	J
						Trichlorofluoromethane	0.37	1.2	PPBV	U
	GWTS Pr GAC-0901				9/1/2015	Benzene	0.36	1.2	PPBV	U
						Chloroform	11	1.2	PPBV	
						Dichlorodifluoromethane	0.51	1.2	PPBV	J
						Tetrachloroethene	160	1.2	PPBV	
						Toluene	0.39	1.2	PPBV	J

TABLE B-3. RESULTS SUMMARY FOR THE GROUNDWATER TREATMENT SYSTEM
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
SP-09	GWTS Stack-0702	GS	TO15	FN	7/8/2015	Benzene	1.7	1.2	PPBV	
						Chloroform	11	1.2	PPBV	
						Dichlorodifluoromethane	0.7	1.2	PPBV	J
						Tetrachloroethene	4.8	1.2	PPBV	
						Trichlorofluoromethane	0.26	1.2	PPBV	J
	GWTS Stack-0801				8/6/2015	Benzene	2.4	1.2	PPBV	
						Chloroform	10	1.2	PPBV	
						Dichlorodifluoromethane	0.76	1.2	PPBV	J
						Tetrachloroethene	4.5	1.2	PPBV	
						Trichlorofluoromethane	0.33	1.2	PPBV	U
	GWTS Stack-0901				9/1/2015	Benzene	2	1.2	PPBV	
						Chloroform	12	1.2	PPBV	
						Dichlorodifluoromethane	0.53	1.2	PPBV	J
						Tetrachloroethene	3.2	1.2	PPBV	
SP-10	IEXEFF-0702	WG	D5174	FN	7/8/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	IEXEFF-0801				8/6/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	IEXEFF-0901				9/1/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				

Sampling conducted by AECOM
Note: RESIN-A-0902, result reported on a dry weight basis (percent moisture 61.9).
Matrix
GS = soil gas
SM = water filter (solid material used to filter water)
WG = groundwater
WQ = water quality

Sample Type
FD = Field Duplicate
FN = Field Normal
TB = Trip Blank

Units

TABLE B-3. RESULTS SUMMARY FOR THE GROUNDWATER TREATMENT SYSTEM
THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result

mg/L = milligrams per Liter
ppbv = parts per billion by volume
pci/L = picoCuries per Liter
µg/kg = micrograms per kilogram

Qualified Results
J = Analyte concentration considered an estimated value because one or more quality control specifications were not met.
J+ = Analyte concentration considered an estimated value because one or more quality control specifications were not met, high bias.
U = Analyte considered not detected due to external contamination.

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
931-IA-01	931-IA-01	GS	TO-15 SIM	FN	7/23/2015	Dichloromethane	0.49	0.68	µg/m^3	J
						Hexane	3.5	0.69	µg/m^3	--
						Benzene	2.5	0.63	µg/m^3	--
						Toluene	160	0.74	µg/m^3	J
						Ethylbenzene	2.4	0.86	µg/m^3	--
						m&p-Xylene	9.4	1.7	µg/m^3	--
						o-Xylene	3.2	0.86	µg/m^3	--
	931-IA-01-A	GS	TO-15 SIM	FN	8/25/2015	Dichloromethane	2.1	0.68	µg/m^3	--
						Hexane	6.8	0.69	µg/m^3	--
						Benzene	2.3	0.63	µg/m^3	--
						Toluene	220	30	µg/m^3	RE3
						Ethylbenzene	5.2	0.86	µg/m^3	--
						m&p-Xylene	18	1.7	µg/m^3	J, Q3
						o-Xylene	7.1	0.86	µg/m^3	--
						Styrene	0.68	0.84	µg/m^3	J
	931-IA-01-B (duplicate)	GS	TO-15 SIM	FD	8/25/2015	Dichloromethane	2.0	0.69	µg/m^3	--
						Hexane	5.6	0.70	µg/m^3	--
						Benzene	2.4	0.63	µg/m^3	--
						Toluene	120	15	µg/m^3	--
						Ethylbenzene	4.4	0.86	µg/m^3	--
						m&p-Xylene	16	1.7	µg/m^3	--
						o-Xylene	6.3	0.86	µg/m^3	--
						Styrene	0.47	0.85	µg/m^3	J
	931-IA-01	GS	TO-15 SIM	FN	9/30/2015	1,3-Butadine	0.23	0.44	µg/m^3	J
						Dichloromethane	1.7	0.69	µg/m^3	--
						Hexane	6.1	0.70	µg/m^3	--
						Benzene	4.4	0.63	µg/m^3	--

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
						Toluene	34	0.75	µg/m^3	J
						Ethylbenzene	5.6	0.86	µg/m^3	--
						m&p-Xylene	21	1.7	µg/m^3	J
						o-Xylene	7.2	0.86	µg/m^3	--
						Styrene	0.64	0.85	µg/m^3	J
931-SS-01	931-SS-01	GS	TO-15	FN	7/23/2015	Toluene	40	4	µg/m^3	--
						m&p-Xylene	5	9	µg/m^3	J
	931-SS-01-A	GS	TO-15	FN	8/26/2015	Toluene	200	100	µg/m^3	RE1
						Tetrachloroethene	8	10	µg/m^3	J
						m&p-Xylene	10	20	µg/m^3	J
	931-SS-01-B	GS	TO-15	FN	8/26/2015	Benzene	7	7	µg/m^3	C1
						Toluene	90	9	µg/m^3	--
						Tetrachloroethene	10	20	µg/m^3	J
						m&p-Xylene	10	20	µg/m^3	J
						o-Xylene	5	10	µg/m^3	J
	931-SS-01	GS	TO-15	FN	10/1/2015	Benzene	10	8	µg/m^3	--
						Toluene	100	10	µg/m^3	--
						m&p-Xylene	10	20	µg/m^3	J
939-IA-01	939-IA-01	GS	TO-15 SIM	FN	7/23/2015	Dichloromethane	1.6	0.69	µg/m^3	J-
						Hexane	5.6	0.70	µg/m^3	--
						Benzene	2.7	0.63	µg/m^3	--
						Toluene	5.7	0.75	µg/m^3	--
						Tetrachloroethene	1.2	1.3	µg/m^3	J
						Ethylbenzene	0.53	0.86	µg/m^3	J
						m&p-Xylene	1.6	1.7	µg/m^3	J
						o-Xylene	0.57	0.86	µg/m^3	J
	939-IA-01	GS	TO-15 SIM	FN	8/25/2015	Dichloromethane	12	4.7	µg/m^3	RE1

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
						Hexane	5.1	0.70	µg/m^3	--
						Carbon Tetrachloride	1.1	1.2	µg/m^3	J
						Benzene	4.7	0.63	µg/m^3	--
						Trichloroethene	0.59	1.1	µg/m^3	J
						Toluene	25	5.1	µg/m^3	--
						Tetrachloroethene	0.85	1.3	µg/m^3	J
						Ethylbenzene	4.2	0.86	µg/m^3	--
						m&p-Xylene	19	1.7	µg/m^3	J, Q3
						o-Xylene	4.9	0.86	µg/m^3	--
						Styrene	0.8	0.85	µg/m^3	J
	939-IA-01	GS	TO-15 SIM	FN	9/30/2015	Dichloromethane	14	0.69	µg/m^3	J
						Hexane	0.77	0.70	µg/m^3	--
						Carbon tetrachloride	0.97	1.3	µg/m^3	J
						Benzene	0.53	0.64	µg/m^3	J
						Trichloroethene	0.97	1.1	µg/m^3	J
						Toluene	9.2	0.75	µg/m^3	J
						Tetrachloroethene	7.0	1.4	µg/m^3	--
						Ethylbenzene	11	0.87	µg/m^3	J
						m&p-Xylene	33	1.7	µg/m^3	J
						o-Xylene	9.0	0.87	µg/m^3	--
						Styrene	0.82	0.85	µg/m^3	J
939-IA-03	939-IA-03-A	GS	TO-15 SIM	FN	7/23/2015	Dichloromethane	5.8	0.69	µg/m^3	J-
						Hexane	9.4	0.70	µg/m^3	J
						Benzene	4.5	0.63	µg/m^3	--
						Toluene	10	0.75	µg/m^3	J
						Ethylbenzene	0.92	0.86	µg/m^3	--
						m&p-Xylene	3.1	1.7	µg/m^3	--

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
						o-Xylene	0.97	0.86	µg/m^3	--
	939-IA-03-B (duplicate)	GS	TO-15 SIM	FD	7/23/2015	Dichloromethane	5.1	0.68	µg/m^3	J-
						Hexane	8.5	0.69	µg/m^3	J
						Benzene	3.8	0.63	µg/m^3	--
						Toluene	8.2	0.74	µg/m^3	J
						Ethylbenzene	0.78	0.86	µg/m^3	J
						m&p-Xylene	2.5	1.7	µg/m^3	--
						o-Xylene	0.80	0.86	µg/m^3	J
	939-IA-03	GS	TO-15 SIM	FN	9/30/2015	Dichloromethane	15.0	0.69	µg/m^3	J
						Hexane	0.69	0.7	µg/m^3	J
						Benzene	0.55	0.64	µg/m^3	J
						Toluene	10	0.75	µg/m^3	J
						Ethylbenzene	13	0.87	µg/m^3	J
						m&p-Xylene	41	1.7	µg/m^3	J
						o-Xylene	11	0.87	µg/m^3	J
939-SS-01	939-SS-01	GS	TO-15	FN	7/23/2015	Tetrachloroethene	30	20	µg/m^3	--
	939-SS-01	GS	TO-15	FN	8/26/2015	Toluene	100	9	µg/m^3	--
						Tetrachloroethene	40	20	µg/m^3	--
	939-SS-01	GS	TO-15	FN	10/1/2015	Toluene	7	9	µg/m^3	J
						Tetrachloroethene	40	20	µg/m^3	--
939-SS-02	939-SS-02	GS	TO-15	FN	7/23/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	939-SS-02	GS	TO-15	FN	8/26/2015	Toluene	300	100	µg/m^3	RE1
						Tetrachloroethene	8	20	µg/m^3	J
	939-SS-02	GS	TO-15	FN	9/30/2015	Toluene	10	10	µg/m^3	--

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
941-IA-01	941-IA-01	GS	TO-15 SIM	FN	7/23/2015	Dichloromethane	0.74	0.68	µg/m^3	J-
						Hexane	1.3	0.69	µg/m^3	--
						Benzene	0.80	0.63	µg/m^3	--
						Trichloroethene	6.3	1.1	µg/m^3	--
						Toluene	3.1	0.74	µg/m^3	--
						Tetrachloroethene	1.3	1.3	µg/m^3	C1
						Ethylbenzene	1.7	0.86	µg/m^3	--
						m&p-Xylene	8.0	1.7	µg/m^3	--
						o-Xylene	2.1	0.86	µg/m^3	--
	941-IA-01	GS	TO-15 SIM	FN	8/25/2015	Dichloromethane	0.89	0.68	µg/m^3	--
						Benzene	0.32	0.63	µg/m^3	J
						Trichloroethene	8.1	1.1	µg/m^3	--
						Toluene	5.6	0.74	µg/m^3	--
						Tetrachloroethene	2.0	1.3	µg/m^3	--
						Ethylbenzene	2.1	0.86	µg/m^3	--
						m&p-Xylene	11	1.7	µg/m^3	J, Q3
						o-Xylene	2.8	0.86	µg/m^3	--
	941-IA-01-A	GS	TO-15 SIM	FN	9/30/2015	Dichloromethane	1.2	0.69	µg/m^3	--
						Chloroform	0.51	0.97	µg/m^3	J
						Benzene	0.51	0.63	µg/m^3	J
						Trichloroethene	11	1.1	µg/m^3	--
						Toluene	2.0	0.75	µg/m^3	--
						Tetrachloroethene	4.1	1.3	µg/m^3	--
						Ethylbenzene	3.0	0.86	µg/m^3	--
						m&p-Xylene	14	1.7	µg/m^3	--
						o-Xylene	3.7	0.86	µg/m^3	--
	941-IA-01-B (duplicate)	GS	TO-15 SIM	FD	9/30/2015	Dichloromethane	1.2	0.69	µg/m^3	--

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
						Chloroform	0.53	0.97	µg/m^3	J
						Benzene	0.49	0.63	µg/m^3	J
						Trichloroethene	11	1.1	µg/m^3	--
						Toluene	2.1	0.75	µg/m^3	--
						Tetrachloroethene	4.0	1.3	µg/m^3	--
						Ethylbenzene	3.1	0.86	µg/m^3	--
						m&p-Xylene	14	1.7	µg/m^3	--
						o-Xylene	3.9	0.86	µg/m^3	--
941-IA-02	941-IA-02	GS	TO-15 SIM	FN	7/23/2015	Dichloromethane	0.69	0.68	µg/m^3	J-
						Hexane	2.5	0.69	µg/m^3	--
						Benzene	1.4	0.63	µg/m^3	--
						Trichloroethene	5.2	1.1	µg/m^3	--
						Toluene	3.4	0.74	µg/m^3	--
						Tetrachloroethene	0.92	1.3	µg/m^3	J
						Ethylbenzene	3.0	0.86	µg/m^3	--
						m&p-Xylene	15	1.7	µg/m^3	--
						o-Xylene	3.8	0.86	µg/m^3	--
	941-IA-02	GS	TO-15 SIM	FN	8/25/2015	Dichloromethane	0.94	0.69	µg/m^3	--
						Hexane	0.38	0.70	µg/m^3	J
						Chloroform	0.49	0.97	µg/m^3	J
						Benzene	0.33	0.63	µg/m^3	J
						Trichloroethene	6.6	1.1	µg/m^3	--
						Toluene	5.4	0.75	µg/m^3	--
						Tetrachloroethene	1.5	1.3	µg/m^3	--
						Ethylbenzene	2.6	0.86	µg/m^3	--
						m&p-Xylene	15	1.7	µg/m^3	J, Q3
						o-Xylene	3.6	0.86	µg/m^3	--

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
	941-IA-02	GS	TO15 SIM	FN	9/30/2015	Dichloromethane	1.7	0.68	µg/m^3	--
						Chloroform	0.66	0.96	µg/m^3	J
						Benzene	0.49	0.63	µg/m^3	J
						Trichloroethene	12	1.1	µg/m^3	J
						Toluene	2.5	0.74	µg/m^3	--
						Tetrachloroethene	3.0	1.3	µg/m^3	--
						Ethylbenzene	3.9	0.86	µg/m^3	--
						m&p-Xylene	18	1.7	µg/m^3	--
						o-Xylene	4.8	0.86	µg/m^3	--
						Styrene	0.45	0.84	µg/m^3	J
OSC-3	OSC-3	GS	TO-15	FN	7/23/2015	Trichloroethene	6	8	µg/m^3	J
						Tetrachloroethene	30	10	µg/m^3	--
	OSC-3	GS	TO-15	FN	8/26/2015	Trichloroethene	9	8	µg/m^3	--
						Tetrachloroethene	40	10	µg/m^3	--
	OSC-3	GS	TO-15	FN	10/1/2015	Trichloroethene	6	8	µg/m^3	J
						Tetrachloroethene	20	10	µg/m^3	Q5
941-SS-01	941-SS-01	GS	TO-15	FN	7/23/2015	Trichloroethene	5	8	µg/m^3	J
						Tetrachloroethene	70	10	µg/m^3	--
	941-SS-01	GS	TO-15	FN	8/26/2015	Trichloroethene	7	8	µg/m^3	J
						Toluene	200	60	µg/m^3	RE1
						Tetrachloroethene	90	10	µg/m^3	--
	941-SS-01	GS	TO-15	FN	10/1/2015	Tetrachloroethene	8	10	µg/m^3	J
SVE-01	SVE-01-A	GS	TO-15	FN	7/24/2015	Toluene	1.5	2.2	ppbv	J
	SVE-01-B (duplicate)	GS	TO-15	FD	7/24/2015	Tetrachloroethene	1.2	2.1	ppbv	J
	SVE-01	GS	TO-15	FN	8/25/2015	Toluene	770	42	ppbv	RE3
						Tetrachloroethene	1.5	2.5	ppbv	J

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
	SVE-01	GS	TO-15	FN	9/30/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
SVE-02	SVE-02	GS	TO-15	FN	7/24/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	SVE-02	GS	TO-15	FN	8/25/2015	Toluene	78	36	ppbv	RE2
						Tetrachloroethene	5.1	2.4	ppbv	--
	SVE-02	GS	TO-15	FN	9/30/2015	Tetrachloroethene	10	2.5	ppbv	J+
SVE-03	SVE-03	GS	TO-15	FN	7/24/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	SVE-03	GS	TO-15	FN	8/25/2015	Toluene	58	24	ppbv	RE1
	SVE-03	GS	TO-15	FN	9/30/2015	cis-1,2-Dichloroethene	6.7	4.2	ppbv	RE1
						Trichloroethene	4.0	4.2	ppbv	RE1, J
						Tetrachloroethene	1,400	99	ppbv	RE2, J
SVE-04	SVE-04	GS	TO-15	FN	7/24/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	SVE-04	GS	TO-15	FN	8/25/2015	Toluene	840	42	ppbv	RE3
	SVE-04-A	GS	TO-15	FN	9/30/2015	Chloroform	36	2.6	ppbv	--
						Tetrachloroethene	32	2.6	ppbv	J+
	SVE-04-B (duplicate)	GS	TO-15	FD	9/30/2015	Chloroform	30	4.7	ppbv	--
						Tetrachloroethene	30	4.7	ppbv	--
DP-01-S	DP-01-S	GS	TO-15	FN	7/24/2015	Chloromethane	1.1	2.3	ppbv	J
						Benzene	2.1	2.3	ppbv	J
						Toluene	3.8	2.3	ppbv	--
						Tetrachloroethene	37	23	ppbv	RE1
	DP-01-S-A	GS	TO-15	FN	8/26/2015	Toluene	470	47	ppbv	RE2
						Tetrachloroethene	72	47	ppbv	RE2
	DP-01-S-B (duplicate)	GS	TO-15	FD	8/26/2015	Toluene	160	28	ppbv	RE2
						Tetrachloroethene	220	28	ppbv	RE2
	--	--	--	--	--	Not sampled	--	--	--	--
DP-01-D	DP-01-D	GS	TO-15	FN	7/24/2015	Tetrachloroethene	60	23	ppbv	RE1
	DP-01-D	GS	TO-15	FN	8/26/2015	Toluene	140	26	ppbv	RE1
						Tetrachloroethene	100	26	ppbv	RE1
	DP-01-D	GS	TO-15	FN	10/1/2015	Tetrachloroethene	2.8	2.6	ppbv	--
DP-05-S	DP-05-S	GS	TO-15	FN	7/24/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	DP-05-S	GS	TO-15	FN	8/25/2015	Toluene	160	23	ppbv	RE2

TABLE B-4. RESULTS SUMMARY FOR VAPOR SAMPLES (INDOOR AIR, SUB-SLAB, AND SOIL VAPOR) THIRD QUARTER 2015, MODESTO GROUNDWATER SUPERFUND SITE

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Quantitation Limit	Units	Qualified Result
	DP-05-S	GS	TO-15	FN	9/30/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
DP-05-D	DP-05-D	GS	TO-15	FN	7/24/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	DP-05-D	GS	TO-15	FN	8/25/2015	Toluene	40	2.3	ppbv	--
	DP-05-D	GS	TO-15	FN	9/30/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
DP-06-S	DP-06-S-A	GS	TO-15	FN	7/24/2015	Toluene	1.2	2.3	ppbv	J
	DP-06-S-B (duplicate)	GS	TO-15	FD	7/24/2015	Toluene	1.2	2.4	ppbv	J
	DP-06-S	GS	TO-15	FN	8/25/2015	Toluene	2,700	440	ppbv	RE2
						Ethylbenzene	1.2	2.4	ppbv	J
						Styrene	1.2	2.4	ppbv	J
	DP-06-S	GS	TO-15	FN	9/30/2015	Toluene	1.4	2.5	ppbv	J
DP-06-D	DP-06-D	GS	TO-15	FN	7/24/2015	Toluene	2.3	2.3	ppbv	--
	DP-06-D	GS	TO-15	FN	8/25/2015	Toluene	720	49	ppbv	RE2
	DP-06-D	GS	TO-15	FN	9/30/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
OSVE-10	OSVE-10	GS	TO-15	FN	7/23/2015	Tetrachloroethene	3.6	2.3	ppbv	--
	OSVE-10	GS	TO-15	FN	8/26/2015	Toluene	9.1	2.1	ppbv	--
						Tetrachloroethene	160	52	ppbv	RE2
	--	--	--	--	--	Not sampled	--	--	--	--
OSVE-11	OSVE-11	GS	TO-15	FN	7/23/2015	Analytes Not Detected At Or Above Laboratory Reporting Limits				
	OSVE-11	GS	TO-15	FN	8/26/2015	Toluene	6.0	2.3	ppbv	--
						Tetrachloroethene	2.7	2.3	ppbv	--
	--	--	--	--	--	Not sampled	--	--	--	--

Matrix
GS = soil gas

Sample Type
FD = Field Duplicate
FN = Field Normal

Units
ppbv = parts per billion volume
$\mu g/m^3$ = micrograms per cubic meter

Qualified Results

RE1, RE2, etc	Result is from a sample re-analysis.
Q3	The quantitation limit standard did not meet recovery criteria for this analyte.
Q5	Sample duplicate precision criteria were not met for this analyte (see duplicate results for this batch in QC summary).
C1	The reported concentration for this analyte is below the quantitation limit.
J	The reported result for this analyte should be considered an estimated value.
J-	The reported result for this analyte should be considered an estimated value (low bias).
J+	The reported result for this analyte should be considered an estimated value (high bias).
--	No flag.

This page intentionally left blank

Appendix C

Laboratory Data Validation Reports

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

RORE, Inc.
5151 Shoreham Place, Suite 260
San Diego, CA 92122
ATTN: Mr. John McGuire

November 3, 2015

SUBJECT: Modesto FY2015, Data Validation

Dear Mr. McGuire,

Enclosed is the final validation report for the fraction listed below. This SDG was received on October 15, 2015. Attachment 1 is a summary of the sample that was reviewed for each analysis.

LDC Project #35200:

SDG #	Fraction
15275B	Volatiles

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Andrea Leasure
Project Manager/Chemist

473 pages-EM/SF

Attachment 1

ADR/IV 90/10

LDC #35200 (Rore Inc.-San Diego, CA / Modesto FY2015)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (TO-15 SIM)																													
Matrix:	Air/Water/Soil			A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	15275B	10/15/15	11/05/15	5	0																												
A	15275B	10/15/15	11/05/15	1	0																												
Total	A/AL			6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6

Shaded cells indicate Level IV validation (all other cells are ADR validation). These sample counts do not include MS/MSD, and DUPs

L:\Rore\Modesto\35200ST.wpd

Data Validation Report
Modesto FY2015

SDG: 15275B

Prepared for

Rore, Inc.
5151 Shoreham Place, Suite 260
San Diego, CA 92122

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, CA 92010

November 3, 2015

INTRODUCTION

This Data Validation Report (DVR) presents EPA Level III and EPA Level IV data validation results for samples collected during the September 2015 sampling period. Data validation was performed in accordance with the US EPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (CLPNFG) (June 2008). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method TO-15 in Selected Ion Monitoring (SIM) mode.

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. EPA Level III Automated Data Review outliers are presented in Enclosure I. DVRs for samples on which EPA Level IV validation was performed are presented in Enclosure II.

All sample results were subjected to EPA Level III data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, initial and continuing calibrations, laboratory blanks, laboratory duplicates (DUP), laboratory control samples (LCS), field duplicate samples and internal standards. Approximately 16 percent of samples were subjected to EPA Level IV evaluation as indicated in Attachment 1, which comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013) with exception of the calibrations and internal standards, which were validated manually. Quality assurance (QA)/QC criteria specified in the CLPNFGs were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not applicable): Data did not warrant qualification since detected results only are affected and the compound was not detected in the associated samples.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt & Technical Holding Times

The canisters were properly pressurized and handled.

All technical holding time requirements were met.

II. Instrument Performance Check

Instrument performance was checked at the frequency required by the method.

All criteria for the instrument performance check were met.

III. Initial Calibration and Initial Calibration Verification

All criteria for the initial calibration and initial calibration verifications were met.

IV. Continuing Calibration

All criteria for the initial calibration verifications and continuing calibration were met.

V. Laboratory Blanks

Laboratory blanks were performed as required by the method. No contaminant concentrations were detected in the laboratory blanks.

Canister blank analyses were performed for every sample canister. No contaminant concentrations were found in the canister blanks.

VI. Field Blank Samples

No field blanks were identified in this SDG.

VII. Laboratory Duplicates Sample

Laboratory duplicates (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Field Duplicate Samples

One field duplicate pair was collected and analyzed for VOCs. The field duplicate result comparisons are provided in Enclosure I.

X. Internal Standards

All internal standard areas and retention times were within QC limits

XI. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compound quantitations were within validation criteria with the following exceptions:

SDG/ Method	Sample	Compound	Finding	Flag	A or P
15275B/ TO-15 SIM	931-IA-01	m & p-xylene Toluene	Sample result exceeded calibration range	J (all detects)	P
15275B/ TO-15 SIM	939-IA-01	Ethylbenzene m & p-xylene Methylene chloride Toluene	Sample result exceeded calibration range	J (all detects)	P
15275B/ TO-15 SIM	939-IA-03	Ethylbenzene m & p-xylene Methylene chloride o-xylene Toluene	Sample result exceeded calibration range	J (all detects)	P
15275B/ TO-15 SIM	941-IA-02	Trichloroethene	Sample result exceeded calibration range	J (all detects)	P

All compounds reported below the RL as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosures I and II.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

Due to results below the RL, data were qualified as estimated in six samples.

Due to results exceeding calibration range, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Data flags are summarized and are presented as Attachment 2

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
30-Sep-2015	931-IA-01	1510003-06	N	None	TO-15 SIM	III
30-Sep-2015	939-IA-03	1510003-05	N	None	TO-15 SIM	III
30-Sep-2015	939-IA-03DUP	B15J011-DUP2	DUP	None	TO-15 SIM	III
30-Sep-2015	939-IA-01	1510003-04	N	None	TO-15 SIM	IV
30-Sep-2015	941-IA-02	1510003-03	N	None	TO-15 SIM	III
30-Sep-2015	941-IA-01-A	1510003-01	N	None	TO-15 SIM	III
30-Sep-2015	941-IA-01-B	1510003-02	FD	None	TO-15 SIM	III

III = EPA Level 3 Data Review *N = Normal Sample* *TB = Trip Blank* *MS = Matrix Spike*
IV = EPA Level 4 Data Validation *FD = Field Duplicate* *FB = Field Blank* *MSD = Matrix Spike Duplicate*

Attachment 2
Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: 15275B **Laboratory: FALSE**

EDD Filename: 15275B_VOCs_1510003 FINAL **eQAPP Name: Rore_Modesto_Rebound_IA_102215**

Method Category: **VOA**

Method: **TO-15 SIM** ***Matrix:*** **Air**

Sample ID: **931-IA-01** ***Collected:*** **9/30/2015 10:22:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.49**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,3-BUTADIENE	0.23	J,C1	0.22	MDL	0.44	MRL	ug/m^3	J	RI
M&P-XYLENE	21	J,C2	0.86	MDL	1.7	MRL	ug/m^3	J	ProfJudg
TOLUENE	34	J,C2	0.37	MDL	0.75	MRL	ug/m^3	J	ProfJudg
STYRENE	0.64	J,C1	0.42	MDL	0.85	MRL	ug/m^3	J	RI

Sample ID: **939-IA-01** ***Collected:*** **9/30/2015 10:30:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.5**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZENE	0.53	J,C1	0.32	MDL	0.64	MRL	ug/m^3	J	RI
CARBON TETRACHLORIDE	0.97	J,C1	0.63	MDL	1.3	MRL	ug/m^3	J	RI
ETHYLBENZENE	11	J,C2	0.43	MDL	0.87	MRL	ug/m^3	J	ProfJudg
M&P-XYLENE	33	J,C2	0.87	MDL	1.7	MRL	ug/m^3	J	ProfJudg
METHYLENE CHLORIDE	14	J,C2	0.35	MDL	0.69	MRL	ug/m^3	J	ProfJudg
STYRENE	0.82	J,C1	0.43	MDL	0.85	MRL	ug/m^3	J	RI
TOLUENE	9.2	J,C2	0.38	MDL	0.75	MRL	ug/m^3	J	ProfJudg
TRICHLOROETHENE	0.97	J,C1	0.54	MDL	1.1	MRL	ug/m^3	J	RI

Sample ID: **939-IA-03** ***Collected:*** **9/30/2015 10:26:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.5**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZENE	0.55	J,C1	0.32	MDL	0.64	MRL	ug/m^3	J	RI
ETHYLBENZENE	13	J,C2	0.43	MDL	0.87	MRL	ug/m^3	J	ProfJudg
HEXANE	0.69	J,C1	0.35	MDL	0.70	MRL	ug/m^3	J	RI
M&P-XYLENE	41	J,C2	0.87	MDL	1.7	MRL	ug/m^3	J	ProfJudg
METHYLENE CHLORIDE	15	J,C2	0.35	MDL	0.69	MRL	ug/m^3	J	ProfJudg
O-XYLENE	11	J,C2	0.43	MDL	0.87	MRL	ug/m^3	J	ProfJudg
TOLUENE	10	J,C2	0.38	MDL	0.75	MRL	ug/m^3	J	ProfJudg

Sample ID: **941-IA-01-A** ***Collected:*** **9/30/2015 10:33:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.49**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZENE	0.51	J,C1	0.32	MDL	0.63	MRL	ug/m^3	J	RI
CHLOROFORM	0.51	J,C1	0.48	MDL	0.97	MRL	ug/m^3	J	RI

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275B **Laboratory: FALSE**

EDD Filename: 15275B_VOCs_1510003 FINAL **eQAPP Name: Rore_Modesto_Rebound_IA_102215**

Method Category: **VOA**

Method: **TO-15 SIM** ***Matrix:*** **Air**

Sample ID: **941-IA-01-B** ***Collected:*** **9/30/2015 10:33:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.49**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZENE	0.49	J,C1	0.32	MDL	0.63	MRL	ug/m^3	J	RI
CHLOROFORM	0.53	J,C1	0.48	MDL	0.97	MRL	ug/m^3	J	RI

Sample ID: **941-IA-02** ***Collected:*** **9/30/2015 10:31:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.48**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZENE	0.49	J,C1	0.31	MDL	0.63	MRL	ug/m^3	J	RI
CHLOROFORM	0.66	J,C1	0.48	MDL	0.96	MRL	ug/m^3	J	RI
STYRENE	0.45	J,C1	0.42	MDL	0.84	MRL	ug/m^3	J	RI
TRICHLOROETHENE	12	J,C2	0.53	MDL	1.1	MRL	ug/m^3	J	ProfJudg

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275B **Laboratory: FALSE**

EDD Filename: 15275B_VOCs_1510003 FINAL **eQAPP Name: Rore_Modesto_Rebound_IA_102215**

Reason Code Legend

Reason Code	*Description*
ProfJudg	Professional Judgment
RI	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Enclosure I

EPA Level III ADR Outliers

(Including Manual Review Outliers)

Quality Control Outlier Reports

15275B

Reporting Limit Outliers

Lab Reporting Batch ID: 15275B **Laboratory: FALSE**

EDD Filename: 15275B_VOCs_1510003 FINAL **eQAPP Name: Rore_Modesto_Rebound_IA_102215**

Method: **TO-15 SIM**

Matrix: **Air**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
931-IA-01	1,3-BUTADIENE	J,C1	0.23	0.44	MRL	ug/m^3	J (all detects)
	STYRENE	J,C1	0.64	0.85	MRL	ug/m^3	
939-IA-01	BENZENE	J,C1	0.53	0.64	MRL	ug/m^3	J (all detects)
	CARBON TETRACHLORIDE	J,C1	0.97	1.3	MRL	ug/m^3	
	STYRENE	J,C1	0.82	0.85	MRL	ug/m^3	
	TRICHLOROETHENE	J,C1	0.97	1.1	MRL	ug/m^3	
939-IA-03	BENZENE	J,C1	0.55	0.64	MRL	ug/m^3	J (all detects)
	HEXANE	J,C1	0.69	0.70	MRL	ug/m^3	
941-IA-01-A	BENZENE	J,C1	0.51	0.63	MRL	ug/m^3	J (all detects)
	CHLOROFORM	J,C1	0.51	0.97	MRL	ug/m^3	
941-IA-01-B	BENZENE	J,C1	0.49	0.63	MRL	ug/m^3	J (all detects)
	CHLOROFORM	J,C1	0.53	0.97	MRL	ug/m^3	
941-IA-02	BENZENE	J,C1	0.49	0.63	MRL	ug/m^3	J (all detects)
	CHLOROFORM	J,C1	0.66	0.96	MRL	ug/m^3	
	STYRENE	J,C1	0.45	0.84	MRL	ug/m^3	

Field Duplicate RPD Report

Lab Reporting Batch ID: 15275B **Laboratory: FALSE**

EDD Filename: 15275B_VOCs_1510003 FINAL **eQAPP Name: Rore_Modesto_Rebound_IA_102215**

Method: TO-15 SIM
Matrix: Air

Analyte	Concentration (ug/m^3)		Sample RPD	eQAPP RPD	Flag
	941-IA-01-A	941-IA-01-B			
BENZENE	0.51	0.49	4	1.00	No Qualifiers Applied
CHLOROFORM	0.51	0.53	4	1.00	
ETHYLBENZENE	3.0	3.1	3	1.00	
M&P-XYLENE	14	14	0	1.00	
METHYLENE CHLORIDE	1.2	1.2	0	1.00	
O-XYLENE	3.7	3.9	5	1.00	
TETRACHLOROETHENE	4.1	4.0	2	1.00	
TOLUENE	2.0	2.1	5	1.00	
TRICHLOROETHENE	11	11	0	1.00	

LDC #: 35200A48 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/22/15
SDG #: 15275B ADR/~~Level IV~~ Page: 1 of 1
Laboratory: USEPA Region 9 Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (Method TO-15 SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	N / N	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 30 |r| ≤ 30
IV.	Continuing calibration	A	Cq | ≤ 30
V.	Laboratory Blanks	N	Not reviewed for ADR validation.
VI.	Field blanks	↓	
VII.	Surrogate spikes	↓	Not reviewed for ADR validation.
VIII.	Matrix spike/Matrix spike duplicates	↓	Not reviewed for ADR validation.
IX.	Laboratory control samples	↓	Not reviewed for ADR validation.
X.	Field duplicates	↓	FD= (1,2)
XI.	Internal standards	A	Not reviewed for ADR validation.
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for ADR validation. *
XIII.	Target compound identification	↓	Not reviewed for ADR validation.
XIV.	System performance	↓	Not reviewed for ADR validation.
XV.	Overall assessment of data	↓	Not reviewed for ADR validation.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	941-IA-01-A	1510003-01	Air	09/30/15
2	941-IA-01-B	1510003-02	Air	09/30/15
3	941-IA-02 * Result flagged "C2" > calib range	1510003-03	Air	09/30/15
4	939-IA-01** – Jeff/P	1510003-04**	Air	09/30/15
5	939-IA-03	1510003-05	Air	09/30/15
6	931-IA-01	1510003-06	Air	09/30/15
7	939-IA-03DUP	1510003-05DUP	Air	09/30/15
8				
9				
10				
11				
12				
13				

Enclosure II

EPA Level IV Data Validation Reports

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Modesto FY2015

LDC Report Date: October 25, 2015

Parameters: Volatiles

Validation Level: Level IV

Laboratory: USEPA Region 9 Laboratory

Sample Delivery Group (SDG): 15275B

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
939-IA-01	1510003-04	Air	09/30/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method TO-15 in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

The canisters were properly pressurized and handled.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 24 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

Canister blank analyses were performed for every sample canister. No contaminants were found in the canister blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Duplicates

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
939-IA-01	Ethylbenzene m,p-Xylenes Methylene chloride Toluene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects) J (all detects) J (all detects)	P

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 15275B	All compounds reported below the RL.	J (all detects)	A

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results exceeding calibration range and results below the RL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Modesto FY2015
Volatiles - Data Qualification Summary - SDG 15275B

Sample	Compound	Flag	A or P	Reason
939-IA-01	Ethylbenzene m,p-Xylenes Methylene chloride Toluene	J (all detects) J (all detects) J (all detects) J (all detects)	P	Compound quantitation (exceeded range)
939-IA-01	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Modesto FY2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15275B

No Sample Data Qualified in this SDG

Modesto FY2015
Volatiles - Field Blank Data Qualification Summary - SDG 15275B

No Sample Data Qualified in this SDG

LDC #: 35200A48 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/22/15
SDG #: 15275B ~~ADR~~/Level IV Page: 1 of 1
Laboratory: USEPA Region 9 Laboratory Reviewer: [illegible]
2nd Reviewer: AYL

METHOD: GC/MS Volatiles (Method TO-15 SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

		Validation Area		Comments
	I.	Sample receipt/Technical holding times	A / A	
	II.	GC/MS Instrument performance check	A	
	III.	Initial calibration/ICV	A / A	RSD ≤ 30 |r| ≤ 30
	IV.	Continuing calibration	A	CCd ≤ 30
	V.	Laboratory Blanks / Individual Canister Blks	A	
	VI.	Field blanks	N	
	~~VII~~	~~Surrogate spikes~~	~~N~~	
VII	VII.	Matrix spike/Matrix spike duplicates / DUP	N / A	
VIII	IX.	Laboratory control samples	A	LCS/~~A~~ a
IX	X.	Field duplicates	N	
X	XI.	Internal standards	A	
XI	XII.	Compound quantitation RL/LOQ/LODs	SW	
XII	XIII.	Target compound identification	A	
XIII	XIV.	System performance	A	
XIV	~~XV.~~	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	~~941-IA-01-A~~	1510003-01	Air	09/30/15
2	941-IA-01-B	1510003-02	Air	09/30/15
3	~~941-IA-02~~	1510003-03	Air	09/30/15
4	939-IA-01**	1510003-04**	Air	09/30/15
5	~~939-IA-03~~	1510003-05	Air	09/30/15
6	931-IA-01	1510003-06	Air	09/30/15
7	~~939-IA-03DUP~~	1510003-05DUP	Air	09/30/15
8				
9				
10				
11				
12				
13				

LDC #: 35200A48

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: APL

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was canister pressure criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 24 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30%?	✓			
IIIb. Initial calibration verificattion				
Was an initial calibration verification standard analyzed after every ICAL for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
V. Laboratory Blanks/Canister Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 24 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
Was a canister blank analyzed for every canister?	✓			
Was there contamination in the canister blanks? If yes, please see the Canister Blanks validation completeness worksheet.		✓		
VI. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes (Optional)				
Were all surrogate percent recoveries (%R) within QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Laboratory Duplicate				
Was a laboratory duplicate analyzed for this SDG?	✓			
Were the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 35200A48

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within ± 40% from the associated calibration standard?	✓			
Were retention times within ± 20.0 seconds from the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 35200A48

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and RLs

Page: 1 of 1
Reviewer: 87
2nd Reviewer: AYE

METHOD: GC/MS VOA (EPA Method TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	Sample ID	Compound	Findings	Qualifications
		4	Dichloromethane*	> calib range	J det/P
			CC, EE, RRR	↓	↓
			Dichloromethane = Methylene Chloride		
					↑ used/present in SEDD.

Comments: See sample calculation verification worksheet for recalculations

COMQUA.15A

LDC #: 35200A48

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: SR
2nd Reviewer: MC

METHOD: GC/MS VOA (EPA Method TO-15)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF 300/275 ~~250~~ std)	Recalculated RRF 300/275 ~~250~~ std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/1/15	a (1st internal standard)	0.906	0.906	0.917	0.917	3.58	3.59
			V (2nd internal standard)	0.934	0.934	0.936	0.936	0.74	0.74
			AA (3rd internal standard)	0.530	0.530	0.534	0.534	2.91	2.91
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 35200A48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA TO-15)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	100215N02	10/2/15	C (1st internal standard)	0.917	0.926	0.926	1.0	1.0
			V (2nd internal standard)	0.936	0.998	0.998	6.6	6.7
			AA (3rd internal standard)	0.534	0.503	0.503	5.8	5.8
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

CCV is LCS

CONCLC.15A

LDC #: 35200A48

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: APL

METHOD: GC/MS VOA (EPA Method TO-15)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 4, AA:

Conc. = $\frac{(79608)(341)(400)(1.50)}{(197049)(0.534)(150)(\quad)}$

= $\frac{(1031.94)(165.83)}{(24.5)(1000)}$

= 7.0 ug/m3

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

RORE, Inc.
5151 Shoreham Place, Suite 260
San Diego, CA 92122
ATTN: Mr. John McGuire

November 10, 2015

SUBJECT: Modesto FY2015, Data Validation

Dear Mr. McGuire,

Enclosed are the final validation reports for the fraction listed below. These SDGs were received on October 21, 2015. Attachment 1 is a summary of the sample that was reviewed for each analysis.

LDC Project #35227:

SDG #	Fraction
15275C, 15275D	Volatiles

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Andrea Leasure
Project Manager/Chemist

1037 pages-EM/SF

Attachment 1

ADR/IV 90/10

LDC #35227 (Rore Inc. / Modesto FY2015)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (TO-15)																													
Matrix:	Water/Soil/Air			A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	15275C	10/21/15	11/11/15	7	0																												
A	15275C	10/21/15	11/11/15	2	0																												
B	15275D	10/21/15	11/11/15	6	0																												
Total	A/AL			15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15

Shaded cells indicate Level IV validation (all other cells are ADR validation). These sample counts do not include MS/MSD, and DUPs

L:\Rore\Modesto\35227ST.wpd

Data Validation Report
Modesto FY2015

SDGs: 15275C, 15275D

Prepared for

Rore, Inc.
5151 Shoreham Place, Suite 260
San Diego, CA 92122

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, CA 92010

November 10, 2015

INTRODUCTION

This Data Validation Report (DVR) presents EPA Level III and EPA Level IV data validation results for samples collected during the September 2015 sampling period. Data validation was performed in accordance with the US EPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (CLPNFG) (June 2008). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method TO-15

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. EPA Level III Automated Data Review outliers are presented in Enclosure I. DVRs for samples on which EPA Level IV validation was performed are presented in Enclosure II.

All sample results were subjected to EPA Level III data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, initial and continuing calibrations, laboratory blanks, laboratory duplicates (DUP), laboratory control samples (LCS), field duplicate samples and internal standards. Approximately 13 percent of samples were subjected to EPA Level IV evaluation as indicated in Attachment 1, which comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013) with exception of the calibrations and internal standards, which were validated manually. Quality assurance (QA)/QC criteria specified in the CLPNFGs were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not applicable): Data did not warrant qualification since detected results only are affected and the compound was not detected in the associated samples.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt & Technical Holding Times

The canisters were properly pressurized and handled.

All technical holding time requirements were met.

II. Instrument Performance Check

Instrument performance was checked at the frequency required by the method.

All criteria for the instrument performance check were met.

III. Initial Calibration and Initial Calibration Verification

All criteria for the initial calibration were met with the following exceptions:

SDG/ Method	Date	Compound	%RSD (Limits)	Associated Samples	Flag	A or P
15275C/ TO-15	10/12/15	Methylene chloride 1,2,4-Trichlorobenzene	49.45 (≤30) 33.48 (≤30)	SVE-04-B	J (all detects) UJ (all non-detects)	P
15275D/ TO-15	10/06/15	Methylene chloride 1,2,4-Trichlorobenzene	39.92 (≤30) 39.92 (≤30)	All samples in SDG 15275D	J (all detects)	P

All criteria for the initial calibration verifications were met with the following exceptions:

SDG/ Method	Date	Compound	%D (Limits)	Associated Samples	Flag	A or P
15275C/ TO-15	10/12/15	Methylene chloride	32 (≤30)	SVE-04-B	J- (all detects)	P
15275C/ TO-15	10/12/15	1,4-Dichlorobenzene 1,2,4-Trichlorobenzene	44 (≤30) 75 (≤30)	SVE-04-B	NA	-

IV. Continuing Calibration

All criteria for the continuing calibration were met with the following exceptions:

SDG/ Method	Date	Compound	%D (Limits)	Associated Samples	Flag	A or P
15275C/ TO-15	10/08/15	Toluene	34.1 (≤30)	SVE-02 DP-05-S DP-05-D DP-06-D	NA	-
15275C/ TO-15	10/08/15	Tetrachloroethene	34.4 (≤30)	SVE-02	J+ (all detects)	P

SDG/ Method	Date	Compound	%D (Limits)	Associated Samples	Flag	A or P
15275C/ TO-15	10/08/15	Tetrachloroethene	34.4 (≤30)	DP-05-S DP-05-D DP-06-D	NA	-
15275C/ TO-15	10/09/15	Toluene	31.2 (≤30)	SVE-01 SVE-03 SVE-04-A DP-06-S	J+ (all detects)	P
15275C/ TO-15	10/09/15	Tetrachloroethene	30.1 (≤30)	SVE-03 SVE-04-A	J+ (all detects)	P
15275C/ TO-15	10/09/15	Tetrachloroethene	30.1 (≤30)	SVE-01 DP-06-S	NA	-
15275C/ TO-15	10/09/15	1,1,2,2-Tetrachloroethane	30.1 (≤30)	SVE-01 SVE-03 SVE-04-A DP-06-S	UJ (all non-detects)	P
15275D/ TO-15	10/07/15	1,2,4-Trichlorobenzene	37.8 (≤30)	All samples in SDG 15275D	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were performed as required by the method. No contaminant concentrations were detected in the laboratory blanks with the exception of several blanks for methylene chloride. The associated sample results were qualified as non-detected (U) due to laboratory blank contamination as applicable. The sample results that were not detected or were significantly greater than the concentrations found in the associated blanks were not qualified. The details regarding the qualification of data are provided in Enclosure I.

Canister blank analyses were performed for every sample canister. No contaminant concentrations were found in the canister blanks with the following exceptions:

SDG/ Method	Canister Blank ID	Analysis Date	Compound	Concentration	Associated Samples
15275C/ TO-15	1136	06/18/15	Methylene chloride	0.61 ppbv	SVE-01
15275C/ TO-15	1974	07/09/15	Methylene chloride	0.49 ppbv	DP-05-D
15275D/ TO-15	618	07/10/15	Methylene chloride	0.53 ppbv	939-SS-01
15275D/ TO-15	11	08/14/15	Methylene chloride	0.52 ppbv	941-SS-01

SDG/ Method	Canister Blank ID	Analysis Date	Compound	Concentration	Associated Samples
15275D/ TO-15	12	08/14/15	Methylene chloride	0.52 ppbv	OSC-3
15275D/ TO-15	1983	06/24/15	Methylene chloride	0.61 ppbv	DP-01-D

Sample concentrations were compared to concentrations detected in the canister blanks. The sample concentrations were not detected or were significantly greater than the concentrations found in the associated blanks with the following exceptions:

SDG/ Method	Sample	Compound	Reported Concentration	Modified Final Concentration
15275C/ TO-15	SVE-01	Methylene chloride	3.1 ppbv	4.7U ppbv
15275C/ TO-15	DP-05-D	Methylene chloride	1.7 ppbv	2.6U ppbv
15275D/ TO-15	939-SS-01	Methylene chloride	20 ug/m3 (2.29 ppbv)	20U ug/m3
15275D/ TO-15	941-SS-01	Methylene chloride	6 ug/m3 (1.20 ppbv)	6U ug/m3
15275D/ TO-15	OSC-3	Methylene chloride	6 ug/m3 (1.20 ppbv)	6U ug/m3
15275D/ TO-15	DP-01-D	Methylene chloride	3.0 ppbv	3.0U ppbv

VI. Field Blank Samples

No field blanks were identified in these SDGs.

VII. Laboratory Duplicates Sample

Laboratory duplicates (DUP) sample analysis was performed on associated project samples. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the exception of several LCS for VOCs. The associated sample results were qualified as detected estimated (J+/J-) or non-detected estimated (UJ) as applicable. The details regarding the qualification of data are provided in Enclosure I.

IX. Field Duplicate Samples

One field duplicate pair was collected and analyzed for VOCs. The field duplicate result comparisons are provided in Enclosure I.

X. Internal Standards

All internal standard areas and retention times were within QC limits

XI. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compounds reported below the RL as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosures I and II.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in these SDGs.

Due to initial calibration %RSD, data were qualified as estimated in seven samples.

Due to initial calibration verification %D, data were qualified as estimated in one sample.

Due to continuing calibration %D and LCS %R, data were qualified as estimated in eleven samples.

Due to results below the RL, data were qualified as estimated in six samples.

Due to laboratory blank contamination, data were qualified as not detected in fifteen samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Data flags are summarized and are presented as Attachment 2

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
30-Sep-2015	SVE-01	1510004-01	N	None	TO-15	III
30-Sep-2015	SVE-03	1510004-03	N	None	TO-15	IV
30-Sep-2015	SVE-03DUP	B15J055-DUP1	DUP	None	TO-15	IV
30-Sep-2015	SVE-02	1510004-02	N	None	TO-15	III
30-Sep-2015	SVE-04-A	1510004-04	N	None	TO-15	III
30-Sep-2015	SVE-04-B	1510004-05	FD	None	TO-15	III
30-Sep-2015	DP-05-S	1510004-06	N	None	TO-15	IV
30-Sep-2015	DP-05-D	1510004-07	N	None	TO-15	III
30-Sep-2015	DP-06-S	1510004-08	N	None	TO-15	III
30-Sep-2015	DP-06-D	1510004-09	N	None	TO-15	III
01-Oct-2015	931-SS-01	1510005-01	N	None	TO-15	III
01-Oct-2015	939-SS-02	1510005-02	N	None	TO-15	III
01-Oct-2015	939-SS-01	1510005-03	N	None	TO-15	III
01-Oct-2015	941-SS-01	1510005-04	N	None	TO-15	III
01-Oct-2015	OSC-3	1510005-05	N	None	TO-15	III
01-Oct-2015	OSC-3DUP	B15J036-DUP2	DUP	None	TO-15	III
01-Oct-2015	DP-01-D	1510005-06	N	None	TO-15	III

III = EPA Level 3 Data Review *N = Normal Sample* *TB = Trip Blank* *MS = Matrix Spike*
IV = EPA Level 4 Data Validation *FD = Field Duplicate* *FB = Field Blank* *MSD = Matrix Spike Duplicate*

Attachment 2
Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: 15275C **Laboratory: FALSE**

EDD Filename: 15275C_VOC_1510004 FINAL_rev **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method Category: **VOA**

Method: **TO-15** ***Matrix:*** **Air**

Sample ID: **DP-05-D** ***Collected:*** **9/30/2015 2:30:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.62**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHYLENE CHLORIDE	1.7	J,C1,Q3,B1	1.3	MDL	2.6	MRL	ppbv	U	Mb

Sample ID: **DP-05-S** ***Collected:*** **9/30/2015 2:26:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.59**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHYLENE CHLORIDE	1.7	J,B1,C1,Q3	1.3	MDL	2.6	MRL	ppbv	U	Mb

Sample ID: **DP-06-D** ***Collected:*** **9/30/2015 2:58:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.6**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHYLENE CHLORIDE	1.7	J,B1,C1,Q3	1.3	MDL	2.6	MRL	ppbv	U	Mb

Sample ID: **DP-06-S** ***Collected:*** **9/30/2015 2:50:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.52**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1,2,2-TETRACHLOROETHANE	2.5	U	1.3	MDL	2.5	MRL	ppbv	UJ	Ccv
METHYLENE CHLORIDE	1.6	J,B1,C1,Q3	1.3	MDL	2.5	MRL	ppbv	U	Mb
TOLUENE	1.4	J,C1,Q2,Q3	1.3	MDL	2.5	MRL	ppbv	J	RI, Lcs, Ccv

Sample ID: **SVE-01** ***Collected:*** **9/30/2015 12:03:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **4.74**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1,2,2-TETRACHLOROETHANE	4.7	U	2.4	MDL	4.7	MRL	ppbv	UJ	Ccv
METHYLENE CHLORIDE	3.1	J,B1,C1,Q3	2.4	MDL	4.7	MRL	ppbv	U	Mb

Sample ID: **SVE-02** ***Collected:*** **9/30/2015 1:35:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.47**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHYLENE CHLORIDE	1.6	J,B1,C1,Q3	1.2	MDL	2.5	MRL	ppbv	U	Mb
TETRACHLOROETHENE	10	J,C4,Q2,Q3	1.2	MDL	2.5	MRL	ppbv	J+	Lcs, Ccv

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275C **Laboratory: FALSE**

EDD Filename: 15275C_VOC_1510004 FINAL_rev **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method Category: **VOA**

Method: **TO-15** ***Matrix:*** **Air**

Sample ID: **SVE-03** ***Collected:*** **9/30/2015 1:22:00 PM** ***Analysis Type:*** **Dilution-01/TOT** ***Dilution:*** **9.92**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TETRACHLOROETHENE	1400	J,Q2,Q3	50	MDL	99	MRL	ppbv	J+	Lcs, Ccv

Sample ID: **SVE-03** ***Collected:*** **9/30/2015 1:22:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **4.22**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1,2,2-TETRACHLOROETHANE	4.2	U	2.1	MDL	4.2	MRL	ppbv	UJ	Ccv
METHYLENE CHLORIDE	2.7	J,B1,C1,Q3	2.1	MDL	4.2	MRL	ppbv	U	Mb
TRICHLOROETHENE	4.0	J,C1	2.1	MDL	4.2	MRL	ppbv	J	RI

Sample ID: **SVE-04-A** ***Collected:*** **9/30/2015 1:58:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.55**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1,2,2-TETRACHLOROETHANE	2.6	U	1.3	MDL	2.6	MRL	ppbv	UJ	Ccv
METHYLENE CHLORIDE	2.1	J,C1	1.3	MDL	2.6	MRL	ppbv	U	Mb
TETRACHLOROETHENE	32	J,Q2,Q3	1.3	MDL	2.6	MRL	ppbv	J+	Lcs, Ccv

Sample ID: **SVE-04-B** ***Collected:*** **9/30/2015 1:58:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **4.72**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2,4-TRICHLOROBENZENE	4.7	J,U,C3	2.4	MDL	4.7	MRL	ppbv	UJ	IcRsd
METHYLENE CHLORIDE	5.0	J,B1,C3,Q2,Q3	2.4	MDL	4.7	MRL	ppbv	UJ	Lcs, Mb, IcRsd, Icv

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275C **Laboratory: FALSE**

EDD Filename: 15275C_VOC_1510004 FINAL_rev **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Reason Code Legend

Reason Code	*Description*
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
Ccv	Continuing Calibration Verification Percent Difference Upper Estimation
IcRsd	Initial Calibration Percent Relative Standard Deviation
Icv	Initial Calibration Verification Percent Difference Lower Estimation
Lcs	Laboratory Control Spike Lower Estimation
Lcs	Laboratory Control Spike Upper Estimation
Mb	Method Blank Contamination
RI	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_SS_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SS_102215**

Method Category: VOA

Method: TO-15 **Matrix:** Air

Sample ID: **931-SS-01** ***Collected:*** **10/1/2015 11:15:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.62**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,3-DICHLOROBENZENE	20	J,U,Q2	8	MDL	20	MRL	ug/m^3	UJ	Lcs
M&P-XYLENE	10	J,C1	10	MDL	20	MRL	ug/m^3	J	RI
METHYLENE CHLORIDE	10	J,B1,C3,Q3	5	MDL	9	MRL	ug/m^3	UJ	Mb, IcRsd
1,2,4-TRICHLOROBENZENE	20	J,U,C4	10	MDL	20	MRL	ug/m^3	UJ	IcRsd, Ccv

Sample ID: **939-SS-01** ***Collected:*** **10/1/2015 12:21:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.46**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2,4-TRICHLOROBENZENE	20	J,U,C4	9	MDL	20	MRL	ug/m^3	UJ	IcRsd, Ccv
1,3-DICHLOROBENZENE	10	J,U,Q2	7	MDL	10	MRL	ug/m^3	UJ	Lcs
METHYLENE CHLORIDE	20	J,B1,C3,Q3	4	MDL	9	MRL	ug/m^3	UJ	Mb, IcRsd
TOLUENE	7	J,C1	5	MDL	9	MRL	ug/m^3	J	RI

Sample ID: **939-SS-02** ***Collected:*** **10/1/2015 12:08:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.53**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2,4-TRICHLOROBENZENE	20	J,U,C4	9	MDL	20	MRL	ug/m^3	UJ	IcRsd, Ccv
1,3-DICHLOROBENZENE	20	J,U,Q2	8	MDL	20	MRL	ug/m^3	UJ	Lcs
METHYLENE CHLORIDE	10	J,B1,C3,Q3	4	MDL	9	MRL	ug/m^3	UJ	Mb, IcRsd

Sample ID: **941-SS-01** ***Collected:*** **10/1/2015 1:23:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.49**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2,4-TRICHLOROBENZENE	10	J,U,C4	6	MDL	10	MRL	ug/m^3	UJ	IcRsd, Ccv
1,3-DICHLOROBENZENE	9	J,U,Q2	4	MDL	9	MRL	ug/m^3	UJ	Lcs
METHYLENE CHLORIDE	6	J,B1,C3,Q3	3	MDL	5	MRL	ug/m^3	UJ	Mb, IcRsd
TETRACHLOROETHENE	8	J,C1	5	MDL	10	MRL	ug/m^3	J	RI

Sample ID: **OSC-3** ***Collected:*** **10/1/2015 1:35:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.48**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2,4-TRICHLOROBENZENE	10	J,U,C4	5	MDL	10	MRL	ug/m^3	UJ	IcRsd, Ccv
1,3-DICHLOROBENZENE	9	J,U,Q2	4	MDL	9	MRL	ug/m^3	UJ	Lcs
METHYLENE CHLORIDE	6	J,B1,C3,Q3,Q5	3	MDL	5	MRL	ug/m^3	UJ	Mb, IcRsd

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_SS_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SS_102215**

Method Category: **VOA**

Method: **TO-15** ***Matrix:*** **Air**

Sample ID: **OSC-3** ***Collected:*** **10/1/2015 1:35:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1.48**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
TRICHLOROETHENE	6	J,C1	4	MDL	8	MRL	ug/m^3	J	RI

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_SS_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SS_102215**

Reason Code Legend

Reason Code	*Description*
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
IcRsd	Initial Calibration Percent Relative Standard Deviation
Lcs	Laboratory Control Spike Lower Estimation
Ld	Laboratory Duplicate Precision
Mb	Method Blank Contamination
RI	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_DP_1510005 FINAL_rev **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method Category: **VOA**

Method: **TO-15** ***Matrix:*** **Air**

Sample ID: **DP-01-D** ***Collected:*** **10/1/2015 1:50:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **2.59**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
1,3-DICHLOROBENZENE	2.6	J,U,Q2	1.3	MDL	2.6	MRL	ppbv	UJ	Lcs
METHYLENE CHLORIDE	3.0	J,B1,C3,Q3	1.3	MDL	2.6	MRL	ppbv	UJ	Mb, IcRsd
1,2,4-TRICHLOROBENZENE	2.6	J,U,C4	1.3	MDL	2.6	MRL	ppbv	UJ	IcRsd, Ccv

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Data Qualifier Summary

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_DP_1510005 FINAL_rev **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Reason Code Legend

Reason Code	*Description*
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
IcRsd	Initial Calibration Percent Relative Standard Deviation
Lcs	Laboratory Control Spike Lower Estimation
Mb	Method Blank Contamination

* denotes a non-reportable result

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Enclosure I

EPA Level III ADR Outliers

(Including Manual Review Outliers)

Quality Control Outlier Reports

15275C

Method Blank Outlier Report

Lab Reporting Batch ID: 15275C **Laboratory: FALSE**

EDD Filename: 15275C_VOC_1510004 FINAL **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method: **TO-15**
Matrix: **Air**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
B15J051-BLK1	10/8/2015 3:09:00 PM	METHYLENE CHLORIDE	0.7 ppbv	DP-05-D DP-05-S DP-06-D SVE-02
B15J055-BLK1	10/9/2015 1:36:00 PM	METHYLENE CHLORIDE	0.6 ppbv	DP-06-S SVE-01 SVE-03 SVE-04-A
B15J069-BLK1	10/13/2015 4:06:00 PM	METHYLENE CHLORIDE	1.1 ppbv	SVE-04-B

The following samples and their listed target analytes were qualified due to contamination reported in this blank

Sample ID	Analyte	Reported Result	Modified Final Result
DP-05-D(Initial/TOT)	METHYLENE CHLORIDE	1.7 ppbv	2.6U ppbv
DP-05-S(Initial/TOT)	METHYLENE CHLORIDE	1.7 ppbv	2.6U ppbv
DP-06-D(Initial/TOT)	METHYLENE CHLORIDE	1.7 ppbv	2.6U ppbv
DP-06-S(Initial/TOT)	METHYLENE CHLORIDE	1.6 ppbv	2.5U ppbv
SVE-01(Initial/TOT)	METHYLENE CHLORIDE	3.1 ppbv	4.7U ppbv
SVE-02(Initial/TOT)	METHYLENE CHLORIDE	1.6 ppbv	2.5U ppbv
SVE-03(Initial/TOT)	METHYLENE CHLORIDE	2.7 ppbv	4.2U ppbv
SVE-04-A(Initial/TOT)	METHYLENE CHLORIDE	2.1 ppbv	2.6U ppbv
SVE-04-B(Initial/TOT)	METHYLENE CHLORIDE	5.0 ppbv	5.0U ppbv

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 15275C **Laboratory: FALSE**

EDD Filename: 15275C_VOC_1510004 FINAL **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method: TO-15
Matrix: Air

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
B15J051 -BS1 (DP-05-D DP-05-S DP-06-D SVE-02)	TETRACHLOROETHENE TOLUENE	134 134	- -	73.00-130.00 78.00-133.00	- -	TETRACHLOROETHENE TOLUENE	J+ (all detects)
B15J055 -BS1 (DP-06-S SVE-01 SVE-03 SVE-04-A)	TETRACHLOROETHENE TOLUENE	140 142	- -	73.00-130.00 78.00-133.00	- -	TETRACHLOROETHENE TOLUENE	J+(all detects)
B15J069 -BS1 (SVE-04-B)	METHYLENE CHLORIDE	72	-	73.00-116.00	-	METHYLENE CHLORIDE	J-(all detects) UJ(all non-detects)

Reporting Limit Outliers

Lab Reporting Batch ID: 15275C **Laboratory: FALSE**

EDD Filename: 15275C_VOC_1510004 FINAL **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method: **TO-15**

Matrix: **Air**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
DP-05-D	METHYLENE CHLORIDE	J,C1, Q3,B1	1.7	2.6	MRL	ppbv	J (all detects)
DP-05-S	METHYLENE CHLORIDE	J,B1,C 1,Q3	1.7	2.6	MRL	ppbv	J (all detects)
DP-06-D	METHYLENE CHLORIDE	J,B1,C 1,Q3	1.7	2.6	MRL	ppbv	J (all detects)
DP-06-S	METHYLENE CHLORIDE TOLUENE	J,B1,C 1,Q3 J,C1, Q2,Q3	1.6 1.4	2.5 2.5	MRL MRL	ppbv ppbv	J (all detects)
SVE-01	METHYLENE CHLORIDE	J,B1,C 1,Q3	3.1	4.7	MRL	ppbv	J (all detects)
SVE-02	METHYLENE CHLORIDE	J,B1,C 1,Q3	1.6	2.5	MRL	ppbv	J (all detects)
SVE-03	METHYLENE CHLORIDE TRICHLOROETHENE	J,B1,C 1,Q3 J,C1	2.7 4.0	4.2 4.2	MRL MRL	ppbv ppbv	J (all detects)
SVE-04-A	METHYLENE CHLORIDE	J,C1	2.1	2.6	MRL	ppbv	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 15275C **Laboratory: FALSE**

EDD Filename: 15275C_VOC_1510004 FINAL_rev **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method: TO-15
Matrix: Air

Analyte	Concentration (ppbv)		Sample RPD	eQAPP RPD	Flag
	SVE-04-A	SVE-04-B			
CHLOROFORM	36	30	18	1.00	No Qualifiers Applied
METHYLENE CHLORIDE	2.1	5.0	82	1.00	
TETRACHLOROETHENE	32	30	6	1.00	

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

LDC #: 35227A48 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/29/15
SDG #: 15275C ADR/~~Level~~IV Page: 1 of 1
Laboratory: USEPA Region 9 Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	N, N	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW, SW	RSD ≤ 30 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks / Canister BLK	N/SW	Not reviewed for ADR validation.
VI.	Field blanks		
VII.	Surrogate spikes		Not reviewed for ADR validation.
VIII.	Matrix spike/Matrix spike duplicates		Not reviewed for ADR validation.
IX.	Laboratory control samples		Not reviewed for ADR validation.
X.	Field duplicates		FD-(4, 5)
XI.	Internal standards	A	Not reviewed for ADR validation.
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for ADR validation.
XIII.	Target compound identification		Not reviewed for ADR validation.
XIV.	System performance		Not reviewed for ADR validation.
XV.	Overall assessment of data		Not reviewed for ADR validation.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1 2	SVE-01	1510004-01	Air	09/30/15
2 1	SVE-02	1510004-02	Air	09/30/15
3 2	SVE-03**	1510004-03**	Air	09/30/15
4 2	SVE-04-A	1510004-04	Air	09/30/15
5 3	SVE-04-B	1510004-05	Air	09/30/15
6 1	DP-05-S**	1510004-06**	Air	09/30/15
7 1	DP-05-D	1510004-07	Air	09/30/15
8 2	DP-06-S	1510004-08	Air	09/30/15
9 1	DP-06-D	1510004-09	Air	09/30/15
10 2	SVE-03DUP	1510004-03DUP	Air	09/30/15
11				
12 1	B15J051			
13 2	B15J055			
3	B15J069			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 35027A48

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: SK
2nd Reviewer: MC

METHOD: GC/MS VOA (EPA Method TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?

Y N N/A Were all percent relative standard deviations (%RSD) ≤ 30%?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	10/12/15	10L	Dichloromethane	49.45	5 (dut)	J/UJ/P
			KKK	33.48	(ND)	↓

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Page: 1 of 1
Reviewer: SR
2nd Reviewer: TPL

METHOD: GC/MS VOA (EPA Method TO15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?

Y N N/A Were all %D within the validation criteria of ≤30 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/12/15	101215N08	Dichloromethane	32	5 (det)	J-/UJ/P
			HHH	44	(ND)	J+ dets/P
			KKK	75	↓	↓

ICV.wpd

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: R
2nd Reviewer: AKL

METHOD: GC/MS VOA (EPA Method TO-15)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?
Y N N/A Were all percent differences (%D) ≤ 30%?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/8/15	100815K024	CC	34.1	2, 6, 7, 9	J+ defs/P (ND)
			AA	34.4		(2 det)
	10/9/15	100915K04	CC	31.2	1, 3, 4, 8	J+ defs/P (8 det)
			AA	30.1		(3,4 det)
			BB	30.1		J-/UJ/P (ND)

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Canister Check Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: AAL

METHOD: GC/MS VOA (EPA TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y/N N/A Was there contamination in the canister blanks? If yes, please see the qualifications below.

Blank analysis date: 6/18/15
Conc. units: ppbv Associated Samples: 1

Compound	Canister ID	Sample Identification								
	1136	1								
Dichloromethane	0.61	3.1/4.7U								

Blank analysis date: 7/9/15
Conc. units: ppbv Associated Samples: 7

Compound	Canister ID	Sample Identification								
	1974	7								
Dichloromethane	0.49	1.7/2.6U								

Blank analysis date:
Conc. units: Associated Samples:

Compound	Canister ID	Sample Identification								
	lab indicated that Restek TO-15 std mixes used have									
	0.5 ppbv Dichloromethane									

CANBLNK.15A

Quality Control Outlier Reports

15275D

Method Blank Outlier Report

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_SS_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SS_102215**

Method: **TO-15**
Matrix: **Air**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
B15J036-BLK1	10/7/2015 11:35:00 AM	METHYLENE CHLORIDE	4 ug/m^3	931-SS-01 939-SS-01 939-SS-02 941-SS-01 OSC-3

The following samples and their listed target analytes were qualified due to contamination reported in this blank

Sample ID	Analyte	Reported Result	Modified Final Result
931-SS-01(Initial/TOT)	METHYLENE CHLORIDE	10 ug/m^3	10U ug/m^3
939-SS-01(Initial/TOT)	METHYLENE CHLORIDE	20 ug/m^3	20U ug/m^3
939-SS-02(Initial/TOT)	METHYLENE CHLORIDE	10 ug/m^3	10U ug/m^3
941-SS-01(Initial/TOT)	METHYLENE CHLORIDE	6 ug/m^3	6U ug/m^3
OSC-3(Initial/TOT)	METHYLENE CHLORIDE	6 ug/m^3	6U ug/m^3

Method Blank Outlier Report

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_DP_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method: **TO-15**
Matrix: **Air**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
B15J036-BLK1	10/7/2015 11:35:00 AM	METHYLENE CHLORIDE	1.1 ppbv	DP-01-D

The following samples and their listed target analytes were qualified due to contamination reported in this blank

Sample ID	Analyte	Reported Result	Modified Final Result
DP-01-D(Initial/TOT)	METHYLENE CHLORIDE	3.0 ppbv	3.0U ppbv

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_SS_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SS_102215**

Method: **TO-15**
Matrix: **Air**

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
B15J036-BS1 (931-SS-01 939-SS-01 939-SS-02 941-SS-01 OSC-3)	1,3-DICHLOROBENZENE	78	-	79.00-124.00	-	1,3-DICHLOROBENZENE	J- (all detects) UJ (all non-detects)

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_DP_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SVMSVE_102215**

Method: **TO-15**
Matrix: **Air**

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
B15J036 -BS1 (DP-01-D)	1,3-DICHLOROBENZENE	78	-	79.00-124.00	-	1,3-DICHLOROBENZENE	J- (all detects) UJ (all non-detects)

Lab Duplicate Outlier Report

Lab Reporting Batch ID: 15275D

Laboratory: FALSE

EDD Filename: 15275D_VOC_SS_1510005 FINAL

eQAPP Name: Rore_Modesto_Rebound_SS_102215

Method: TO-15
Matrix: Air

QC Sample ID (Associated Sample ID)	Analyte	Sample RPD	eQAPP RPD	Flag
OSC-3DUP (OSC-3)	METHYLENE CHLORIDE	46	20.00	No Qual, OK by Difference
	TETRACHLOROETHENE	27	20.00	

Project Name and Number: R15S07 - Modesto FY2015 Rebound Study

Reporting Limit Outliers

Lab Reporting Batch ID: 15275D **Laboratory: FALSE**

EDD Filename: 15275D_VOC_SS_1510005 FINAL **eQAPP Name: Rore_Modesto_Rebound_SS_102215**

Method: **TO-15**

Matrix: **Air**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
931-SS-01	M&P-XYLENE	J,C1	10	20	MRL	ug/m^3	J (all detects)
939-SS-01	TOLUENE	J,C1	7	9	MRL	ug/m^3	J (all detects)
941-SS-01	TETRACHLOROETHENE	J,C1	8	10	MRL	ug/m^3	J (all detects)
OSC-3	TRICHLOROETHENE	J,C1	6	8	MRL	ug/m^3	J (all detects)

LDC #: 35227B48 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/29/15
SDG #: 15275D ADR/~~Level IV~~ Page: 1 of 1
Laboratory: USEPA Region 9 Laboratory Reviewer: M
2nd Reviewer: ARL

METHOD: GC/MS Volatiles (Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	N, N	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW, A	RSD ≤ 30 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks / Canister Blk	N / SW	Not reviewed for ADR validation.
VI.	Field blanks		
VII.	Surrogate spikes		Not reviewed for ADR validation.
VIII.	Matrix spike/Matrix spike duplicates		Not reviewed for ADR validation.
IX.	Laboratory control samples		Not reviewed for ADR validation.
X.	Field duplicates		
XI.	Internal standards	A	Not reviewed for ADR validation.
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for ADR validation.
XIII.	Target compound identification		Not reviewed for ADR validation.
XIV.	System performance		Not reviewed for ADR validation.
XV.	Overall assessment of data		Not reviewed for ADR validation.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	931-SS-01 ug/m3	1510005-01	Air	10/01/15
2	939-SS-02	1510005-02	Air	10/01/15
3	939-SS-01	1510005-03	Air	10/01/15
4	941-SS-01	1510005-04	Air	10/01/15
5	OSC-3	1510005-05	Air	10/01/15
6	DP-01-D ppbv	1510005-06	Air	10/01/15
7	OSC-3DUP	1510005-05DUP	Air	10/01/15
8				
9				
10				
11				
12				
13	B15J036			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 35227B48

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Reviewer: SC
2nd Reviewer: MR

METHOD: GC/MS VOA (EPA Method TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?

Y N N/A Were all percent relative standard deviations (%RSD) ≤ 30%?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/6/15	ICAL	Dichloromethane	39.92	All (dets)	J/UJ/P
			KKK	39.92		

LDC #: 35227B48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: 8
2nd Reviewer: MPL

METHOD: GC/MS VOA (EPA Method TO-15)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?
Y N N/A Were all percent differences (%D) ≤ 30%?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	10/7/15	100715N02	KKK	37.8	All (ND)	J-/UJ/P

LDC #: 35227B48

VALIDATION FINDINGS WORKSHEET
Canister Check Blanks

Reviewer: A
2nd Reviewer: APL

METHOD: GC/MS VOA (EPA TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was there contamination in the canister blanks? If yes, please see the qualifications below.

Blank analysis date: 7/10/15
Conc. units: ppbv Associated Samples: 3

Compound	Canister ID	Sample Identification								
	618	3*	3							
Dichloromethane	0.53	~~1.37~~ 2.29 ppbv	20/U	ug/m3						

Blank analysis date: 8/14/15
Conc. units: ppbv Associated Samples: 4

Compound	Canister ID	Sample Identification								
	11	4*	4							
Dichloromethane	0.52	1.20 ppbv	6/U	ug/m3						

Blank analysis date: 8/14/15
Conc. units: ppbv Associated Samples: 5

Compound	Canister ID	Sample Identification								
	12	5*	5							
Dichloromethane	0.52	1.20 ppbv	6/U	ug/m3						
	Lab indicated that peak is trace mixed have 0.5 ppbv dichloromethane									

CANBLNK.15A

* pic - DF & unit corr

LDC #: 35227B48

VALIDATION FINDINGS WORKSHEET
Canister Check Blanks

Reviewer: [illegible]
2nd Reviewer: AR

METHOD: GC/MS VOA (EPA TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was there contamination in the canister blanks? If yes, please see the qualifications below.

Blank analysis date: 6/24/15
Conc. units: ppbv Associated Samples: 6

Compound	Canister ID	Sample Identification								
	1983	6		6*						
Dichloromethane	0.61	3.0/4	~~ug/m3~~ ppbv	1.17 ppbv						

Blank analysis date:
Conc. units: Associated Samples:

Compound	Canister ID	Sample Identification								

Blank analysis date:
Conc. units: Associated Samples:

Compound	Canister ID	Sample Identification								

Enclosure II

EPA Level IV Data Validation Reports

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Modesto FY2015

LDC Report Date: November 2, 2015

Parameters: Volatiles

Validation Level: Level IV

Laboratory: USEPA Region 9 Laboratory

Sample Delivery Group (SDG): 15275C

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
SVE-03	1510004-03	Air	09/30/15
DP-05-S	1510004-06	Air	09/30/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method TO-15

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

The canisters were properly pressurized and handled.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 24 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/08/15	Toluene Tetrachloroethene	34.1 34.4	DP-05-S	NA	-
10/09/15	Toluene	31.2	SVE-03	NA	-
10/09/15	Tetrachloroethene	30.1	SVE-03	J+ (all detects)	P
10/09/15	1,1,2,2-Tetrachloroethane	30.1	SVE-03	UJ (all non-detects)	P

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analysis Date	Compound	Concentration	Associated Samples
B15J051-BLK1	10/08/15	Methylene chloride	0.7 ppbv	DP-05-S
B15J055-BLK1	10/09/15	Methylene chloride	0.6 ppbv	SVE-03

Canister blank analyses were performed for every sample canister. No contaminants were found in the canister blanks.

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
DP-05-S	Methylene chloride	1.7 ppbv	2.6U ppbv
SVE-03	Methylene chloride	2.7 ppbv	4.2U ppbv

The laboratory indicated that the Restek internal standard stock mixes used have 0.5 ppbv of Methylene chloride.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Duplicates

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	%R (Limits)	Flag	A or P
B15J051-BS1 (DP-05-S)	Toluene Tetrachloroethene	134 (78-133) 134 (73-130)	NA	-
B15J055-BS1 (SVE-03)	Toluene	142 (78-133)	NA	-

LCS ID (Associated Samples)	Compound	%R (Limits)	Flag	A or P
B15J055-BS1 (SVE-03)	Tetrachloroethene	140 (73-130)	J+ (all detects)	P

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 15275C	All compounds reported below the RL.	J (all detects)	A

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to continuing calibration %D, LCS %R, and results below the RL, data were qualified as estimated in two samples.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Modesto FY2015
Volatiles - Data Qualification Summary - SDG 15275C

Sample	Compound	Flag	A or P	Reason
SVE-03	Tetrachloroethene	J+ (all detects)	P	Continuing calibration (%D)
SVE-03	1,1,2,2-Tetrachloroethane	UJ (all non-detects)	P	Continuing calibration (%D)
SVE-03	Tetrachloroethene	J+ (all detects)	P	Laboratory control samples (%R)
SVE-03 DP-05-S	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Modesto FY2015
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15275C

Sample	Compound	Modified Final Concentration	A or P
DP-05-S	Methylene chloride	2.6U ppbv	A
SVE-03	Methylene chloride	4.2U ppbv	A

Modesto FY2015
Volatiles - Field Blank Data Qualification Summary - SDG 15275C

No Sample Data Qualified in this SDG

LDC #: 35227A48 **VALIDATION COMPLETENESS WORKSHEET** Date: 10/29/15
SDG #: 15275C ADR/Level IV Page: 1 of 1
Laboratory: USEPA Region 9 Laboratory Reviewer: SL
2nd Reviewer: AM

METHOD: GC/MS Volatiles (Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 30 IC/≤30
IV.	Continuing calibration	SW A	CC/≤30
V.	Laboratory Blanks /Canister BLK	SW/~~SW~~ A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	~~Matrix spike/Matrix spike~~ Laboratory duplicates	A	
IX.	Laboratory control samples	SW	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	~~SVE-01~~	1510004-01	Air	09/30/15
2	~~SVE-02~~	1510004-02	Air	09/30/15
3 2	SVE-03**	1510004-03**	Air	09/30/15
4	~~SVE-04-A~~	1510004-04	Air	09/30/15
5	~~SVE-04-B~~	1510004-05	Air	09/30/15
6 1	DP-05-S**	1510004-06**	Air	09/30/15
7	~~DP-05-D~~	1510004-07	Air	09/30/15
8	DP-06-S	1510004-08	Air	09/30/15
9	~~DP-06-D~~	1510004-09	Air	09/30/15
10	SVE-03DUP	1510004-03DUP	Air	09/30/15
11				
12 1	B15J051-BLK1			
13 2	B15J055-BLK1			

LDC #: 35227A48

VALIDATION FINDINGS CHECKLIST

Reviewer: JR
2nd Reviewer: APL

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was canister pressure criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 24 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30%?	✓			
IIIb. Initial calibration verificattion				
Was an initial calibration verification standard analyzed after every ICAL for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?		✓		
V. Laboratory Blanks/Canister Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 24 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
Was a canister blank analyzed for every canister?	✓			
Was there contamination in the canister blanks? If yes, please see the Canister Blanks validation completeness worksheet.		✓		
VI. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes (Optional)				
Were all surrogate percent recoveries (%R) within QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Laboratory Duplicate				
Was a laboratory duplicate analyzed for this SDG?	✓			
Were the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 35227A48

VALIDATION FINDINGS CHECKLIST

Reviewer: 8
2nd Reviewer: APC

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within ± 40% from the associated calibration standard?	✓			
Were retention times within ± 20.0 seconds from the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: [illegible]
2nd Reviewer: MML

METHOD: GC/MS VOA (EPA Method TO-15)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?
Y N N/A Were all percent differences (%D) ≤ 30%?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	10/8/15	100815K024	CC	34.1	6 (ND)	J+ all/P
		"	AA	34.4		
	10/9/15	100915K04	CC	31.2	3 (ND)	
			AA	30.1	(all)	
			BD	30.1	(ND)	J-/UJ/P

CONCAL.wpd

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: K
2nd Reviewer: ABL

METHOD: GC/MS VOA (EPA TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 10/8/15
Conc. units: ppbv
Associated Samples: 6

Compound	Blank ID	Sample Identification								
BIS	J051-BLK1	6								
Dichloromethane	0.7	1.7/2.6 U								
RL										

Blank analysis date: 10/9/15
Conc. units: ppbv
Associated Samples: 3

Compound	Blank ID	Sample Identification								
BIS	J055-BLK1	3								
Dichloromethane	0.6	2.7/4.2 U								
		The lab indicated that the Restek IS stock mixed used have								
RL		0.5 ppbv dichloromethane (text)								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		B15J051-BS1	CC	134 (73-133)	( )	( )	6 (ND)	J+ detects/P
			AA	134 (73-130)	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		B15J055-BS1	CC	142 (73-133)	( )	( )	3 (ND)	
			AA	140 (73-130)	( )	( )	(det)	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 35227848

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: SR
2nd Reviewer: AVL

METHOD: GC/MS VOA (EPA Method TO-15)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/7/15	C (1st internal standard)	0.704	0.704	0.683	0.683	6.45	6.43
			V (2nd internal standard)	0.942	0.942	0.892	0.892	6.58	6.58
			AA (3rd internal standard)	0.490	0.490	0.515	0.515	11.17	11.18
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: R
2nd Reviewer: ARL

METHOD: GC/MS VOA (EPA TO-15)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	100815C04	10/8/15	C (1st internal standard)	0.683	0.619	0.619	9.4	9.4
			V (2nd internal standard)	0.892	0.771	0.771	13.6	13.5
			AA (3rd internal standard)	0.515	0.692	0.692	34.4	34.4
2	100915C04	10/9/15	C (1st internal standard)	0.683	0.582	0.582	14.8	14.7
			V (2nd internal standard)	0.892	0.728	0.728	18.4	18.4
			AA (3rd internal standard)	0.515	0.670	0.670	30.1	30.1
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 35227A48

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd reviewer: ATL

METHOD: GC/MS VOA (EPA Method TO-15)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 6, Dichloromethane

Conc. = $\frac{(57887)(20)(2.59)}{(1718324)(1.011)(\quad)(\quad)}$

= 1.7 ppbv

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

RORE, Inc.
5151 Shoreham Place, Suite 260
San Diego, CA 92122
ATTN: Mr. John McGuire

November 11, 2015

SUBJECT: Modesto October 2015 GW Monitoring, Data Validation

Dear Mr. McGuire,

Enclosed is the final validation report for the fraction listed below. This SDG was received on October 28, 2015. Attachment 1 is a summary of the sample that was reviewed for each analysis.

LDC Project #35287:

SDG #	**Fraction**
15280B	Volatiles

The data validation was performed under EPA Level III & IV guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008

Please feel free to contact us if you have any questions.

Sincerely,

Andrea Leasure
Project Manager/Chemist

1202 pages-EM/SF

Attachment 1

ADR/IV 90/10

LDC #35287 (Rore Inc.-San Diego, CA / Modesto October 2015 GW Monitoring)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (524.2)																													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	15280B	10/28/15	11/18/15	45	0																												
A	15280B	10/28/15	11/18/15	5	0																												
Total	A/AL			50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50

Shaded cells indicate Level IV validation (all other cells are ADR validation). These sample counts do not include MS/MSD, and DUPs

L:\Rore\Modesto\35287ST.wpd

Data Validation Report
Modesto October 2015 GW Monitoring

SDG: 15280B

Prepared for

Rore, Inc.
5151 Shoreham Place, Suite 260
San Diego, CA 92122

Prepared by

Laboratory Data Consultants, Inc.
2701 Loker Ave West, Suite 220
Carlsbad, CA 92010

November 11, 2015

INTRODUCTION

This Data Validation Report (DVR) presents EPA Level III and EPA Level IV data validation results for samples collected during the October 2015 sampling period. Data validation was performed in accordance with the US EPA *Contract Laboratory Program National Functional Guidelines* (CLPNFGs) *for Superfund Organic Methods Data Review* (June 2008). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

The sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. EPA Level III Automated Data Review outliers are presented in Enclosure I. DVRs for samples on which EPA Level IV validation was performed are presented in Enclosure II.

All sample results were subjected to EPA Level III data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, initial and continuing calibrations, laboratory blanks, surrogates, matrix spike/matrix spike duplicates (MS/MSD), laboratory control sample (LCS), and internal standards. Approximately 10 percent of samples were subjected to EPA Level IV evaluation as indicated in Attachment 1, which comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013) with exception of the calibrations and internal standards, which were validated manually. Quality assurance (QA)/QC criteria specified in the CLPNFGs were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not applicable): Data did not warrant qualification since detected results only are affected and the compound was not detected in the associated samples.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt & Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the exception of two samples for VOCs. The associated aromatic compound results were qualified as non-detected estimated (UJ). The details regarding the qualification of data are provided in Enclosure I.

II. Instrument Performance Check

Instrument performance was checked at the frequency required by the method.

All criteria for the instrument performance check were met.

III. Initial Calibration and Initial Calibration Verification

All criteria for the initial calibration and initial calibration verifications of each method were met.

IV. Continuing Calibration

All criteria for the continuing calibration verifications of each method were met with the following exceptions:

SDG/ Method	Date	Compound	%D (Limits)	Associated Samples	Flag	A or P
15280B/ 524.2	10/08/15	Dichlorodifluoromethane	45.6 (≤30)	MW-10C MW-11A MW-12A MW-13A MW-14A MW-15A MW-16A MW-16B MW-16C MW-17A MW-18A MW-19A MW-19B1 MW-20C MW-32B	NA	-
15280B/ 524.2	10/09/15	Dichlorodifluoromethane	40.8 (≤30)	MW-17B MW-17C MW-20B MW-21A MW-22A MW-23A MW-24B MW-25B MW-26B MW-27B MW-28B MW-29B MW-30A	NA	-
15280B/ 524.2	10/09/15	Dichlorodifluoromethane	40.8 (≤30)	MW-20A	J+ (all detects)	P

V. Laboratory Blanks

Laboratory blanks were performed as required by the method. No contaminant concentrations were detected in the laboratory blanks with the exception of one blank for acetone. The associated sample results were not detected or were significantly greater than the concentrations found in the blanks, therefore no data were qualified. The details are presented in Enclosure I.

VI. Field Blank

No field blanks were identified in this SDG.

VII. Surrogate

All surrogate recoveries (%R) were within QC limits with the exception of one sample for VOCs. The associated sample results were qualified as detected estimated (J+) as applicable. The details regarding the qualification of data are provided in Enclosures I and II.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on associated project samples. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the exception of several MS/MSD pairs for several VOCs. In instances where the sample concentration was significantly greater than the spiked amount or high %R where the results were non-detected, no data were qualified. The remainder of the data were qualified as detected estimated (J/J+) or non-detected estimated (UJ) as applicable. The details regarding the qualification of data are provided in Enclosure I.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the exception of several LCS for VOCs. The associated sample results were qualified as detected estimated (J+/J-) or non-detected estimated (UJ) as applicable. The details regarding the qualification of data are provided in Enclosures I and II.

X. Field Duplicate

No field duplicate samples were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compounds reported below the RL as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosures I and II.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to holding time exceedances and MS/MSD %R and RPD, data were qualified as estimated in two samples.

Due to continuing calibration %D and surrogate %R, data were qualified as estimated in one sample.

Due to LCS %R, data were qualified as estimated in twenty-two samples.

Due to results below the RL, data were qualified as estimated in thirty-four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Data flags are summarized and are presented as Attachment 2

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
01-Oct-2015	MW-02A	1510013-02	N	5030B	524.2	III
01-Oct-2015	MW-03A	1510013-03	N	5030B	524.2	III
01-Oct-2015	MW-03AMS	B15J040-MS2	MS	5030B	524.2	III
01-Oct-2015	MW-03AMSD	B15J040-MSD2	MSD	5030B	524.2	III
01-Oct-2015	MW-11A	1510013-15	N	5030B	524.2	IV
01-Oct-2015	EW-01R	1510013-49	N	5030B	524.2	III
01-Oct-2015	MW-13A	1510013-17	N	5030B	524.2	III
01-Oct-2015	MW-30A	1510013-41	N	5030B	524.2	III
01-Oct-2015	MW-30B	1510013-42	N	5030B	524.2	III
01-Oct-2015	MW-23A	1510013-34	N	5030B	524.2	III
01-Oct-2015	MW-17B	1510013-24	N	5030B	524.2	III
01-Oct-2015	MW-29B	1510013-40	N	5030B	524.2	IV
01-Oct-2015	MW-35B	1510013-48	N	5030B	524.2	III
01-Oct-2015	MW-35BMS	B15J062-MS1	MS	5030B	524.2	III
01-Oct-2015	MW-35BMSD	B15J062-MSD1	MSD	5030B	524.2	III
01-Oct-2015	MW-31A	1510013-43	N	5030B	524.2	III
01-Oct-2015	MW-32B	1510013-44	N	5030B	524.2	III
01-Oct-2015	MW-32BMS	B15J048-MS1	MS	5030B	524.2	III
01-Oct-2015	MW-32BMSD	B15J048-MSD1	MSD	5030B	524.2	III
01-Oct-2015	MW-34B	1510013-47	N	5030B	524.2	III
01-Oct-2015	MW-28B	1510013-39	N	5030B	524.2	III
01-Oct-2015	MW-25B	1510013-36	N	5030B	524.2	III
01-Oct-2015	MW-20A	1510013-29	N	5030B	524.2	III
01-Oct-2015	MW-07A	1510013-09	N	5030B	524.2	III
01-Oct-2015	MW-04A	1510013-04	N	5030B	524.2	III
01-Oct-2015	MW-06A	1510013-08	N	5030B	524.2	III

III = EPA Level 3 Data Review *N = Normal Sample* *TB = Trip Blank* *MS = Matrix Spike*
IV = EPA Level 4 Data Validation *FD = Field Duplicate* *FB = Field Blank* *MSD = Matrix Spike Duplicate*

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
01-Oct-2015	EW-02	1510013-50	N	5030B	524.2	III
01-Oct-2015	MW-18A	1510013-26	N	5030B	524.2	III
01-Oct-2015	MW-05A	1510013-07	N	5030B	524.2	IV
01-Oct-2015	MW-08A	1510013-10	N	5030B	524.2	III
01-Oct-2015	MW-09B	1510013-11	N	5030B	524.2	III
01-Oct-2015	MW-01A	1510013-01	N	5030B	524.2	IV
01-Oct-2015	MW-14A	1510013-18	N	5030B	524.2	III
01-Oct-2015	MW-17C	1510013-25	N	5030B	524.2	III
01-Oct-2015	MW-17A	1510013-23	N	5030B	524.2	III
01-Oct-2015	MW-27B	1510013-38	N	5030B	524.2	III
01-Oct-2015	MW-04B	1510013-05	N	5030B	524.2	III
01-Oct-2015	MW-04C	1510013-06	N	5030B	524.2	III
02-Oct-2015	MW-15A	1510013-19	N	5030B	524.2	III
02-Oct-2015	MW-24B	1510013-35	N	5030B	524.2	III
02-Oct-2015	MW-21A	1510013-32	N	5030B	524.2	III
02-Oct-2015	MW-22A	1510013-33	N	5030B	524.2	III
02-Oct-2015	MW-12A	1510013-16	N	5030B	524.2	III
02-Oct-2015	MW-19A	1510013-27	N	5030B	524.2	III
02-Oct-2015	MW-19B1	1510013-28	N	5030B	524.2	III
02-Oct-2015	MW-20B	1510013-30	N	5030B	524.2	IV
02-Oct-2015	MW-20C	1510013-31	N	5030B	524.2	III
02-Oct-2015	MW-16A	1510013-20	N	5030B	524.2	III
02-Oct-2015	MW-16B	1510013-21	N	5030B	524.2	III
02-Oct-2015	MW-16C	1510013-22	N	5030B	524.2	III
02-Oct-2015	MW-33B	1510013-45	N	5030B	524.2	III
02-Oct-2015	MW-10B	1510013-13	N	5030B	524.2	III

III = EPA Level 3 Data Review *N = Normal Sample* *TB = Trip Blank* *MS = Matrix Spike*
IV = EPA Level 4 Data Validation *FD = Field Duplicate* *FB = Field Blank* *MSD = Matrix Spike Duplicate*

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
02-Oct-2015	MW-10C	1510013-14	N	5030B	524.2	III
02-Oct-2015	MW-32C	1510013-46	N	5030B	524.2	III
02-Oct-2015	MW-26B	1510013-37	N	5030B	524.2	III
02-Oct-2015	MW-10A	1510013-12	N	5030B	524.2	III

III = EPA Level 3 Data Review *N = Normal Sample* *TB = Trip Blank* *MS = Matrix Spike*
IV = EPA Level 4 Data Validation *FD = Field Duplicate* *FB = Field Blank* *MSD = Matrix Spike Duplicate*

Attachment 2
Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method Category: **VOA**

Method: **524.2** ***Matrix:*** **Water**

Sample ID: **EW-01R** ***Collected:*** **10/1/2015 9:40:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
HEXACHLOROBUTADIENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: **EW-02** ***Collected:*** **10/1/2015 1:45:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
HEXACHLOROBUTADIENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: **MW-01A** ***Collected:*** **10/1/2015 3:50:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CHLOROFORM	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: **MW-04B** ***Collected:*** **10/1/2015 5:45:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.5	J,C1,Q3	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: **MW-04C** ***Collected:*** **10/1/2015 6:00:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.5	J,C1,Q3	2.0	MDL	4.0	MRL	ug/L	J	RI
TETRACHLOROETHENE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: **MW-05A** ***Collected:*** **10/1/2015 2:35:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CHLOROFORM	0.4	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method Category: **VOA**

Method: **524.2** ***Matrix:*** **Water**

Sample ID: **MW-06A** ***Collected:*** **10/1/2015 1:45:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMODICHLOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: **MW-07A** ***Collected:*** **10/1/2015 1:25:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.5	J,C1,Q3	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: **MW-08A** ***Collected:*** **10/1/2015 3:05:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.3	J,C1,Q3	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMODICHLOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: **MW-09B** ***Collected:*** **10/1/2015 3:25:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.5	J,C1,Q3	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: **MW-10A** ***Collected:*** **10/2/2015 2:15:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.5	J,C1,Q3	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMODICHLOROMETHANE	0.2	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: **MW-10B** ***Collected:*** **10/2/2015 11:25:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.9	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: **MW-10C** ***Collected:*** **10/2/2015 12:05:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.9	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B

Laboratory: FALSE

EDD Filename: 15280B_VOC_1510013 FINAL

eQAPP Name: Rore_Modesto_GW_100115

Method Category: VOA

Method: 524.2 **Matrix:** Water

Sample ID: MW-11A **Collected:** 10/1/2015 9:30:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.8	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI, Surr
CHLOROFORM	3.3		0.2	MDL	0.5	MRL	ug/L	J+	Surr

Sample ID: MW-12A **Collected:** 10/2/2015 7:25:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.1	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
TRICHLOROFLUOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: MW-13A **Collected:** 10/1/2015 9:55:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.1	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMODICHLOROMETHANE	0.2	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: MW-14A **Collected:** 10/1/2015 4:30:00 PM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.0	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: MW-15A **Collected:** 10/2/2015 6:30:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2-DICHLOROETHANE	0.2	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: MW-16C **Collected:** 10/2/2015 10:00:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.4	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B

Laboratory: FALSE

EDD Filename: 15280B_VOC_1510013 FINAL

eQAPP Name: Rore_Modesto_GW_100115

Method Category: VOA

Method: 524.2 **Matrix:** Water

Sample ID: MW-17A **Collected:** 10/1/2015 5:10:00 PM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMODICHLOROMETHANE	0.4	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: MW-17B **Collected:** 10/1/2015 11:15:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
CHLOROFORM	0.4	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: MW-17C **Collected:** 10/1/2015 4:55:00 PM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-19A **Collected:** 10/2/2015 7:45:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.1	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: MW-19B1 **Collected:** 10/2/2015 8:00:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.5	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: MW-20A **Collected:** 10/1/2015 1:00:00 PM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
BROMODICHLOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
DICHLORODIFLUOROMETHANE	2.5	J,C4	0.2	MDL	0.5	MRL	ug/L	J+	Ccv

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B

Laboratory: FALSE

EDD Filename: 15280B_VOC_1510013 FINAL

eQAPP Name: Rore_Modesto_GW_100115

Method Category: VOA

Method: 524.2 **Matrix:** Water

Sample ID: MW-20B *Collected:* 10/2/2015 8:20:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-20C *Collected:* 10/2/2015 8:45:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	3.8	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

Sample ID: MW-21A *Collected:* 10/2/2015 7:00:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-22A *Collected:* 10/2/2015 7:15:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-23A *Collected:* 10/1/2015 11:00:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-24B *Collected:* 10/2/2015 6:45:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.5	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-25B *Collected:* 10/1/2015 12:30:00 PM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B | Laboratory: FALSE

EDD Filename: 15280B_VOC_1510013 FINAL | eQAPP Name: Rore_Modesto_GW_100115

Method Category: VOA

Method: 524.2 **Matrix:** Water

Sample ID: MW-26B **Collected:** 10/2/2015 1:00:00 PM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.0	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-27B **Collected:** 10/1/2015 5:25:00 PM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.2	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-28B **Collected:** 10/1/2015 12:25:00 PM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.2	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-29B **Collected:** 10/1/2015 11:25:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
CHLOROFORM	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI

Sample ID: MW-30A **Collected:** 10/1/2015 10:15:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.6	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: MW-30B **Collected:** 10/1/2015 10:35:00 AM **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,A1,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
1,2,3-TRICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,2,4-TRICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B

Laboratory: FALSE

EDD Filename: 15280B_VOC_1510013 FINAL

eQAPP Name: Rore_Modesto_GW_100115

Method Category: VOA

Method: 524.2 **Matrix:** Water

Sample ID: MW-30B *Collected:* 10/1/2015 10:35:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2,4-TRIMETHYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,2-DICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,3,5-TRIMETHYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,3-DICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,4-DICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
2-CHLOROTOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
4-CHLOROTOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
ACETONE	2.7	J,A1,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
BROMOBENZENE	0.5	J,U,A1,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs, StoA
CHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
CHLOROFORM	0.4	J,A1,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
ETHYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
HEXACHLOROBUTADIENE	0.5	J,U,A1,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
ISOPROPYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
M&P-XYLENE	1.0	J,U,A1	0.5	MDL	1.0	MRL	ug/L	UJ	StoA
NAPHTHALENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
N-BUTYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
N-PROPYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
O-XYLENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
P-ISOPROPYLTOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
SEC-BUTYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
STYRENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
TERT-BUTYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
TETRACHLOROETHENE	0.3	J,C1,A1	0.2	MDL	0.5	MRL	ug/L	J	RI
TOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA

Sample ID: MW-31A *Collected:* 10/1/2015 11:45:00 AM *Analysis Type:* Initial/TOT *Dilution:* 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
ACETONE	2.3	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method Category: **VOA**

Method: **524.2** ***Matrix:*** **Water**

Sample ID: **MW-31A** ***Collected:*** **10/1/2015 11:45:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
HEXACHLOROBUTADIENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: **MW-32B** ***Collected:*** **10/1/2015 11:50:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	4.0	J,U,Q4,Q6	2.0	MDL	4.0	MRL	ug/L	UJ	Ms

Sample ID: **MW-32C** ***Collected:*** **10/2/2015 12:30:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
ACETONE	2.1	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
HEXACHLOROBUTADIENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: **MW-33B** ***Collected:*** **10/2/2015 10:55:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,A1,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
1,2,3-TRICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,2,4-TRICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,2,4-TRIMETHYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,2-DICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,3,5-TRIMETHYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,3-DICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
1,4-DICHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
2-CHLOROTOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
4-CHLOROTOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
ACETONE	3.3	J,A1,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
BROMOBENZENE	0.5	J,U,A1,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs, StoA

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method Category: **VOA**

Method: **524.2** ***Matrix:*** **Water**

Sample ID: **MW-33B** ***Collected:*** **10/2/2015 10:55:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CHLOROBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
ETHYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
HEXACHLOROBUTADIENE	0.5	J,U,Q2,A1	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
ISOPROPYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
M&P-XYLENE	1.0	J,U,A1	0.5	MDL	1.0	MRL	ug/L	UJ	StoA
NAPHTHALENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
N-BUTYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
N-PROPYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
O-XYLENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
P-ISOPROPYLTOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
SEC-BUTYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
STYRENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
TERT-BUTYLBENZENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA
TOLUENE	0.5	J,U,A1	0.2	MDL	0.5	MRL	ug/L	UJ	StoA

Sample ID: **MW-34B** ***Collected:*** **10/1/2015 12:10:00 PM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
ACETONE	3.4	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
HEXACHLOROBUTADIENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs

Sample ID: **MW-35B** ***Collected:*** **10/1/2015 11:30:00 AM** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROPROPENE	0.5	J,U,Q4,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
BROMOBENZENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
HEXACHLOROBUTADIENE	0.5	J,U,Q2	0.2	MDL	0.5	MRL	ug/L	UJ	Lcs
TETRACHLOROETHENE	6.7	J,Q4	0.2	MDL	0.5	MRL	ug/L	J+	Ms

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B

Laboratory: FALSE

EDD Filename: 15280B_VOC_1510013 FINAL

eQAPP Name: Rore_Modesto_GW_100115

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Data Qualifier Summary

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Reason Code Legend

Reason Code	*Description*
Ccv	Continuing Calibration Verification Percent Difference Upper Estimation
Lcs	Laboratory Control Spike Lower Estimation
Lcs	Laboratory Control Spike Upper Estimation
Mb	Method Blank Contamination
Ms	Matrix Spike Lower Estimation
Ms	Matrix Spike Precision
Ms	Matrix Spike Upper Estimation
RI	Reporting Limit Trace Value
StoA	Sampling to Analysis Estimation
Surr	Surrogate/Tracer Recovery Upper Estimation

* denotes a non-reportable result

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Enclosure I

EPA Level III ADR Outliers

(Including Manual Review Outliers)

Quality Control Outlier Reports

15280B

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: 524.2 **Preparation Method: 5030B**

Matrix: Water

Sample ID	Type	Actual	Criteria	Units	Flag
MW-30B (Initial/TOT)	Sampling To Analysis	11.00	7.00	DAYS	J- (all detects)
MW-33B (Initial/TOT)		11.00	7.00	DAYS	UJ (all non-detects)
					Qualify aromatic compounds only

Method Blank Outlier Report

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: **524.2**
Matrix: **Water**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
B15J064-BLK1	10/12/2015 10:26:00 AM	ACETONE	15 ug/L	EW-02 MW-17B MW-20A MW-24B MW-25B MW-28B

Surrogate Outlier Report

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: **524.2**
Matrix: **Water**

Sample ID (Analysis Type)	*Surrogate*	*Sample % Recovery*	*% Recovery Limits*	*Affected Compounds*	*Flag*
MW-11A (Initial/ TOT)	4-Bromofluorobenzene	112	82.00-111.00	All Target Analytes	J+ (all detects)

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: 524.2

Matrix: Water

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
MW-03AMSD (MW-03A)	2-BUTANONE	-	-	67.00-123.00	24 (20.00)	2-BUTANONE	J (all detects)
	CHLOROMETHANE	-	144	70.00-124.00	23 (20.00)	CHLOROMETHANE	
MW-03AMS MW-03AMSD (MW-03A)	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	144	160	73.00-139.00	-	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	J+(all detects) Tetrachloroethene, No Qual, >4x
	1,1-DICHLOROETHENE	-	134	80.00-126.00	-	1,1-DICHLOROETHENE	
	1,1-DICHLOROPROPENE	-	124	88.00-120.00	-	1,1-DICHLOROPROPENE	
	CIS-1,2-DICHLOROETHENE	-	116	87.00-113.00	-	CIS-1,2-DICHLOROETHENE	
	DICHLORODIFLUOROMETHANE	164	183	53.00-153.00	-	DICHLORODIFLUOROMETHANE	
	TETRACHLOROETHENE	618	295	87.00-118.00	-	TETRACHLOROETHENE	
	TRANS-1,2-DICHLOROETHE	-	120	86.00-119.00	-	TRANS-1,2-DICHLOROETH	
	TRICHLOROFLUOROMETHANE	-	151	74.00-141.00	-	TRICHLOROFLUOROMETHANE	
	VINYL CHLORIDE	134	152	77.00-127.00	-	VINYL CHLORIDE	
MW-32BMSD (MW-32B)	2-BUTANONE	-	-	67.00-123.00	37 (20.00)	2-BUTANONE	J(all detects)
MW-32BMSD (MW-32B)	ACETONE	-	58	60.00-125.00	52 (20.00)	ACETONE	J(all detects) UJ(all non-detects)
MW-32BMS MW-32BMSD (MW-32B)	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	147	161	73.00-139.00	-	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	J+(all detects)
	1,1-DICHLOROETHANE	-	122	85.00-117.00	-	1,1-DICHLOROETHANE	
	1,1-DICHLOROETHENE	-	130	80.00-126.00	-	1,1-DICHLOROETHENE	
	1,1-DICHLOROPROPENE	-	124	88.00-120.00	-	1,1-DICHLOROPROPENE	
	CHLOROMETHANE	130	140	70.00-124.00	-	CHLOROMETHANE	
	DICHLORODIFLUOROMETHANE	179	194	53.00-153.00	-	DICHLORODIFLUOROMETHANE	
	TOLUENE	-	114	87.00-113.00	-	TOLUENE	
	TRICHLOROFLUOROMETHANE	-	150	74.00-141.00	-	TRICHLOROFLUOROMETHANE	
	VINYL CHLORIDE	144	156	77.00-127.00	-	VINYL CHLORIDE	
MW-35BMS MW-35BMSD (MW-35B)	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	143	-	73.00-139.00	-	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	J+(all detects)
	1,1-DICHLOROPROPENE	123	-	88.00-120.00	-	1,1-DICHLOROPROPENE	
	1,2-DICHLOROPROPANE	-	118	83.00-114.00	-	1,2-DICHLOROPROPANE	
	CHLOROMETHANE	134	129	70.00-124.00	-	CHLOROMETHANE	
	DICHLORODIFLUOROMETHANE	168	159	53.00-153.00	-	DICHLORODIFLUOROMETHANE	
	TETRACHLOROETHENE	122	121	87.00-118.00	-	TETRACHLOROETHENE	
	TOLUENE	-	116	87.00-113.00	-	TOLUENE	
	TRICHLOROETHENE	115	121	90.00-112.00	-	TRICHLOROETHENE	
	VINYL CHLORIDE	141	141	77.00-127.00	-	VINYL CHLORIDE	

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: **524.2**
Matrix: **Water**

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
B15J048-BS1 (MW-10C MW-11A MW-12A MW-13A MW-14A MW-15A MW-16A MW-16B MW-16C MW-17A MW-18A MW-19A MW-19B1 MW-20C MW-32B)	CHLOROMETHANE	130	-	70.00-124.00	-	CHLOROMETHANE	J+ (all detects)
B15J054-BS1 (MW-03A MW-17B MW-17C MW-20A MW-20B MW-21A MW-22A MW-23A MW-24B MW-25B MW-26B MW-27B MW-28B MW-29B MW-30A)	BROMOBENZENE	88	-	90.00-110.00	-	BROMOBENZENE	J-(all detects) UJ(all non-detects)
B15J054-BS1 (MW-03A MW-17B MW-17C MW-20A MW-20B MW-21A MW-22A MW-23A MW-24B MW-25B MW-26B MW-27B MW-28B MW-29B MW-30A)	CHLOROMETHANE	128	-	70.00-124.00	-	CHLOROMETHANE	J+(all detects)
B15J062-BS1 (EW-01R EW-02 MW-30B MW-31A MW-32C MW-33B MW-34B MW-35B)	1,1-DICHLOROPROPENE BROMOBENZENE HEXACHLOROBUTADIENE	86 88 77	- - -	88.00-120.00 90.00-110.00 81.00-123.00	- - -	1,1-DICHLOROPROPENE BROMOBENZENE HEXACHLOROBUTADIENE	J-(all detects) UJ(all non-detects)

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: **524.2**

Matrix: **Water**

QC Sample ID (Associated Samples)	*Compound*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
B15J064-BS1 (EW-02 MW-17B MW-20A MW-24B MW-25B MW-28B)	ACETONE	180	-	60.00-125.00	-	ACETONE	J+(all detects)

Reporting Limit Outliers

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: **524.2**

Matrix: **Water**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
MW-01A	CHLOROFORM	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-04B	ACETONE	J,C1, Q3	3.5	4.0	MRL	ug/L	J (all detects)
MW-04C	ACETONE TETRACHLOROETHENE	J,C1, Q3 J,C1	3.5 0.3	4.0 0.5	MRL MRL	ug/L ug/L	J (all detects)
MW-05A	CHLOROFORM	J,C1	0.4	0.5	MRL	ug/L	J (all detects)
MW-06A	BROMODICHLOROMETHANE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-07A	ACETONE	J,C1, Q3	2.5	4.0	MRL	ug/L	J (all detects)
MW-08A	ACETONE BROMODICHLOROMETHANE	J,C1, Q3 J,C1	3.3 0.3	4.0 0.5	MRL MRL	ug/L ug/L	J (all detects)
MW-09B	ACETONE	J,C1, Q3	3.5	4.0	MRL	ug/L	J (all detects)
MW-10A	ACETONE BROMODICHLOROMETHANE	J,C1, Q3 J,C1	3.5 0.2	4.0 0.5	MRL MRL	ug/L ug/L	J (all detects)
MW-10B	ACETONE	J,C1	2.9	4.0	MRL	ug/L	J (all detects)
MW-10C	ACETONE	J,C1	3.9	4.0	MRL	ug/L	J (all detects)
MW-11A	ACETONE	J,C1	2.8	4.0	MRL	ug/L	J (all detects)
MW-12A	ACETONE TRICHLOROFLUOROMETHANE	J,C1 J,C1	3.1 0.3	4.0 0.5	MRL MRL	ug/L ug/L	J (all detects)
MW-13A	ACETONE BROMODICHLOROMETHANE	J,C1 J,C1	3.1 0.2	4.0 0.5	MRL MRL	ug/L ug/L	J (all detects)
MW-14A	ACETONE	J,C1	3.0	4.0	MRL	ug/L	J (all detects)
MW-15A	1,2-DICHLOROETHANE	J,C1	0.2	0.5	MRL	ug/L	J (all detects)
MW-16C	ACETONE	J,C1	3.4	4.0	MRL	ug/L	J (all detects)
MW-17A	BROMODICHLOROMETHANE	J,C1	0.4	0.5	MRL	ug/L	J (all detects)
MW-17B	CHLOROFORM	J,C1	0.4	0.5	MRL	ug/L	J (all detects)
MW-19A	ACETONE	J,C1	2.1	4.0	MRL	ug/L	J (all detects)
MW-19B1	ACETONE	J,C1	2.5	4.0	MRL	ug/L	J (all detects)
MW-20A	BROMODICHLOROMETHANE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-20C	ACETONE	J,C1	3.8	4.0	MRL	ug/L	J (all detects)
MW-24B	ACETONE	J,C1	2.5	4.0	MRL	ug/L	J (all detects)
MW-26B	ACETONE	J,C1	2.0	4.0	MRL	ug/L	J (all detects)
MW-27B	ACETONE	J,C1	2.2	4.0	MRL	ug/L	J (all detects)
MW-28B	ACETONE	J,C1	2.2	4.0	MRL	ug/L	J (all detects)
MW-29B	CHLOROFORM	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-30A	ACETONE	J,C1	2.6	4.0	MRL	ug/L	J (all detects)

Project Name and Number: R16S02 - Modesto October 2015 Groundwater Monitoring

Reporting Limit Outliers

Lab Reporting Batch ID: 15280B **Laboratory: FALSE**

EDD Filename: 15280B_VOC_1510013 FINAL **eQAPP Name: Rore_Modesto_GW_100115**

Method: **524.2**

Matrix: **Water**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
MW-30B	ACETONE	J,A1,C1	2.7	4.0	MRL	ug/L	J (all detects)
	CHLOROFORM	J,A1,C1	0.4	0.5	MRL	ug/L	
	TETRACHLOROETHENE	J,C1,A1	0.3	0.5	MRL	ug/L	
MW-31A	ACETONE	J,C1	2.3	4.0	MRL	ug/L	J (all detects)
MW-32C	ACETONE	J,C1	2.1	4.0	MRL	ug/L	J (all detects)
MW-33B	ACETONE	J,A1,C1	3.3	4.0	MRL	ug/L	J (all detects)
MW-34B	ACETONE	J,C1	3.4	4.0	MRL	ug/L	J (all detects)

LDC #: 35287A1

SDG #: 15280B

Laboratory: USEPA Region 9 Laboratory

VALIDATION COMPLETENESS WORKSHEET

ADR/~~Level IV~~

Date: 11/6/15

Page: 1 of 3

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	N, SW	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A, A	RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	N	Not reviewed for ADR validation.
VI.	Field blanks		
VII.	Surrogate spikes		Not reviewed for ADR validation.
VIII.	Matrix spike/Matrix spike duplicates		Not reviewed for ADR validation.
IX.	Laboratory control samples		Not reviewed for ADR validation.
X.	Field duplicates		
XI.	Internal standards	A	Not reviewed for ADR validation.
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for ADR validation.
XIII.	Target compound identification		Not reviewed for ADR validation.
XIV.	System performance		Not reviewed for ADR validation.
XV.	Overall assessment of data		Not reviewed for ADR validation.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-01A**	1510013-01**	Water	10/01/15
2	MW-02A	1510013-02	Water	10/01/15
3	MW-03A	1510013-03	Water	10/01/15
4	MW-04A	1510013-04	Water	10/01/15
5	MW-04B pH = 5	1510013-05	Water	10/01/15
6	MW-04C	1510013-06	Water	10/01/15
7	MW-05A** pH = 5	1510013-07**	Water	10/01/15
8	MW-06A	1510013-08	Water	10/01/15
9	MW-07A	1510013-09	Water	10/01/15
10	MW-08A	1510013-10	Water	10/01/15
11	MW-09B	1510013-11	Water	10/01/15
12	MW-10A	1510013-12	Water	10/02/15
13	MW-10B	1510013-13	Water	10/02/15

LDC #: 35287A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/6/15

SDG #: 15280B ADR/Level IV Page: 2 of 3

Laboratory: USEPA Region 9 Laboratory Reviewer: [illegible]

2nd Reviewer: ATL

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14	MW-10C	1510013-14	Water	10/02/15
15	MW-11A**	1510013-15**	Water	10/01/15
16	MW-12A	1510013-16	Water	10/02/15
17	MW-13A	1510013-17	Water	10/01/15
18	MW-14A	1510013-18	Water	10/01/15
19	MW-15A	1510013-19	Water	10/02/15
20	MW-16A	1510013-20	Water	10/02/15
21	MW-16B	1510013-21	Water	10/02/15
22	MW-16C pH=5	1510013-22	Water	10/02/15
23	MW-17A pH=5	1510013-23	Water	10/01/15
24	MW-17B	1510013-24	Water	10/01/15
25	MW-17C	1510013-25	Water	10/01/15
26	MW-18A pH=5	1510013-26	Water	10/01/15
27	MW-19A	1510013-27	Water	10/02/15
28	MW-19B1	1510013-28	Water	10/02/15
29	MW-20A	1510013-29	Water	10/01/15
30	MW-20B**	1510013-30**	Water	10/02/15
31	MW-20C	1510013-31	Water	10/02/15
32	MW-21A	1510013-32	Water	10/02/15
33	MW-22A pH=5	1510013-33	Water	10/02/15
34	MW-23A	1510013-34	Water	10/01/15
35	MW-24B	1510013-35	Water	10/02/15
36	MW-25B	1510013-36	Water	10/01/15
37	MW-26B	1510013-37	Water	10/02/15
38	MW-27B	1510013-38	Water	10/01/15
39	MW-28B	1510013-39	Water	10/01/15
40	MW-29B**	1510013-40**	Water	10/01/15
41	MW-30A	1510013-41	Water	10/01/15
42	MW-30B J-/UJ/A aromatic pH=5	1510013-42	Water	10/01/15
43	MW-31A	1510013-43	Water	10/01/15
44	MW-32B	1510013-44	Water	10/01/15
45	MW-33B J-/UJ/A aromatic pH=3	1510013-45	Water	10/02/15
46	MW-32C	1510013-46	Water	10/02/15
47	MW-34B	1510013-47	Water	10/01/15
48	MW-35B	1510013-48	Water	10/01/15

LDC #: 35287A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/6/15
SDG #: 15280B ADR/Level IV Page: 3 of 3
Laboratory: USEPA Region 9 Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
49	EW-01R	1510013-49	Water	10/01/15
50	EW-02	1510013-50	Water	10/01/15
51	MW-03AMS	1510013-03MS	Water	10/01/15
52	MW-03AMSD	1510013-03MSD	Water	10/01/15
53	MW-32BMS	1510013-44MS	Water	10/01/15
54	MW-32BMSD	1510013-44MSD	Water	10/01/15
55	MW-35BMS	1510013-48MS	Water	10/01/15
56	MW-35BMSD	1510013-48MSD	Water	10/01/15
57	3RE			
58	5RE			
59	7RE			
60	22RE pH=5			

Notes: 24RE

	29RE						
	35RE						
	36RE						
	39RE						

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 35287A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: AYL

METHOD: GC/MS VOA (EPA Method 524.2)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: <30.0%)	Associated Samples	Qualifications
	10/8/15	100815D02	JJ	45.6	14-23, 26-28, 31, 44	J+ all detects
	10/9/15	100915D02	JJ	40.8	24-25, 29, 30, 32-41	(29-detects)

CONCAL.1S5

Enclosure II

EPA Level IV Data Validation Reports

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: Modesto October 2015 GW Monitoring

LDC Report Date: November 8, 2015

Parameters: Volatiles

Validation Level: Level IV

Laboratory: USEPA Region 9 Laboratory

Sample Delivery Group (SDG): 15280B

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW-01A	1510013-01	Water	10/01/15
MW-05A	1510013-07	Water	10/01/15
MW-11A	1510013-15	Water	10/01/15
MW-20B	1510013-30	Water	10/02/15
MW-29B	1510013-40	Water	10/01/15

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (June 2008). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) Method 524.2

All sample results were subjected to Level IV data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J+ (Estimated, High Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying high bias, due to non-conformances discovered during data validation.

J- (Estimated, Low Bias): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated, displaying low bias, due to non-conformances discovered during data validation.

J (Estimated, Bias Indeterminate): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation. Bias is indeterminate.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
10/09/15	Dichlorodifluoromethane	40.8	MW-20B MW-29B	NA	-

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
MW-11A	Bromofluorobenzene	112 (82-111)	All TCL compounds	J+ (all detects)	P

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. No data were qualified since there were no associated samples in this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	%R (Limits)	Flag	A or P
B15J048-BS1 (MW-11A)	Chloromethane	130 (70-124)	NA	-
B15J054-BS1 (MW-20B MW-29B)	Chloromethane	128 (70-124)	NA	-
B15J054-BS1 (MW-20B MW-29B)	Bromobenzene	88 (90-110)	UJ (all non-detects)	P

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
MW-01A MW-05A MW-11A MW-29B	All compounds reported below the RL.	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to surrogate %R, LCS %R, and results below the RL, data were qualified as estimated in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

Modesto October 2015 GW Monitoring
Volatiles - Data Qualification Summary - SDG 15280B

Sample	Compound	Flag	A or P	Reason
MW-11A	All TCL compounds	J+ (all detects)	P	Surrogates (%R)
MW-20B MW-29B	Bromobenzene	UJ (all non-detects)	P	Laboratory control samples (%R)
MW-01A MW-05A MW-11A MW-29B	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

Modesto October 2015 GW Monitoring
Volatiles - Laboratory Blank Data Qualification Summary - SDG 15280B

No Sample Data Qualified in this SDG

Modesto October 2015 GW Monitoring
Volatiles - Field Blank Data Qualification Summary - SDG 15280B

No Sample Data Qualified in this SDG

LDC #: 35287A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/6/15
SDG #: 15280B ~~ADR~~/Level IV Page: 1 of 3
Laboratory: USEPA Region 9 Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	RSD ≤ 20 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	%Rs & RPDs out - no assoc'd
IX.	Laboratory control samples	SW	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Level IV validation

	Client ID	Lab ID	Matrix	Date
1	MW-01A**	1510013-01**	Water	10/01/15
2	~~MW-02A~~	1510013-02	Water	10/01/15
3	MW-03A	1510013-03	Water	10/01/15
4	MW-04A	1510013-04	Water	10/01/15
5	MW-04B	1510013-05	Water	10/01/15
6	~~MW-04C~~	1510013-06	Water	10/01/15
7	MW-05A** pH=5	1510013-07**	Water	10/01/15
8	~~MW-06A~~	1510013-08	Water	10/01/15
9	MW-07A	1510013-09	Water	10/01/15
10	MW-08A	1510013-10	Water	10/01/15
11	MW-09B	1510013-11	Water	10/01/15
12	MW-10A	1510013-12	Water	10/02/15
13	~~MW-10B~~	1510013-13	Water	10/02/15

LDC #: 35287A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/2/15
SDG #: 15280B ADR/Level IV Page: 2 of 3
Laboratory: USEPA Region 9 Laboratory Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
14	~~MW-10C~~	1510013-14	Water	10/02/15
15 3	MW-11A**	1510013-15**	Water	10/01/15
16	~~MW-12A~~	1510013-16	Water	10/02/15
17	MW-13A	1510013-17	Water	10/01/15
18	MW-14A	1510013-18	Water	10/01/15
19	MW-15A	1510013-19	Water	10/02/15
20	MW-16A	1510013-20	Water	10/02/15
21	MW-16B	1510013-21	Water	10/02/15
22	MW-16C	1510013-22	Water	10/02/15
23	MW-17A	1510013-23	Water	10/01/15
24	MW-17B	1510013-24	Water	10/01/15
25	MW-17C	1510013-25	Water	10/01/15
26	MW-18A	1510013-26	Water	10/01/15
27	MW-19A	1510013-27	Water	10/02/15
28	MW-19B1	1510013-28	Water	10/02/15
29	~~MW-20A~~	1510013-29	Water	10/01/15
30 1	MW-20B**	1510013-30**	Water	10/02/15
31	~~MW-20C~~	1510013-31	Water	10/02/15
32	MW-21A	1510013-32	Water	10/02/15
33	MW-22A	1510013-33	Water	10/02/15
34	MW-23A	1510013-34	Water	10/01/15
35	MW-24B	1510013-35	Water	10/02/15
36	MW-25B	1510013-36	Water	10/01/15
37	MW-26B	1510013-37	Water	10/02/15
38	MW-27B	1510013-38	Water	10/01/15
39	~~MW-28B~~	1510013-39	Water	10/01/15
40 4	MW-29B**	1510013-40**	Water	10/01/15
41	~~MW-30A~~	1510013-41	Water	10/01/15
42	MW-30B	1510013-42	Water	10/01/15
43	MW-31A	1510013-43	Water	10/01/15
44	MW-32B	1510013-44	Water	10/01/15
45	MW-33B	1510013-45	Water	10/02/15
46	MW-32C	1510013-46	Water	10/02/15
47	MW-34B	1510013-47	Water	10/01/15
48	~~MW-35B~~	1510013-48	Water	10/01/15

LDC #: 35287A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 11/6/15
SDG #: 15280B ADR/Level IV Page: 3 of 3
Laboratory: USEPA Region 9 Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA Method 524.2)

	Client ID	Lab ID	Matrix	Date
49	~~EW-01R~~	1510013-49	Water	10/01/15
50	~~EW-02~~	1510013-50	Water	10/01/15
51	MW-03AMS	1510013-03MS	Water	10/01/15
52	MW-03AMSD	1510013-03MSD	Water	10/01/15
53	MW-32BMS	1510013-44MS	Water	10/01/15
54	MW-32BMSD	1510013-44MSD	Water	10/01/15
55	MW-35BMS	1510013-48MS	Water	10/01/15
56	~~MW-35BMSD~~	1510013-48MSD	Water	10/01/15
57				
58				
59				
60				

Notes:

1	B15J040-BLK1						
2	B15J044-BLK1						
3	B15J048-BLK1						
4	B15J054-BLK1						

LDC #: 35387A1

VALIDATION FINDINGS CHECKLIST

Reviewer: RC
2nd Reviewer: APL

Method: Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ ~~20%~~ 7 ~~or percent recoveries (%R) 80-120%?~~	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?		✓		
V. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target compounds were detected in the field blanks.			✓	
VII. Surrogate spikes				
Were all surrogate %R within QC limits?		✓		
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?		✓		
VIII. Matrix spike/Matrix spike duplicates				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		

LDC #: 35787A1

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: ARL

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
XI. Internal standards				
Were internal standard area counts within +/-30% of the associated continuing calibration standard?	✓			
Were retention times within - 30% of the associated continuing calibration standard?	✓			
XII. Compound quantitation/RLs				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 35287A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: SL
2nd Reviewer: APL

METHOD: GC/MS VOA (EPA Method 524.2)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were all percent differences (%D) ≤ 30% ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	10/9/15	100915D02	TJ	40.8	30, 40	J+ all ND
					B15J054-BLK1	

CONCAL.1S5

LDC #: 35087A1

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Reviewer: [illegible]
2nd Reviewer: AML

METHOD: GC/MS VOA (EPA Method 524.2)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all surrogate %R within QC limits?
Y N N/A If the percent recovery (%R) was out of QC limits, was a reanalysis performed to confirm samples with %R out of outside of criteria?

#	Date	Lab ID/Reference	Surrogate	%Recovery (Limits)	Associated Samples	Qualifications
		15 (dets/ND)	BFB	112 (82-111)		J+ dets/P
				( )		
				( )		
				( )	

LDC #: 35287A1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method 524.2)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		B15J048-BS1	A	130 (70-124)	( )	( )	15 (ND)	J+ all/P
				( )	( )	( )	B15J048-BLK1	
				( )	( )	( )		
				( )	( )	( )		
		B15J054-BS1	A	128 (70-124)	( )	( )	30, 40 (ND	
			WW	88 (90-110)	( )	( )	B15J054-BLK1	J-/UJ/P
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC #: 35787A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: AML

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (5.0std)	Recalculated RRF (5.0std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	8/25/15	C (1st Internal Standard)	3.530	3.530	3.273	3.273	5.38	5.38
			V (2nd Internal Standard)	1.008	1.008	1.035	1.036	3.38	3.39
			AA (3rd Internal Standard)	0.485	0.485	0.472	0.472	2.79	2.81
2	ICAL	10/8/15	(1st Internal Standard)						
			(2nd Internal Standard)						
			AA (3rd Internal Standard)	0.422	0.422	0.424	0.423	7.56	7.58
3			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						
4			(1st Internal Standard)						
			(2nd Internal Standard)						
			(3rd Internal Standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 35287A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: SR
2nd Reviewer: APL

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = $(A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	100715D03	10/7/15	C (1st Internal Standard)	3.273	3.487	3.487	6.5	6.5
			V (2nd Internal Standard)	1.035	1.021	1.021	1.4	1.4
			AA (3rd Internal Standard)	0.472	0.440	0.440	6.8	6.8
2	100815D02	10/8/15	C (1st Internal Standard)		4.226	4.226	29.1	29.1
			V (2nd Internal Standard)		1.077	1.077	4.1	4.1
			AA (3rd Internal Standard)		0.513	0.513	8.7	8.7
3	100915D02	10/9/15	C (1st Internal Standard)		3.939	3.939	20.3	20.3
			V (2nd Internal Standard)		1.056	1.056	2.0	2.0
			AA (3rd Internal Standard)	↓	0.450	0.450	4.7	4.6
4	100915A02	10/9/15	(1st Internal Standard)					
			AA (2nd Internal Standard)					
			AA (3rd Internal Standard)	0.424	0.452	0.452	6.6	6.6

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 32271

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: APL

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 7

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	5.0	5.16	103	103	0
Bromofluorobenzene	↓	4.99	100	100	↓
1,2-Dichlorobenzene-d4	↓	4.57	91	91	↓
1,2-Dichloroethane-d4	↓	4.97	99	99	↓

Sample ID: 7RE

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	5.0	4.951	99	99	1
Bromofluorobenzene	↓	4.347	87	87	↓
1,2-Dichlorobenzene-d4	↓	4.207	84	84	↓
1,2-Dichloroethane-d4	↓	5.424	108	108	↓

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
1,2-Dichloroethane-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
1,2-Dichloroethane-d4					

LDC #: 35287A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: SC
2nd Reviewer: AAL

METHOD: GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration, SA = Spike added, SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 51/52

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	5.0	5.0	ND	6.11	6.71	122	122	134	134	9	9
Trichloroethene	↓	↓	↓	5.56	5.60	111	111	112	112	0.7	0.7
Benzene	↓	↓	↓	5.25	5.49	105	105	110	110	4	4
Toluene	↓	↓	↓	5.64	5.62	113	113	112	112	0.4	0.4
Chlorobenzene	↓	↓	↓	5.14	5.20	103	103	104	104	1	1

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 25387A1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: SC
2nd reviewer: AYL

METHOD: GC/MS VOA (EPA Method 524.2)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
RRF	=	Relative response factor of the calibration standard.
V_o	=	Volume or weight of sample pruged in milliliters (ml) or grams (g).
Df	=	Dilution factor.
%S	=	Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. K, 1:

Conc. = $\frac{(15296)(5)(\quad)(\quad)}{(55594)(4.142)(\quad)(\quad)}$

= 0.3 ug/L

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

This Page Was Intentionally Left Blank.

Appendix D

System Uptime and Shutdown Tables

Appendix D

System Uptime and Shutdown Tables

This section presents quantitative results on operational time for the groundwater treatment system (GWTS) and soil vapor extraction (SVE) systems. Operation time and percentage of uptime for this reporting period (April 1 through June 30, 2013) are as follows:

Remedial System	Total Operation Hours	Percentage of Operation
Groundwater Treatment	2,203	99.8%

Tables D-1 through D-3 present GWTS shutdown summaries for July, August, and September 2015 respectively.

Table D-1. GWTS Shutdown Summary, July 2015

7/8/2015-7/8/2015	1.0	Collected IX resin profile sample.	
Total	1.0	Hours in month: 744	Percent operational: 99.8

GWTS = groundwater treatment system
IX = ion exchange

Source: AECOM

Table D-2. GWTS Shutdown Summary, August 2015

Date	Duration, hours	Reason	
8/11/2015 – 8/11/2015	1.7	Collect primary IX vessel resin sample for Profile.	
8/19/2015 – 8/19/2015	1.2	Install and calibrate new bag filter pressure transmitter.	
Total	2.9	Hours in month: 744	Percent operational: 99.6

GWTS = groundwater treatment system
IX = ion exchange

Source: AECOM

Table D-3 GWTS Shutdown Summary, September 2015

Date	Duration, hours	Reason	
9/10/2015- 9/10/2015	1.5	Collected IX resin profile sample.	
Total	1.5	Hours in month: 720	Percent operational: 99.8

GWTS = groundwater treatment system
IX = ion exchange
LGAC = liquid-phase granular-activated carbon

Source: AECOM

Appendix E

Operation and Maintenance Process Logs

Groundwater/Soil Vapor Sampling Field Data Logs

URS Corporation
Modesto, Superfund Site
Process Data Sheet

Groundwater Treatment System

			Hour Meter	Utility Power		System Influent				Anti-Scalant Sequestrant	Air Stripper Water						
						Flow	Pressure	Total Flow	pH		Influent Pressure	Effluent Pressure	Flow	Pressure	Influent Pressure	Effluent Pressure	Flow
Initials	Date	Time	Hrs	kW	kWh	GPM	PSI	Gallons	pH	T-3 Gallons	Bag Filter F-1 PSI	PSI	GPM	Pump P-3 PSI	PSI	Bag Filter F-2 PSI	GPM
GB	7/6/15	8:09	76920	15.98	60532	50	29	—	—	21	8.7	6.7	61	61	58	57	58
GB	7/8/15	7:31	77064	15.98	62272	47.5	31	—	7.39	18	8.8	5.8	58	61	60	58	57
GB	7/16/15	8:08	77255	—	~~77255~~	48	31	—	—	22	7.5	5.5	58	58	57	~~59~~	~~56~~
GB	7/23/15	8:10	77423	15.98	66552	47	32	—	—	18	7.9	4.9	57	62	59	58	58
GB	7/29/15	8:07	77519	15.98	67687	47	32	—	—	28	7.5	5.5	58	62	59	58	58
Design Range or Target Value				10.0-30	N/A	3.0-85	30-50	n/a	5.0-12.0	3.0-25	30-50	30-50	40-70	30-50	30-50	30-50	40-70

GroundWater Treatment System

Air Stripper Vapor						Liquid Carbon			Ion Exchange			System Effluent				Radiation Meter	
Sump Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Influent Pressure	Mid-Bed Pressure	Effluent Pressure	Influent Pressure	Mid-Bed Pressure	Flow	Flow	Pressure	pH	Effluent Total Flow	Outside GWTS	Inside GWTS
Air Stripper Trays		VGAC Vessel		Stack													
in. H2O	in. H2O	ppm	ppm	°F	CFM	PSI	PSI	PSI	PSI	PSI	GPM	Gpm	PSI	pH	Gallons	mR/hr Peak	mR/hr Peak
13	6	—	—	70.7	635	44	39	33	29	14	44	54	~~[illegible]~~ 6	—	60436	—	—
13	6	0.3	0.1	69.7	625	44	39	33	28	14	44	54	6	7.73	64677	—	—
12.5	5	—	—	69.9	590	43	39	32	27	14	43	53	5	—	70123	—	—
13	6	—	—	69.5	640	45	40	33	28	14	44	54	6	—	74825	—	—
13.5	6	—	—	69.7	646	45	40	33	28	14	44	54	5.5	—	77512	—	—
5.0-25	5.0-25	0-100	0-10	65-75	550-650	25-70	25-60	25-50	1.0-10	1.0-10	3.0-60	3.0-50	1.0-5	5.0-12	N/A	0-1	0-1

Soil Vapor Extraction System

		SVE Influent				Blower				Filter		Vapor				Radiation Meter	
		Pressure	Temp	Flow	Dilution	Hour Meter	Effluent Pressure	Temp	Flow	Influent Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Outside SVE	Inside SVE
Date	Time	in. H2O	°F	CFM	Yes-No	Hrs	in. H2O	°F	CFM	in. H2O	in. H2O	VGAC Vessel ppm	ppm	Stack °F	CFM	mR/hr Peak	mR/hr Peak
7/6/15	9:52	-60	87.7	174	No	26929	3.0	202	175	-67	-63	—	—	202	175	—	—
7/8/15	11:45	-61	86.2	160	No	27075	3.0	201	168	-67	-63	—	—	201	168	—	—
		25-70	65-75	100-200	NO	N/A	2.0-10	65-75	100-200	N/A	N/A	0-100	0-10	65-75	100-200	0-1	0-1

Note: For pressures measured relative to atmospheric (barometric) pressure, use (-) for vacuum

Reviewed By: Date:

URS Group
Preventative and Corrective Maintenance Log
Modesto Superfund Site

Site Name: Modesto GW
Period: 7/1/15 (month/day/year) to 7/31/15 (month/day/year)

Date	Initials	Hour Meter	Maintenance Performed	LOTO Required	LOTO Description (Where?Why?)	LOCK ON (Date/Time)	Zero Energy Check	LOCK OFF (Date/Time)	LOCK ID (Lock No.)
7/5	GB	77064	Changed Bag Filters	Y / N			Y / N		
7/6	GB	77064	Added Sequestrant	Y / N			Y / N		
7/16	GB	77255	Changed Bag Filter	Y / N			Y / N		
7/16	GB	77255	Fixed Air Leak	Y / N			Y / N		
7/23	GB	77423	Added Sequestrant	Y / N			Y / N		
				Y / N			Y / N		

URS Group
Preventative and Corrective Maintenance Log
Modesto Superfund Site

Site Name: Modesto GW

Shutdown Date: 7/8/15 Startup Date: 7/8/15
Shutdown Time: 10:15 Startup Time: 11:15 1 Hour
Shutdown Purpose or Cause:
Shutdown System To Collect Resin Sample
Corrective Actions Taken (if shutdown was unplanned):
Performed By: GB

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Reviewed by:_____ Date: _____

URS Corporation
Modesto Superfund Site
Site Inspections

Task Description	7/2/2015	7/8/2015	7/16/2015	7/23/2015	7/27/2015
WEEKLY	Task Performed (Technician Initials or Value)				
Groundwater Treatment System					
Record Process Logs	✓	✓	✓	✓	✓
Check Blowers and motors for heat, noise, and vibration	✓	✓	✓	✓	✓
Check Air Stripper Feed pump/motor (P-2) for heat, noise, and vibration.	✓	✓	✓	✓	✓
Inspect all process piping for leaks	✓	✓	✓	✓	✓
Inspect all process hoses/fittings for leaks	✓	✓	✓	✓	✓
Check Air Stripper Effluent pump/motor (P-3) for heat, noise, and vibration.	✓	✓	✓	✓	✓
Inspect Sump (Pump as Necessary).	✓	✓	✓	✓	✓
Check Air Stripper sump level site glass. Clean as necessary	✓	✓	✓	✓	✓
Inspect IX system influent vacuum break for leaks	✓	✓	✓	✓	✓
Clean up compound area	✓	✓	✓	✓	✓
Drain VGAC condensate	✓	✓	✓	✓	✓
Perform autodialer operational check	✓	✓	✓	✓	✓
Autodialer battery check	✓	✓	✓	✓	✓
Perform inspection of EW-1R pipeline	✓	✓	✓	✓	✓
Inspection of Spill Response Kit	✓	✓	✓	✓	✓
Inspection of Emergency Response Plan/MSDS Binder	✓	✓	✓	✓	✓
Soil Vapor Extraction System					
Record Process Logs	✓	✓			
Check Blowers and motors for heat, noise, and vibration	✓	✓			
Inspect all process piping for leaks	✓	✓			
Clean up compound area	✓	✓			
Drain VGAC condensate	✓	✓			
Perform autodialer operational check	✓	✓			
Inspection of Spill Response Kit	✓	✓			
Inspection of Emergency Response Plan/MSDS Binder	✓	✓			

Task Description	Performed		
MONTHLY	Date	Initials	Reading
Check fire extinguisher	7/2/15	GB	
Inspect EW-1R vault	7/2/15	GB	
Inspect VI Mitigation operations - "Part House"	7/23/15	GB	
Replace Auto Dialer Batteries (if necessary)	7/23/15	GB	
SEMI-ANNUAL			
Interlock Checks Groundwater	6/11/15	GB	
Interlock Checks SVE	6/11/15	GB	
ANNUAL			
Collect Amp Reads	12/24/14	GB	
Instrument Calibration			
System Effluent Flow Meter (Performed in June and December)	6/15/15	GB	

Notes:

Reviewed by:_____ Date:_____

Date: 7/8/15
Weather:
Sampler: George Bradshaw

SAMPLE COLLECTION RECORD
MODESTO SUPERFUND SITE

Time	Description	Totalizer Reading (gallons)	Flow (gpm)
7/8/15	GWTS Effluent	6467700	54

Time	Sample Location - Test Method		Sample Description	LOCID	No. of Containers	Container Type	Preservative	pH	Cond	Temp
0820	EFF-0702	E524.2	Effluent	SP-07	3	40 ml VOA	HCl	7.73	1140	20.6
0820	EFF-0702	SM5210B	Effluent	SP-07	1	1 Liter Poly	None	7.73	1140	20.6
0820	EFF-0702	SM2540D/SM2540C	Effluent	SP-07	1	1 Liter Poly	None	7.73	1140	20.6
0820	EFF-0702	D5174	Effluent	SP-07	1	1 Liter Poly	HNO3	7.73	1140	20.6
0835	IEXEFF-0702	D5174	IEX Effluent	SP-10	1	1 Liter Poly	HNO3	7.66	1070	20.5
0840	IEX Mid-0702	D5174	IEX Mid	SP-06	1	1 Liter Poly	HNO3	7.66	1060	20.7
	Pre IEX-0702	D5174	IEX Influent	SP-05	1	1 Liter Poly	HNO3			
0845	CRB EFF-0702	E524.2	CRB Effluent	SP-05	3	40 ml VOA	HCl	7.72	1060	20.6
0900	CRB Mid-0702	E524.2	CRB Mid	SP-04	3	40 ml VOA	HCl	7.63	1070	20.6
0905	CRB INF-0702	E524.2	CRB Influent	SP-03	3	40 ml VOA	HCl	7.58	1050	20.3
0915	GWTS-INF-0702	E524.2	Influent	SP-01	3	40 ml VOA	HCl	7.39	1080	20.4
0915	GWTS-INF-0702	D5174	Influent	SP-01	1	1 Liter Poly	HNO3	7.39	1080	20.4
0908	MW-103-NS	E524.2	FD (CRB INF)	SP-04	3	40 ml VOA	HCl	7.58	1050	20.3
0843	MW-106-NS	D5174	FD (IEX MID)	SP-06	1	250 ml Poly	HNO3	7.66	1060	20.7
	MW-107-0702	SM5210B	FD	SP-07	1	1 Liter Poly	None			
	MW-107-0702	SM2540D/SM2540C	FD	SP-07	1	1 Liter Poly	None			
0800	MW-301-3Q15	E524.2	TB	xxxxx	2	40 ml VOA	HCl	#	START	END
0945	GWTS Stack-0702	TO-15	GWTP VGAC Effluent	SP-09	1	1 Liter Summa	None	35603	-30	-5
1000	GWTS Pr GAC-0702	TO-15	GWTP VGAC Influent	SP-08	1	1 Liter Summa	None	35617	-30	-5
1005	MW-108-NS	TO-15	FD (GWTP VGAC Inf)	SP-08	1	1 Liter Summa	None	9785	-30	-5
	SVE Stack-0702	TO-15	SVE Stack Effluent	SP-12	1	400 ml Summa	None			
	SVE Pre GAC-0702	TO-15	SVE Manifold Influent	SP-11	1	400 ml Summa	None			

Sampler Signature	Date
George Bradshaw	7/8/15

Notes:

FD = Field Duplicate
FB = Field Blank (ambient)
NS = Normal Sample
TB = Trip Blank

Scan COCs to:
URS Attn: Debbie Casagrande (916) 679-2040

URS Corporation
Modesto, Superfund Site
Process Data Sheet

Groundwater Treatment System

			Hour Meter	Utility Power		System Influent				Anti-Scalent Sequestrant	Air Stripper Water						
						Flow	Pressure	Total Flow	pH		Influent Pressure	Effluent Pressure	Flow	Pressure	Influent Pressure	Effluent Pressure	Flow
										T-3		Bag Filter F-1		Pump P-3		Bag Filter F-2	
Initials	Date	Time	Hrs.	kW	kWh	GPM	PSI	Gallons	pH	Gallons	PSI	PSI	GPM	PSI	PSI	PSI	GPM
GB	8/6/15	9:23	77160	70559	15.98	47	31.5	—	7.64	22	8.4	5.4	58	60.5	58.5	57.5	58
GB	8/4/15	8:21	77879	71936	15.98	47	32	—	—	19	8.1	5.1	58	59	59	56	57
GB	8/19/15	8:05	78069	74463	15.98	47	32	—	—	18	7.9	5.9	58	61	59	58	57
GB	8/27/15	8:36	78261	76402	15.98	47	31	—	—	28	8.0	6.0	58	61	56.5	56.5	58
Design Ranges or Target Value				10.0-30	N/A	3.0-85	30-50	n/a	5.0-12.0	3.0-25	40-50	30-50	10-70	30-50	30-50	30-50	40-70

GroundWater Treatment System

Air Stripper Vapor						Liquid Carbon			Ion Exchange			System Effluent				Radiation Meter	
Sump Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Influent Pressure	Mid-Bed Pressure	Effluent Pressure	Influent Pressure	Mid-Bed Pressure	Flow	Flow	Pressure	pH	Effluent Total Flow	Outside GWTS	Inside GWTS
Air Stripper Trays		VGAC Vessel		Stack													
in. H2O	in. H2O	ppm	ppm	°F	CFM	PSI	PSI	PSI	PSI	PSI	GPM	Gpm	~~mH2O~~ PSI	pH	Gallons	mR/hr Peak	mR/hr Peak
12	6	0.2	0.0	70.5	635	43	38	32	27	7	44	54	5	7.36	84267	—	—
13	5	—	—	69.7	615	43	37	31	27	13	42	53	5	—	87559	—	—
12	5	—	—	69.7	610	44	38	32	21	14	43	54	5.5	—	92864	—	—
13	6	—	—	70.1	610	43	37	30.5	20.5	12	41	53	5	—	98199	—	—
5.0-25	5.0-25	0-100	0-10	65-75	550-650	25-70	25-60	25-50	1.0-10	1.0-10	3.0-60	3.0-50	1.0-5	5.0-12	N/A	0-1	0-1

Soil Vapor Extraction System

		SVE Influent				Blower				Filter		Vapor				Radiation Meter	
		Pressure	Temp	Flow	Dilution	Hour Meter	Effluent Pressure	Temp	Flow	Influent Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Outside SVE	Inside SVE
												VGAC Vessel		Stack			
Date	Time	in. H2O	°F	CFM	Yes/No	Hrs.	in. H2O	°F	CFM	in. H2O	in. H2O	ppm	ppm	°F	CFM	mR/hr Peak	mR/hr Peak
		25-70	65-75	100-200	NO	N/A	2.0-10	65-75	100-200	N/A	N/A	0-100	0-10	65-75	100-200	0-1	0-1

Note: For pressures measured relative to atmospheric (barometric) pressure, use (-) for vacuum

Reviewed By: ..... Date: .....

URS Group
Preventative and Corrective Maintenance Log
Modesto Superfund Site

Site Name: Modesto GW
Period: 8/1/15 (month/day/year) to 8/31/15 (month/day/year)

Date	Initials	Hour Meter	Maintenance Performed	LOTO Required	LOTO Description (Where?Why?)	LOCK ON (Date/Time)	Zero Energy Check	LOCK OFF (Date/Time)	LOCK ID (Lock No.)
8/6/15	GB	77160	Changed Bag Filters	Y (N)			Y / N		
8/11/15	GB	77879	Changed Bag Filters	Y (N)			Y / N		
8/11/15	GB	7879	Replaced Pressure Gauges	Y (N)			Y / N		
8/19/15	GB	78069	Installed New Pressure Transmitter	Y (N)			Y / N		
8/19/15	GB	78069	Calibrated Pressure Sensors	Y (N)			Y / N		
				Y / N			Y / N		

URS Group
Preventative and Corrective Maintenance Log
Modesto Superfund Site

Site Name: MODESTO GW

Shutdown Date: 8/11/15 Startup Date: 8/11/15 1.7 hrs.
Shutdown Time: 8:40 Startup Time: 10:20
Shutdown Purpose or Cause:
Shutdown System to collect Primary IX Vessel Resin Sample for Profiling.
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Shutdown Date: 8/19/15 Startup Date: 8/19/15 1.2 hrs
Shutdown Time: 8:37 Startup Time: 9:51
Shutdown Purpose or Cause:
Shutdown System to install and calibrate new bag filter pressure transmitter.
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Reviewed by:_____ Date: _____

URS Corporation
Modesto Superfund Site
Site Inspections

Task Description	8/6 2015	8/11 2015	8/17 2015	8/20 2015	/ /
WEEKLY	Task Performed (Technician Initials or Value)				
Groundwater TreatmentSystem					
Record Process Logs	GB	GB	GB	GB	
Check Blowers and motors for heat, noise, and vibration					
Check Air Stripper Feed pump/motor (P-2) for heat, noise, and vibration.					
Inspect all process piping for leaks					
Inspect all process hoses/fittings for leaks					
Check Air Stripper Effluent pump/motor (P-3) for heat, noise, and vibration.					
Inspect Sump (Pump as Necessary).					
Check Air Stripper sump level site glass. Clean as necessary					
Inspect IX system influent vacuum break for leaks					
Clean up compound area					
Drain VGAC condensate					
Perform autodialer operational check					
Autodialer battery check					
Perform inspection of EW-1R pipeline					
Inspection of Spill Response Kit					
Inspection of Emergency Response Plan/MSDS Binder					
Soil Vapor Extraction System					
Record Process Logs					
Check Blowers and motors for heat, noise, and vibration					
Inspect all process piping for leaks					
Clean up compound area					
Drain VGAC condensate					
Perform autodialer operational check					
Inspection of Spill Response Kit					
Inspection of Emergency Response Plan/MSDS Binder					

NO CONTRACT

NO CONTRACT

Task Description	Performed		
MONTHLY	Date	Initials	Reading
Check fire extinguisher	8/11/2015	GB	
Inspect EW-1R vault			
Inspect VI Mitigation operations - "Part House"			
Replace Auto Dialer Batteries (if necessary)			
Quarterly			
Interlock Checks Groundwater	6/11/15	GB	
Interlock Checks SVE	6/11/15	GB	
Collect Well Flow read at SVE-02			
Collect Well Flow read at SVE-03			
Collect Well Flow read at SVE-04			
ANNUAL			
Collect Amp radings	12/24/14	GB	
Instrument Calibration			
System Effluent Flow Meter (Performed in June and December)	6/15/15	GB	

Notes:

Reviewed by: Date:

Date: 8/6/15
Weather: Overcast
Sampler: G. Bradshaw

SAMPLE COLLECTION RECORD
MODESTO SUPERFUND SITE

Time	Description	Totalizer Reading (gallons)	Flow (gpm)
	GWTS Effluent		

Time	Sample Location - Test Method		Sample Description	LOCID	No. of Containers	Container Type	Preservative	pH	Cond	Temp
1005	EFF-0801	E524.2	Effluent	SP-07	3	40 ml VOA	HCl	7.36	1070	22.8
1005	EFF-0801	SM5210B	Effluent	SP-07	1	1 Liter Poly	None	7.36	1070	22.8
1005	EFF-0801	SM2540D/SM2540C	Effluent	SP-07	1	1 Liter Poly	None	7.36	1070	22.8
	EFF-0801	D5174	Effluent	SP-07	1	1 Liter Poly	HNO3			
1011	IEXEFF-0801	D5174	IEX Effluent	SP-10	1	1 Liter Poly	HNO3	7.66	1060	22.2
1017	IEX Mid-0801	D5174	IEX Mid	SP-06	1	1 Liter Poly	HNO3	7.82	1060	21.8
1022	Pre IEX-0801	D5174	IEX Influent	SP-05	1	1 Liter Poly	HNO3	7.97	1060	21.8
	CRB EFF-0801	E524.2	CRB Effluent	SP-05	3	40 ml VOA	HCl			
1027	CRB Mid-0801	E524.2	CRB Mid	SP-04	3	40 ml VOA	HCl	8.07	1060	21.9
1030	CRB INF-0801	E524.2	CRB Influent	SP-03	3	40 ml VOA	HCl	8.11	1050	21.7
1035	GWTS-INF-0801	E524.2	Influent	SP-01	3	40 ml VOA	HCl	7.64	1070	22.2
	GWTS-INF-0801	D5174	Influent	SP-01	1	1 Liter Poly	HNO3			
	MW-103-NS	E524.2	FD (CRB INF)	SP-04	3	40 ml VOA	HCl			
	MW-106-NS	D5174	FD (IEX MID)	SP-06	1	250 ml Poly	HNO3			
	MW-107-0801	SM5210B	FD	SP-07	1	1 Liter Poly	None			
	MW-107-0801	SM2540D/SM2540C	FD	SP-07	1	1 Liter Poly	None			
0930	MW-302-3Q15	E524.2	TB	xxxxx	2	40 ml VOA	HCl	#	START	END
1102	GWTS Stack-0801	TO-15	GWTP VGAC Effluent	SP-09	1	1 Liter Summa	None	9521	-30	-5
1110	GWTS Pr GAC-0801	TO-15	GWTP VGAC Influent	SP-08	1	1 Liter Summa	None	94921	-30	-5
	MW-108-NS	TO-15	FD (GWTP VGAC Inf)	SP-08	1	1 Liter Summa	None			
	SVE Stack-0801	TO-15	SVE Stack Effluent	SP-12	1	400 ml Summa	None			
	SVE Pre GAC-0801	TO-15	SVE Manifold Influent	SP-11	1	400 ml Summa	None			

Sampler Signature	Date
George Bradshaw	8/6/15

Notes:

FD = Field Duplicate
FB = Field Blank (ambient)
NS = Normal Sample
TB = Trip Blank

Scan COCs to:
URS Attn: Debbie Casagrande (916) 679-2040

URS Corporation
Modesto, Superfund Site
Process Data Sheet

Groundwater Treatment System

			Hour Meter	Utility Power		System Influent				Anti-Scalent Sequestrant	Air Stripper Water						
						Flow	Pressure	Total Flow	pH		Influent Pressure *	Effluent Pressure	Flow	Pressure	Influent Pressure	Effluent Pressure	Flow
Initials	Date	Time	Hrs	kW	kWh	GPM	PSI	Gallons	pH	T-3 Gallons	Bag Filter F-1 PSI	PSI	GPM	Pump P 3 PSI	Bag Filter F-2 PSI	PSI	GPM
GB	9/4/15	8:53	78381	15.98	77825	47	31	—	7.53	25	8.5	5.5	58	60	60 *	57	57
GB	9/10/15	8:15	78596	15.98	80356	47	31	—	—	25	8.1	6.1	56	64	58	56	58
GB	9/17/15	8:30	78763	15.98	82341	47	31	—	—	20	12.8	10.8	56	62	58	56	56
GB	9/24/15	8:51	78932	—	—	47	31	—	—	30	12.5	13.0	56	57	60	54.5	55
GB	9/28/15	8:00	79027	—	—	47	31	—	—	28	13.3	11.5	56	65	58.8	56.8	58
Design Range or Target Value				10.0-30	N/A	3.0-85	30-50	n/a	5.0-12.0	3.0-25	30-50	30-50	40-70	30-50	30-50	30-50	40-70

GroundWater Treatment System

Air Stripper Vapor						Liquid Carbon			Ion Exchange			System Effluent				Radiation Meter	
Sump Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Influent Pressure	Mid-Bed Pressure	Effluent Pressure	Influent Pressure	Mid-Bed Pressure	Flow	Flow	Pressure	pH	Effluent Total Flow	Outside GWTS	Inside GWTS
Air Stripper Trays in. H2O	in. H2O	VGAC Vessel ppm	ppm	Stack °F	CFM	PSI	PSI	PSI	PSI	PSI	GPM	Gpm	psi	pH	Gallons	mR/hr Peak	mR/hr Peak
13	6	0.1	0.0	70.0	610	41	36	30	20	12	41	52	5	7.71	15660	0.01	0.02
11	4	—	—	70.3	630	41	35	29	19	12	39	52	5	—	07564	—	—
13	6	—	—	69.5	600	40	34	28	19	12	39	51	4.5	—	12219	—	—
13	6	—	—	69.7	610	37.5	30	26	17.5	10	37	49	4.0	—	16894	—	—
12	5	—	—	69.7	610	40	32	27	18	10	38	50	4.5	—	19538	—	—
5.0-25	5.0-25	0-100	0-10	65-75	550-650	25-70	25-60	25-50	1.0-10	1.0-10	3.0-60	3.0-50	1.0-5	5.0-12	N/A	0-1	0-1

Soil Vapor Extraction System

		SVE Influent				Blower				Filter		Vapor				Radiation Meter	
		Pressure	Temp	Flow	Dilution	Hour Meter	Effluent Pressure	Temp	Flow	Influent Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Outside SVE	Inside SVE
Date	Time	in. H2O	°F	CFM	Yes/No	Hrs	in. H2O	°F	CFM	in. H2O	in. H2O	VGAC Vessel ppm	ppm	Stack °F	CFM	mR/hr Peak	mR/hr Peak
		25-70	65-75	100-200	NO	N/A	2.0-10	65-75	100-200	N/A	N/A	0-100	0-10	65-75	100-200	0-1	0-1

Note: For pressures measured relative to atmosphere (barometric) pressure, use (-) for vacuum

Reviewed By: Date: _____

9/1 : 79% 1X
9/10 : 75% 1X
9/17 : 76% 1X
9/24 : 76% 1X
9/28 : 76% 1X

URS Group
Preventative and Corrective Maintenance Log
Modesto Superfund Site

Site Name: Modesto GW
Period: 9/1/15 (month/day/year) to 9/30/15 (month/day/year)

Date	Initials	Hour Meter	Maintenance Performed	LOTO Required	LOTO Description (Where?Why?)	LOCK ON (Date/Time)	Zero Energy Check	LOCK OFF (Date/Time)	LOCK ID (Lock No.)
9/10	GB	78596	Bag Filters	Y / N			Y / N		
9/17	GB	78763	Installed LOAC ARVS	Y / N			Y / N		
9/24	GB	78932	Bag Filters	Y / N			Y / N		
9/24	GB	78932	Added Sequestrant	Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		

URS Group
Preventative and Corrective Maintenance Log
Modesto Superfund Site

Site Name: Modesto GW

Shutdown Date: 9/10/15 Startup Date: 9/10/15
Shutdown Time: 9:00 Startup Time: 10:30 1.5 Hr.
Shutdown Purpose or Cause:
Shutdown System To Collect IX Vessel Resin Sample.
Corrective Actions Taken (if shutdown was unplanned):
Performed By: GB.

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Shutdown Date: Startup Date:
Shutdown Time: Startup Time:
Shutdown Purpose or Cause:
Corrective Actions Taken (if shutdown was unplanned):
Performed By:

Reviewed by: Date:

URS Corporation
Modesto Superfund Site
Site Inspections

Task Description	9/11 2015	9/10/2015	19/17/2015	19/24/15	19/28/15
WEEKLY	Task Performed (Technician Initials or Value)				
Groundwater TreatmentSystem					
Record Process Logs	GB	GB	GB	GB	GB
Check Blowers and motors for heat, noise, and vibration					
Check Air Stripper Feed pump/motor (P-2) for heat, noise, and vibration					
Inspect all process piping for leaks					
Inspect all process hoses/fittings for leaks					
Check Air Stripper Effluent pump/motor (P-3) for heat, noise, and vibration					
Inspect Sump (Pump as Necessary)					
Check Air Stripper sump level site glass. Clean as necessary					
Inspect IX system influent vacuum break for leaks					
Clean up compound area					
Drain VGAC condensate					
Perform autodialer operational check					
Autodialer battery check					
Perform inspection of EW-1R pipeline					
Inspection of Spill Response Kit					
Inspection of Emergency Response Plan/MSDS Binder					
Soil Vapor Extraction System					
Record Process Logs					
Check Blowers and motors for heat, noise, and vibration					
Inspect all process piping for leaks					
Clean up compound area					
Drain VGAC condensate		N/A	A		
Perform autodialer operational check					
Inspection of Spill Response Kit					
Inspection of Emergency Response Plan/MSDS Binder					

Task Description	Performed		
MONTHLY	Date	Initials	Reading
Check fire extinguisher	9-1	GB	
Inspect EW-1R vault	9/17	GB	
Inspect VI Mitigation operations - "Part House"	9/17	GB	
Replace Auto Dialer Batteries (if necessary)	9/1	GB	
Quarterly			
Interlock Checks Groundwater	9-17	GB	
Interlock Checks SVE	w/A	—	
Collect Well Flow read at SVE-02	N/A	N/A	N/A
Collect Well Flow read at SVE-03			
Collect Well Flow read at SVE-04			
ANNUAL			
Collect Amp radings	(12/24/14)	GB	
Instrument Calibration			
System Effluent Flow Meter (Performed in June and December)	6/15/15	GB	

Notes:

Reviewed by_____ Date____

Date: Tuesday, September 01, 2015
Weather: Clear, Windy, Cool
Sampler: George Bradshaw

SAMPLE COLLECTION RECORD
MODESTO SUPERFUND SITE

Time	Description	Totalizer Reading (gallons)	Flow (gpm)
830	GWTS Effluent	156,600	52

Time	Sample Location - Test Method		Sample Description	LOCID	No. of Containers	Container Type	Preservative	pH	Cond	Temp
938	EFF-0901	E524.2	Effluent	SP-07	3	40 ml VOA	HCl	7.71	1120	21.5
938	EFF-0901	SM5210B	Effluent	SP-07	1	1 Liter Poly	None	7.71	1120	21.5
938	EFF-0901	SM2540D/SM2540C	Effluent	SP-07	1	1 Liter Poly	None	7.71	1120	21.5
	EFF-0901	D5174	Effluent	SP-07	1	1 Liter Poly	HNO3			
946	IEXEFF-0901	D5174	IEX Effluent	SP-10	1	1 Liter Poly	HNO3	7.53	1080	21.3
950	IEX Mid-0901	D5174	IEX Mid	SP-06	1	1 Liter Poly	HNO3	7.55	1060	21.3
955	Pre IEX-0901	D5174	IEX Influent	SP-05	1	1 Liter Poly	HNO3	7.61	1060	21.3
	CRB EFF-0901	E524.2	CRB Effluent	SP-05	3	40 ml VOA	HCl			
1005	CRB Mid-0901	E524.2	CRB Mid	SP-04	3	40 ml VOA	HCl	7.72	1060	21.4
1020	CRB INF-0901	E524.2	CRB Influent	SP-03	3	40 ml VOA	HCl	7.91	1060	21.5
1028	GWTS-INF-0901	E524.2	Influent	SP-01	3	40 ml VOA	HCl	7.53	1090	21.3
	GWTS-INF-0901	D5174	Influent	SP-01	1	1 Liter Poly	HNO3			
	MW-103-NS	E524.2	FD (CRB INF)	SP-04	3	40 ml VOA	HCl			
	MW-106-NS	D5174	FD (IEX MID)	SP-06	1	250 ml Poly	HNO3			
	MW-107-0901	SM5210B	FD	SP-07	1	1 Liter Poly	None			
	MW-107-0901	SM2540D/SM2540C	FD	SP-07	1	1 Liter Poly	None			
835	MW-303-3Q15	E524.2	TB	xxxxx	2	40 ml VOA	HCl	n/a	n/a	n/a
1048	GWTS Stack-0901	TO-15	GWTP VGAC Effluent	SP-09	1	1 Liter Summa	None	#37814	Start -30	End -5
1056	GWTS Pr GAC-0901	TO-15	GWTP VGAC Influent	SP-08	1	1 Liter Summa	None	#35634	Start -30	End -5
	MW-108-NS	TO-15	FD (GWTP VGAC Inf)	SP-08	1	1 Liter Summa	None			
	SVE Stack-0901	TO-15	SVE Stack Effluent	SP-12	1	400 ml Summa	None			
	SVE Pre GAC-0901	TO-15	SVE Manifold Influent	SP-11	1	400 ml Summa	None			

Sampler Signature	Date
George Bradshaw	9/1/2015

Notes:

FD = Field Duplicate
FB = Field Blank (ambient)
NS = Normal Sample
TB = Trip Blank

Scan COCs to:
URS Attn: Debbie Casagrande (916) 679-2040

A Note: canister # a- y #

B = Dup

unused (#6 762) (#1468 6L)

Sample Collection Field Form

Sample ID	Date	Time (Collection)	Depth [1] (D) feet	Diameter (Ø) inches	Well Casing Volume L	Purge Volume [2] L	Pump Flow L/min	Purge Required (min:sec)	Time of Purge Start	Time of Purge End	Shut-in-Test (30 sec) vaci	Shut-in-Test (30 sec) vacf	Sample Duration (min:sec)	Canister Vacuum initial	Canister Vacuum Final	Canister Volume	Canister #
DP-06-S-B	8/25/15	1325	16	1.00	2.471106968	9.884427873	8	01:14	1320	1322	✓	✓	1:00	30	4	400 ml	657 ✓
~~DP-06-S~~	~~8/25/15~~	~~1325~~	~~16~~	~~1.00~~	~~2.471106968~~	~~9.884427873~~	~~8~~	~~01:14~~	~~-~~	~~-~~	~~-~~	~~-~~	~~1:00~~	~~-~~	~~-~~	~~400 ml~~	
DP-06-D	8/25/15	1335	35	1.00	5.405546493	21.62218597	8	02:42	1330	1333	✓	✓	1:00	30	4	400 ml	2001 ✓
DP-05-S	8/25/15	1303	16	1.00	2.471106968	9.884427873	8	01:14	1256	1258	✓	✓	1:00	30	4	400 ml	1094 ✓
DP-05-D	8/25/15	1314	36	1.00	5.559990678	22.23996271	8	02:47	1306	1309	✓	✓	1:00	30	4	400 ml	865 ✓
DP-01-S	A 8/26/15	0934	29	0.25	0.279930086	1.119720345	8	00:08	0929	0930	✓	✓	1:00	29	4	400 ml	635 ○
DP-01-D	8/26/15	0946	39	0.25	0.376457702	1.505830809	8	00:11	0944	0945	✓	✓	1:00	30	4	400 ml	664 ○
SVE-01	8/25/15	1150	38	2.00	23.4755162	93.90206479	8	11:44	11:37	11:49	✓	✓	1:00	30	4	400 ml	1075 ✓
SVE-02	8/25/15	1245	12	2.00	7.413320904	29.65328362	8	03:42	1239	1243	✓	✓	1:00	30	4	400 ml	668 ✓
SVE-03	8/25/15	1210	23	2.00	14.20886507	56.83546027	8	07:06	1200	1208	✓	✓	1:00	30	4	400 ml	1061 ✓
SVE-04	8/25/15	1232	38	2.00	23.4755162	93.90206479	8	11:44	1217	1229	✓	✓	1:00	30	4	400 ml	888 ✓
OSVE-10	8/26/15	1005	5	2	3.08888371	12.35553484	8	0.001072529	1000	1001	✓	✓	1:00	30	4	400 ml	1984 ○
OSVE-11	8/26/15	1014	5	2	3.08888371	12.35553484	8	0.001072529	1008	1009	✓	✓	1:00	29	4	400 ml	891 ○

931-IA-01-A 8/25/15 11:04 → + 111 C 5014 R ✓

931-IA-01-B 8/25/15 11:05 → + 109 C 5210 R ✓

939-IA-03- 8/25/15 → 11:16 →

939-IA-01 8/25/15 → 11:18 → + 454 C 5022 R ✓

+ 5721 C 5017 R ✓

941-IA-01 8/25/15 11:20 + 501 C 5215 R ✓

941-IA-02 8/25/15 11:27 106 C 5023 R ✓

931	-SS	-01	-B 1056	8/26/15					N/A	N/A	✓	✓	-	29	4		1582
931	-SS	-01	-A 1053	8/26/15					1047	1048	✓	✓	-	30	4		1582
* DP	-01	-S	-B (Duplicate)	8/26/15	0937				0935	0936	✓	✓	-	30	4		1972 *
939	-SS	-02	1108						1103	1104	✓	✓	-	29	4		~~1972~~ 1587
939	-SS	-01	1115						1110	1111	✓	✓	-	29	4		1586
941	-SS	-01	1121						1120	1121	✓	✓	-	30	4		02
OSC	-3		1130					AIR = +	CAN 1124	Reg 1126	✓	✓	-	30	4		06

Notes:

[1] Well depth also includes length of above fround and horizontal piping, if necessary to purge

[2] Purge Volume = 4x well casing volume

PV = 4*Vwc

Vwc = D*pi*(Ø/2)2

PT=PV/PF

1 ft^3 = 28.3168 L

Notes:

Trans 82°F doors op closed sunny

Part 82° doors closed fan on

Hallands 90° Doors closed front door open back

ENVIRONMENTAL PROTECTION AGENCY
Region 9 Laboratory

CHAIN OF CUSTODY RECORD

1337 S. 46th St., Bldg. 201
Richmond, CA 94804-4698

PROJ. NO.: 011-40001-15

PROJECT NAME: Aug 2015 SVE sampling Modesto, superfund site

SAMPLERS: (Signature) Sara McMullen & Jacobe Washburn

Sara McMullen

Pg 1 of 2

DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	TO-15 SIM	TO-15						REMARKS
8/25/15	11:04	Air		X	931-IA-01-A	1 6L	X							can # 111 reg # 5014
8/25/15	11:05			X	931-IA-01-B	1 6L	X							can # 109 reg # 5210 duplicate
8/25/15	11:16			X	939-IA-03	1 6L	X							can # 454 reg # 5022
8/25/15	11:18			X	939-IA-01	1 6L	X							can # 5721 reg # 5[illegible]
8/25/15	11:20			X	941-IA-01	1 6L	X							can # 561 reg # 5215
8/25/15	11:27			X	941-IA-02	1 6L	X							can # 106 reg # 5023
8/25/15	~~11:50~~ 11:50			X	SVE-01	1 400mL		X						can # 1075
8/25/15	12:45			X	SVE-02	1 400mL		X						can # 668
8/25/15	12:10			X	SVE-03	1 400mL		X						can # 1061
8/25/15	12:32			X	SVE-04	1 400mL		X						can # 888
8/26/15	9:34			X	DP-01-S-A	1 400mL		X						can # ~~634~~ 635
8/26/15	9:37			X	DP-01-S-B	1 400mL		X						can # 1972
8/26/15	9:46			X	DP-01-D	1 400mL		X						can # 664
8/25/15	13:03			X	DP-05-S	1 400mL		X						can # 1094
8/25/15	13:14			X	DP-05-D	1 400mL		X						can # 865

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Sara McMullen	8/26/15				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Received for Laboratory by: (Signature)	Date / Time	Temp.	Seals Intact (Y/N)	Conditions / Remarks

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

9-4455

ENVIRONMENTAL PROTECTION AGENCY
Region 9 Laboratory

CHAIN OF CUSTODY RECORD

1337 S. 46th St., Bldg. 201
Richmond, CA 94804-4698

PROJ. NO.: 011-4000-15
PROJECT NAME: Modesto Superfund Site
SAMPLERS: (Signature) Sara McMullen & Jacobe Washburn
Sara McMullen

pg. 2 of 2

DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	REMARKS
8/25/15	13:25	Air		X	DP-06-S	1 400mL	can # 657
8/25/15	13:35			X	DP-06-D	1 400mL	can # 2001
8/26/15	10:53			X	931-SS-01-A	1 400mL	can # 1582
8/26/15	10:56			X	931-SS-01-B	1 400mL	can # 1588
8/26/15	11:08			X	939-SS-02	1 400mL	can # 1587
8/26/15	11:15			X	939-SS-01	1 400mL	can # 1586
8/26/15	11:21			X	941-SS-01	1 6L	can # 02
8/26/15	11:30			X	OSC-3	1 6L	can # 6
8/26/15	10:05			X	OSVE-10	1 400mL	can # 1984
8/26/15	10:14			X	OSVE-11	1 400mL	can # 1891
					unused canisters:		
			400mL		1592, 1579, 1109, 1628, 2004		
			6L		762, 468		

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Sara McMullen	8/26/15				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Received for Laboratory by: (Signature)	Date / Time	Temp. / Seals Intact (Y/N)	Conditions / Remarks		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

9-4455

ENVIRONMENTAL PROTECTION AGENCY
Region 9 Laboratory

CHAIN OF CUSTODY RECORD

1337 S. 46th St., Bldg. 201
Richmond, CA 94804-4698

PROJ. NO.: 011-40001-15

PROJECT NAME: Modesto Superfund site 3Q2015 Event

SAMPLERS: (Signature) Sara M. Mullen

pg. 1 of 2

DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	TO-15 SIM	TO-15					REMARKS
9/30/15	10:33	Air			941-IA-01-A	1	X						can #102 reg # 05013 82°F doors shut
9/30/15	10:37				941-IA-01-B	1	X						canister # 7106 reg # 5024 (Duplicate) doors shut
9/30/15	10:31				941-IA-02	1	X						can # 1187 reg # 05029 82.75°F doors shut
9/30/15	10:30				939-IA-01	1	X						can # 24L reg # 05212 78°F doors shut
9/30/15	10:26				939-IA-03	1	X						can # 770 reg # 05034 78°F doors shut
9/30/15	10:22				931-IA-01	1	X						can # 133 reg # 05026 75°F doors shut
9/30/15	12:03				SVE-01	1		X					can # 1136
9/30/15	13:35				SVE-02	1		X					can #656
9/30/15	13:22				SVE-03	1		X					can # 885
9/30/15	13:58				SVE-04-A	1		X					can #1112
9/30/15	13:58				SVE-04-B	1		X					can # 647 (Duplicate)
9/30/15	14:26				DP-05-S	1		X					can #870
9/30/15	14:30				DP-05-D	1		X					can # 1974
9/30/15	14:50				DP-06-S	1		X					can #1115
9/30/15	14:58				DP-06-D	1		X					can #1971

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Sara M. Mullen	9/31/2015				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Received for Laboratory by: (Signature)	Date / Time	Temp.	Seals Intact (Y/N)	Conditions / Remarks

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

9-4455

ENVIRONMENTAL PROTECTION AGENCY
Region 9 Laboratory

CHAIN OF CUSTODY RECORD

1337 S. 46th St., Bldg. 201
Richmond, CA 94804-4698

PROJ. NO.: 011-40001-15

PROJECT NAME: Modesto Superfund Site SVE/IAISS 3Q2015 event

SAMPLERS: (Signature) Sara McMullen

Pg. 2 of 2

DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	TO-15	REMARKS
10/1/2015	11:15	Air			931-SS-01	1	X	can # 649
10/1/2015	12:05				939-SS-02	1	X	can # 900
10/1/2015	12:21				939-SS-a	1	X	Can #68
10/1/2015	~~12:50~~ 13:23				941-SS-01	1	X	can #11 (6L)
10/1/2015	13:35				OSC-3	1	X	can #12 (6L)
~~10/1/2015~~					~~OSVE-10~~	1	X	~~can #~~ SM
~~10/1/2015~~					~~OSVE-11~~	1	X	~~can #~~ SM ran out of filters
~~10/1/2015~~					~~DP-01-S~~	1	X	~~can #~~ SM
10/1/2015					~~DP-02~~ DP-01-D	1	X	can # 1983

Unused canisters: #s...
627, 634, 2003, 631, 629,
859, 188. (400mL)
#114 (6L)

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Sara McMullen	10/1/2015				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Received for Laboratory by: (Signature)	Date / Time	Temp.	Seals Intact (Y/N)	Conditions / Remarks

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

9-4455

ENVIRONMENTAL PROTECTION AGENCY
Region 9 Laboratory

CHAIN OF CUSTODY RECORD

1337 S. 46th St., Bldg. 201
Richmond, CA 94804-4698

PROJ. NO.: July 2015 SVE Sampling

PROJECT NAME: Modesto Superfund Site

SAMPLERS: (Signature)

DATE	TIME	MATRIX	COMP.	GRAB	SAMPLE IDENTIFICATION	NO. OF CONTAINERS	TO-15 SIM	TO-15	Initial pressure	Final pressure	REMARKS
7/23/15	13:05	6L		X	931-IA-01	1	X		~~28~~ 30		Canister # 451 reg # 5214
7/23/15	13:20	6L		X	939-IA-01	1	X				canister # 105 reg # 5031
7/23/15	13:22	6L		X	939-IA-03-A	1	X				canister # 103 reg # 5046
7/23/15	13:25	6L		X	939-IA-03-B	1	X		replaced reg # w/ 5012		canister # 125 reg # ~~5045~~ Duplicate
7/23/15	13:35	6L		X	941-IA-01	1	X				canister # 450 reg # 5024
7/23/15	13:37	6L		X	941-IA-02	1	X				canister # 108 reg # 5020
7/23/15	10:45	400mL		X	SVE-01-A	1		X			canister # ~~1111~~ 658 ~~reg~~
~~7/23/15~~ 7/24/15	9:35	400mL		X	SVE-02	1		X	~~28~~ 4	Start 29 end 4	canister # 1111
~~7/23/15~~ 7/24/15	10:15	400mL		X	SVE-03	1		X	29	4	canister # 650
~~7/23/15~~ 7/24/15	10:48 9:55	400mL		X	SVE-03-B	1		X	29	4	canister # ~~648~~ 848
~~7/23/15~~ 7/24/15	4:30	400mL		X	SVE-04	1		X	27	3	canister # ~~884~~ 874?
~~7/23/15~~ 7/24		400mL		X	DP-01-S	1		X	29	4	canister # 1594
~~7/23/15~~ 7/24		400mL		X	DP-01-D	1		X	29	4	canister # 1593
~~7/23/15~~ 7/24	13:20	400mL		X	DP-05-S	1		X	30	4	canister # 1067
~~7/23/15~~ 7/24	13:25	400mL		X	DP-05-D	1		X	30	4	canister # (1967)
7/24/15	13:35				DP-06-S-A				30	4	3 canister # 2002
7/24/15	13:45				DP-06-S-B				30	4	canister # 564
7/24/15	13:40				DP-06-D				30	4	canister # 1966
7/23/15	13:55		X		931-SS-01	1			29	4	canister # 1988
7/23/15	14:24				939-SS-02						canister # 1991

Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Received for Laboratory by: (Signature)	Date / Time	Temp. / Seals Intact (Y/N)

Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Conditions / Remarks		

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

9-3278

start 29 end 4 7/23/15 17:00 canister # 4637

start 29 end 4 7/23/15 17:40 canister # 656

941-SS-01 start 29 end 4 7/23/15 ~~4:58~~ 16:58 canister # 38

939-SS-01 7/23/15 14:35 canister # 1099 start 29 end 4

WELL GAUGING DATA

Project # 150916-KB2 Date 9/16/15 Client Rose

Site 941 McHenry Ave, Modesto

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC
MW-01A	4	1230					48.29	100.82	
MW-02A	4	1220					47.40	97.70	
MW-03A									
MW-04A									
MW-04B	2	0911					49.51	153.63	
MW-04C	2	0927					54.04	237.22	
MW-05A	2	1250					47.71	89.19	
MW-06A	2	0900					46.91	82.12	
MW-07A	2	1159					46.94	88.36	
MW-08A	2	1253					48.64	88.08	
MW-09B	2	1237					49.31	153.50	
MW-10A	2	1400	parked over				48.44	90.41	
MW-10B	2	0847					48.66	162.44	
MW-10C	2	1349	parked over				53.33	230.10	
MW-11A	2	1302					45.09	91.97	
MW-12A	2	1125					49.30	98.62	
MW-13A	2	1430					46.62	97.74	

WELL GAUGING DATA

Project # 150916 KD-2 Date 9/16/15 Client RDRE

Site 941 McHenry Ave, Modesto, CA

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC
MW-14A	2	1312					46.22	89.89	
MW-15A	2	1301					48.64	101.29	
MW-16A	2	1158					51.53	85.66	
MW-16B	2	1213					51.51	138.78	
MW-16C	2	1226					54.94	235.46	
MW-17A	2	0957					47.86	87.05	
MW-17B									
MW-17C	2	1010					53.68	231.0	
MW-18A	2	0826					48.34	65.71	
MW-19A	2 ~~1210~~	1140					50.19	101.19	
MW-19B1	2 ~~1210~~	1210					50.99	147.56	
MW-20B	2	1320					49.96	161.93	
MW-20C	2	1326					53.71	234.81	
MW-21A	2	1101					51.44	100.38	
MW-22A	2	1110					51.15	60.19	
MW-23A	2	1416					46.42	99.28	
MW-20A									

WELL GAUGING DATA

Project # 150916KD-2 Date 9/16/15 Client RORE

Site 941 McHenry Ave, Modesto, CA

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC
MW-24B	2	1350	parked over				51.79	154.88	
MW-25B									
MW-26B	2	1032					48.34	154.82	
MW-27B	2	1022					48.08	154.91	
MW-28B	2	1407					47.18	154.61	
MW-29B	2	1424					47.24	154.86	
MW-30A	2	1327					44.58	97.81	
MW-30B	2	1336					45.69	155.45	
MW-31A	2	1344					45.51	99.48	
MW-32B									
MW-32C	2	1128					54.64	236.53	
MW-33B	2	1045					51.13	161.44	
MW-34B	2	1355					45.12	153.81	
MW-35B									
EW-01									
EW-02									

WELL GAUGING DATA

Project # 150001-ET1 Date 10/1/15 Client RARE

Site 941 McHenry Ave, Modesto, CA

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC
MW-01A	4	1545					48.57	100.82	
MW-02A	4	0900					47.55	97.70	
MW-03A	4	0905					49.20	93.47	
MW-04A	4	1318					49.53	88.33	
MW-04B	2	1740					49.61	153.83	
MW-04C	2	1755					53.30	237.22	
MW-05A	2	1430					47.95	89.19	
MW-06A	2	1340					47.10	82.12	
MW-07A	2	1320					47.21	88.36	
MW-08A	2	1500					48.83	88.08	
MW-08B	2	1520					49.38	153.50	
MW-10A	2	1410					48.62	90.41	
MW-10B	2	1120					48.80	162.44	
MW-10C	2	1200	Odor				52.40	230.10	
MW-11A	2	0920					45.32	91.97	
MW-12A	2	0720					49.55	98.62	
MW-13A	2	0950					46.91	92.74	

WELL GAUGING DATA

Project # 151001-ETC Date 10/1/15 Client RORE

Site 941 McHenry Ave Modesto, CA

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC
MW-14A	2	1625					46.38	87.89	
MW-15A	2	0625					48.81	101.29	
MW-16A	2	0915					51.76	85.66	
MW-16B	2	0930					51.75	138.78	
MW-16C	2	0955					55.42	235.46	
MW-17A	2	1705	Odor				48.08	87.05	
MW-17B	2	1057					48.61	138.83	
MW-17C	2	1650					52.72	231.19	
MW-18A	2	1400					48.52	65.71	
MW-19A	2	0740					50.43	101.17	
MW-19B1	2	0755					51.12	147.56	
MW-20A	2	0245					49.79	85.74	
MW-20B	2	0815					50.19	161.93	
MW-20C	2	0840					53.35	234.81	
MW-21A	2	0655					51.91	100.38	
MW-22A	2	1055					46.81	99.28	
MW-23A	2	0710					51.52	60.19	

WELL GAUGING DATA

Project # 150001-E+1 Date 10/1/15 Client RRe

Site 941 McHenry Ave, Modesto, CA

Well ID	Well Size (in.)	Time Gauged	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC
MW-24B	2	0640					52.02	154.88	
MW-25B	2	1211					51.38	155.00	
MW-26B	2	1255					48.98	154.82	
MW-27B	2	1720					48.32	154.41	
MW-28B	2	1220					47.39	154.61	
MW-29B	2	1120					47.44	154.86	
MW-30A	2	1000					44.79	97.81	
MW-30B	2	1030					45.58	155.45	
MW-31A	2	1140					46.18	99.48	
MW-32B	2	1132					51.53	155.04	
MW-32C	2	1225					52.08	236.53	
MW-33B	2	1050					57.31	161.44	
MW-34B	2	1205					45.12	153.81	
MW-35B	2	1209					48.09	168.30	
EW-01R	Pump	0940					53.21	–	
EW-02	Pump	1345					58.16	–	

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-01A	Well Diameter: 2 3 (4) 6 8 ____
Total Well Depth (TD): 100.82	Depth to Water (DTW): 48.51
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1545	Retrieved	PDB For	Sampling			
1555	Replaced	with new	PDB			

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1550 Depth to Water: 48.51

Sample I.D.: MW-01A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RONE
Sampler: ET	Date: 10/1/15
Well I.D.: ET ~~MW-2A~~ MW-02A	Well Diameter: 2 3 (4) 6 8 ____
Total Well Depth (TD): 97.70	Depth to Water (DTW): 47.55
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0900		Retrieved PDB for sample				
0910		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 0945 Depth to Water: 47.55

Sample I.D.: MW-02A Laboratory: ERA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

LOW FLOW WELL MONITORING DATA SHEET

Project #: 1	Client: RORE
Sampler: KO	Start Date: 10/1/15
Well I.D.: MW-03A	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: 93.47	Depth to Water Pre: 49.70 Post: 49.77
Depth to Free Product: —	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: YSI Pro Plus

Purge Method: 2" Grundfos Pump Peristaltic Pump (Bladder Pump)
Sampling Method: Dedicated Tubing (New Tubing) Other_____
Flow Rate: 200 ml/min Pump Depth:_____

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or mL)	Observations
0905	21.2	7.22	1143	24	5.48	-84.0	300	49.74
0908	21.0	6.91	1252	12	4.94	-107.5	900	49.76
0911	21.0	6.92	1254	10	4.86	-135.0	1500	49.77
0914	21.0	6.93	1255	9	4.87	-156.2	2100	49.77
0917	21.0	6.95	1255	9	4.75	-159.2	2700	49.77
0920	20.9	6.95	1255	8	4.77	-161.2	3300	49.77
		*	MS/MSD	Taken				

Did well dewater? Yes (No)	Amount actually evacuated: 3300 ml
Sampling Time: 0925	Sampling Date: 10/1/15
Sample I.D.: MW-03A	Laboratory: EPA
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: (VOCs)
Equipment Blank I.D.: @ Time	Duplicate I.D.:

WELL MONITORING DATA SHEET

Project #: 150916-KO1	Site: RORE & Modesto Superfund
Sampler: KO	Date: 10/1/15
Well I.D.: MW-04A	Well Diameter: 2 3 (4) 6 8 ____
Total Well Depth (TD): 88.33	Depth to Water (DTW): 49.53
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: 75I Pro Plus
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method:
- Disposable Bailer
- Positive Air Displacement
- Electric Submersible
- Waterra
- 2" Rediflo pump
- Extraction Pump
- Other Bladder pump

Sampling Method:
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: New tubing

Flow Rate= 200 ml/min

____(Gals.) X ____ = ____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°C ~~°F~~)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	ml ~~Gals.~~ Removed	DTW Observations
~~0905~~ 1316	22.0	7.80	246	42	3.01	152.7	300	49.57
1321	21.2	7.60	245	11	0.56	147.5	900	49.60
1324	21.1	7.55	248	12	0.43	127.2	1500	49.62
1327	21.1	7.48	259	11	0.35	101.8	2100	49.64
1330	21.1	7.42	262	10	0.33	96.8	2700	49.65
1333	21.0	7.40	262	10	0.33	95.0	3300	49.66

Did well dewater? Yes (No) Gallons actually evacuated: 3,300 ml

Sampling Date: 10/1/15 Sampling Time: 1335 Depth to Water: 49.66

Sample I.D.: MW-04A Laboratory: EPA

Analyzed for: VOCs Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

FB I.D. (if applicable): @ Time Analyzed for:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: ROREE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-04B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 153.63	Depth to Water (DTW): 49.61
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1740		Retrieved PDB for Sample				
1750		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1745 Depth to Water: 49.61

Sample I.D.: MW-04B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-04C	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 237.22	Depth to Water (DTW): 53.30
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, ~~Positive Air Displacement~~, ~~Electric Submersible~~, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1755		Retrieved PDB	for Sample			
1805		Replaced with	new PDB			

Did well dewater? Yes (No)	Gallons actually evacuated: –
Sampling Date: 10/1/15 Sampling Time: 1805 ~~1755~~	Depth to Water: 53.30
Sample I.D.: MW-04C	Laboratory: EPA
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other: VOCs
EB I.D. (if applicable): @ Time	Duplicate I.D. (if applicable):
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other:
D.O. (if req'd): Pre-purge: mg/L	Post-purge: mg/L
O.R.P. (if req'd): Pre-purge: mV	Post-purge: mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-05A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 89.19	Depth to Water (DTW): 47.95
Depth to Free Product: —	Thickness of Free Product (feet): —
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1430		Retrieved PDB for sample				
1490		Replaced with new PDB				

Did well dewater? Yes (No)		Gallons actually evacuated: —	
Sampling Date: 10/1/15	Sampling Time: 1435	Depth to Water: 47.95	
Sample I.D.: MW-05A		Laboratory: ERA	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs			
EB I.D. (if applicable): @ Time		Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:			
D.O. (if req'd): Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-06A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 82.12	Depth to Water (DTW): 47.10
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1340		Retrieved PDB for Sample				
1350		Replaced with a new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1345 Depth to Water: 47.10

Sample I.D.: MW-06A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-07A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 88.36	Depth to Water (DTW): 47.21
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1320		Retrieved PDB for Sampling				
1330		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1325 Depth to Water: 47.21

Sample I.D.: MW-07A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-08A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 88.08	Depth to Water (DTW): 48.83
Depth to Free Product: —	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1500	Retrieved	PDB for	Sample			
1510		Replaced	w/ a new	PDB		

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1505 Depth to Water: 48.83

Sample I.D.: MW-08A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET	Client: RARE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-09B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 153.50	Depth to Water (DTW): 49.38
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1520	Retrieved	PDB for	sample			
1530		Replaced	with new	PDB		

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1525 Depth to Water: 49.38

Sample I.D.: MW-09B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-1A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 92.41	Depth to Water (DTW): 48.62
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1410		Retrieved PDB for Sample				
1420		Replaced with new PDB				

Did well dewater? Yes (No)		Gallons actually evacuated:	
Sampling Date: 10/2/15	Sampling Time: 1415	Depth to Water: 48.62	
Sample I.D.: MW-1A		Laboratory: EPA	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOC			
EB I.D. (if applicable): @ Time		Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:			
D.O. (if req'd): Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET	Client: RMRE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-10B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD):	Depth to Water (DTW): 48.80
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other _____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1120		Retrieved PDB for sampling				
1130		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 1125 Depth to Water: 48.80

Sample I.D.: MW-10B Laboratory: ERA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151091-ET1	Client: RNRB
Sampler: ET	Date: 10/2/15
Well I.D.: MW-10C	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 230.10	Depth to Water (DTW): 52.40
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1200		Retrieved PDB for Sampling				
1210		Replaced with new PDB				

Did well dewater? Yes (No)		Gallons actually evacuated:	
Sampling Date: 10/2/15	Sampling Time: 1205	Depth to Water: 52.40	
Sample I.D.: MW-10C		Laboratory: EPA	
Analyzed for: TPH-G BTEX MTBE TPH-D		Oxygenates (5) Other: VOCs	
EB I.D. (if applicable):	@ Time	Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D		Oxygenates (5) Other:	
D.O. (if req'd): Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-~~11A~~ 11A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 91.97	Depth to Water (DTW): 45.32
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0925		Retrieved PDB for sampling				
0935		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 0930 Depth to Water: 45.32

Sample I.D.: MW-11A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ETI	Client: RARB
Sampler: ET	Date: 10/2/15
Well I.D.: MW-12A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 98.62	Depth to Water (DTW): 49.55
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0720		Retrieved PDB for sampling				
0730		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0725 Depth to Water: 49.55

Sample I.D.: MW-12A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-13A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 97.74	Depth to Water (DTW): 46.91
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, ~~Waterra~~, ~~Peristaltic~~, ~~Extraction Pump~~, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0950		Removed PDB for Sample				
1000		Replaced PDB with new one				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 0955 Depth to Water: 46.91

Sample I.D.: MW-13A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 154001-ETI	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-14A ~~MW-14A~~ ~~MW-14A~~	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 49.89	Depth to Water (DTW): ~~45.30~~ 57 46.38
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1625		Removed PDB for sample				
1635		Replaced with new PDB				

Did well dewater? Yes (No)	Gallons actually evacuated: —
Sampling Date: 10/1/15 Sampling Time: 57 ~~1645~~ 1630	Depth to Water: 46.38
Sample I.D.: MW-14A	Laboratory: ERA
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other: VOCs
EB I.D. (if applicable): @ Time	Duplicate I.D. (if applicable):
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other:
D.O. (if req'd): Pre-purge: ____ mg/L	Post-purge: ____ mg/L
O.R.P. (if req'd): Pre-purge: ____ mV	Post-purge: ____ mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-15A	Well Diameter: 2 3 4 6 8 ____
Total Well Depth (TD): 101.27	Depth to Water (DTW): 48.81
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0625		Retrieved PDB for sampling				
0635		Replaced with new PDB				

Did well dewater? Yes No Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0630 Depth to Water: 48.81

Sample I.D.: MW-15A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 154081-ETI	Client: ROPE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-16A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 85.66	Depth to Water (DTW): 51.76
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0915		Retrieved PDB for sampling				
0925		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0920 Depth to Water: 51.76

Sample I.D.: MW-16A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ETI	Client: RMR
Sampler: ET	Date: 10/2/15
Well I.D.: MW-16B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 138.78	Depth to Water (DTW): 51.25
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0930		Retrieved PDB for sampling				
0940		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0935 Depth to Water: 51.75

Sample I.D.: MW-16B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-16C	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 235.46	Depth to Water (DTW): 55.42
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0955		Retrieved PDB for Sampling				
1005		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 1000 ~~10/2/15~~ (7) Depth to Water: 55.42

Sample I.D.: MW-16C Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ETI	Client: ROPE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-17A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 87.05	Depth to Water (DTW): 48.08
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1705		Retrieved PDB for Sampling				
1715		Replaced with New PDB				

Did well dewater? Yes (No)		Gallons actually evacuated: —	
Sampling Date: 10/1/15	Sampling Time: 1710	Depth to Water: 48.08	
Sample I.D.: MW-17A		Laboratory: ERA	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs			
EB I.D. (if applicable): @ Time		Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:			
D.O. (if req'd): Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): Pre-purge:	mV	Post-purge:	mV

LOW FLOW WELL MONITORING DATA SHEET

Project #: 150916-KM1	Client: RORE
Sampler: KO	Start Date: 10/1/15
Well I.D.: MW 17B	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 138.83	Depth to Water Pre: 48.61 Post: 48.61
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: YSI Pro Plus

Purge Method: 2" Grundfos Pump Peristaltic Pump (Bladder Pump)
Sampling Method: Dedicated Tubing (New Tubing) Other ___
Flow Rate: 200 ml/min Pump Depth: ___

Time	Temp. (°C or °F)	pH	Cond. (mS or (µS))	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or (mL))	DTW Observations
1057	20.5	6.68	436	31	1.61	145.9	300	48.61
1100	19.8	7.06	814	5	4.05	124.6	900	48.61
1103	19.8	7.10	826	3	4.09	139.1	1500	48.61
1106	19.7	7.12	829	3	4.24	146.0	2100	48.61
1109	19.7	7.13	830	3	4.31	150.8	2700	48.61
1112	19.7	7.13	829	3	4.30	152.1	3300	48.61

Did well dewater? Yes (No)	Amount actually evacuated: 3300 ml
Sampling Time: 1115	Sampling Date: 10/1/15
Sample I.D.: MW-17B	Laboratory: EPA
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: (VOCs)
Equipment Blank I.D.: @ Time	Duplicate I.D.:

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: ROPE
Sampler: MW-17C	Date: 10/1/15
Well I.D.: ET	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 23.19	Depth to Water (DTW): 52.72
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1650		Retrieved PDB for Sample				
1700		Replaced with new PDB				

Did well dewater? Yes (No)		Gallons actually evacuated: —	
Sampling Date: 10/1/15	Sampling Time: 1655	Depth to Water: 52.72	
Sample I.D.: MW-17C		Laboratory: EPA	
Analyzed for: TPH-G BTEX MTBE TPH-D		Oxygenates (5) Other: VOCs	
EB I.D. (if applicable):	@ Time	Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D		Oxygenates (5) Other:	
D.O. (if req'd): Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET	Client: ROPC
Sampler: ET	Date: 10/1/15
Well I.D.: MW-18A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 65.71	Depth to Water (DTW): 48.52
Depth to Free Product: —	Thickness of Free Product (feet): —
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: —	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1405		Retrieved PDB for sample				
1410		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1405 Depth to Water: 48.52

Sample I.D.: MW-18A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151021-ET1	Client: RORE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-19A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 101.19	Depth to Water (DTW): 50.43
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, ~~Peristaltic~~, ~~Extraction Pump~~, Other _____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0740		Retrieved PDB for sampling				
0750		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0745 Depth to Water: 50.43

Sample I.D.: MW-19A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ES1	Client: RARE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-19B1	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 147.56	Depth to Water (DTW): 51.12
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0755		Retrieved PDB for Sampling				
0805		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0800 Depth to Water: 51.12

Sample I.D.: MW-19B1 Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

LOW FLOW WELL MONITORING DATA SHEET

Project #: 150916-1601	Client: ROPE
Sampler: KO	Start Date: 10/1/15
Well I.D.: MW-20A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 85.74	Depth to Water Pre: 49.70 Post:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: YSI Pro Plus

Purge Method: 2" Grundfos Pump Peristaltic Pump (Bladder Pump)
Sampling Method: Dedicated Tubing (New Tubing) Other ____
Flow Rate: 200 ml/min Pump Depth: ____

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or mL)	DTW Observations
1245	23.2	7.10	792	854	2.73	189.5	300	49.74
1248	22.5	7.10	1013	703	5.54	166.4	900	49.77
1251	22.4	7.12	1013	573	5.68	164.4	1500	49.79
1254	22.5	7.13	1012	555	5.42	165.1	2100	49.80
1257	22.3	7.13	1014	528	5.51	165.8	2700	49.80

Did well dewater? Yes (No)	Amount actually evacuated: 2700 ml
Sampling Time: 1300	Sampling Date: 10/1/15
Sample I.D.: MW-20A	Laboratory: EPA
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: (VOCs)
Equipment Blank I.D.: @ Time	Duplicate I.D.:

WELL MONITORING DATA SHEET

Project #: 157001-ET1	Client: ROPE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-20B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 161.93	Depth to Water (DTW): 50.19
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0815		Retrieved PDB for Sampling				
0825		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0820 Depth to Water: 50.19

Sample I.D.: MW-20B Laboratory: ERA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-20C	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 23.81	Depth to Water (DTW): 53.35
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, ~~Other~~ ____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

____ (Gals.) X	____	=	____ Gals.
1 Case Volume	Specified Volumes		Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0840	Retrieved PDB for Sampling					
0850	Replaced with new PDB					
	(PDB had a hole in the bottom of it only had enough					
	water in it for 1 complete VOA)					

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0845 Depth to Water: 53.35

Sample I.D.: MW-20C Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-21A	Well Diameter: 2 3 4 6 8 ____
Total Well Depth (TD): 100.38	Depth to Water (DTW): 51.91
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0655		Retrieved PDB for Sampling				
0705		Replaced with new PDB				

Did well dewater? Yes No		Gallons actually evacuated: –	
Sampling Date: 10/2/15	Sampling Time: 0700	Depth to Water: 51.91	
Sample I.D.: MW-21A		Laboratory: EPA	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs			
EB I.D. (if applicable): @ Time		Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:			
D.O. (if req'd): Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-E11	Client: RORE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-22A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 60.10	Depth to Water (DTW): 51.52
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0710		Retrieved PDB for sampling				
0720		Replaced PDB with new one				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0715 Depth to Water: 51.52

Sample I.D.: MW-22A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-23A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 99.28	Depth to Water (DTW): 46.81
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1055		Retrieved PDB for sampling				
1105		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1100 Depth to Water: 46.81

Sample I.D.: MW-23A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-24B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 154.88	Depth to Water (DTW): 52.02
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, (Positive Air Displacement), Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
0640		Retrieved PDB for Sampling				
0650		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 0645 Depth to Water: 52.02

Sample I.D.: MW-24B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

LOW FLOW WELL MONITORING DATA SHEET

Project #: 150916-1521	Client: RORE
Sampler: KO	Start Date: 10/1/15
Well I.D.: MW-25B	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 155.00	Depth to Water Pre: 51.38 Post: 51.52
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: YSI Pro Plus

Purge Method: 2" Grundfos Pump Peristaltic Pump (Bladder) Pump
Sampling Method: Dedicated Tubing (New Tubing) Other_____
Flow Rate: 200 ml/min Pump Depth:_____

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or mL)	DTW Observations
1211	22.3	7.35	428	10	2.73	191.7	300	51.42
1214	22.3	7.36	427	6	1.53	183.0	900	51.45
1217	22.2	7.35	426	4	0.78	167.7	1500	51.48
1220	22.1	7.34	426	3	0.51	154.7	2100	51.50
1223	22.1	7.34	426	3	0.49	148.1	2700	51.51
1226	22.1	7.35	426	3	0.52	146.0	3300	51.52

Did well dewater? Yes (No)	Amount actually evacuated: 3300 ml
Sampling Time: 1230	Sampling Date: 10/1/15
Sample I.D.: MW-25B	Laboratory: EPA
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: (VOCs)
Equipment Blank I.D.: @ Time	Duplicate I.D.:

WELL MONITORING DATA SHEET

Project #: 150001-E+1	Client: RRE
Sampler: ET	Date: 10/2/15
Well I.D.: MW-26B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 159.82	Depth to Water (DTW): 48.98
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1255		Retrieved PDB for Sampling				
1305		Replaced PDB with ~~to~~ new one				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 1300 Depth to Water: 48.98

Sample I.D.: MW-26B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-27B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 154.91	Depth to Water (DTW): 48.32
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1720	Removed	PDB to Sample				
1730	Replaced	with new	PDB			

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1725 Depth to Water: 48.32

Sample I.D.: MW-27B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ETI	Client: RARE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-28B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 154.61	Depth to Water (DTW): 47.39
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1220		Retrieved PDB for Sampling				
1230		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1225 Depth to Water: 47.39

Sample I.D.: MW-28B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORF
Sampler: ET	Date: 10/1/15
Well I.D.: MW-29B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 154.86	Depth to Water (DTW): 47.44
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1120		Retrieved PDB for sampling				
1130		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1125 Depth to Water: 47.44

Sample I.D.: MW-29B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-30A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 97.81	Depth to Water (DTW): 94.79
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1010		Retrieved PDB for Sampling				
1020		Replaced with new PDB				

Did well dewater? Yes (No)		Gallons actually evacuated: —	
Sampling Date: 10/1/15	Sampling Time: 1015	Depth to Water: 94.79	
Sample I.D.: MW-30A		Laboratory: ERA	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs			
EB I.D. (if applicable): @ Time		Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:			
D.O. (if req'd): Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd): Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ETA	Client: RORE
Sampler: ET	Date: 10/1/15
Well I.D.: 1 of MW-30B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 155.45	Depth to Water (DTW): 45.58
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1030		Retrieved PDB	for sample			
1040		Replaced with	new PDB			

Did well dewater? Yes (No) Gallons actually evacuated:

Sampling Date: 10/1/15 Sampling Time: 1035 Depth to Water: 45.58

Sample I.D.: MW-30B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: ROAE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-31A	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 99.48	Depth to Water (DTW): 46.18
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer / Disposable Bailer / Positive Air Displacement / Electric Submersible / Waterra / Peristaltic / Extraction Pump / Other_____

Sampling Method: Bailer / Disposable Bailer / Extraction Port / Dedicated Tubing / Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1140		Retrieved PDB for sampling				
1150		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1145 Depth to Water: 46.18

Sample I.D.: MW-31A Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

LOW FLOW WELL MONITORING DATA SHEET

Project #: 150916-1621	Client: RORE
Sampler: KO	Start Date: 10/1/15
Well I.D.: MW 32B	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 155.34	Depth to Water Pre: 51.53 Post: 51.62
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: YSI Pro Plus

Purge Method: 2" Grundfos Pump Peristaltic Pump (Bladder Pump)
Sampling Method: Dedicated Tubing (New Tubing) Other ___

Flow Rate: 200 ml/min Pump Depth: ___

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or ml)	DTW Observations
1132	19.9	7.64	824	13	1.74	160.8	300	51.56
1135	19.5	7.58	828	4	0.79	143.7	900	51.59
1138	19.5	7.57	831	4	0.98	129.5	1500	51.61
1141	19.4	7.55	830	3	1.31	117.7	2100	51.62
1144	19.4	7.51	834	3	1.35	112.5	2700	51.62
1147	19.4	7.50	835	3	1.39	112.2	3300	51.62
	*	MS/MSD	collected					

Did well dewater? Yes (No) Amount actually evacuated: 3300 ml

Sampling Time: 1150 Sampling Date: 10/1/15

Sample I.D.: MW 32B Laboratory: ERA

Analyzed for: TPH-G BTEX MTBE TPH-D Other: (VOCs)

Equipment Blank I.D.: @ Time Duplicate I.D.:

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RMB
Sampler: ET	Date: 10/2/15
Well I.D.: MW-32C	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 23.53	Depth to Water (DTW): 52.08
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1225		Retrieved PDB for Sampling				
1235		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 1230 Depth to Water: 52.08

Sample I.D.: MW-32C Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 150001-ET1	Client: RORE
Sampler: Et	Date: 10/2/15
Well I.D.: MW-33B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): 161.44	Depth to Water (DTW): 51.31
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, ~~Waterra~~, ~~Peristaltic~~, ~~Extraction Pump~~, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1050		Retrieves PDB for Sampling				
1100		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/2/15 Sampling Time: 1055 Depth to Water: 51.31

Sample I.D.: MW-33B Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 151001-ET1	Client: RARE
Sampler: ET	Date: 10/1/15
Well I.D.: MW-34B	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth (TD): (57) ~~45.12~~ 153.81	Depth to Water (DTW): (57) ~~153.81~~ 45.12
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other_____

Sampling Method: Bailer, Disposable Bailer, Extraction Port, Dedicated Tubing, Other: PDB

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1205		Retrieved PDB for Sampling				
1215		Replaced with new PDB				

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1210 Depth to Water: (57) ~~53~~ 45.12

Sample I.D.: MW-34B Laboratory: ERA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: VOCs

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

LOW FLOW WELL MONITORING DATA SHEET

Project #: 150916-1501	Client: RORE
Sampler: 150	Start Date: 10/1/15
Well I.D.: MW-35B	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 168.36	Depth to Water Pre: 48.09 Post: 48.20
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: YSI Pro Plus

Purge Method: 2" Grundfos Pump Peristaltic Pump (Bladder Pump)
Sampling Method: Dedicated Tubing (New Tubing) Other ___

Flow Rate: 200 ml/min Pump Depth: ___

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or mL)	DTW Observations
1009	21.5	7.33	622	18	1.56	158.2	300	48.12
1012	20.5	7.35	691	15	2.10	145.6	900	48.15
1015	20.3	7.39	696	14	4.00	142.7	1500	~~48.8~~ (K) 48.18
1018	20.3	7.41	692	6	4.30	151.3	2100	48.20
1021	20.4	7.42	689	5	4.39	151.0	2700	48.22
1024	20.4	7.42	688	5	4.26	149.2	3300	48.24
		* MS/MSD		Taken				

Did well dewater? Yes (No)	Amount actually evacuated: 3300 ml
Sampling Time: 1030	Sampling Date: 10/1/15
Sample I.D.: MW-35B	Laboratory: EPA
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: VOCs
Equipment Blank I.D.: @ Time	Duplicate I.D.:

WELL MONITORING DATA SHEET

Project #: 150916 KD-2	Client: RORE
Sampler: KD	Date: 10/1/15
Well I.D.: EW-01R	Well Diameter: 2 3 4 (6) 8 ____
Total Well Depth (TD): Pump	Depth to Water (DTW): 53.21
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, (Extraction Pump), Other_____

Sampling Method: Bailer, Disposable Bailer, (Extraction Port), Dedicated Tubing, Other: _____

_____(Gals.) X _____ = _____ Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or (°C))	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	D.O. ORP Observations
0940	21.0	7.00	1109	5	—	4.18 212.2

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 0940 Depth to Water: 53.21

Sample I.D.: EW-01R Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: (VOCs)

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 150916-K01	Client: RORE
Sampler: KD	Date: 10/1/15
Well I.D.: EW-02	Well Diameter: 2 3 4 (6) 8 ____
Total Well Depth (TD): Pump	Depth to Water (DTW): 58.16
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, Peristaltic, (Extraction Pump), Other_____

Sampling Method: Bailer, Disposable Bailer, (Extraction Port), Dedicated Tubing, Other: _____

_____(Gals.) X _____ = _____ Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or (°C))	pH	Cond. (mS or (µS))	Turbidity (NTUs)	Gals. Removed	D.O. ORP Observations
1345	21.0	7.53	1054	3	—	4.86 145.4

Did well dewater? Yes (No) Gallons actually evacuated: —

Sampling Date: 10/1/15 Sampling Time: 1345 Depth to Water: 58.16

Sample I.D.: EW02 Laboratory: EPA

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: (VOC)

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELLHEAD INSPECTION CHECKLIST

Client: RRe

Date: 10/1/15

Site Address: 941 McHenry Ave Modesto, CA

Job Number: 15/001-ET1

Technician: ET

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)	Repair Order Submitted
MW-01A			3/3 tabs stripped			X		
MW02A	X							
MW-03A	X							
MW-04A	X							
MW-04B	X							
MW-04C	X							
MW-05A			1/2 tabs stripped			X		
MW-06A	X							
MW-07A	X							
MW-08A		X	1/2 tabs stripped			X		
MW-09B	X	X						
MW-10A	X							
MW-10B	X							
MW-10C			Missing 2/2 bolts			X		
MW-11A	X							
MW-12A			1/2 tabs broken			X		

NOTES:

WELLHEAD INSPECTION CHECKLIST

Client: RMC

Date: 10/1/15

Site Address: 911 McHenry Ave Modesto CA

Job Number: 15001-ET1

Technician: ET

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)	Repair Order Submitted
MW-13A		Missing	1/2 bolts			X		
MW-14A	X							
MW-15A		1/2	bolts missing			X		
MW-16A	X							
MW-16B	X							
MW-16C	X							
MW-17A	X							
MW-17B	X							
MW-17C	X							
MW-18A	X							
MW-19A		2/2	bolts missing			X		
MW-19B1		1/2	bolts missing			X		
MW-20A	X							
MW-20B	X							
MW-20C	X		2/2 tabs	broken		X		
MW-21A	X							

NOTES:

WELLHEAD INSPECTION CHECKLIST

Client: RMC

Date: 10/1/15

Site Address: 941 McHenry Ave Modesto, CA

Job Number: 15/001-ET1

Technician: ET

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)	Repair Order Submitted
MW-22A	X							
MW-23A		1/2 tabs broken		2/2 bolts missing		X		
MW-24B	X							
MW-25B	X							
MW-26B			1/2 tabs broken			X		
MW-27B	X							
MW-28B		1/2 tabs broken				X		
MW-29B	X							
MW-30A	X							
MW-31A	X							
MW-32B	X							
MW-32C	X							
MW-33B	X							
MW-34B	X							
MW-35B	X							
MW-30B	X							

NOTES:

TEST EQUIPMENT CALIBRATION LOG

PROJECT NAME RORE (S Modesto Superfund				PROJECT NUMBER 1509			
EQUIPMENT NAME	EQUIPMENT NUMBER	DATE/TIME OF TEST	STANDARDS USED	EQUIPMENT READING	CALIBRATED TO: OR WITHIN 10%:	TEMP. °C	INITIALS
YSI Pro Plus	13E 102999	10/1/15 0840	pH 4.0 7.0 10.0	4.0 7.0 10.0	Y	19.0	[illegible]
↓	↓	↓	Conductivity 3500 uS	3900 uS	Y	18.9	[illegible]
↓	↓	↓	D.O. 100 %	100 %	Y	18.7	[illegible]
↓	↓	↓	ORP 238	238	Y	19.0	[illegible]

Appendix F

Operational History

Table F-1

SYSTEM MAINTENANCE AND MODIFICATIONS TO GROUNDWATER TREATMENT SYSTEM MODESTO SUPERFUND SITE

No.	Event	Start Date	End Date
1	Shut down for influent tank cleanout.	04-Oct-12	04-Oct-12
2	Shut down system to install Timemark at EW-02.	18-Oct-12	18-Oct-12
3	Shut down system to clean out stripper sump.	25-Oct-12	25-Oct-12
4	Changed bag filters.	01-Nov-12	01-Nov-12
5	Changed bag filters.	14-Nov-12	14-Nov-12
6	Replaced four hoses: two at the influent and effluent of the post airstripper bag filter housing, one at the GAC-2 (lead LGAC vessel) influent, and one at the GAC-3 (lag LGAC vessel) effluent.	27-Nov-12	27-Nov-12
7	Changed bag filters.	29-Nov-12	29-Nov-12
8	Calibrated the sewer outfall flow meter. Changed bag filters.	11-Dec-12	11-Dec-12
9	Changed bag filters due to processing purge water from sampling event.	14-Dec-12	14-Dec-12
10	Installed new exhaust fan/motor assembly in GWTS trailer. Changed bag filters due to processing water from sampling event.	20-Dec-12	20-Dec-12
11	Changed bag filters.	03-Jan-13	03-Jan-13
12	GWTS media exchange of LGAC, VGAC, and IX vessels. Spent media removed from site by Baker Filtration.	09-Jan-13	09-Jan-13
13	Changed bag filters.	16-Jan-13	16-Jan-13
14	Primed and painted connex.	17-Jan-13	18-Jan-13
15	Changed bag filters.	30-Jan-13	30-Jan-13
16	LGAC manway gasket replaced and bag filters changed.	14-Feb-13	14-Feb-13
17	Air stripper tray gaskets replaced and the trays and sump were cleaned.	19-Feb-13	19-Feb-13
18	Changed bag filters.	28-Feb-13	28-Feb-13
19	VGAC inlet flange gasket replaced and bag filters chanted.	14-Mar-13	14-Mar-13
20	Changed bag filters.	04-Apr-13	04-Apr-13
21	Changed the two bag filters prior to the stripper.	15-Apr-13	15-Apr-13
22	Changed the bag filter at the stripper effluent.	25-Apr-13	25-Apr-13
23	Changed bag filters.	09-May-13	09-May-13
24	Installed motion detector flood lights.	23-May-13	23-May-13
25	Changed bag filters. Calibrated the sewer outfall flow meter.	30-May-13	30-May-13
26	Primary IX media exchange. Changed bag filters.	13-Jun-13	13-June-13
27	Cleaned out influent tank.	20-Jun-13	20-June-13
28	Changed bag filters.	27-Jun-13	27-June-13
29	Replaced timing relay on blower.	03-Jul-13	03-Jul-13
30	Changed bag filters.	11-Jul-13	11-Jul-13
31	Changed bag filters.	15-Jul-13	15-Jul-13
32	Changed bag filters.	19-Jul-13	19-Jul-13
33	Changed bag filters.	26-Jul-13	26-July-13
34	Changed bag filters. Replaced auto-sampler refrigerator.	02-Aug-13	02-Aug-13
35	Changed bag filters.	05-Aug-13	05-Aug-13
36	Changed bag filters.	08-Aug-13	08-Aug-13
37	Changed bag filters.	19-Aug-13	19-Aug-13
38	Changed bag filters.	22-Aug-13	22-Aug-13
30	Changed bag filters.	05-Sep-13	05-Sep-13
40	Changed bag filters.	17-Sep-13	17-Sep-13
41	Changed two bag filters. Vacuumed out influent tank and stripper sump. Air relief fittings tightened at pipeline after carbon and before IX vessel.	19-Sep-13	19-Sep-13
42	Changed bag filters. New clamps, gaskets, handles, and bolts installed at all three filter assembly locations.	27-Sep-13	27-Sep-13

Table F-1 (Continued)

No.	Event	Start Date	End Date
43	Changed bag filters.	03-Oct-13	03-Oct-13
44	Drained primary LGAC for media exchange.	09-Oct-13	09-Oct-13
45	GWTS media exchange of primary LGAC. Spent media removed from site by Baker Filtration.	10-Oct-13	10-Oct-13
46	Changed bag filters.	17-Oct-13	17-Oct-13
47	Changed bag filters.	28-Oct-13	28-Oct-13
48	Changed bag filters.	07-Nov-13	07-Nov-13
49	Changed bag filters.	14-Nov-13	14-Nov-13
50	Changed bag filters.	21-Nov-13	21-Nov-13
51	Changed bag filters.	26-Nov-13	26-Nov-13
52	Changed bag filters.	05-Dec-13	05-Dec-13
53	Changed bag filters.	12-Dec-13	12-Dec-13
54	Calibrated the sewer outfall meter.	19-Dec-13	19-Dec-13
55	GWTS media exchange of LGAC, VGAC, and IX vessels. Spent media removed by Baker Filtration. Changed bag filters.	20-Dec-13	20-Dec-13
56	Changed bag filters.	26-Dec-13	26-Dec-13
57	Changed bag filters.	30-Dec-13	30-Dec-13
58	Changed bag filters.	01-Jan-14	01-Jan-14
59	Changed bag filters.	16-Jan-14	16-Jan-14
60	Changed bag filters.	23-Jan-14	23-Jan-14
61	Changed bag filters.	30-Jan-14	30-Jan-14
62	Changed bag filters.	06-Feb-14	06-Feb-14
63	Changed pre-stripper bag filters only.	11-Feb-14	11-Feb-14
64	Changed bag filters.	13-Feb-14	13-Feb-14
65	Changed bag filters twice due to cloudy influent tank after shutting down to recalibrate pressure sensors.	20-Feb-14	20-Feb-14
66	Changed pre-stripper bag filters twice.	24-Feb-14	24-Feb-14
67	Changed bag filters.	26-Feb-14	26-Feb-14
68	Changed bag filters. Replaced GWTS VGAC flange, cleaned a rotometer, and calibrated pressure transmitters.	03-Mar-14	03-Mar-14
69	Changed bag filters.	05-Mar-14	05-Mar-14
70	Changed only three bag filters.	06-Mar-14	06-Mar-14
71	Changed only three bag filters.	10-Mar-14	10-Mar-14
72	Changed only three bag filters.	13-Mar-14	13-Mar-14
73	Changed bag filters.	20-Mar-14	20-Mar-14
74	Changed pre-stripper bag filters.	24-Mar-14	24-Mar-14
75	Changed only three bag filters.	28-Mar-14	28-Mar-14
76	Changed bag filters.	02-Apr-14	02-Apr-14
77	Changed pre-stripper bag filters.	07-Apr-14	07-Apr-14
78	Changed bag filters.	10-Apr-14	10-Apr-14
79	Changed bag filters.	17-Apr-14	17-Apr-14
80	Changed bag filters.	24-Apr-14	24-Apr-14
81	Changed bag filters.	01-May-14	01-May-14
82	Changed bag filters.	08-May-14	08-May-14
83	Changed bag filters.	15-May-14	15-May-14
84	GWTS media exchange of the primary LGAC and IX vessels. Spent media removed by Baker Filtration. Repaired outlet screen in vessel IX-2. Changed bag filters.	21-May-14	22-May-14
85	Changed bag filters.	27-May-14	27-May-14
86	Changed pre-stripper bag filters.	29-May-14	29-May-14

Table F-1 (Continued)

No.	Event	Start Date	End Date
87	Changed bag filters.	05-Jun-14	05-Jun-14
88	Changed bag filters.	12-Jun-14	12-Jun-14
89	Changed bag filters. Effluent meter calibration performed by Cooper Controls.	19-Jun-14	19-Jun-14
90	Changed bag filters.	29-Jun-14	29-Jun-14
91	Changed bag filters.	03-Jul-14	03-Jul-14
92	Changed pre-stripper bag filters.	09-Jul-14	09-Jul-14
93	Changed after-stripper bag filter.	10-Jul-14	10-Jul-14
94	Changed pre-stripper bag filters.	14-Jul-14	14-Jul-14
94	Changed bag filters. Installed a Y-strainer at effluent.	17-Jul-14	17-Jul-14
96	Changed pre-stripper bag filters.	21-Jul-14	21-Jul-14
97	Restarted EW-01R.	22 Jul-14	22-Jul-14
98	Changed bag filters.	24-Jul-14	24-Jul-14
99	Changed bag filters.	31-Jul-14	31-Jul-14
100	Changed bag filters.	07-Aug-14	07-Aug-14
101	Changed bag filters.	14-Aug-14	14-Aug-14
102	Changed bag filters.	21-Aug-14	21-Aug-14
103	Changed bag filters.	28-Aug-14	28-Aug-14
104	Changed bag filters. Removed defective isolation valve to IX vessels.	08-Sep-14	08-Sept-14
105	Changed bag filters. Installed new high pressure switch at LGAC influent.	18-Sep-14	18-Sep-14
106	Changed bag filters. Installed high pressure switch.	9-Oct-14	9-Oct-14
107	Repaired stripper effluent pipeline.	20-Oct-14	20-Oct-14
108	Changed bag filters.	30-Oct-14	30-Oct-14
109	GWTS media exchange of the primary LGAC vessel. Spent media removed by Baker Filtration. Changed bag filters.	13-Nov-14	13-Nov-14
110	Changed bag filters.	10-Dec-14	10-Dec-14
111	Pumped out EW-01R vault due to excessive rain.	12-Dec-14	12-Dec-14
112	Effluent meter calibration performed by Cooper Controls.	17-Dec-14	17-Dec-14
113	GWTS media exchange of VGAC and IX (primary only) vessels. Spent media removed by Baker Filtration. Removed unused GAC vessel for scrap.	24-Dec-14	24-Dec-14
114	Installed new auto dialer. Changed bag filters.	31-Dec-14	31-Dec-14
115	Changed bag filters. Cleaned out influent equalization tank. Recalibrated pressure sensors.	2-Jan-15	2-Jan-15
116	Changed bag filters.	8-Jan-15	8-Jan-15
117	Changed bag filters.	19-Jan-15	19-Jan-15
118	Changed bag filters. Repaired leak at sequestrant pump. Recalibrated pressure sensors.	21-Jan-15	21-Jan-15
119	Changed bag filters.	30-Jan-15	31-Jan-15
120	Changed bag filters.	3-Feb-15	3-Feb-15
121	Installed replacement pump and motor in EW-01R. Restarted EW-01R.	5-Feb-15	5-Feb-15
122	Changed bag filters and auto dialer programming corrected.	11-Feb-15	11-Feb-15
123	Balanced EW flows.	18-Feb-15	18-Feb-15
124	Inspected internals of IX secondary vessel.	26-Feb-15	26-Feb-15
125	Changed bag filters.	5-Mar-15	5-Mar-15
126	Changed bag filters.	25-Mar-15	25-Mar-15
127	Changed bag filters and repaired leak at IX transfer hose.	8-Apr-15	8-Apr-15
128	Changed bag filters and collected IX resin profile sample.	22-Apr-15	22-Apr-15
129	Changed bag filters.	30-Apr-15	30-Apr-15
130	Changed bag filters.	14-May-15	14-May-15
131	Changed bag filters and added sequestrant.	28-May-15	28-May-15

Table F-1 (Continued)

No.	Event	Start Date	End Date
132	GWTS media exchange of LGAC and IX (primary only) vessels. Spent media removed by Baker Filtration.	3 Jun-15	3-Jun-15
133	Replaced pressure gauges.	11-Jun-15	11-Jun-15
134	Performed effluent totalizer certification.	15-Jun-15	15-Jun-15
135	Changed bag filters.	19-Jun-15	19-Jun-15
136	Changed bag filters, added sequestrant, and collected IX resin sample.	8-Jul-15	8-Jul-15
137	Changed bag filters and fixed hose leak.	16-Jul-15	16-Jul-15
138	Added sequestrant.	23-Jul-15	23-Jul-15
139	Changed bag filters.	6-Aug-15	6-Aug-15
140	Changed bag filters, replaced pressure gauges, and collected IX resin profile sample.	11-Aug-15	11-Aug-15
141	Installed new pressure transmitter and calibrated pressure sensors for bag filter housing.	19-Aug-15	19-Aug-15
142	Changed bag filters and collected IX resin profile sample.	10-Sep-15	10-Sep-15
143	Installed air relief valves on LGAC vessels.	17-Sep-15	17-Sep-15
144	Changed bag filters and added sequestrant.	24-Sep-15	24-Sep-15

EW = extraction well
GAC = granular activated carbon
GWTS = groundwater treatment system
IX = ion exchange
LGAC = liquid phase granular activated carbon
VGAC = vapor phase granular activated carbon

Appendix G

Well Construction Details, Groundwater Elevations, Analytical Data, Historical PCE Information, and Mass Removed Data

G-1 – Well Construction Details
G-2(a) or (b) – Groundwater Monitoring Well Table Elevations
G-3 – Searchable Historical and Current Analytical Table
G-4 – Historical PCE Concentration Trends in Groundwater Monitoring Wells
G-5 – PCE Mass Removed by Groundwater Treatment System

Table G-1. Well Construction Details				
Well No.	Casing Diameter (inches)	Boring Depth (feet bgs)	Screen Interval (feet bgs)	Top of Casing Elevation (feet msl)[a]
Groundwater Monitoring Wells				
MW-01A	4	101	91-101	91.61
MW-02A	4	96	86-96	90.88[b]
MW-03A	4	94	84-94	91.49[b]
MW-04A	4	89	78-88	91.13
MW-04B	2	154	144-154	91.11
MW-04C	2	237	227-237	91.25
MW-05A	2	90	60-90	90.74
MW-06A	2	90	60-90	89.72[b]
MW-07A	2	90	60-90	91.24
MW-08A	2	90	60-90	91.44
MW-09A	2	155	144-154	91.20[b]
MW-09B		155	144-154	91.19
MW-10A	2	91	60-89	90.48
MW-10B	2	160	153-163	90.21
MW-10C	2	230	220-230	90.5
MW-11A	2	92	70-90	89.91
MW-12A	2	99	87-97	91.15[b]
MW-13A	2	99	77-97	89.27
MW-14A	2	92	70-90	89.79
MW-15A	2	102	80-100	91.76
MW-16A	2	86	76-86	91.89
MW-16B	2	139	129-139	91.82
MW-16C	2	236	226-236	91.64
MW-17A	2	88	77-87	89.64
MW-17B	2	140	129-139	89.69
MW-17C	2	232	222-232	89.76
MW-18A	2	66	56-66	90.14
MW-19A	2	101	91-101	91.22
MW-19B1	2	147	137-147	91.08
MW-20A	2	86	76-86	90.7
MW-20B	2	162	152-162	90.65
MW-20C	2	235	225-235	90.79
MW-21A	2	102	90-100	91.75[c]
MW-22A	2	62	50-60	91.69[c]
MW-23A	2	102	89-99	90.26[c]
MW-24B	2	157	145-155	92.93[c]
MW-25B	2	157	145-155	91.78[c]
MW-26B	2	157	145-155	89.71[c]
MW-27B	2	157	145-155	89.34[c]
MW-28B	2	157	145-155	89.21[c]
MW-29B	2	157	145-155	89.74[c]
MW-30A	2	155	89-99	89.58[d]
MW-30B	2	156	145-155	89.57[d]
MW-31A	2	108	90-100	89.57[d]
MW-32B	2	240	145-155	91.75[d]
MW-32C	2	240	226-236	91.86[d]
MW-33B	2	160	150-160	91.34[d]
MW-34B	2	156	145-155	88.06[d]
MW-35B	2	175	159-169	89.33[d]
EW-01	5	115	65-95	89.54[d]
EW-01R	6	120	59-109	90.65[b]
EW-02	6	116	60.5-110.5	91.64[e]

Table G-1. (Continued)				
Well No.	Casing Diameter (inches)	Boring Depth (feet bgs)	Screen Interval (feet bgs)	Top of Casing Elevation (feet msl)[a]
Soil Vapor Wells				
SVE-01	2	40	18-38	89.84
SVE-02	2	13	7-12	91.36
SVE-03	2	39	13-23	91.38
SVE-04	2	39	28-38	91.38
DP-1				91.44
DP-1A	1	40	28-29	
DP-1B	1	40	38-39	
DP-2			-	91.27
DP-2A	1	40	15-16	
DP-2B	1	40	34-35	
DP-3			-	91.86
DP-3A	1	40	19-20	
DP-3B	1	40	29-30	
DP-4			-	91.92
DP-4A	1	40	23-24	
DP-4B	1	40	38.5-39.5	
DP-5			-	91.27
DP-5A	2	37	15-16	
DP-5B	2	37	34-35	
DP-6			-	91.69
DP-6A	2	36	15-16	
DP-6B	2	36	34-35	

[a] Wells resurveyed in February 2003.
[b] Wells resurveyed in September 2006.
[c] Wells installed and surveyed in September 2011.
[d] Well installed between June and August 2013 and surveyed in September 2013.
[e] Well installed June 2012 and surveyed August 2012

bgs = below ground surface
msl = mean sea level

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-1A	101	91 - 101	89.14	Apr-00[a]	NA	50.62
			89.14	Aug-00[a]	NA	50.34
			89.14	Nov-00[a]	NA	48.92
			89.14	Feb-01[a]	NA	50.28
			89.14	Aug-01	42.71	46.43
			89.14	Oct-01	44.55	44.59
			89.14	Nov-01	44.41	44.73
			89.14	Feb-02	43.17	45.97
			89.14	May-02	42.44	46.70
			89.14	Aug-02	45.60	43.54
			89.14	Nov-02	46.00	43.14
			89.14	Feb-03	44.95	44.19
			91.611	May-03	44.15	47.46
			91.61	Aug-03	45.55	46.06
			91.61	Nov-03	46.15	45.46
			91.61	Feb-04	44.70	46.91
			91.61	May-04	43.95	47.66
			91.61	Aug-04	46.20	45.41
			91.61	Nov-04	45.70	45.91
			91.61	Feb-05	44.30	47.31
			91.61	May-05	42.60	49.01
			91.61	Aug-05	43.40	48.21
			91.61	Nov-05	44.40	47.21
			91.61	Feb-06	43.04	48.57
			91.61	May-06	41.65	49.96
			91.61	Aug-06	42.53	49.08
			91.61	Aug-06[b]	43.07	48.54
			91.61	Nov-06	43.66	47.95
			91.61	Feb-07	42.34	49.27
			91.61	May-07	40.94	50.67
			91.61	Aug-07	43.25	48.36
			91.61	Nov-07	43.85	47.76
			91.61	Feb-08	42.73	48.88
			91.61	May-08	42.10	49.51
			91.61	Aug-08	43.45	48.16
			91.61	Dec-08	44.28	47.33
			91.61	Feb-09	43.71	47.90
			91.61	Jun-09	43.88	47.73
			91.61	Aug-09	49.45	42.16
			91.61	Nov-09	46.45	45.16
MW-2A	96	86 - 96	88.63	Apr-00[a]	NA	50.48
			88.63	Aug-00[a]	NA	50.19
			88.63	Nov-00[a]	NA	48.80
			88.63	Feb-01[a]	NA	50.32
			88.63	Aug-01	42.00	46.63
			88.63	Oct-01	44.30	44.33
			88.63	Nov-01	44.20	44.43
			88.63	Feb-02	42.77	45.86
			88.63	May-02	42.10	46.53
			88.63	Aug-02	45.50	43.13
			88.63	Nov-02	45.70	42.93
			88.63	Feb-03	44.60	44.03
			90.911	May-03	43.75	47.16
			90.91	Aug-03	45.10	45.81
			90.91	Nov-03	45.65	45.26
			90.91	Feb-04	44.13	46.78

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			90.91	May-04	43.10	47.81
			90.91	Aug-04	45.81	45.10
			90.91	Nov-04	45.14	45.77
			90.91	Feb-05	43.43	47.48
			90.91	May-05	41.93	48.98
			90.91	Aug-05	42.90	48.01
			90.91	Nov-05	43.75	47.16
			90.91	Feb-06	42.25	48.66
			90.91	May-06	40.97	49.94
			90.882	Aug-06	41.52	49.36
			90.88	Aug-06[b]	44.20	46.68
			90.88	Nov-06	42.90	47.98
			90.88	Feb-07	41.61	49.27
			90.88	May-07	40.20	50.68
			90.88	Aug-07	42.52	48.36
			90.88	Nov-07	43.10	47.78
			90.88	Feb-08	42.01	48.87
			90.88	May-08	41.35	49.53
			90.88	Aug-08	42.65	48.23
			90.88	Dec-08	43.48	47.40
			90.88	Feb-09	42.94	47.94
			90.88	Jun-09	43.25	47.63
			90.88	Aug-09	44.63	46.25
			90.88	Nov-09	45.57	45.31
MW-3A	94	84 - 94	89.42	Apr-00[a]	NA	50.75
			88.42	Aug-00[a]	NA	50.12
			89.42	Nov-00[a]	NA	48.62
			88.42	Feb-01[a]	NA	50.22
			89.42	Aug-01	43.00	46.42
			88.42	Oct-01	45.35	44.07
			89.42	Nov-01	44.09	45.33
			88.42	Feb-02	43.98	45.44
			89.42	May-02	43.14	46.28
			88.42	Aug-02	46.55	42.87
			89.42	Nov-02	46.70	42.72
			88.42	Feb-03	45.80	43.62
			91.591	May-03	44.10	47.49
			91.59	Aug-03	46.25	45.34
			91.59	Nov-03	47.95	43.64
			91.59	Feb-04	45.25	46.34
			91.59	May-04	44.35	47.24
			91.59	Aug-04	47.05	44.54
			91.59	Nov-04	46.52	45.07
			91.59	Feb-05	44.85	46.74
			91.59	May-05	43.20	48.39
			91.59	Aug-05	44.27	47.32
			91.59	Nov-05	46.25	45.34
			91.59	Feb-06	44.65	46.94
			91.59	May-06	43.25	48.34
			91.492	Aug-06	43.82	47.67
			91.49	Aug-06[b]	45.64	45.85
			91.49	Nov-06	46.61	44.88
			91.49	Feb-07	45.91	45.58
			91.49	May-07	41.19	50.30
			91.49	Aug-07	46.53	44.96
			91.49	Nov-07	47.2	44.29
			91.49	Feb-08	46.1	45.39
			91.49	May-08	45.25	46.24
			91.49	Aug-08	46.6	44.89

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.49	Dec-08	46.36	45.13
			91.49	Feb-09	46.18	45.31
			91.49	Jun-09	46.28	45.21
			91.49	Aug-09	47.73	43.76
			91.49	Nov-09	48.5	42.99
MW-4A	89	78 - 88	88.66	Apr-00[a]	NA	50.15
			88.66	Aug-00[a]	NA	50.01
			88.66	Nov-00[a]	NA	48.11
			88.66	Feb-01[a]	NA	49.74
			88.66	Aug-01	43.50	45.16
			88.66	Oct-01	44.11	44.55
			88.66	Nov-01	44.46	44.20
			88.66	Feb-02	43.21	45.45
			88.66	May-02	42.13	46.53
			88.66	Aug-02	44.80	43.86
			88.66	Nov-02	45.50	43.16
			88.66	Feb-03	44.35	44.31
			91.131	May-03	44.05	47.08
			91.13	Aug-03	45.10	46.03
			91.13	Nov-03	46.25	44.88
			91.13	Feb-04	44.85	46.28
			91.13	May-04	44.25	46.88
			91.13	Aug-04	45.90	45.23
			91.13	Nov-04	46.32	44.81
			91.13	Feb-05	44.68	46.45
			91.13	May-05	42.90	48.23
			91.13	Aug-05	43.75	47.38
			91.13	Nov-05	44.80	46.33
			91.13	Feb-06	43.36	47.77
			91.13	May-06	41.80	49.33
			91.13	Aug-06	42.34	48.79
			91.13	Aug-06[b]	43.17	47.96
			91.13	Nov-06	44.05	47.08
			91.13	Feb-07	43.03	48.10
			91.13	May-07	40.83	50.30
			91.13	Aug-07	43.53	47.60
			91.13	Nov-07	44.39	46.74
			91.13	Feb-08	43.30	47.83
			91.13	May-08	42.36	48.77
			91.13	Aug-08	43.64	47.49
			91.13	Dec-08	44.79	46.34
			91.13	Feb-09	44.21	46.92
			91.13	Jun-09	44.18	46.95
			91.13	Aug-09	45.62	45.51
			91.13	Nov-09	46.89	44.24
MW-4B	154	144-154	91.11	Dec-08	44.73	46.38
			91.11	Feb-09	43.78	47.33
			91.11	Jun-09	44.80	46.31
			91.11	Aug-09	46.72	44.39
			91.11	Nov-09	46.73	44.38
MW-4C	237	227-237	91.25	Dec-08	44.35	46.90
			91.25	Feb-09	42.76	48.49
			91.25	Jun-09	49.75	41.50
			91.25	Aug-09	53.94	37.31
			91.25	Nov-09	46.00	45.25

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-5A	90	60 - 90	90.61	Apr-00[a]	NA	50.39
			90.61	Aug-00[a]	NA	50.45
			90.61	Nov-00[a]	NA	48.41
			90.61	Feb-01[a]	NA	50.11
			90.61	Aug-01	42.44	48.17
			90.61	Oct-01	43.75	46.86
			90.61	Nov-01	43.86	46.75
			90.61	Feb-02	42.65	47.96
			90.61	May-02	41.62	48.99
			90.61	Aug-02	44.60	46.01
			90.61	Nov-02	45.60	45.01
			90.61	Feb-03	44.35	46.26
			90.741	May-03	43.30	47.44
			90.74	Aug-03	44.45	46.29
			90.74	Nov-03	45.55	45.19
			90.74	Feb-04	44.13	46.61
			90.74	May-04	43.10	47.64
			90.74	Aug-04	45.12	45.62
			90.74	Nov-04	45.25	45.49
			90.74	Feb-05	43.55	47.19
			90.74	May-05	41.93	48.81
			90.74	Aug-05	42.70	48.04
			90.74	Nov-05	43.75	46.99
			90.74	Feb-06	42.36	48.38
			90.74	May-06	40.90	49.84
			90.74	Aug-06	41.47	49.27
			90.74	Aug-06[b]	42.07	48.67
			90.74	Nov-06	43.15	47.59
			90.74	Feb-07	41.95	48.79
			90.74	May-07	40.21	50.53
			90.74	Aug-07	42.55	48.19
			90.74	Nov-07	43.35	47.39
			90.74	Feb-08	42.34	48.40
			90.74	May-08	41.50	49.24
			90.74	Aug-08	42.68	48.06
			90.74	Dec-08	43.81	46.93
			90.74	Feb-09	43.33	47.41
			90.74	Jun-09	43.19	47.55
			90.74	Aug-09	44.68	46.06
			90.74	Nov-09	45.97	44.77
MW-6A	90	60 - 90	89.98	Apr-00[a]	NA	50.23
			89.98	Aug-00[a]	NA	50.21
			89.98	Nov-00[a]	NA	47.96
			89.98	Feb-01[a]	NA	49.78
			89.98	Aug-01	41.30	48.68
			89.98	Oct-01	42.90	47.08
			89.98	Nov-01	43.48	46.50
			89.98	Feb-02	41.98	48.00
			89.98	May-02	40.87	49.11
			89.98	Aug-02	44.20	45.78
			89.98	Nov-02	44.50	45.48
			89.98	Feb-03	43.65	46.33
			89.481	May-03	42.60	46.88
			89.48	Aug-03	44.10	45.38
			89.48	Nov-03	45.22	44.26

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			89.48	Feb-04	43.45	46.03
			89.48	May-04	42.85	46.63
			89.48	Aug-04	44.62	44.86
			89.48	Nov-04	45.25	44.23
			89.48	Feb-05	43.60	45.88
			89.48	May-05	41.81	47.67
			89.48	Aug-05	42.65	46.83
			89.48	Nov-05	43.78	45.70
			89.48	Feb-06	42.35	47.13
			89.48	May-06	40.71	48.77
			89.722	Aug-06	40.86	48.86
			89.72	Aug-06[b]	41.16	48.56
			89.72	Nov-06	42.20	47.52
			89.72	Feb-07	40.94	48.78
			89.72	May-07	39.52	50.20
			89.72	Aug-07	41.61	48.11
			89.72	Nov-07	42.56	47.16
			89.72	Feb-08	41.42	48.30
			89.72	May-08	40.44	49.28
			89.72	Aug-08	41.75	47.97
			89.72	Dec-08	42.98	46.74
			89.72	Feb-09	42.32	47.40
			89.72	Jun-09	42.23	47.49
			89.72	Aug-09	43.61	46.11
			89.72	Nov-09	44.89	44.83
MW-7A	90	60 - 90	91.23	Apr-00[a]	NA	50.86
			91.23	Aug-00[a]	NA	51.06
			91.23	Nov-00[a]	NA	49.24
			91.23	Feb-01[a]	NA	50.73
			91.23	Aug-01	41.33	49.90
			91.23	Oct-01	42.72	48.51
			91.23	Nov-01	43.07	48.16
			91.23	Feb-02	41.96	49.27
			91.23	May-02	40.67	50.56
			91.23	Aug-02	43.70	47.53
			91.23	Nov-02	44.60	46.63
			91.23	Feb-03	43.60	47.63
			91.241	May-03	42.65	48.59
			91.24	Aug-03	43.85	47.39
			91.24	Nov-03	45.05	46.19
			91.24	Feb-04	43.70	47.54
			91.24	May-04	42.80	48.44
			91.24	Aug-04	44.30	46.94
			91.24	Nov-04	44.98	46.26
			91.24	Feb-05	43.38	47.86
			91.24	May-05	41.82	49.42
			91.24	Aug-05	42.35	48.89
			91.24	Nov-05	43.40	47.84
			91.24	Feb-06	42.17	49.07
			91.24	May-06	40.82	50.42
			91.24	Aug-06	41.31	49.93
			91.24	Aug-06[b]	41.50	49.74
			91.24	Nov-06	42.53	48.71
			91.24	Feb-07	41.46	49.78
			91.24	May-07	40.21	51.03
			91.24	Aug-07	41.77	49.47

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.24	Nov-07	42.63	48.61
			91.24	Feb-08	41.82	49.42
			91.24	May-08	40.96	50.28
			91.24	Aug-08	41.98	49.26
			91.24	Dec-08	43.15	48.09
			91.24	Feb-09	NA	NA
			91.24	Jun-09	42.65	48.59
			91.24	Aug-09	43.92	47.32
			91.24	Nov-09	45.29	45.95
MW-8A	90	60 - 90	91.53	Apr-00	NA	50.52
			91.53	Aug-00	NA	50.42
			91.53	Nov-00	NA	48.54
			91.53	Feb-01	NA	50.25
			91.53	Aug-01	42.41	49.12
			91.53	Oct-01	45.60	45.93
			91.53	Nov-01	45.68	45.85
			91.53	Feb-02	44.36	47.17
			91.53	May-02	43.31	48.22
			91.53	Aug-02	46.20	45.33
			91.53	Nov-02	47.50	44.03
			91.53	Feb-03	45.65	45.88
			91.441	May-03	44.40	47.04
			91.44	Aug-03	45.40	46.04
			91.44	Nov-03	46.57	44.87
			91.44	Feb-04	45.22	46.22
			91.44	May-04	43.85	47.59
			91.44	Aug-04	46.15	45.29
			91.44	Nov-04	45.97	45.47
			91.44	Feb-05	44.35	47.09
			91.44	May-05	42.75	48.69
			91.44	Aug-05	43.39	48.05
			91.44	Nov-05	44.47	46.97
			91.44	Feb-06	43.14	48.30
			91.44	May-06	41.61	49.83
			91.44	Aug-06	42.21	49.23
			91.44	Aug-06	42.94	48.50
			91.44	Nov-06	44.03	47.41
			91.44	Feb-07	42.88	48.56
			91.44	May-07	40.96	50.48
			91.44	Aug-07	43.43	48.01
			91.44	Nov-07	44.28	47.16
			91.44	Feb-08	43.32	48.12
			91.44	May-08	42.41	49.03
			91.44	Aug-08	43.53	47.91
			91.44	Dec-08	44.73	46.71
			91.44	Feb-09	44.28	47.16
			91.44	Jun-09	44.08	47.36
			91.44	Aug-09	45.55	45.89
			91.44	Nov-09	46.91	44.53
MW-9B	155	144 - 154	91.19	Apr-00[a]	NA	50.24
			91.19	Aug-00[a]	NA	48.38
			91.19	Nov-00[a]	NA	47.72
			91.19	Feb-01[a]	NA	50.05
			91.19	Aug-01	44.04	47.15
			91.19	Oct-01	45.17	46.02

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.19	Nov-01	44.76	46.43
			91.19	Feb-02	42.64	48.55
			91.19	May-02	42.72	48.47
			91.19	Aug-02	47.05	44.14
			91.19	Nov-02	45.90	45.29
			91.19	Feb-03	44.45	46.74
			91.181	May-03	44.20	46.98
			91.18	Aug-03	47.00	44.18
			91.18	Nov-03	46.55	44.63
			91.18	Feb-04	44.37	46.81
			91.18	May-04	44.55	46.63
			91.18	Aug-04	47.25	43.93
			91.18	Nov-04	46.42	44.76
			91.18	Feb-05	44.45	46.73
			91.18	May-05	43.15	48.03
			91.18	Aug-05	45.25	45.93
			91.18	Nov-05	45.40	45.78
			91.18	Feb-06	43.31	47.87
			91.18	May-06	42.30	48.88
			91.202	Aug-06	43.51	47.69
			91.2	Aug-06[b]	43.98	47.22
			91.20	Nov-06	43.80	47.40
			91.20	Feb-07	42.14	49.06
			91.20	May-07	40.52	50.68
			91.20	Aug-07	44.37	46.83
			91.20	Nov-07	44.05	47.15
			91.20	Feb-08	42.45	48.75
			91.20	May-08	42.54	48.66
			91.20	Aug-08	44.50	46.70
			91.20	Dec-08	44.47	46.73
			91.20	Feb-09	43.62	47.58
			91.20	Jun-09	44.52	46.68
			91.20	Aug-09	46.54	44.66
			91.20	Nov-09	46.52	44.68
MW-10A	91	60 - 89	90.47	Apr-00[a]	NA	49.66
			90.47	Aug-00[a]	NA	50.67
			90.47	Nov-00[a]	NA	46.94
			90.47	Feb-01[a]	NA	49.03
			90.47	Aug-01	42.54	47.93
			90.47	Oct-01	44.19	46.28
			90.47	Nov-01	44.51	45.96
			90.47	Feb-02	42.93	47.54
			90.47	May-02	41.86	48.61
			90.47	Aug-02	45.20	45.27
			90.47	Nov-02	46.00	44.47
			90.47	Feb-03	44.70	45.77
			90.481	May-03	43.55	46.93
			90.48	Aug-03	45.20	45.28
			90.48	Nov-03	46.35	44.13
			90.48	Feb-04	44.70	45.78
			90.48	May-04	43.85	46.63
			90.48	Aug-04	45.81	44.67
			90.48	Nov-04	46.48	44.00
			90.48	Feb-05	44.74	45.74
			90.48	May-05	42.87	47.61
			90.48	Aug-05	43.90	46.58

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			90.48	Nov-05	45.07	45.41
			90.48	Feb-06	43.45	47.03
			90.48	May-06	41.70	48.78
			90.48	Aug-06	42.33	48.15
			90.48	Aug-06[b]	42.59	47.89
			90.48	Nov-06	43.51	46.97
			90.48	Feb-07	42.21	48.27
			90.48	May-07	40.81	49.67
			90.48	Aug-07	43.03	47.45
			90.48	Nov-07	43.96	46.52
			90.48	Feb-08	42.70	47.78
			90.48	May-08	41.77	48.71
			90.48	Aug-08	43.24	47.24
			90.48	Dec-08	44.40	46.08
			90.48	Feb-09	43.69	46.79
			90.48	Jun-09	43.55	46.93
			90.48	Aug-09	45.02	45.46
			90.48	Nov-09	46.34	44.14
MW-10B	163	153-163	90.21	Dec-08	44.12	46.09
			90.21	Feb-09	43.18	47.03
			90.21	Jun-09	43.90	46.31
			90.21	Aug-09	45.81	44.40
			90.21	Nov-09	46.07	44.14
			90.21	Mar-10	44.01	46.20
MW-10C	230	220-230	90.5	Dec-08	44.13	46.37
			90.5	Feb-09	42.50	48.00
			90.5	Jun-09	48.50	42.00
			90.5	Aug-09	53.44	37.06
			90.5	Nov-09	45.75	44.75
MW-11A	92	70 - 90	89.91	Apr-00[a]	NA	50.83
			89.91	Aug-00[a]	NA	50.64
			89.91	Nov-00[a]	NA	49.38
			89.91	Feb-01[a]	NA	50.93
			89.91	Aug-01	40.32	49.59
			89.91	Oct-01	41.50	48.41
			89.91	Nov-01	43.12	46.79
			89.91	Feb-02	40.15	49.76
			89.91	May-02	39.56	50.35
			89.91	Aug-02	42.60	47.31
			89.91	Nov-02	43.90	46.01
			89.91	Feb-03	41.90	48.01
			89.911	May-03	41.15	48.76
			89.91	Aug-03	42.65	47.26
			89.91	Nov-03	43.52	46.39
			89.91	Feb-04	42.00	47.91
			89.91	May-04	41.35	48.56
			89.91	Aug-04	42.86	47.05
			89.91	Nov-04	43.35	46.56
			89.91	Feb-05	41.75	48.16
			89.91	May-05	40.22	49.69
			89.91	Aug-05	40.85	49.06
			89.91	Nov-05	41.80	48.11
			89.91	Feb-06	40.53	49.38
			89.91	May-06	39.27	50.64

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			89.91	Aug-06	39.86	50.05
			89.91	Aug-06[b]	40.05	49.86
			89.91	Nov-06	40.90	49.01
			89.91	Feb-07	39.79	50.12
			89.91	May-07	38.74	51.17
			89.91	Aug-07	40.34	49.57
			89.91	Nov-07	41.07	48.84
			89.91	Feb-08	40.11	49.80
			89.91	May-08	39.38	50.53
			89.91	Aug-08	40.47	49.44
			89.91	Dec-08	41.47	48.44
			89.91	Feb-09	41.01	48.90
			89.91	Jun-09	41.12	48.79
			89.91	Aug-09	42.44	47.47
			89.91	Nov-09	43.52	46.39
MW-12A	99	87 - 97	91.17	Apr-00[a]	NA	50.01
			91.17	Aug-00[a]	NA	49.45
			91.17	Nov-00[a]	NA	47.28
			91.17	Feb-01[a]	NA	49.51
			91.17	Aug-01	43.18	47.99
			91.17	Oct-01	44.63	46.54
			91.17	Nov-01	44.86	46.31
			91.17	Feb-02	43.21	47.96
			91.17	May-02	42.04	49.13
			91.17	Aug-02	46.10	45.07
			91.17	Nov-02	46.30	44.87
			91.17	Feb-03	45.05	46.12
			91.151	May-03	44.50	46.65
			91.15	Aug-03	46.20	44.95
			91.15	Nov-03	46.88	44.27
			91.15	Feb-04	44.95	46.20
			91.15	May-04	44.50	46.65
			91.15	Aug-04	46.75	44.40
			91.15	Nov-04	47.02	44.13
			91.15	Feb-05	45.10	46.05
			91.15	May-05	43.52	47.63
			91.15	Aug-05	44.95	46.20
			91.15	Nov-05	45.80	45.35
			91.15	Feb-06	44.01	47.14
			91.15	May-06	42.41	48.74
			91.152	Aug-06	43.22	47.93
			91.15	Aug-06[b]	43.51	47.64
			91.15	Nov-06	44.05	47.10
			91.15	Feb-07	42.61	48.54
			91.15	May-07	41.44	49.71
			91.15	Aug-07	43.91	47.24
			91.15	Nov-07	44.43	46.72
			91.15	Feb-08	43.02	48.13
			91.15	May-08	42.45	48.70
			91.15	Aug-08	44.15	47.00
			91.15	Dec-08	44.90	46.25
			91.15	Feb-09	44.14	47.01
			91.15	Jun-09	44.27	46.88
			91.15	Aug-09	46.04	45.11
			91.15	Nov-09	47.02	44.13

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-13A	99	77 - 97	89.33	Apr-00[a]	NA	49.21
			89.33	Aug-00[a]	NA	49.30
			89.33	Nov-00[a]	NA	46.88
			89.33	Feb-01[a]	NA	48.67
			89.33	Aug-01	41.68	47.65
			89.33	Oct-01	43.23	46.10
			89.33	Nov-01	43.64	45.69
			89.33	Feb-02	41.99	47.34
			89.33	May-02	40.82	48.51
			89.33	Aug-02	44.10	45.23
			89.33	Nov-02	44.70	44.63
			89.33	Feb-03	43.60	45.73
			89.271	May-03	42.35	46.92
			89.27	Aug-03	43.80	45.47
			89.27	Nov-03	45.25	44.02
			89.27	Feb-04	43.72	45.55
			89.27	May-04	42.65	46.62
			89.27	Aug-04	42.65	46.62
			89.27	Nov-04	45.30	43.97
			89.27	Feb-05	43.63	45.64
			89.27	May-05	41.75	47.52
			89.27	Aug-05	42.45	46.82
			89.27	Nov-05	43.70	45.57
			89.27	Feb-06	42.31	46.96
			89.27	May-06	40.52	48.75
			89.27	Aug-06	40.92	48.35
			89.27	Aug-06[b]	41.08	48.19
			89.27	Nov-06	42.15	47.12
			89.27	Feb-07	40.99	48.28
			89.27	May-07	39.68	49.59
			89.27	Aug-07	41.80	47.47
			89.27	Nov-07	42.64	46.63
			89.27	Feb-08	41.48	47.79
			89.27	May-08	40.38	48.89
			89.27	Aug-08	41.66	47.61
			89.27	Dec-08	43.01	46.26
			89.27	Feb-09	42.40	46.87
			89.27	Jun-09	42.25	47.02
			89.27	Aug-09	43.40	45.87
			89.27	Nov-09	44.84	44.43
MW-14A	92	70 - 90	89.81	Apr-00[a]	NA	50.19
			89.81	Aug-00[a]	NA	49.93
			89.81	Nov-00[a]	NA	48.39
			89.81	Feb-01[a]	NA	49.95
			89.81	Aug-01	41.21	48.60
			89.81	Oct-01	42.57	47.24
			89.81	Nov-01	42.89	46.92
			89.81	Feb-02	41.35	48.46
			89.81	May-02	40.60	49.21
			89.81	Aug-02	43.80	46.01
			89.81	Nov-02	44.00	45.81
			89.81	Feb-03	43.10	46.71
			89.791	May-03	42.15	47.64
			89.79	Aug-03	43.30	46.49
			89.79	Nov-03	44.60	45.19
			89.79	Feb-04	43.03	46.76

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			89.79	May-04	42.33	47.46
			89.79	Aug-04	43.85	45.94
			89.79	Nov-04	44.40	45.39
			89.79	Feb-05	42.87	46.92
			89.79	May-05	41.20	48.59
			89.79	Aug-05	41.85	47.94
			89.79	Nov-05	42.90	46.89
			89.79	Feb-06	41.60	48.19
			89.79	May-06	40.15	49.64
			89.79	Aug-06	40.49	49.30
			89.79	Aug-06[b]	40.72	49.07
			89.79	Nov-06	41.72	48.07
			89.79	Feb-07	40.60	49.19
			89.79	May-07	39.31	50.48
			89.79	Aug-07	41.18	48.61
			89.79	Nov-07	42.03	47.76
			89.79	Feb-08	41.05	48.74
			89.79	May-08	40.15	49.64
			89.79	Aug-08	41.35	48.44
			89.79	Dec-08	42.45	47.34
			89.79	Feb-09	41.92	47.87
			89.79	Jun-09	41.95	47.84
			89.79	Aug-09	43.18	46.61
			89.79	Nov-09	44.40	45.39
MW-15A	102	80 - 100	91.75	Apr-00[a]	NA	50.80
			91.75	Aug-00[a]	NA	50.40
			91.75	Nov-00[a]	NA	48.76
			91.75	Feb-01[a]	NA	50.55
			91.75	Aug-01	42.48	49.27
			91.75	Oct-01	43.88	47.87
			91.75	Nov-01	44.05	47.70
			91.75	Feb-02	42.73	49.02
			91.75	May-02	41.92	49.83
			91.75	Aug-02	45.10	46.65
			91.75	Nov-02	45.60	46.15
			91.75	Feb-03	44.45	47.30
			91.761	May-03	44.05	47.71
			91.76	Aug-03	45.25	46.51
			91.76	Nov-03	46.05	45.71
			91.76	Feb-04	44.46	47.30
			91.76	May-04	43.85	47.91
			91.76	Aug-04	45.82	45.94
			91.76	Nov-04	46.05	45.71
			91.76	Feb-05	44.30	47.46
			91.76	May-05	42.85	48.91
			91.76	Aug-05	43.95	47.81
			91.76	Nov-05	44.80	46.96
			91.76	Feb-06	43.26	48.50
			91.76	May-06	41.92	49.84
			91.76	Aug-06	42.66	49.10
			91.76	Aug-06[b]	42.90	48.86
			91.76	Nov-06	43.55	48.21
			91.76	Feb-07	42.30	49.46
			91.76	May-07	41.09	50.67
			91.76	Aug-07	43.20	48.56
			91.76	Nov-07	43.80	47.96
			91.76	Feb-08	42.65	49.11

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.76	May-08	42.05	49.71
			91.76	Aug-08	43.40	48.36
			91.76	Dec-08	44.25	47.51
			91.76	Feb-09	43.68	48.08
			91.76	Jun-09	43.86	47.90
			91.76	Aug-09	45.47	46.29
			91.76	Nov-09	46.46	45.30
MW-16A	86	76-86	91.89	Dec-08	47.01	44.88
			91.89	Feb-09	45.81	46.08
			91.89	Jun-09	46.43	45.46
			91.89	Aug-09	48.65	43.24
			91.89	Nov-09	48.95	42.94
MW-16B	139	129-139	91.82	Dec-08	46.98	44.84
			91.82	Feb-09	45.75	46.07
			91.82	Jun-09	46.40	45.42
			91.82	Aug-09	48.67	43.15
			91.82	Nov-09	48.90	42.92
MW-16C	236	226-236	91.64	Dec-08	46.70	44.94
			91.64	Feb-09	45.01	46.63
			91.64	Jun-09	50.05	41.59
			91.64	Aug-09	54.46	37.18
			91.64	Nov-09	48.52	43.12
MW-17A	88	77-87	89.64	Dec-08	44.20	45.44
			89.64	Feb-09	43.45	46.19
			89.64	Jun-09	43.25	46.39
			89.64	Aug-09	44.43	45.21
			89.64	Nov-09	46.03	43.61
MW-17B	140	129-139	89.69	Dec-08	44.39	45.30
			89.69	Feb-09	43.41	46.28
			89.69	Jun-09	43.60	46.09
			89.69	Aug-09	45.29	44.40
			89.69	Nov-09	46.20	43.49
MW-17C	232	222-232	89.76	Dec-08	44.33	45.43
			89.76	Feb-09	42.55	47.21
			89.76	Jun-09	48.68	41.08
			89.76	Aug-09	52.98	36.78
			89.76	Nov-09	45.91	43.85
MW-18A	66	56-66	90.14	Dec-08	44.47	45.67
			90.14	Feb-09	43.70	46.44
			90.14	Jun-09	43.57	46.57
			90.14	Aug-09	45.03	45.11
			90.14	Nov-09	46.35	43.79
MW-19A	101	91-101	91.22	Dec-08	45.51	45.71
			91.22	Feb-09	44.55	46.67
			91.22	Jun-09	45.45	45.77
			91.22	Aug-09	47.14	44.08
			91.22	Nov-09	47.50	43.72
MW-19B	147	137-147	91.08	Dec-08	45.89	45.19
			91.08	Feb-09	44.76	46.32
			91.08	Jun-09	46.07	45.01
			91.08	Aug-09	48.26	42.82
			91.08	Nov-09	47.92	43.16

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-20A	86	76-86	90.70	Dec-08	45.27	45.43
			90.70	Feb-09	44.31	46.39
			90.70	Jun-09	44.56	46.14
			90.70	Aug-09	47.12	43.58
			90.70	Nov-09	47.26	43.44
MW-20B	162	152-162	90.65	Dec-08	45.45	45.20
			90.65	Feb-09	44.36	46.29
			90.65	Jun-09	45.08	45.57
			90.65	Aug-09	48.22	42.43
			90.65	Nov-09	47.40	43.25
MW-20C	235	225-235	90.79	Dec-08	45.01	45.78
			90.79	Feb-09	43.53	47.26
			90.79	Jun-09	48.60	42.19
			90.79	Aug-09	53.44	37.35
			90.79	Nov-09	46.73	44.06
EW-1			89.54	Nov-06	43.40	46.14
			89.54	Feb-07	42.21	47.33
			89.54	May-07	40.28	49.26
			89.54	Aug-07	42.90	46.64
			89.54	Feb-08	42.48	47.06
			89.54	May-08	41.75	47.79
			89.54	Aug-08	42.99	47.66
			89.54	Feb-09	43.55	45.99
			89.54	Jun-09	43.34	46.20
			89.54	Aug-09	44.99	44.55
			89.54	Nov-09	46.16	43.38
EW-1R[3]	114	59-109	90.65	Aug-06	41.80	48.85
			90.65	Aug-06[b]	48.70	41.95
			90.65	Nov-06	49.40	41.25
			90.65	Feb-07	48.24	42.41
			90.65	May-07	40.33	50.32
			90.65	Aug-07	48.60	42.05
			90.65	Nov-07	49.50	41.15
			90.65	Feb-08	49.98	40.67
			90.65	May-08	49.50	41.15
			90.65	Aug-08	51.51	39.14
			90.65	Dec-08	52.16	38.49
			90.65	Feb-09	53.88	36.77
			90.65	Jun-09	52.04	38.61
			90.65	Aug-09	54.86	35.79
			90.65	Nov-09	55.82	34.83

Notes:
[1]Wells re-surveyed in May 2003.
[2]Wells re-surveyed in September 2006
[3]EW-1R is the replacement extraction well. It was installed in August 2006 and started on August 24,

[a]Historical data from Ecology and Environment
[b]Second round of Aug. 2006 water levels recorded after the start of EW-1R

ft bgs - feet below ground surface
MSL - Mean Sea Level
MW- Monitoring Well
NA - Not Applicable
TOC - Top of Casing

This page intentionally left blank

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
CPT23	-			Jun-13	47.00	
EW-01R (SP-01)		59 - 109	92.03	Mar-10	54.23	37.80
				Nov-10	55.82	36.21
				Mar-11	54.27	37.76
				Jun-11	53.82	38.21
				Sep-11	54.52	37.51
				Nov-11	56.14	35.89
				Jan-12	55.58	36.45
				Apr-12	41.18	50.85
				Aug-12	54.89	37.14
				Dec-12	42.82	47.83
				Mar-13	41.90	48.75
				May-13	41.70	48.95
				Sep-13	43.05	47.60
				Dec-13	43.43	47.22
				Feb-14	43.25	47.40
				Apr-14	42.91	47.74
				Jan-15	46.18	43.36
				Jun-15	40.30	49.24
				Oct-15	53.21	37.44
EW-02			91.64	Dec-12	53.07	38.57
				Mar-13		
				May-13	54.45	37.19
				Sep-13	58.70	32.94
				Dec-13	62.30	29.34
				Feb-14	65.48	26.16
				Apr-14	65.29	26.35
				Jan-15	64.83	26.81
				Jun-15	56.27	35.37
				Oct-15	58.16	33.48
MW-01A		91 - 101	91.61	Mar-10	44.81	46.80
				May-10	43.78	47.83
				Aug-10	44.41	47.20
				Nov-10	44.98	46.63
				Mar-11	43.11	48.50
				Jun-11	42.20	49.41
				Sep-11	42.73	48.88
				Nov-11	42.97	48.64
				Jan-12	42.19	49.42
				Apr-12	41.51	50.10
				Aug-12	42.00	49.61
				Dec-12	42.94	48.67

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Mar-13	41.89	49.72
				May-13	41.73	49.88
				Sep-13	43.06	48.55
				Dec-13	43.39	48.22
				Feb-14	43.16	48.45
				Apr-14	42.82	48.79
				Sep-14	46.00	45.61
				Jan-15	46.11	45.50
				Jun-15	46.68	44.93
				Oct-15	48.57	43.04
MW-02A	96	86 - 96	90.88	Mar-10	44.02	46.86
				May-10	43.03	47.85
				Aug-10	43.52	47.36
				Nov-10	44.21	46.67
				Mar-11	42.38	48.50
				Jun-11	41.44	49.44
				Sep-11	41.90	48.98
				Nov-11	42.12	48.76
				Jan-12	41.52	49.36
				Apr-12	40.80	50.08
				Aug-12	41.15	49.73
				Dec-12	42.13	48.75
				Mar-13	41.11	49.77
				May-13	40.95	49.93
				Sep-13	42.28	48.60
				Dec-13	42.59	48.29
				Feb-14	42.40	48.48
				Apr-14	42.08	48.80
				Sep-14	45.09	45.79
				Jan-15	45.21	45.67
				Jun-15	45.80	45.08
				Oct-15	47.55	43.33
MW-03A	94	84 - 94	91.49	Mar-10	46.77	44.72
				May-10	45.76	45.73
				Aug-10	46.38	45.11
				Nov-10	46.89	44.60
				Mar-11	44.95	46.54
				Jun-11	44.00	47.49
				Sep-11	44.56	46.93
				Nov-11	44.89	46.60
				Jan-12	44.19	47.30
				Apr-12	41.84	49.65

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Aug-12	43.82	47.67
				Dec-12	43.76	47.73
				Mar-13	42.70	48.79
				May-13	42.53	48.96
				Sep-13	43.94	47.55
				Dec-13	44.25	47.24
				Feb-14	44.03	47.46
				Apr-14	43.68	47.81
				Sep-14	47.38	44.11
				Jan-15	47.03	44.46
				Jun-15	47.89	43.60
				Oct-15	49.20	42.29
MW-04A	89	78 - 88	91.13	Mar-10	45.39	45.74
				May-10	44.23	46.90
				Aug-10	44.58	46.55
				Nov-10	45.47	45.66
				Mar-11	43.51	47.62
				Jun-11	42.47	48.66
				Sep-11	42.94	48.19
				Nov-11	43.33	47.80
				Jan-12	42.74	48.39
				Apr-12	41.90	49.23
				Aug-12	42.10	49.03
				Dec-12	44.50	46.63
				Mar-13	43.43	47.70
				May-13	43.20	47.93
				Sep-13	44.45	46.68
				Dec-13	44.89	46.24
				Feb-14	44.71	46.42
				Apr-14	44.20	46.93
				Sep-14	47.03	44.10
				Jan-15	47.28	43.85
				Jun-15	47.70	43.43
				Oct-15	49.53	41.60
MW-04B	154	144 - 154	91.11	Mar-10	44.70	46.41
				May-10	43.82	47.29
				Aug-10	45.31	45.80
				Nov-10	45.24	45.87
				Mar-11	43.08	48.03
				Jun-11	42.18	48.93
				Sep-11	43.48	47.63
				Nov-11	43.38	47.73

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Jan-12	42.44	48.67
				Apr-12	41.83	49.28
				Aug-12	42.80	48.31
				Dec-12	43.57	47.54
				Mar-13	42.35	48.76
				May-13	42.35	48.76
				Sep-13	44.31	46.80
				Dec-13	44.16	46.95
				Feb-14	43.77	47.34
				Apr-14	43.40	47.71
				Sep-14	47.56	43.55
				Jan-15	46.81	44.30
				Jun-15	47.53	43.58
				Oct-15	49.61	41.50
MW-04C	237	227 - 237	91.25	Mar-10	43.15	48.10
				May-10	44.64	46.61
				Aug-10	50.22	41.03
				Nov-10	45.22	46.03
				Mar-11	42.86	48.39
				Jun-11	42.75	48.50
				Sep-11	47.15	44.10
				Nov-11	43.69	47.56
				Jan-12	41.94	49.31
				Apr-12	41.49	49.76
				Aug-12	47.47	43.78
				Dec-12	43.31	47.94
				Mar-13	42.33	48.92
				May-13	43.88	47.37
				Sep-13	48.05	43.20
				Dec-13	43.99	47.26
				Feb-14	43.86	47.39
				Apr-14	44.57	46.68
				Sep-14	57.40	33.85
				Jan-15	47.05	44.20
				Jun-15	51.38	39.87
				Oct-15	53.30	37.95
MW-05A	90	60 - 90	90.74	Mar-10	44.43	46.31
				May-10	43.39	47.35
				Aug-10	43.72	47.02
				Nov-10	44.60	46.14
				Mar-11	42.71	48.03
				Jun-11	41.75	48.99

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Sep-11	42.08	48.66
				Nov-11	42.48	48.26
				Jan-12	41.87	48.87
				Apr-12	41.09	49.65
				Aug-12	41.34	49.40
				Dec-12	42.38	48.36
				Mar-13	41.39	49.35
				May-13	41.17	49.57
				Sep-13	42.45	48.29
				Dec-13	42.91	47.83
				Feb-14	42.71	48.03
				Apr-14	42.32	48.42
				Sep-14	45.38	45.36
				Jan-15	45.61	45.13
				Jun-15	46.18	44.56
				Oct-15	47.95	42.79
MW-06A	90	60 - 90	89.72	Mar-10	43.49	46.23
				May-10	42.24	47.48
				Aug-10	42.53	47.19
				Nov-10	43.54	46.18
				Mar-11	41.66	48.06
				Jun-11	40.50	49.22
				Sep-11	40.96	48.76
				Nov-11	41.40	48.32
				Jan-12	40.81	48.91
				Apr-12	40.24	49.48
				Aug-12	40.27	49.45
				Dec-12	41.90	47.82
				Mar-13	40.89	48.83
				May-13	40.65	49.07
				Sep-13	41.94	47.78
				Dec-13	42.54	47.18
				Feb-14	42.36	47.36
				Apr-14	41.83	47.89
				Sep-14	44.60	45.12
				Jan-15	45.06	44.66
				Jun-15	45.34	44.38
				Oct-15	47.10	42.62
MW-07A	90	60 - 90	91.24	Mar-10	43.89	47.35
				May-10	42.89	48.35
				Aug-10	43.00	48.24
				Nov-10	43.97	47.27

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Mar-11	42.30	48.94
				Jun-11	41.36	49.88
				Sep-11	41.55	49.69
				Nov-11	41.85	49.39
				Jan-12	41.40	49.84
				Apr-12	40.92	50.32
				Aug-12	40.82	50.42
				Dec-12	41.99	49.25
				Mar-13	41.11	50.13
				May-13	40.81	50.43
				Sep-13	41.86	49.38
				Dec-13	42.35	48.89
				Feb-14	42.21	49.03
				Apr-14	41.90	49.34
				Sep-14	44.48	46.76
				Jan-15	45.01	46.23
				Jun-15	45.42	45.82
				Oct-15	47.21	44.03
MW-08A	90	60 - 90	91.44	Mar-10	45.39	46.05
				May-10	44.33	47.11
				Aug-10	44.64	46.80
				Nov-10	45.53	45.91
				Mar-11	43.69	47.75
				Jun-11	42.66	48.78
				Sep-11	42.98	48.46
				Nov-11	43.38	48.06
				Jan-12	42.80	48.64
				Apr-12	41.91	49.53
				Aug-12	42.28	49.16
				Dec-12	43.27	48.17
				Mar-13	42.28	49.16
				May-13	42.10	49.34
				Sep-13	43.36	48.08
				Dec-13	43.80	47.64
				Feb-14	44.21	47.23
				Apr-14	43.25	48.19
				Sep-14	46.27	45.17
				Jan-15	46.56	44.88
				Jun-15	47.05	44.39
				Oct-15	48.83	42.61
MW-09B	155	144 - 154	91.2	Mar-10	44.47	46.73
				May-10	43.68	47.52

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Aug-10	45.13	46.07
				Nov-10	45.16	46.04
				Mar-11	42.91	48.29
				Jun-11	42.07	49.13
				Sep-11	43.33	47.87
				Nov-11	43.18	48.02
				Jan-12	42.31	48.89
				Apr-12	41.60	49.60
				Aug-12	42.61	48.59
				Dec-12	43.30	47.89
				Mar-13	42.10	49.09
				May-13	42.15	49.04
				Sep-13	44.09	47.10
				Dec-13	43.80	47.39
				Feb-14	43.49	47.70
				Apr-14	43.23	47.96
				Sep-14	47.30	43.89
				Jan-15	46.59	44.60
				Jun-15	47.26	43.93
				Oct-15	49.38	41.82
MW-10A	91	60 - 89	90.48	Mar-10	44.68	45.80
				May-10	43.52	46.96
				Aug-10	43.94	46.54
				Nov-10	44.93	45.55
				Mar-11	42.85	47.63
				Jun-11	41.77	48.71
				Sep-11	42.31	48.17
				Nov-11	42.82	47.66
				Jan-12	42.15	48.33
				Apr-12	41.55	48.93
				Aug-12	41.62	48.86
				Dec-12	43.37	47.11
				Mar-13	42.27	48.21
				May-13	42.04	48.44
				Sep-13	43.45	47.03
				Dec-13	44.08	46.40
				Feb-14	43.75	46.73
				Apr-14	43.22	47.26
				Sep-14	46.32	44.16
				Jan-15	46.52	43.96
				Jun-15	46.74	43.74
				Oct-15	48.62	41.86

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-10B	160	153 - 163	90.21	Mar-10	44.01	46.20
				May-10	43.08	47.13
				Aug-10	44.44	45.77
				Nov-10	44.55	45.66
				Mar-11	42.37	47.84
				Jun-11	41.37	48.84
				Sep-11	42.66	47.55
				Nov-11	42.66	47.55
				Jan-12	41.72	48.49
				Apr-12	41.11	49.10
				Aug-12	41.90	48.31
				Dec-12	42.95	47.26
				Mar-13	41.68	48.53
				May-13	41.65	48.56
				Sep-13	43.33	46.88
				Dec-13	43.63	46.58
				Feb-14	43.20	47.01
				Apr-14	42.77	47.44
				Sep-14	46.75	43.46
				Jan-15	46.22	43.99
				Jun-15	46.43	43.78
				Oct-15	48.80	41.41
MW-10C	230	220 - 230	90.5	Mar-10	42.87	47.63
				May-10	44.22	46.28
				Aug-10	49.92	40.58
				Nov-10	44.88	45.62
				Mar-11	42.47	48.03
				Jun-11	42.20	48.30
				Sep-11	46.99	43.51
				Nov-11	43.51	46.99
				Jan-12	41.65	48.85
				Apr-12	41.30	49.20
				Aug-12	47.14	43.36
				Dec-12	43.50	47.00
				Mar-13	41.96	48.54
				May-13	43.60	46.90
				Sep-13	47.94	42.56
				Dec-13	43.83	46.67
				Feb-14	43.71	46.79
				Apr-14	44.26	46.24
				Sep-14	54.02	36.48
				Jan-15	46.84	43.66

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Jun-15	50.90	39.60
				Oct-15	52.40	38.10
MW-11A	92	70 - 90	89.91	Mar-10	42.15	47.76
				May-10	41.12	48.79
				Aug-10	41.42	48.49
				Nov-10	42.19	47.72
				Mar-11	40.57	49.34
				Jun-11	39.65	50.26
				Sep-11	39.93	49.98
				Nov-11	40.08	49.83
				Jan-12	39.63	50.28
				Apr-12	39.18	50.73
				Aug-12	39.18	50.73
				Dec-12	40.24	49.67
				Mar-13	39.29	50.62
				May-13	39.10	50.81
				Sep-13	40.17	49.74
				Dec-13	40.59	49.32
				Feb-14	40.50	49.41
				Apr-14	40.22	49.69
				Sep-14	42.76	47.15
				Jan-15	43.22	46.69
				Jun-15	43.64	46.27
				Oct-15	45.32	44.59
MW-12A	99	87 - 97	91.15	Mar-10	45.17	45.98
				May-10	44.07	47.08
				Aug-10	44.86	46.29
				Nov-10	45.56	45.59
				Mar-11	43.31	47.84
				Jun-11	42.40	48.75
				Sep-11	43.22	47.93
				Nov-11	43.54	47.61
				Jan-12	42.79	48.36
				Apr-12	42.12	49.03
				Aug-12	46.93	44.22
				Dec-12	43.49	47.66
				Mar-13	42.72	48.43
				May-13	42.45	48.70
				Sep-13	44.17	46.98
				Dec-13	44.43	46.72
				Feb-14	44.05	47.10
				Apr-14	43.60	47.55

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Sep-14	47.20	43.95
				Jan-15	47.16	43.99
				Jun-15	47.42	43.73
				Oct-15	49.55	41.60
MW-13A	99	77 - 97	89.27	Mar-10	43.44	45.83
				May-10	42.17	47.10
				Aug-10	42.35	46.92
				Nov-10	43.44	45.83
				Mar-11	41.67	47.60
				Jun-11	40.46	48.81
				Sep-11	40.76	48.51
				Nov-11	41.32	47.95
				Jan-12	40.77	48.50
				Apr-12	40.19	49.08
				Aug-12	40.17	49.10
				Dec-12	41.87	47.40
				Mar-13	40.88	48.39
				May-13	40.57	48.70
				Sep-13	41.85	47.42
				Dec-13	42.55	46.72
				Feb-14	42.39	46.88
				Apr-14	41.85	47.42
				Sep-14	44.53	44.74
				Jan-15	45.07	44.20
				Jun-15	45.16	44.11
				Oct-15	46.91	42.36
MW-14A	92	70 - 90	89.79	Mar-10	43.04	46.75
				May-10	41.93	47.86
				Aug-10	42.17	47.62
				Nov-10	43.00	46.79
				Mar-11	41.35	48.44
				Jun-11	40.34	49.45
				Sep-11	40.58	49.21
				Nov-11	40.91	48.88
				Jan-12	40.42	49.37
				Apr-12	39.89	49.90
				Aug-12	39.89	49.90
				Dec-12	41.25	48.54
				Mar-13	40.30	49.49
				May-13	40.06	49.73
				Sep-13	41.22	48.57
				Dec-13	41.77	48.02

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Feb-14	41.65	48.14
				Apr-14	41.23	48.56
				Sep-14	43.86	45.93
				Jan-15	44.32	45.47
				Jun-15	44.71	45.08
				Oct-15	46.38	43.41
MW-15A	102	80 - 100	91.76	Mar-10	44.82	46.94
				May-10	43.80	47.96
				Aug-10	44.40	47.36
				Nov-10	45.03	46.73
				Mar-11	43.11	48.65
				Jun-11	42.23	49.53
				Sep-11	42.77	48.99
				Nov-11	43.02	48.74
				Jan-12	42.41	49.35
				Apr-12	41.80	49.96
				Aug-12	42.10	49.66
				Dec-12	43.10	48.66
				Mar-13	42.14	49.62
				May-13	41.93	49.83
				Sep-13	43.27	48.49
				Dec-13	43.58	48.18
				Feb-14	43.34	48.42
				Apr-14	43.00	48.76
				Sep-14	46.27	45.49
				Jan-15	46.31	45.45
				Jun-15	46.84	44.92
				Oct-15	48.81	42.95
MW-16A	86	76 - 86	91.89	Mar-10	46.55	45.34
				May-10	45.41	46.48
				Aug-10	47.34	44.55
				Nov-10	47.40	44.49
				Mar-11	44.62	47.27
				Jun-11	43.58	48.31
				Sep-11	45.51	46.38
				Nov-11	45.53	46.36
				Jan-12	44.29	47.60
				Apr-12	43.54	48.35
				Aug-12	44.46	47.43
				Dec-12	45.71	46.18
				Mar-13	44.37	47.52
				May-13	44.22	47.67

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Sep-13	46.69	45.20
				Dec-13	46.59	45.30
				Feb-14	45.89	46.00
				Apr-14	45.36	46.53
				Sep-14	49.97	41.92
				Jan-15	49.05	42.84
				Jun-15	49.21	42.68
				Oct-15	51.76	40.13
MW-16B	139	129 - 139	91.82	Mar-10	46.48	45.34
				May-10	45.33	46.49
				Aug-10	47.32	44.50
				Nov-10	47.34	44.48
				Mar-11	44.60	47.22
				Jun-11	43.53	48.29
				Sep-11	45.43	46.39
				Nov-11	45.46	46.36
				Jan-12	44.24	47.58
				Apr-12	43.51	48.31
				Aug-12	44.43	47.39
				Dec-12	45.64	46.18
				Mar-13	44.32	47.50
				May-13	44.18	47.64
				Sep-13	46.66	45.16
				Dec-13	46.54	45.28
				Feb-14	45.84	45.98
				Apr-14	45.31	46.51
				Sep-14	49.94	41.88
				Jan-15	49.01	42.81
				Jun-15	49.20	42.62
				Oct-15	51.75	40.07
MW-16C	236	226 - 236	91.64	Mar-10	45.51	46.13
				May-10	46.22	45.42
				Aug-10	52.77	38.87
				Nov-10	47.40	44.24
				Mar-11	44.73	46.91
				Jun-11	44.07	47.57
				Sep-11	49.02	42.62
				Nov-11	45.99	45.65
				Jan-12	44.12	47.52
				Apr-12	43.39	48.25
				Aug-12	48.55	43.09
				Dec-12	45.85	45.79

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Mar-13	44.67	46.97
				May-13	45.65	45.99
				Sep-13	50.20	41.44
				Dec-13	46.79	44.85
				Feb-14	45.87	45.77
				Apr-14	46.40	45.24
				Sep-14	55.89	35.75
				Jan-15	49.41	42.23
				Jun-15	51.90	39.74
				Oct-15	55.42	36.22
MW-17A	88	77 - 87	89.64	Mar-10	44.36	45.28
				May-10	43.01	46.63
				Aug-10	43.42	46.22
				Nov-10	44.48	45.16
				Mar-11	42.51	47.13
				Jun-11	41.15	48.49
				Sep-11	41.81	47.83
				Nov-11	42.48	47.16
				Jan-12	41.75	47.89
				Apr-12	41.04	48.60
				Aug-12	41.10	48.54
				Dec-12	43.07	46.57
				Mar-13	41.92	47.72
				May-13	41.58	48.06
				Sep-13	43.17	46.47
				Dec-13	43.90	45.74
				Feb-14	43.53	46.11
				Apr-14	42.90	46.74
				Sep-14	45.95	43.69
				Jan-15	46.31	43.33
				Jun-15	46.17	43.47
				Oct-15	48.08	41.56
MW-17B	140	129 - 139	89.69	Mar-10	44.21	45.48
				May-10	43.02	46.67
				Aug-10	43.98	45.71
				Nov-10	44.60	45.09
				Mar-11	42.42	47.27
				Jun-11	41.17	48.52
				Sep-11	42.31	47.38
				Nov-11	42.68	47.01
				Jan-12	41.70	47.99
				Apr-12	41.06	48.63

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Aug-12	41.54	48.15
				Dec-12	43.09	46.60
				Mar-13	41.88	47.81
				May-13	41.67	48.02
				Sep-13	43.68	46.01
				Dec-13	43.96	45.73
				Feb-14	43.49	46.20
				Apr-14	42.97	46.72
				Sep-14	46.57	43.12
				Jan-15	46.40	43.29
				Jun-15	46.49	43.20
				Oct-15	48.61	41.08
MW-17C	232	222 - 232	89.76	Mar-10	43.06	46.70
				May-10	44.10	45.66
				Aug-10	51.62	38.14
				Nov-10	45.08	44.68
				Mar-11	42.36	47.40
				Jun-11	41.85	47.91
				Sep-11	43.30	46.46
				Nov-11	44.07	45.69
				Jan-12	41.60	48.16
				Apr-12	40.97	48.79
				Aug-12	47.40	42.36
				Dec-12	43.56	46.20
				Mar-13	42.26	47.50
				May-13	43.60	46.16
				Sep-13	48.60	41.16
				Dec-13	44.23	45.53
				Feb-14	44.06	45.70
				Apr-14	44.55	45.21
				Sep-14	52.17	37.59
				Jan-15	47.42	42.34
				Jun-15	50.48	39.28
				Oct-15	52.72	37.04
MW-18A	66	56 - 66	90.14	Mar-10	44.58	45.56
				May-10	43.39	46.75
				Aug-10	43.89	46.25
				Nov-10	44.00	46.14
				Mar-11	42.77	47.37
				Jun-11	41.56	48.58
				Sep-11	42.28	47.86
				Nov-11	42.83	47.31

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Jan-12	42.11	48.03
				Apr-12	41.48	48.66
				Aug-12	41.57	48.57
				Dec-12	43.30	46.84
				Mar-13	42.14	48.00
				May-13	41.90	48.24
				Sep-13	43.43	46.71
				Dec-13	44.10	46.04
				Feb-14	43.62	46.52
				Apr-14	43.11	47.03
				Sep-14	46.36	43.78
				Jan-15	46.62	43.52
				Jun-15	46.60	43.54
				Oct-15	48.52	41.62
MW-19A	101	91 - 101	91.22	Mar-10	45.43	45.79
				May-10	44.37	46.85
				Aug-10	45.83	45.39
				Nov-10	46.02	45.20
				Mar-11	43.65	47.57
				Jun-11	42.63	48.59
				Sep-11	44.07	47.15
				Nov-11	44.14	47.08
				Jan-12	43.18	48.04
				Apr-12	42.58	48.64
				Aug-12	44.18	47.04
				Dec-12	44.25	46.97
				Mar-13	43.13	48.09
				May-13	42.96	48.26
				Sep-13	45.04	46.18
				Dec-13	45.08	46.14
				Feb-14	44.56	46.66
				Apr-14	44.14	47.08
				Sep-14	48.35	42.87
				Jan-15	47.84	43.38
				Jun-15	48.03	43.19
				Oct-15	50.43	40.79
MW-19B1	147	137 - 147	91.08	Mar-10	45.55	45.53
				May-10	44.68	46.40
				Aug-10	46.78	44.30
				Nov-10	46.42	44.66
				Mar-11	43.84	47.24
				Jun-11	42.93	48.15

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Sep-11	44.85	46.23
				Nov-11	44.59	46.49
				Jan-12	43.45	47.63
				Apr-12	42.81	48.27
				Aug-12	44.03	47.05
				Dec-12	44.61	46.47
				Mar-13	43.44	47.64
				May-13	43.45	47.63
				Sep-13	45.90	45.18
				Dec-13	45.50	45.58
				Feb-14	44.88	46.20
				Apr-14	44.52	46.56
				Sep-14	49.31	41.77
				Jan-15	48.12	42.96
				Jun-15	48.74	42.34
				Oct-15	51.12	39.96
MW-20A	86	76 - 86	90.7	Mar-10	45.28	45.42
				May-10	44.08	46.62
				Aug-10	44.97	45.73
				Nov-10	45.79	44.91
				Mar-11	43.40	47.30
				Jun-11	42.28	48.42
				Sep-11	43.35	47.35
				Nov-11	43.74	46.96
				Jan-12	42.84	47.86
				Apr-12	42.15	48.55
				Aug-12	41.12	49.58
				Dec-12	44.08	46.62
				Mar-13	42.93	47.77
				May-13	42.70	48.00
				Sep-13	44.47	46.23
				Dec-13	44.90	45.80
				Feb-14	44.39	46.31
				Apr-14	43.88	46.82
				Sep-14	47.57	43.13
				Jan-15	47.41	43.29
				Jun-15	47.55	43.15
				Oct-15	49.79	40.91
MW-20B	162	152 - 162	90.65	Mar-10	45.19	45.46
				May-10	44.11	46.54
				Aug-10	45.74	44.91
				Nov-10	45.96	44.69

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Mar-11	43.38	47.27
				Jun-11	42.34	48.31
				Sep-11	43.94	46.71
				Nov-11	44.00	46.65
				Jan-12	42.69	47.96
				Apr-12	42.21	48.44
				Aug-12	43.06	47.59
				Dec-12	44.21	46.44
				Mar-13	42.94	47.71
				May-13	42.85	47.80
				Sep-13	45.05	45.60
				Dec-13	45.01	45.64
				Feb-14	44.43	46.22
				Apr-14	43.94	46.71
				Sep-14	48.28	42.37
				Jan-15	47.43	43.22
				Jun-15	47.88	42.77
				Oct-15	50.19	40.46
MW-20C	235	225 - 235	90.79	Mar-10	43.84	46.95
				May-10	44.42	46.37
				Aug-10	50.67	40.12
				Nov-10	45.78	45.01
				Mar-11	43.14	47.65
				Jun-11	42.65	48.14
				Sep-11	47.52	43.27
				Nov-11	44.74	46.05
				Jan-12	42.48	48.31
				Apr-12	41.89	48.90
				Aug-12	47.39	43.40
				Dec-12	45.05	45.74
				Mar-13	43.10	47.69
				May-13	44.24	46.55
				Sep-13	48.59	42.20
				Dec-13	45.08	45.71
				Feb-14	44.35	46.44
				Apr-14	45.14	45.65
				Sep-14	55.00	35.79
				Jan-15	47.91	42.88
				Jun-15	51.09	39.70
				Oct-15	53.35	37.44
MW-21A	102	90 - 100	91.75	Nov-11	45.34	46.41
				Jan-12	44.62	47.13

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Apr-12	43.42	48.33
				Aug-12	44.83	46.92
				Dec-12	45.68	46.07
				Mar-13	44.31	47.44
				May-13	44.17	47.58
				Sep-13	46.47	45.28
				Dec-13	46.28	45.47
				Feb-14	45.81	45.94
				Apr-14	45.60	46.15
				Sep-14	49.65	42.10
				Jan-15	48.74	43.01
				Jun-15	49.28	42.47
				Oct-15	51.91	39.84
MW-22A	62	50 - 60	91.69	Nov-11	45.36	46.33
				Jan-12	44.20	47.49
				Apr-12	43.45	48.24
				Aug-12	44.02	47.67
				Dec-12	45.63	46.06
				Mar-13	44.33	47.36
				May-13	44.11	47.58
				Sep-13	46.29	45.40
				Dec-13	46.52	45.17
				Feb-14	45.93	45.76
				Apr-14	45.28	46.41
				Sep-14	49.45	42.24
				Jan-15	48.89	42.80
				Jun-15	48.92	42.77
				Oct-15	46.81	44.88
MW-23A	102	89 - 99	90.26	Nov-11	40.85	49.41
				Jan-12	40.71	49.55
				Apr-12	40.19	50.07
				Aug-12	40.26	50.00
				Dec-12	41.33	48.93
				Mar-13	40.49	49.77
				May-13	40.35	49.91
				Sep-13	41.48	48.78
				Dec-13	41.80	48.46
				Feb-14	41.76	48.50
				Apr-14	41.45	48.81
				Sep-14	44.08	46.18
				Jan-15	44.30	45.96
				Jun-15	44.95	45.31

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Oct-15	51.52	38.74
MW-24B	157	145 - 155	92.93	Nov-11	45.94	46.99
				Jan-12	44.89	48.04
				Apr-12	44.21	48.72
				Aug-12	44.91	48.02
				Dec-12	46.20	46.73
				Mar-13	44.96	47.97
				May-13	44.81	48.12
				Sep-13	46.91	46.02
				Dec-13	47.00	45.93
				Feb-14	46.47	46.46
				Apr-14	45.99	46.94
				Sep-14	49.87	43.06
				Jan-15	49.41	43.52
				Jun-15	49.75	43.18
				Oct-15	52.02	40.91
MW-25B	157	145 - 155	91.78	Nov-11	45.40	46.38
				Jan-12	44.27	47.51
				Apr-12	43.44	48.34
				Aug-12	44.12	47.66
				Dec-12	45.62	46.16
				Mar-13	44.29	47.49
				May-13	44.14	47.64
				Sep-13	46.40	45.38
				Dec-13	46.53	45.25
				Feb-14	45.81	45.97
				Apr-14	45.31	46.47
				Sep-14	48.86	42.92
				Jan-15	48.72	43.06
				Jun-15	49.16	42.62
				Oct-15	51.38	40.40
MW-26B	157	145 - 155	89.71	Nov-11	43.03	46.68
				Jan-12	41.95	47.76
				Apr-12	41.23	48.48
				Aug-12	41.78	47.93
				Dec-12	43.50	46.21
				Mar-13	42.19	47.52
				May-13	41.97	47.74
				Sep-13	44.18	45.53
				Dec-13	44.46	45.25
				Feb-14	43.87	45.84
				Apr-14	43.25	46.46

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Sep-14	47.07	42.64
				Jan-15	46.83	42.88
				Jun-15	46.76	42.95
				Oct-15	48.98	40.73
MW-27B	157	145 - 155	89.34	Nov-11	42.36	46.98
				Jan-12	41.40	47.94
				Apr-12	40.70	48.64
				Aug-12	41.19	48.15
				Dec-12	42.89	46.45
				Mar-13	41.65	47.69
				May-13	41.42	47.92
				Sep-13	43.62	45.72
				Dec-13	43.93	45.41
				Feb-14	43.41	45.93
				Apr-14	42.82	46.52
				Sep-14	46.41	42.93
				Jan-15	46.21	43.13
				Jun-15	46.21	43.13
				Oct-15	48.32	41.02
MW-28B	157	145 - 155	89.21	Nov-11	41.40	47.81
				Jan-12	40.62	48.59
				Apr-12	40.06	49.15
				Aug-12	40.52	48.69
				Dec-12	41.91	47.30
				Mar-13	40.46	48.75
				May-13	40.60	48.61
				Sep-13	42.40	46.81
				Dec-13	42.61	46.60
				Feb-14	42.36	46.85
				Apr-14	41.89	47.32
				Sep-14	45.21	44.00
				Jan-15	45.15	44.06
				Jun-15	45.44	43.77
				Oct-15	47.39	41.82
MW-29B	157	145 - 155	89.74	Nov-11	41.45	48.29
				Jan-12	40.72	49.02
				Apr-12	40.15	49.59
				Aug-12	40.63	49.11
				Dec-12	41.74	48.00
				Mar-13	40.67	49.07
				May-13	40.60	49.14
				Sep-13	42.33	47.41

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Dec-13	42.50	47.24
				Feb-14	42.26	47.48
				Apr-14	41.84	47.90
				Sep-14	45.20	44.54
				Jan-15	45.06	44.68
				Jun-15	45.44	44.30
				Oct-15	47.44	42.30
MW-30A	155	89 - 99	89.58	Sep-13	39.85	49.73
				Dec-13	40.06	49.52
				Feb-14	40.04	49.54
				Apr-14	39.72	49.86
				Sep-14	42.34	47.24
				Jan-15	42.64	46.94
				Oct-15	44.79	44.79
MW-30B	156	145 - 155	89.57	Sep-13	40.73	48.84
				Dec-13	40.01	49.56
				Feb-14	39.97	49.60
				Apr-14	39.89	49.68
				Sep-14	43.44	46.13
				Jan-15	42.69	46.88
				Jun-15	43.85	45.72
				Oct-15	45.58	43.99
MW-31A	108	90 - 100	89.57	Sep-13	40.60	48.97
				Dec-13	41.33	48.24
				Feb-14	41.06	48.51
				Apr-14	40.93	48.64
				Sep-14	42.12	47.45
				Jan-15	43.85	45.72
				Jun-15	44.03	45.54
				Oct-15	46.18	43.39
MW-32B	240	145 - 155	91.75	Sep-13	46.70	45.05
				Dec-13	46.25	45.50
				Feb-14	45.51	46.24
				Apr-14	44.94	46.81
				Sep-14	49.92	41.83
				Jan-15	48.67	43.08
				Jun-15	48.91	42.84
				Oct-15	51.23	40.52
MW-32C	240	226 - 236	91.86	Sep-13	51.00	40.86
				Dec-13	47.00	44.86
				Feb-14	45.91	45.95
				Apr-14	45.97	45.89

TABLE G-2(b)
GROUNDWATER MONITORING WELL WATER TABLE ELEVATION
MODESTO GROUNDWATER SUPERFUND SITE

Well Identification	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth To Water (feet from TOC)	Water Table Elevation (feet above MSL)
				Sep-14	55.04	36.82
				Jan-15	49.33	42.53
				Jun-15	51.43	40.43
				Oct-15	52.08	39.78
MW-33B	160	150 - 160	91.34	Sep-13	46.70	44.64
				Dec-13	46.35	44.99
				Feb-14	45.51	45.83
				Apr-14	44.87	46.47
				Sep-14	49.79	41.55
				Feb-15		
				Oct-15	51.31	40.03
MW-34B	156	145 - 155	88.06	Sep-13	39.95	48.11
				Dec-13	40.57	47.49
				Feb-14	40.00	48.06
				Apr-14	39.82	48.24
				Sep-14	42.99	45.07
				Jan-15	43.00	45.06
				Jun-15	43.35	44.71
				Oct-15	45.12	42.94
MW-35B	175	159 - 169	89.33	Sep-13	49.05	40.28
				Dec-13	43.37	45.96
				Feb-14	42.81	46.52
				Apr-14	42.38	46.95
				Sep-14	45.82	43.51
				Jan-15	45.74	43.59
				Jun-15	45.84	43.49
				Oct-15	48.09	41.24

ft bgs - feet below ground surface
MSL - Mean Sea Level
MW - Monitoring Well
NA - Not Applicable
TOC - Top of Casing

Table G-3. Historical through Current Analytical Data included as Excel file on this CD.

FIGURE G-4(a)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

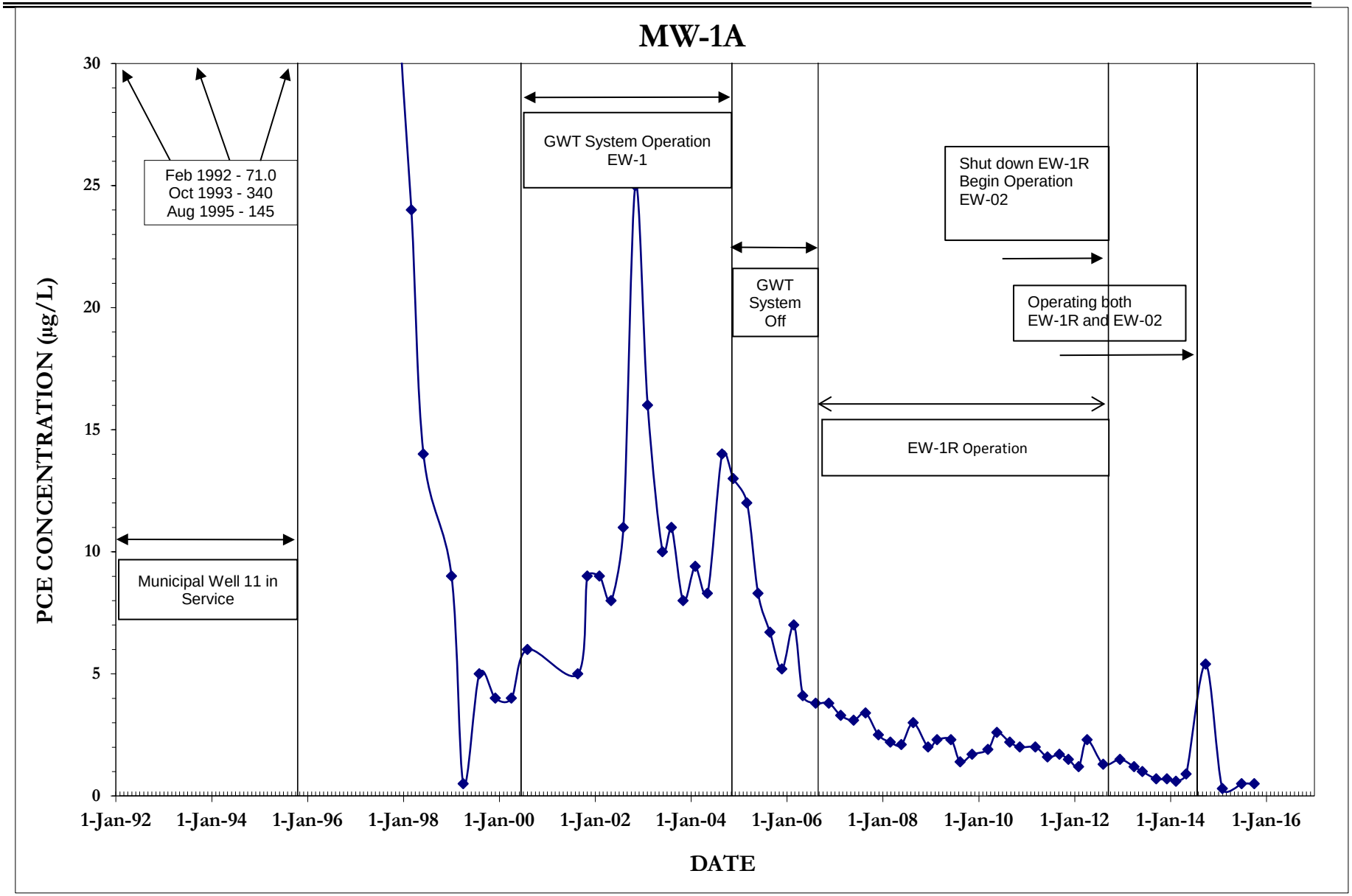


FIGURE G-4(b)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

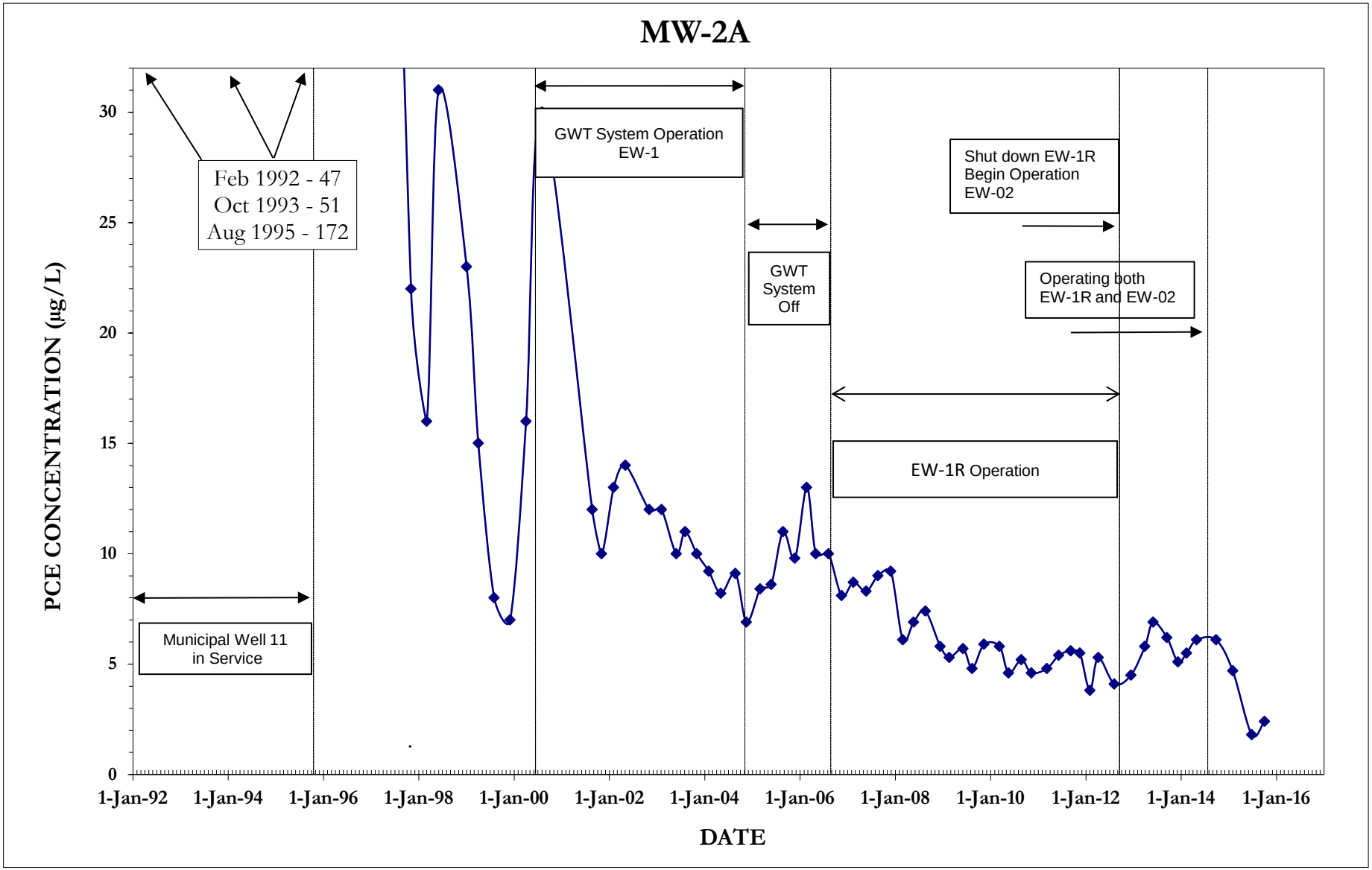


FIGURE G-4(c)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

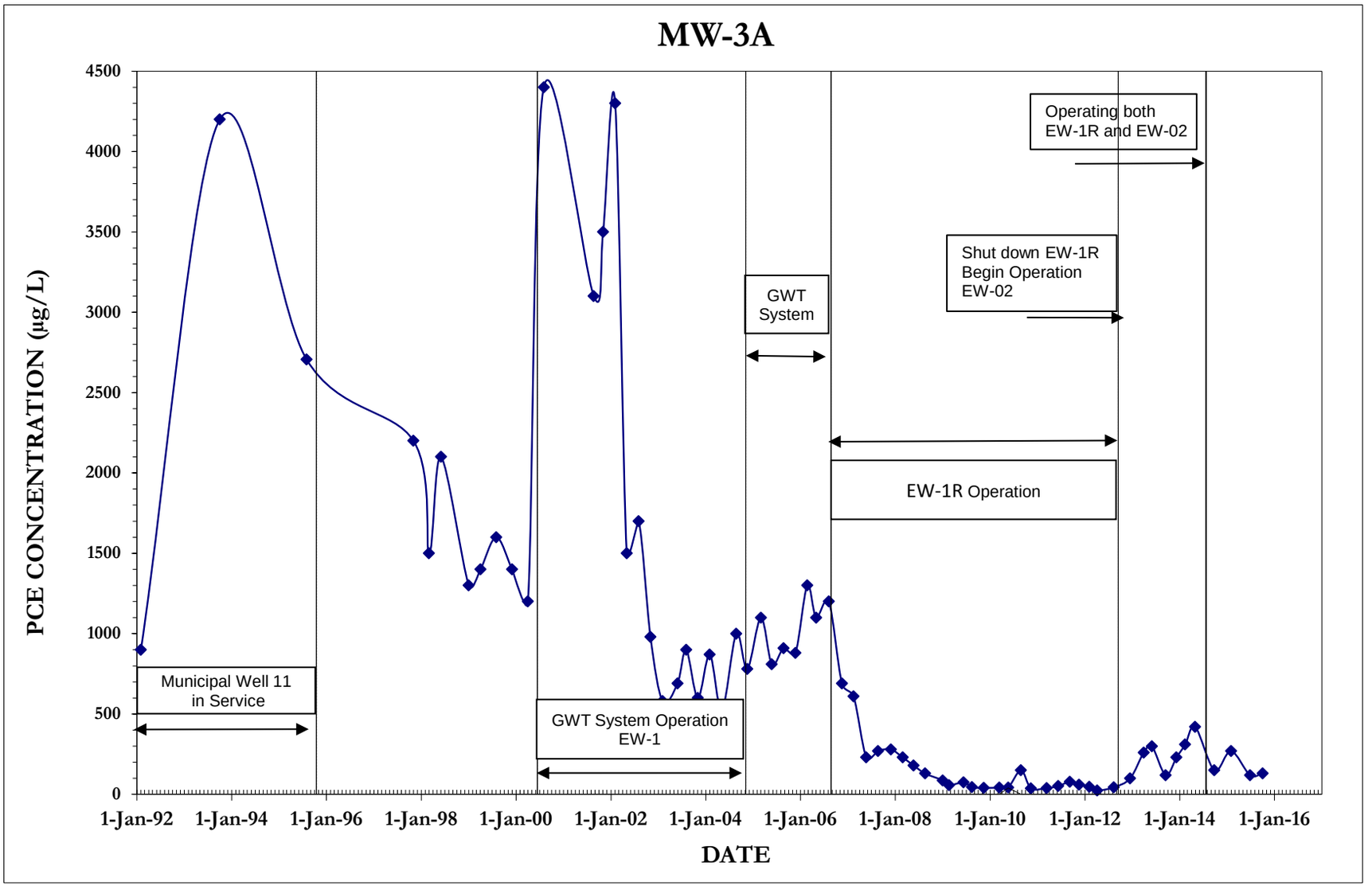


FIGURE G-4(d)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

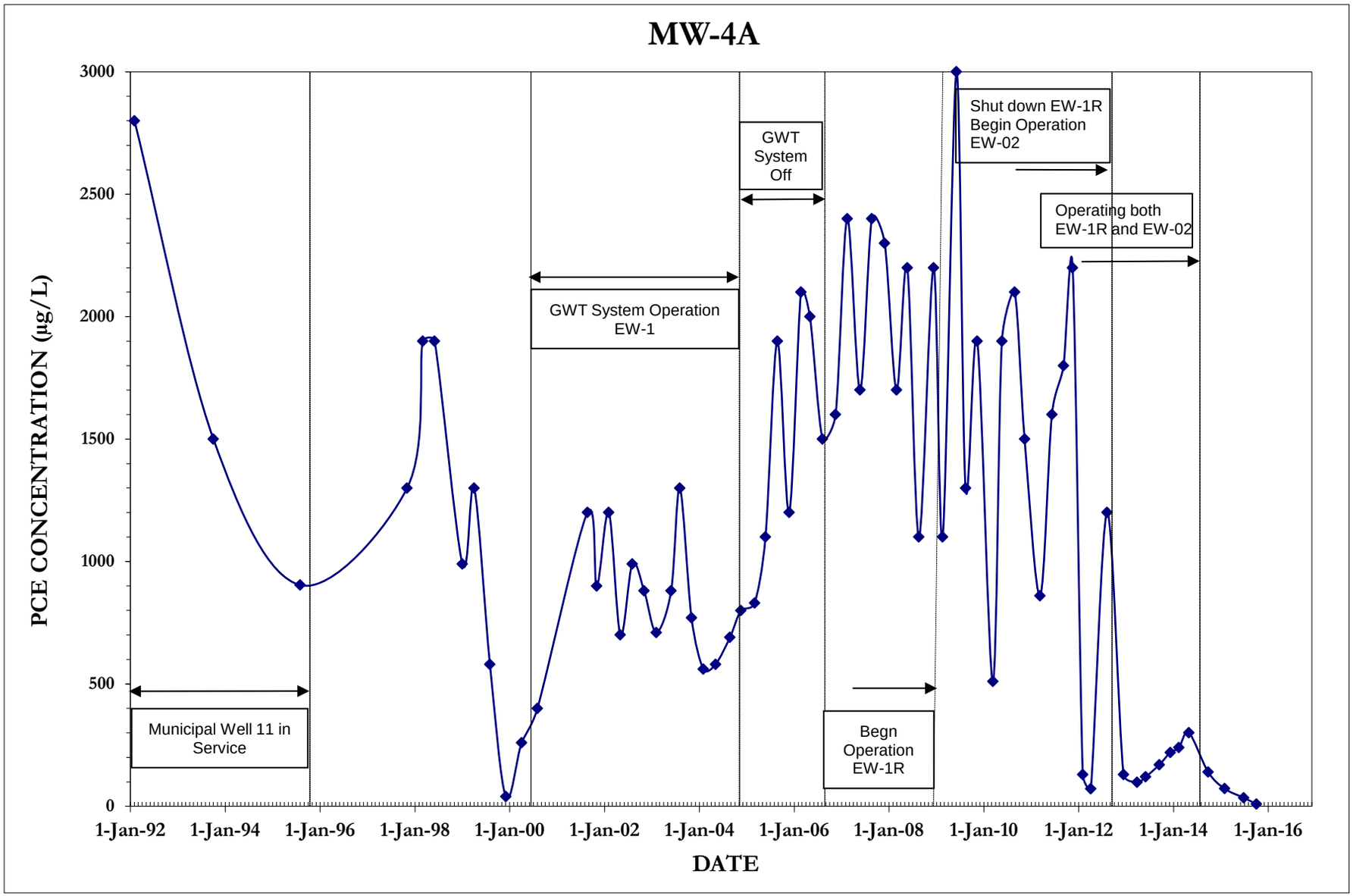


FIGURE G-4(e)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

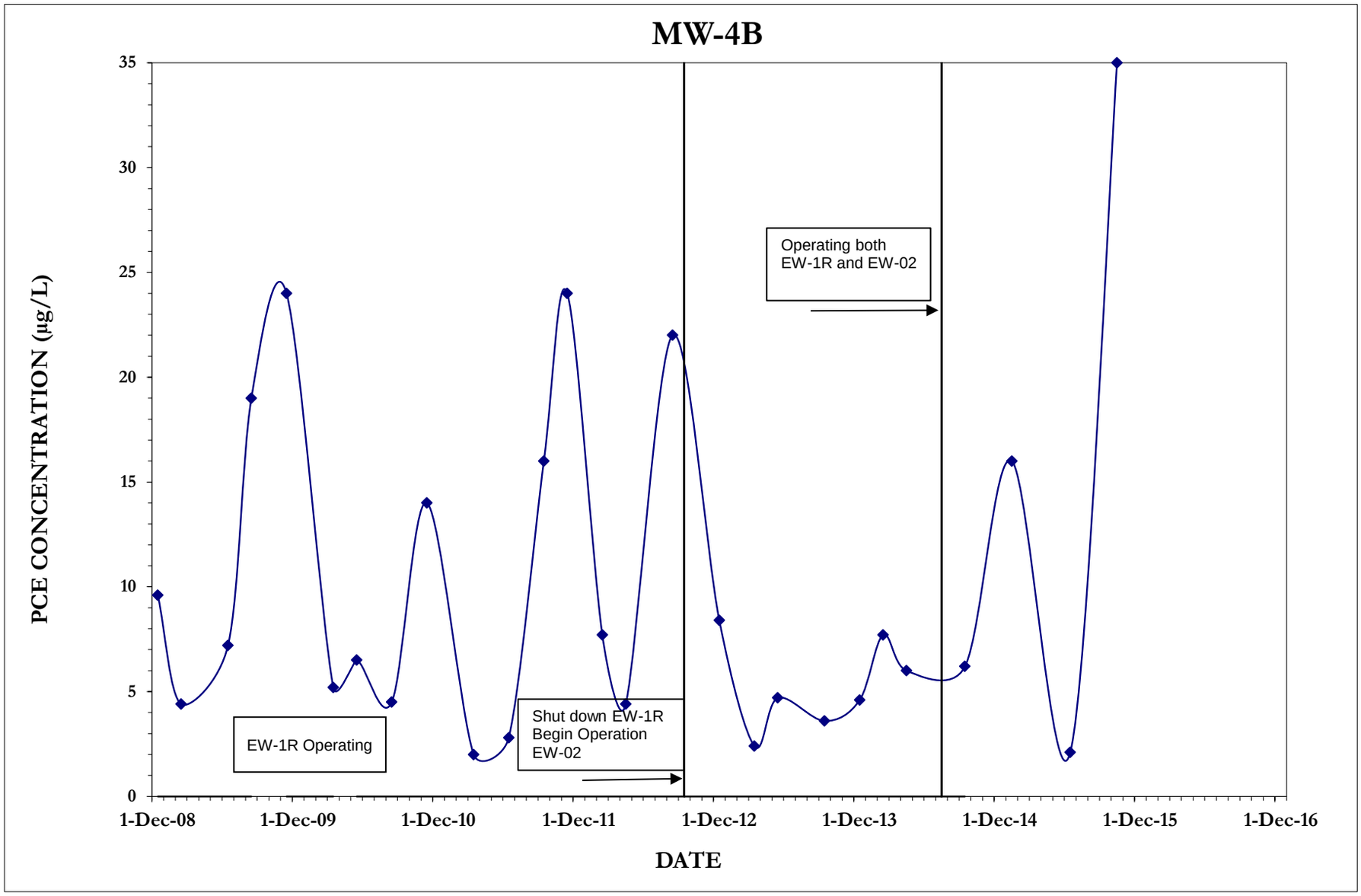


FIGURE G-4(f)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

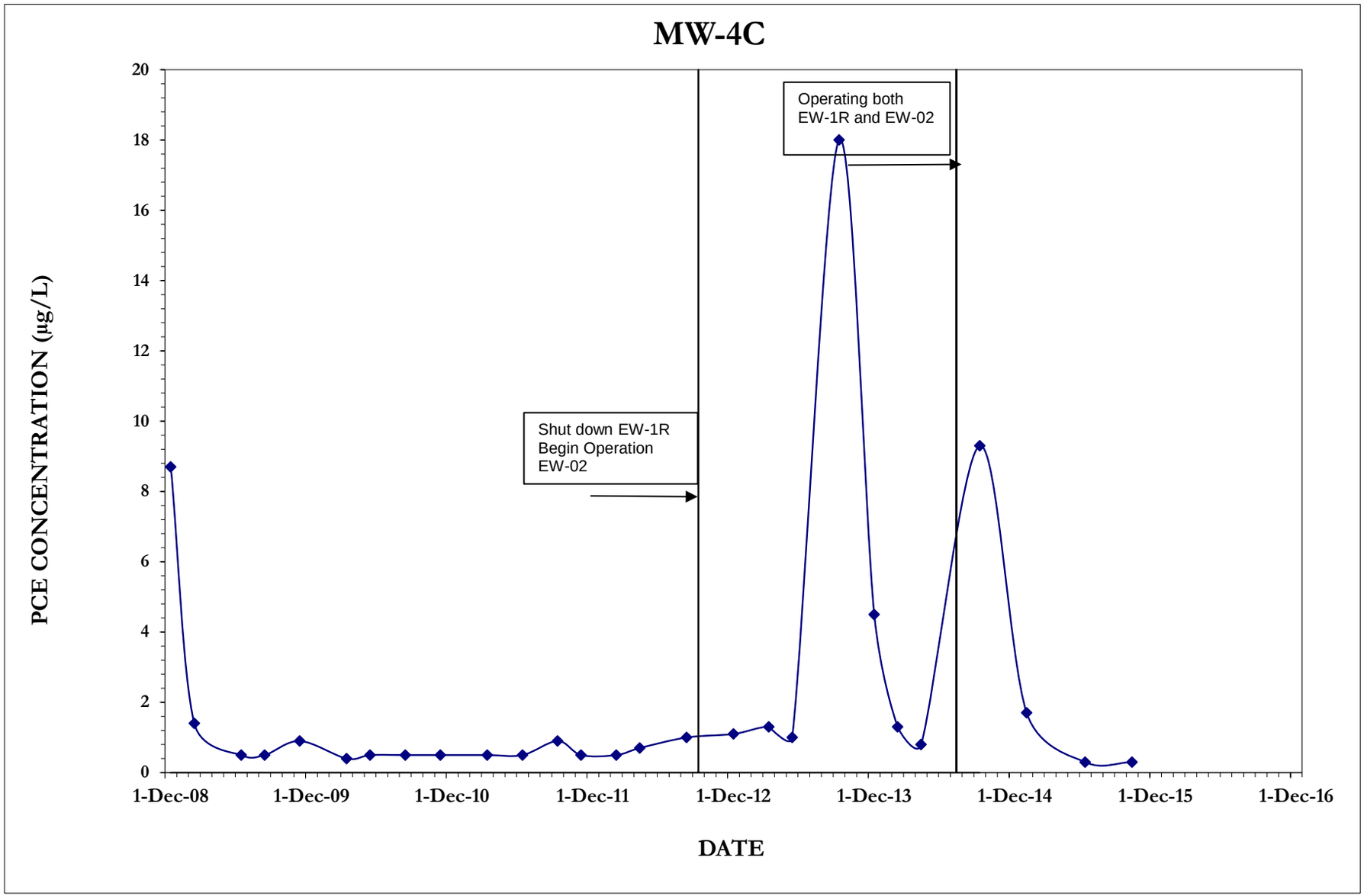


FIGURE G-4(g)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

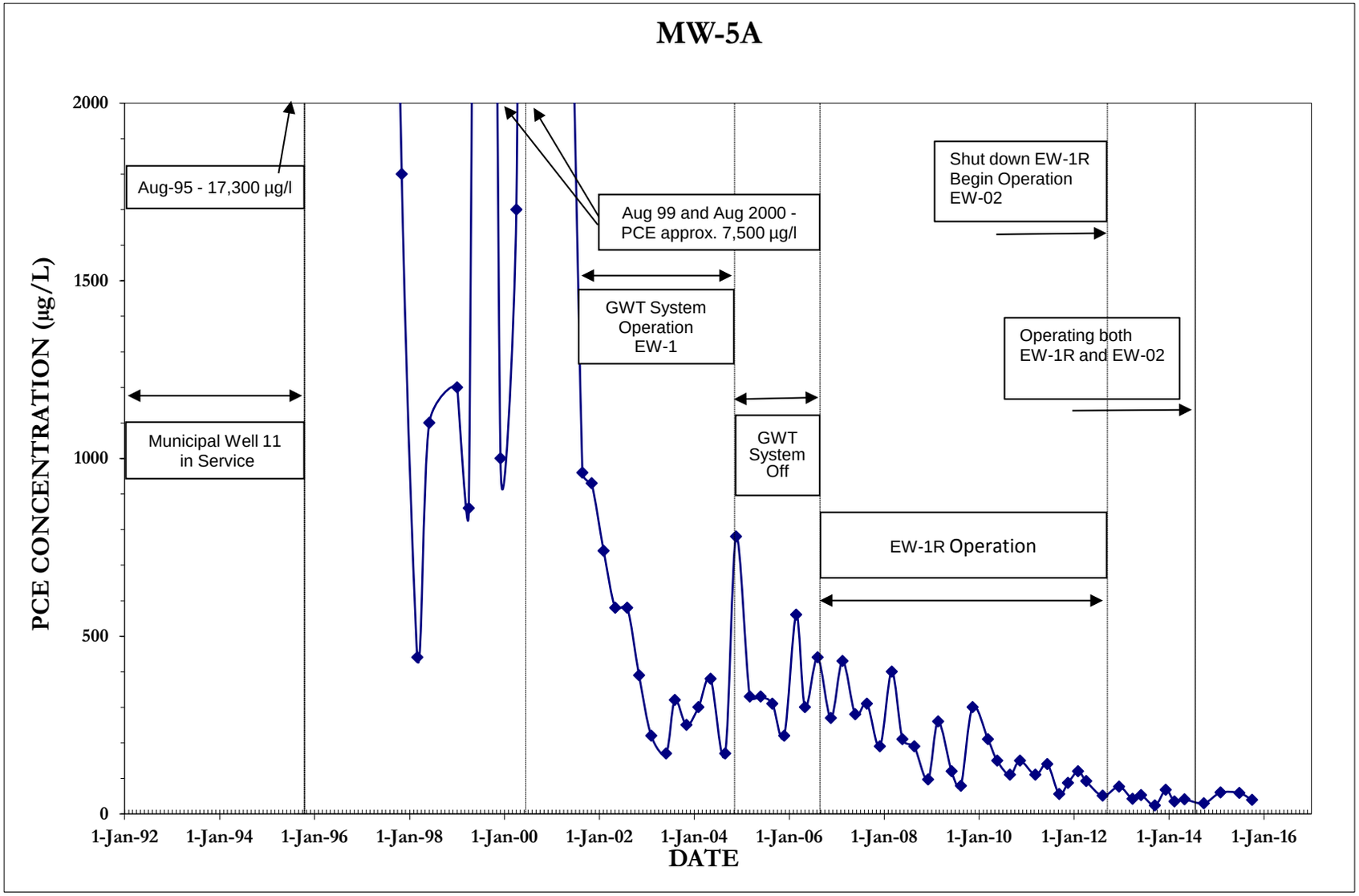


FIGURE G-4(h)

HISTORICAL PCE CONCENTRATION IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

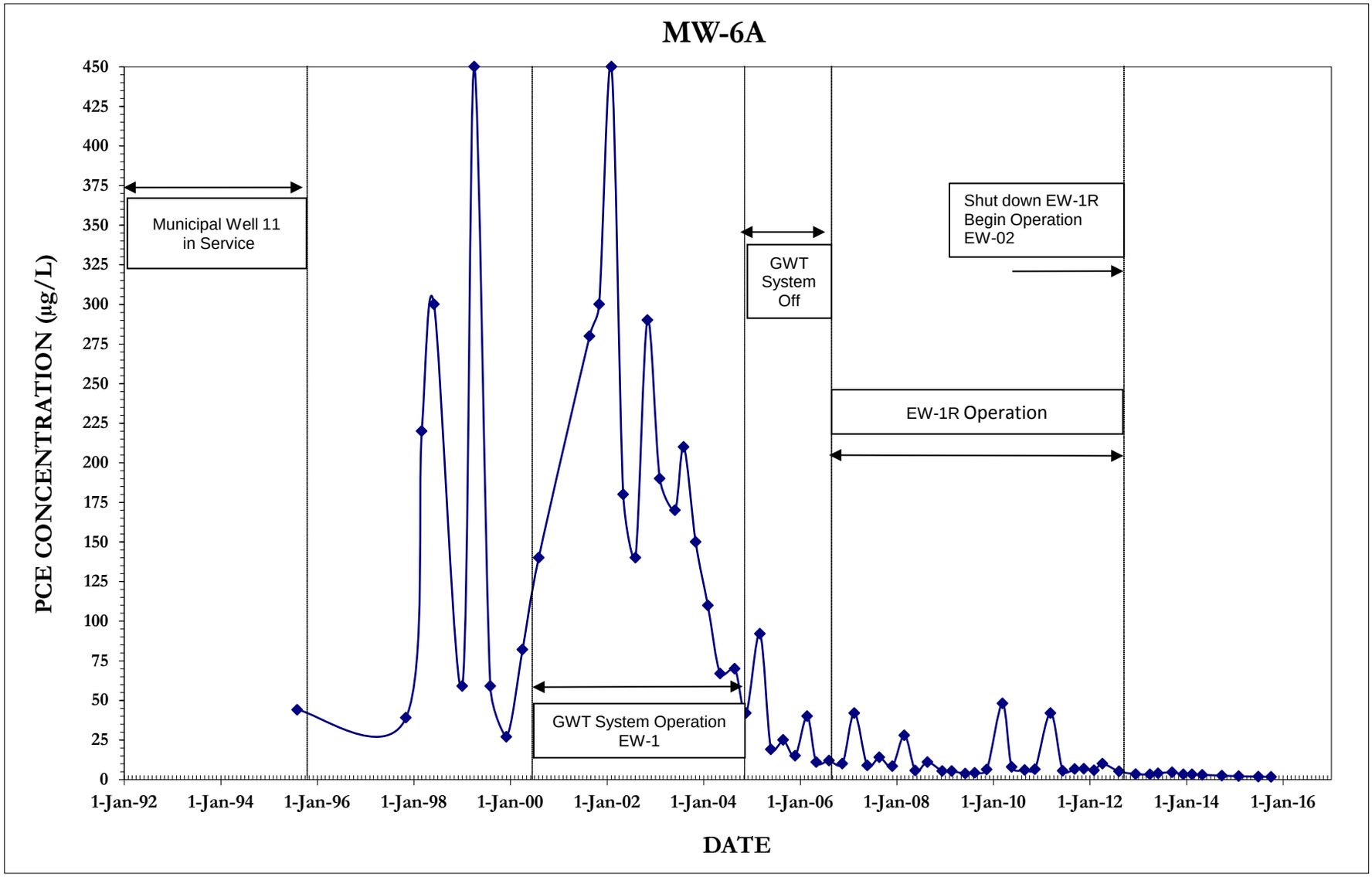


FIGURE G-4(i)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

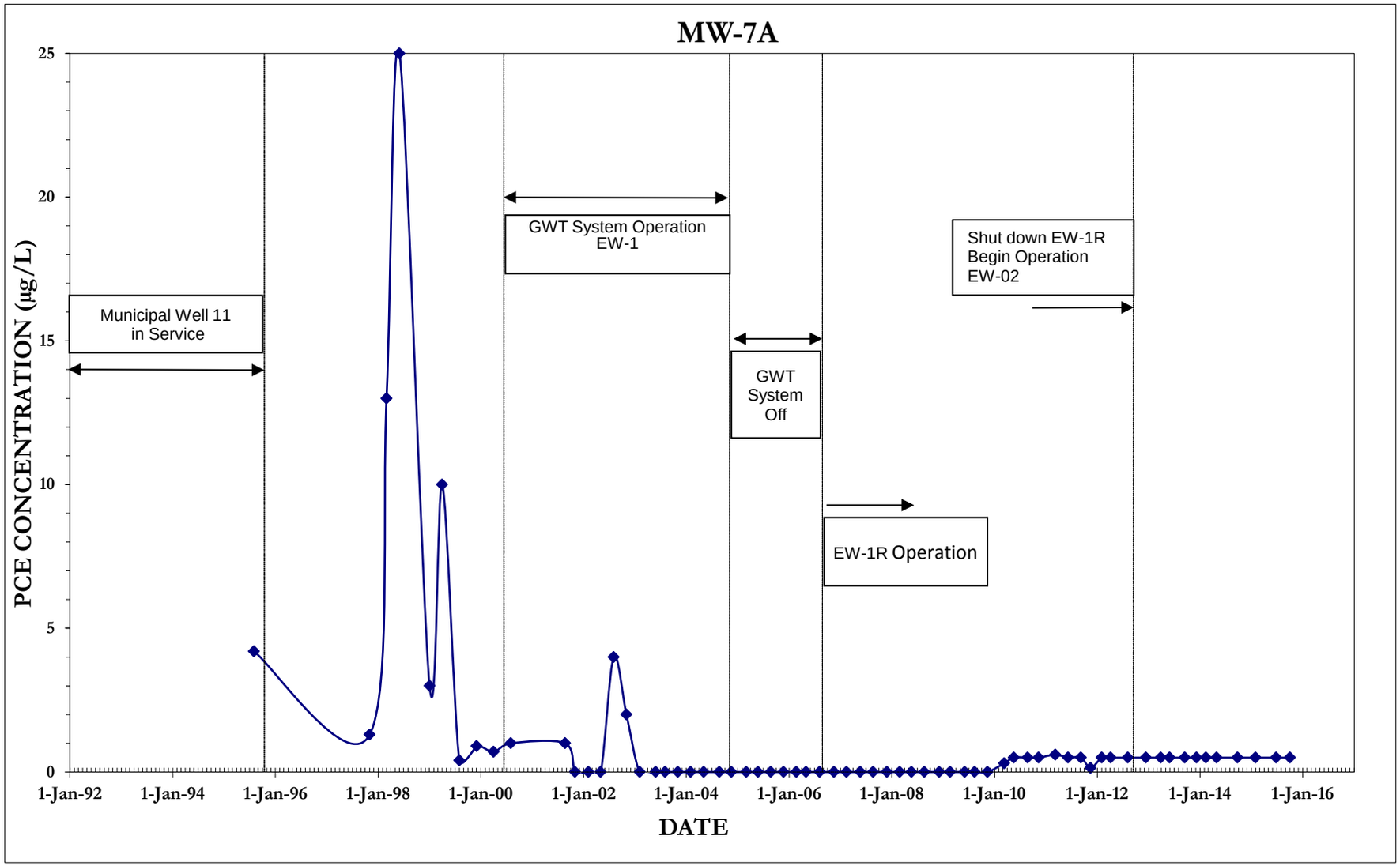


FIGURE G-4(j)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

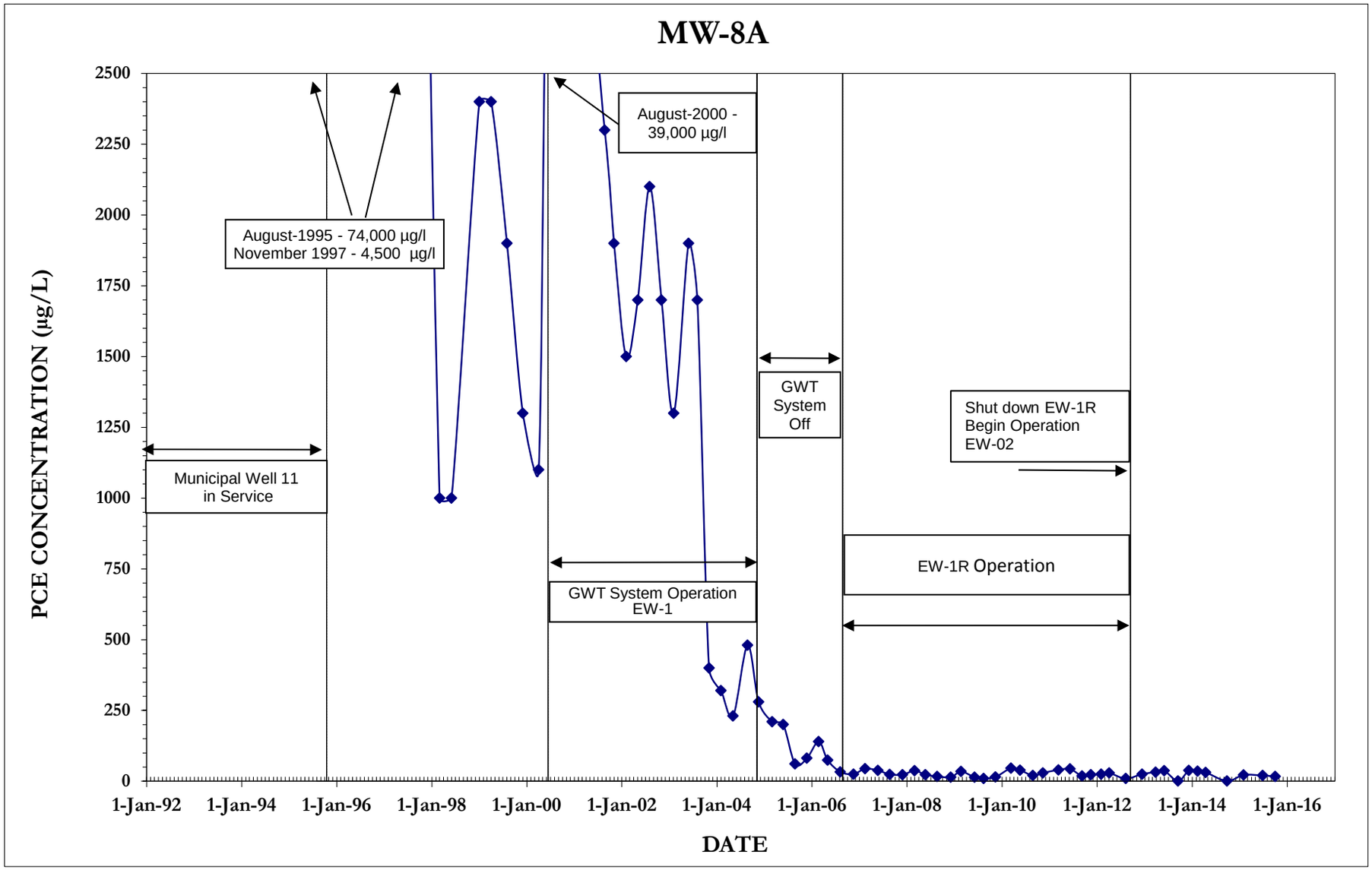


FIGURE G-4(k)

HISTORICAL PCE CONCENTRATIONS IN GROUDNWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

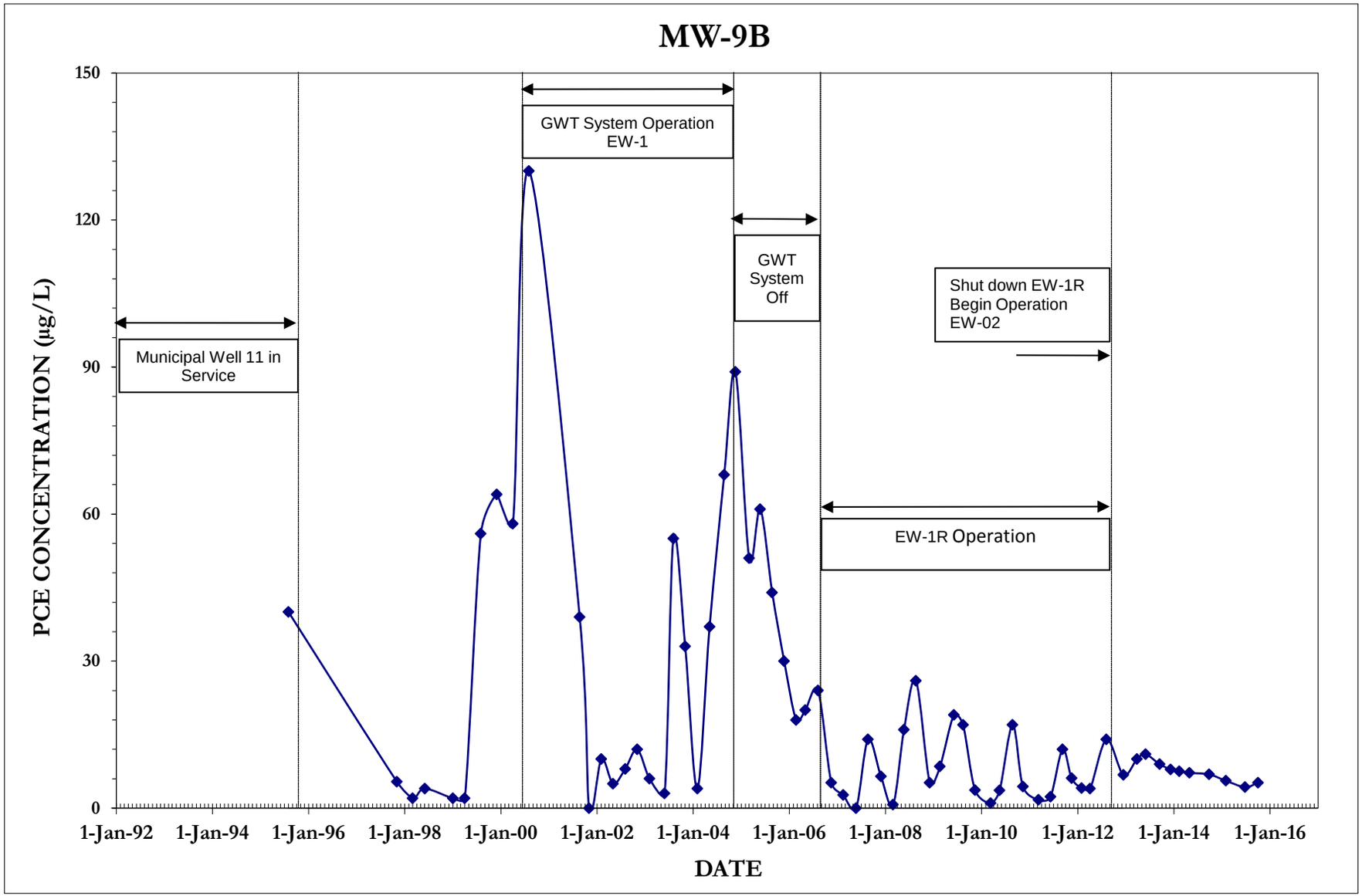


FIGURE G-4(I)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

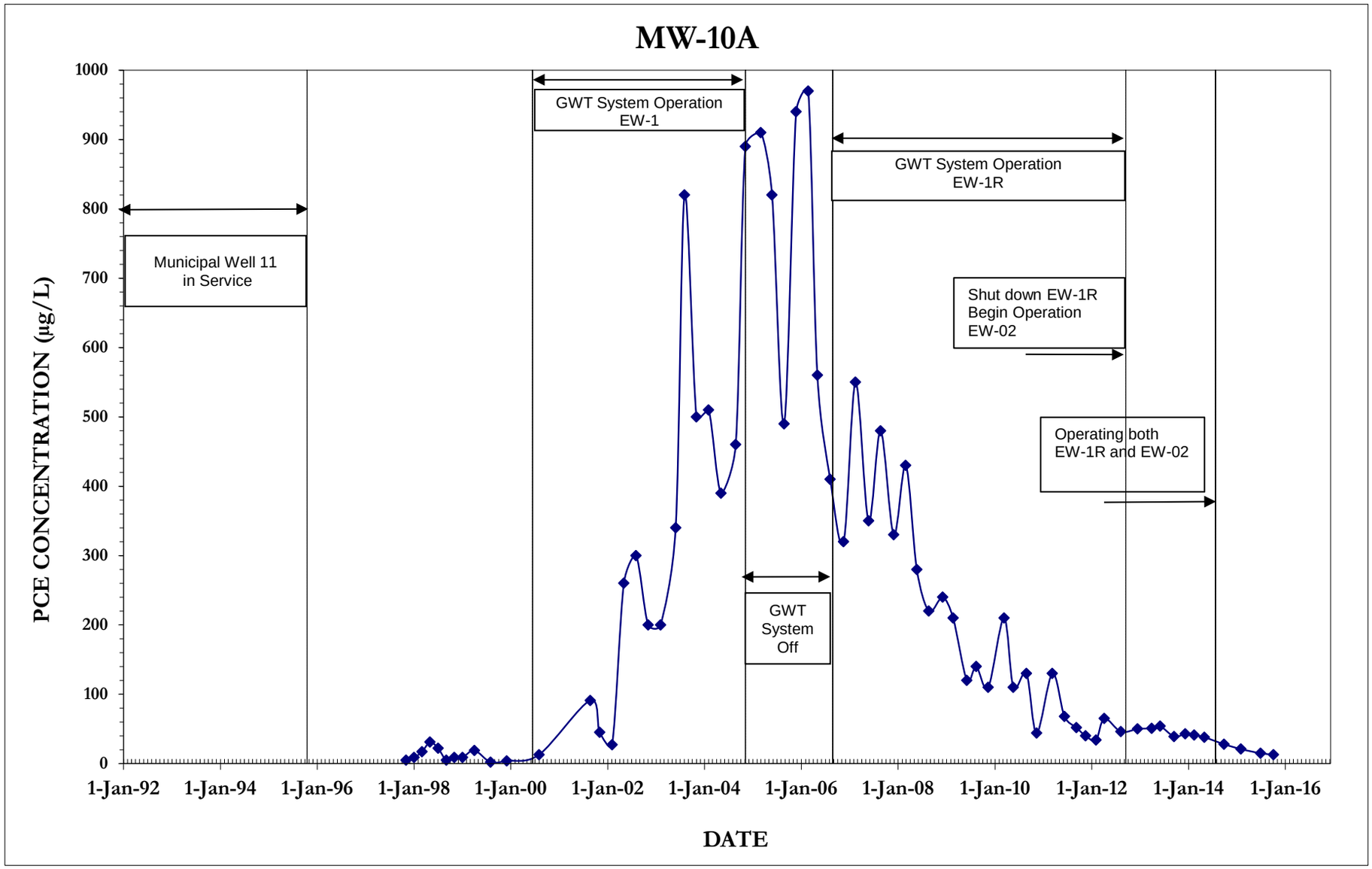


FIGURE G-4(m)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

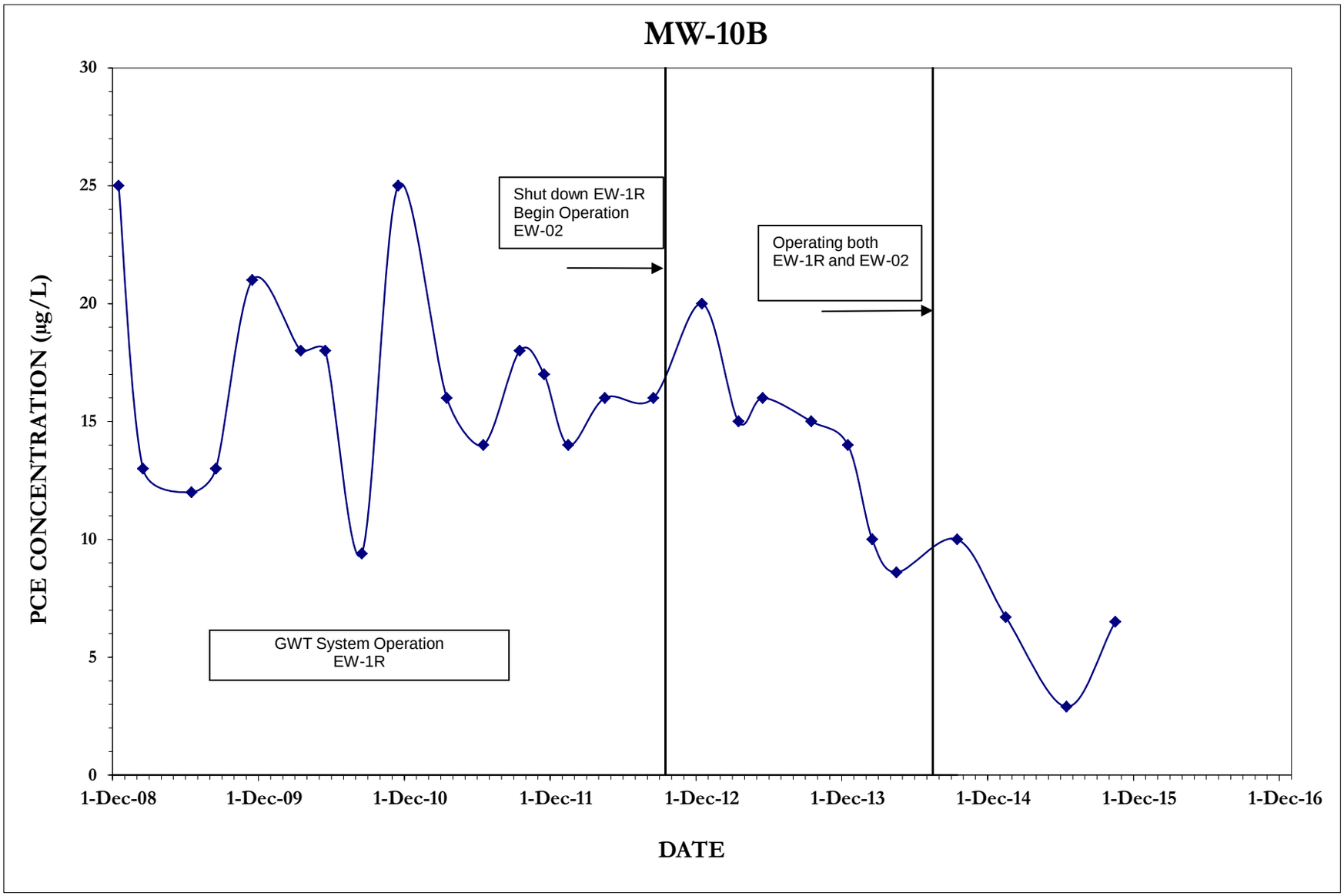


FIGURE G-4(n)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

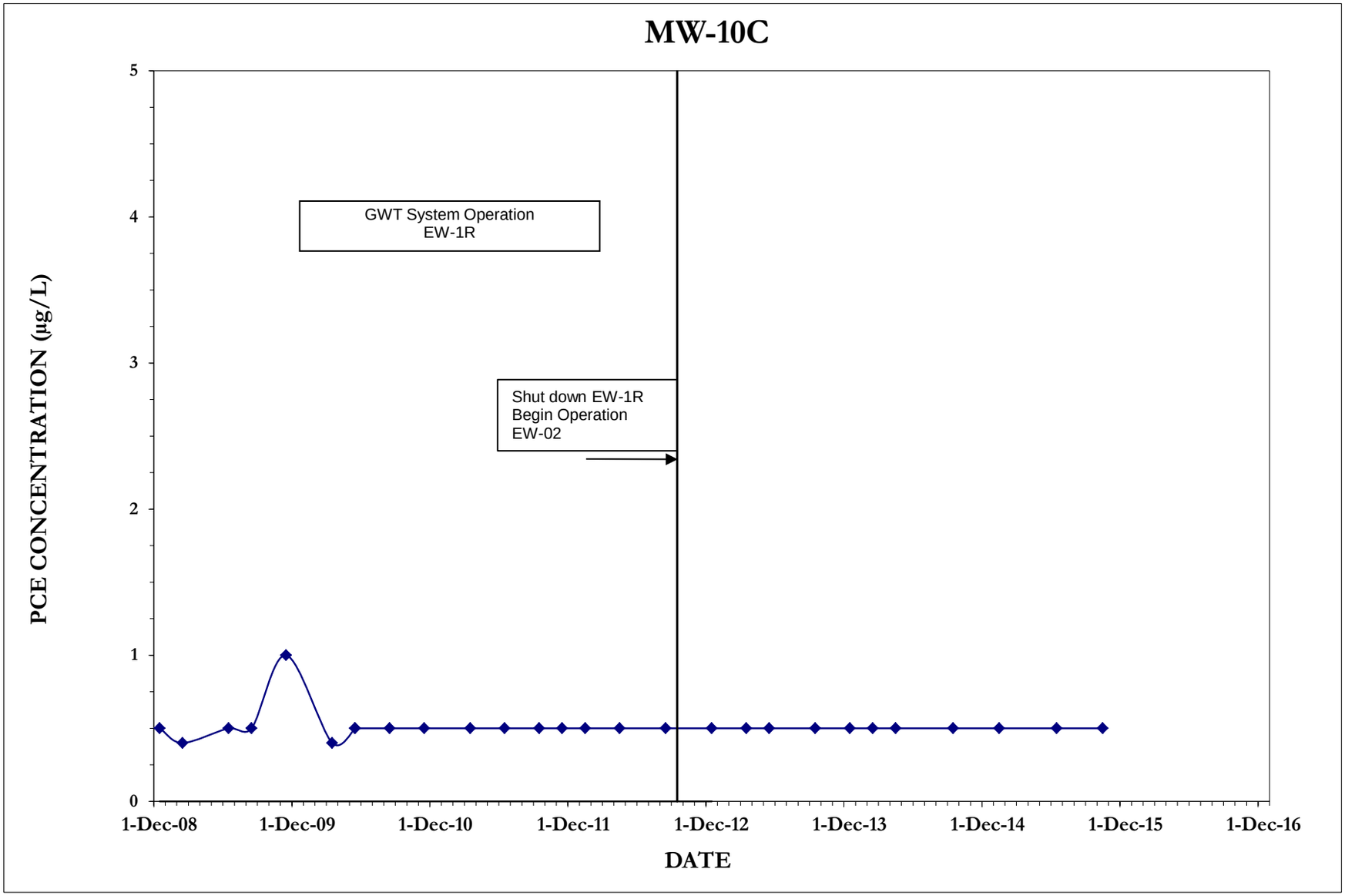


FIGURE G-4(o)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

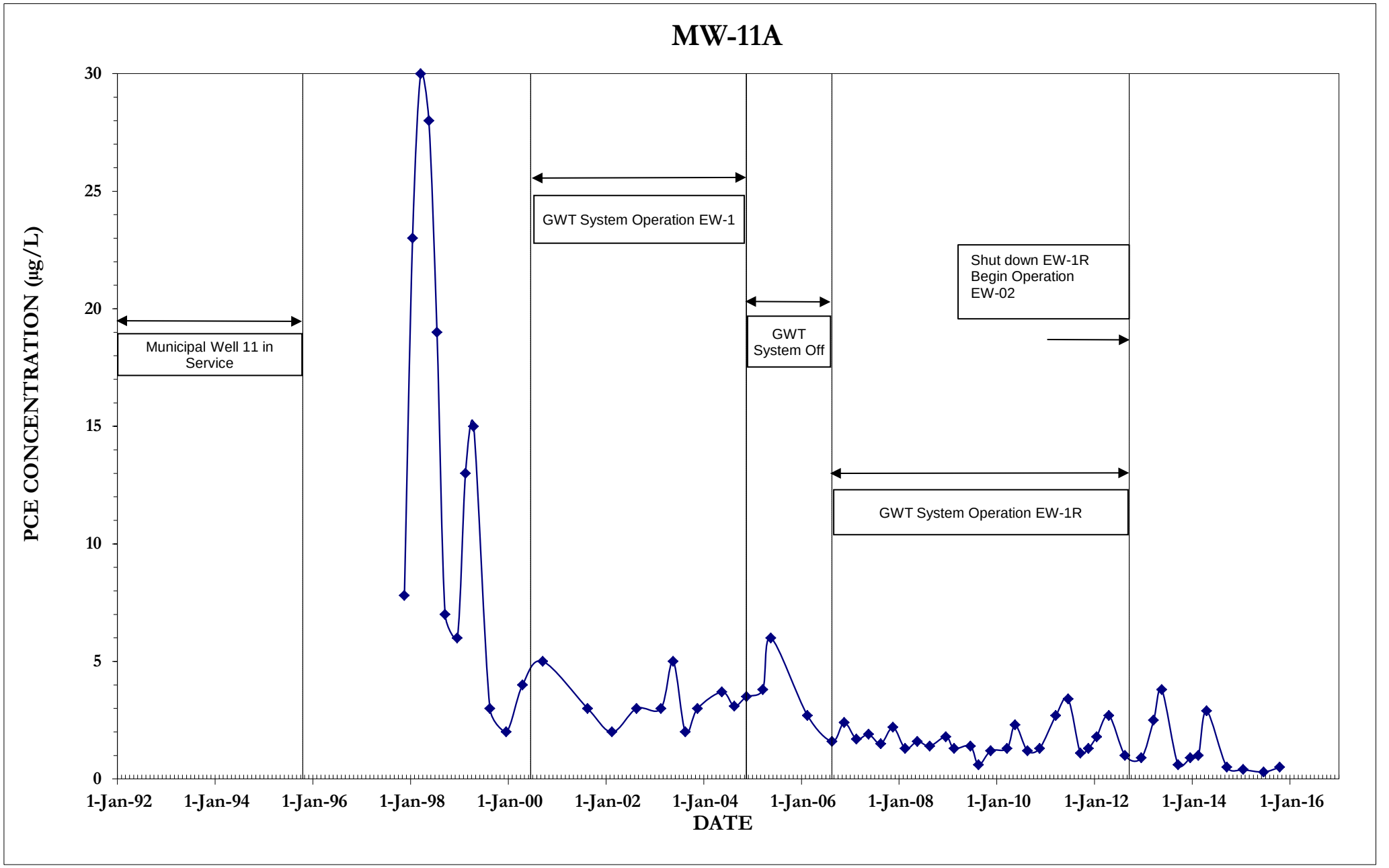


FIGURE G-4(p)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

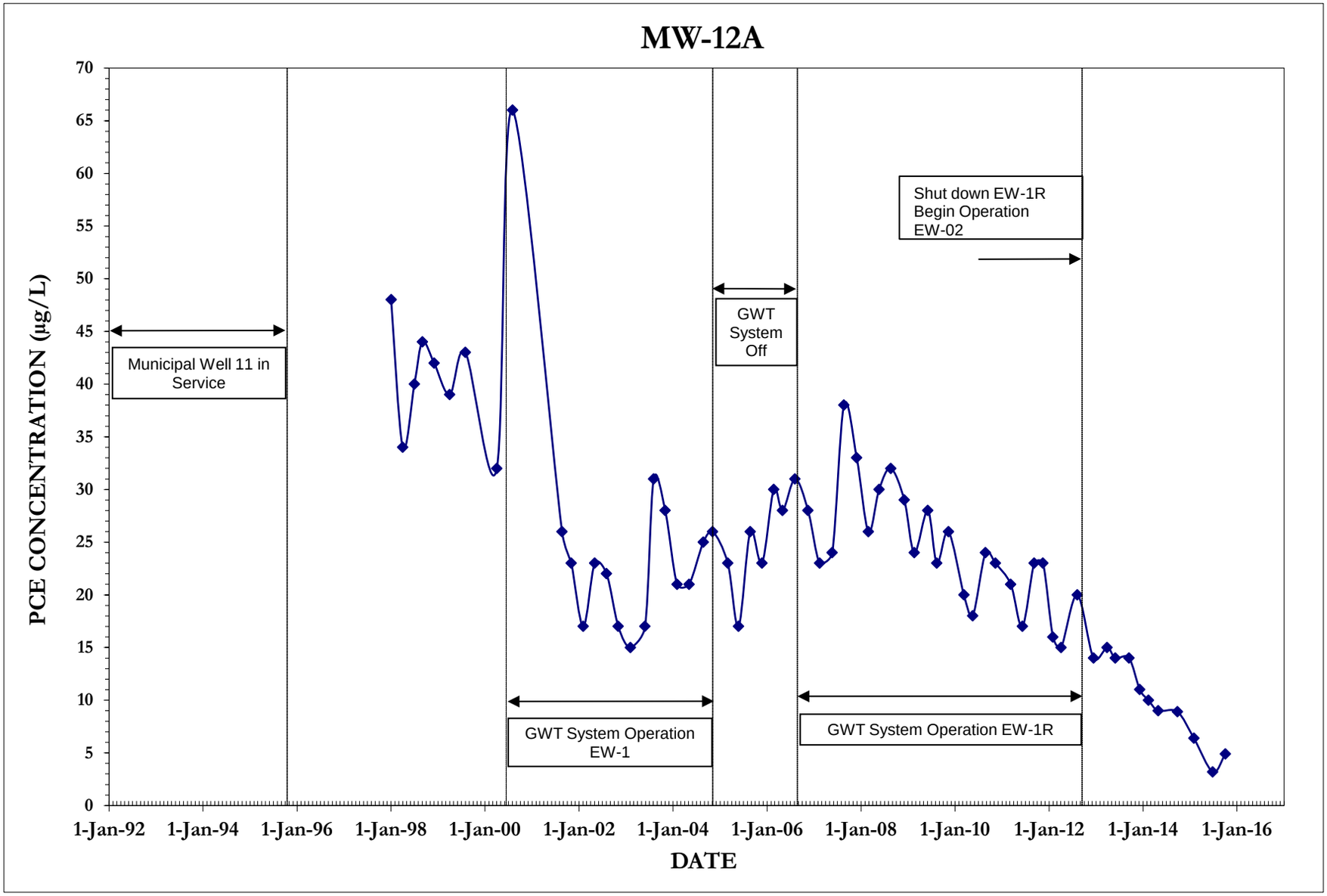


FIGURE G-4(q)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

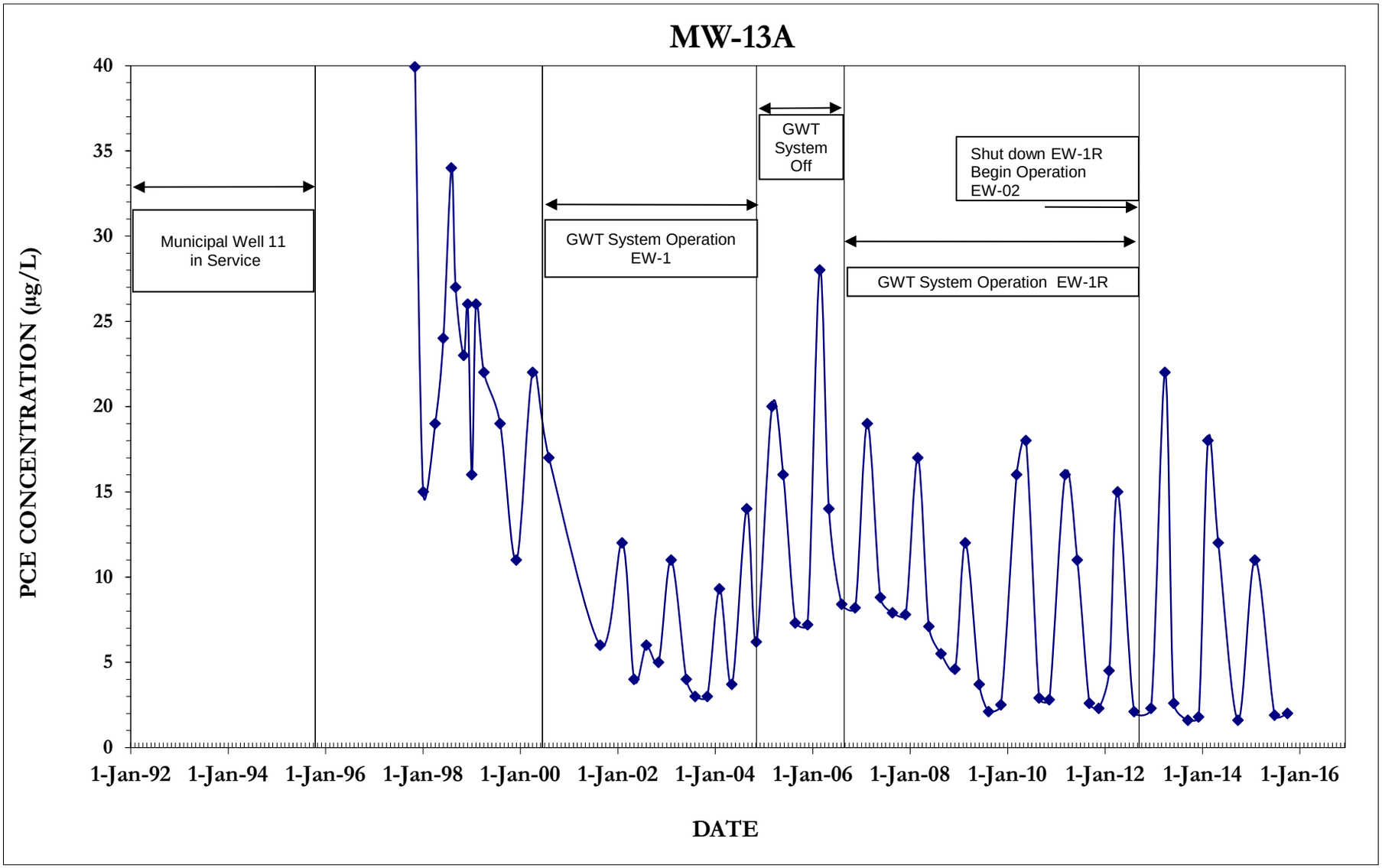


FIGURE G-4(r)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

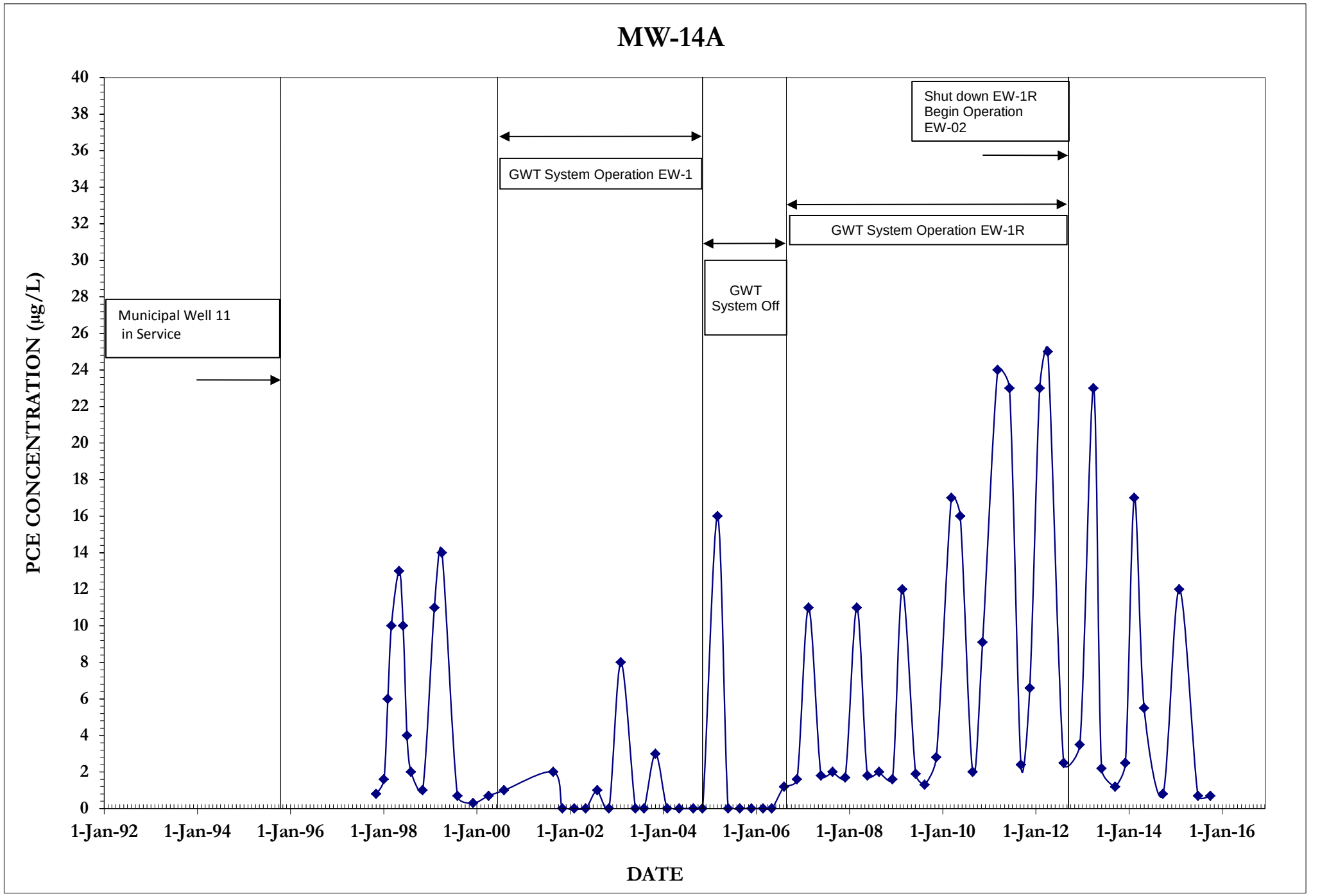


FIGURE G-4(s)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

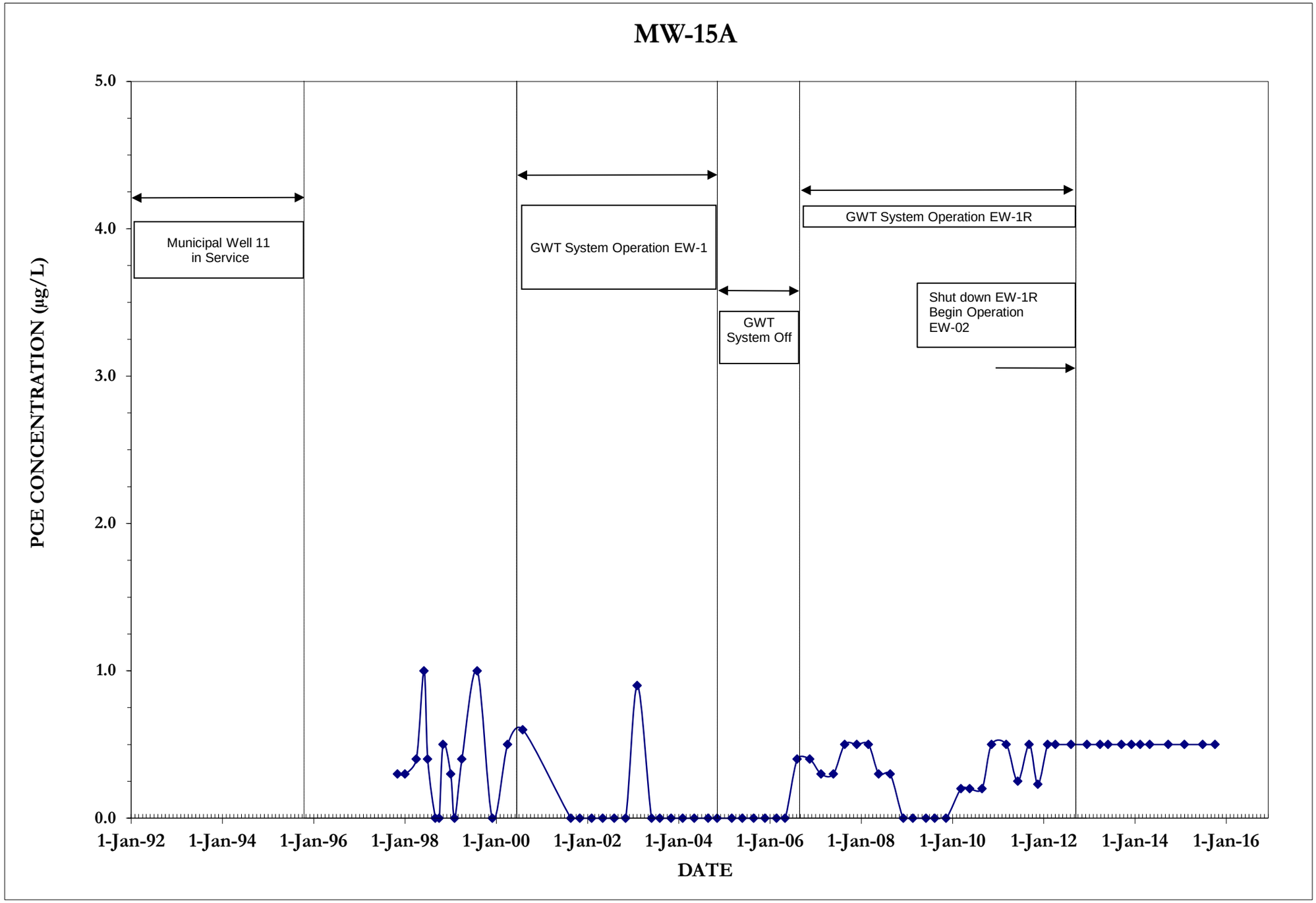


FIGURE G-4(t)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

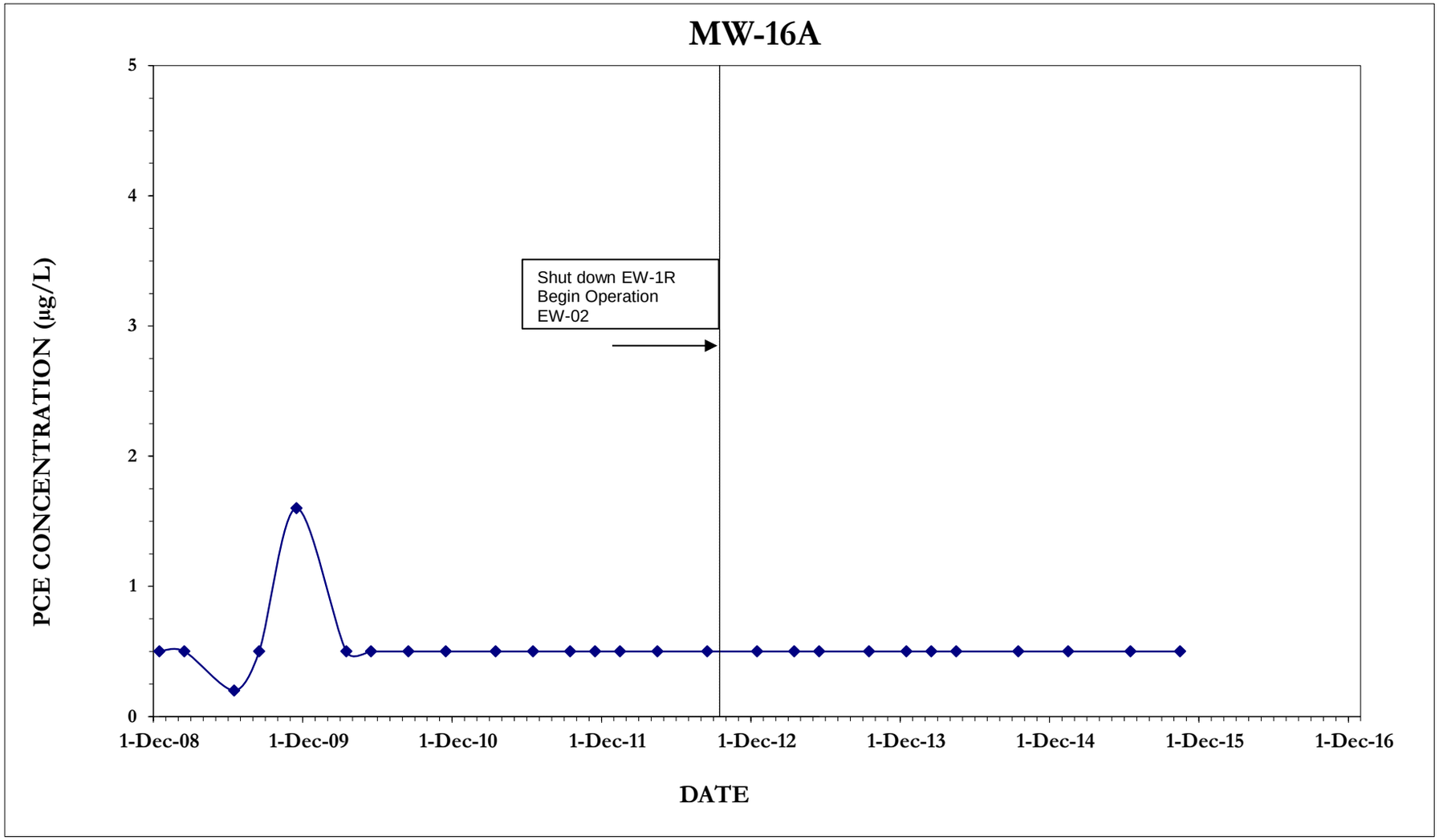


FIGURE G-4(u)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

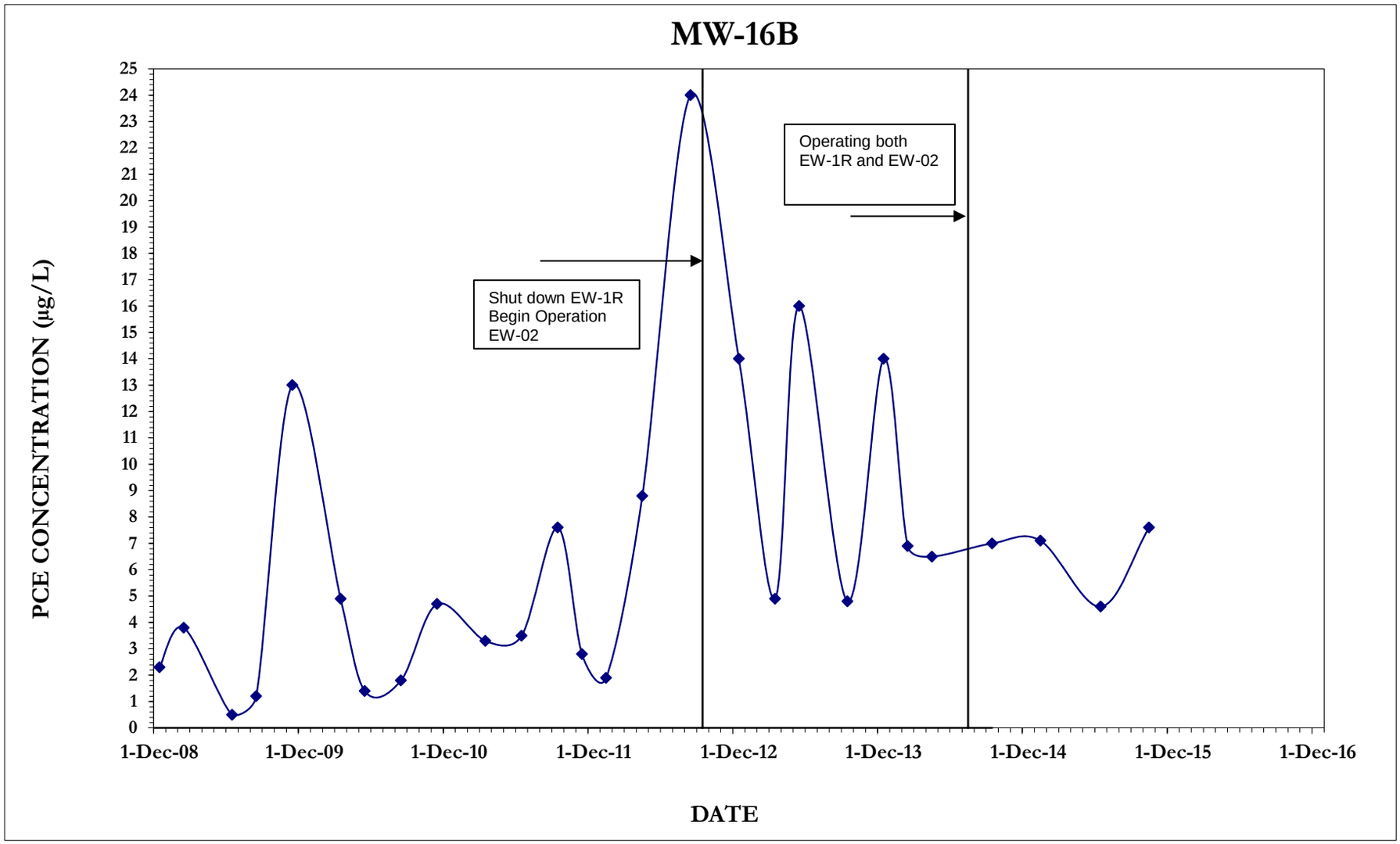


FIGURE G-4(v)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

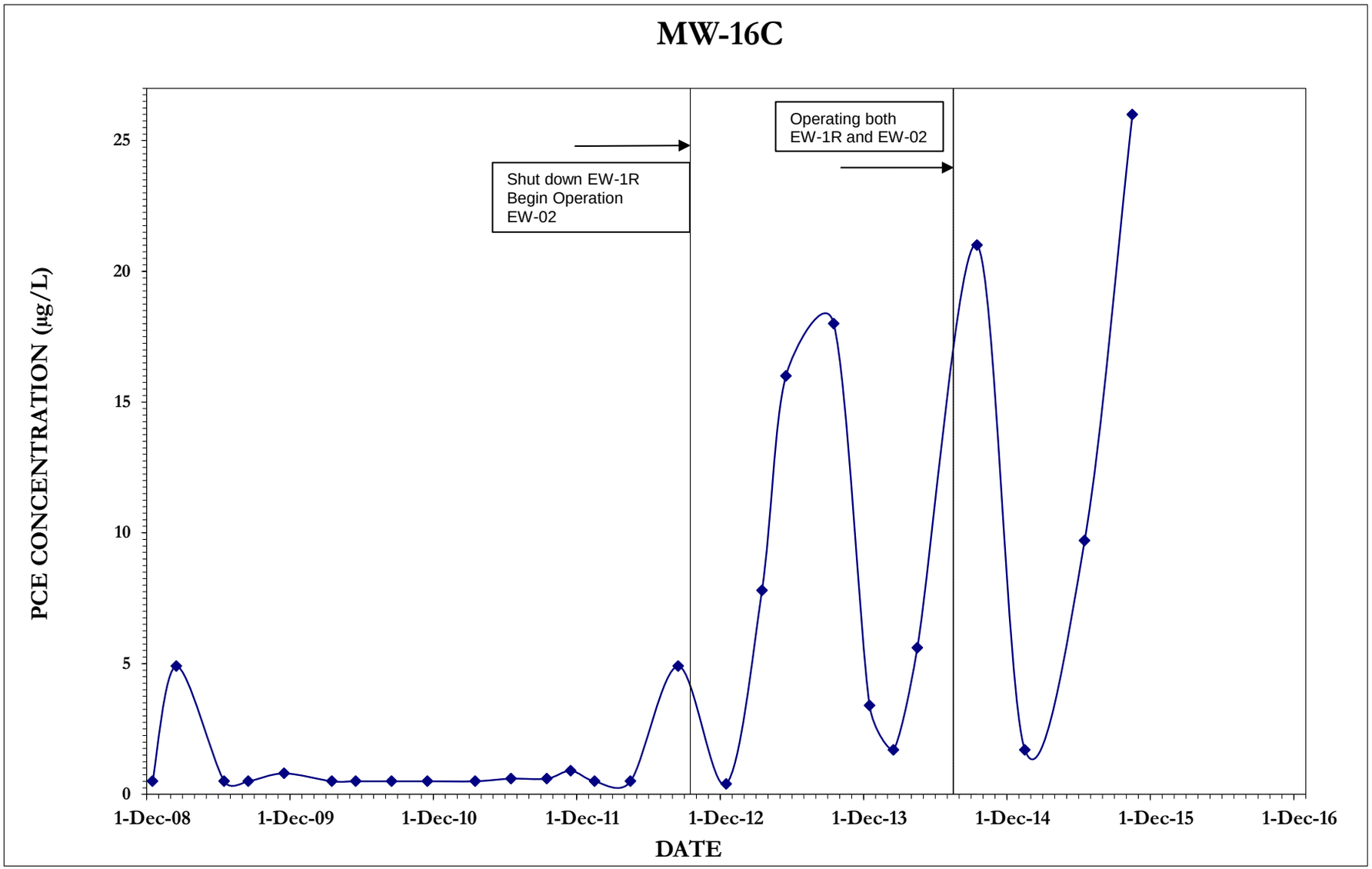


FIGURE G-4(w)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

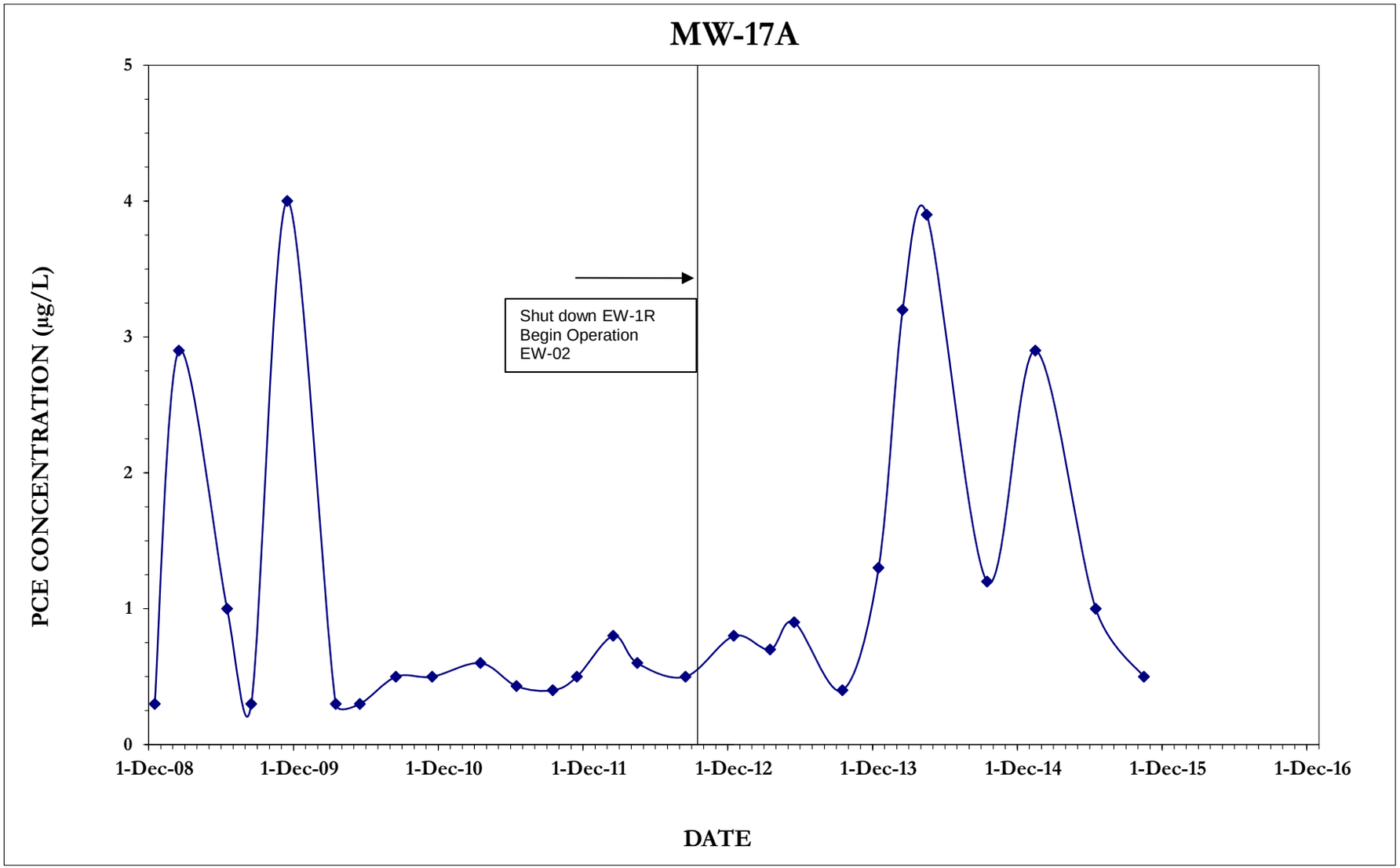


FIGURE G-4(x)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

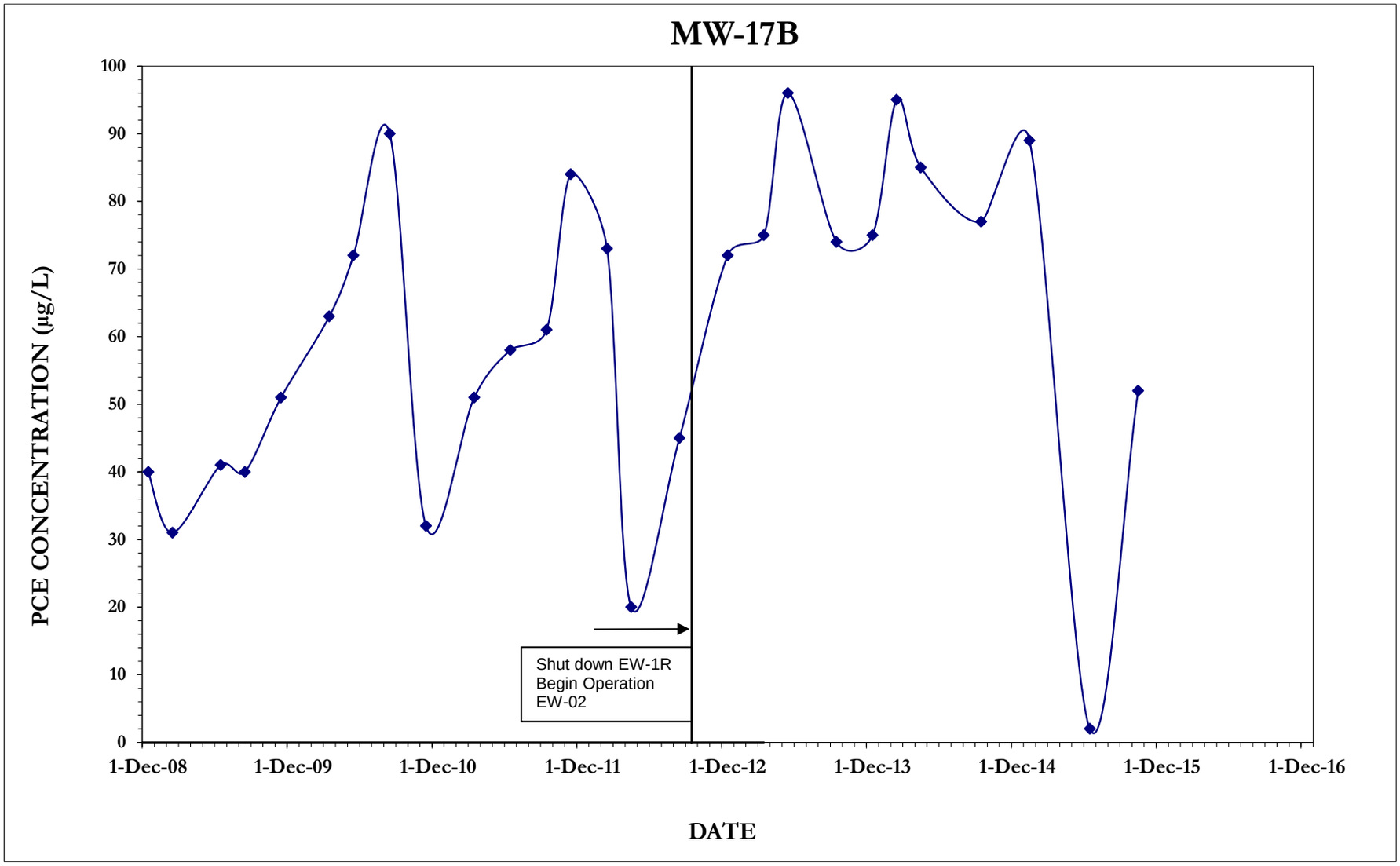


FIGURE G-4(y)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

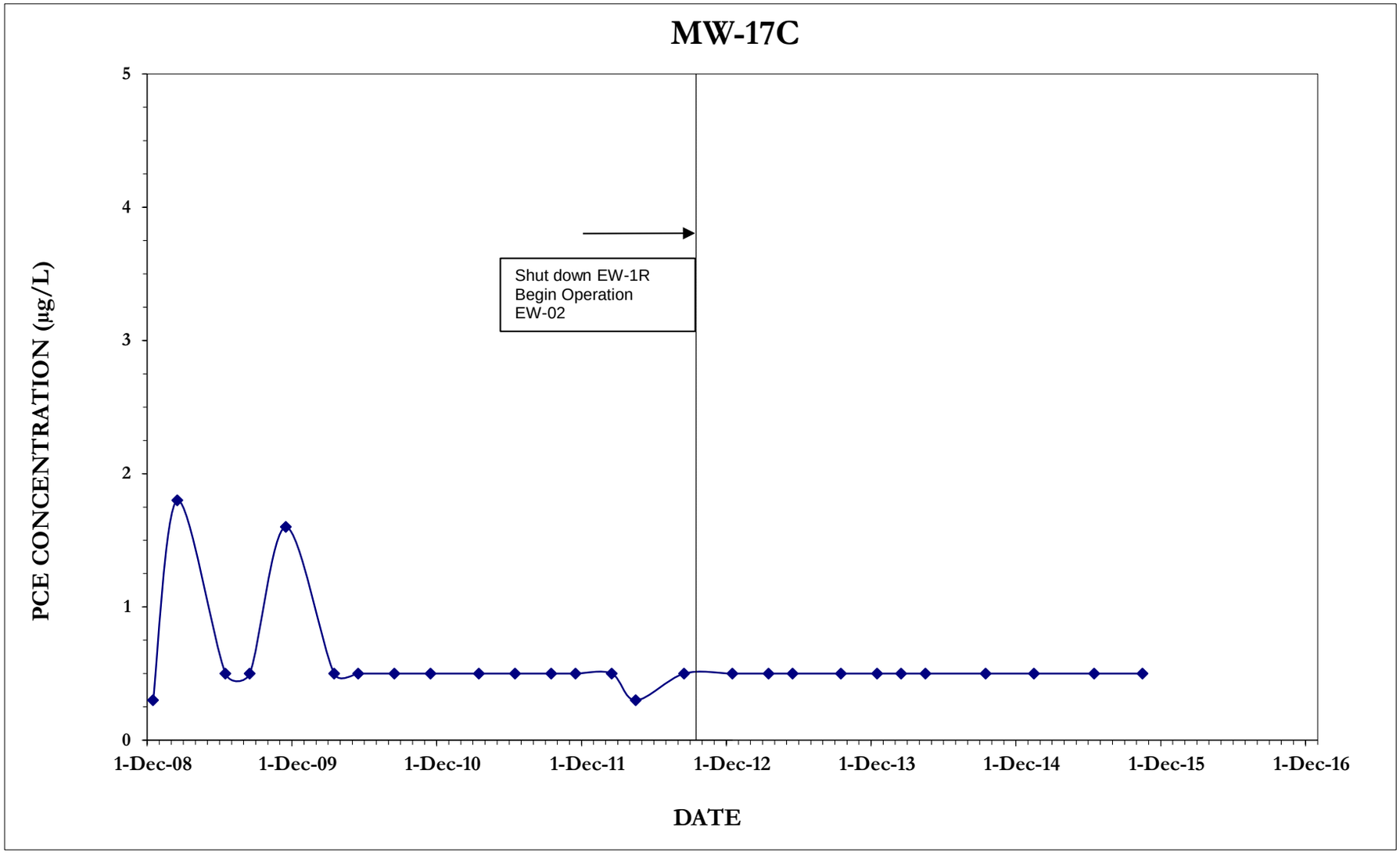


FIGURE G-4(z)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

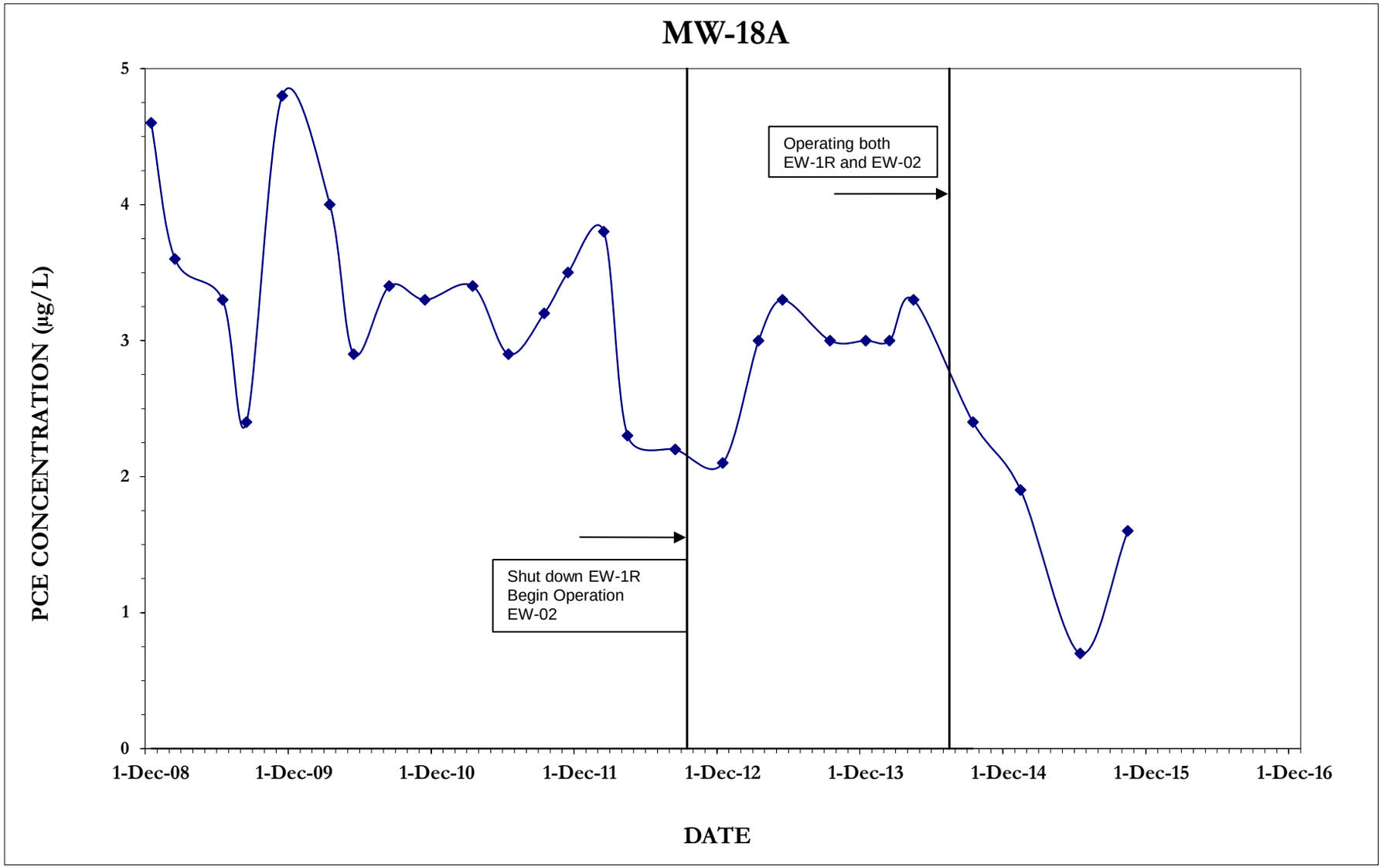


FIGURE G-4(aa)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

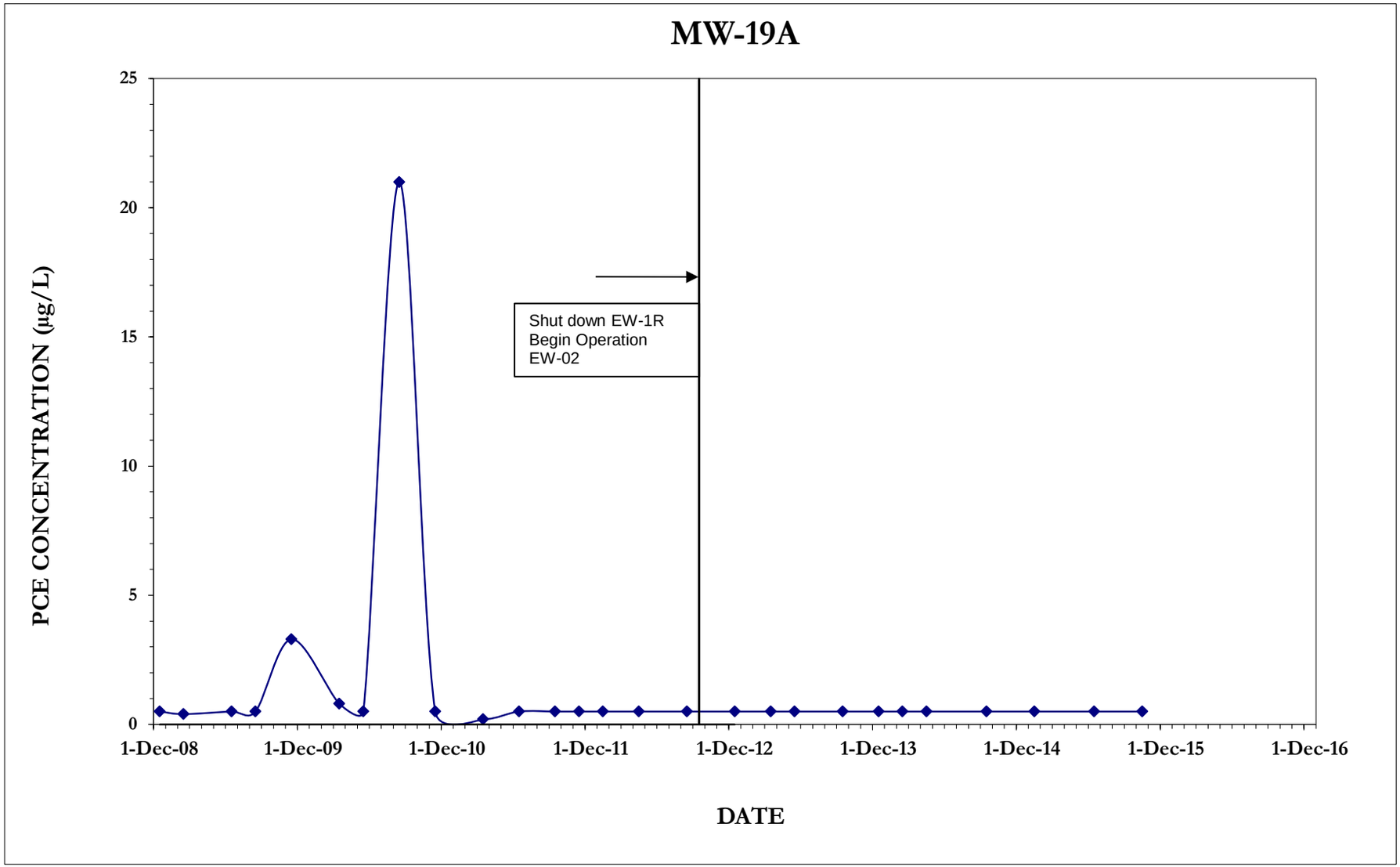


FIGURE G-4(ab)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

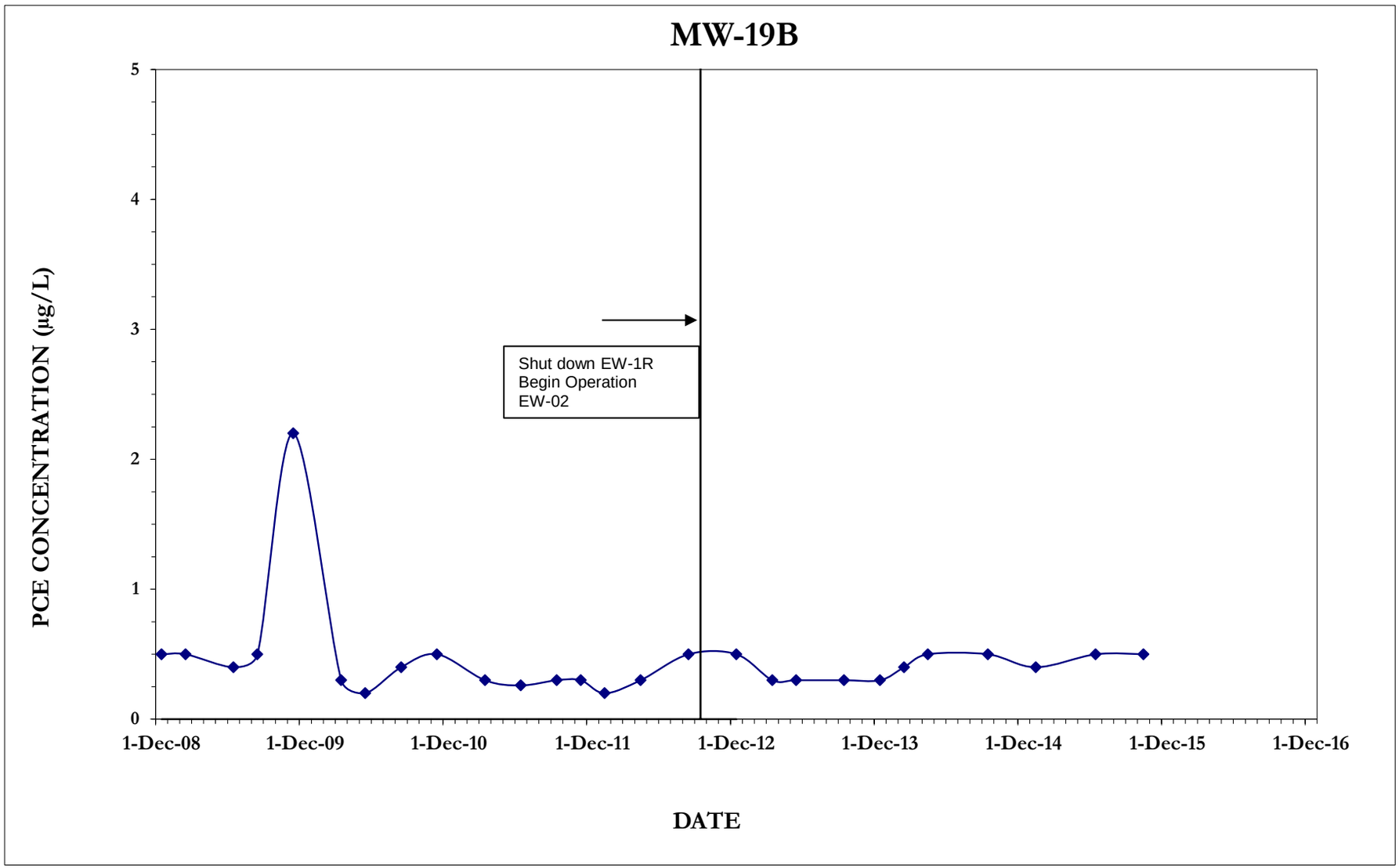


FIGURE G-4(ac)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

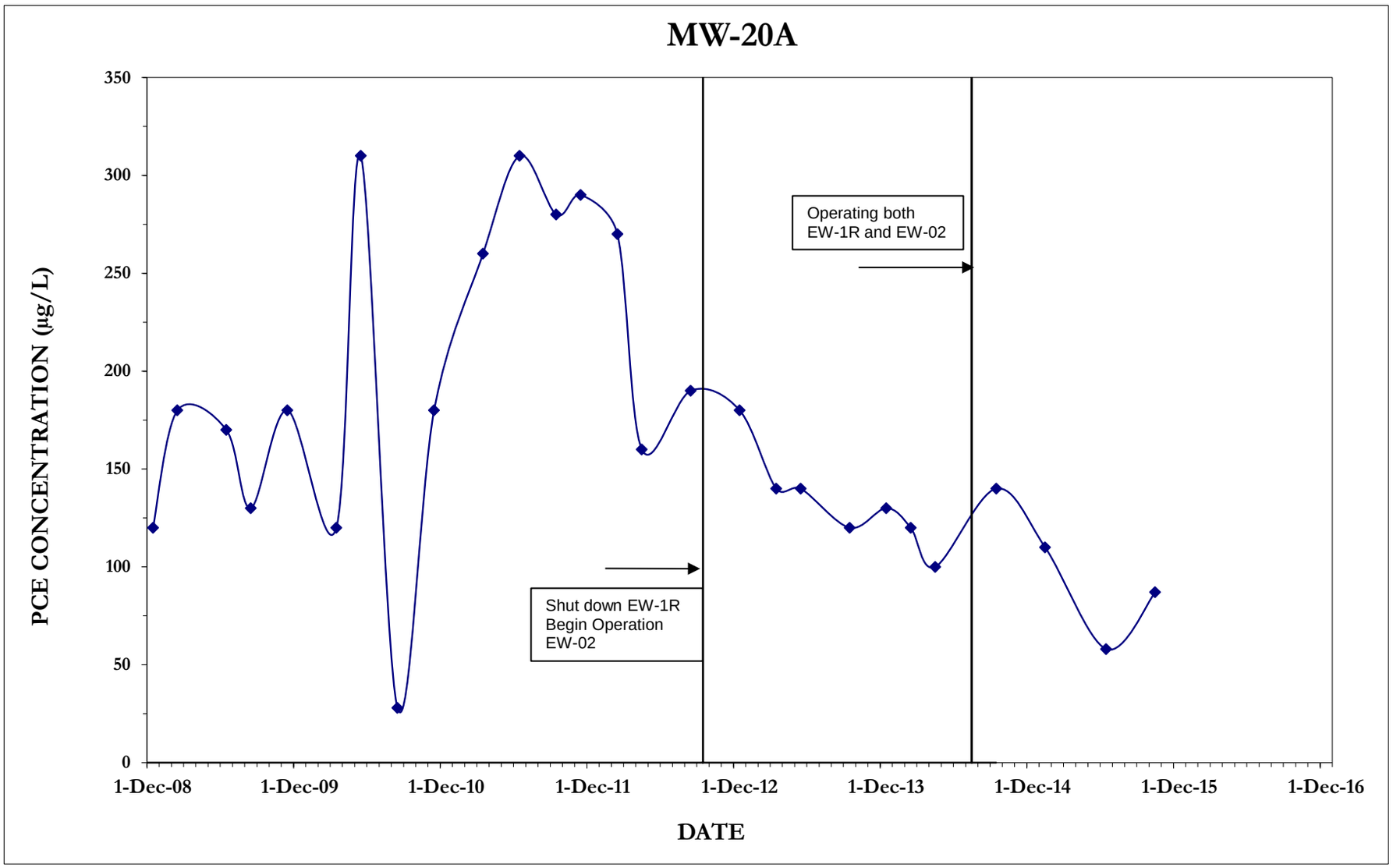


FIGURE G-4(ad)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

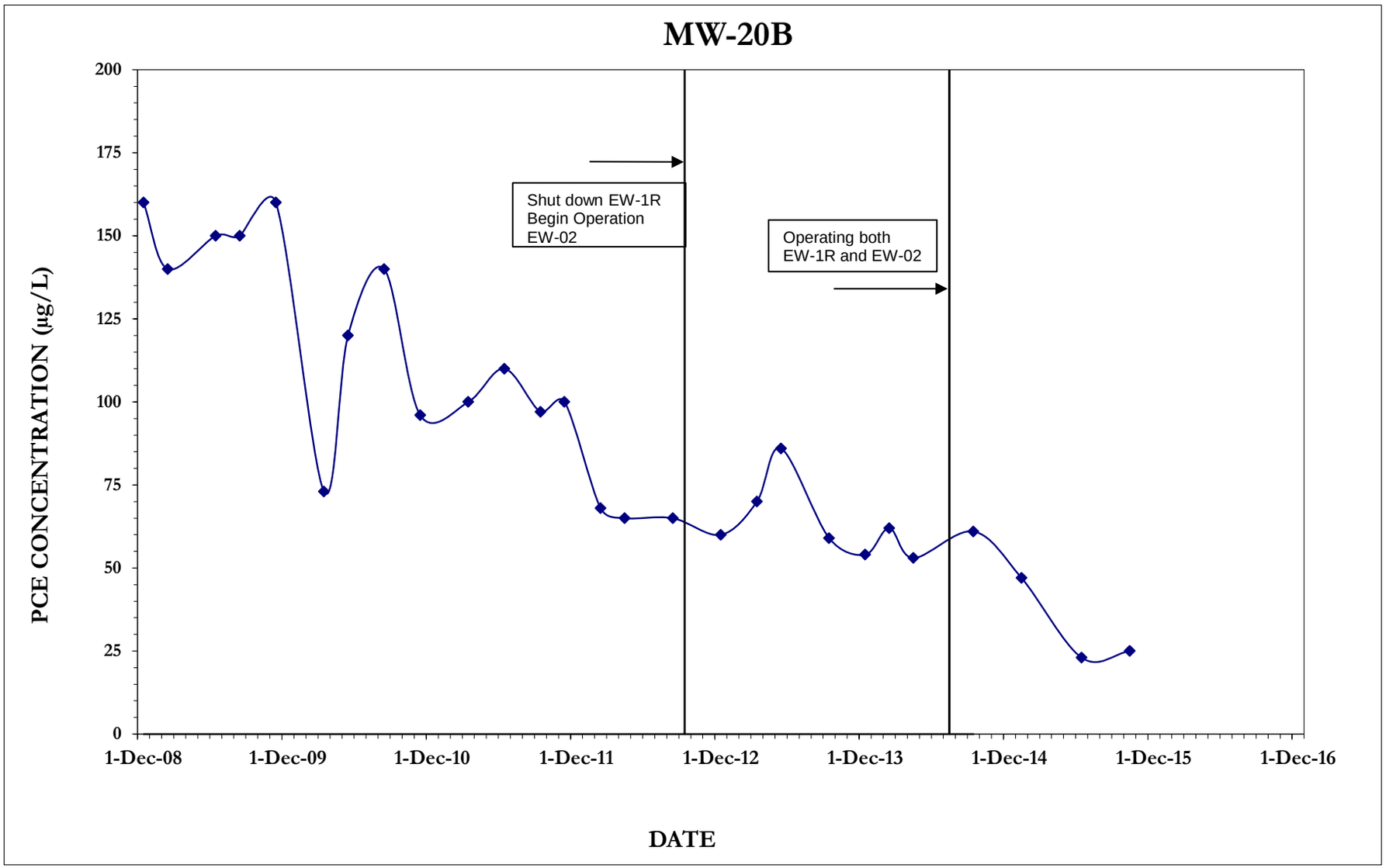


FIGURE G-4(ae)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

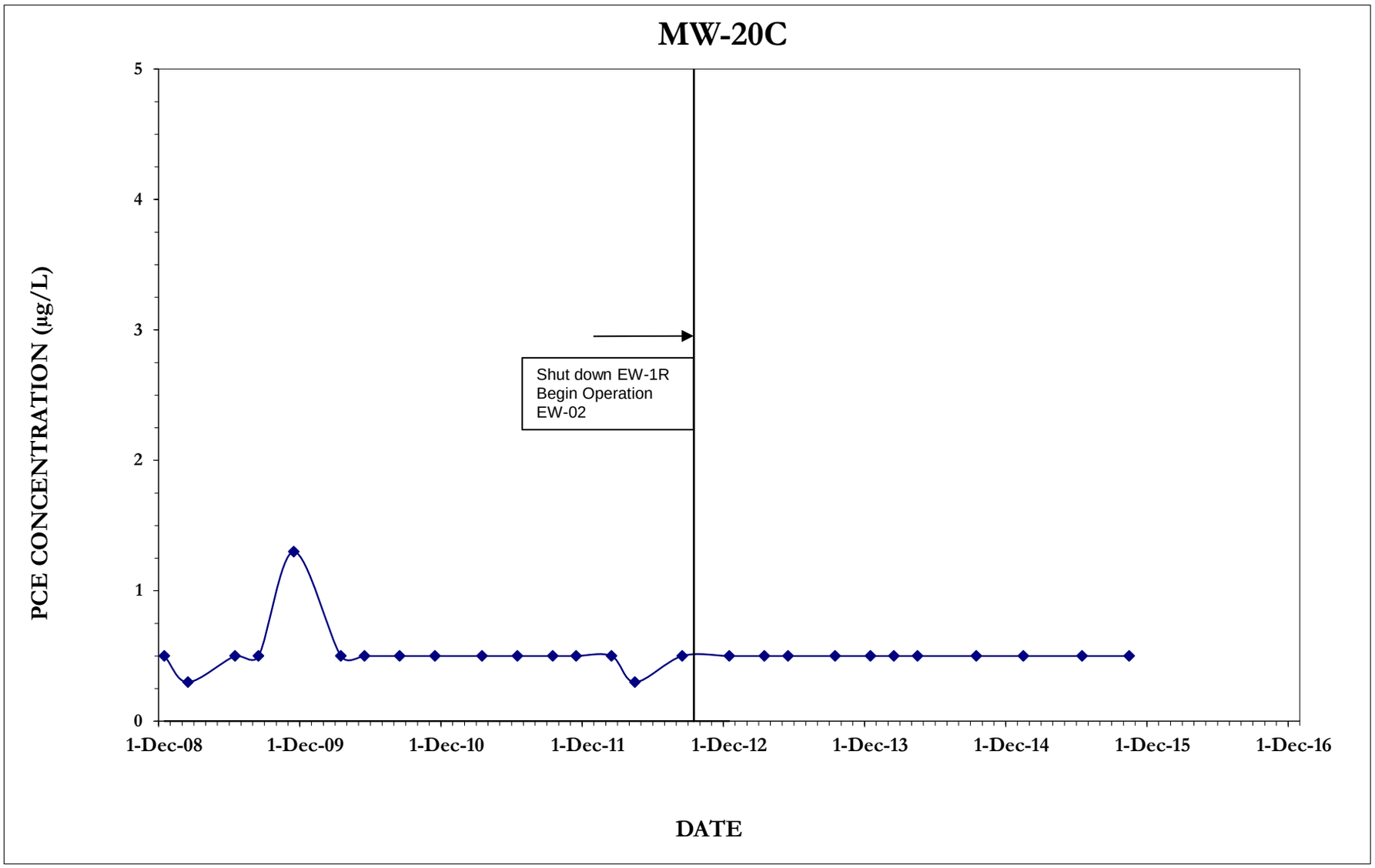


FIGURE G-4(af)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

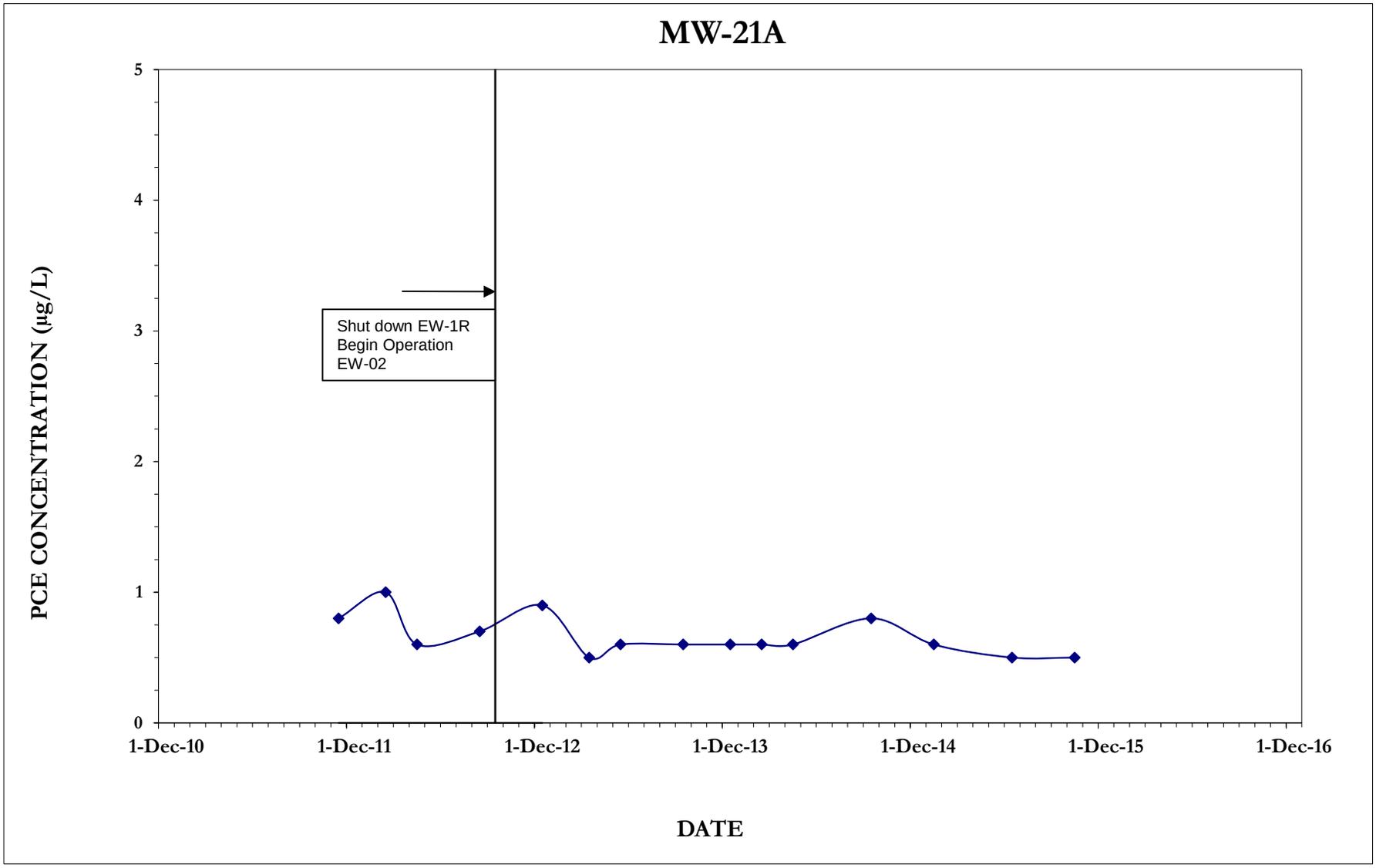


FIGURE G-4(ag)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

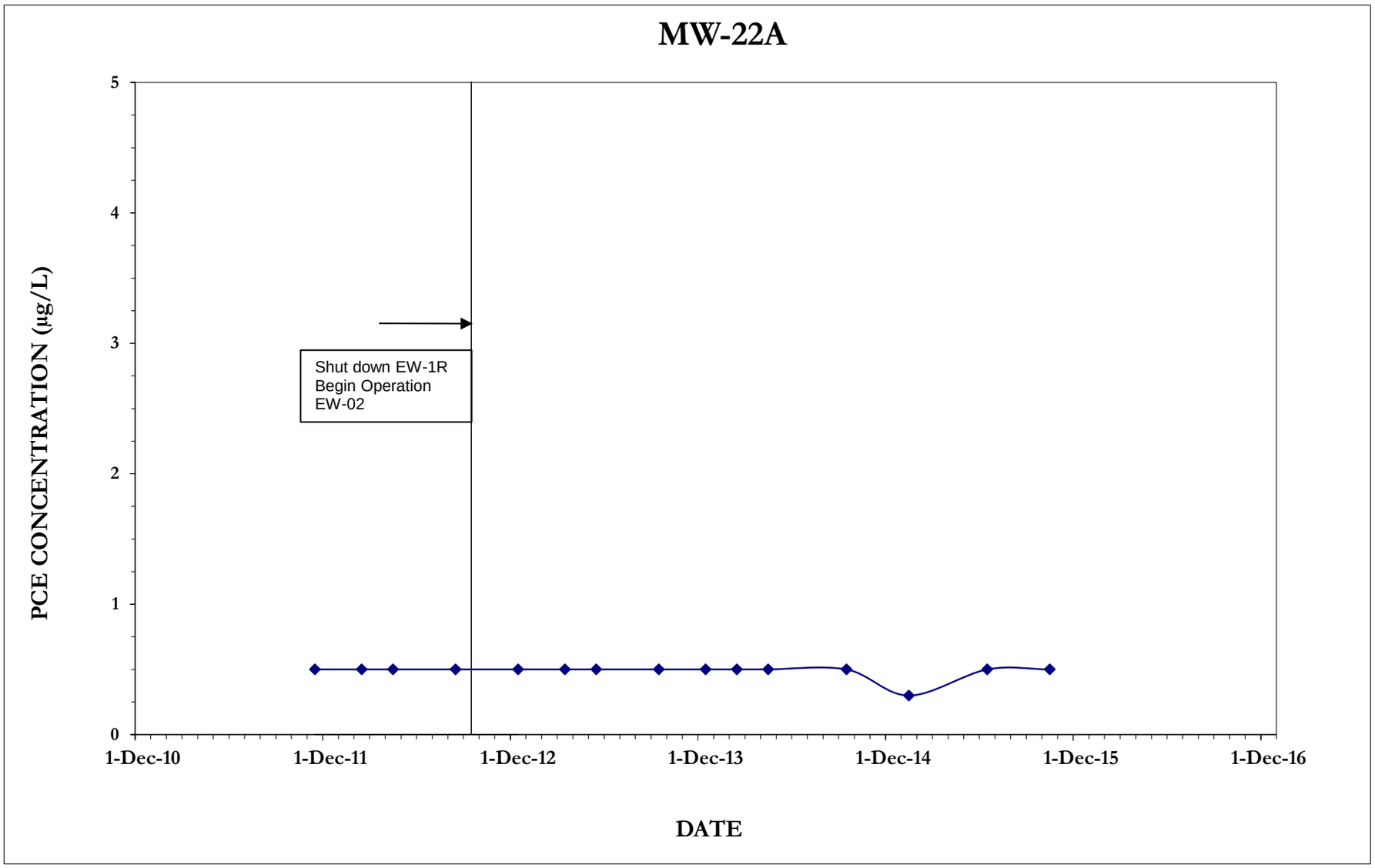


FIGURE G-4(ah)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

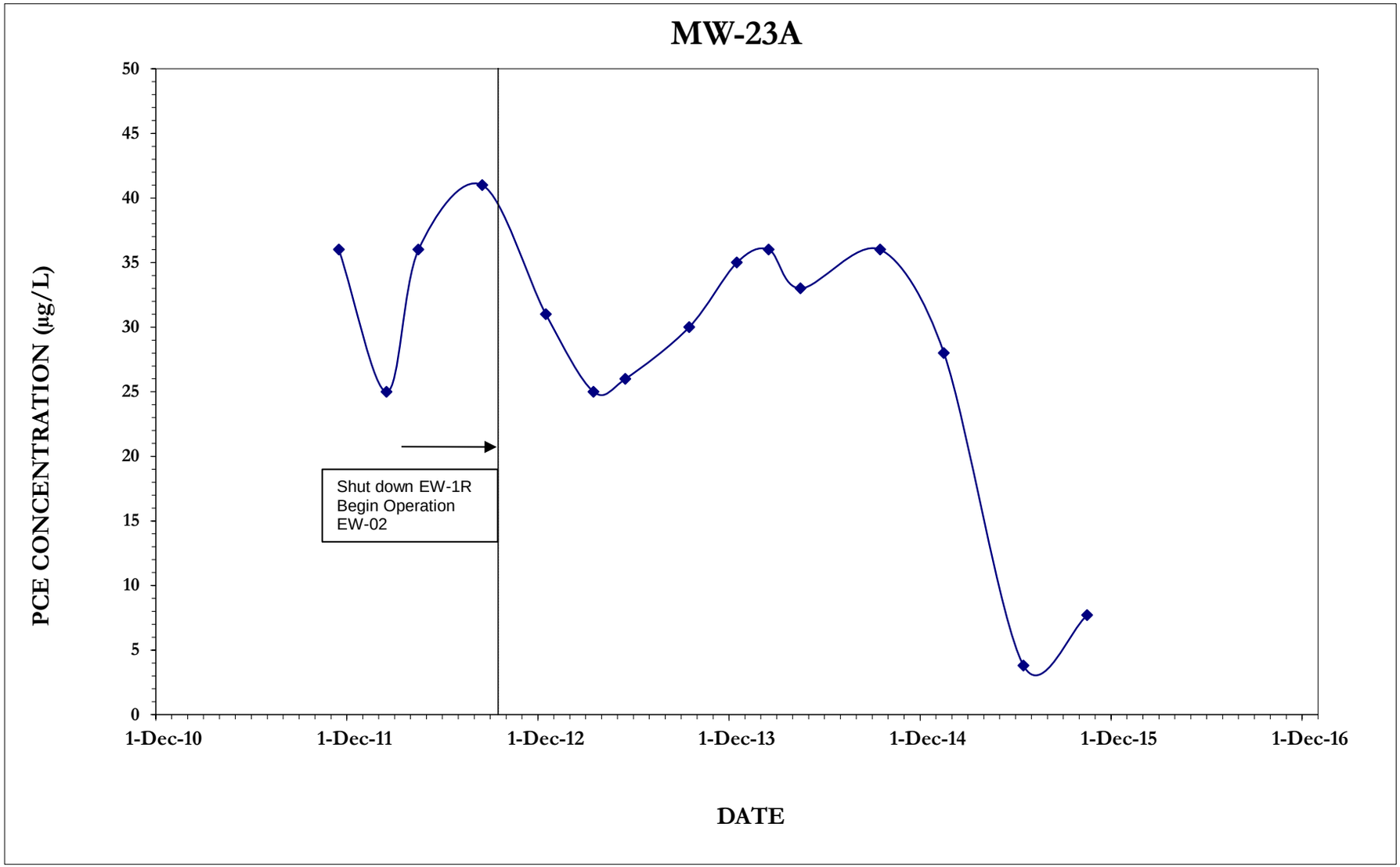


FIGURE G-4(ai)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

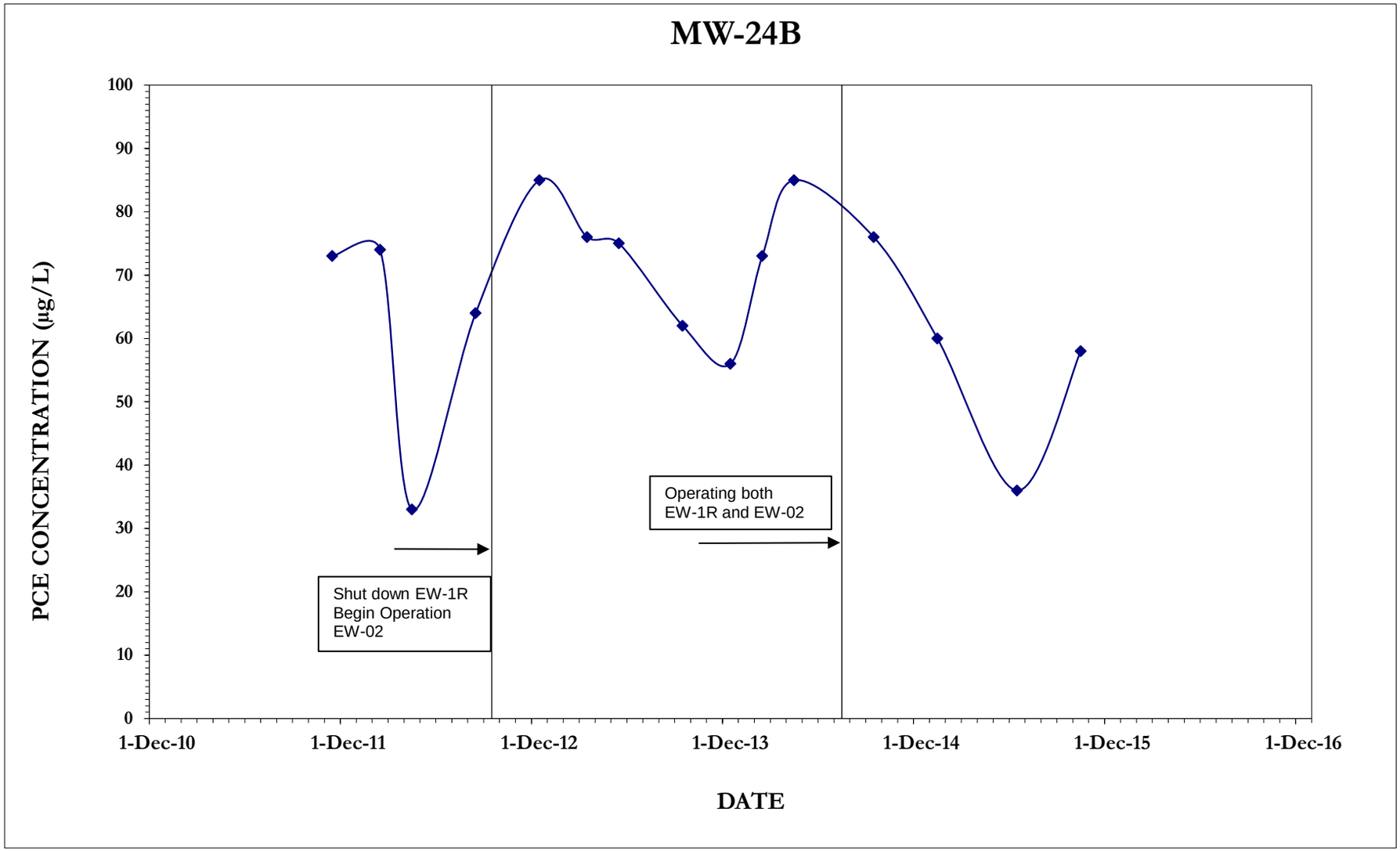


FIGURE G-4(aj)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

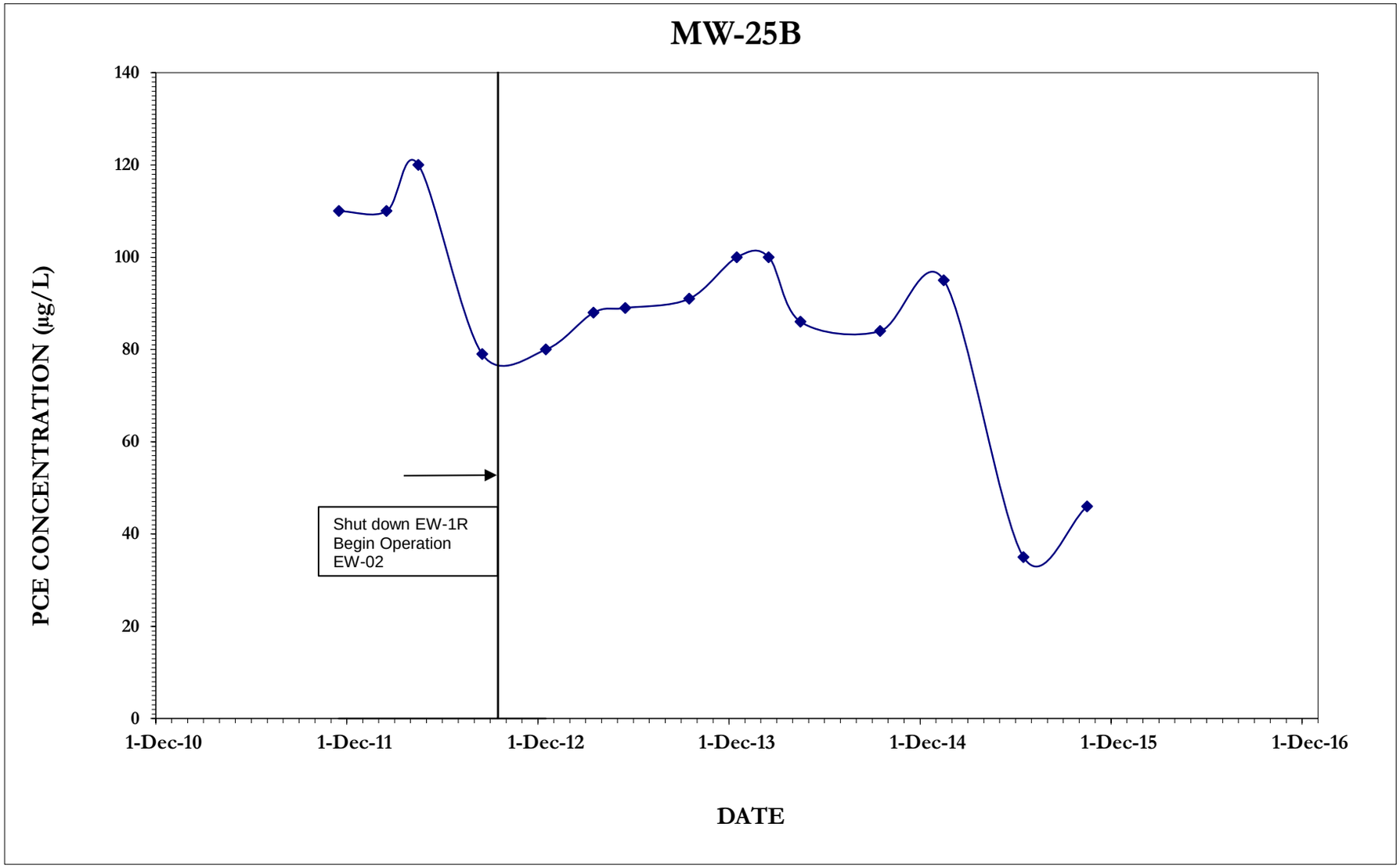


FIGURE G-4(ak)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

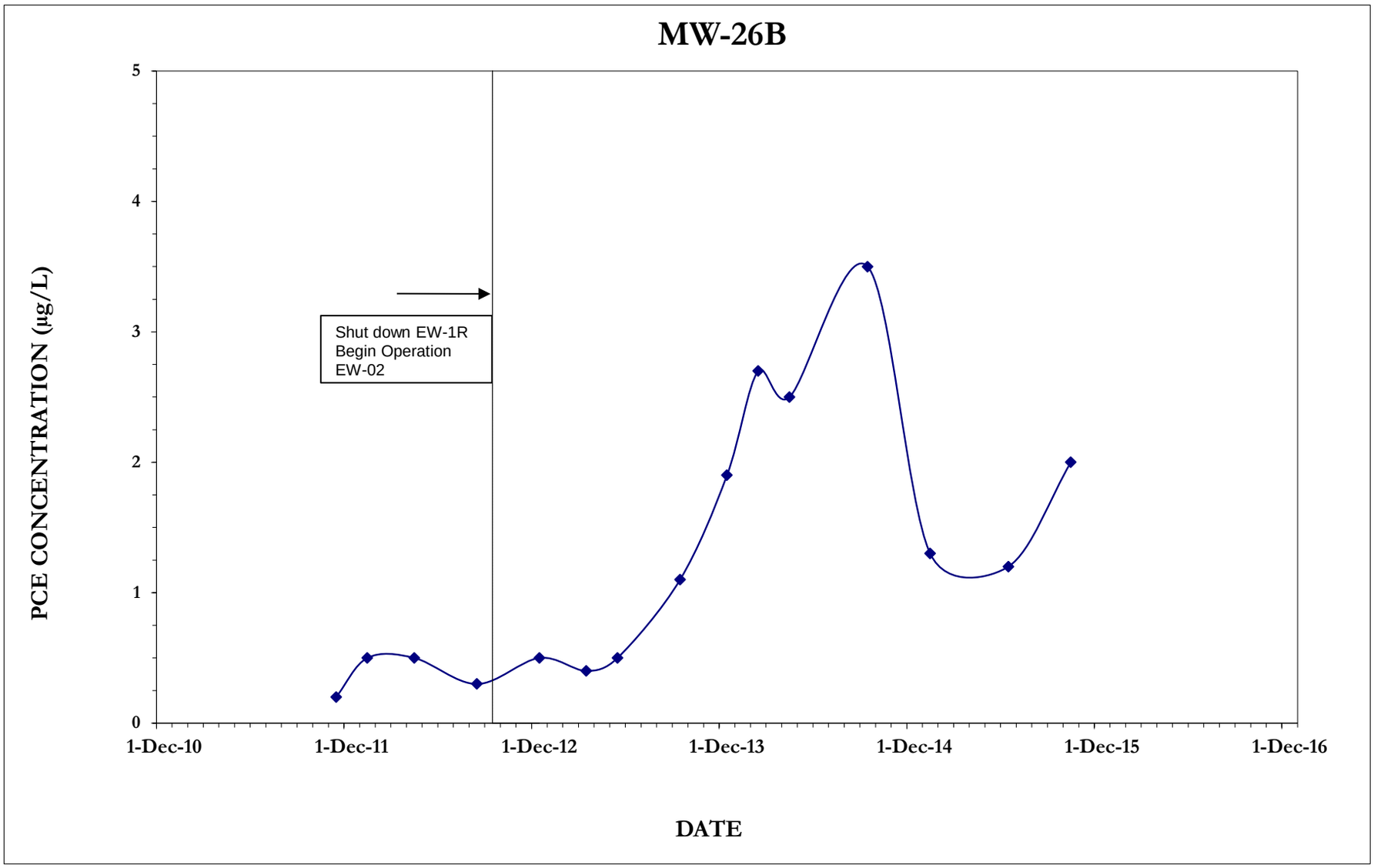


FIGURE G-4(al)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

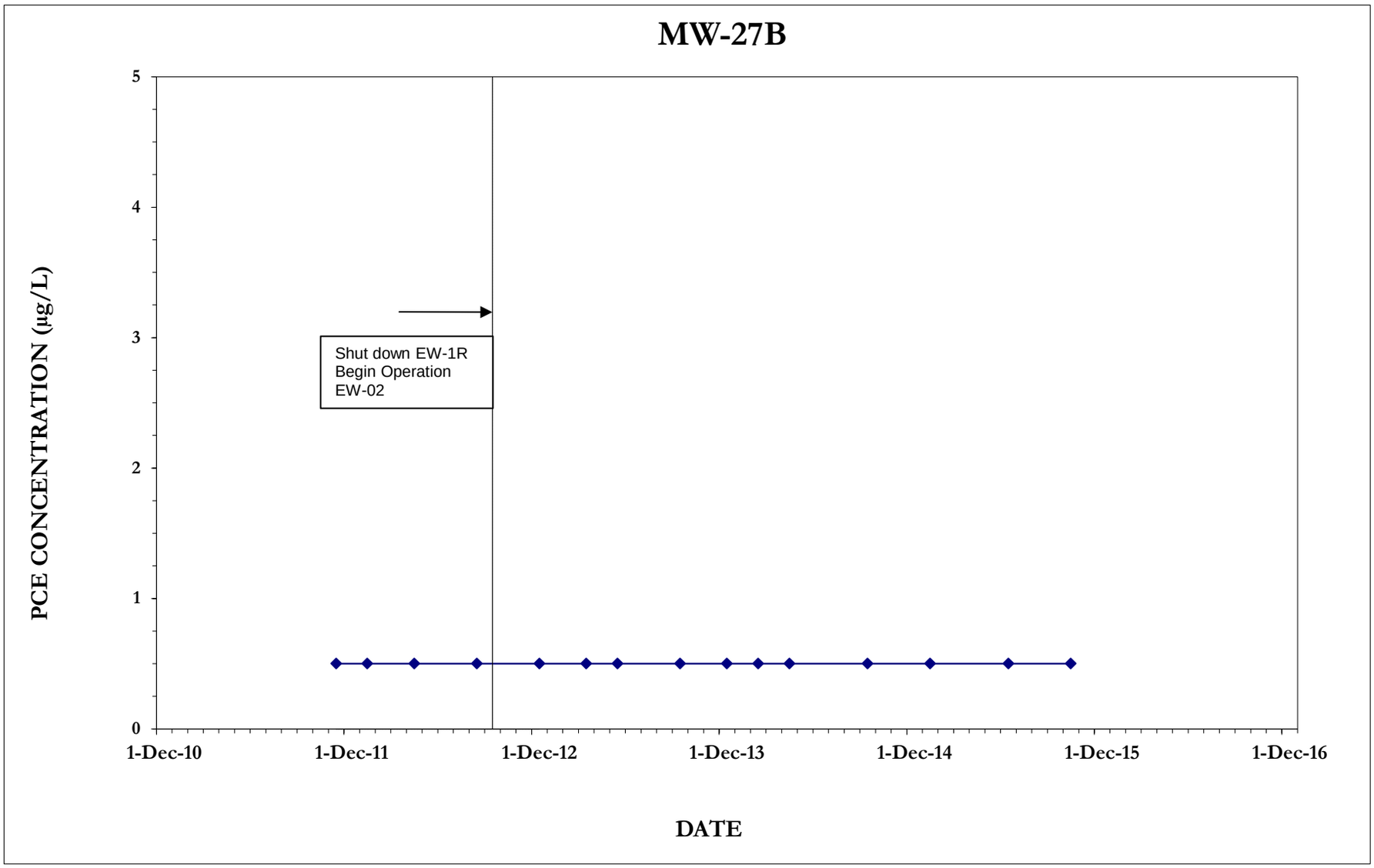


FIGURE G-4(am)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

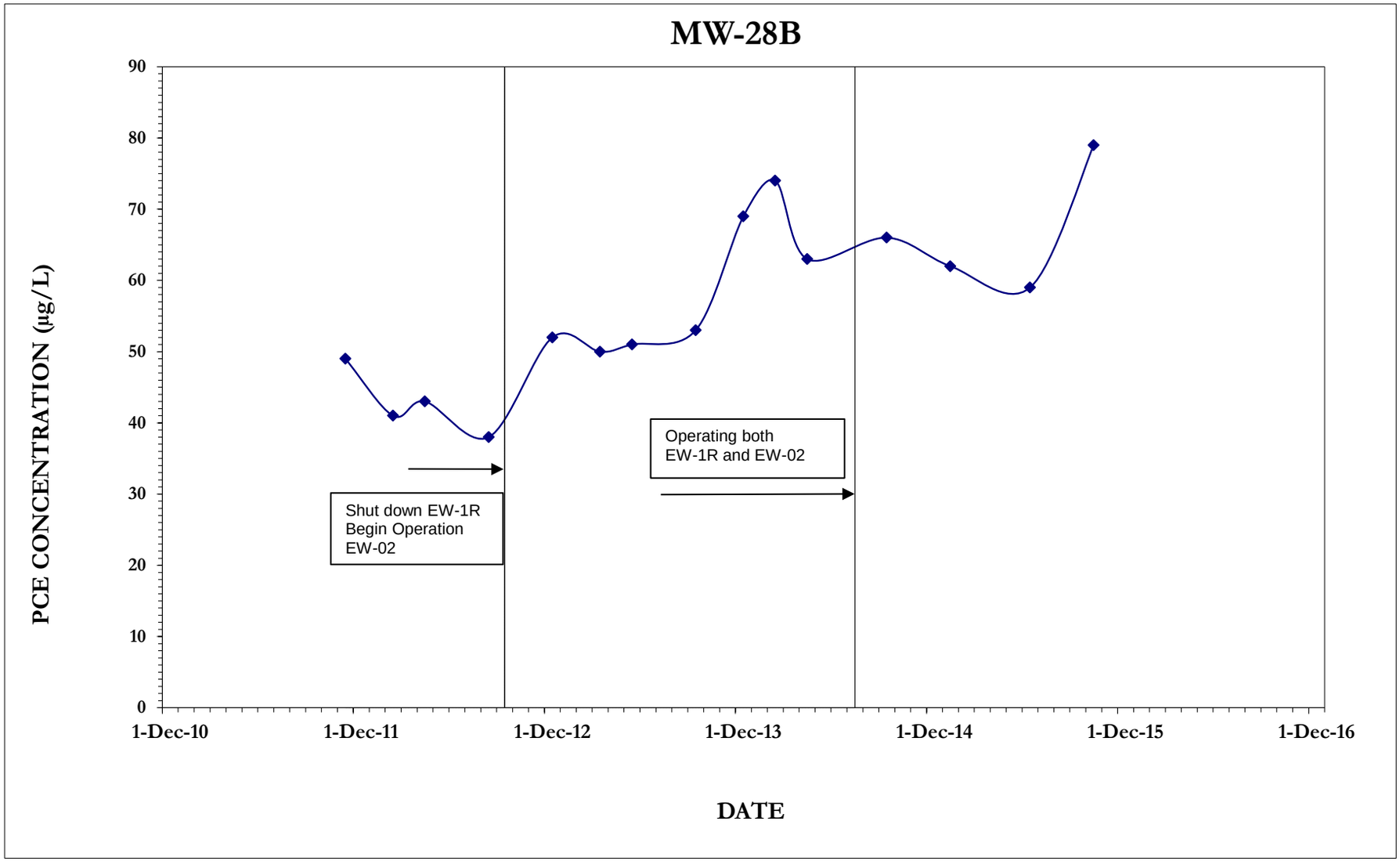


FIGURE G-4(an)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

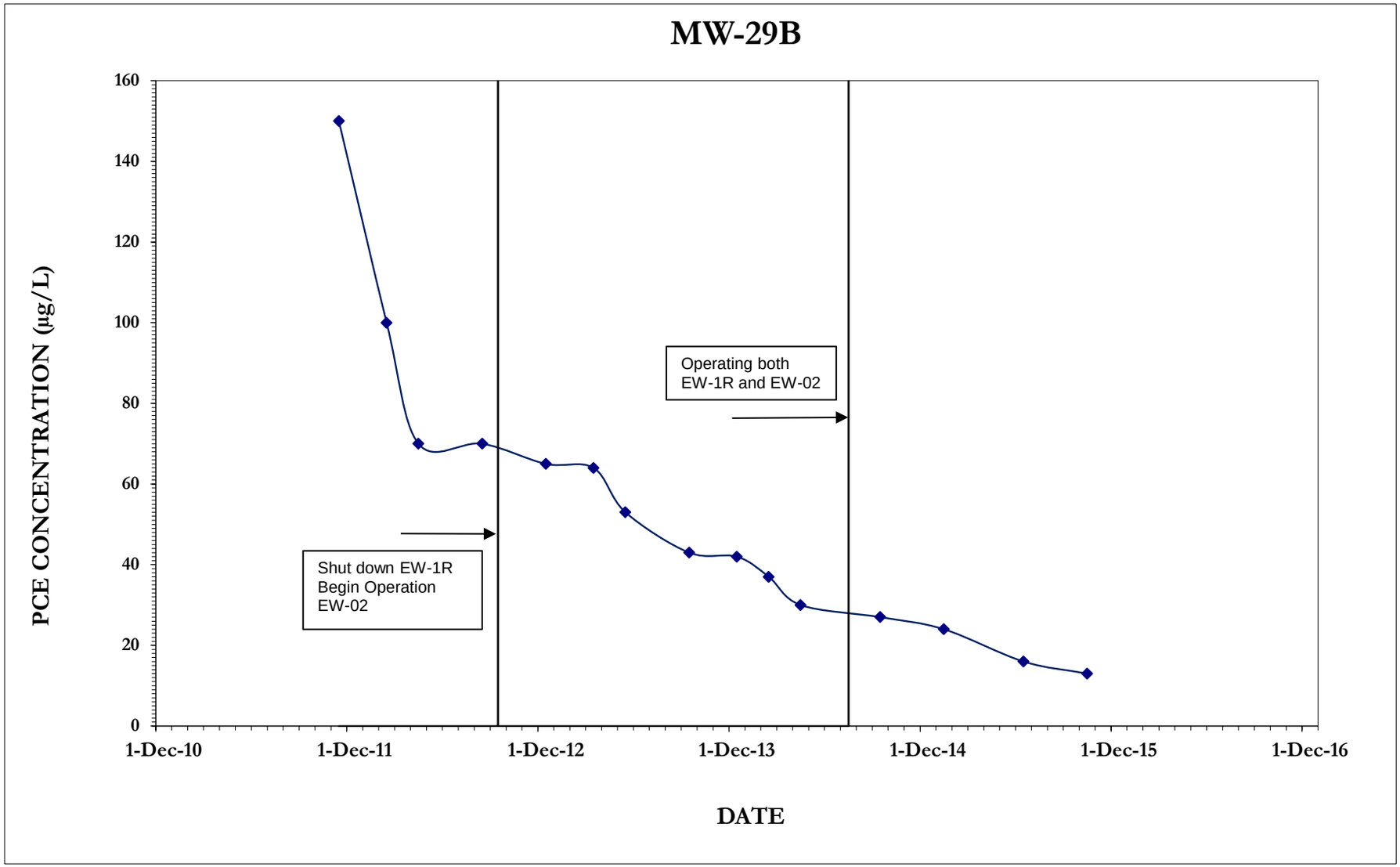


FIGURE G-4 (ao)
HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

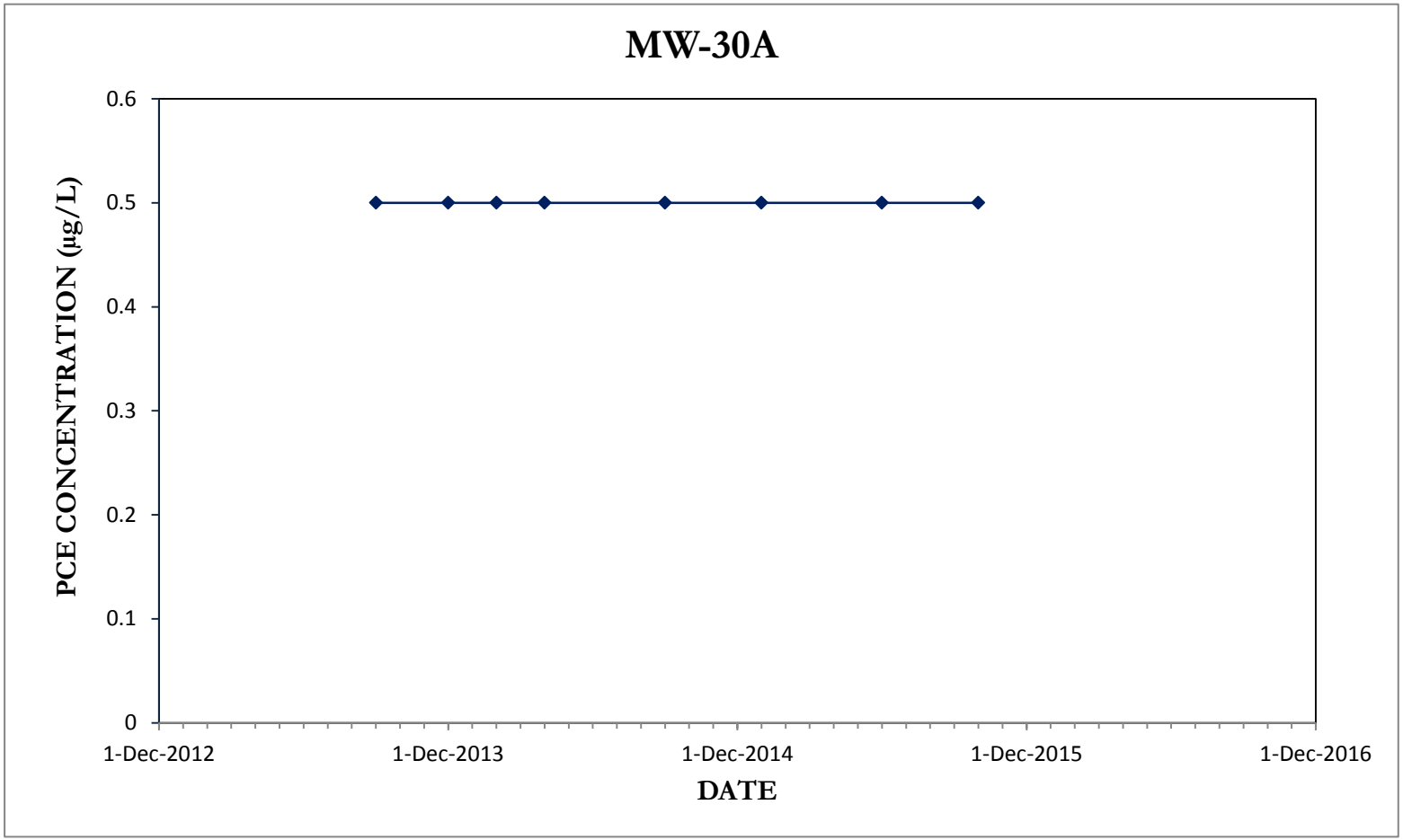


FIGURE G-4 (ap)

HISTORICAL PCE CONCENTRATIONS IN
GROUNDWATER MONITORING WELLS
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

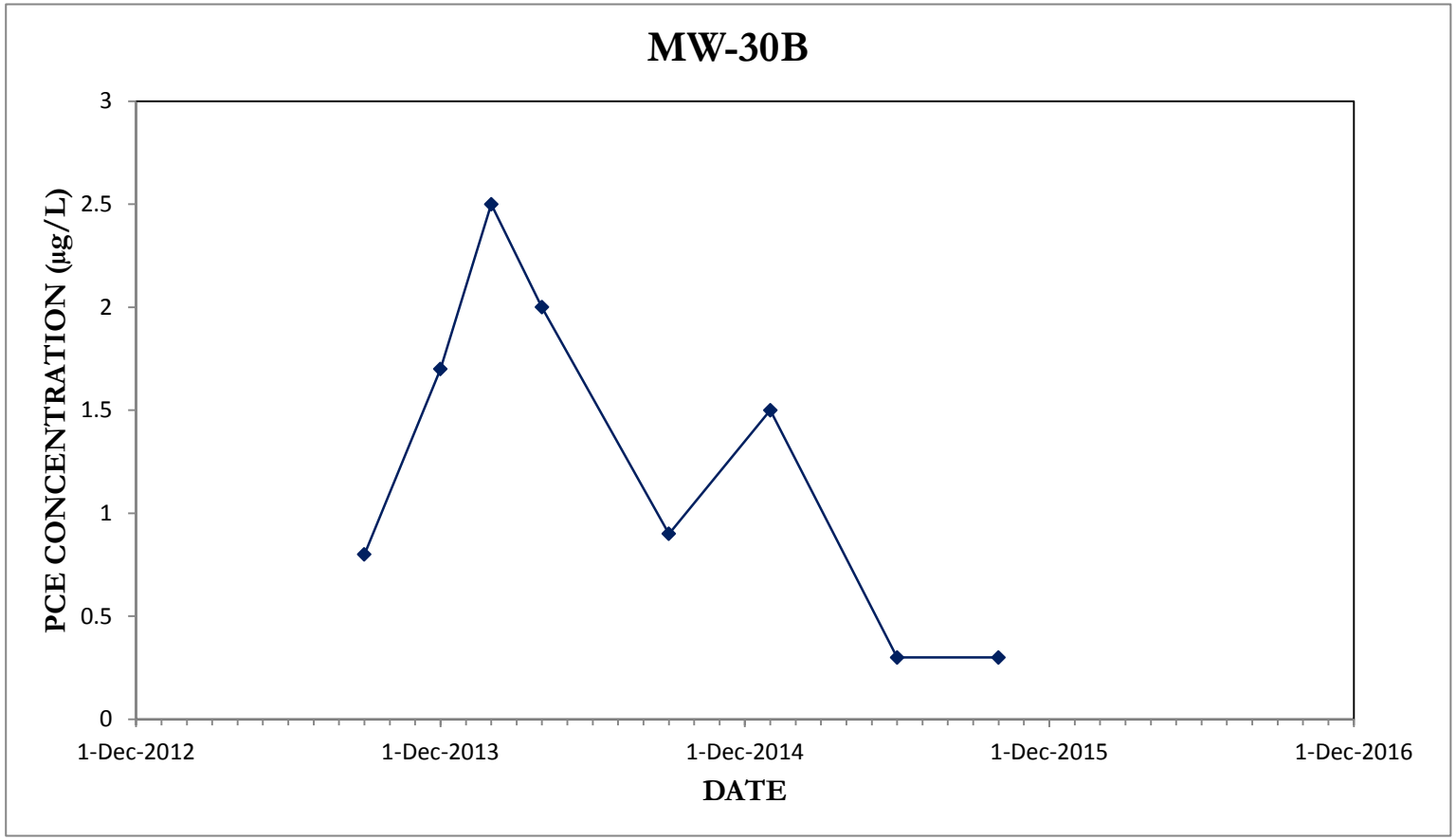


FIGURE G-4 (aq)

HISTORICAL PCE CONCENTRATIONS IN
GROUNDWATER MONITORING WELLS
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

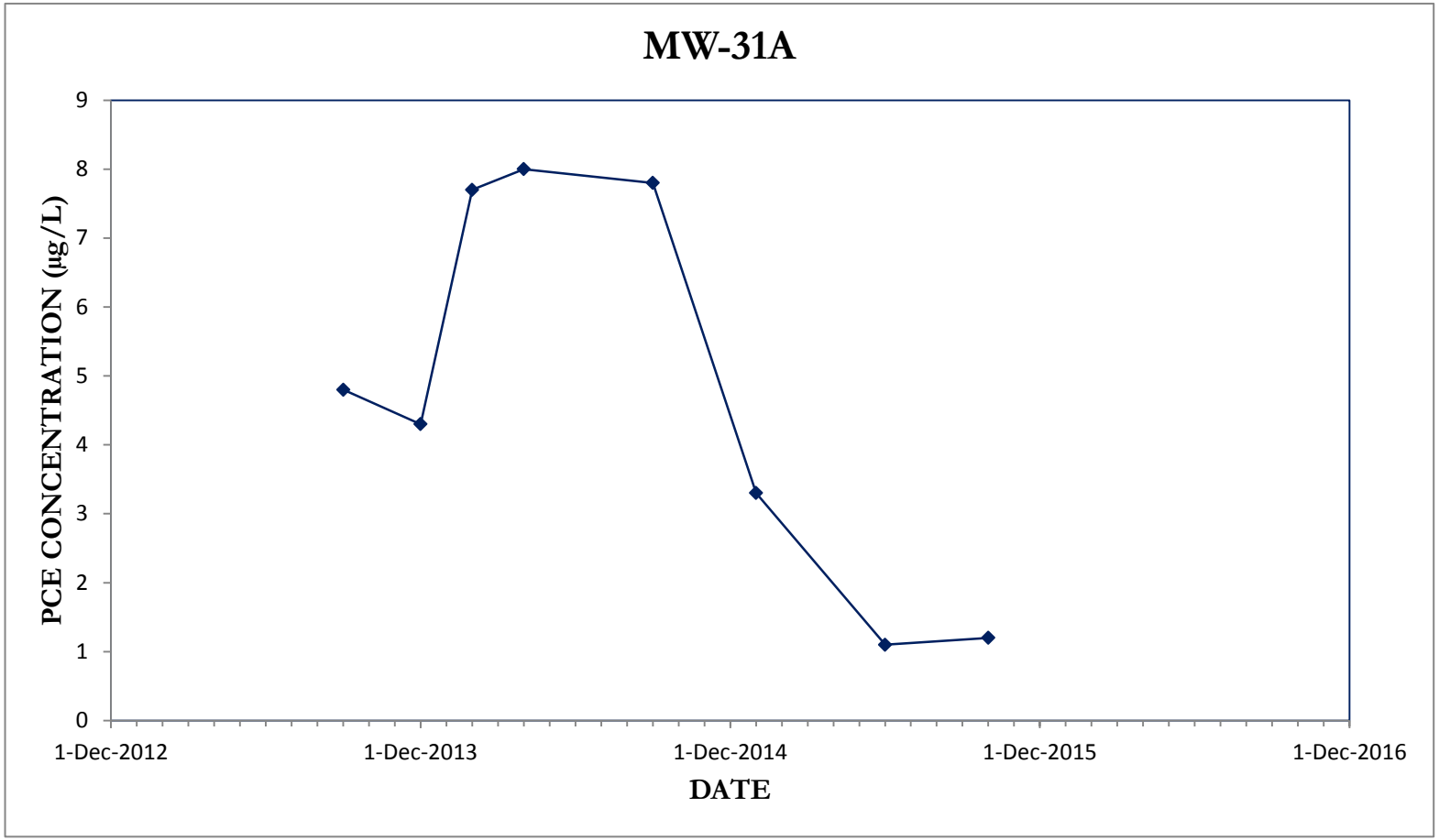


FIGURE G-4 (ar)

HISTORICAL PCE CONCENTRATIONS IN
GROUNDWATER MONITORING WELLS
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

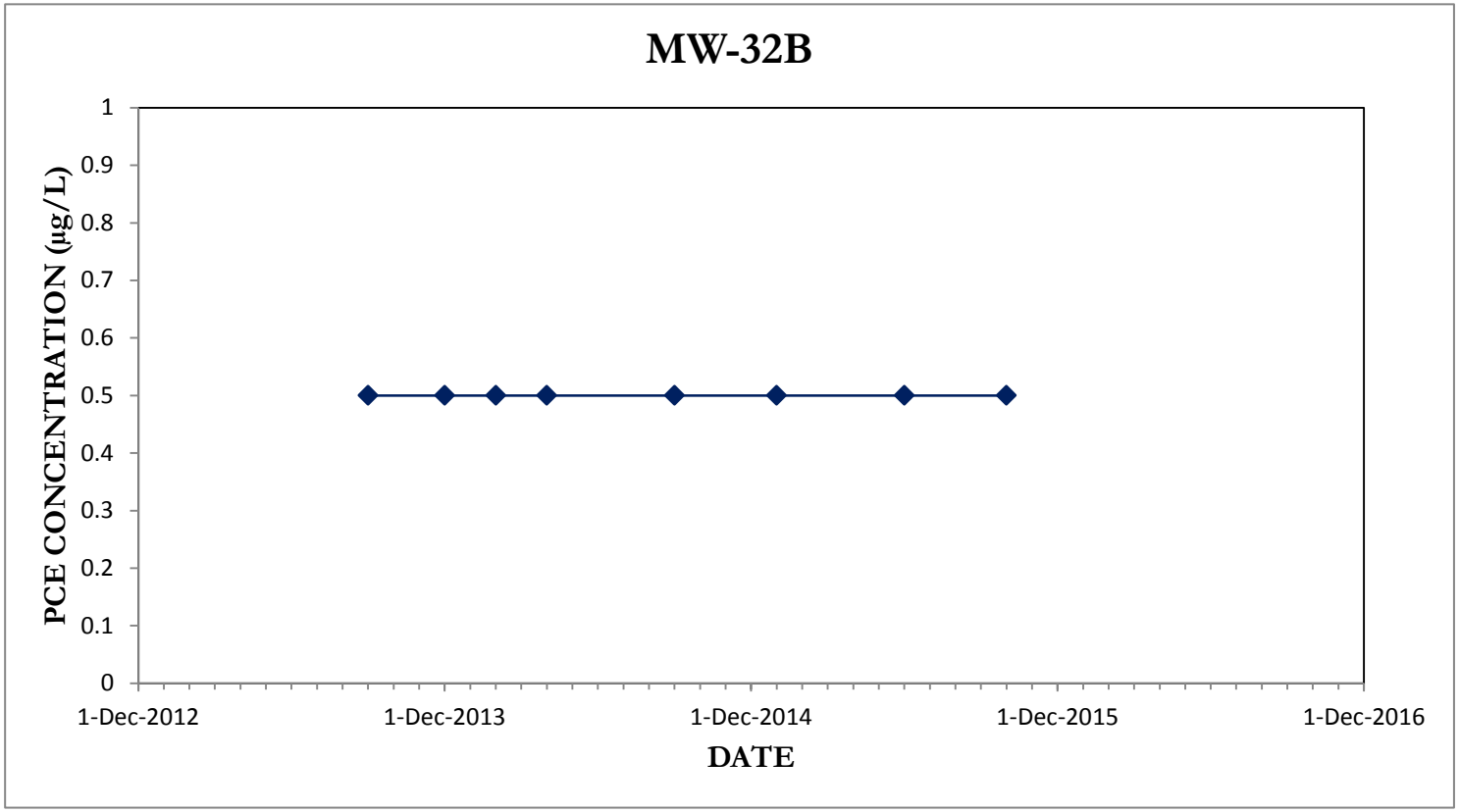


FIGURE G-4 (as)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

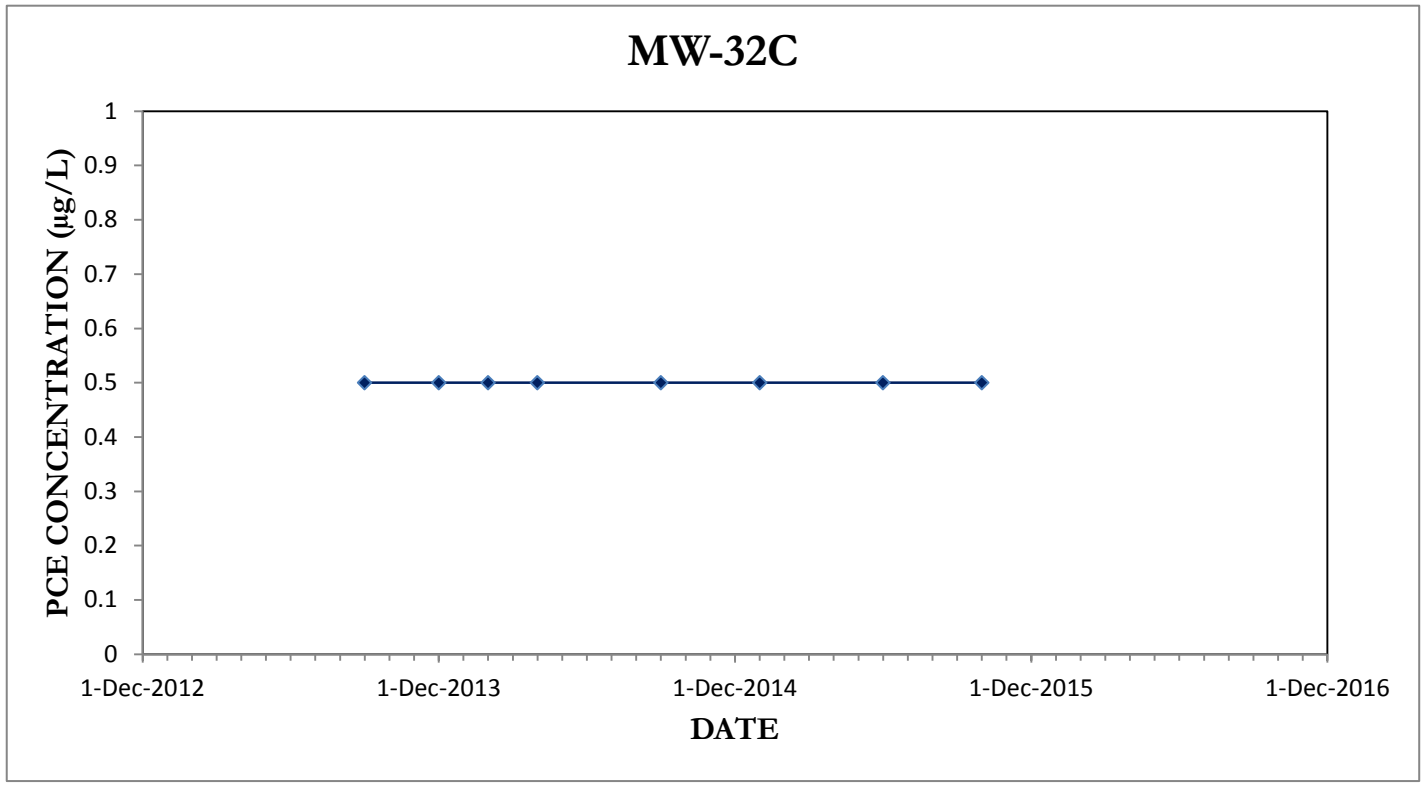


FIGURE G-4 (at)

HISTORICAL PCE CONCENTRATIONS IN
GROUNDWATER MONITORING WELLS
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

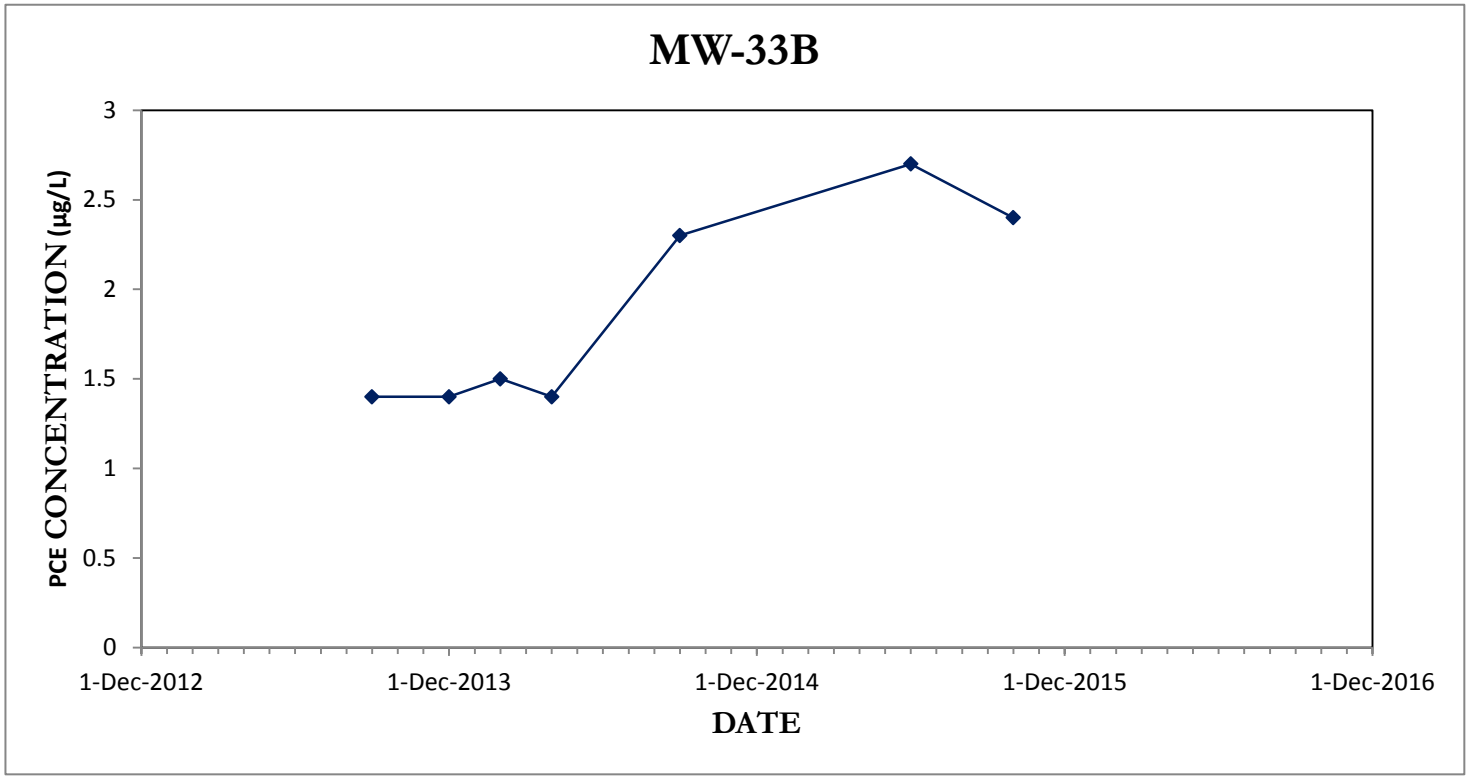


FIGURE G-4 (au)

HISTORICAL PCE CONCENTRATIONS IN GROUNDWATER MONITORING WELLS MODESTO SUPERFUND SITE MODESTO, CALIFORNIA

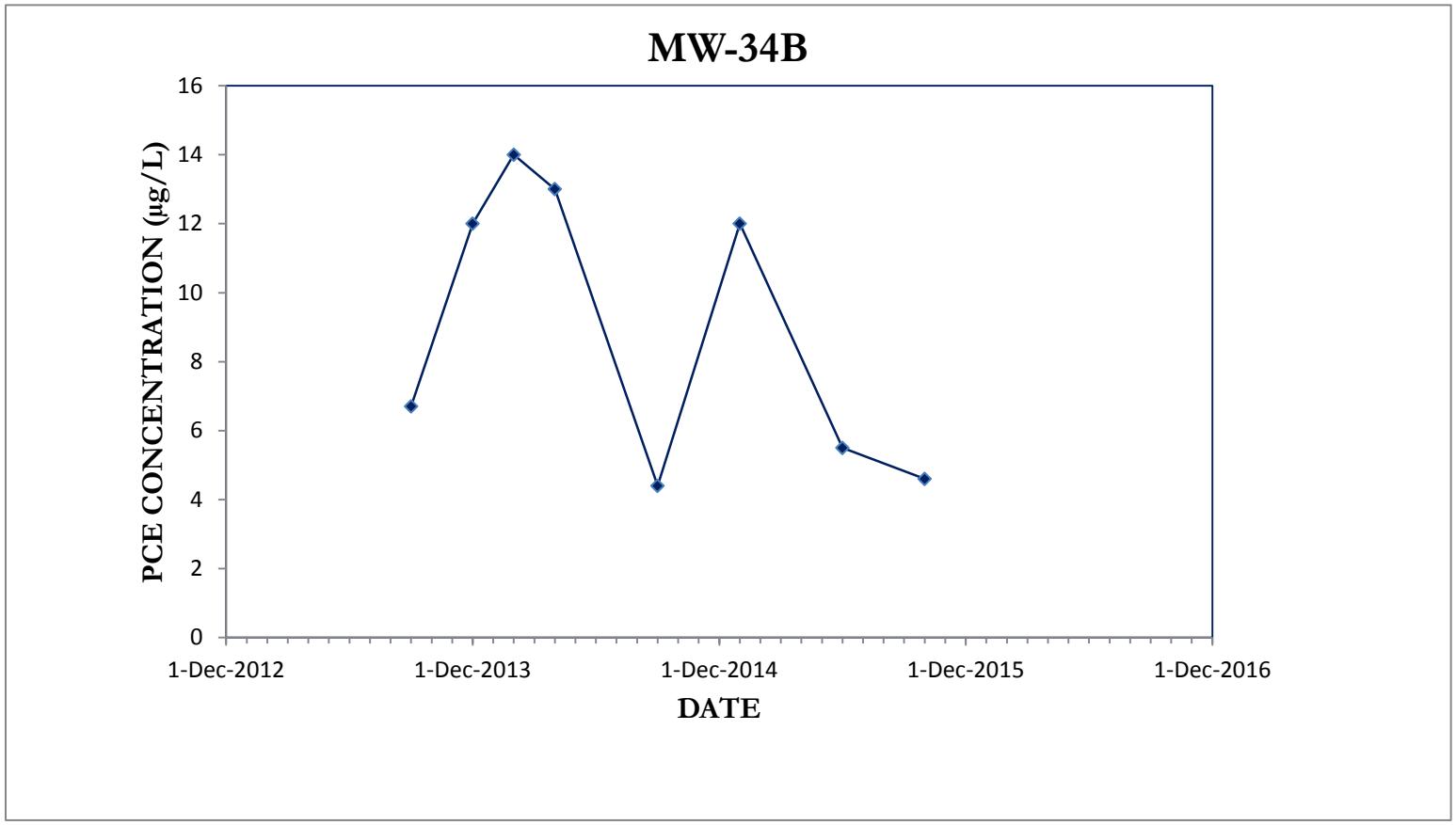


FIGURE G-4 (av)

HISTORICAL PCE CONCENTRATIONS IN
GROUNDWATER MONITORING WELLS
MODESTO SUPERFUND SITE
MODESTO, CALIFORNIA

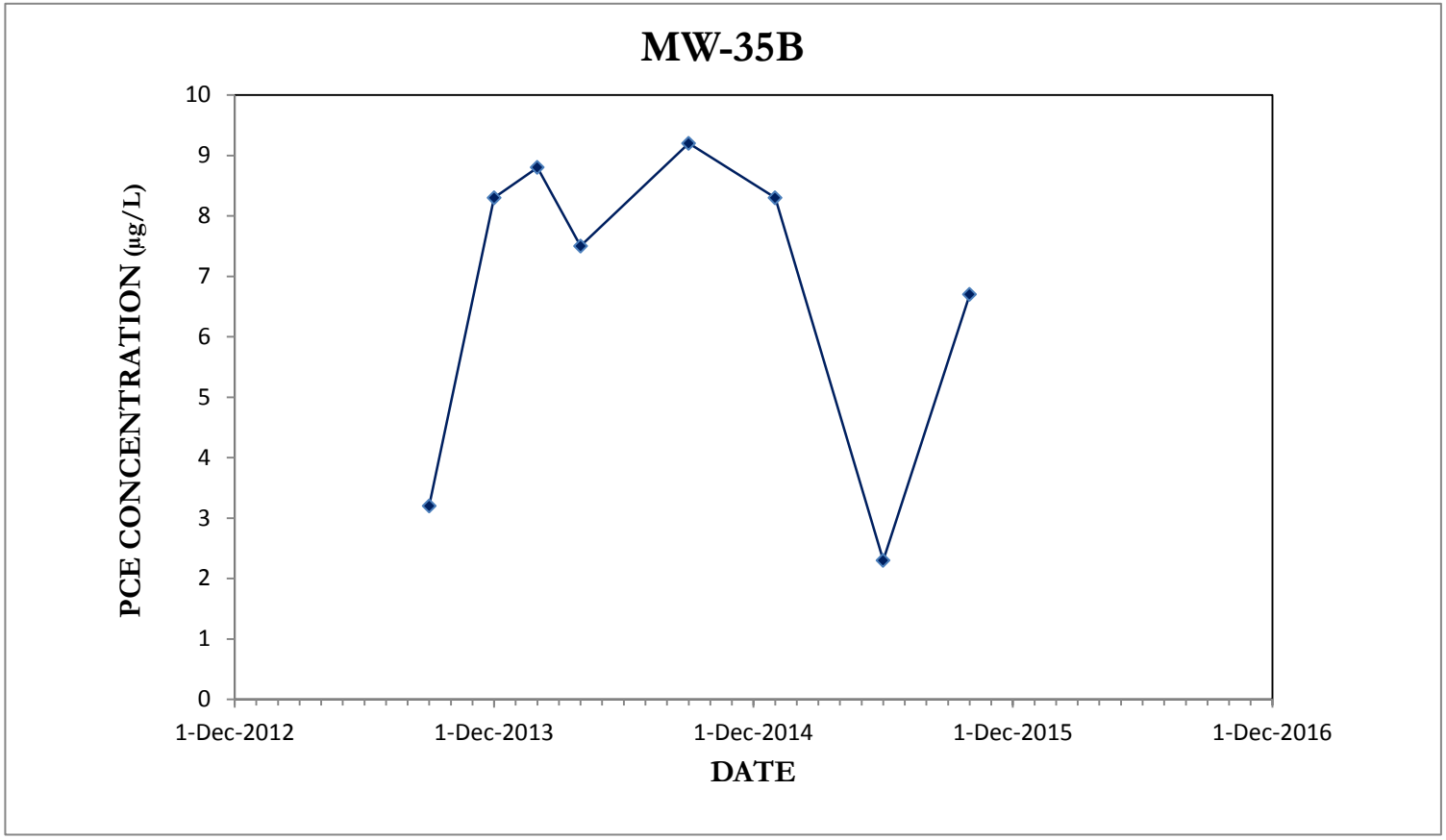


TABLE G-5 PCE MASS REMOVED BY GROUNDWATER TREATMENT SYSTEM MODESTO SUPERFUND SITE MODESTO, CALIFORNIA
(Page 1 of 4)

Sample Date	Volume of Water Treated Since Previous sample (gallons)	Total Volume of Water Treated (gallons)	Influent PCE concentration (µg/L)	Mass of PCE Removed Since Previous sample (lbs)	Cumulative Mass of PCE Removed (lbs)
28-Aug-01	701,200	701,200	330	1.93	1.93
21-Sep-01	673,100	1,374,300	770	4.33	6.26
17-Oct-01	1,842,900	3,217,200	890	13.69	19.95
13-Nov-01	1,208,800	4,426,000	780	7.87	27.81
13-Dec-01	2,126,600	6,552,600	710	12.60	40.42
16-Jan-02	1,992,550	8,545,150	750	12.47	52.89
19-Feb-02	2,435,550	10,980,700	820	16.67	69.56
21-Mar-02	2,144,100	13,124,800	321	5.74	75.30
17-Apr-02	1,908,400	15,033,200	690	10.99	86.29
23-May-02	2,543,200	17,576,400	900	19.10	105.39
20-Jun-02	1,699,600	19,276,000	730	10.35	115.75
18-Jul-02	1,989,500	21,265,500	620	10.29	126.04
19-Aug-02	2,289,500	23,555,000	610	11.66	137.70
26-Sep-02	2,659,200	26,214,200	620	13.76	151.46
24-Oct-02	1,769,600	27,983,800	580	8.57	160.02
18-Nov-02	1,764,700	29,748,500	550	8.10	168.12
18-Dec-02	2,086,100	31,834,600	310	5.40	173.52
16-Jan-03	1,503,500	33,338,100	380	4.77	178.29
20-Feb-03	2,377,800	35,715,900	490	9.72	188.01
20-Mar-03	1,877,700	37,593,600	490	7.68	195.69
30-Apr-03	2,701,900	40,295,500	410	9.25	204.94
29-May-03	1,794,800	42,090,300	270	4.04	208.98
26-Jun-03	1,679,200	43,769,500	490	6.87	215.85
24-Jul-03	1,470,800	45,240,300	510	6.26	222.11
28-Aug-03	1,402,800	46,643,100	540	6.32	228.43
18-Sep-03	902,600	47,545,700	550	4.14	232.58
23-Oct-03	1,420,900	48,966,600	450	5.34	237.91
19-Nov-03	962,500	49,929,100	390	3.13	241.05
18-Dec-03	870,100	50,799,200	420	3.05	244.10
22-Jan-04	1,210,000	52,009,200	350	3.53	247.63
26-Feb-04	1,191,800	53,201,000	290	2.88	250.51
8-Apr-04	431,700	53,632,700	230	0.83	251.34
22-Apr-04	1,369,164	55,001,864	310	3.54	254.89
20-May-04	1,844,450	56,846,313	350	5.39	260.27
23-Jun-04	1,502,110	58,348,423	250	3.13	263.41
29-Jul-04	2,355,600	60,704,023	350	6.88	270.29
26-Aug-04	1,767,150	62,471,173	350	5.16	275.45
4-Oct-04	1,931,540	64,402,713	330	5.32	280.77
21-Oct-04	1,168,970	65,571,683	290	2.83	283.60
24-Aug-06	0	0	620.00	0.00	285.42
28-Sep-06	1,460,060	67,784,613	530.00	6.46	291.88
24-Oct-06	2,861,570	70,646,183	580	13.85	305.73
15-Nov-06	2,370,250	73,016,433	500	9.89	315.62
27-Dec-06	2,139,250	75,155,683	450	8.03	323.66
29-Jan-07	2,365,450	77,521,133	420.0	8.29	331.95
28-Feb-07	1,240,000	78,761,133	360.0	3.73	335.67
26-Mar-07	1,847,900	80,609,033	320.0	4.94	340.61

TABLE G-5 PCE MASS REMOVED BY GROUNDWATER TREATMENT SYSTEM MODESTO SUPERFUND SITE MODESTO, CALIFORNIA
(Page 2 of 4)

Sample Date	Volume of Water Treated Since Previous sample (gallons)	Total Volume of Water Treated (gallons)	Influent PCE concentration (µg/L)	Mass of PCE Removed Since Previous sample (lbs)	Cumulative Mass of PCE Removed (lbs)
16-Apr-07	1,521,900	82,130,933	320.0	4.06	344.67
2-Jul-07	0	82,130,933	76.0	0.00	344.67
23-Jul-07	1,281,000	83,411,933	290.0	3.10	347.77
23-Aug-07	2,451,700	85,863,633	290.0	5.93	353.71
18-Sep-07	1,554,100	87,417,733	360.0	4.67	358.38
29-Oct-07	2,562,300	89,980,033	280.0	5.99	364.36
28-Nov-07	1,285,700	91,265,733	310.0	3.33	367.69
20-Dec-07	1,538,400	92,804,133	260.0	3.34	371.03
17-Jan-08	2,473,700	95,277,833	240.0	4.95	375.98
25-Feb-08	2,249,000	97,526,833	250.0	4.69	375.72
31-Mar-08	2,318,700	99,845,533	280.0	5.42	381.14
25-Apr-08	1,569,600	101,415,133	210.0	2.75	383.89
22-May-08	1,761,600	103,176,733	280.0	4.12	388.01
24-Jun-08	2,024,600	105,201,333	240.0	4.06	392.06
23-Jul-08	2,905,200	108,106,533	240.0	5.82	397.88
28-Aug-08	1,045,500	109,152,033	220.0	1.92	399.80
25-Sep-08	1,148,600	110,300,633	150.0	1.44	401.24
30-Oct-08	2,067,400	112,368,033	250.0	4.31	405.55
25-Nov-08	1,437,600	113,805,633	210.0	2.52	408.07
30-Dec-08	2,350,906	116,156,539	190.0	3.73	411.80
30-Jan-09	2,004,294	118,160,833	190.0	3.18	414.98
24-Feb-09	1,677,300	119,838,133	180.0	2.52	417.50
30-Mar-09	2,266,700	122,104,833	170.0	3.22	420.72
23-Apr-09	1,565,200	123,670,033	160.0	2.09	422.81
26-May-09	2,045,500	125,715,533	180.0	3.07	425.88
29-Jun-09	1,844,200	127,559,733	150.0	2.31	428.19
29-Jul-09	1,952,600	129,512,333	190.0	3.10	431.28
10-Aug-09	793,600	130,305,933	250.0	1.66	432.94
22-Sep-09	2,874,700	133,180,633	170.0	4.08	437.02
26-Oct-09	1,407,400	134,588,033	250.0	2.94	439.95
23-Nov-09	1,712,600	136,300,633	160.0	2.29	442.24
16-Dec-09	1,351,400	137,652,033	180.0	2.03	444.27
27-Jan-10	2,585,600	140,237,633	160.0	3.45	447.72
25-Feb-10	1,771,800	142,009,433	160.0	2.37	450.09
11-Mar-10	882,600	142,892,033	180.0	1.33	451.42
7-Apr-10	1,743,300	144,635,333	180.0	2.62	454.03
12-May-10	2,337,600	146,972,933	160.0	3.12	457.16
17-Jun-10	1,527,400	148,500,333	130.0	1.66	458.81
15-Jul-10	1,846,600	150,346,933	140.0	2.16	460.97
12-Aug-10	1,846,600	152,193,533	150.0	2.31	463.28
9-Sep-10	1,832,100	154,025,633	210.0	3.21	466.49
14-Oct-10	2,295,600	156,321,233	140.0	2.68	469.18
18-Nov-10	2,268,500	158,589,733	130.0	2.46	471.64
9-Dec-10	1,365,000	159,954,733	88.0	1.00	472.64
13-Jan-11	2,271,000	162,225,733	110.0	2.08	474.72
10-Feb-11	1,850,600	164,076,333	120.0	1.85	476.58
9-Mar-11	1,747,400	165,823,733	120.0	1.75	478.33
14-Apr-11	2,373,000	168,196,733	120.0	2.38	480.70
10-May-11	1,730,400	169,927,133	140.0	2.02	482.73
2-Jun-11	1,516,100	171,443,233	120.0	1.52	484.25
14-Jul-11	2,753,400	174,196,633	140.0	3.22	487.46

TABLE G-5 PCE MASS REMOVED BY GROUNDWATER TREATMENT SYSTEM MODESTO SUPERFUND SITE MODESTO, CALIFORNIA
(Page 3 of 4)

Sample Date	Volume of Water Treated Since Previous sample (gallons)	Total Volume of Water Treated (gallons)	Influent PCE concentration (µg/L)	Mass of PCE Removed Since Previous sample (lbs)	Cumulative Mass of PCE Removed (lbs)
11-Aug-11	1,833,700	176,030,333	160.0	2.45	489.91
13-Sep-11	1,966,400	177,996,733	130.0	2.13	492.04
13-Oct-11	1,960,000	179,956,733	140.0	2.29	494.33
9-Nov-11	1,761,100	181,717,833	130.0	1.91	496.25
8-Dec-11	1,745,200	183,463,033	150.0	2.18	498.43
12-Jan-12	2,269,900	185,732,933	140.0	2.65	501.08
9-Feb-12	1,811,900	187,544,833	150.0	2.27	503.35
8-Mar-12	1,794,700	189,339,533	120.0	1.80	505.15
5-Apr-12	1,448,800	190,788,333	130.0	1.57	506.72
8-May-12	2,039,800	192,828,133	130.0	2.21	508.93
7-Jun-12	1,932,900	194,761,033	150.0	2.42	511.35
18-Jul-12	592,700	195,353,733	740.0	3.66	515.01
8-Aug-12	1,363,800	196,717,533	97.0	1.10	516.12
6-Sep-12	1,837,500	198,555,033	110.0	1.69	517.80
11-Oct-12	1,907,200	200,462,233	840.0	13.37	531.17
8-Nov-12	1,367,800	201,830,033	860.0	9.82	540.99
6-Dec-12	1,611,200	203,441,233	690.0	9.28	550.27
16-Jan-13	2,374,000	205,815,233	580.0	11.49	561.76
6-Feb-13	1,395,400	207,210,633	520.0	6.06	567.82
7-Mar-13	1,585,100	208,795,733	560.0	7.41	575.23
4-Apr-13	1,855,900	210,651,633	490.0	7.59	582.82
2-May-13	1,635,500	212,287,133	440.0	6.01	588.82
6-Jun-13	2,322,000	214,609,133	370.0	7.17	595.99
11-Jul-13	2,016,500	216,625,633	350.0	5.89	601.88
8-Aug-13	1,838,400	218,464,033	340.0	5.22	607.10
12-Sep-13	2,299,000	220,763,033	280.0	5.37	612.47
3-Oct-13	1,106,400	221,869,433	260.0	2.40	614.87
7-Nov-13	2,188,300	224,057,733	260.0	4.75	619.62
5-Dec-13	1,835,700	225,893,433	270.0	4.14	623.76
9-Jan-14	2,219,400	228,112,833	260.0	4.82	628.57
6-Feb-14	1,821,900	229,934,733	240.0	3.65	632.22
13-Mar-14	2,013,600	231,948,333	210.0	3.53	635.75
2-Apr-14	1,249,600	233,197,933	210.0	2.19	637.94
1-May-14	1,909,200	235,107,133	190.0	3.03	640.97
5-Jun-14	2,223,000	237,330,133	210.0	3.90	644.87
3-Jul-14	1,817,300	239,147,433	170.0	3.27	648.14
7-Aug-14	2,304,900	241,452,333	110.0	1.71	649.84
4-Sep-14	1,859,900	243,312,233	110.0	1.82	651.66
2-Oct-14	1,978,000	245,290,233	120	2.16	653.82
6-Nov-14	2,154,800	247,445,033	89	1.42	655.24
4-Dec-14	1,918,400	249,363,433	110	1.82	656.68
8-Jan-15	1,571,000	250,934,433	180	2.16	658.69
3-Feb-15	1,338,200	252,272,633	180	1.42	661.19
5-Mar-15	1,659,100	253,931,733	87	1.82	662.58
1-Apr-15	1,911,500	255,843,233	86	2.16	664.34
6-May-15	2,459,800	258,303,033	100	1.42	666.47
11-Jun-15	2,551,400	262,777,533	100	1.44	668.08
8-Jul-15	1,923,100	264,736,533	94	2.01	669.61
6-Aug-15	1,959,000	266,466,433	77	2.49	670.72

Notes:
µg/L - micrograms per liter

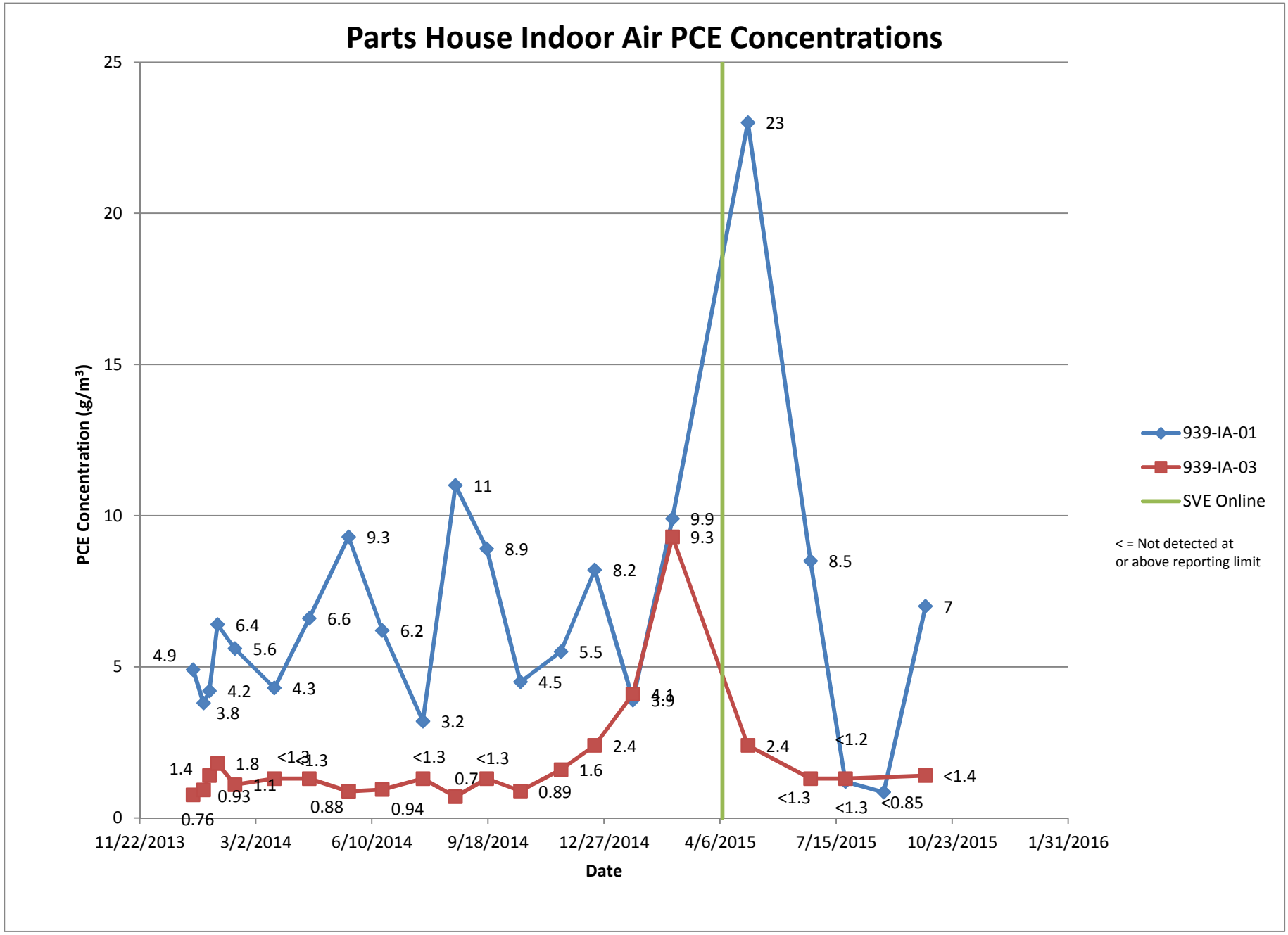
TABLE G-5 PCE MASS REMOVED BY GROUNDWATER TREATMENT SYSTEM MODESTO SUPERFUND SITE MODESTO, CALIFORNIA
(Page 4 of 4)

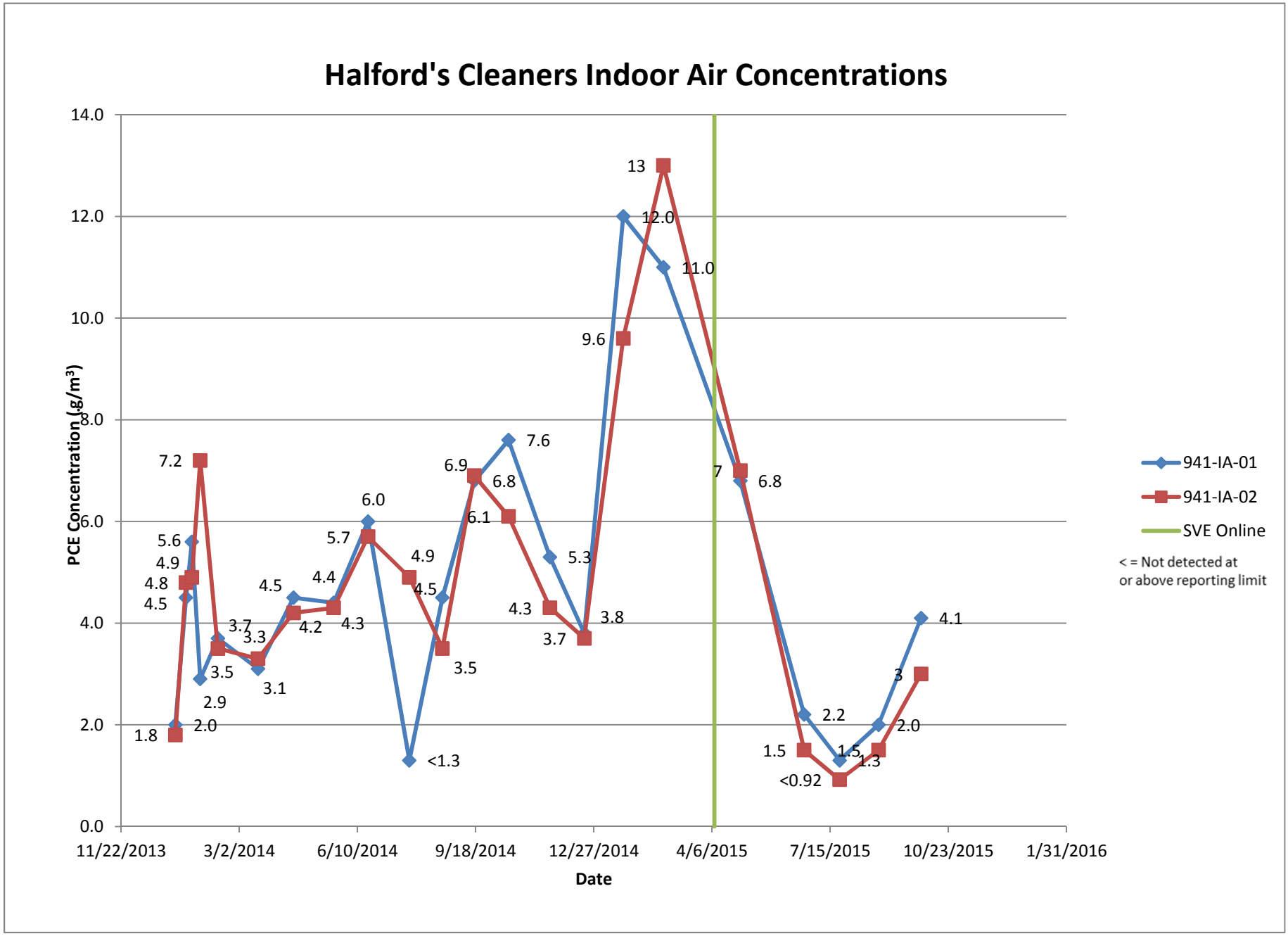
Sample Date	Volume of Water Treated Since Previous sample (gallons)	Total Volume of Water Treated (gallons)	Influent PCE concentration (µg/L)	Mass of PCE Removed Since Previous sample (lbs)	Cumulative Mass of PCE Removed (lbs)

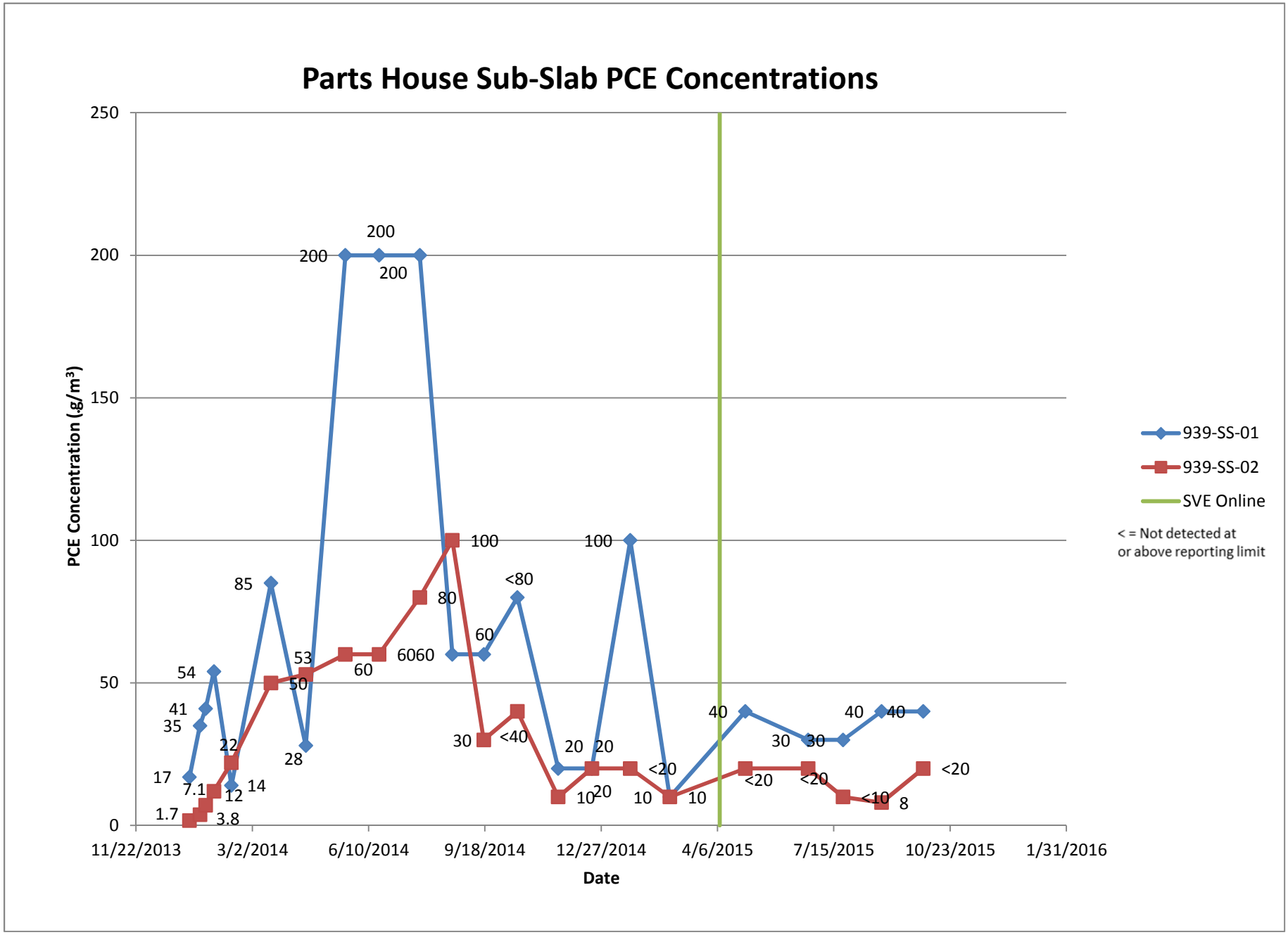
lbs - pounds
PCE - Tetrachloroethene

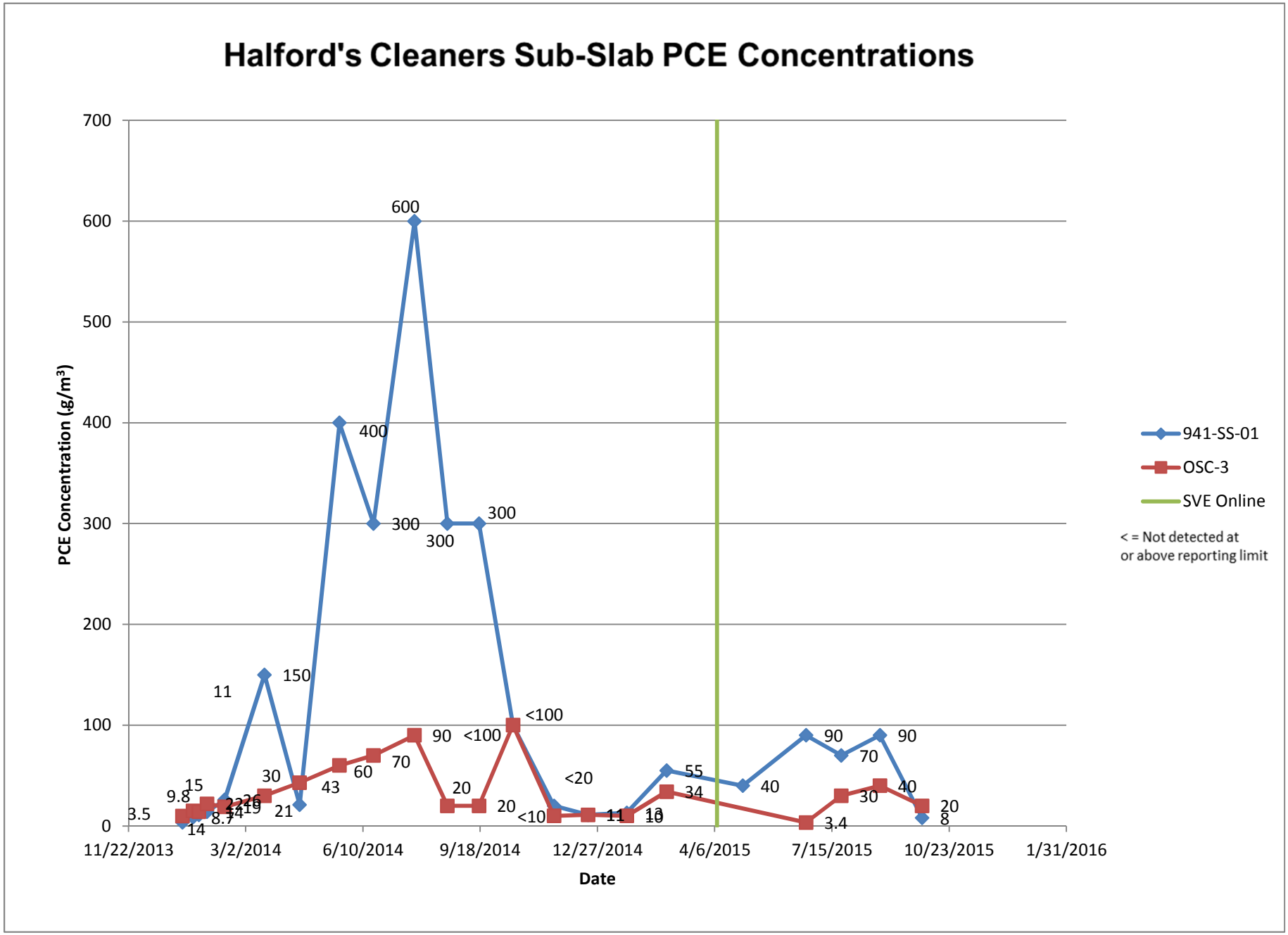
Appendix H

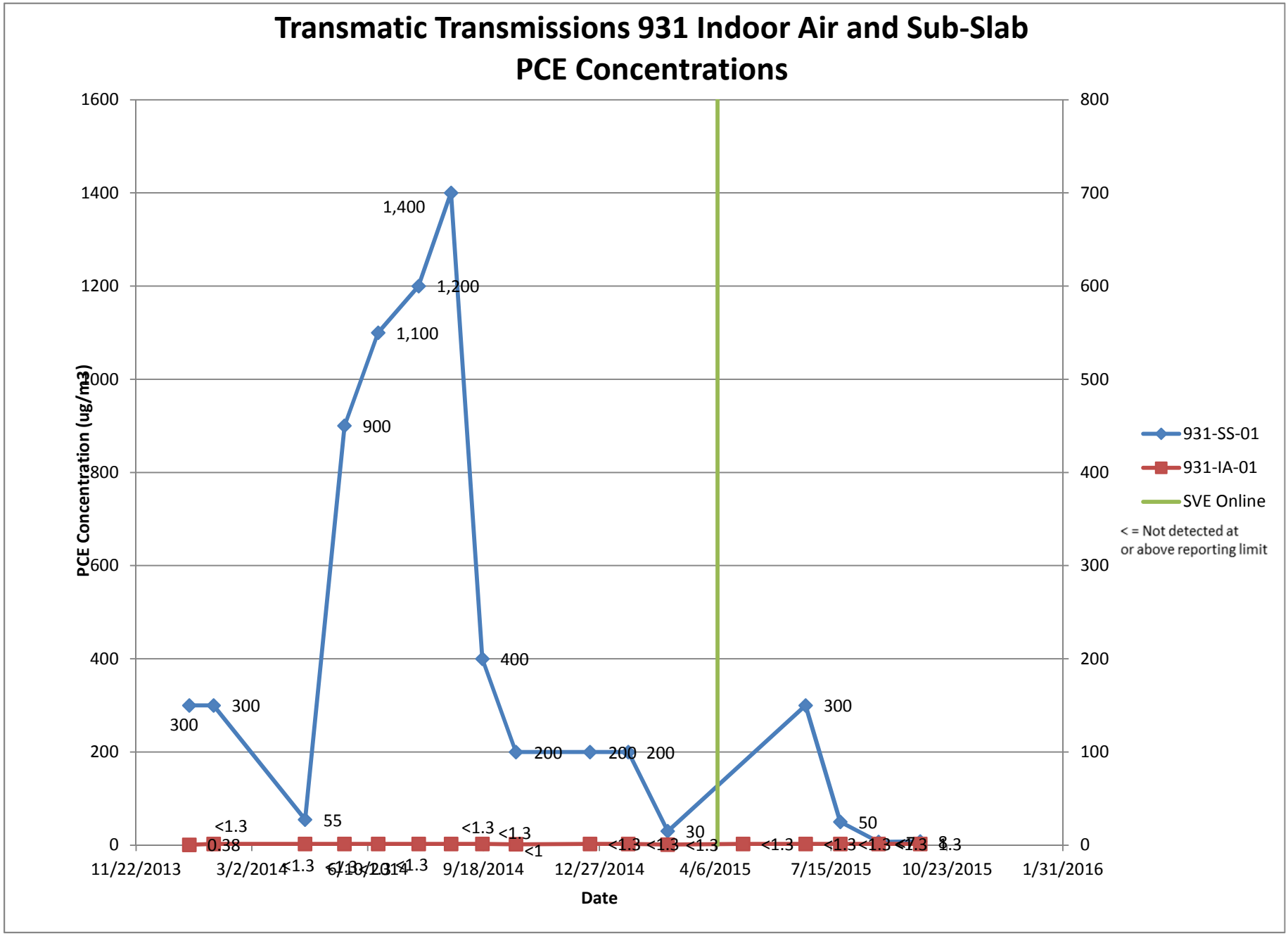
PCE Soil Vapor Concentration Trends in Indoor Air, Sub-slab, and Soil Vapor Monitoring Wells

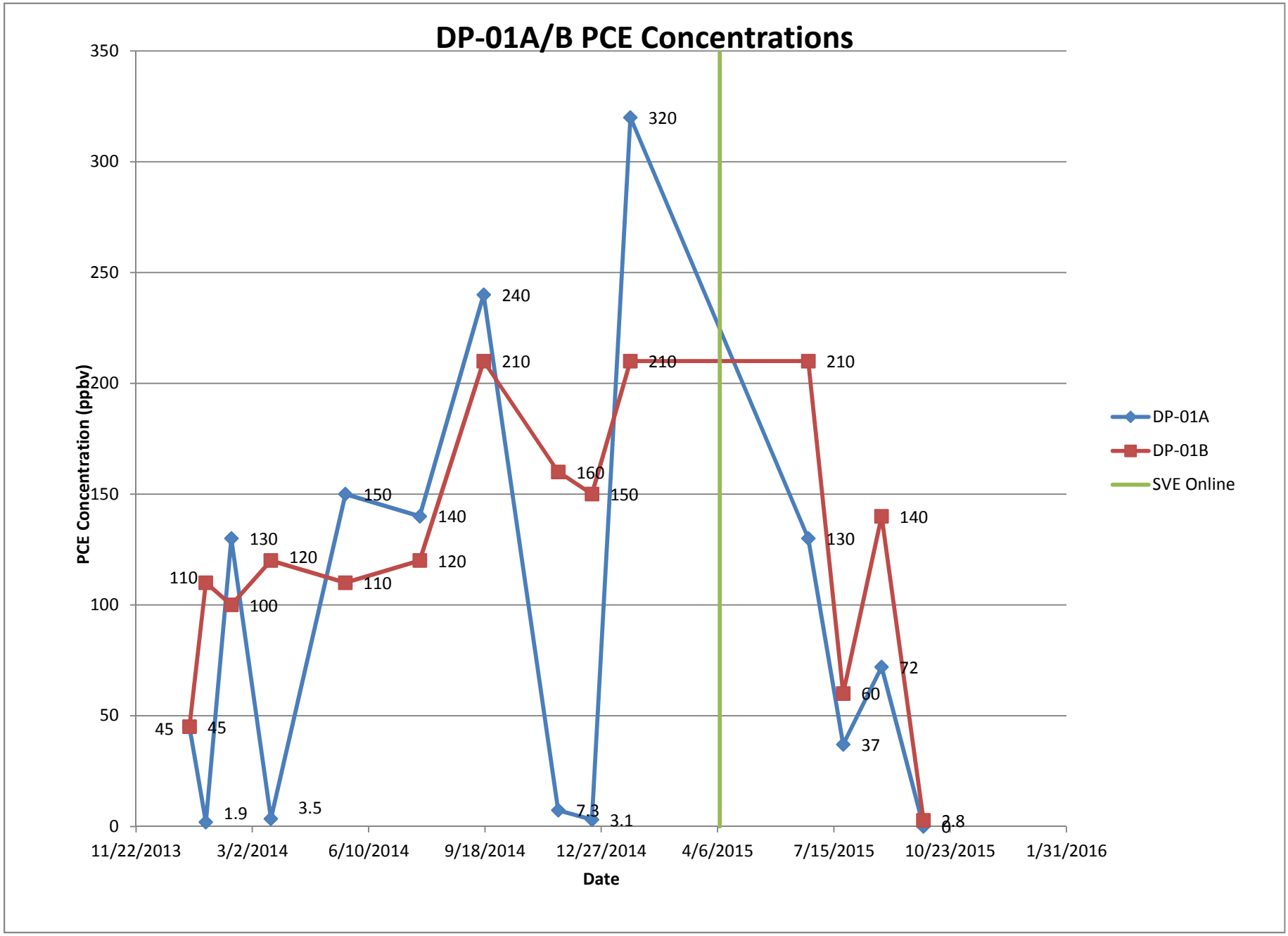

Parts House Indoor Air PCE Concentrations
PCE Concentration (µg/m³)
25
20
15
10
5
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
Date
939-IA-01
939-IA-03
SVE Online
< = Not detected at
or above reporting limit
4.9
3.8
6.4
5.6
4.2
4.3
6.6
9.3
6.2
3.2
11
8.9
4.5
5.5
8.2
3.9
9.9
23
8.5
<1.2
<0.85
7
1.4
0.76
1.8
0.93
1.1
<1.3
<1.3
0.88
0.94
<1.3
0.7
<1.3
0.89
1.6
2.4
4.1
9.3
2.4
<1.3
<1.3
<1.4

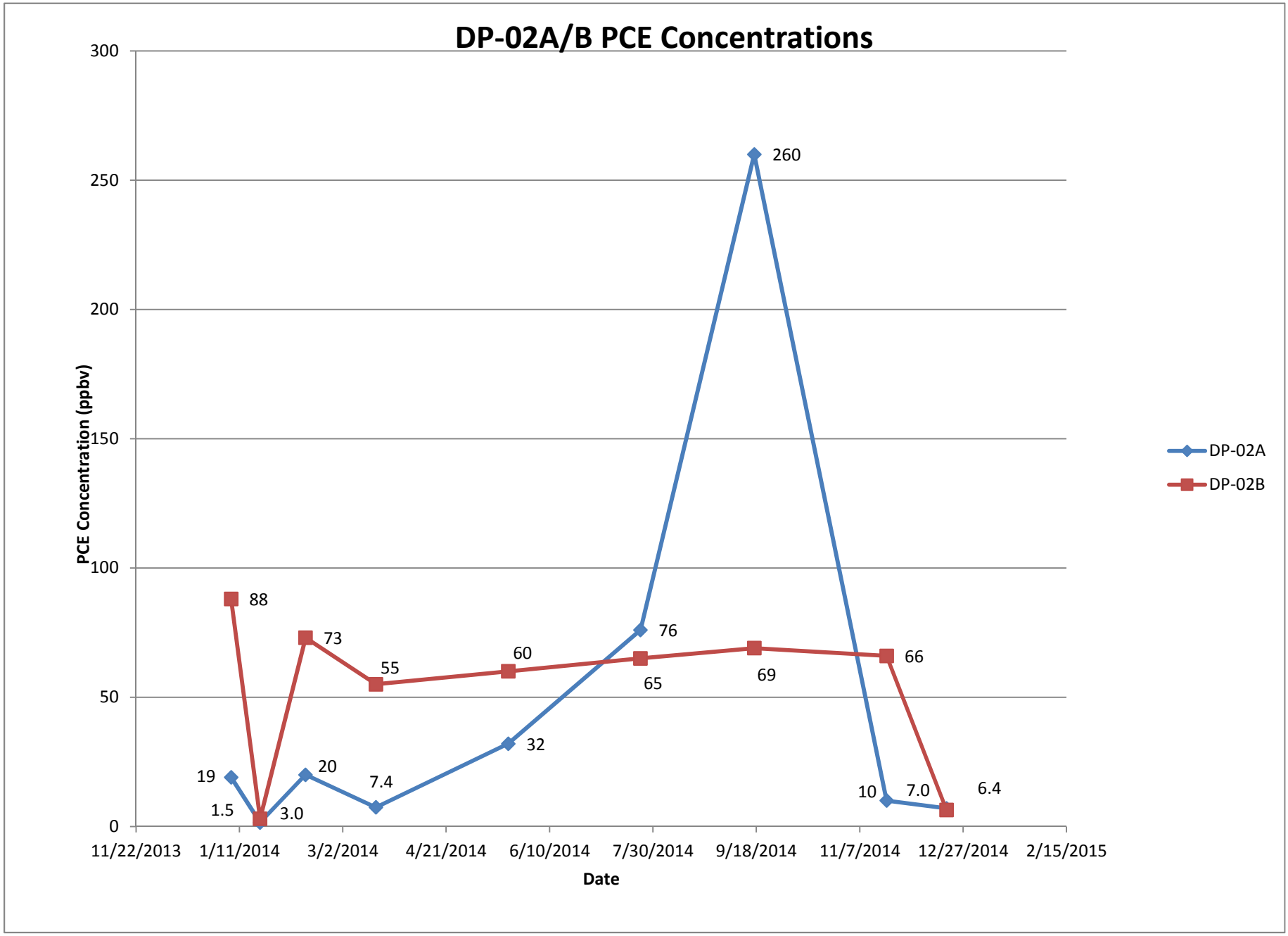

Halford's Cleaners Indoor Air Concentrations
PCE Concentration (µg/m³)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
Date
941-IA-01
941-IA-02
SVE Online
< = Not detected at
or above reporting limit

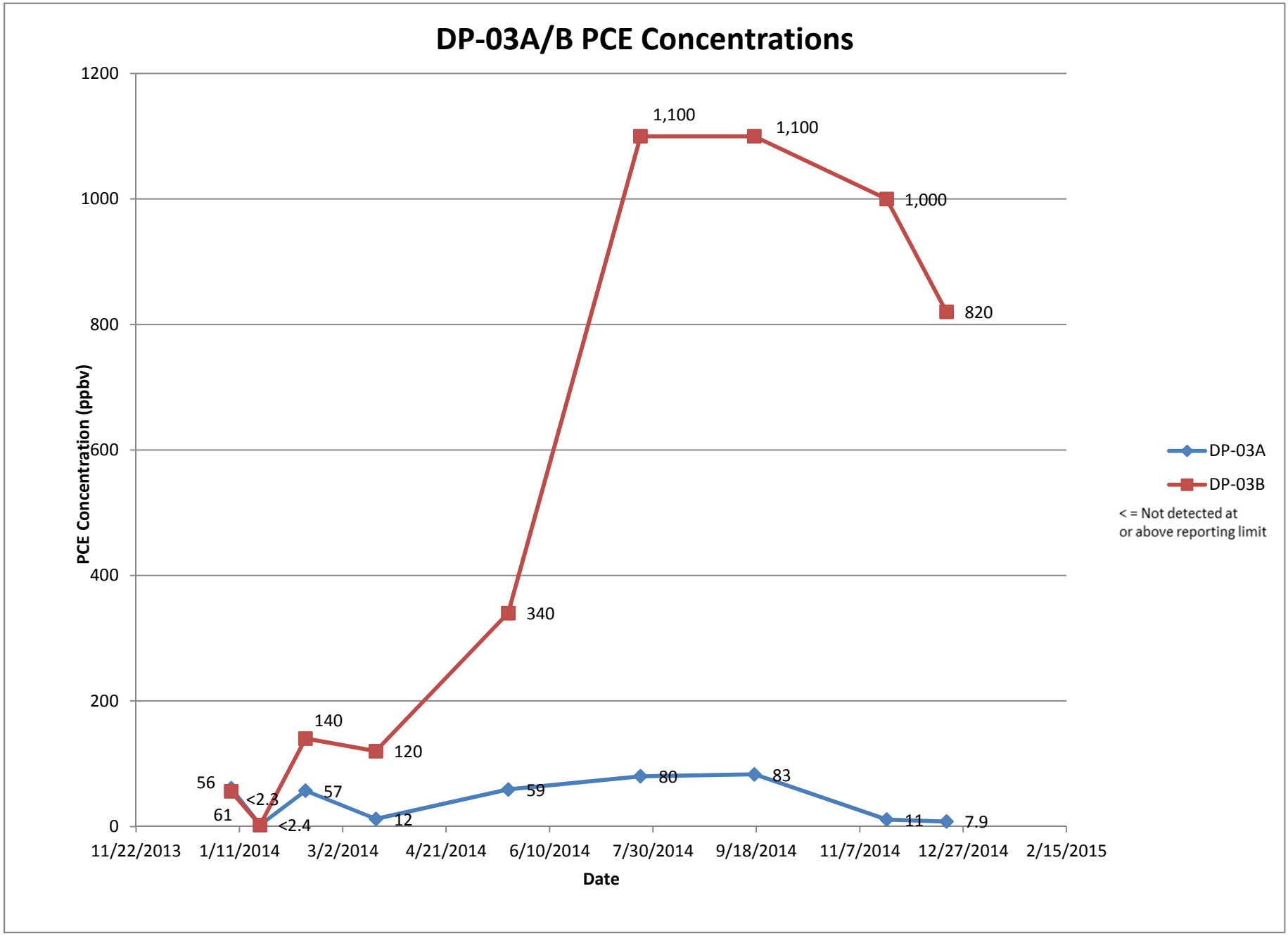

Parts House Sub-Slab PCE Concentrations
PCE Concentration (µg/m³)
250
200
150
100
50
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
Date
939-SS-01
939-SS-02
SVE Online
< = Not detected at
or above reporting limit

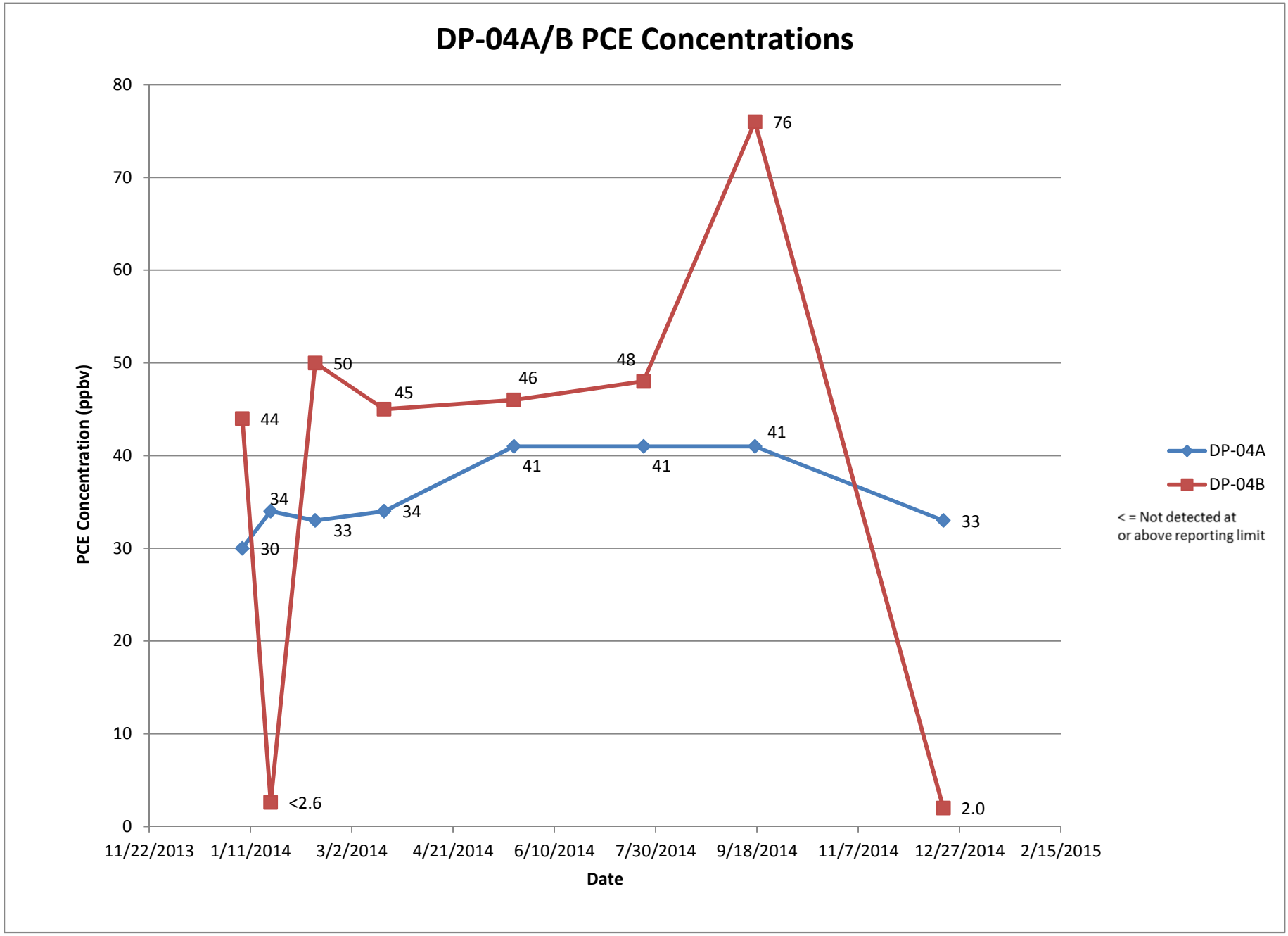

Halford's Cleaners Sub-Slab PCE Concentrations
PCE Concentration (g/m³)
700
600
500
400
300
200
100
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
Date
941-SS-01
OSC-3
SVE Online
< = Not detected at
or above reporting limit

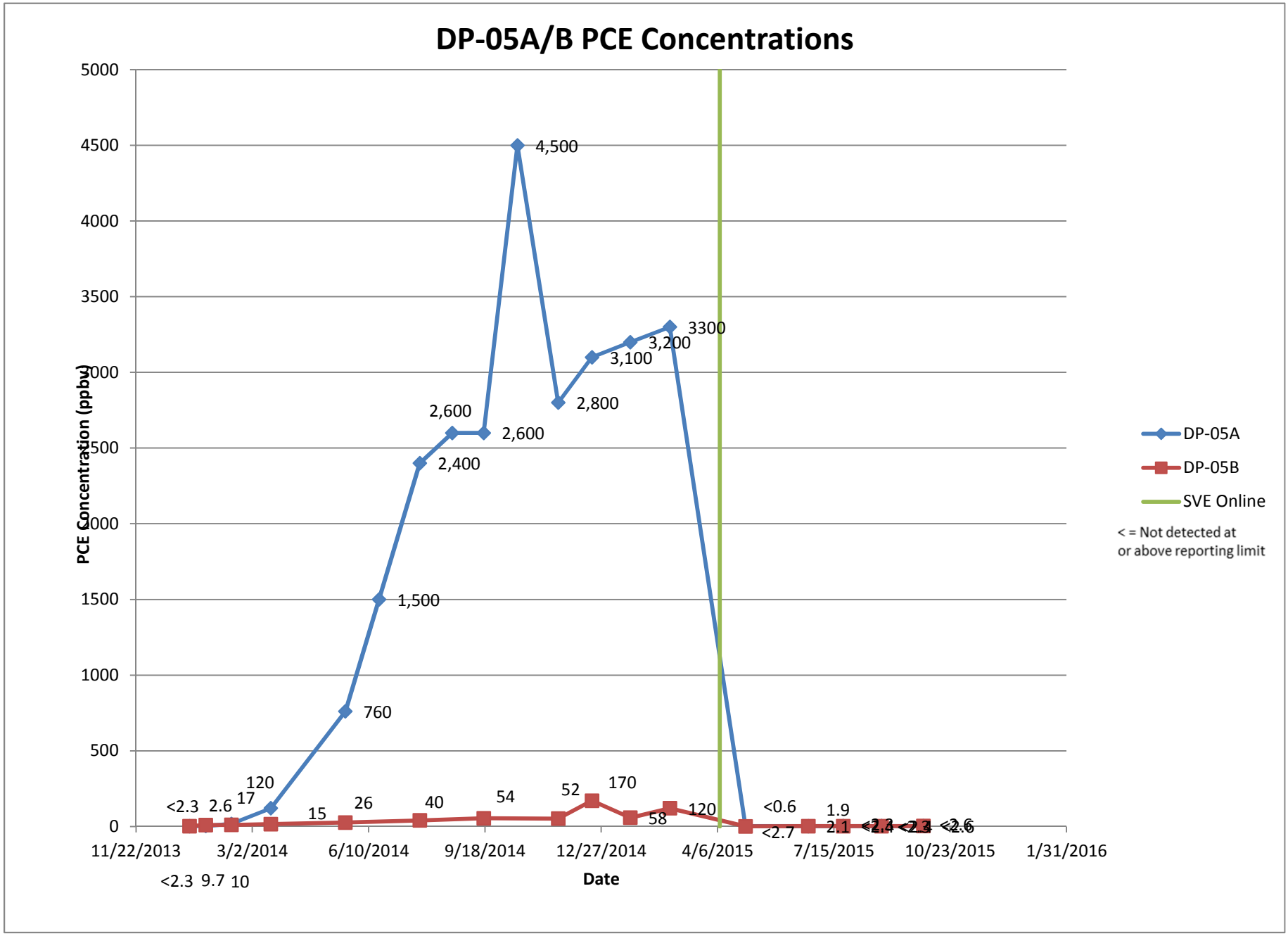

Transmatic Transmissions 931 Indoor Air and Sub-Slab
PCE Concentrations
PCE Concentration (ug/m3)
Date
931-SS-01
931-IA-01
SVE Online
< = Not detected at
or above reporting limit
11/22/2013
3/2/2014
6/13/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016

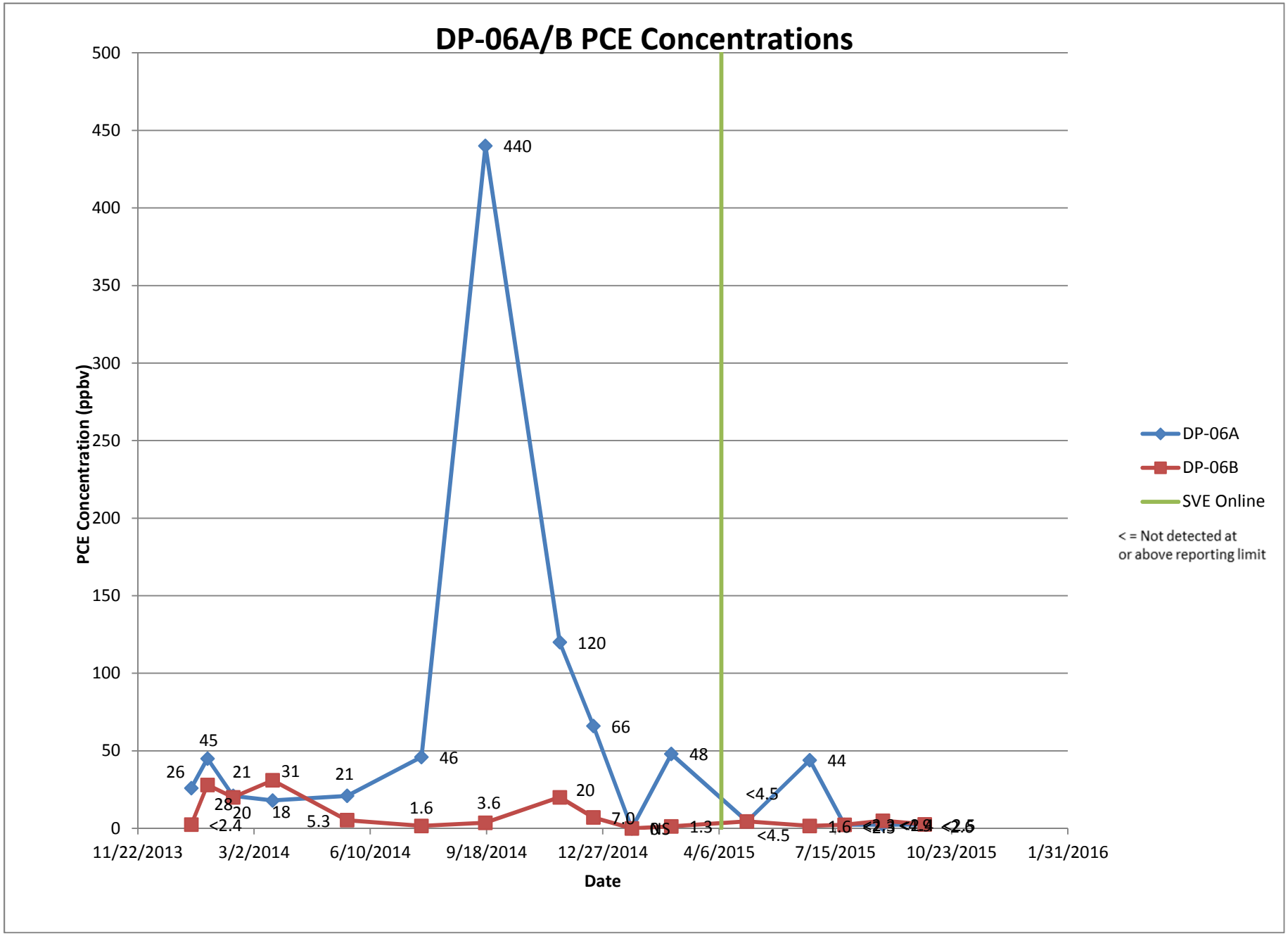

DP-01A/B PCE Concentrations
PCE Concentration (ppbv)
350
300
250
200
150
100
50
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
Date
DP-01A
DP-01B
SVE Online
45
45
1.9
130
100
3.5
150
120
110
140
120
240
210
7.3
160
150
3.1
320
210
130
60
37
72
140
3.8
0

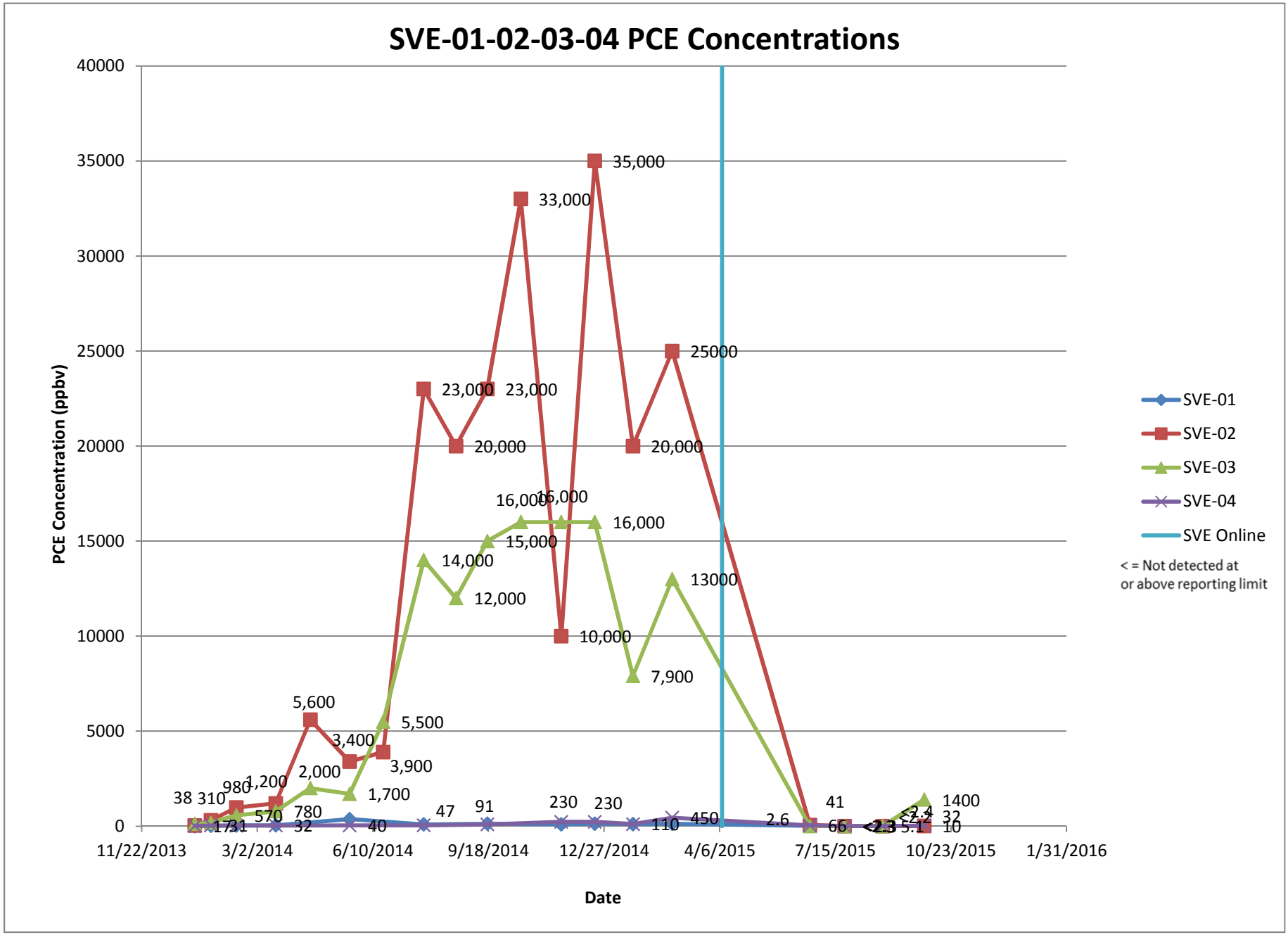

DP-02A/B PCE Concentrations
PCE Concentration (ppbv)
300
250
200
150
100
50
0
11/22/2013
1/11/2014
3/2/2014
4/21/2014
6/10/2014
7/30/2014
9/18/2014
11/7/2014
12/27/2014
2/15/2015
Date
DP-02A
DP-02B
19
1.5
20
3.0
7.4
32
76
260
10
7.0
88
73
55
60
65
69
66
6.4

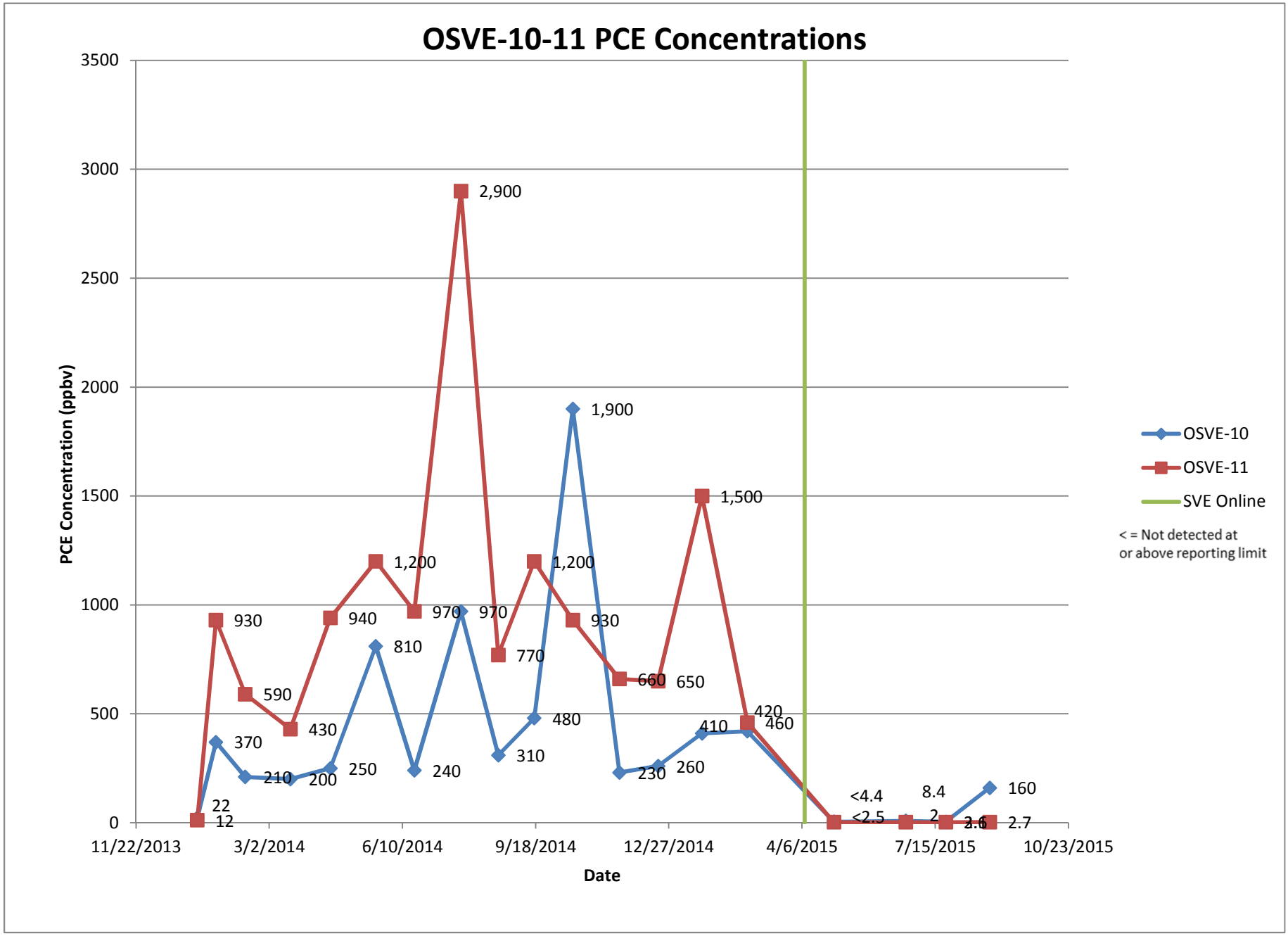

DP-03A/B PCE Concentrations
PCE Concentration (ppbv)
1200
1000
800
600
400
200
0
11/22/2013
1/11/2014
3/2/2014
4/21/2014
6/10/2014
7/30/2014
9/18/2014
11/7/2014
12/27/2014
2/15/2015
Date
1,100
1,100
1,000
820
340
140
120
56
<2.3
61
<2.4
57
12
59
80
83
11
7.9
DP-03A
DP-03B
< = Not detected at
or above reporting limit


DP-04A/B PCE Concentrations
PCE Concentration (ppbv)
80
70
60
50
40
30
20
10
0
11/22/2013
1/11/2014
3/2/2014
4/21/2014
6/10/2014
7/30/2014
9/18/2014
11/7/2014
12/27/2014
2/15/2015
Date
44
<2.6
50
45
46
48
76
2.0
30
34
33
34
41
41
41
33
DP-04A
DP-04B
< = Not detected at
or above reporting limit


DP-05A/B PCE Concentrations
PCE Concentration (ppbv)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
Date
4,500
3300
3,200
3,100
2,800
2,600
2,600
2,400
1,500
760
120
17
<2.3
2.6
15
26
40
54
52
170
58
120
<0.6
<2.7
1.9
2.1
<2.3
9.7
10
DP-05A
DP-05B
SVE Online
< = Not detected at
or above reporting limit


DP-06A/B PCE Concentrations
PCE Concentration (ppbv)
500
450
400
350
300
250
200
150
100
50
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
Date
440
120
66
45
26
21
31
21
46
48
44
28
20
18
5.3
1.6
3.6
20
7.0
1.3
<4.5
<4.5
1.6
<2.4
DP-06A
DP-06B
SVE Online
< = Not detected at
or above reporting limit


SVE-01-02-03-04 PCE Concentrations
PCE Concentration (ppbv)
Date
40000
35000
30000
25000
20000
15000
10000
5000
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
1/31/2016
35,000
33,000
25000
23,000
23,000
20,000
20,000
16,000
16,000
16,000
15,000
14,000
12,000
13000
10,000
7,900
5,600
5,500
3,400
3,900
2,000
1,700
1,200
980
310
38
570
780
32
40
47
91
230
230
110
450
2.6
41
66
1400
32
10
SVE-01
SVE-02
SVE-03
SVE-04
SVE Online
< = Not detected at
or above reporting limit


OSVE-10-11 PCE Concentrations
PCE Concentration (ppbv)
3500
3000
2500
2000
1500
1000
500
0
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
4/6/2015
7/15/2015
10/23/2015
Date
2,900
1,900
1,500
1,200
1,200
930
940
970
970
930
810
770
660
650
590
430
480
420
460
410
370
310
250
240
230
260
210
200
22
12
<4.4
<2.5
8.4
2
2.6
2.7
160
OSVE-10
OSVE-11
SVE Online
< = Not detected at
or above reporting limit

This page intentionally left blank