



**2016 Annual Status Report
Boomsnub/Airco Superfund Site
Hazel Dell, Washington**

Prepared for

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LIST OF ACRONYMS AND ABBREVIATIONS

ALS	ALS Environmental
BDCM	bromodichloromethane
BOC	The BOC Group, Inc.
Boomsnub	Boomsnub Corporation
CD	Consent Decree
COC	Contaminant of concern
DCE	Dichloroethene
EA	EA Engineering, Science, and Technology, Inc., PBC
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ft	feet
gpm	gallons per minute
IWS	in-well stripping
lb	pound
Linde	Linde LLC
µg/L	micrograms per liter
NFS	no further sampling
O&M	operation and maintenance
OU	operable unit
QASP	Quality Assurance and Sampling Plan
ROD	Record of Decision
Site	Boomsnub/Airco Superfund Site
SVE	soil vapor extraction
TCE	trichloroethene
URS	URS Group, Inc.
VOC	volatile organic compound

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EXECUTIVE SUMMARY

Introduction

This Annual Status Report summarizes information on activities that took place during 2016 at the Boomsnub/Airco Superfund Site (Site) in Hazel Dell, Washington. EA Engineering, Science, and Technology, Inc., PBC (EA), under contract to Linde LLC (Linde), is operating and maintaining a Site-wide groundwater extraction and treatment system. Work at the Site is conducted under a Consent Decree (CD) between the U.S. Environmental Protection Agency (EPA) and Linde, formerly The BOC Group, Inc. (BOC), Docket No. CO7-5163FDB, which was entered by the court on 29 June 2007 (EPA 2007).

Site Background and Operating Objectives

In 1987, the Washington State Department of Ecology (Ecology) determined that a plume of chromium-contaminated groundwater was emanating from the Boomsnub Corporation (Boomsnub) manufacturing facility. In 1991, during cleanup activities at the Boomsnub facility, a second plume containing volatile organic compounds (VOCs) was detected and determined to be coming from the Linde industrial gas production facility, located east of the Boomsnub facility. The two contaminant plumes overlap and become commingled downgradient of the source areas.

The Site is divided into three operable units (OUs) to manage cleanup activities: OU-1 (Boomsnub Soil); OU-2 (Linde Soil); and OU-3 (Site-wide Groundwater). The primary VOC of concern is trichloroethene (TCE), which serves as an indicator of VOC presence at the Site. The operating objectives are to remove sources of VOCs and chromium that may be acting as the source to groundwater, remove VOCs and chromium from the groundwater, halt the off-property migration of VOCs and chromium in groundwater, and reduce contaminant migration into the deeper Troutdale aquifer which serves as the drinking water source for the area.

In 1994 and 2001 EPA conducted removal actions at OU-1 to remove the majority of the hexavalent chromium contaminated soils which were serving as a source of hexavalent chromium in groundwater.

The OU-2 selected remedial action was a combination of in-well stripping (IWS) and soil vapor extraction (SVE) systems to remove VOCs from both the soil and groundwater. The systems became operational in February 2004. The SVE system was operated to treat the vadose zone soil in OU-2 until 2008, when it was turned off with EPA approval. The IWS system was operated to treat groundwater in OU-2, until it was turned off with EPA approval in August 2013. Following shutdown of the IWS system, groundwater samples were collected from monitoring wells within the TCE source area at an increased frequency to monitor for changes or possible rebound in VOC concentrations. Two years of post-shutdown sampling were completed in late 2015 and the results were evaluated and provided to EPA. It was agreed that the IWS system will remain off.

The OU-3 groundwater extraction and treatment system is designed to operate continuously with minimal operator supervision. The treatment system is composed of an ion-exchange system to remove chromium from extracted groundwater; and a granular activated carbon air stripper system to remove TCE and other volatile contaminants from groundwater. The treatment facility is located on the Boomsnub property. Treated groundwater is discharged to an infiltration gallery located on the Linde property. The groundwater treatment system has been in operation since 1990.

In 2008, an investigation identified another plume of VOC contamination in groundwater north of the Boomsnub/Airco Plume (OU-3 plume). This offsite plume is referred to as the Northern Plume. The Northern Plume continues to be monitored along with the OU-3 plume to evaluate potential impacts to the Site and treatment system. The source of this plume is unknown; however, EPA does not attribute this contamination to activities on the Boomsnub or Linde properties.

2016 OU-3 System Operations

During the 2016 reporting period, 65,225,777 gallons of groundwater were treated and discharged to the Linde infiltration gallery. The groundwater extraction and treatment system operated within the performance standards established for the Site. The system was in operation approximately 99 percent of the reporting period. The percent availability includes actual minutes of operation and scheduled down time. Routine monitoring of the treatment system influent and effluent was conducted throughout the year and included monthly sampling and analysis of TCE, chromium, and pH. In addition, semiannual site-wide groundwater monitoring was conducted in Spring 2016 and Fall 2016.

The mass of contaminants removed during the reporting period continued to decline compared to the previous reporting period. This is primarily due to the continuing downward trend in contaminant concentrations in Site groundwater, as reflected in the average influent concentrations of chromium and TCE at the Site over the years.

2016 Annual Screening of Groundwater Monitoring Data

Annual screening of groundwater monitoring data is conducted for each monitoring and extraction well currently sampled. The data are used to determine what changes, if any, should be made to current system operations and the well sampling schedule. The annual screening for this report was conducted in accordance with EPA's *Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions* (EPA 2013). A combination of quantitative and qualitative evaluations of the Site data was used to derive the recommendations for the annual screening.

Based on the results of the annual screening of groundwater monitoring data through 2016, the following conclusions and recommendations are made:

- Changes to sampling frequencies are recommended based on the results of the annual assessment. Well sampling frequency recommendations for 2017 are provided in Table 2 and summarized in Table 5.
- Pumping rates and plume capture should be reviewed to determine if pumping should be reduced or discontinued in the following active extraction wells where VOCs and chromium concentrations have been consistently below the cleanup levels for at least the last four sampling events: MW-6B, MW-10C, MW-21D, MW-22D, and PW-1B.

Status of Previous Recommendations for 2016

To meet the operating objectives for OU-2 and OU-3, planned activities for 2016 were recommended in the 2015 Annual Status report. The status of those planned activities is summarized below:

- **Well Sampling** – Wells were sampled in accordance with the updated sampling schedule and subsequent revisions approved by EPA.
- **Monitoring Well MW-23D** – Well MW-23D has been grouped with the Northern Plume monitoring wells for data reporting and evaluation.
- **Extraction Well Pumping Rates** – The evaluation of pumping rates and plume capture has been rescheduled for 2017.
- **Easement Agreements and Restrictive Covenants** – EA requested access to parcels on a case-by-case basis where no access agreement is in place. EPA has been asked to provide assistance in obtaining easement agreements and restrictive covenants with non-responsive property owners.
- **Infrastructure Removal** – A revised proposal for removal of selected infrastructure in the original Toe-of-Plume area is on hold until the Site Closure Plan is approved by EPA.
- **Padden Parkway Business Park** – The Padden Parkway development began in 2016 and well elevations were modified to match property grade. Two monitoring wells were decommissioned and several well elevations were modified to match the new property grade. EA began design of pipeline modifications and it is anticipated that the required modifications will be completed in Spring 2017.
- **Progress Reports** – The semiannual Site Progress Reports were combined with the semiannual Groundwater Sampling Reports and submitted for the Spring and Fall events in 2016.
- **Closure Strategy/Closure Plan** – The Site closure strategy was discussed with EPA, and EPA provided comments on the draft Closure Plan (EA 2009). A revised Closure Plan (Revision 2) was submitted to EPA in September 2016 (EA 2016f), and EPA comments on Revision 2 of the plan were received in December 2016. EA edited the Closure Plan, Revision 2 and submitted it to EPA, along with a response to comments, on 19 January 2017. The final version will be submitted after EA receives EPA approval.

Recommendations and Planned Activities for 2016

The following activities are planned during the 2017 reporting period:

- **Well Sampling** – Sample wells in accordance with the updated sampling schedule (Table 2), which has been updated based on results of the closure analysis conducted in accordance with the Site Closure Plan. Fall 2017 is anticipated to be a large sampling event which will include all wells currently in the sampling program.
- **Closure Plan** – Finalize the Site Closure Plan, with EPA approval.
- **Extraction Well Pumping Rates** – Evaluate pumping rates and plume capture to determine if pumping should be reduced or discontinued in the following active extraction wells where VOCs and chromium remediation monitoring is complete: MW-6B, MW-10C, MW-21D, MW-22D, and PW-1B.
- **Easement Agreements and Restrictive Covenants** – Continue to request EPA assistance to obtain the required agreements with non-responsive property owners including Clark County (various parcels) and parcels 144492-000, 144718-000, and 099630-000. EA will continue efforts to obtain agreements as opportunities arise.
- **Infrastructure Removal** – Following EPA approval of the Closure Plan, submit a revised proposal for removal of selected infrastructure in the original Toe-of-Plume area. This infrastructure is no longer needed for Site remediation or monitoring, and is planned for removal to allow development of Parcel No. 144718-000.
- **Padden Parkway Business Park** – Work with the owner/developer of the Padden Parkway Business Park as they develop their property. Modify the pipeline running through containment vault CV-8 to accommodate property development.
- **In-situ Treatments** – Following EPA approval of the Closure Plan, discuss with EPA the potential need for in-situ treatment in areas of residual contamination and plan an implementation strategy.

1. INTRODUCTION

This Annual Status Report summarizes information on activities that took place during 2016 at the Boomsnub/Airco Superfund Site (Site) in Hazel Dell, Washington. EA Engineering, Science, and Technology, Inc., PBC (EA), under contract to Linde LLC (Linde), is operating and maintaining a Site-wide groundwater extraction and treatment system. Work at the Site is conducted under a Consent Decree (CD) between the U.S. Environmental Protection Agency (EPA) and Linde, formerly The BOC Group, Inc. (BOC), Docket No. CO7-5163FDB, which was entered by the court on 29 June 2007 (EPA 2007).

1.1 Background

The Site is located just north of the city limits of Vancouver, Washington, as depicted on Figure 1. It includes two adjacent facilities, the former Boomsnub Corporation (Boomsnub) chrome plating facility and the Linde industrial gas production facility. The Linde plant manufactures compressed and liquefied gas products including nitrogen, oxygen, and argon. The plant also stores and distributes other specialty gases such as hydrogen and helium. The facility was built by Air Liquide America Corporation in 1963 and has been in operation since 1964.

In 1987, the Washington State Department of Ecology (Ecology) determined that a plume of chromium-contaminated groundwater was emanating from the Boomsnub facility. While cleanup activities were being conducted at the Boomsnub facility, volatile organic compounds (VOCs) were detected in groundwater samples and were suspected to be coming from the Linde property. Linde began investigating the nature and extent of VOCs in 1991. In June 1994, EPA took over the role of lead regulatory agency from Ecology and in April 1995 the Site was placed on the National Priorities List. The primary constituents of concern at the Site are hexavalent chromium and selected VOCs. Previous studies indicated that almost all chromium in groundwater was hexavalent chromium (ICF Kaiser 1999). For this reason, most historical and recent groundwater samples have been analyzed only for total chromium to represent hexavalent chromium. The primary VOC of concern is trichloroethene (TCE), which serves as an indicator of VOC presence at the Site. The chromium and TCE groundwater contaminant plumes overlapped and were commingled downgradient of the source areas. In the 1990s, the plumes were found to extend approximately 4,400 feet (ft) in a west-northwest direction from the sources.

The Site is divided into three operable units (OUs) to manage cleanup activities: OU-1, Boomsnub Soil; OU-2, BOC (Linde) Soil; and OU-3, Site-wide Groundwater. EPA conducted soil removal actions at OU-1 in 1994 and 2001 to remove the majority of the hexavalent chromium-contaminated soils serving as a source for groundwater contamination. Linde has conducted numerous site investigations, conducted a removal action, and operated a VOC source removal system on their property at OU-2.

The highest concentrations of Site contaminants have occurred in a shallow groundwater-bearing zone referred to as the alluvial aquifer. The alluvial aquifer is not used as a municipal water

supply, although a limited number of private wells pump from this aquifer. TCE and chromium have been detected, although at considerably lower concentrations, in the deeper groundwater-bearing zone, the Troutdale aquifer. The Troutdale aquifer serves as a municipal water supply for the city of Vancouver and Clark County. Municipal water supply wells are not located in areas known to contain elevated concentrations of chemicals detected at the Site.

A groundwater extraction and treatment system is used to capture and treat Site groundwater. The groundwater extraction and treatment system has been operational since 1990 and was constructed along the axis of the chromium plume. Since the initial system was installed, it has been modified, upgraded, and expanded several times to handle the VOCs and chromium, to increase pumping and treatment capacity, and to increase removal efficiency. The monitoring and extraction well network for the Site is presented on Figure 2. In recent years, selected portions of the extraction system have been shut down as the contaminant plumes have decreased in extent.

Chromium is removed from the extracted groundwater using an ion-exchange system. VOCs are removed from the extracted groundwater using air stripping with granular activated carbon treatment of the off-gases. The treatment facility is located on the Boomsnub property. Treated groundwater is discharged to an infiltration gallery located on the Linde property. The infiltration gallery was constructed during September and October 2005 and began receiving water in February 2006 (EA 2006). Prior to construction of the infiltration gallery, the treated groundwater was discharged to the City of Vancouver sanitary sewer system.

The Record of Decision (ROD) for the Site, dated February 2000, identified the remedy for OU-3 as continued groundwater extraction and treatment until groundwater cleanup levels are achieved throughout the groundwater plume (EPA 2000). The remediation goals include the reduction of total chromium in groundwater to 80 micrograms per liter ($\mu\text{g/L}$) and the reduction of TCE to 5 $\mu\text{g/L}$. The ROD also identified other Site chemicals of concern and their cleanup levels as follows: bromodichloromethane (BDCM) (1 $\mu\text{g/L}$), carbon tetrachloride (1 $\mu\text{g/L}$), chlorodibromomethane (1 $\mu\text{g/L}$), 1,2-dichloroethane (5 $\mu\text{g/L}$), 1,1-dichloroethene (DCE) (1 $\mu\text{g/L}$), tetrachloroethene (5 $\mu\text{g/L}$), and 1,1,1-trichloroethane (200 $\mu\text{g/L}$).

An Action Memorandum was issued by EPA in September 2001, identifying the requirements for remediation activities for OU-2 (EPA 2001). On 18 September 2002, Linde and EPA entered an Administrative Order on Consent (EPA Docket Number CERCLA 10-2002-0052; EPA 2002), addressing the specific design, construction, and operational requirements for a Non-Time-Critical Removal Action for OU-2 to implement the requirements of the Action Memorandum.

On 1 April 2002, Linde assumed interim responsibility for the operation and maintenance (O&M) of the groundwater extraction and treatment system. Linde continues with O&M of the system.

In October 2002, URS Group, Inc. (URS), working under contract with EPA and in cooperation with representatives from the EPA Environmental Services Assistance Team, conducted additional soil characterization activities on the Boomsnub property around the groundwater extraction and treatment system building. The purpose of the work was to identify areas in the shallow soils (15 ft or less deep) with concentrations of chromium above the cleanup levels specified in the ROD. The results of the soil characterization activities were presented in the *Soil Characterization: Groundwater Treatment System Compound* report, finalized in April 2003 (URS 2003).

In September 2003, Linde began construction of the Non-Time Critical Removal Action at their facility to address the VOC source area (OU-2). The selected remedial action was a combination of in-well stripping (IWS) and soil vapor extraction (SVE) systems to remove VOCs from both the groundwater and soil. The systems became operational in February 2004. The SVE system was operated to treat the vadose zone soil in OU-2 until 2008, when it was turned off with EPA approval. The IWS system was operated to treat groundwater in OU-2, until it was turned off with EPA approval in August 2013.

The Toe-of-Plume Pilot Study, an *in situ* treatment program, was performed in 2006 to treat an area of recalcitrant contamination near the original toe of the groundwater contaminant plumes. Chromium and TCE concentrations in the pilot study monitoring wells have remained below the cleanup level since that time, indicating that the treatment was effective.

In 2008, an investigation identified another plume of VOC contamination in groundwater north of the Boomsnub/Airco Plume (OU-3 plume), in the area around well AMW-18 (EA 2008). This offsite plume is referred to as the Northern Plume. In May 2011, EPA and Linde performed a joint investigation of the Northern Plume area to get a better understanding of the source, extent, and concentrations of VOCs in the plume (EA 2011). A new monitoring well (AMW-64) was installed in February 2012, at the request of the EPA, to monitor the Northern Plume northwest of well AMW-18 (EA 2012). The Northern Plume continues to be monitored, along with the OU-3 plume, to evaluate potential impacts to the Site and treatment system, and in accordance with an agreement between Linde and EPA. The source of this plume is unknown; however, EPA does not attribute this contamination to activities on the Boomsnub or Linde properties.

1.2 Purpose

The purpose of this report is to provide an overview of Site activities at OU-2 and OU-3 for the reporting period of 1 January through 31 December 2016.

1.3 Operating Objectives

The operating objectives for OU-2, identified in the 2001 Action Memorandum (EPA 2001), include the following:

- Remove VOCs from the vadose zone that may be acting as the source to groundwater.

- Remove VOCs from groundwater on the western portion of the Linde property.
- Halt off-property migration of VOCs in groundwater.

The operating objectives for OU-3 are defined in the ROD (EPA 2000). Activities at the Site are designed to meet the following overall objectives:

- Reduce contaminant migration within the alluvial aquifer (expansion of the plumes).
- Continue mass removal activities designed to restore impacted groundwater to Site-specific cleanup levels.
- Reduce contaminant migration into the Troutdale aquifer by reducing contamination in the alluvial aquifer.

1.4 Organization of this Document

This report is divided into eight sections and three appendices:

- Section 1 provides the background, purpose, and operating objectives.
- Sections 2 and 3 present summaries of the system operations and monitoring for OU-2 and OU-3, respectively.
- Section 4 provides a discussion of groundwater monitoring results and trends.
- Section 5 summarizes other Site activities conducted during the reporting period.
- Section 6 presents the results of the annual assessment of groundwater monitoring data and provides recommendations, as appropriate, for changes to the well sampling schedule.
- Section 7 summarizes the status of previously recommended activities for 2016, and presents recommendations and planned activities for 2017.
- Section 8 lists the references cited in this document.

Information on chromium and TCE concentrations in groundwater is presented in Appendices A and B, respectively. The information is presented both by well groupings and by individual wells. Appendices A and B are organized in sections, as follows:

- Tables reporting chromium and TCE groundwater concentrations for the last four semiannual sampling events are provided in Appendices A-1 and B-1, respectively. Only wells sampled during the 2016 reporting period are included in these tables.
- Graphs showing chromium and TCE concentration trends by well grouping are presented in Appendices A-2 and B-2, respectively. All wells in the active sampling program are included. These graphs allow a comparison of trends within geographical or hydrogeological groupings. They also allow immediate comparison of concentrations between wells in a grouping and the ability to identify potential outliers.

- Graphs showing chromium and TCE concentrations over time for individual wells are presented in Appendices A-3 and B-3, respectively. All wells in the Closure Monitoring Program are included.

Appendix C includes supporting information for the closure monitoring assessment, including a list of wells excluded from closure monitoring, and tables showing the results of the remediation monitoring analysis and attainment monitoring analysis for each contaminant of concern (COC).

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2. OU-2 MONITORING

This section provides a summary of the OU-2 monitoring conducted between 1 January and 31 December 2016. Groundwater sampling and analyses were conducted in accordance with the recommendations in the 2015 Annual Status Report (EA 2016b). Locations of the OU-2 treatment and monitoring wells are shown on Figure 3.

Since the IWS system was turned off in August 2013, groundwater samples from OU-2 have been collected to monitor for changes/rebound in VOC concentrations. Groundwater monitoring was conducted in Spring and Fall 2016, following EPA approval of the associated QASP addenda (EA 2016a, 2016e). Groundwater samples were collected from five OU-2 monitoring wells during the 2016 reporting period. The samples were submitted to ALS Environmental (ALS) of Kelso, Washington and analyzed for VOCs using EPA Method 8260C.

Section 4.2.2.2 provides a discussion and presents the TCE data from OU-2 wells sampled during the 2016 reporting period. Residual VOC contamination in OU-2 groundwater will continue to be monitored to evaluate the potential need for future remedial actions in this area.

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3. OU-3 SYSTEM OPERATIONS AND MONITORING

This section provides a summary of OU-3 system operations, system performance, and plume monitoring conducted from 1 January to 31 December 2016. Groundwater sampling and analyses were conducted in accordance with the procedures in the EPA-approved Site Quality Assurance and Sampling Plan (QASP; EA 2004), and subsequent EPA-approved QASP addenda (EA 2016a, 2016e).

3.1 System Operations

Routine system operation details are presented in the semiannual Progress and Groundwater Monitoring Reports (EA 2016c, 2016d, 2017). In 2016 three Progress reports were submitted to EPA due to a shift in reporting months during the combining of the Progress and Groundwater reports. The reports were combined, with EPA approval, for greater efficiency. The groundwater extraction and treatment system operated within the performance standards established for the Site.

3.1.1 Groundwater Extraction System

The extraction well pumping rates were recorded once a month during the reporting period. The recorded pumping rates are shown in Table 1. With the exception of well MW-14E, there were no major changes to extraction well pumping rates during 2016. The pump in well MW-14E stopped working in June and was removed in July. The well was re-developed, and the pump was fixed and restarted on 22 September 2016.

3.1.2 Groundwater Treatment System

Routine monitoring of the treatment system influent and effluent was conducted throughout the year including monthly sampling and analysis of VOCs, chromium, and pH. Treatment system components are briefly described in the following sections.

3.1.2.1 Ion-Exchange and Air Stripper Systems

As reported in the Progress and Groundwater Monitoring Reports (EA 2016c, 2016d and 2017) monthly influent and effluent sample concentrations were used to determine approximate chromium and TCE removal rates on a monthly basis. In 2016, the ion-exchange system had an annual average chromium removal rate of approximately 98 percent and the air stripper system an annual average VOC removal rate of approximately 98 percent.

3.1.2.2 Linde Infiltration Gallery

Treated groundwater from the Site treatment system is discharged back into the alluvial aquifer through an infiltration gallery. The infiltration gallery is located in the southeast corner of the Linde property and is designed to accept treated water at 160 gallons per minute (gpm). During

2016, the average system flow rate was typical to previous years at approximately 125 gpm (Table 1). No modifications or significant repairs were made to the infiltration gallery during the reporting period.

TCE and chromium concentrations in effluent discharged to the infiltration gallery during 2016 were consistently below the maximum allowable effluent concentrations of 1.9 µg/L for TCE and 19.2 µg/L for chromium. Effluent monitoring results are provided in the Progress and Groundwater Monitoring Reports (EA 2016c, 2016d, 2017).

3.2 System Performance

OU-3 system performance for 2016 is summarized in the following table. Additional details are provided in the Progress and Groundwater Monitoring reports.

OU-3 System Performance Summary, 2016

Month	Hours/Month	Hours of Operation/Month	Availability (percent)	Flow (gallons)
January	744	744	100	5,631,741
February	696	696	100	5,280,367
March	744	741.32	99.64	5,628,171
April	720	650.5	90.35	4,935,775
May	744	739.88	99.45	5,581,116
June	720	720	100	4,935,775
July	744	744	100	5,472,622
August	744	744	100	5,424,183
September	720	720	100	5,297,596
October	744	744	100	5,696,102
November	720	720	100	5,542,506
December	744	744	100	5,799,823
2016 Totals	8,784	8,707.7	99.12	65,225,777
Note: The percent availability includes actual minutes of operation and scheduled down time.				

3.2.1 Water Treated

During the reporting period, 65,225,777 gallons of groundwater were treated and discharged to the Linde infiltration gallery.

3.2.2 System Availability

The treatment system was operational for 8,707.7 hours, or approximately 99 percent of the reporting period, exceeding the 90 percent requirement of the CD. Details are provided in the Progress and Groundwater Monitoring Reports (EA 2016c, 2016d, 2017).

3.2.3 Mass Removal

The following table presents cumulative chromium and TCE removed in 2016, along with monthly influent data and flow.

OU-3 Chromium and TCE Removal Summary, 2016

Date	Monthly Flow (gallons)	Influent Chromium (µg/L)	Influent TCE (µg/L)	Monthly Chromium Removal (lbs)	Monthly TCE Removal (lbs)	Cumulative Chromium Removed (lbs)	Cumulative TCE Removed (lbs)
January	5,631,741	52.5	13	2.5	0.6	22,392.4	2,215.5
February	5,280,367	53.4	14	2.4	0.6	22,394.7	2,216.1
March	5,628,171	52.7	14	2.5	0.7	22,397.2	2,216.7
April	4,935,775	50.7	13	2.1	0.5	22,399.3	2,217.3
May	5,581,116	49.4	13	2.3	0.6	22,401.6	2,217.9
June	4,935,775	51.6	13	2.3	0.6	22,403.9	2,218.5
July	5,472,622	45.4	11	2.1	0.5	22,406.0	2,219.0
August	5,424,183	43.6	12	2.0	0.5	22,408.0	2,219.5
September	5,297,596	44.3	11	2.0	0.5	22,409.9	2,220.0
October	5,696,102	48.9	13	2.3	0.6	22,412.3	2,220.6
November	5,542,506	46.5	16	2.2	0.7	22,414.4	2,221.4
December	5,799,823	46.7	15	2.3	0.7	22,416.7	2,222.1

Note:
 lbs = pounds
 µg/L = micrograms per liter

On the basis of measured influent and effluent concentrations and the total monthly treatment system flow, 27 pounds (lbs) of chromium and 7.1 lbs of TCE were removed by the groundwater extraction and treatment system during 2016. This brings the cumulative total mass of chromium and TCE removed to approximately 22,417 and 2,222 lbs, respectively, since initiating operations in 1990. The mass of contaminants removed during the reporting period continued to decline compared to the previous reporting period. This is primarily due to the continuing downward trend in contaminant concentrations in Site groundwater, as reflected in the average influent concentrations of chromium and TCE at the Site over the years.

Figure 4 shows the cumulative removal amounts for total chromium and TCE since June 1999. Figure 5 depicts the total chromium and TCE concentrations in the treatment system influent and effluent since 1999. Figure 6 provides a comparison of the average annual influent chromium and TCE concentrations over the last 16 years.

3.3 Plume Monitoring

3.3.1 Semiannual Site-wide Groundwater Monitoring

Semiannual Site-wide groundwater monitoring was conducted in Spring and Fall 2016, following EPA approval of the associated QASP addenda (EA 2016a, 2016e). The sampling events were conducted as planned and no significant issues or problems were encountered.

Groundwater samples were submitted to ALS of Kelso, Washington for analysis. The samples were analyzed for chromium using EPA Method 200.7 and/or VOCs using EPA Method 8260C. Groundwater monitoring results and concentration trends are discussed in Section 4.

3.3.2 Water Level Gauging Program

Depth-to-groundwater measurements were collected from monitoring and extraction wells at the Site during the Spring and Fall sampling events. Groundwater level data are collected to determine the groundwater flow direction and gradient. During both sampling events in 2016, the measurements were made while the groundwater treatment system was actively pumping to assess groundwater flow under drawdown conditions.

Generalized groundwater elevation contour maps for the alluvial and Troutdale aquifers for the Spring and Fall 2016 water level gauging events are provided in the Progress and Groundwater Sampling Reports (EA 2016d, 2017). The groundwater elevation contours maps for the Fall event are also presented as Figures 7 and 8, herein. The flow direction and horizontal gradient in both aquifers were similar to those observed previously. The alluvial aquifer groundwater elevations measured in Fall 2016 were generally about 1 to 3 ft lower than those measured in Spring 2016, reflecting the seasonal variation in rainfall. In the deeper, semi-confined Troutdale aquifer, the groundwater elevations measured in Fall 2016 were generally about 1 ft lower than those measured in Spring 2016.

The vertical hydraulic gradient varies at the Site due to the groundwater pumping. Water levels in alluvial aquifer well clusters tend to be similar at the different depths, except near active extraction wells where groundwater withdrawals impact the flow patterns. However, there is a significant downward hydraulic gradient from the alluvial aquifer to the semi-confined Troutdale aquifer.

The horizontal gradients for the alluvial and Troutdale aquifers were determined using data from the Fall 2016 water level gauging event. In the alluvial aquifer, the hydraulic gradient across the Linde property was approximately 0.008; this area is impacted by the infiltration gallery. Downgradient, within the plume area, (using an average from just west of the Linde property to the original toe-of-plume area) the gradient was approximately 0.004. The flow direction within the alluvial aquifer is generally to the west-northwest.

In the Troutdale aquifer, the average hydraulic gradient across the Site area was approximately 0.006. The flow direction in this aquifer is generally to the west-southwest.

4. GROUNDWATER MONITORING RESULTS AND TRENDS

This section presents the concentration trends observed in groundwater since 1995, when EPA assumed regulatory responsibility for the Site, with a focus on data collected during 2016. More detailed presentations of the 2016 groundwater monitoring data are provided in the Semiannual Progress and Groundwater Monitoring reports (EA 2016d, 2017).

Groundwater sampling and analyses were conducted to monitor the groundwater quality in extraction and monitoring wells in accordance with the procedures in the Site QASP (EA 2004). Task-specific QASP addenda are prepared for each sampling event to be compliant with the schedule established in the Long-Term Monitoring Plan (EA 2007) and subsequent updates. The sampling schedule is reviewed and updated annually; recommendations are presented in the Annual Status Reports. The recommended sampling schedule for 2016 was presented in the 2015 Annual Status Report (EA 2016b). The 2016 well sampling frequencies are presented in Table 2.

The Spring 2016 sampling event included wells on a semiannual sampling schedule. The Fall 2016 sampling event included wells on a semiannual, annual, and biennial (every two years) sampling schedule.

4.1 Well Groupings

To facilitate analysis of contaminant concentrations across the Site, the wells are grouped by aquifer and geographical location as follows:

- Alluvial aquifer wells
 - Upgradient wells
 - TCE Source wells (includes OU-2 monitoring wells)
 - Proximal wells
 - Intermediate wells
 - Church of God wells
 - Toe-of-Plume wells
- Troutdale aquifer wells.

The aquifer and geographic well groupings are presented on Figure 9. All wells except those identified as Troutdale aquifer wells are screened within or slightly below the alluvial aquifer.

4.2 Contaminant Concentrations and Trends

4.2.1 Overview

Groundwater monitoring results indicate that the current pumping scheme is maintaining control of the plume and that overall concentrations for both chromium and TCE continue on decreasing

trends. The extent of impacted groundwater in the alluvial aquifer, as determined from groundwater sampling data obtained in 1995 and Fall 2016, is presented on Figure 10 for chromium and on Figure 11 for TCE (OU-3 plume). These figures illustrate that groundwater remedial actions have been effective in mass removal and in reducing the footprints of both the chromium and TCE plumes. During Fall 2016, no chromium concentrations exceeded the Site cleanup level in downgradient wells, indicating that chromium contamination in groundwater is now limited to the chromium source area (see Figure 10).

Chromium and TCE concentrations detected in groundwater during sampling in 2016 are presented in Appendices A-1 and B-1, respectively. The highest concentration of chromium during the 2016 reporting period was detected in the sample collected from well MW-4B (795 µg/L) during the Fall 2016 sampling event, located within the Proximal well group (in the chromium source area). The highest concentration of TCE was detected during Fall 2016 in the sample collected from well MW-23D (140 µg/L); this well has been reclassified from the Church of God well group to the Northern Plume well group. TCE concentrations in this well had been below the cleanup level of 5 µg/L since Fall 2006 and the spike in TCE concentration during the Fall 2015 sampling event appears to indicate the arrival of the Northern Plume at this well. The highest concentration of TCE detected within the OU-2/OU-3 plume was in the groundwater sample from well AMW-2A (120 µg/L), located in the TCE Source well group, during the Fall 2016 event. Wells with 2016 groundwater sampling results exceeding the Site cleanup levels of 80 µg/L for chromium and 5 µg/L TCE are highlighted on Figures 12 and 13, respectively.

For this report, tables, figures, and graphs were used to assist in evaluating groundwater trends across the Site. Chromium and TCE concentration trends are presented in Appendices A and B, respectively. The information is presented both by well groupings and by individual wells.

Specific information on trends observed within each well grouping is discussed in the following sections. Analytical results for 2016 are provided along with prior results (Spring and Fall 2015) for comparison purposes. In data summary tables presented in this report, analytical results shown in red bold are above the Site-specific cleanup level of 80 µg/L for chromium or 5 µg/L for TCE. For duplicate samples, the higher of the two results is reported.

4.2.2 Alluvial Aquifer Wells - TCE and Chromium

During the 2016 reporting period, groundwater samples were collected from all well groups.

4.2.2.1 Upgradient Wells

The Upgradient wells are located near the upgradient (eastern) Site boundary. The wells in the Upgradient well group are currently on a biennial sample schedule (sampled every two years).

Chromium

Four monitoring wells were sampled for chromium during the Fall 2016 event. The chromium concentration was below the cleanup level of 80 µg/L in all four wells sampled as presented in the following table.

Upgradient Well Chromium Concentrations, in $\mu\text{g/L}$

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
AMW-6A	--	--	--	5.8
AMW-7A	--	--	--	1.1 J
AMW-10A	--	--	--	3.7 J
AMW-11A	--	--	--	1.2 J

Note:
-- No sample collected.
J Estimated concentration.

TCE

Five monitoring wells were sampled for TCE during the Fall 2016 event. The TCE concentration remained below the cleanup level of 5 $\mu\text{g/L}$ in all five wells sampled as presented in the following table.

Upgradient Well TCE Concentrations, in $\mu\text{g/L}$

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
AMW-6A	--	--	--	0.23 J
AMW-7A	--	--	--	0.21 J
AMW-8A	--	--	--	0.37 J
AMW-10A	--	--	--	0.5 U
MW-11A	--	--	--	0.25 J

Note:
-- No sample collected.
J Estimated concentration.
U Analyte not detected above the specified reporting limit.

4.2.2.2 TCE Source Area Wells

The TCE Source Area wells are located on the western half of the Linde property (Figure 9), in the vicinity of the historic TCE-impacted soil. A source removal system was previously operated in this area. These wells are typically sampled for VOCs only, as part of the OU-2 monitoring program, as these wells are upgradient of the chromium source area.

Chromium

During the 2016 reporting period, well AMW-54A was sampled as a chromium background well. The chromium result in this well (11.8 $\mu\text{g/L}$) was below the cleanup level of 80 $\mu\text{g/L}$.

TCE

During the 2016 reporting period, TCE concentrations were below the 5 $\mu\text{g/L}$ cleanup level in groundwater samples collected from two of the five wells sampled, as presented in the following table.

TCE Source Area Well TCE Concentrations, in µg/L

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
AMW-1A	6.1	25	0.50 U	0.44 J
AMW-2A	57	63	80	120
AMW-12A	32	31	18	19
AMW-53A	11	11	0.26 J	1.1
MW-1A	5.9	5.6	2.2	51

Note:
 J Estimated concentration.
 Results shown in **red bold** exceed the established cleanup level of 5 µg/L.

Since the IWS system was turned off in August 2013, groundwater samples from the TCE Source Area have been collected to monitor for changes/rebound in VOC concentrations. The TCE concentrations were notably higher during the fall sampling event than measured during the spring in wells AMW-2A and MW-1A. Concentrations measured in well AMW-2A increased from 80 µg/L in Spring 2016 to 120 µg/L in Fall 2016, and concentrations measured in well MW-1A increased from 2.2 µg/L in Spring 2016 to 51 µg/L in Fall 2016. TCE concentrations in well AMW-2A have been on an increasing trend since Fall 2013. Historically, TCE concentrations in wells in this area fluctuate, with an overall decreasing trend (Appendix B).

4.2.2.3 Proximal Wells

The Proximal wells are located west of the maintenance building (former machine shop) on the Boomsnub property and east of NE St. Johns Road (Figure 9). These wells are proximal to the chromium source. All four extraction wells in this group (MW-6B, MW-10B, MW-10C, and PW-1B) were actively pumping when they were sampled during both the spring and fall sampling events.

Chromium

During the 2016 reporting period, chromium concentrations were below the 80 µg/L cleanup level in groundwater samples collected from four of the seven wells sampled, as presented in the following table.

Proximal Well Chromium Concentrations, in µg/L

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
MW-2A	--	39.8	--	91.9 J
MW-3A	--	--	--	98.3
MW-4B	--	702	--	795
MW-6B	25.7	13.5	27.1	11.4
MW-10B	35.2	33.5	36.5	28.4
MW-10C	71	58.8	75.6	53.1
PW-1B	39.1	38.6	56.4	38.7

Notes:
 -- No sample collected.
 J Estimated concentration.
 Results shown in **red bold** exceed the established cleanup level of 80 µg/L.

Chromium concentrations were below the 80 µg/L groundwater cleanup level, and lower than during the previous sampling event in Spring 2016, in all four extraction wells sampled semiannually. Chromium concentrations were above the 80 µg/L groundwater cleanup level in the two monitoring wells sampled annually. Well AMW-3A is sampled every two years. The chromium concentration in well MW-3A is above the cleanup level for the first time since Fall 2012 and concentrations continue to fluctuate in this well. Groundwater samples from well MW-4B continue to exhibit some of the highest concentrations of chromium in groundwater at the Site. The chromium concentration in well MW-4B has consistently remained above the cleanup level. However, concentration fluctuations are typical in these wells. Historically, groundwater from wells in the Proximal area have had large fluctuations in chromium concentrations and results from the sampling event were within the normal range of fluctuations (Appendix A).

TCE

During the 2016 reporting period, TCE concentrations were below the 5 µg/L cleanup level in groundwater samples collected from 9 of the 10 wells sampled, as presented in the following table.

Proximal Well TCE Concentrations, in µg/L

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
MW-2A	--	--	--	1.7
MW-3B	--	--	--	1.4
MW-4B	--	--	--	3.1
MW-6B	4.5	4.6	3.3	3.6
MW-9B	--	--	--	2.4
MW-10B	13	11	10	10
MW-10C	2.5	2.0	1.6	1.8
MW-12C	--	--	--	0.69
MW-13C	--	--	--	3.5
PW-1B	2.3	2.3	1.8	2.9

Note:
 -- No sample collected.
 Results shown in **red bold** exceed the established cleanup level of 5 µg/L.

The TCE concentration exceeded the cleanup level only in well MW-10B which consistently remains above the cleanup level. Historically, TCE concentrations in groundwater samples from this area have been on a decreasing trend (Appendix B).

4.2.2.4 Intermediate Wells

The Intermediate wells are located west of NE St. Johns Road, north and south of NE 78th Street (Figure 9). All five extraction wells in this area (MW-14C, MW-14E, MW-18D, MW-19D, and MW-20D) were actively pumping during both the Spring and Fall 2016 sampling events.

Chromium

During the fall sampling event, chromium concentrations were below the 80 µg/L cleanup level in all five wells sampled, as presented in the following table.

Intermediate Well Chromium Concentrations, in µg/L

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
MW-14C	59.7	58.2	62.6	51.5
MW-14E	44.3	44.5	49.3	42.1
MW-18D	88.9	87.2	86.5	74
MW-19D	88.9	91.7	91.6	79.5
MW-20D	58	56.6	58.1	50
Note: -- No sample collected. Results shown in red bold exceed the established cleanup level of 80 µg/L.				

Notably, chromium concentrations in wells MW-18D and MW-19D dropped below the cleanup level for the first time. The chromium concentrations in all five wells sampled were lower in the Fall 2016 event than during the previous sampling event in Spring 2016. Chromium concentrations in groundwater samples from wells in this area continue on an overall decreasing trend (Appendix A).

TCE

TCE concentrations were below the 5 µg/L groundwater cleanup level in three of the seventeen wells sampled in this area (Appendix B). Seven of these wells (AMW-16, AMW-17, AMW-18, AMW-23, AMW-64 MW-23D, and MW-38) were sampled to monitor the offsite Northern Plume. TCE concentrations in six of the Northern Plume monitoring wells remain above the cleanup level as shown in the following table.

Northern Plume Well TCE Concentrations, in µg/L

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
AMW-16	94	80	71	67
AMW-17	120	110	64	96
AMW-18	34	42	40	40
AMW-23	--	--	--	0.50 U
AMW-64	53	45	28	24
MW-23D	--	130	140	140
MW-38	53	50	29	23
Note: -- No sample collected. U Analyte not detected above the specified reporting limit. Results shown in red bold exceed the established cleanup level of 5 µg/L.				

Well AMW-23, located downgradient (west) of the current Northern Plume area, was sampled per EPA request, to obtain baseline information before potential impacts by the Northern Plume. TCE was not detected in well AMW-23. TCE concentrations remain above the 5 µg/L groundwater cleanup level in the remaining six Northern Plume impacted wells sampled. TCE concentrations in groundwater from the Northern Plume wells remained relatively constant during 2016. Additional discussion of the Northern Plume, including previous monitoring results, is provided in Appendix G of the Progress and Groundwater Sampling Report (EA 2017).

TCE concentrations were below the 5 µg/L groundwater cleanup level in two of the ten OU-3 wells (not impacted by the Northern Plume) sampled in this area as shown on the following table.

OU-3 Intermediate Well TCE Concentrations, in µg/L

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
AMW-59	--	--	--	56
CPU-14	5.5	5.5	--	4.9
MW-14C	14 J	11	10	9.2
MW-14E	70	64	61	63
MW-15E	--	2.4	--	2.1
MW-18D	36	34	29	27
MW-18E	--	69	--	76
MW-19D	24	24	22	23
MW-20D	32	31	26	23
PZ-39	34	36	28	29

Note:
 -- No sample collected.
 Results shown in **red bold** exceed the established cleanup level of 5 µg/L.

TCE concentrations in groundwater samples collected from the OU-3 plume wells during 2016 remained relatively stable in comparison to previous sampling results. Notably, the TCE concentrations in well CPU-14 (4.9 µg/L) dropped below the cleanup level for the first time. Historically, TCE concentrations in groundwater samples from wells in the Intermediate area have been on a decreasing trend, except where impacted by the Northern Plume (Appendix B).

4.2.2.5 Church of God Wells

The Church of God wells are located north of NE 78th Street between the west side of the Clark County sports field complex and the western Church of God property line (Figure 9). Two extraction wells in this area (MW-21D and MW-22D) were actively pumping during both the Spring and Fall 2016 sampling events. Church of God wells sampled for chromium and TCE during 2016 are shown in the following tables.

Chromium

Chromium was not detected above the 80 µg/L cleanup level in groundwater from either of the two wells sampled, as shown in the following table.

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
MW-21D	8.3	9.1	9.6	8.7
MW-22D	20	18.6	19.1	15.1

TCE

During the 2016 reporting period, TCE concentrations in groundwater were below the 5 µg/L cleanup level in groundwater from five of the six wells sampled, as presented in the following table.

Church of God Well TCE Concentrations, in µg/L

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
AMW-27	4.2	3.3	3.2	3.0
AMW-61	--	5.5	--	5.9
CPU-12	4.0	2.2	--	2.5
MW-21D	3.2	2.8	2.5	2.4
MW-22D	3.3	2.8	2.7	2.3
Note: -- No sample collected. U Analyte not detected above the specified reporting limit. Results shown in red bold exceed the established cleanup level of 5 µg/L.				

TCE concentrations were above the 5 µg/L cleanup level in the groundwater samples collected from well AMW-61. The TCE concentrations in silt well AMW-61 fluctuate. Historically, TCE concentrations in samples collected from wells in this area have been on an overall decreasing trend (Appendix B).

4.2.2.6 Toe-of-Plume Wells

The Toe-of-Plume wells are located west of the Church of God building (Figure 9). TCE Groundwater samples were collected during the reporting period only from well MW-35, where concentrations remained below the cleanup level.

4.2.3 Troutdale Aquifer Wells – TCE and Chromium

The Troutdale aquifer serves as a municipal water supply for the City of Vancouver and Clark County. Groundwater samples were collected from three Troutdale aquifer wells, including the Bennett private well, during the 2016 reporting period.

Chromium

Chromium concentrations were below the 80 µg/L cleanup level in the one well sampled for chromium during the Fall event (Bennett, 4 U µg/L). This is consistent with previous results (Appendix A).

TCE

During the 2016 reporting period, TCE concentrations were above the 5 µg/L cleanup level in two of the three wells sampled, as presented in the following table. TCE concentrations in groundwater from wells AMW-24 and MW-33 have fluctuated somewhat but have consistently remained above the cleanup level. The TCE concentration in groundwater from the Bennett private well historically fluctuates above and below the cleanup level (Appendix B).

Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
AMW-24	--	9.9	--	8.2
BENNETT	4.2	5.2	1.8	1.7
MW-33	--	8.5	--	6.3

Notes:
 -- No sample collected.
 Results shown in **red bold** exceed the established cleanup level of 5 µg/L.

4.2.4 Other Detected VOCs

In addition to TCE, several other VOCs were detected at the Site. Routinely detected other VOCs include: tetrachloroethene; trichlorofluoromethane; 1,1,1-trichloroethane; 1,1-DCE; BDCM; chlorodibromomethane; and cis-1,2-DCE (EA 2016d, 2017). Vinyl chloride and trans-1,2-DCE were also detected in only a few wells and at estimated concentrations (above the method detection limit but below the method reporting limit) during 2016. BDCM and 1,1-DCE were the only other VOCs that exceeded the cleanup level.

Detected concentrations of BDCM exceeded the 1.0 µg/L Site-specific cleanup level, as established in the ROD (EPA 2000), in two of the forty-eight groundwater samples analyzed for VOCs during the Fall 2016 event (EA 2016d, 2017). These wells are in the alluvial aquifer Intermediate well group, where the highest TCE concentrations remain.

Detected concentrations of 1,1-DCE exceeded the 1.0 µg/L Site-specific cleanup level, as established in the ROD (EPA 2000), in four of twenty-six groundwater samples analyzed for VOCs during the Spring 2016 event, and seven of the forty-eight groundwater samples analyzed for VOCs during the Fall 2016 event (EA 2016d, 2017). During the reporting period, six wells with 1,1-DCE concentrations above the cleanup level were alluvial aquifer wells. Five of these wells are in the Intermediate well group, where the highest TCE concentrations remain, and one well (MW-23D) was in the Northern Plume Group. In addition, 1,1-DCE exceeded the cleanup level in one Troutdale aquifer well (1.1 µg/L in AMW-24) during the Fall sampling event. Results for all VOCs analyzed are provided in the Progress and Groundwater Monitoring Reports (EA 2016d, 2017).

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5. OTHER ACTIVITIES

During the 2016 reporting period, the following other activities were performed.

5.1 Easement Agreements and Restrictive Covenants

EA, on behalf of Linde, has pursued easement agreements and restrictive covenants for non-Linde owned properties, as required by Sections 25 and 26 of the CD (EPA 2007). Properties which include Site infrastructure but for which Linde has been unable to negotiate easement agreements include the following:

Easement Agreements Needed

Property Owner	Parcel Number	Reason Agreement Needed
Clark County	144505-000 and various un-numbered	Wells, vaults, pipelines
Gaither Family II LLC	144492-000	Well CPU-12
Holtgrieve Estate	144718-000	Wells, vaults, pipelines
Xylem LLC	099630-000	Well MW-33

Further progress toward gaining easement agreements and restrictive covenants from non-responsive property owners is pending EPA assistance.

5.2 Padden Parkway Development

The Padden Parkway development began in 2016. Two monitoring wells were decommissioned and several well elevations were modified to match the new property grade. EA began design of pipeline modifications and it is anticipated that the required modifications will be completed during 2017. EA plans to work with the owner/developer of the Padden Parkway Business Park as they develop their property, and modify the pipeline running through containment vault CV-8 to accommodate property development.

5.3 Closure Plan

The Site closure strategy was discussed with EPA, and EPA provided comments on the draft Closure Plan (EA 2009). A revised Closure Plan (Revision 2) was submitted to EPA in September 2016 (EA 2016f), and EPA comments were received in December 2016. EA edited Revision 2 of the Closure Plan and resubmitted it to EPA, along with responses to EPA comments, on 19 January 2017. EA plans to finalize the Closure Plan with EPA approval.

5.4 Sustainability Practices

Linde and EA have a commitment to sustainable practices. In the office and in the field, attempts are made to reduce, reuse, and recycle whenever possible. In addition, the following monitoring and O&M activities are in place:

- Using passive diffusion bags or dedicated pumps for groundwater sampling wherever possible to eliminate the use of disposable tubing and decontamination solutions.
- Using the infiltration gallery to discharge treated groundwater from the OU-3 treatment system back into the alluvial aquifer instead of to the sanitary sewer, eliminating the processing of millions of gallons per year of clean water through the city sewage treatment plant.
- Upgrading the groundwater treatment system to minimize energy usage by using variable frequency drives and smaller pumps, optimizing water flow to minimize head loss, removing redundant tanks (and pumps), and replacing air stripper packing.

6. ANNUAL ASSESSMENT OF GROUNDWATER SAMPLING

This section summarizes the annual assessment of the groundwater sampling results and sampling frequency for the Site. The purpose of this assessment is to determine if any changes should be made to the current system operations and/or well monitoring schedule. To this end, the assessment includes two primary tasks: (1) evaluation of the status of wells included in the Closure Monitoring Program, specifically with regards to progress toward completion of remediation and attainment monitoring; and (2) evaluation of recommended changes to the well sampling frequencies.

6.1 Evaluation of Closure Monitoring Wells

The procedures used to evaluate groundwater monitoring data for wells included in the Closure Monitoring Program are based on the Site closure requirements described in the Closure Plan, Revision 2 for the Site (EA 2016f), which incorporates EPA suggestions and recent EPA guidance, as discussed below. Note that in previous years, annual groundwater screening was conducted in accordance with the Site Draft Closure Plan, Revision 1 (EA 2009). The former screening procedure made use of statistical analysis to identify concentrations of COCs that were statistically below the Site-specific cleanup levels. Further references to the Closure Plan, herein, refer to the 2016 version of the plan (Revision 2).

As described in the Closure Plan, site closure will occur when the concentrations of all Site COCs in groundwater monitoring and extraction wells included in the Closure Monitoring Program have reached the Site-specific cleanup levels, as defined in the ROD. The following EPA guidance documents were used to develop the procedures in the Closure Plan to determine when the groundwater cleanup levels have been achieved:

- *Recommended Approach for Evaluating Completion of Groundwater Restoration Remedial Actions at a Groundwater Monitoring Well* (EPA 2014)
- *Guidance for Evaluating Completion of Groundwater Restoration Remedial Actions* (EPA 2013).

Site closure will occur in two phases: (1) remediation monitoring will be performed to determine when remediation is complete (see Section 6.1.1); and (2) attainment monitoring will be performed to confirm COC concentrations are expected to remain below the cleanup levels in the future (see Section 6.1.2). The Site will be closed once all Closure Monitoring Program wells have reached attainment for all COCs.

Table 3 lists the wells included in the Closure Monitoring Program for the Site, as presented in the Closure Plan (EA 2016f). Wells excluded from closure monitoring are listed on Table C-1 in Appendix C. Excluded wells include wells that have never had COC concentrations greater than the cleanup levels and wells impacted by the Northern Plume (EA 2016f).

The sections below present the results of annual screening to evaluate whether VOCs and/or chromium concentrations in groundwater from Closure Monitoring Program wells at the Site have met the requirements for remediation monitoring complete and/or attainment monitoring complete.

6.1.1 Remediation Monitoring Phase

The remediation monitoring phase refers to the phase of the remedy where remedial activities are being implemented to reach groundwater cleanup levels. Once the cleanup levels have been met decisions can be made regarding shutting off pumps in nearby extraction wells, in preparation for attainment monitoring.

The most recent four data points from each Closure Monitoring Program well were evaluated to assess whether remediation monitoring is complete for each COC in each well, in accordance with the Closure Plan (EA 2016f) and EPA guidance (EPA 2014). Remediation monitoring is considered complete for wells where all COCs have been either non-detect or reported at levels below the cleanup levels for the most recent four consecutive sampling events. These wells may be considered for decreased sampling frequency.

If certain COCs meet their cleanup levels during four consecutive sampling events in a given well but other COCs are reported at concentrations above cleanup levels during one or more of the four sampling events, then remediation monitoring is considered complete for the COCs that have been below cleanup levels for four events. A decision may be made to remove the COCs that are below the cleanup levels from the monitoring program for wells fitting this scenario.

Factors used in evaluating the status of the closure monitoring wells are presented in Table 2. In the table, wells are presented by well groupings (as presented in Section 4.1) to demonstrate what is happening in specific areas of the plume. Columns titled "Remediation Monitoring Phase Complete?" in Table 2 show the results of the analysis based on the most recent four data points for TCE, all VOCs, and chromium. Columns titled "Never Exceeded Cleanup Level?" indicate wells where no exceedance has been reported for VOCs or for chromium. Generally, in accordance with the Closure Plan (EA 2016f), COCs that have never exceeded cleanup levels in a well are excluded from the Closure Monitoring Program.

Summary data are provided in Table 2 for TCE and chromium, the primary COCs at the Site. However, as indicated in the table, for a few wells, remediation monitoring is incomplete due to other VOCs reported at concentrations exceeding cleanup levels. Specifically, wells AMW-3A and AMW-4A in OU-2 have completed remediation monitoring for TCE, but had exceedances of the cleanup levels for chlorodibromomethane and/or BDCM. Data for the other Site COCs are included on Table C-2 in Appendix C.

Closure Monitoring Program wells that are currently undergoing remediation monitoring and wells for which remediation monitoring is complete are shown on Table 3 and Figures 14 and 15 for VOCs and chromium, respectively. Note that wells classified as "Remediation Phase Complete" (yellow-shaded) on the figures are not yet ready for attainment monitoring, due to

continued groundwater extraction nearby, and therefore are not yet included as part of the attainment monitoring program.

Per the Closure Plan, more than four data points may be required to document the completion of remediation monitoring in some cases, if statistical analysis is required to evaluate a mixture of COC concentrations above and below the cleanup levels from recent sampling events (EA 2016f). However, statistical analysis was not performed as part of this annual assessment. Rather, wells with any exceedances of the cleanup level over the last four sampling events were considered, for the purposes of this assessment, to require additional remediation monitoring.

6.1.2 Attainment Monitoring Phase

The attainment monitoring phase is intended to confirm that COC concentrations will remain at or below the cleanup levels in the future. In accordance with EPA guidance, the attainment monitoring phase for each well will not begin until after the remediation monitoring phase is complete for the well and the groundwater in the vicinity is in steady state conditions.

Table 4 summarizes which of the closure monitoring wells/COCs currently meet the requirements for the initiation of attainment monitoring: (1) remediation monitoring is complete and (2) steady state conditions are present in the vicinity of the well (i.e., no pumping from extraction wells in the area has occurred for at least one month).

Cleanup attainment will be measured using eight data points, in accordance with EPA guidance (EPA 2014). As with the remediation monitoring, the attainment monitoring phase evaluation is conducted separately for each COC at each well. If the eight consecutive attainment monitoring results are either non-detect or below the cleanup level for one or more COCs in a given well, then attainment monitoring will be considered complete for that well/COC(s).

For wells that are ready for attainment monitoring, Table 4 provides a summary of their status, based on an evaluation of VOC and chromium concentrations reported from the last eight sampling events. This evaluation indicates that thirteen wells meet the requirements for attainment monitoring complete for both VOCs and chromium (or are excluded from closure monitoring for one of the COCs). For two wells (AMW-27 and MW-35), attainment monitoring is almost complete for TCE, and for one well (AMW-27), attainment monitoring is almost complete for chromium.

Closure Monitoring Program wells that are currently undergoing attainment monitoring and wells for which attainment monitoring is complete are shown on Table 4 and Figures 14 and 15 for VOCs and chromium, respectively.

Similar to remediation monitoring, statistical analysis may be used to assess completion of attainment monitoring; however, no statistical analyses were conducted for this report.

6.2 Evaluation of Sampling Frequency

As part of the annual assessment, the current sampling frequency for each well is evaluated and, if appropriate, revised. When proposing a revised sampling frequency for a well, the following factors were considered: the current sampling frequency; the use of the well at the Site; and, for closure monitoring wells, whether remediation monitoring and/or attainment monitoring is complete for VOCs and/or chromium. These factors are summarized in Table 2. Additionally, a review of graphs of historical TCE and chromium concentrations in each well sampled during 2016 (presented in Appendices A and B) was performed during the evaluation of recommended sampling frequencies for 2017.

Wells to be sampled in 2017 are included on Figure 16. Recommended sampling frequencies for 2017 are included in Table 2 and summarized in Table 5. Recommended changes in sampling frequency for Closure Monitoring Program wells are based on the factors described below:

- A number of monitoring wells meet the requirements for remediation but not attainment monitoring complete for VOCs and/or chromium. For the majority of these monitoring wells, sampling will be temporarily discontinued for VOCs and/or chromium, until attenuation monitoring begins for each well. Previously, wells were identified for “no further sampling (NFS)” when remediation monitoring was complete and sampling was not required for other purposes; however, the designation for these wells has been changed to “On Hold” to signify that sampling of these wells for attenuation monitoring will occur in future years. These wells will remain available for future sampling, if needed, and then for attainment monitoring.
- Some active extraction wells also meet the requirements for remediation monitoring complete for VOCs and/or chromium. In cases where COC concentrations in these extraction wells are stable below the cleanup levels and semiannual monitoring is not required for other purposes, the sampling frequency is recommended to be decreased from semiannual to annual for the COCs reported at concentrations below cleanup levels.
- Wells for which attainment monitoring is complete and for which sampling is not required for other purposes are designated for NFS, as no further sampling of these wells is recommended. Two wells (CPU-13 and MW-27D) have changes to sampling frequency recommended for this reason. These wells are no longer needed as sentinel wells because extraction wells MW-21D and MW-22D, located farther upgradient, no longer contain COCs at concentrations exceeding cleanup levels.
- Some wells at the site have not been sampled in a number of years, yet remediation monitoring for these wells is not complete. For example, this category includes cluster wells that did not have the highest COC concentrations in the cluster and therefore were not sampled regularly. These wells will be sampled annually going forward, in order to try to expedite the closure monitoring process.
- For two wells (AMW-3A and AMW-4A), remediation monitoring was previously determined to be complete based on TCE concentrations. However, exceedances of the

VOCs chlorodibromomethane and BDCM necessitate additional remediation monitoring in these wells.

- Three Troutdale wells (AMW-23, MW-33, and Bennett) were previously recommended for sampling every 5 years for chromium. However, no chromium concentrations exceeding the cleanup level have been reported historically in these wells. Therefore, these wells are not subject to closure monitoring for chromium, and no further sampling for chromium is recommended. Additionally, the sampling frequency for VOCs from the Bennett well is proposed to be decreased from semiannual to annual, consistent with the other Troutdale wells.
- The sampling frequency for two wells used to monitor both OU-3 and potential Northern Plume TCE impacts is proposed to be decreased. Sampling of well MW-15E for VOCs is recommended to be decreased from annual to biennial, as remediation monitoring is complete and Northern Plume impacts have not been noted to date. Sampling of well PZ-39 for VOCs is recommended to be decreased from semiannual to annual, as concentrations are steadily decreasing.

Generally, changes in sampling frequency are not recommended for Northern Plume wells or infiltration gallery wells. Four infiltration gallery wells are sampled biennially. Six Northern Plume wells are monitored semiannually for VOCs, and one additional well (AMW-23) is recommended for annual sampling of VOCs to monitor the approach of the Northern Plume (Tables 2 and 5).

Changes to monitoring frequencies, both increases and decreases, have been recommended for a number of wells, as presented in Table 2. A new criterion was adopted for this annual report, in which wells that have never had exceedances for VOCs or chromium do not require closure monitoring for those COCs. This resulted in a change to “NA” for some COCs in some of the Closure Monitoring Program wells (Table 2).

6.3 Annual Well Screening Conclusions and Recommendations

Based on the results of the annual screening of groundwater monitoring data through 2016, the following conclusions and recommendations are made:

- Changes to sampling frequencies are recommended based on the results of the annual assessment. Well sampling frequency recommendations for 2017 are provided in Table 2 and summarized in Table 5.
- Pumping rates and plume capture should be reviewed to determine if pumping should be reduced or discontinued in the following active extraction wells where VOCs and chromium concentrations have been consistently below the cleanup levels for at least the last four sampling events: MW-6B, MW-10C, MW-21D, MW-22D, and PW-1B.

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7. RECOMMENDATIONS AND PLANNED ACTIVITIES

The following sections summarize the status of activities recommended for 2016, as well as recommendations and planned activities for 2017.

7.1 Status of Previous Recommendations for 2016

To meet the operating objectives for OU-2 and OU-3, planned activities for 2016 were recommended in the 2015 Annual Status report. The status of those planned activities is summarized below:

- **Well Sampling** – Wells were sampled in accordance with the updated sampling schedule and subsequent revisions approved by EPA.
- **Monitoring Well MW-23D** – Well MW-23D has been grouped with the Northern Plume monitoring wells for data reporting and evaluation.
- **Extraction Well Pumping Rates** – The evaluation of pumping rates and plume capture has been rescheduled for 2017.
- **Easement Agreements and Restrictive Covenants** – EA requested access to parcels on a case-by-case basis where no access agreement is in place. EPA has been asked to provide assistance in obtaining easement agreements and restrictive covenants with non-responsive property owners.
- **Infrastructure Removal** – A revised proposal for removal of selected infrastructure in the original Toe-of-Plume area is on hold until the Site Closure Plan is approved by EPA.
- **Padden Parkway Business Park** – The Padden Parkway development began in 2016 and well elevations were modified to match property grade. Two monitoring wells were decommissioned and several well elevations were modified to match the new property grade. EA began design of pipeline modifications and it is anticipated that the required modifications will be completed in Spring 2017.
- **Progress Reports** – The semiannual Site Progress Reports were combined with the semiannual Groundwater Sampling Reports and submitted for the Spring and Fall events in 2016.
- **Closure Strategy/Closure Plan** – The Site closure strategy was discussed with EPA, and EPA provided comments on the draft Closure Plan (EA 2009). A revised Closure Plan (revision 2) was submitted to EPA in September 2016 (EA 2016f), and EPA comments on revision 2 of the plan were received in December 2016. EA edited revision 2 of the Closure Plan and resubmitted it to EPA, along with responses to EPA comments, on 19 January 2017. EA plans to finalize the Closure Plan with EPA approval.

7.2 Recommendations and Planned Activities for 2017

The following activities are planned during the 2017 reporting period:

- **Well Sampling** – Sample wells in accordance with the updated sampling schedule (Table 2), which has been updated based on results of the closure analysis conducted in accordance with the Site Closure Plan. Fall 2017 is anticipated to be a large sampling event which will include all wells currently in the sampling program. As discussed in Section 6.2, beginning in the Fall 2017 event, sampling every 5 years is recommended for wells that have not been recently monitored but for which remediation monitoring is not complete.
- **Closure Plan** – Finalize the Site Closure Plan, with EPA approval.
- **Extraction Well Pumping Rates** – Evaluate pumping rates and plume capture to determine if pumping should be reduced or discontinued in the following active extraction wells where VOCs and chromium remediation monitoring is complete: MW-6B, MW-10C, MW-21D, MW-22D, and PW-1B.
- **Easement Agreements and Restrictive Covenants** – Continue to request EPA assistance to obtain the required agreements with non-responsive property owners including Clark County (various parcels) and parcels 144492-000, 144718-000, and 099630-000. EA will continue efforts to obtain agreements as opportunities arise.
- **Infrastructure Removal** – Following EPA approval of the Closure Plan, submit a revised proposal for removal of selected infrastructure in the original Toe-of-Plume area. This infrastructure is no longer needed for Site remediation or monitoring, and is planned for removal to allow development of Parcel No. 144718-000.
- **Padden Parkway Business Park** – Work with the owner/developer of the Padden Parkway Business Park as they develop their property. Modify the pipeline running through containment vault CV-8 to accommodate property development.
- **In-situ Treatments** – Following EPA approval of the Closure Plan, discuss with EPA the potential need for in-situ treatment in areas of residual contamination and plan an implementation strategy.

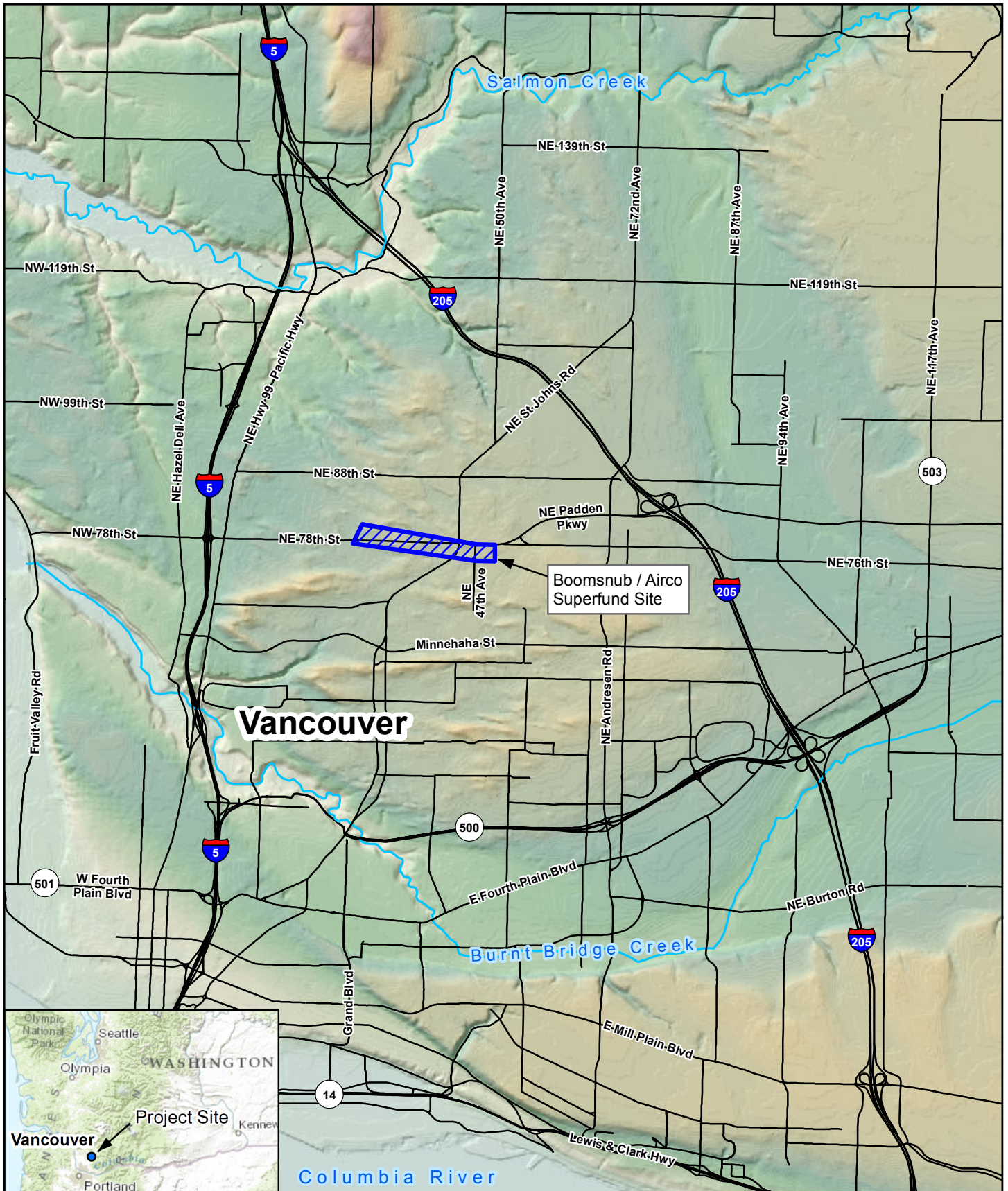
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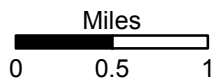
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FIGURES

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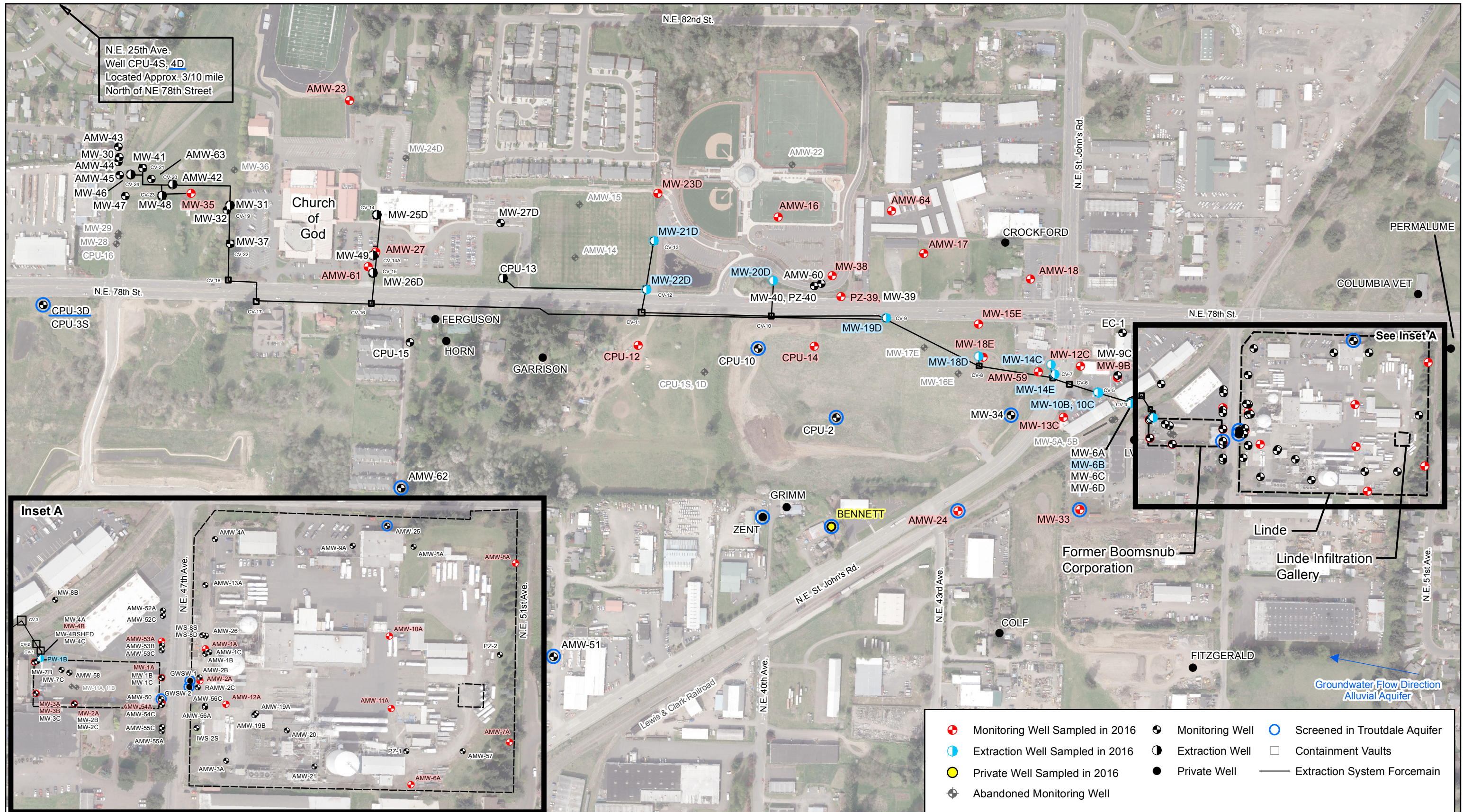


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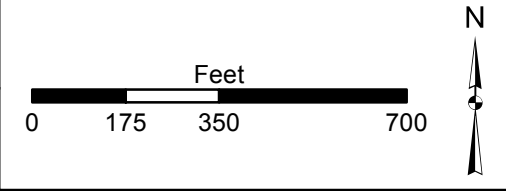
FIGURE 1
 SITE LOCATION MAP

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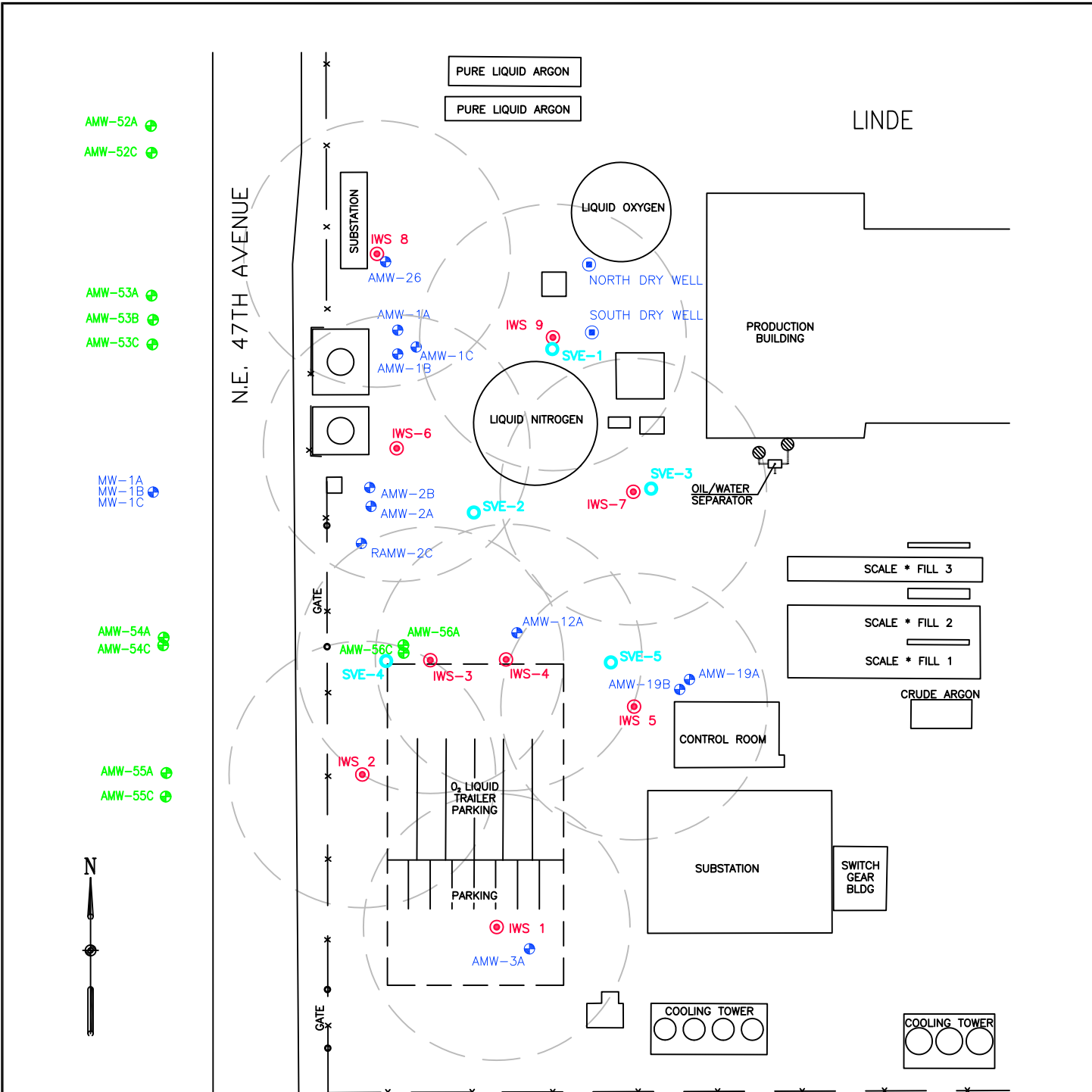


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**FIGURE 2
 MONITORING AND EXTRACTION WELL
 NETWORK**

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LINDE

NE. 47TH AVENUE

AMW-52A
AMW-52C

AMW-53A
AMW-53B
AMW-53C

MW-1A
MW-1B
MW-1C

AMW-54A
AMW-54C

AMW-55A
AMW-55C



PURE LIQUID ARGON

PURE LIQUID ARGON

LIQUID OXYGEN

NORTH DRY WELL

SOUTH DRY WELL

PRODUCTION BUILDING

LIQUID NITROGEN

OIL/WATER SEPARATOR

SCALE * FILL 3

SCALE * FILL 2

SCALE * FILL 1

CRUDE ARGON

CONTROL ROOM

SUBSTATION

SWITCH GEAR BLDG

COOLING TOWER

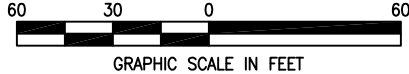
COOLING TOWER

LEGEND

- DRY WELL
- AMW-3A SOURCE AREA MONITORING WELL
- AMW-55C DOWNGRADIENT MONITORING WELL
- IWS IN WELL STRIPPING WELL
- SVE-5 SOIL VAPOR EXTRACTION WELL

IN WELL STRIPPING WELL WITH ESTIMATED 55 FEET IN WELL STRIPPING RADIUS OF INFLUENCE

- A - SCREENED AT WATER TABLE ~ 25' TO 35' BGS
- B - SCREENED AT MIDAQUIFER ~ 45' TO 55' BGS
- C - SCREENED AT BASE OF AQUIFER ~ 60' TO 70' BGS



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FIGURE 3
OU-2 TREATMENT AND MONITORING WELLS



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NOTE: WELL LOCATIONS ARE APPROXIMATE

FIGURE 4. OU-3 CUMULATIVE REMOVAL OVER TIME

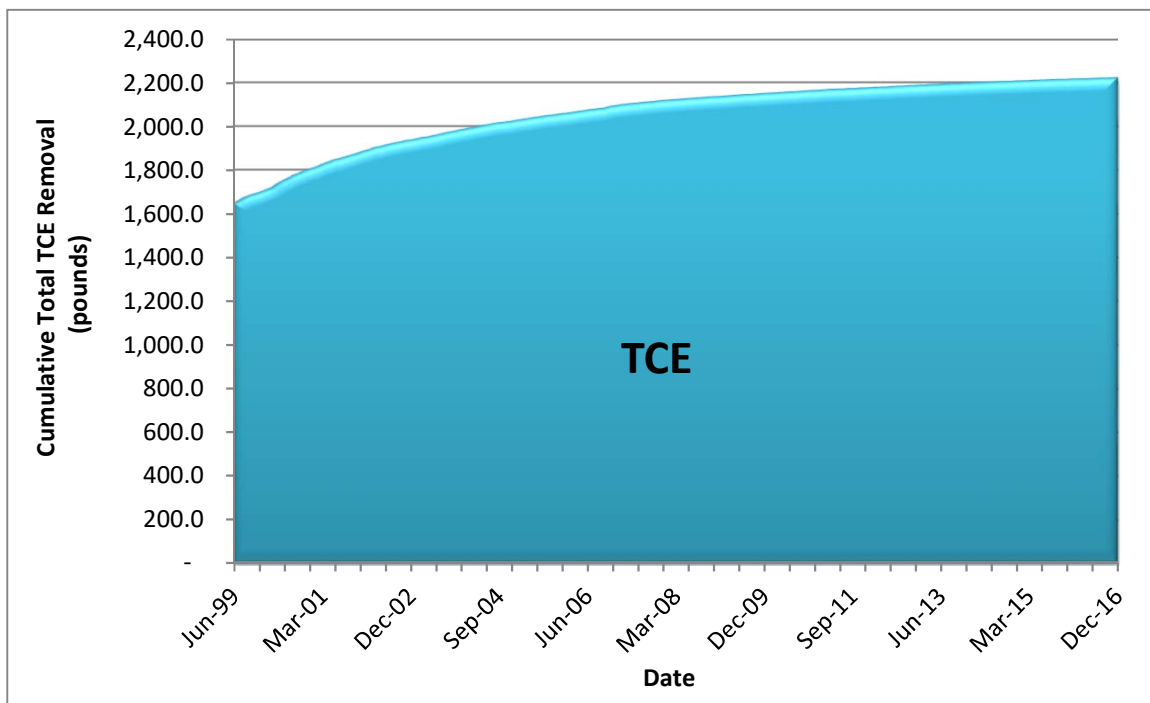
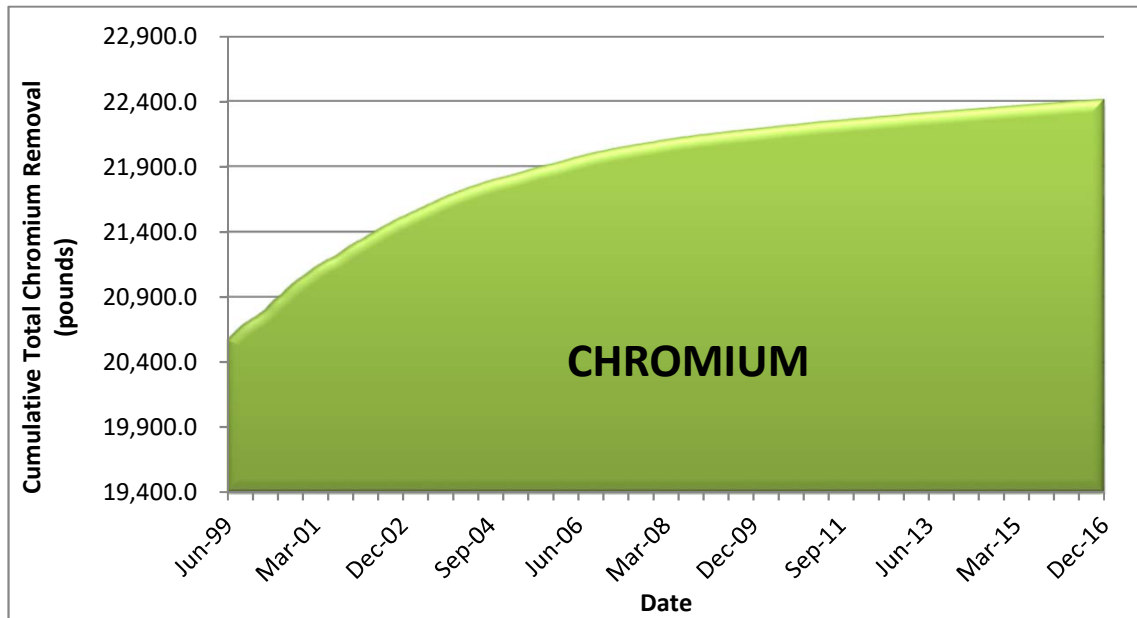


FIGURE 5. OU-3 INFLUENT AND EFFLUENT CONCENTRATIONS VERSUS TIME - LOGARITHMIC SCALE

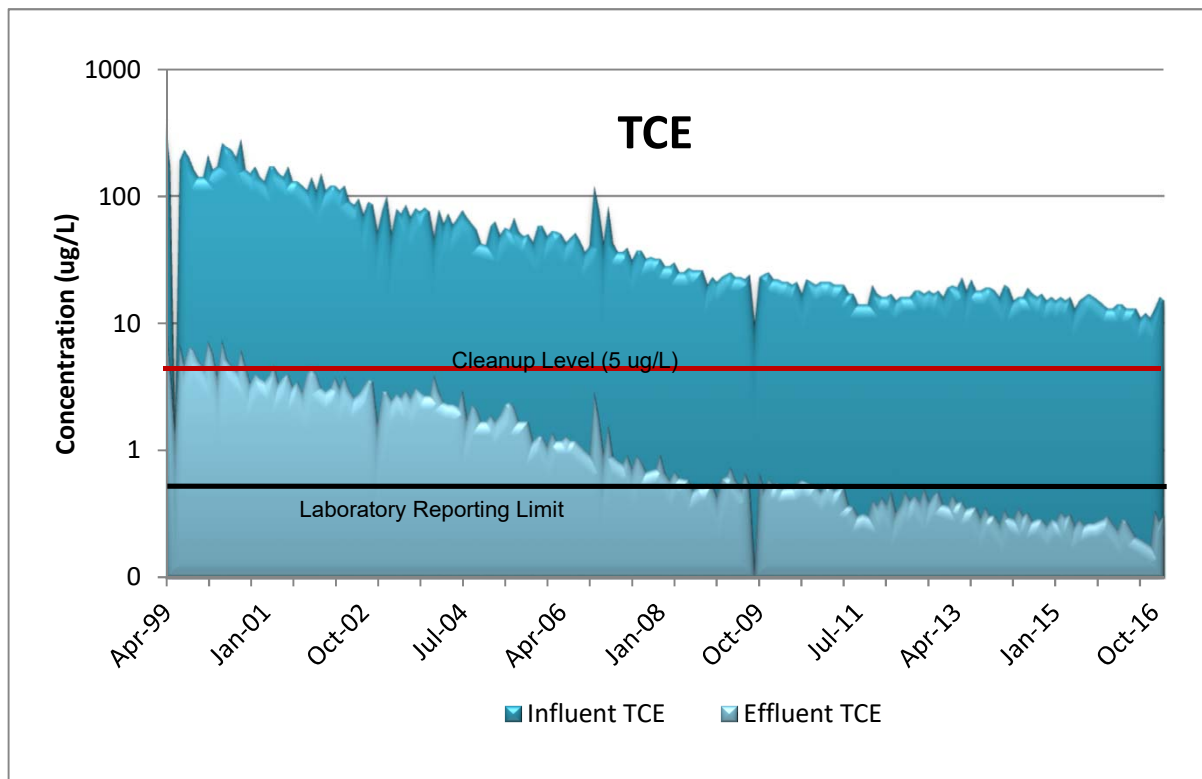
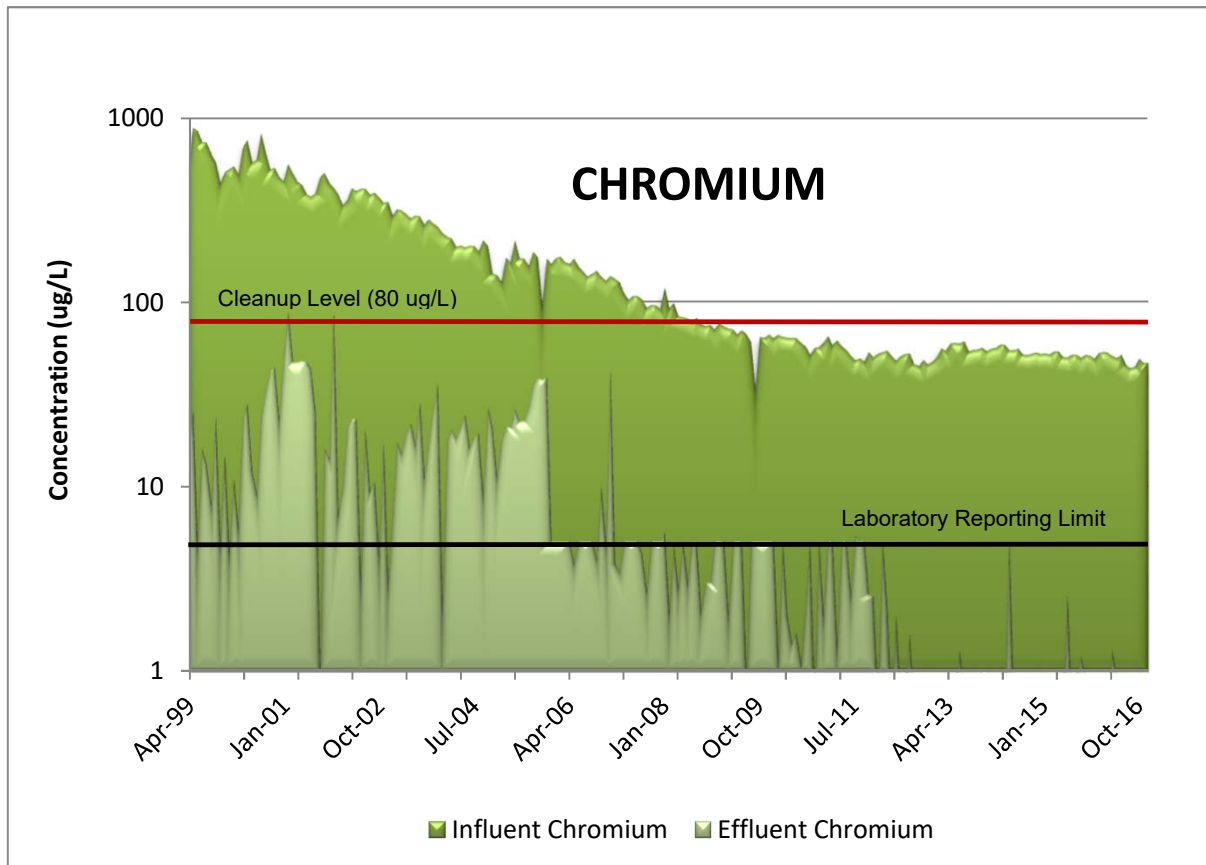
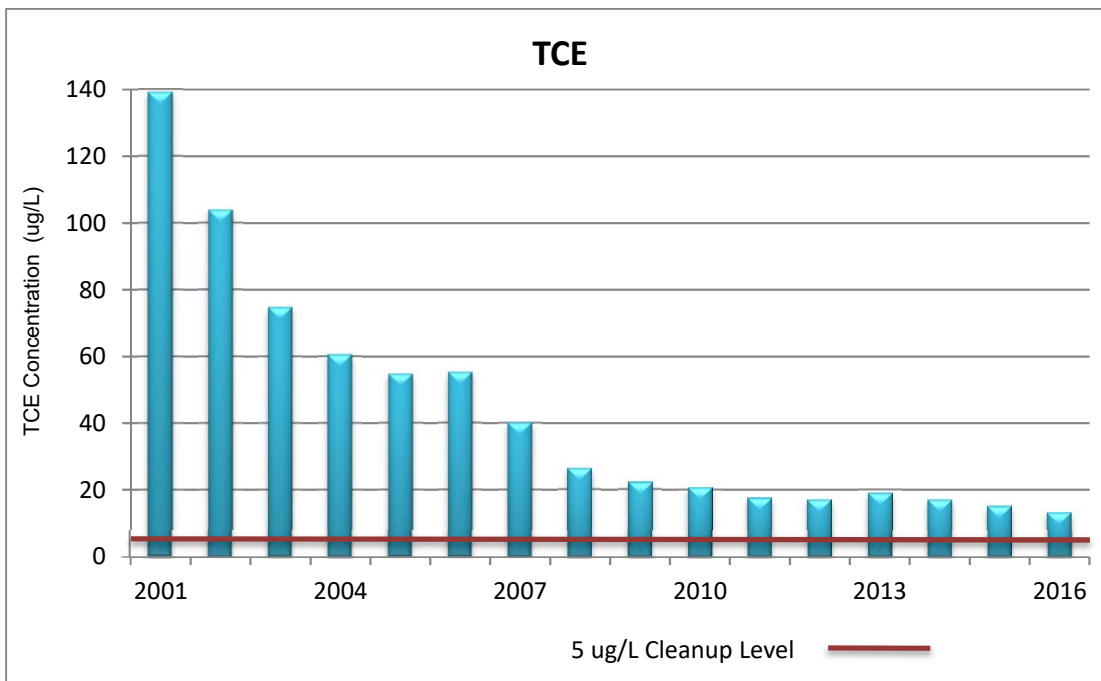
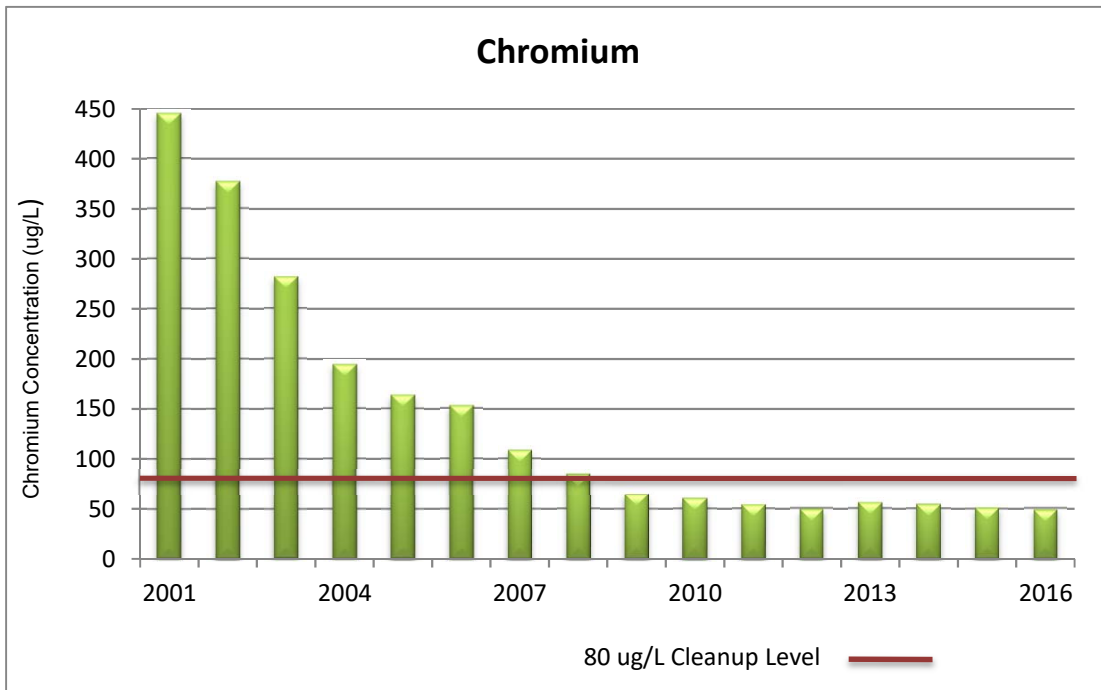
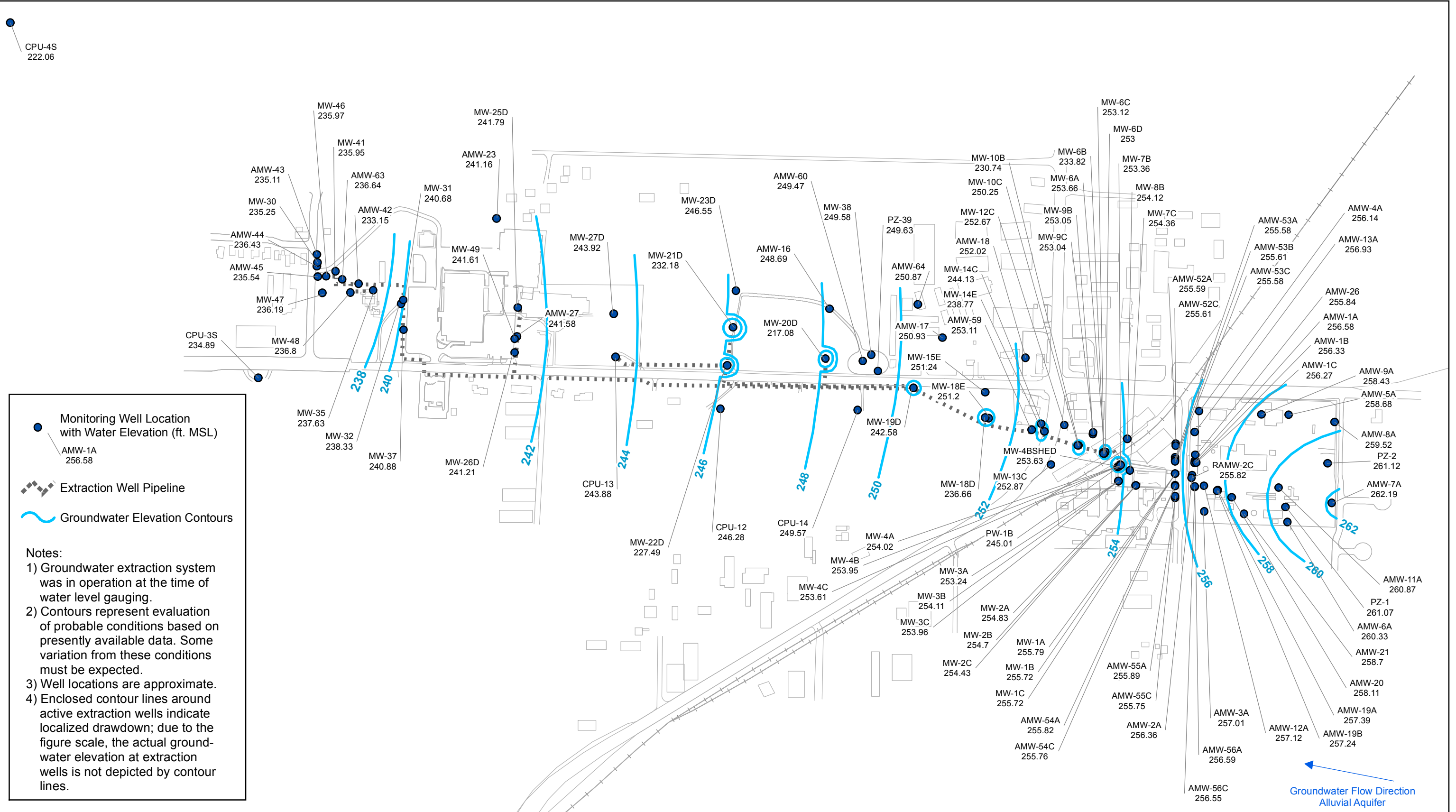


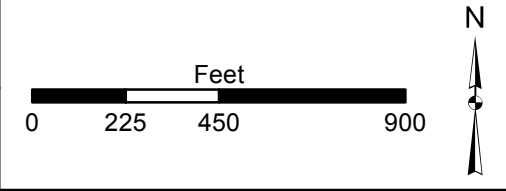
FIGURE 6. OU-3 INFLUENT CONCENTRATIONS OVER TIME



Note: Concentrations per year are an average of monthly data.



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**FIGURE 7
 ALLUVIAL AQUIFER GROUNDWATER CONTOURS
 FALL 2016**

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CPU-4D
104.79

CPU-3D
115.14

CPU-10
132.68

CPU-2
133.35

AMW-50
143.1

AMW-25
146.56

AMW-62
126.48

AMW-24
135.51

MW-33
142.08

AMW-51
126.27

Monitoring Well Location with Water Elevation (ft. MSL)

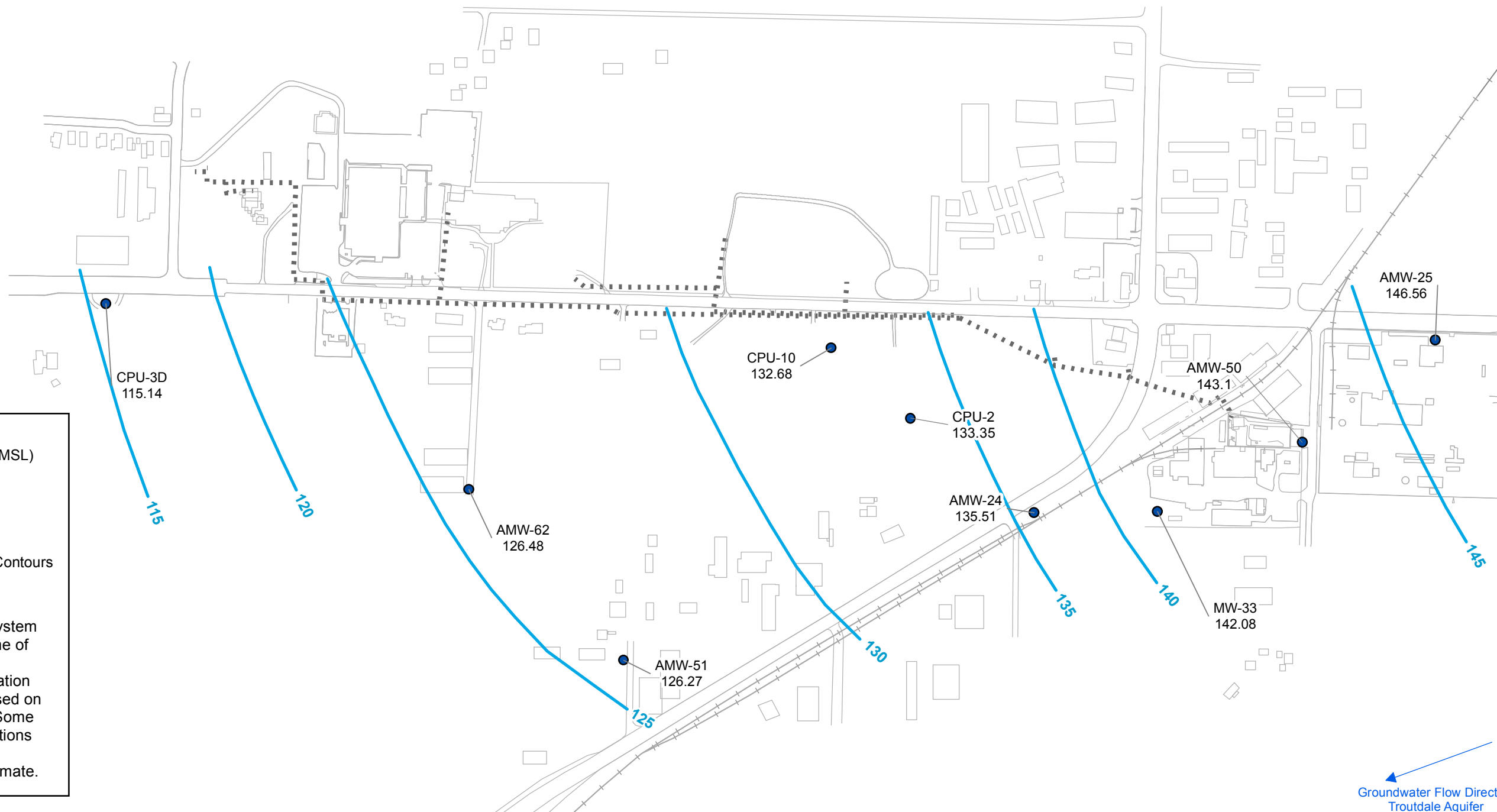
AMW-51
126.27

Extraction Well Pipeline

Groundwater Elevation Contours

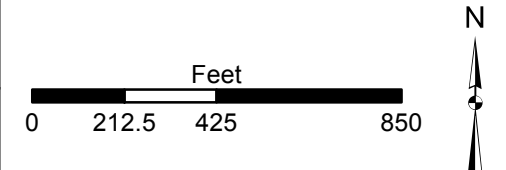
Notes:

- 1) Groundwater extraction system was in operation at the time of water level gauging.
- 2) Contours represent evaluation of probable conditions based on presently available data. Some variation from these conditions must be expected.
- 3) Well locations are approximate.



Groundwater Flow Direction
Troutdale Aquifer

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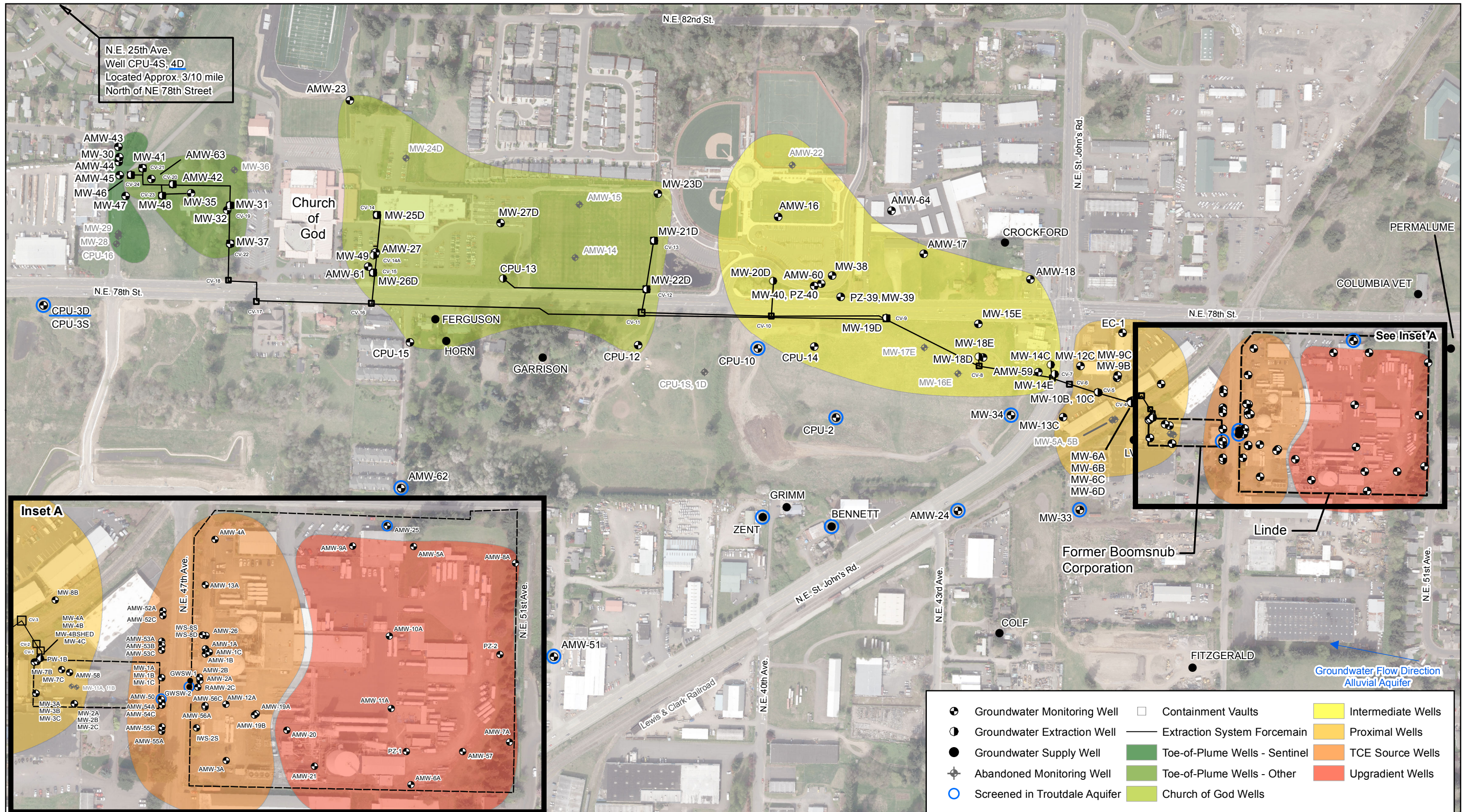


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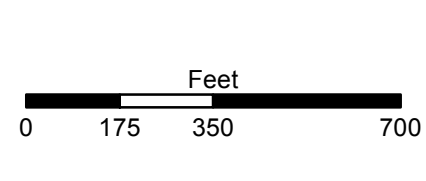
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FIGURE 8
 TROUTDALE AQUIFER GROUNDWATER
 CONTOURS
 FALL 2016

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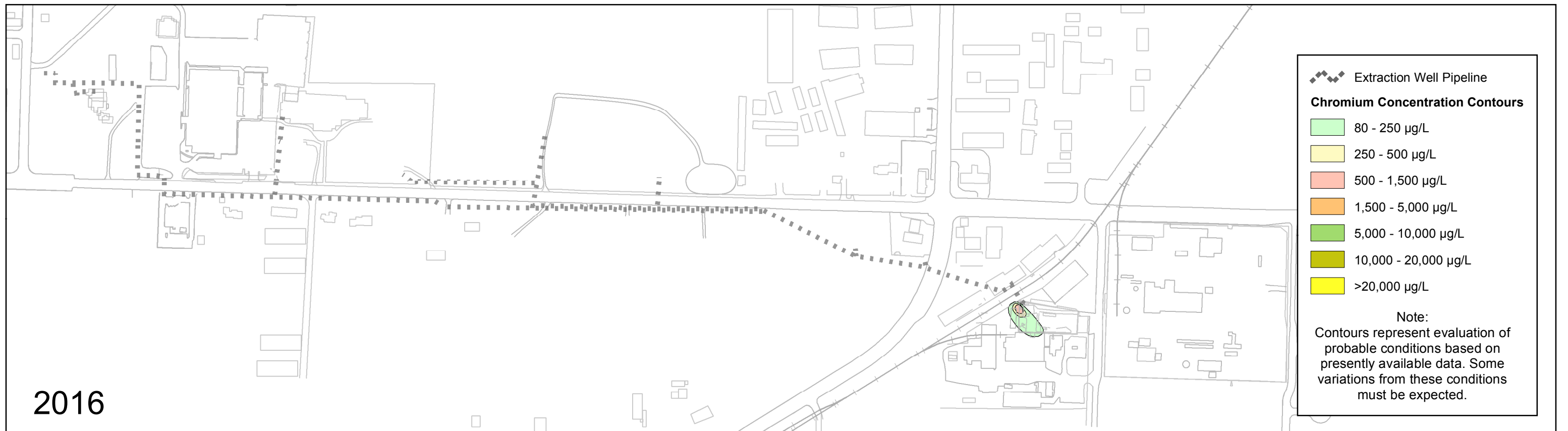
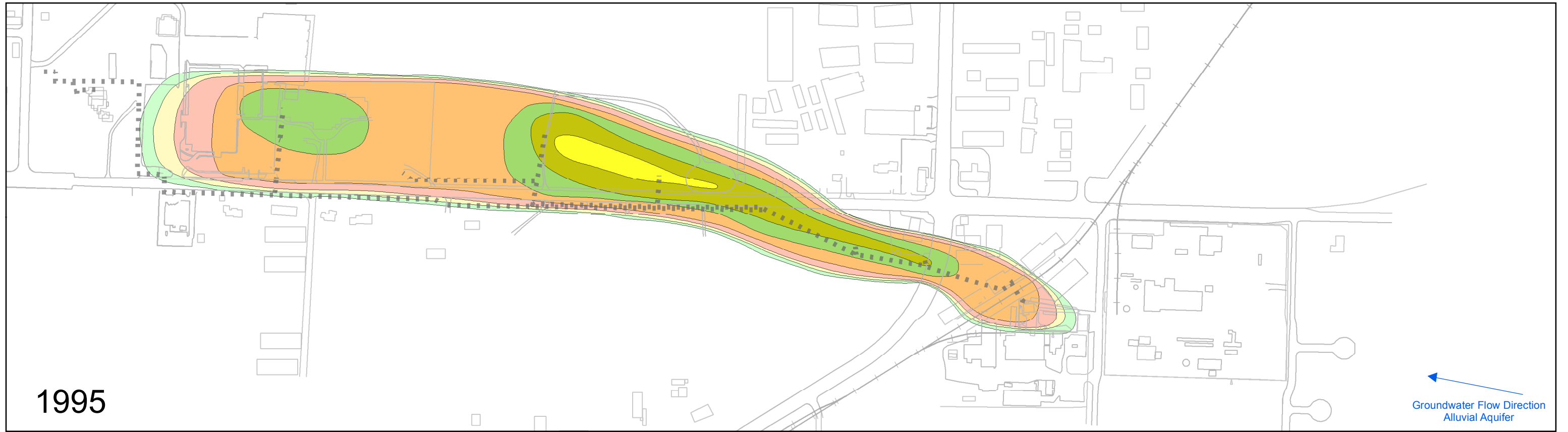


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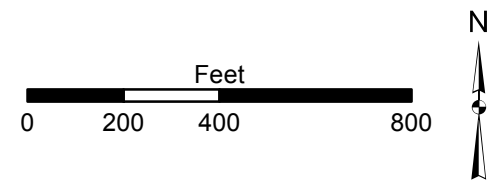
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**FIGURE 9
 EXTRACTION AND MONITORING
 WELL GROUPINGS**

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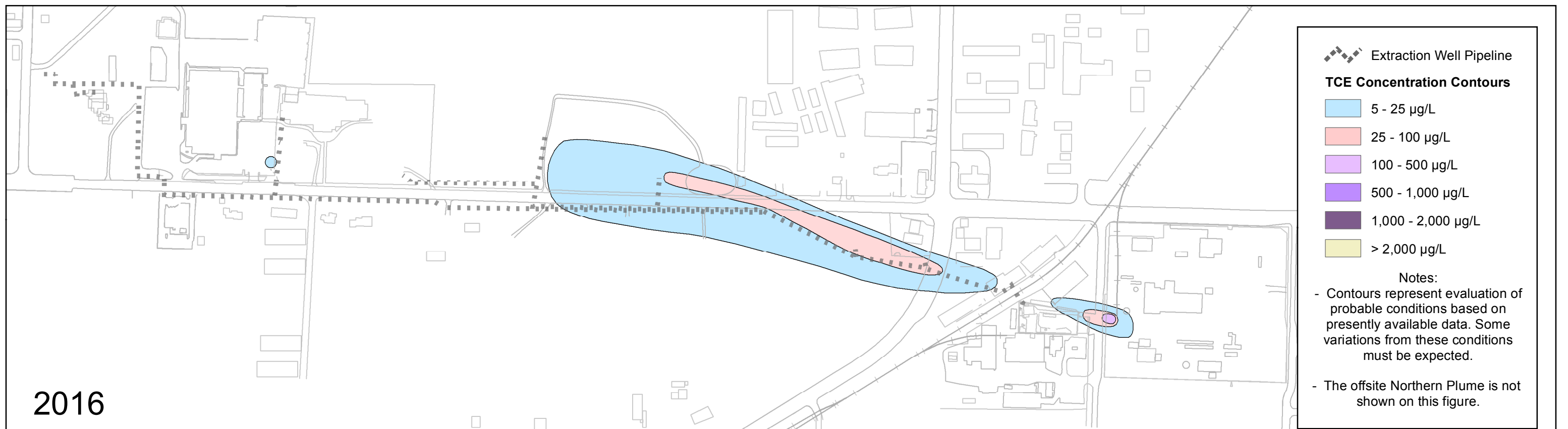
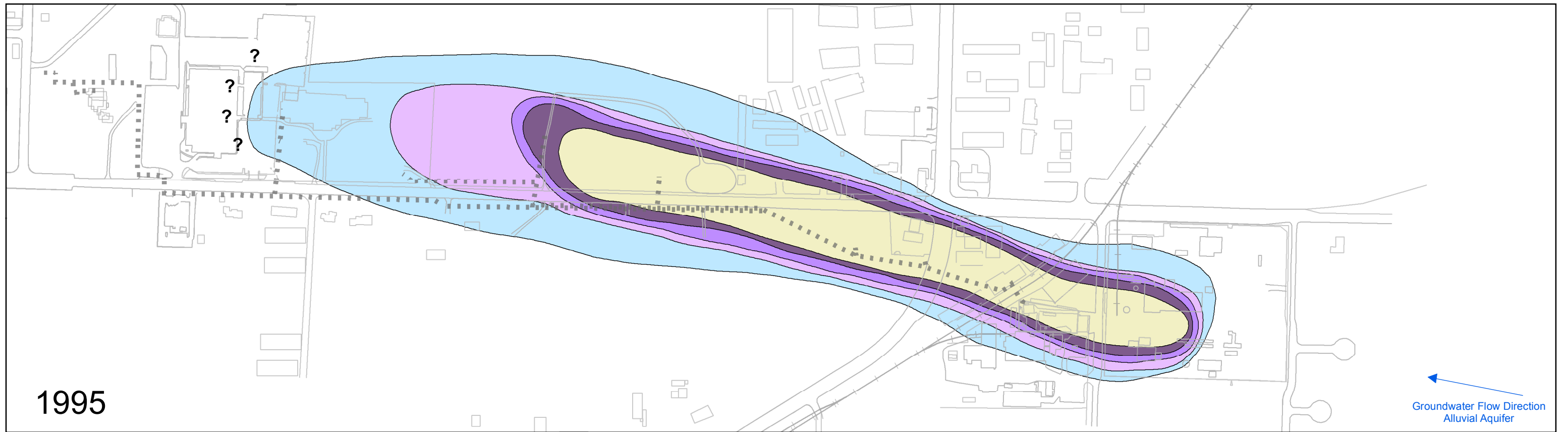


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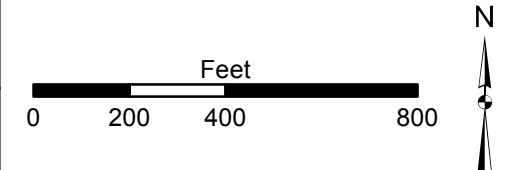
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FIGURE 10
 CHROMIUM PLUME COMPARISON
 1995 VS. 2016

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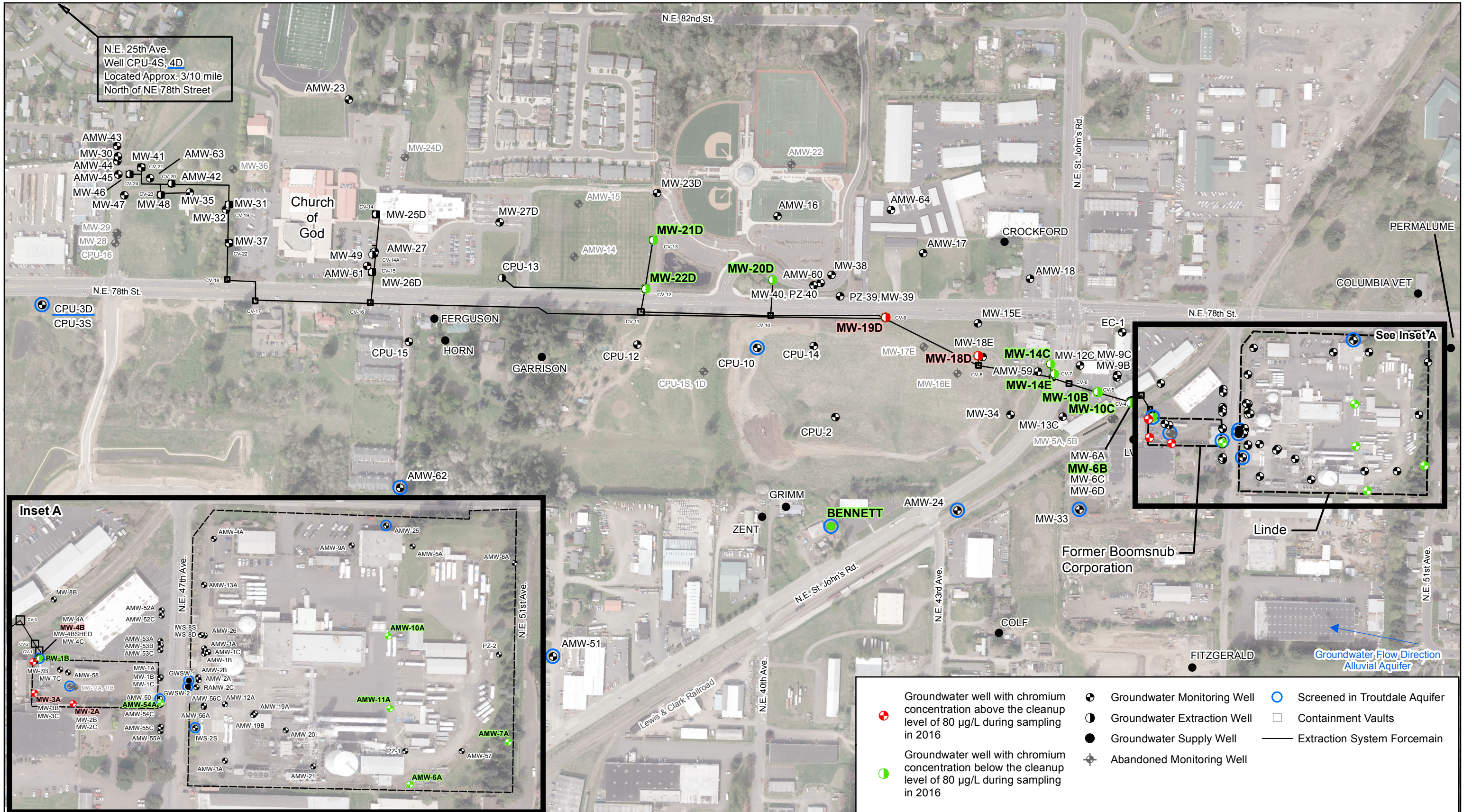


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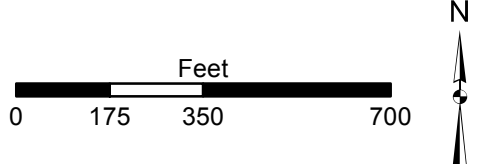
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FIGURE 11
 TRICHLOROETHENE PLUME COMPARISON
 1995 VS. 2016

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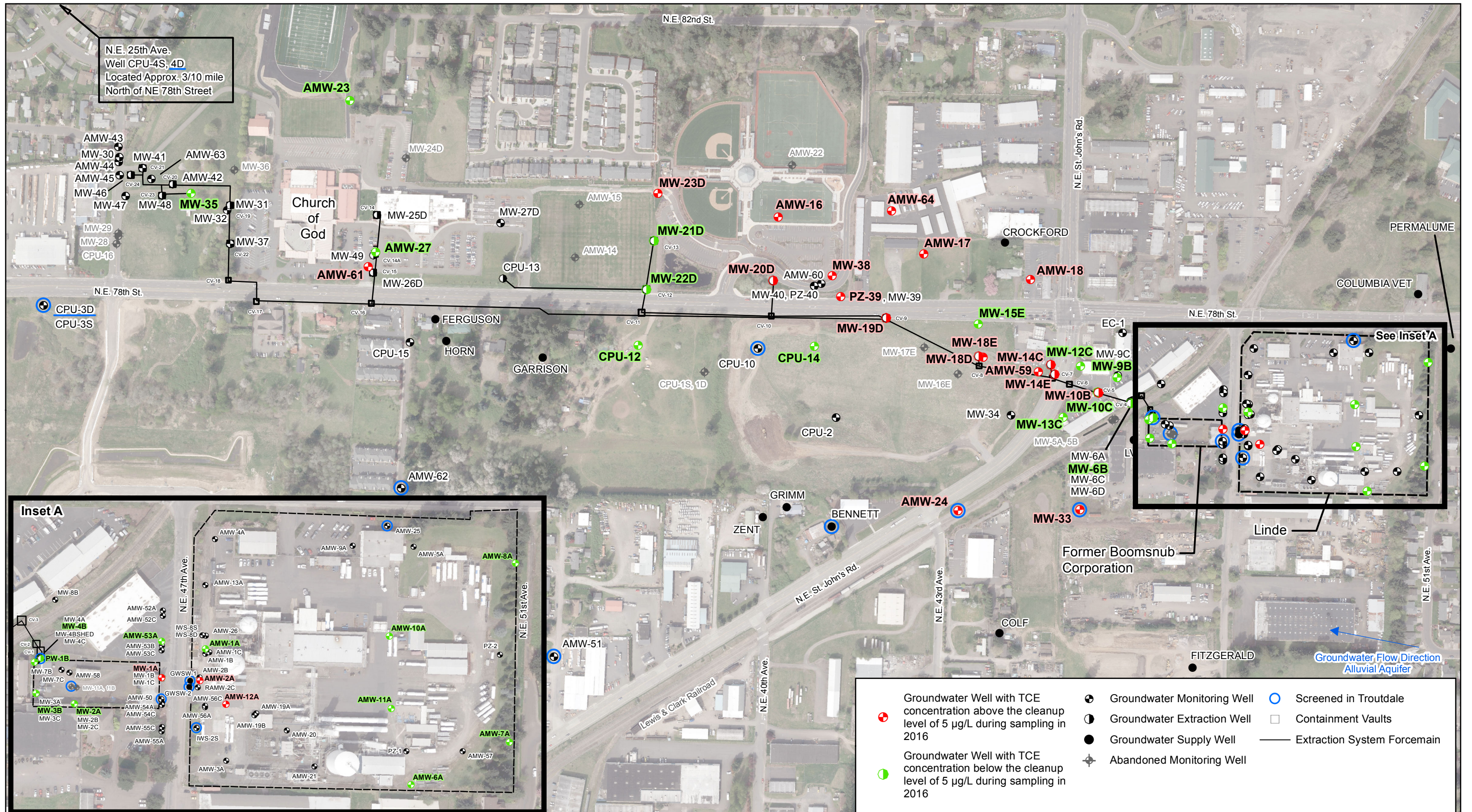


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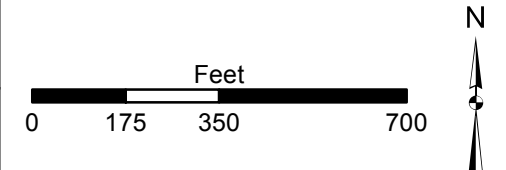
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**FIGURE 12
 WELLS WITH CHROMIUM CONCENTRATIONS
 ABOVE THE CLEANUP LEVEL IN 2016**

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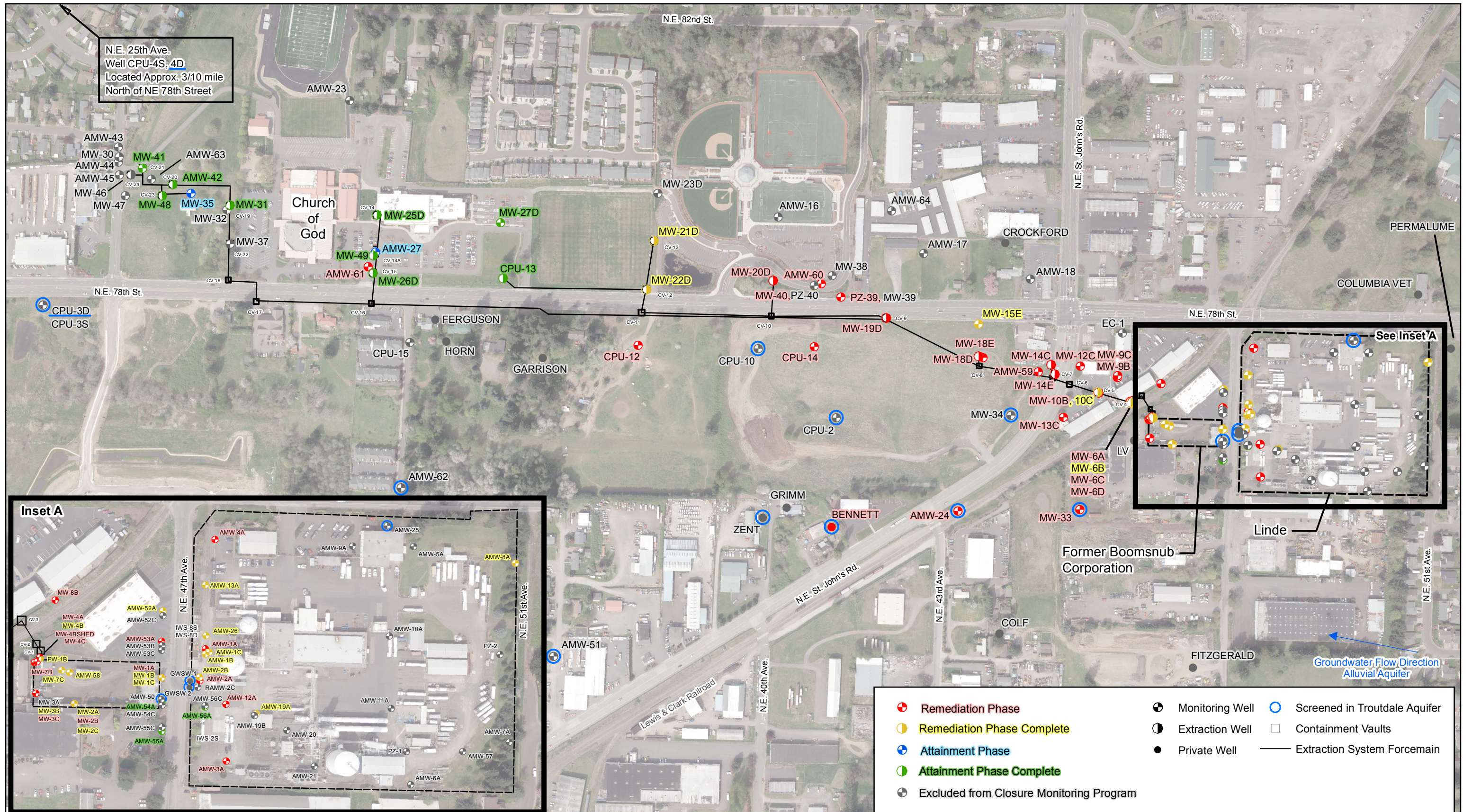


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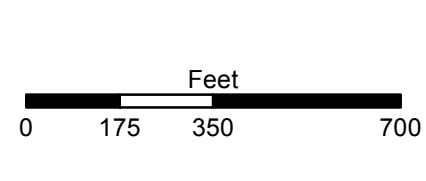
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**FIGURE 13
 WELLS WITH TCE CONCENTRATIONS
 ABOVE THE CLEANUP LEVEL IN 2016**

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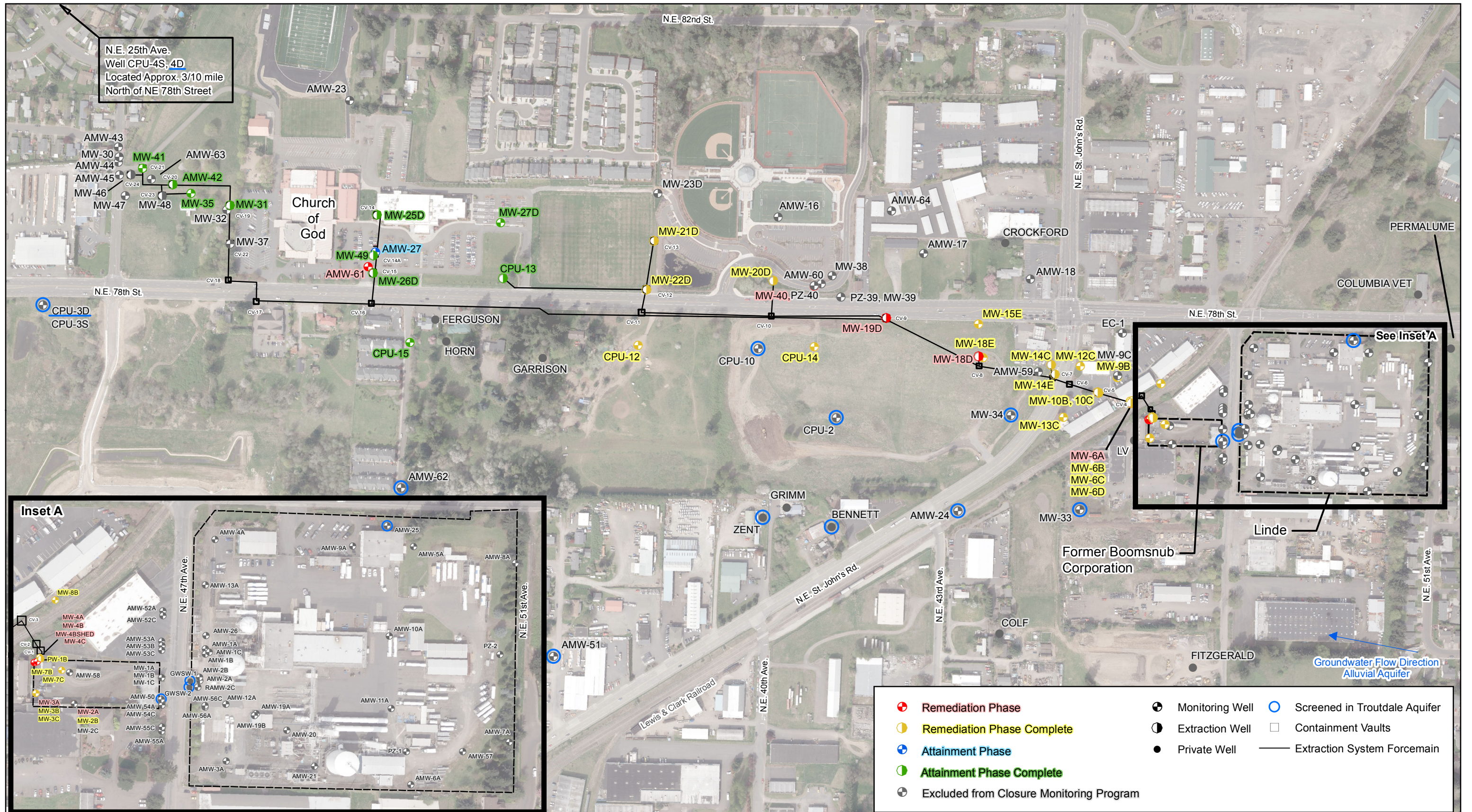


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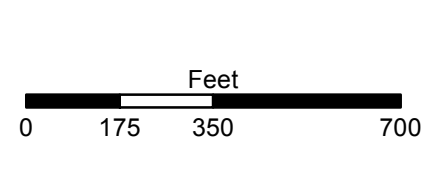
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FIGURE 14
 STATUS OF CLOSURE MONITORING PROGRAM
 VOLATILE ORGANIC COMPOUNDS
 2016 ANNUAL REPORT

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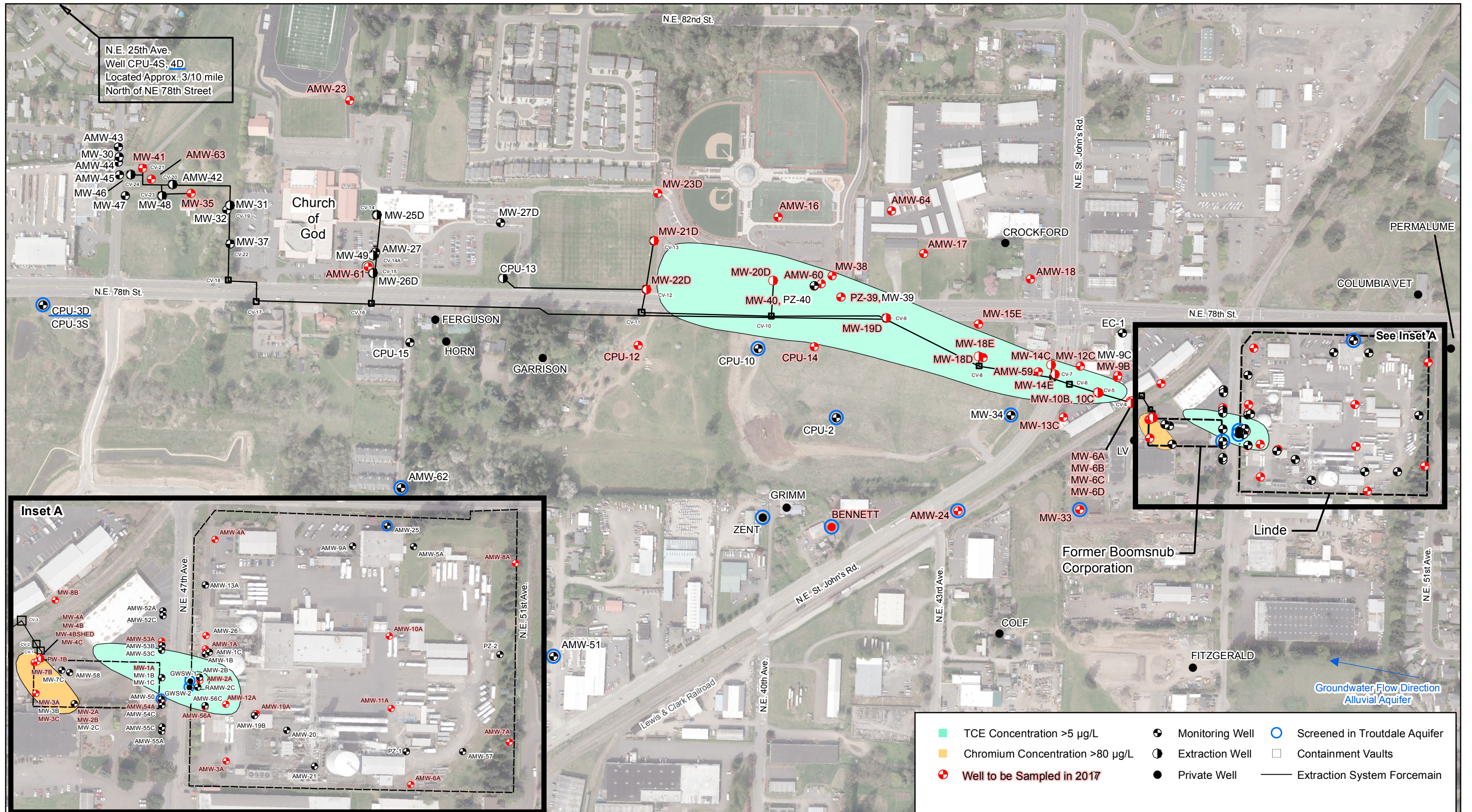


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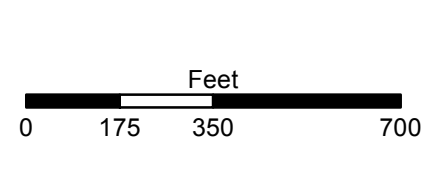
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FIGURE 15
 STATUS OF CLOSURE MONITORING PROGRAM
 CHROMIUM
 2016 ANNUAL REPORT

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**FIGURE 16
 WELLS TO BE SAMPLED IN 2017**

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TABLES

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TABLE 1. 2016 EXTRACTION WELL PUMPING RATES

Flow Rates (gpm)												
Well ID	January	February	March	April	May	June	July	August	September	October	November	December
MW-6B	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.2	6.2
MW-10B	11.0	10.1	10.0	10.0	10.0	10.0	10.0	10.0	9.8	10.0	10.0	10.0
MW-10C	11.5	10.2	11.5	11.6	11.6	11.5	11.5	11.5	11.3	11.4	11.5	11.5
MW-14C	13.2	13.1	13.1	13.2	13.2	13.1	13.2	13.2	12.8	12.8	12.8	12.8
MW-14E	4.2	4.0	4.0	3.6	3.6	0.0	0.0	0.0	8.7	8.7	9.2	9.2
MW-18D	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
MW-19D	8.6	9.0	9.0	9.0	9.0	8.3	8.3	8.3	8.3	8.5	8.2	8.2
MW-20D	16.0	15.9	15.9	16.6	16.6	16.2	15.7	15.7	15.5	15.8	15.7	15.7
MW-21D	10.1	10.3	10.1	10.5	10.5	10.1	10.1	10.1	10.0	10.0	9.9	9.9
MW-22D	16.4	16.4	16.6	16.1	16.1	16.3	16.5	16.5	16.2	16.4	16.1	16.1
PW-1B	11.6	11.6	11.8	11.6	11.6	11.6	11.6	11.6	11.5	11.5	11.5	11.5
Total	125.6	123.6	125	125.2	125.2	120.1	119.9	119.9	127.1	128.1	128.1	128.1
Notes: MW-14E pump stopped working in June and was removed in July. The well was re-developed, pump fixed and restarted on September 22. gpm = gallons per minute												

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TABLE 2. WELLS AND RECOMMENDED SAMPLING FREQUENCIES

Well Name	Well Type	Total Number VOC Datapoints	TCE Annual Evaluation (Last 4 Samples)									Never Exceeded Cleanup Level for VOCs?	Total Number Cr Datapoints	Chromium Annual Evaluation (Last 4 Samples)							Never Exceeded Cleanup Level for Cr?	2016 Sampling Frequency ¹		2017 Sampling Frequency Recommendations and When Sampled Next ²		Well Use / Rationale for Recommendation			
			Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Consecutive Samples < Cleanup Goal	Remediation Monitoring Phase Complete for TCE? ³	Remediation Phase Complete for all VOCs? ³	Date of First of the Most Recent Four Samples			Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Consecutive Samples < Cleanup Goal	Remediation Monitoring Phase Complete for Chromium? ³	VOCs		Cr	VOCs	Cr					
Closure Monitoring Program Wells																													
Upgradient Wells																													
AMW-8A	M	36	10/2012	10/2016	0.33	0.46	0.37	4	YES	YES		2	04/1995	10/1995	U	U	U	2	NA					Biennial	NA	Biennial 2017	NA	TCE background well	
TCE Source Wells																													
AMW-1A	M	55	04/2015	10/2016	U	25.00	0.44	2	NO	NO																		OU-2 well (TCE fluctuating above and below cleanup level); well cluster	
AMW-1B	M	31	01/2009	10/2010	0.45	0.51	0.45	4	YES	YES														NFS	NA	On Hold	NA	OU-2 well; remediation monitoring complete	
AMW-1C	M	24	10/2007	10/2009	U	U	U	4	YES	YES														NFS	NA	On Hold	NA	OU-2 well; remediation monitoring complete	
AMW-2A	M	58	07/2015	10/2016	63.00	120.00	120.00	None	NO	NO														Semiannual	NA	Semiannual	NA	OU-2 well; well cluster - most impacted	
AMW-2B	M	36	10/2012	10/2015	0.34	0.41	0.41	4	YES	YES														NFS	NA	On Hold	NA	OU-2 well; well cluster - remediation monitoring complete	
AMW-3A	M	45	10/2012	10/2015	0.34	0.53	0.53	4	YES	NO														NFS	NA	Annual	NA	OU-2 well; remediation monitoring complete for TCE and Cr but not Chlorodibromomethane and Bromodichloromethane	
AMW-4A	M	12	05/2004	10/2009	U	0.23	0.23	4	YES	NO														NFS	NA	Annual	NA	OU-2 well; remediation monitoring complete for TCE and Cr but not Bromodichloromethane	
AMW-12A	M	56	04/2015	10/2016	18.00	32.00	19.00	None	NO	NO														Semiannual	NA	Semiannual	NA	OU-2 well; TCE above cleanup level	
AMW-13A	M	45	10/2012	10/2015	0.17	0.26	0.26	4	YES	YES														NFS	NA	On Hold	NA	OU-2 well; remediation monitoring complete	
AMW-19A	M	42	10/2012	10/2015	1.10	1.40	1.40	4	YES	YES														Every 5 years	NA	Every 5 years 2017	NA	OU-2 boundary well	
AMW-26	M	28	10/2009	10/2014	0.24	2.30	0.70	4	YES	YES														Every 5 years	NA	Every 5 years 2017	NA	OU-2 boundary well	
AMW-52A	M	28	10/2012	10/2015	U	0.32	0.32	4	YES	YES														NFS	NA	On Hold	NA	OU-2 well; remediation monitoring complete	
AMW-53A	M	41	07/2015	10/2016	0.26	11.00	1.10	2	NO	NO														Semiannual	NA	Semiannual	NA	OU-2 well - TCE fluctuating above and below cleanup level	
AMW-54A	M	29	10/2012	10/2015	1.80	3.00	3.00	4	YES	YES														Every 5 years	Biennial	Every 5 years 2017	Every 5 years 2017	OU-2 boundary well; remediation and attainment monitoring complete	
AMW-55A	M	23	10/2012	10/2015	1.00	1.30	1.00	4	YES	YES														NFS	NA	NFS	NA	OU-2 well; remediation and attainment monitoring complete	
AMW-56A	M	28	10/2012	10/2015	1.70	2.70	1.70	4	YES	YES														Every 5 years	NA	Every 5 years 2017	NA	OU-2 boundary well; remediation and attainment monitoring complete	
MW-1A	M	56	04/2015	10/2016	2.20	51.00	51.00	None	NO	NO														Semiannual	NA	Semiannual	NA	OU-2 well - TCE fluctuating above and below cleanup level; well cluster	
MW-1B	M	26	10/2006	10/2009	U	0.29	0.28	4	YES	YES														NFS	NA	On Hold	NA	OU-2 well; remediation monitoring complete; well cluster	
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES	YES														NFS	NA	On Hold	NA	OU-2 well; remediation monitoring complete; well cluster	
Proximal Wells																													
AMW-58	M	8	10/2006	10/2012	U	1.90	0.10	4	YES	YES		7	01/2005	10/2010	2.60	34.70	3.60	4	NA	X				NFS	NFS	On Hold	NA	Remediation monitoring complete for TCE; Cr never exceeded cleanup level	
MW-2A	M	26	10/2011	10/2016	1.70	1.90	1.70	4	YES	YES		26	10/2013	10/2016	39.80	220.00	91.90	None	NO						Biennial	Annual	On Hold	Annual	Well cluster - Cr residual contamination; remediation monitoring complete for VOCs.
MW-2B	M	14	10/2002	10/2009	2.40	6.80	2.40	1	NO	NO		10	10/2002	10/2009	U	9.60	9.60	4	YES						NFS	NFS	Annual	On Hold	Well cluster - closure monitoring; remediation monitoring complete for Cr
MW-2C	M	8	10/2002	10/2009	0.36	3.30	0.36	4	YES	YES		8	10/2002	10/2009	U	11.60	U	4	NA	X				NFS	NFS	On Hold	NA	Well cluster - closure monitoring; remediation monitoring complete for TCE; Cr never exceeded cleanup level	
MW-3A	M	19	05/2004	10/2008	0.23	0.91	0.23	4	NA	NA	X	23	04/2013	10/2016	54.50	98.30	98.30	None	NO						NFS	Biennial	NA	Biennial 2017	Well cluster - closure monitoring for Cr; TCE never exceeded cleanup level
MW-3B	M	15	10/2010	10/2016	1.40	2.00	1.40	4	YES	YES		10	10/2002	10/2009	U	10.40	U	4	YES						Biennial	NFS	On Hold	On Hold	Well cluster - previously most TCE impacted; closure monitoring; remediation monitoring complete
MW-3C	M	7	05/1995	10/2004	3.80	12.00	3.80	1	NO	NO		7	05/1995	10/2004	4.40	7.65	6.10	4	YES						NFS	NFS	Annual	On Hold	Well cluster - not optimal depth; closure monitoring; remediation monitoring complete for Cr
MW-4A	M	19	10/2003	10/2009	3.50	5.50	5.50	None	NO	NO		20	10/2012	10/2014	362.00	505.00	495.00	None	NO						NFS	Every 5 years	Annual	Annual	Well cluster - not optimal depth; closure monitoring
MW-4B	M	15	10/2011	10/2016	3.10	4.60	3.10	4	YES	YES		18	10/2013	10/2016	702.00	809.00	795.00	None	NO						Biennial	Annual	On Hold	Annual	Well cluster - remediation monitoring complete for TCE; Cr residual contamination
MW-4BShed	M	14	05/2003	10/2009	4.10	7.20	4.10	1	NO	NO		13	10/2004	10/2013	65.60	101.00	65.60	2	NO						Biennial	Annual	Biennial 2017	Annual	Well cluster - not optimal depth; closure monitoring
MW-4C	M	8	05/1998	10/2009	3.80	40.00	3.80	1	NO	NO		8	05/1998	10/2009	61.00	248.00	61.00	1	NO						NFS	NFS	Annual	Annual	Well cluster - not optimal depth; closure monitoring
MW-6A	M	4	05/1995	10/2009	U	38.10	U	3	NO	NO		6	05/1995	10/2013	U	167.00	133.00	None	NO						NFS	Every 5 years	Annual	Annual	Well cluster - not optimal depth; closure monitoring

TABLE 2. WELLS AND RECOMMENDED SAMPLING FREQUENCIES

Well Name	Well Type	Total Number VOC Datapoints	TCE Annual Evaluation (Last 4 Samples)								Never Exceeded Cleanup Level for VOCs?	Total Number Cr Datapoints	Chromium Annual Evaluation (Last 4 Samples)							Never Exceeded Cleanup Level for Cr?	2016 Sampling Frequency ¹		2017 Sampling Frequency Recommendations and When Sampled Next ²		Well Use / Rationale for Recommendation
			Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Consecutive Samples < Cleanup Goal	Remediation Monitoring Phase Complete for TCE? ³	Remediation Phase Complete for all VOCs? ³			Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Consecutive Samples < Cleanup Goal	Remediation Monitoring Phase Complete for Chromium? ³		VOCs	Cr	VOCs	Cr	
MW-6B	E	54	04/2015	10/2016	3.30	4.60	3.60	4	YES	YES		49	04/2015	10/2016	11.40	27.10	11.40	4	YES		Semiannual	Semiannual	Annual	Annual	Extraction well - active; remediation monitoring complete (also well cluster, previously most impacted)
MW-6C	M	10	10/2002	10/2009	0.54	52.00	0.54	1	NO	NO		8	10/2002	10/2009	U	22.90	U	4	YES		NFS	NFS	Annual	On Hold	Well cluster - not optimal depth; remediation monitoring complete for Cr
MW-6D	M	8	05/1999	10/2009	4.30	25.00	4.30	1	NO	NO		7	04/1995	10/2009	5.61	29.80	29.80	4	YES		NFS	NFS	Annual	On Hold	Well cluster - not optimal depth; remediation monitoring complete for Cr
MW-7B	M	7	04/1995	10/2014	3.60	110.00	3.60	1	NO	NO		6	04/1995	10/2009	U	72.60	U	4	YES		Every 5 years	NFS	Annual	On Hold	Well cluster - adjacent to MW-4 cluster; remediation monitoring complete for Cr
MW-7C	M	6	05/1995	10/2009	0.18	3.00	0.18	4	YES	YES		6	05/1995	10/2009	6.50	13.50	12.30	4	YES		NFS	NFS	On Hold	On Hold	Well cluster - closure monitoring; remediation monitoring complete
MW-8B	M	14	10/2008	10/2014	1.80	6.00	1.80	3	NO	NO		10	05/1998	10/2008	6.30	13.00	7.30	4	YES		Every 5 years	NFS	Annual	On Hold	Plume area - not included in any other category; remediation monitoring complete for Cr
MW-9B	M	17	10/2010	10/2016	2.40	5.70	2.40	3	NO	NO		12	05/1999	10/2008	U	25.30	3.60	4	YES		Biennial	NFS	Annual	On Hold	Well cluster - previously most TCE impacted; remediation monitoring complete for Cr
MW-9C	M	9	10/1997	10/2009	3.80	53.00	3.80	1	NO	NO		9	10/1997	10/2009	4.10	65.40	65.40	4	NA	X	NFS	NFS	Annual	NA	Well cluster - not optimum depth; closure monitoring for TCE; Cr never exceeded cleanup level
MW-10B	E	54	04/2015	10/2016	10.00	13.00	10.00	None	NO	NO		49	04/2015	10/2016	28.40	36.50	28.40	4	YES		Semiannual	Semiannual	Semiannual	Annual	Extraction well - active (also well cluster); remediation monitoring complete for Cr
MW-10C	E	56	04/2015	10/2016	1.60	2.50	1.80	4	YES	YES		51	04/2015	10/2016	53.10	75.60	53.10	4	YES		Semiannual	Semiannual	Annual	Annual	Extraction well - active (also well cluster); remediation monitoring complete
MW-12C	M	27	10/2010	10/2016	0.69	24.00	0.69	3	NO	NO		20	10/2007	10/2010	U	4.50	U	4	YES		Biennial	NFS	Biennial 2017	On Hold	TCE Plume boundary; remediation monitoring in progress; remediation complete for Cr
MW-13C	M	29	10/2010	10/2016	2.40	5.80	3.50	2	NO	NO		21	10/2007	10/2010	27.50	35.40	27.50	4	YES		Biennial	NFS	Biennial 2017	On Hold	TCE Plume boundary; TCE fluctuates above and below cleanup level; remediation complete for Cr
PW-1B	E	81	04/2015	10/2016	1.80	2.90	2.90	4	YES	YES		76	04/2015	10/2016	38.60	56.40	38.70	4	YES		Semiannual	Semiannual	Annual	Annual	Extraction well - active; remediation monitoring complete
Intermediate Wells																									
AMW-59	M/D	12	10/2010	10/2016	56.00	92.00	56.00	None	NO	NO		8	10/2006	10/2009	U	4.80	U	4	NA	X	Biennial	NFS	Biennial 2017	NA	Plume area - silt well; remediation monitoring for TCE; Cr never exceeded cleanup level
AMW-60	M	3	01/2005	10/2009	U	0.94	U	3	YES	NO		3	01/2005	10/2009	U	8.90	2.10	3	NA	X	NFS	NFS	Annual	NA	Silt well, closure monitoring - TCE and Cr have never exceeded the cleanup level, but 1,1-dichloroethene was detected once above the cleanup level.
CPU-14	M	33	10/2014	10/2016	4.90	5.50	4.90	1	NO	NO		26	10/2012	04/2015	U	53.60	U	4	YES		Annual	Biennial	Annual	On Hold	Plume boundary; remediation monitoring complete for Cr
MW-14C	E	66	04/2015	10/2016	9.20	14.00	9.20	None	NO	NO		61	04/2015	10/2016	51.50	62.60	51.50	4	YES		Semiannual	Semiannual	Semiannual	Annual	Extraction well - active (also well cluster); remediation monitoring complete for Cr
MW-14E	E	64	04/2015	10/2016	61.00	70.00	63.00	None	NO	NO		59	04/2015	10/2016	42.10	49.30	42.10	4	YES		Semiannual	Semiannual	Semiannual	Annual	Extraction well - active (also well cluster); remediation monitoring complete for Cr
MW-15E	M	28	04/2014	10/2016	2.10	2.40	2.10	4	YES	YES		11	10/2002	10/2008	3.30	17.30	3.30	4	YES		Annual	NFS	Biennial 2017	On Hold	Remediation monitoring complete; monitoring potential Northern Plume impacts, but none noted to date
MW-18D	E	75	04/2015	10/2016	27.00	36.00	27.00	None	NO	NO		70	04/2015	10/2016	74.00	88.90	74.00	1	NO		Semiannual	Semiannual	Semiannual	Semiannual	Extraction well - active (also well cluster)
MW-18E	M/D	33	10/2013	10/2016	69.00	120.00	76.00	None	NO	NO		23	10/2008	10/2011	U	12.50	4.70	4	YES		Annual	NFS	Annual 2017	On Hold	Plume area - TCE residual contamination; remediation monitoring complete for Cr
MW-19D	E	74	04/2015	10/2016	22.00	24.00	23.00	None	NO	NO		69	04/2015	10/2016	79.50	91.70	79.50	1	NO		Semiannual	Semiannual	Semiannual	Semiannual	Extraction well - active
MW-20D	E	78	04/2015	10/2016	23.00	32.00	23.00	None	NO	NO		73	04/2015	10/2016	50.00	58.10	50.00	4	YES		Semiannual	Semiannual	Semiannual	Annual	Extraction well - active; remediation monitoring complete for Cr
MW-40	M	6	10/1999	10/2008	1.20	8.20	1.20	3	NO	NO		4	10/2002	10/2008	126.00	443.00	126.00	None	NO		NFS	NFS	Annual	Annual	Closure monitoring
PZ-39	M	15	04/2015	10/2016	28.00	36.00	29.00	None	NO	NO		2	10/2009	10/2010	U	4.80	4.80	2	NA	X	Semiannual	NFS	Annual	NA	Monitoring for Northern Plume impacts; TCE concentrations decreasing; Cr never exceeded cleanup level
Church of God Wells																									
AMW-27	E/M	52	04/2015	10/2016	3.00	4.20	3.00	4	YES	YES		38	01/2013	10/2014	U	15.80	U	4	YES		Annual	NFS	On Hold	NFS	Extraction well - inactive; remediation monitoring complete for TCE & Cr
AMW-61	M	11	10/2013	10/2016	5.50	8.50	5.90	None	NO	NO		5	01/2005	10/2010	17.30	1410.00	35.20	2	NO		Annual	NFS	Annual	Every 5 years 2017	Plume area - silt well; closure monitoring
CPU-12	M	34	10/2014	10/2016	2.20	5.10	2.50	3	NO	NO		22	10/2007	10/2010	U	8.00	U	4	YES		Biennial	NFS	Biennial 2017	Annual	TCE Plume boundary; remediation monitoring complete for Cr
CPU-13	E	59	04/2013	10/2014	0.92	1.20	0.94	4	YES	YES		54	04/2013	10/2014	25.30	54.80	45.70	4	YES		Every 5 years	Every 5 years	NFS	NFS	Former sentinel well; remediation and attainment monitoring complete
CPU-15	M	14	10/2001	05/2004	U	U	U	4	YES	YES	X	10	05/1998	05/2004	3.00	8.91	3.00	4	YES		NFS	NFS	NA	NFS	Remediation and attainment monitoring complete
MW-21D	E	81	04/2015	10/2016	2.40	3.20	2.40	4	YES	YES		76	04/2015	10/2016	8.30	9.60	8.70	4	YES		Semiannual	Semiannual	Semiannual	Annual	Extraction well - active; remediation monitoring complete; monitor TCE for Northern Plume impacts
MW-22D	E	76	04/2015	10/2016	2.30	3.30	2.30	4	YES	YES		71	04/2015	10/2016	15.10	20.00	15.10	4	YES		Semiannual	Semiannual	Annual	Annual	Extraction well - active; remediation monitoring complete

TABLE 2. WELLS AND RECOMMENDED SAMPLING FREQUENCIES

Well Name	Well Type	Total Number VOC Datapoints	TCE Annual Evaluation (Last 4 Samples)								Never Exceeded Cleanup Level for VOCs?	Total Number Cr Datapoints	Chromium Annual Evaluation (Last 4 Samples)							Never Exceeded Cleanup Level for Cr?	2016 Sampling Frequency ¹		2017 Sampling Frequency Recommendations and When Sampled Next ²		Well Use / Rationale for Recommendation
			Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Consecutive Samples < Cleanup Goal	Remediation Monitoring Phase Complete for TCE? ³	Remediation Phase Complete for all VOCs? ³			Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Consecutive Samples < Cleanup Goal	Remediation Monitoring Phase Complete for Chromium? ³		VOCs	Cr	VOCs	Cr	
MW-25D	E	77	10/2012	10/2014	1.30	3.00	1.70	4	YES	YES		71	10/2012	10/2014	2.70	6.30	6.30	4	YES		NFS	NFS	NFS	NFS	Former extraction well; remediation and attainment monitoring complete
MW-26D	E	76	10/2012	10/2014	0.35	2.10	0.35	4	YES	YES		71	10/2012	10/2014	7.00	38.60	11.40	4	YES		NFS	NFS	NFS	NFS	Former extraction well; remediation and attainment monitoring complete
MW-27D	E	50	10/2011	10/2014	0.63	1.50	1.50	4	YES	YES		45	10/2011	10/2014	U	12.20	U	4	YES		Every 5 years	Every 5 years	NFS	NFS	Former sentinel well; remediation and attainment monitoring complete
MW-49	E	34	10/2012	10/2014	1.10	1.70	1.60	4	YES	YES		31	10/2012	10/2014	9.30	12.20	12.20	4	YES		NFS	NFS	NFS	NFS	Former extraction well; remediation and attainment monitoring complete
Toe Wells																									
AMW-42	E	52	10/2009	10/2014	0.65	1.30	0.65	4	YES	YES		47	10/2009	10/2014	U	21.30	U	4	YES		NFS	NFS	NFS	NFS	Remediation and attainment monitoring complete
MW-31	E	40	10/2008	10/2012	0.20	0.36	0.26	4	YES	YES		39	10/2008	10/2012	8.10	12.90	11.40	4	YES		NFS	NFS	NFS	NFS	Remediation and attainment monitoring complete
MW-35	E/M	68	04/2015	10/2016	2.80	3.70	3.40	4	YES	YES		57	10/2012	04/2015	U	29.30	U	4	YES		Semiannual	NFS	Semiannual	NFS	Pending well abandonment; attainment monitoring complete for Cr
MW-41	E/M	57	10/2009	10/2014	U	U	U	4	YES	YES		51	10/2009	10/2014	U	U	U	4	YES		Every 5 years	Every 5 years	Every 5 years 2017	Every 5 years 2017	Attainment monitoring complete for TCE and Cr. EPA request for sampling every 5 years to support Toe-of-Plume Pilot Study.
MW-48	E	38	10/2006	10/2009	U	U	U	4	YES	YES		34	10/2006	10/2009	4.00	35.00	35.00	4	NA	X	NFS	NFS	NFS	NA	Remediation and attainment monitoring complete; Cr never exceeded cleanup level
Troutdale Wells																									
AMW-24	M/D	28	10/2013	10/2016	8.30	11.00	8.30	None	NO	NO		21	10/2011	10/2014	3.50	13.60	13.60	4	NA	X	Annual	Every 5 Years	Annual	NA	Troutdale well - TCE impacted; Cr never exceeded cleanup level
MW-33	M/D	27	10/2013	10/2016	6.30	11.00	6.30	None	NO	NO		23	10/2011	10/2014	1.90	3.20	2.20	4	NA	X	Annual	Every 5 Years	Annual	NA	Troutdale well - TCE impacted; Cr never exceeded cleanup level
BENNETT	Other	22	04/2015	10/2016	1.70	5.20	1.70	2	NO	NO		20	04/2014	10/2016	U	U	U	4	NA	X	Semiannual	Every 5 years	Annual	NA	Troutdale well - TCE impacted; Cr never exceeded cleanup level; semiannual TCE sampling requested previously
Wells Excluded from Closure Monitoring Program																									
Northern Plume Wells																									
AMW-16	M	31	04/2015	10/2016	67.00	94.00	67.00	None	NO	NO		17	10/2007	10/2010	U	2.80	2.80	4	NA	X	Semiannual	NFS	Semiannual	NA	Northern Plume monitoring well
AMW-17	M/D	41	04/2015	10/2016	64.00	120.00	96.00	None	NO	NO		17	10/2006	10/2009	U	2.60	U	4	NA	X	Semiannual	NFS	Semiannual	NA	Northern Plume monitoring well
AMW-18	M	42	04/2015	10/2016	34.00	42.00	40.00	None	NO	NO		13	10/2004	10/2007	U	U	U	4	NA	X	Semiannual	NFS	Semiannual	NA	Northern Plume monitoring well
AMW-23	M	10	10/2001	10/2016	U	U	U	4	YES	YES	X	6	10/1997	10/2003	U	3.10	U	4	NA	X	NA	NA	Annual	NA	New Northern Plume monitoring well
AMW-64	M	15	04/2015	10/2016	24.00	53.00	24.00	None	NO	NO									NA		Semiannual	NA	Semiannual	NA	Northern Plume monitoring well
MW-23D	M	34	10/2014	10/2016	1.40	140.00	140.00	None	NO	NO		22	10/2007	10/2010	U	4.10	4.10	4	NA		Semiannual	NFS	Semiannual	NA	Northern Plume monitoring well
MW-38	M	11	04/2015	10/2016	23.00	53.00	23.00	None	NO	NO									NA		Semiannual	NA	Semiannual	NA	Northern Plume monitoring well
Toe Wells																									
AMW-63	M	10	05/2009	10/2014	U	0.17	0.17	4	YES	YES	X	10	05/2009	10/2014	U	12.40	U	4	YES	X	Every 5 years	Every 5 years	Every 5 years 2017	Every 5 years 2017	TCE and Cr below cleanup levels. EPA request for sampling every 5 years to support Toe-of-Plume Pilot Study.
Infiltration Gallery Wells																									
AMW-6A	M/D	20	10/2010	10/2016	0.23	0.46	0.23	4	YES	YES	X	19	10/2010	10/2016	5.00	9.60	5.80	4	YES	X	Biennial	Biennial	Biennial 2017	Biennial 2017	Infiltration gallery monitoring well
AMW-7A	M/D	29	10/2010	10/2016	0.21	0.43	0.21	4	YES	YES	X	20	10/2010	10/2016	0.70	3.10	1.10	4	YES	X	Biennial	Biennial	Biennial 2017	Biennial 2017	Infiltration gallery monitoring well
AMW-10A	M/D	19	10/2010	10/2016	U	0.32	U	4	YES	YES	X	18	10/2010	10/2016	3.70	18.70	3.70	4	YES	X	Biennial	Biennial	Biennial 2017	Biennial 2017	Infiltration gallery monitoring well
AMW-11A	M/D	20	10/2010	10/2016	0.25	0.45	0.25	4	YES	YES	X	19	10/2010	10/2016	1.20	4.00	1.20	4	YES	X	Biennial	Biennial	Biennial 2017	Biennial 2017	Infiltration gallery monitoring well

NOTES:
 The rationale for changing wells from NFS (2016 recommendation) to "On Hold" or "Every 5 Years" is presented in Section 6.2.
Bold text indicates changes in 2016 for recommendations for sampling frequency.
¹ The 2016 sampling frequencies shown are those recommended in the 2015 Annual Status Report for the Boomsnub/Airco Superfund Site.
² A summary of all 2017 recommended sampling frequencies is provided in Table 5.
³ The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.
 COC = Contaminant of Concern. NA = Not applicable.
 Cr = Chromium. NFS = No further sampling (closure monitoring complete, or for a well excluded from closure monitoring, further sampling determined to be unnecessary)
 E = Extraction well. TCE = Trichloroethene.
 E/M = Extraction well with pump pulled; now sampled as a monitoring well. U = Analyte not detected above the reporting limit.
 EPA = U.S. Environmental Protection Agency. µg/L = Micrograms per liter.
 M = Monitoring well. VOC = Volatile organic compound.
 M/D = Monitoring well with dedicated pump installed. X = Never exceeded cleanup level
 Biennial sampling (every 2 years) - these wells will be sampled next in Fall 2017, to support the upcoming Five-Year Review.
 Every 5 years - these wells will be sampled next in Fall 2017, to support the upcoming Five-Year Review; they will be sampled again in 2022.
 On Hold - sampling on hold pending attainment monitoring; no sampling planned for 2017.
 Wells not included in the Closure Monitoring Program and not determined to require sampling for another purpose have been deleted from this table.
 Where no entries are present for one of the two constituents (TCE or Cr) for a given well, that constituent is not a COC for and has not been sampled in the well.
 TCE summary data are presented as a representation of all VOCs.

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TABLE 3. CLOSURE MONITORING PROGRAM WELLS

Well Name	No longer Impacted by Treatment System/Under Steady State Conditions ? ⁽¹⁾	Remediation Phase Complete for VOCs?	VOCs Not Completing Remediation Phase (# Results needed)	Currently Ready for Attainment Monitoring of VOCs?	Remediation Phase Complete for Chromium?	Currently Ready for Attainment Monitoring of Chromium?
Upgradient						
AMW-8A	No	Yes		No	NA	NA
TCE Source Area ⁽²⁾						
AMW-1A	No	No	Chlorodibromomethane (4) Bromodichloromethane (4) Trichloroethene (2)	No	NA	NA
AMW-1B	No	Yes		No	NA	NA
AMW-1C	No	Yes		No	NA	NA
AMW-2A	No	No	Trichloroethene (4)	No	NA	NA
AMW-2B	No	Yes		No	NA	NA
AMW-3A	Yes	No	Chlorodibromomethane (3) Bromodichloromethane (3)	No	NA	NA
AMW-4A	Yes	No	Bromodichloromethane (4)	No	NA	NA
AMW-12A	No	No	Trichloroethene (4)	No	NA	NA
AMW-13A	No	Yes		No	NA	NA
AMW-19A	No	Yes		No	NA	NA
AMW-26	No	Yes		No	NA	NA
AMW-52A	No	Yes		No	NA	NA
AMW-53A	No	No	Bromodichloromethane (4) Trichloroethene (2)	No	NA	NA
AMW-54A	Yes	Yes		Yes	NA	NA
AMW-55A	Yes	Yes		Yes	NA	NA
AMW-56A	Yes	Yes		Yes	NA	NA
MW-1A	No	No	Trichloroethene (4)	No	NA	NA
MW-1B	No	Yes		No	NA	NA
MW-1C	No	Yes		No	NA	NA
Proximal						
AMW-58	No	Yes		No	NA ³	NA ³
MW-2A	No	Yes		No	No	No
MW-2B	No	No	Trichloroethene (3)	No	Yes	No
MW-2C	No	Yes		No	NA ³	NA ³
MW-3A	No	NA ³		NA ³	No	No
MW-3B	No	Yes		No	Yes	No
MW-3C	No	No	Trichloroethene (3)	No	Yes	No
MW-4A	No	No	Trichloroethene (4)	No	No	No
MW-4B	No	Yes		No	No	No
MW-4BSHED	No	No	Trichloroethene (3)	No	No	No
MW-4C	No	No	Trichloroethene (3)	No	No	No
MW-6A	No	No	Trichloroethene (1)	No	No	No
MW-6B	No	Yes		No	Yes	No

TABLE 3. CLOSURE MONITORING PROGRAM WELLS

Well Name	No longer Impacted by Treatment System/Under Steady State Conditions ? ⁽¹⁾	Remediation Phase Complete for VOCs?	VOCs Not Completing Remediation Phase (# Results needed)	Currently Ready for Attainment Monitoring of VOCs?	Remediation Phase Complete for Chromium?	Currently Ready for Attainment Monitoring of Chromium?
MW-6C	No	No	1,1-Dichloroethylene (1) Tetrachloroethane (1) Trichloroethene (3)	No	Yes	No
MW-6D	No	No	Trichloroethene (3)	No	Yes	No
MW-7B	No	No	1,1-Dichloroethylene (2) Trichloroethene (3)	No	Yes	No
MW-7C	No	Yes		No	Yes	No
MW-8B	No	No	Trichloroethene (1)	No	Yes	No
MW-9B	No	No	Trichloroethene (1)	No	Yes	No
MW-9C	No	No	Trichloroethene (3)	No	NA ³	NA ³
MW-10B	No	No	Trichloroethene (4)	No	Yes	No
MW-10C	No	Yes		No	Yes	No
MW-12C	No	No	Trichloroethene (1)	No	Yes	No
MW-13C	No	No	Trichloroethene (2)	No	Yes	No
PW-1B	No	Yes		No	Yes	No
Intermediate						
AMW-59	No	No	1,1-Dichloroethylene (4) Trichloroethene (4)	No	NA ³	NA ³
AMW-60	No	No	1,1-Dichloroethylene (3)	No	NA ³	NA ³
CPU-14	No	No	Trichloroethene (3)	No	Yes	No
MW-14C	No	No	Trichloroethene (4)	No	Yes	No
MW-14E	No	No	1,1-Dichloroethylene (4) Trichloroethene (4)	No	Yes	No
MW-15E	No	Yes		No	Yes	No
MW-18D	No	No	Trichloroethene (4)	No	No	No
MW-18E	No	No	1,1-Dichloroethylene (4) Trichloroethene (4)	No	Yes	No
MW-19D	No	No	1,1-Dichloroethylene (1) Trichloroethene (4)	No	No	No
MW-20D	No	No	1,1-Dichloroethylene (4) Trichloroethene (4)	No	Yes	No
MW-40	No	No	1,1-Dichloroethylene (1) Trichloroethylene (1)	No	No	No
PZ-39	No	No	1,1-Dichloroethylene (4) Trichloroethene (4)	No	NA ³	NA ³
Church of God						
AMW-27	Yes [Jan-13]	Yes		Yes	Yes	Yes
AMW-61	Yes	No	Trichloroethene (4)	No	No	No
CPU-12	No	No	Trichloroethene (1)	No	Yes	Yes
CPU-13	Yes [May-13]	Yes		Yes	Yes	Yes
CPU-15	Yes	NA ³		NA ³	Yes	Yes
MW-21D	No	Yes		No	Yes	No
MW-22D	No	Yes		No	Yes	No

TABLE 3. CLOSURE MONITORING PROGRAM WELLS

Well Name	No longer Impacted by Treatment System/Under Steady State Conditions ? ⁽¹⁾	Remediation Phase Complete for VOCs?	VOCs Not Completing Remediation Phase (# Results needed)	Currently Ready for Attainment Monitoring of VOCs?	Remediation Phase Complete for Chromium?	Currently Ready for Attainment Monitoring of Chromium?
MW-25D	Yes [Jan-13]	Yes		Yes	Yes	Yes
MW-26D	Yes [Jan-13]	Yes		Yes	Yes	Yes
MW-27D	Yes [Nov-09]	Yes		Yes	Yes	Yes
MW-49	Yes [Jan-13]	Yes		Yes	Yes	Yes
Toe of Plume						
AMW-42	Yes [Feb-05]	Yes		Yes	Yes	Yes
MW-31	Yes [Pre 2002]	Yes		Yes	Yes	Yes
MW-35	Yes [Feb-05]	Yes		Yes	Yes	Yes
MW-41	Yes	Yes		Yes	Yes	Yes
MW-48	Yes [Jun-04]	Yes		No	NA ³	NA ³
Troutdale						
AMW-24	Yes	No	1,1-Dichloroethylene (4) Trichloroethene (4)	No	NA ³	NA ³
BENNETT	Yes	No	Trichloroethene (2)	No	NA ³	NA ³
MW-33	Yes	No	1,1-Dichloroethylene (2) Trichloroethene (4)	No	NA ³	NA ³
Notes:						
Table 4 presents attainment status for wells currently in attainment monitoring.						
COC = Contaminant of Concern identified for the Site						
NA = Not Applicable						
VOC = Volatile organic compound						
(1) Implies the well is no longer influenced by nearby extraction wells or by discharge to the infiltration gallery, and that groundwater at the well has achieved post-remediation steady-state conditions.						
(2) Chromium is not a contaminant of concern (COC) for TCE Source Area wells						
(3) Designated as NA since contaminant(s) never exceeded cleanup level.						
Per the Closure Monitoring Plan, the determination of whether Remediation Phase is Complete is based on analysis of the most recent four samples for each COC.						

TABLE 4. ATTAINMENT MONITORING STATUS

Well Name	Date Pumping Ceased	Attainment Phase Complete for VOCs?	VOCs Not Completing Attainment Phase (# Results needed)	Attainment Phase Complete for Chromium? (# Results Needed)
TCE Source Area ^a				
AMW-54A		Yes		NA
AMW-55A		Yes		NA
AMW-56A		Yes		NA
Church of God				
AMW-27	Jan-13	No	Trichloroethene (2)	No (1)
CPU-13	May-13	Yes		Yes
CPU-15		NA		Yes
MW-25D	Jan-13	Yes		Yes
MW-26D	Jan-13	Yes		Yes
MW-27D	Nov-09	Yes		Yes
MW-49	Jan-13	Yes		Yes
Toe of Plume				
AMW-42	Feb-05	Yes		Yes
MW-31	Pre 2002	Yes		Yes
MW-35	Feb-05	No	Trichloroethene (1)	Yes
MW-41		Yes		Yes
MW-48	Jun-04	Yes		NA
Notes:				
^a Chromium is not a COC for TCE Source Area wells.				
This table includes wells from Table 3 that are ready for attainment monitoring for either VOCs and/or Chromium.				
Per the Closure Monitoring Plan, the determination of whether Attainment Phase is complete is based on analysis of the most recent eight samples for each contaminant of concern.				
NA = Not applicable				
VOC = Volatile organic compound				

TABLE 5. SUMMARY OF 2017 WELL SAMPLING FREQUENCIES

Well Name	Recommendation						Rationale for Recommendation
	Well Type	Semi-annual	Annual	Biennial ^a	Every 5 Years ^b	On Hold ^c	
Closure Monitoring Program Wells							
Upgradient Wells							
AMW-8A	M			VOCs			TCE background well
TCE Source Wells							
AMW-1A	M	VOCs					OU-2 well
AMW-1B	M					VOCs	OU-2 well; remediation monitoring complete
AMW-1C	M					VOCs	OU-2 well; remediation monitoring complete
AMW-2A	M	VOCs					OU-2 well; well cluster - most impacted
AMW-2B	M					VOCs	OU-2 well; well cluster - remediation monitoring complete
AMW-3A	M		VOCs				OU-2 well; remediation monitoring complete for TCE and Cr but not Chlorodibromomethane and Bromodichloromethane
AMW-4A	M		VOCs				OU-2 well; remediation monitoring complete for TCE and Cr but not Bromodichloromethane
AMW-12A	M	VOCs					OU-2 well
AMW-13A	M					VOCs	OU-2 well; remediation monitoring complete
AMW-19A	M				VOCs		OU-2 boundary well
AMW-26	M				VOCs		OU-2 boundary well
AMW-52A	M					VOCs	OU-2 well; remediation monitoring complete
AMW-53A	M	VOCs					OU-2 well
AMW-54A	M				X		OU-2 boundary well and Cr background well; remediation and attainment monitoring complete
AMW-55A	M						OU-2 well; remediation and attainment monitoring complete
AMW-56A	M				VOCs		OU-2 boundary well; remediation and attainment monitoring complete
MW-1A	M	VOCs					OU-2 well
MW-1B	M					VOCs	OU-2 well; remediation monitoring complete
MW-1C	M					VOCs	OU-2 well; remediation monitoring complete
Proximal Wells							
AMW-58	M					VOCs	Remediation monitoring complete for TCE; Cr never exceeded cleanup level
MW-2A	M		Cr			VOCs	Well cluster - Cr residual contamination; remediation monitoring complete for TCE
MW-2B	M		VOCs			Cr	Well cluster - closure monitoring; remediation monitoring complete for Cr
MW-2C	M					VOCs	Well cluster - closure monitoring; remediation monitoring complete for TCE; Cr never exceeded cleanup level
MW-3A	M			Cr			Well cluster - closure monitoring for Cr; TCE never exceeded cleanup level
MW-3B	M					X	Well cluster - previously most TCE impacted; closure monitoring; remediation monitoring complete

TABLE 5. SUMMARY OF 2017 WELL SAMPLING FREQUENCIES

Well Name	Recommendation						Rationale for Recommendation
	Well Type	Semi-annual	Annual	Biennial ^a	Every 5 Years ^b	On Hold ^c	
MW-3C	M		VOCs			Cr	Well cluster - not optimal depth; closure monitoring; remediation monitoring complete for Cr
MW-4A	M		X				Well cluster - not optimal depth; closure monitoring
MW-4B	M		Cr			VOCs	Well cluster - remediation monitoring complete for TCE; Cr residual contamination
MW-4BSHED	M		Cr	VOCs			Well cluster - not optimal depth; closure monitoring
MW-4C	M		X				Well cluster - not optimal depth; closure monitoring
MW-6A	M		X				Well cluster - not optimal depth; closure monitoring
MW-6B	E		X				Extraction well - active; remediation monitoring complete (also well cluster, previously most impacted)
MW-6C	M		VOCs			Cr	Well cluster - not optimal depth; remediation monitoring complete for Cr
MW-6D	M		VOCs			Cr	Well cluster - not optimal depth; remediation monitoring complete for Cr
MW-7B	M		VOCs			Cr	Well cluster - adjacent to MW-4 cluster; remediation monitoring complete for Cr
MW-7C	M					X	Well cluster - closure monitoring; remediation monitoring complete
MW-8B	M		VOCs			Cr	Plume area - not included in any other category; remediation monitoring complete for Cr
MW-9B	M			VOCs		Cr	Well cluster - previously most TCE impacted; remediation monitoring complete for Cr
MW-9C	M		VOCs				Well cluster - not optimum depth; closure monitoring for TCE; Cr never exceeded cleanup level
MW-10B	E	VOCs	Cr				Extraction well - active (also well cluster); remediation monitoring complete for Cr
MW-10C	E		X				Extraction well - active (also well cluster); remediation monitoring complete
MW-12C	M			VOCs		Cr	TCE Plume boundary; remediation monitoring in progress
MW-13C	M			VOCs		Cr	TCE Plume boundary; TCE fluctuates above and below cleanup level
PW-1B	E		X				Extraction well - active; remediation monitoring complete
Intermediate Wells							
AMW-59	M/D			VOCs			Plume area - silt well; remediation monitoring for TCE; Cr never exceeded cleanup level
AMW-60	M		VOCs				Silt well, closure monitoring - TCE and Cr have never exceeded the cleanup level

TABLE 5. SUMMARY OF 2017 WELL SAMPLING FREQUENCIES

Well Name	Recommendation						Rationale for Recommendation
	Well Type	Semi-annual	Annual	Biennial ^a	Every 5 Years ^b	On Hold ^c	
CPU-14	M		VOCs			Cr	Plume boundary; remediation monitoring complete for Cr
MW-14C	E	VOCs	Cr				Extraction well - active (also well cluster); remediation monitoring complete for Cr
MW-14E	E	VOCs	Cr				Extraction well - active (also well cluster); remediation monitoring complete for Cr
MW-15E	M			VOCs		Cr	Remediation monitoring complete; monitoring potential Northern Plume impacts, but none noted to date
MW-18D	E	X					Extraction well - active (also well cluster)
MW-18E	M/D		VOCs			Cr	Plume area - TCE residual contamination; remediation monitoring complete for Cr
MW-19D	E	X					Extraction well - active
MW-20D	E	VOCs	Cr				Extraction well - active; remediation monitoring complete for Cr
MW-40	M		X				Closure monitoring
PZ-39	M		VOCs				Monitoring for Northern Plume impacts; TCE concentrations decreasing; Cr never exceeded cleanup level
Church of God Wells							
AMW-27	E/M					VOCs	Extraction well - inactive; remediation monitoring complete for TCE; attainment monitoring complete for Cr
AMW-61	M		VOCs		Cr		Plume area - silt well; closure monitoring
CPU-12	M		Cr	VOCs			TCE Plume boundary; remediation monitoring complete for Cr
CPU-13	E						Former sentinel well; remediation and attainment monitoring complete
CPU-15	M						Remediation and attainment monitoring complete
MW-21D	E	VOCs	Cr				Extraction well - active; remediation monitoring complete; monitor TCE for Northern Plume impacts
MW-22D	E		X				Extraction well - active; remediation monitoring complete
MW-25D	E						Former extraction well; remediation and attainment monitoring complete
MW-26D	E						Former extraction well; remediation and attainment monitoring complete
MW-27D	E						Former sentinel well; remediation and attainment monitoring complete
MW-49	E						Former extraction well; remediation and attainment monitoring complete
Toe Wells							
AMW-42	E						Remediation and attainment monitoring complete
MW-31	E						Remediation and attainment monitoring complete
MW-35	E/M	VOCs					Pending well abandonment; attainment monitoring complete for Cr
MW-41	E/M				X		Attainment monitoring complete for TCE and Cr. EPA request for sampling every 5 years to support Toe-of-Plume Pilot Study.

TABLE 5. SUMMARY OF 2017 WELL SAMPLING FREQUENCIES

Well Name	Recommendation						Rationale for Recommendation
	Well Type	Semi-annual	Annual	Biennial ^a	Every 5 Years ^b	On Hold ^c	
MW-48	E						Remediation and attainment monitoring complete; Cr never exceeded cleanup level
Troutdale Wells							
AMW-24	M/D		VOCs				Troutdale well - TCE impacted; Cr never exceeded cleanup level
MW-33	M/D		VOCs				Troutdale well - TCE impacted; Cr never exceeded cleanup level
BENNETT	Other		VOCs				Troutdale well - TCE impacted; Cr never exceeded cleanup level; semiannual TCE sampling requested previously
Wells Excluded from Closure Monitoring Program							
Northern Plume Wells							
AMW-16	M	VOCs					Northern Plume monitoring well
AMW-17	M/D	VOCs					Northern Plume monitoring well
AMW-18	M	VOCs					Northern Plume monitoring well
AMW-23	M		VOCs				New Northern Plume monitoring well
AMW-64	M	VOCs					Northern Plume monitoring well
MW-23D	M	VOCs					Northern Plume monitoring well
MW-38	M	VOCs					Northern Plume monitoring well
Toe Wells							
AMW-63	M				X		TCE and Cr never exceeded cleanup levels. EPA request for sampling every 5 years to support Toe-of-Plume Pilot Study.
Infiltration Gallery Wells							
AMW-6A	M/D			X			Infiltration gallery monitoring well
AMW-7A	M/D			X			Infiltration gallery monitoring well
AMW-10A	M/D			X			Infiltration gallery monitoring well
AMW-11A	M/D			X			Infiltration gallery monitoring well
Total Wells:		19	35	13	7	26	Total Wells 100
(Note that TCE and Cr are on different sampling schedules in a number of wells.)							
Notes:							
	Wells to be sampled once in 2017.						
	Wells to be sampled twice in 2017.						
Wells excluded from the Closure Monitoring Program have been deleted from this table.							
^a Biennial sampling (every 2 years) - these wells will be sampled next in Fall 2017, to support the upcoming Five-Year Review.							
^b Every 5 years - these wells will be sampled next in Fall 2017, to support the upcoming Five-Year Review; they will be sampled again in 2022.							
^c On Hold - sampling on hold pending attainment monitoring; no sampling planned for 2017.							
Cr	= Chromium			E	= Extraction well		
EPA	= U.S. Environmental Protection Agency			E/M	= Extraction well with pump pulled; now sampled as a monitoring well		
TCE	= Trichlorethene			M	= Monitoring well		
VOC	= Volatile organic compound			M/D	= Monitoring well with dedicated pump installed		
X	= Cr and VOCs						

APPENDIX A

**CHROMIUM CONCENTRATIONS IN
GROUNDWATER**

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APPENDIX A-1

**CHROMIUM CONCENTRATIONS –
SUMMARY TABLE**

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A-1. Chromium Concentrations Summary

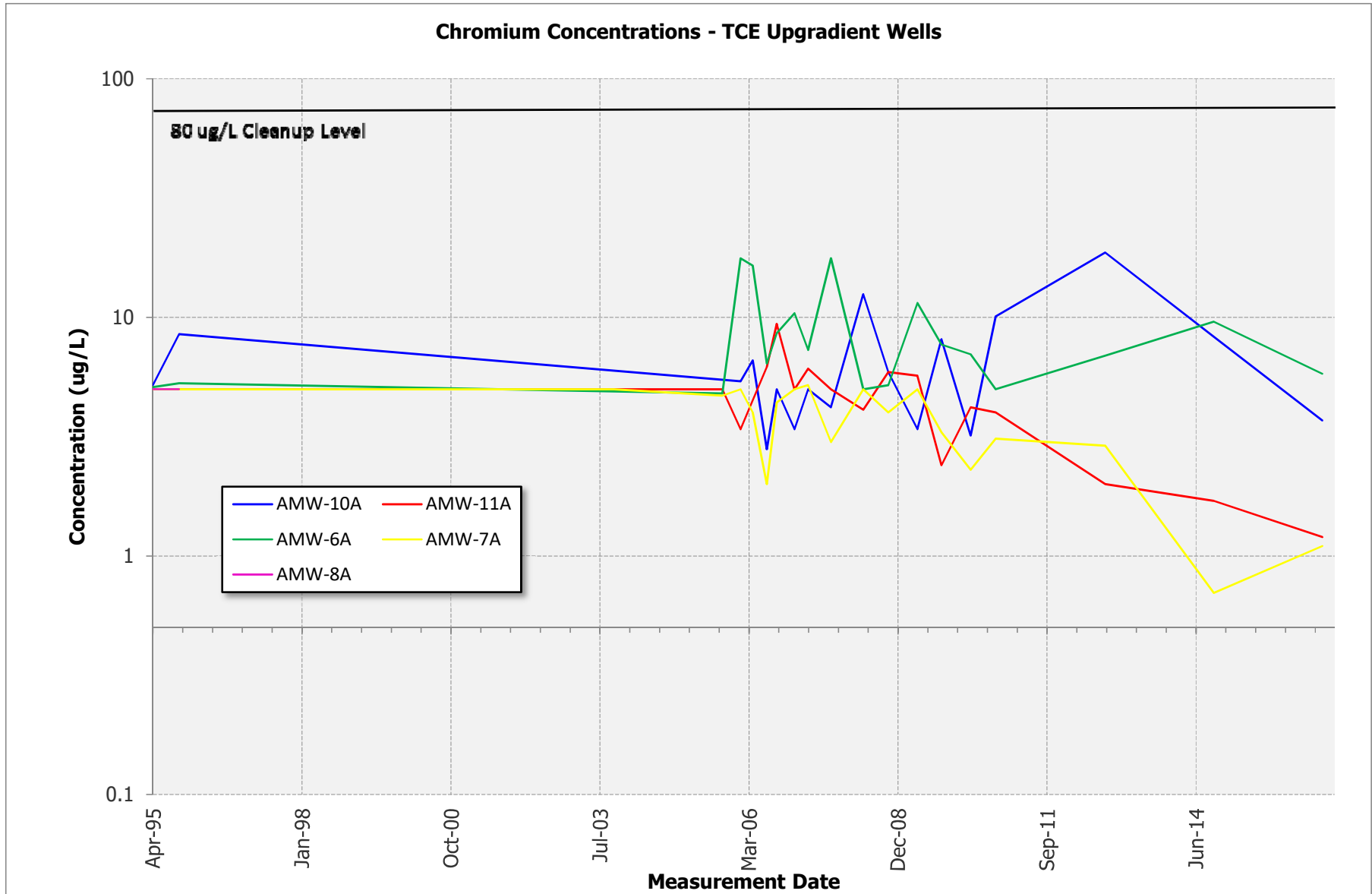
Well Group	Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
Upgradient	AMW-6A	--	--	--	5.80
	AMW-7A	--	--	--	1.10 J
	AMW-10A	--	--	--	3.70 J
	AMW-11A	--	--	--	1.20 J
TCE Source (OU-2)	AMW-54A	--	--	--	11.8
Proximal	MW-2A	--	39.8	--	91.9 J
	MW-3A	--	--	--	98.3
	MW-4B	--	702	--	795
	MW-6B	25.7	13.5	27.1	11.4
	MW-10B	35.2	33.5	36.5	28.4
	MW-10C	71.0	58.8	75.6	53.1
	PW-1B	39.1	38.6	56.4	38.7
Intermediate	MW-14C	59.7	58.2	62.6	51.5
	MW-14E	44.3	44.5	49.3	42.1
	MW-18D	88.9	87.2	86.5	74.0
	MW-19D	88.9	91.7	91.6	79.5
	MW-20D	58.0	56.6	58.1	50.0
Church of God	MW-21D	8.30	9.10	9.60	8.70
	MW-22D	20.0	18.6	19.1	15.1
Troutdale Aquifer	BENNETT	4.00 U	--	--	4.00 U
<p>NOTES:</p> <p>Only wells sampled for chromium during Fall 2016 are included in this table.</p> <p>Results are in micrograms per liter ($\mu\text{g/L}$).</p> <p>Results are for total chromium, unless otherwise noted.</p> <p>Results shown in red bold exceed the cleanup level of 80 $\mu\text{g/L}$.</p> <p>-- = Not sampled.</p> <p>J = The result is an estimated concentration that is less than the method reporting limit but greater than or equal to the method detection limit.</p> <p>U = Analyte not detected above the specified reporting limit.</p>					

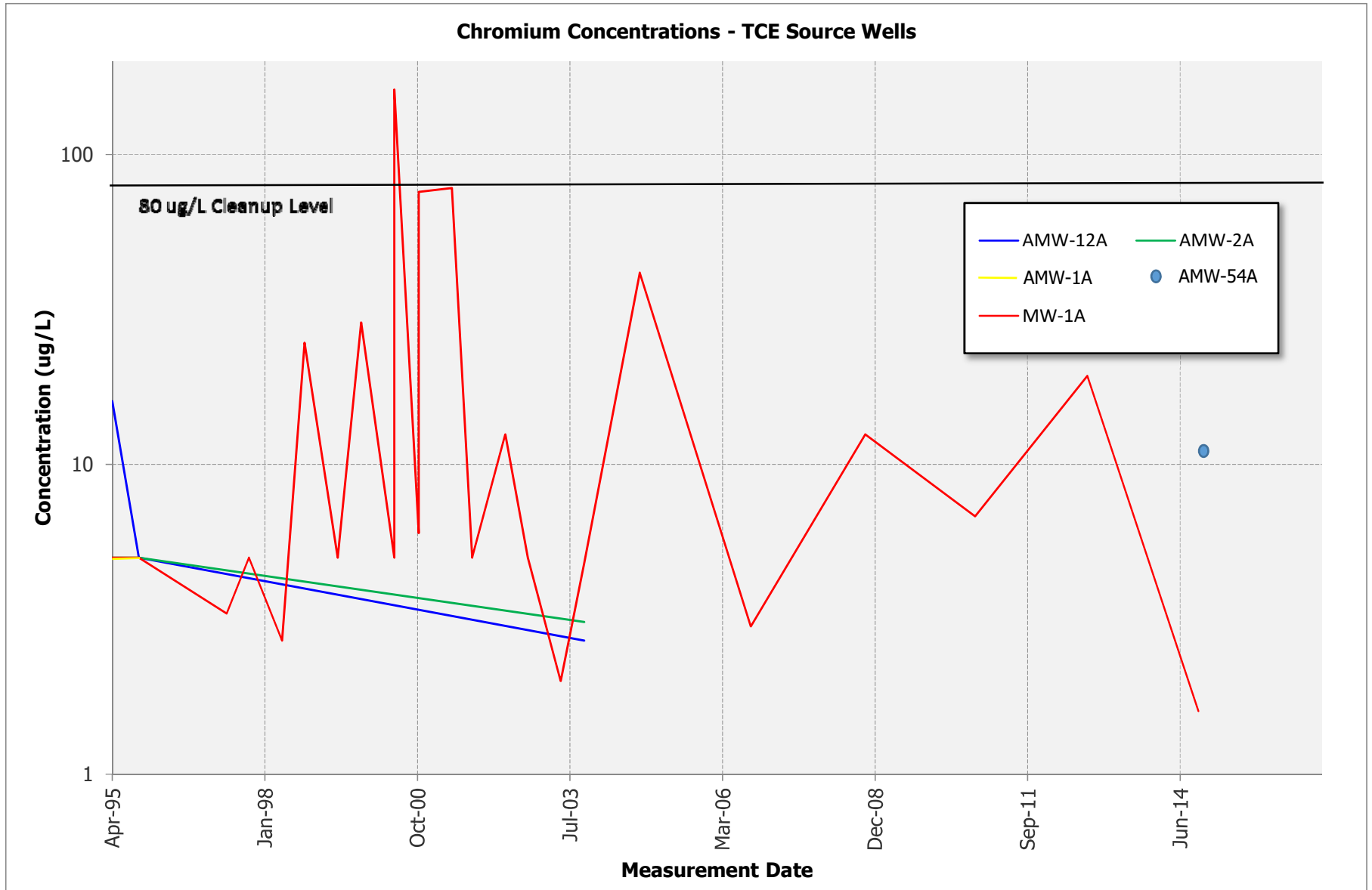
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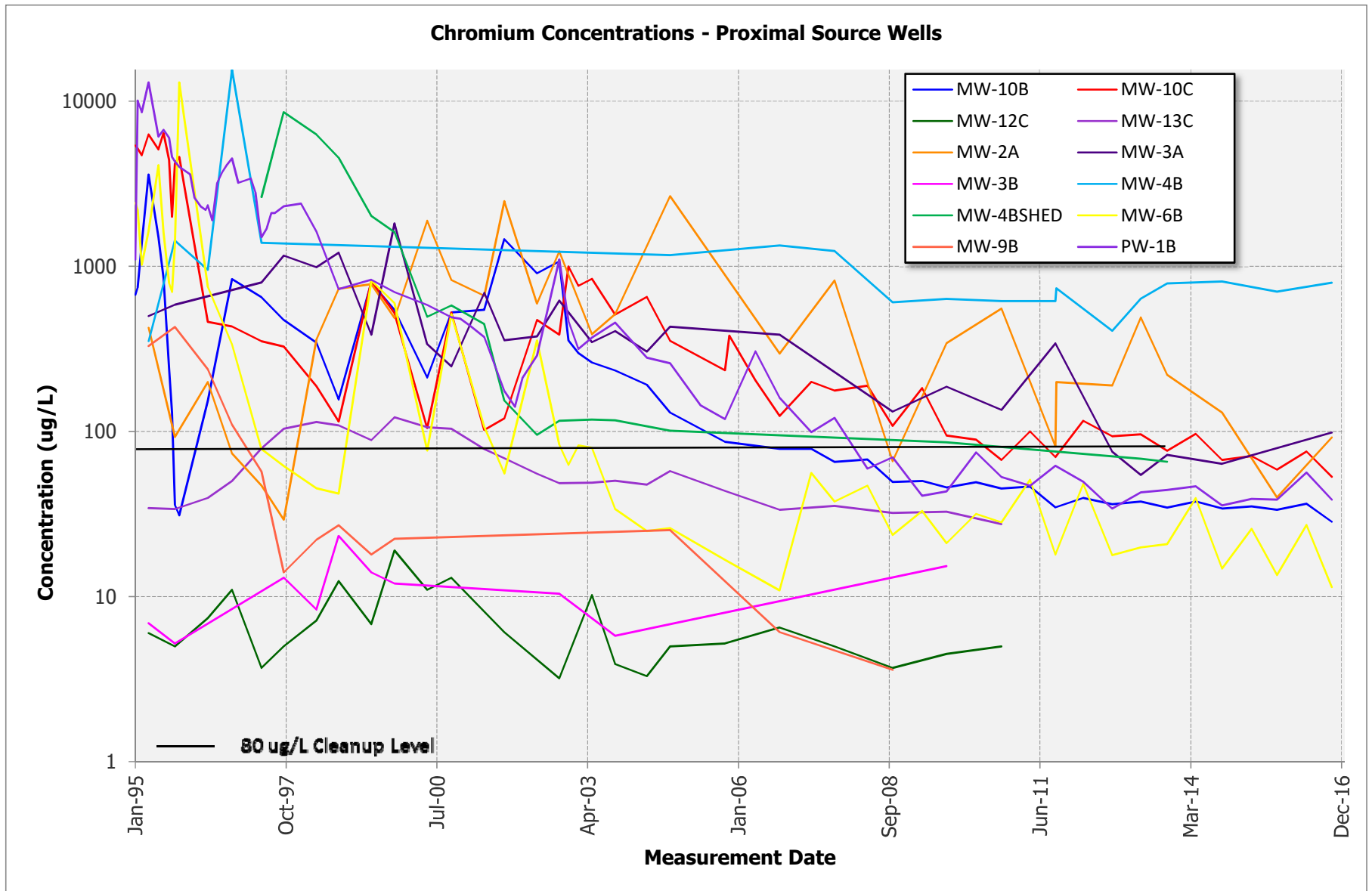
APPENDIX A-2

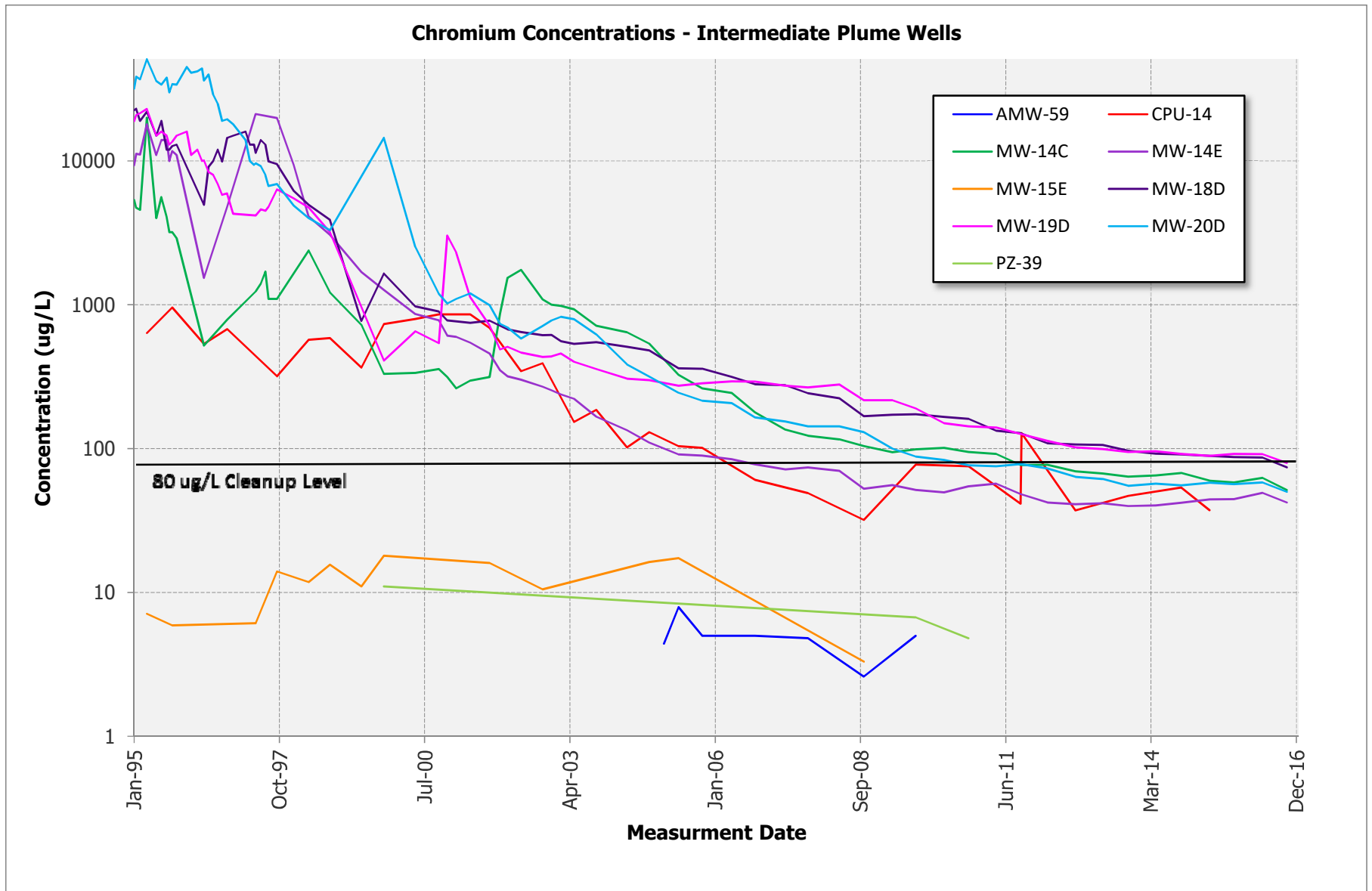
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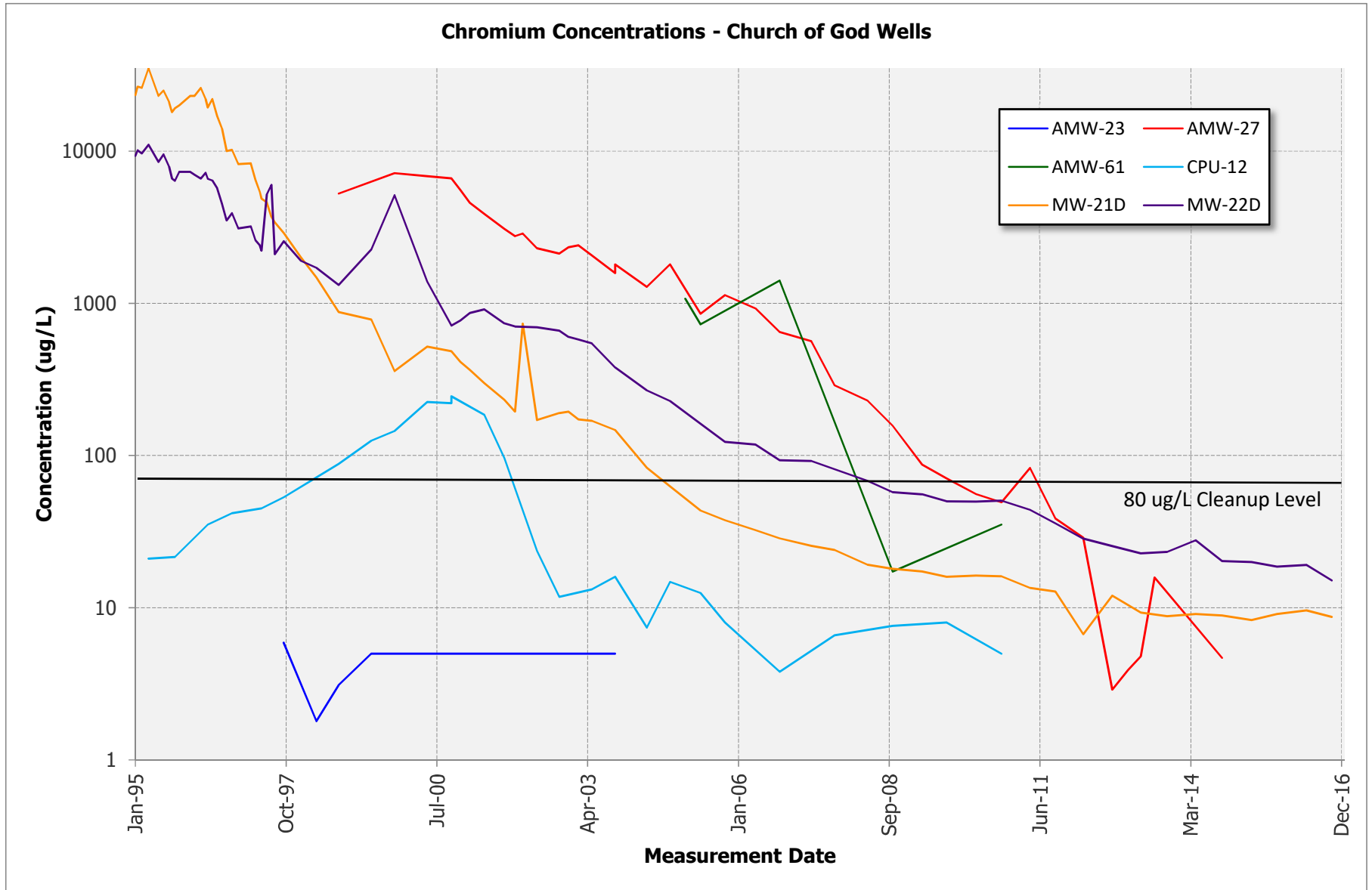
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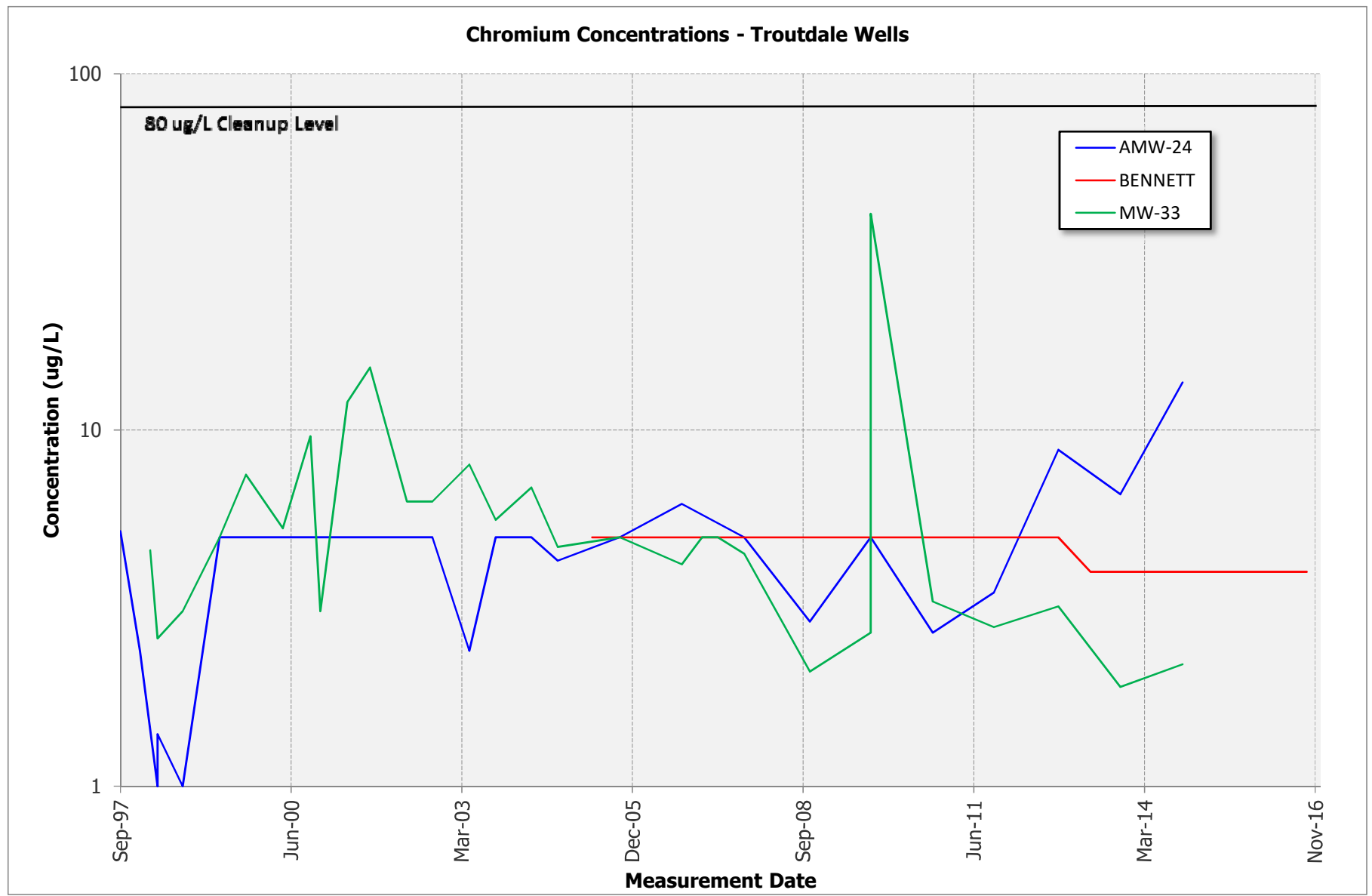








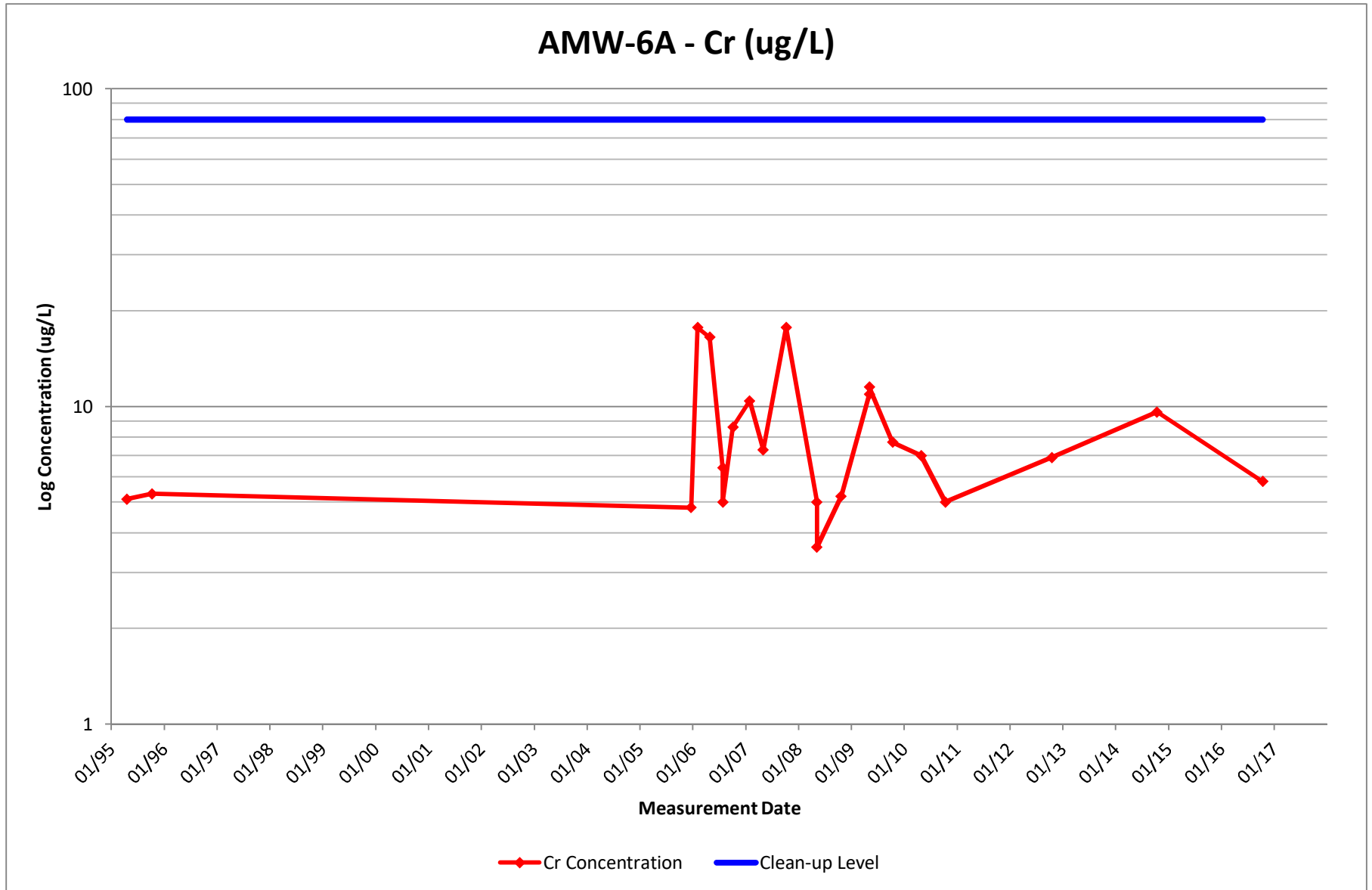


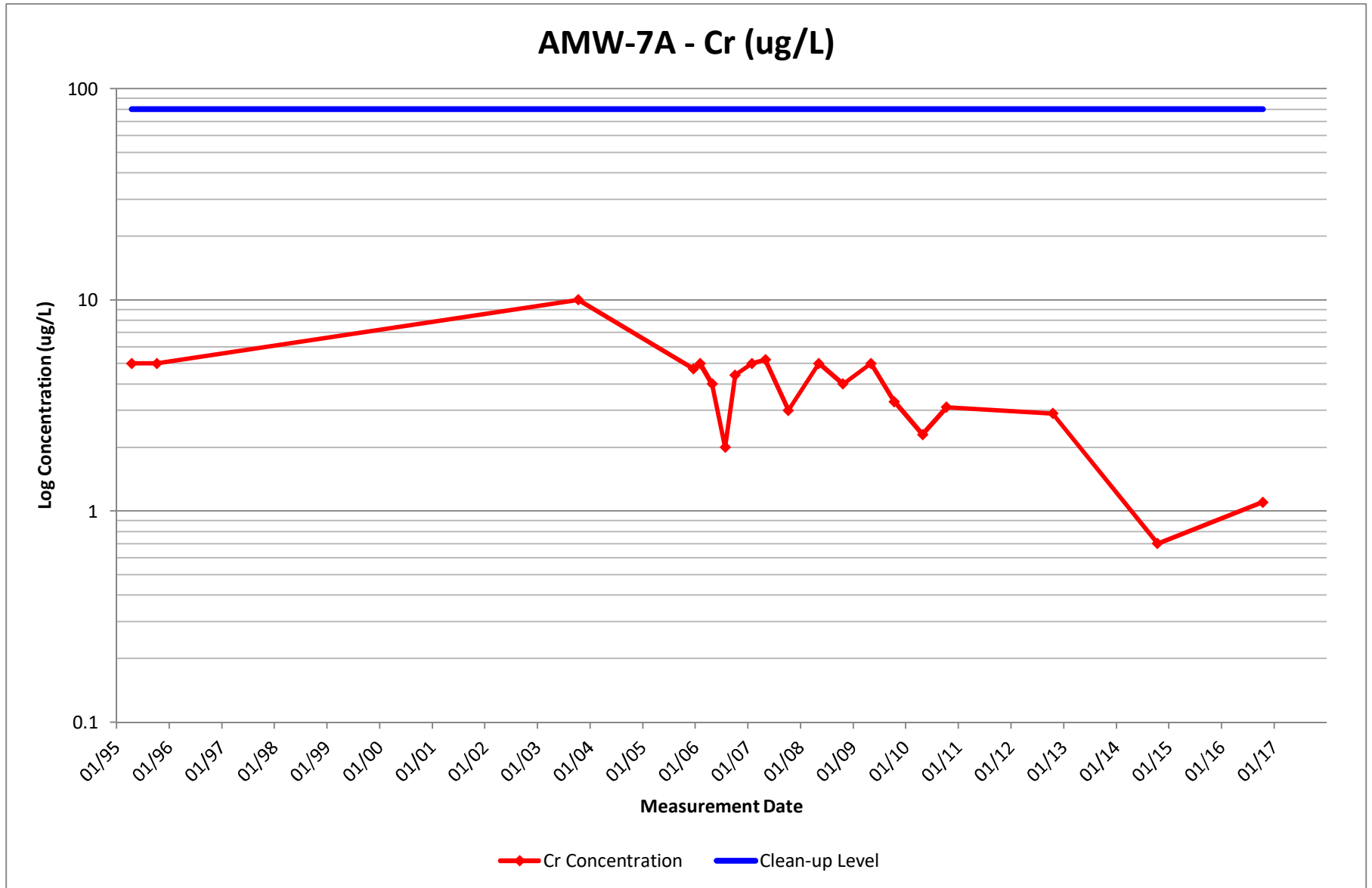


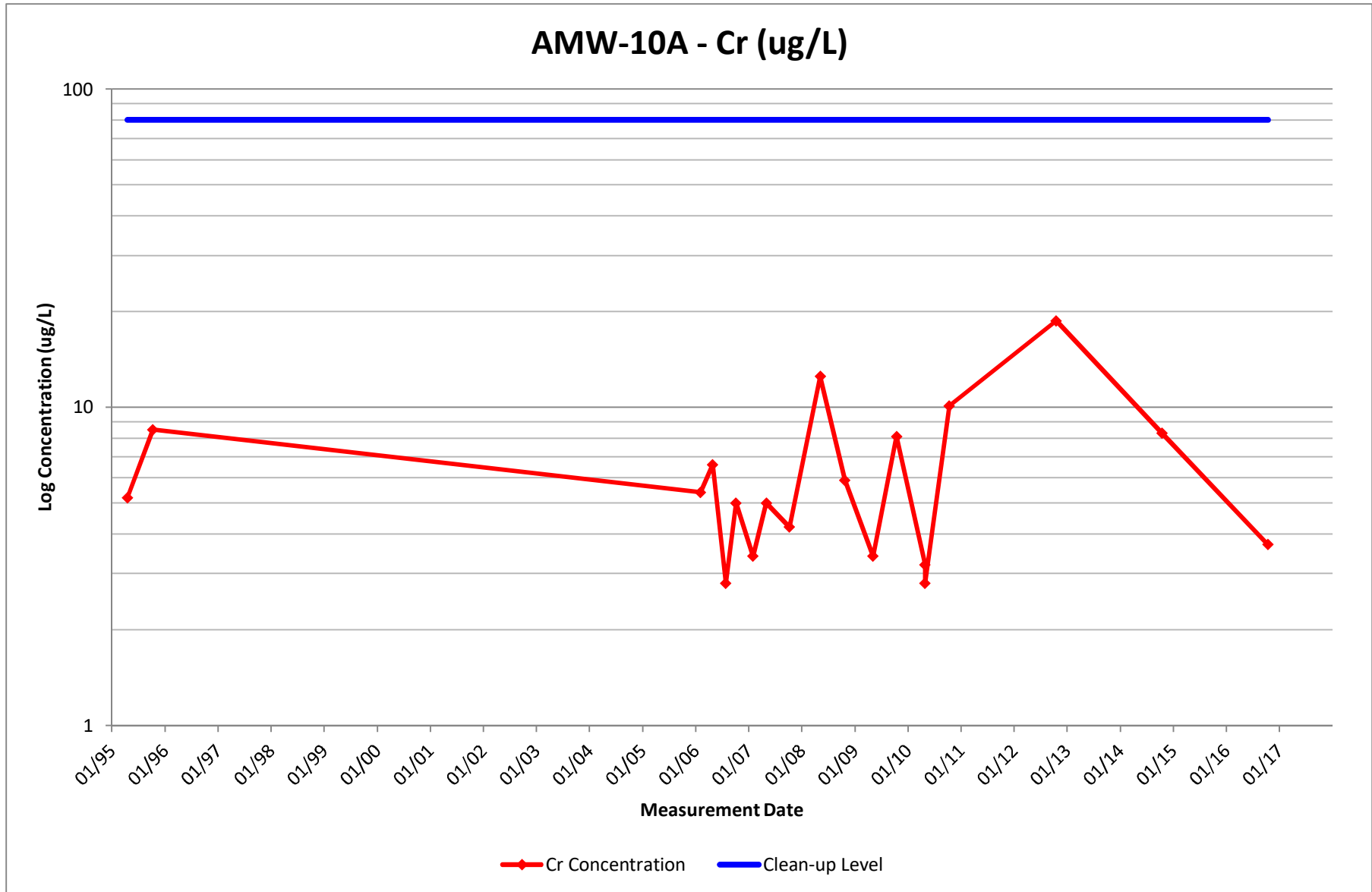
APPENDIX A-3

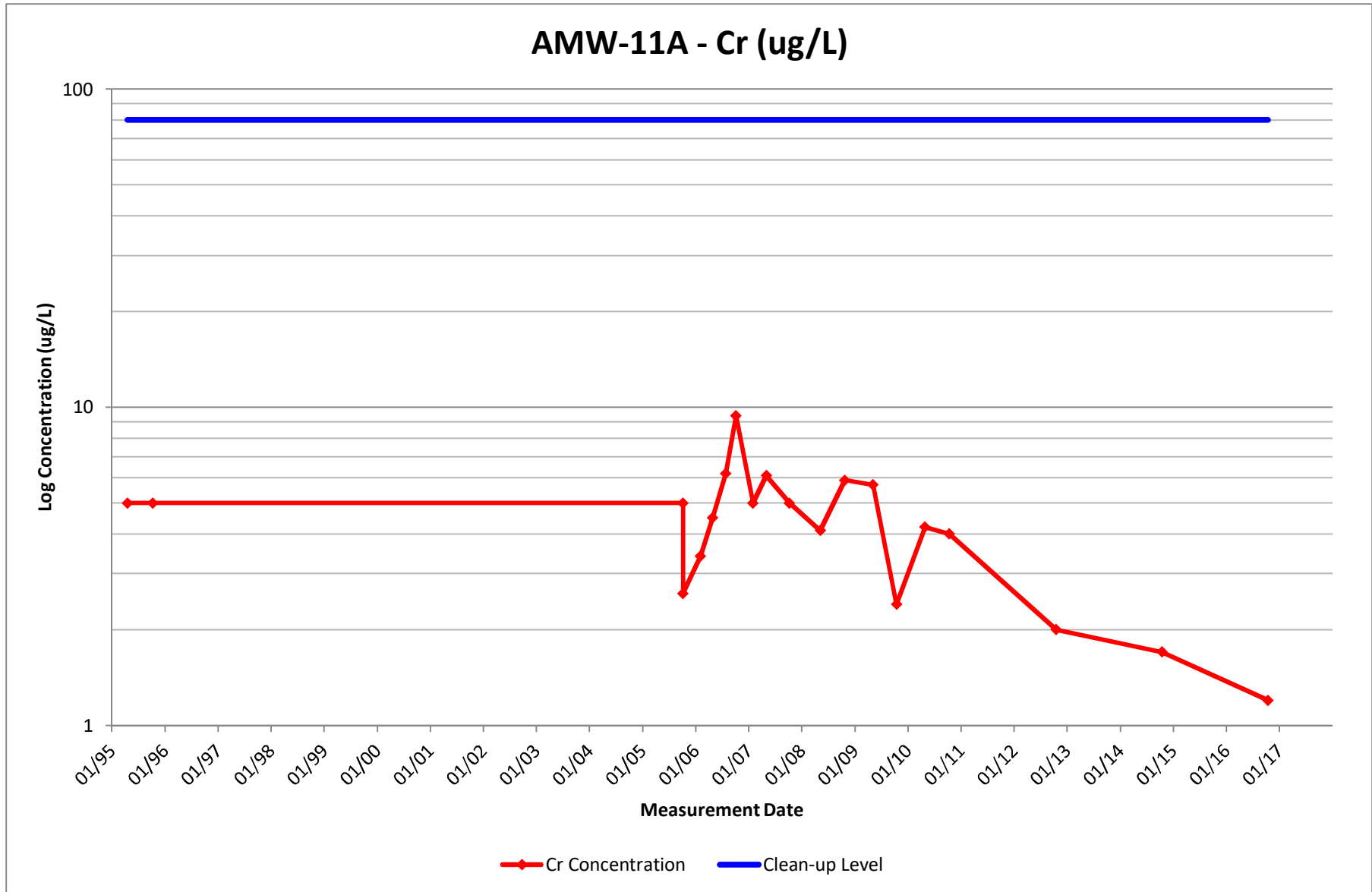
**CHROMIUM CONCENTRATIONS –
INDIVIDUAL WELLS**

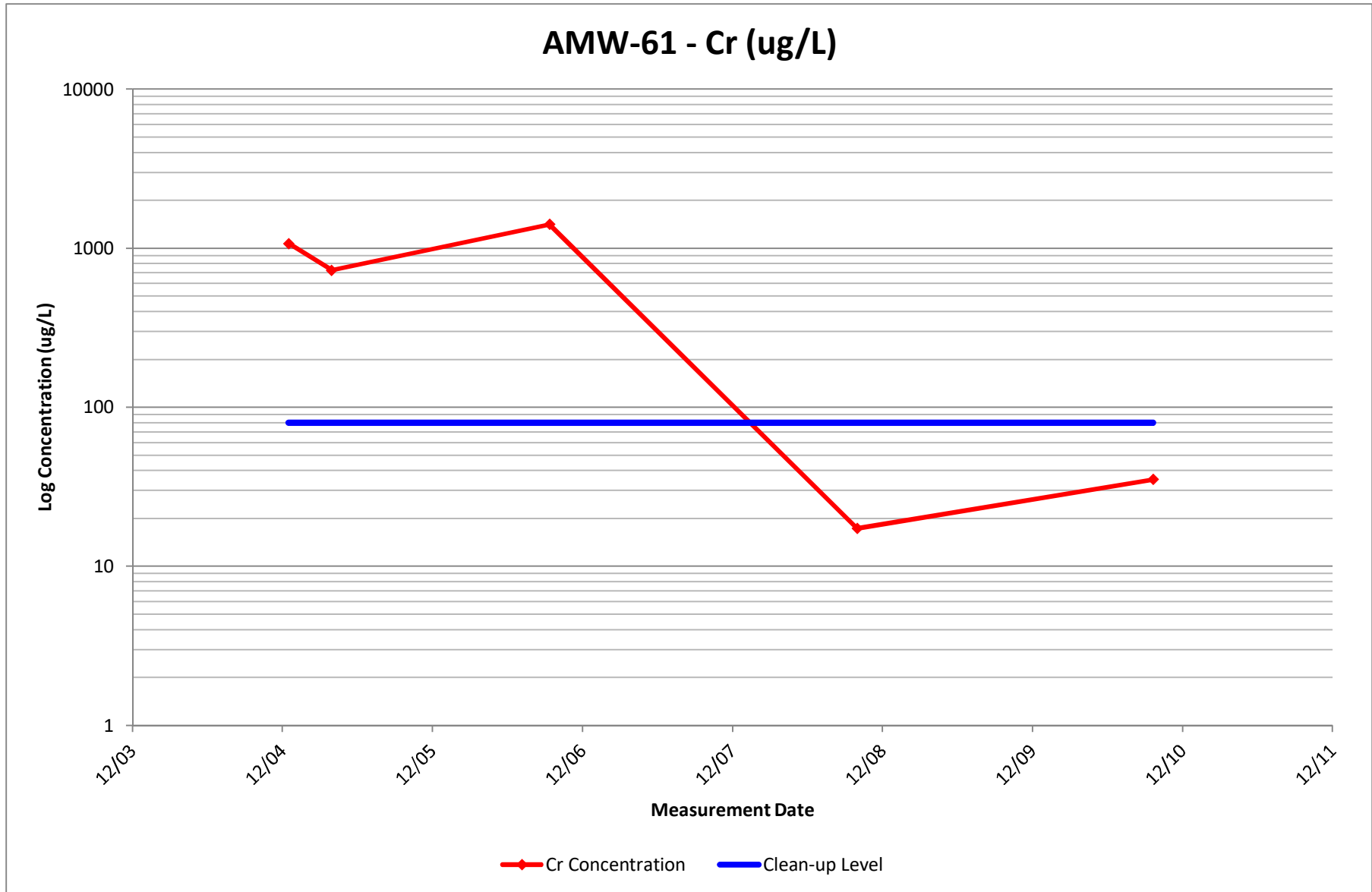
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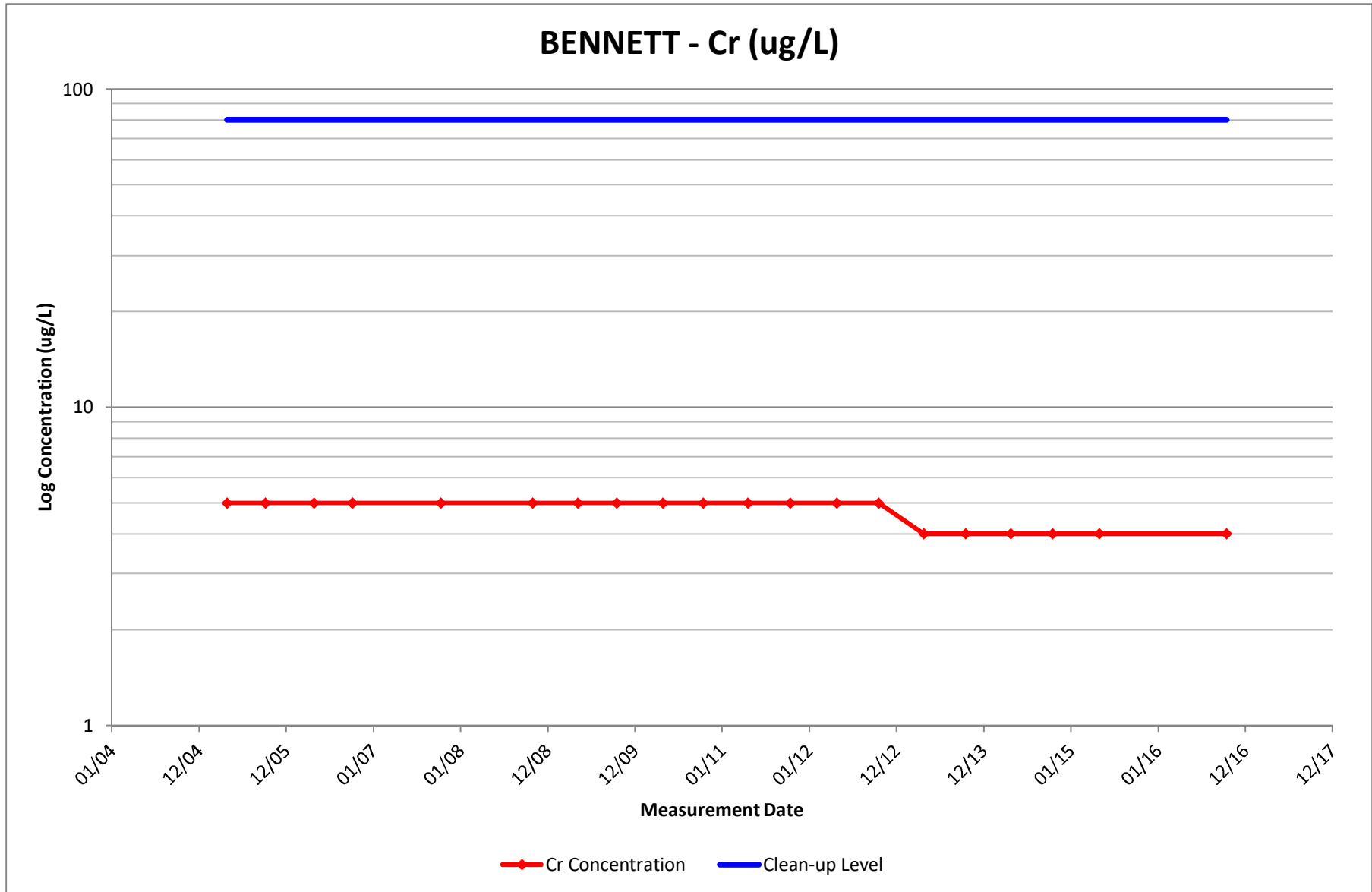


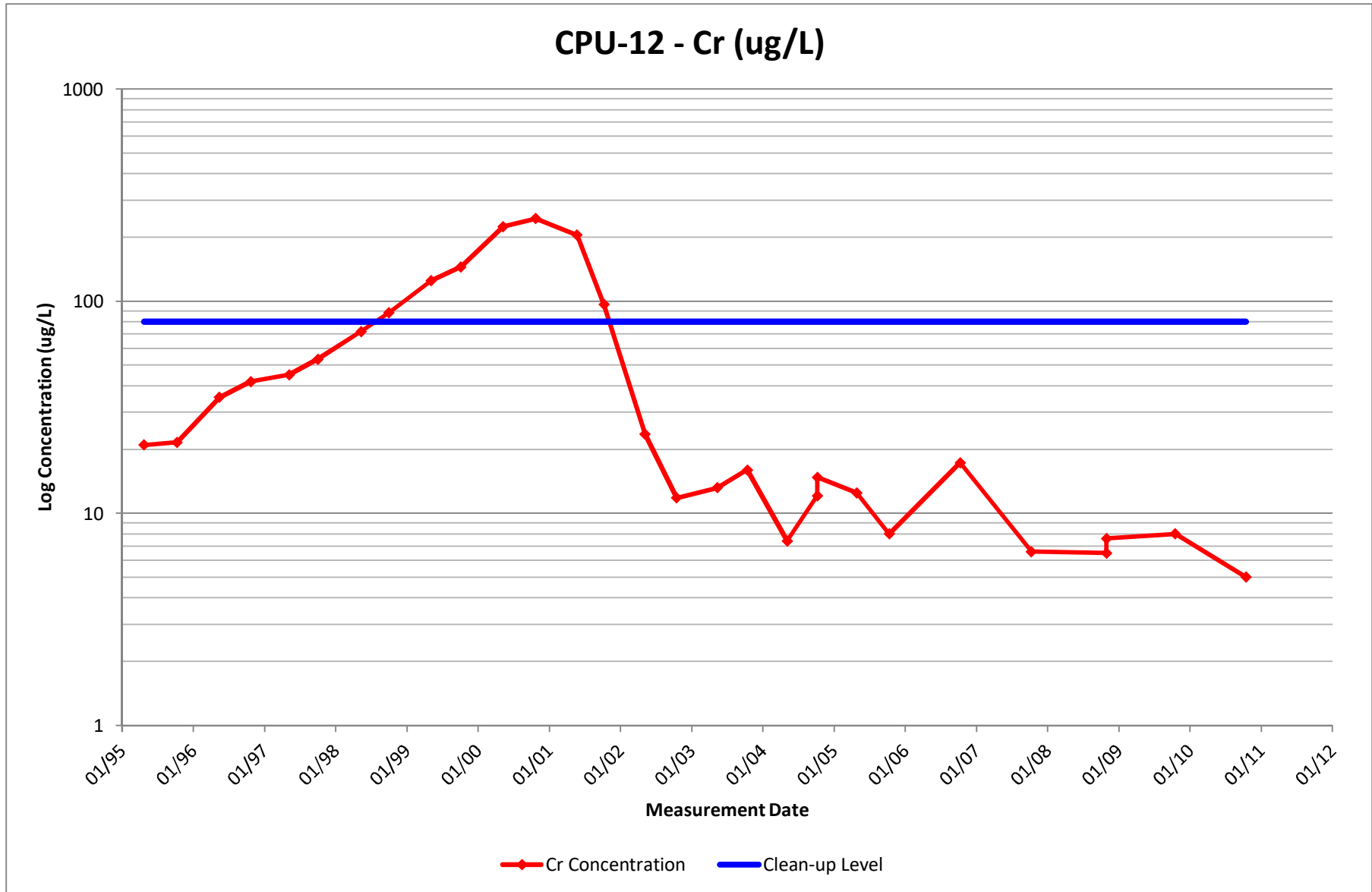


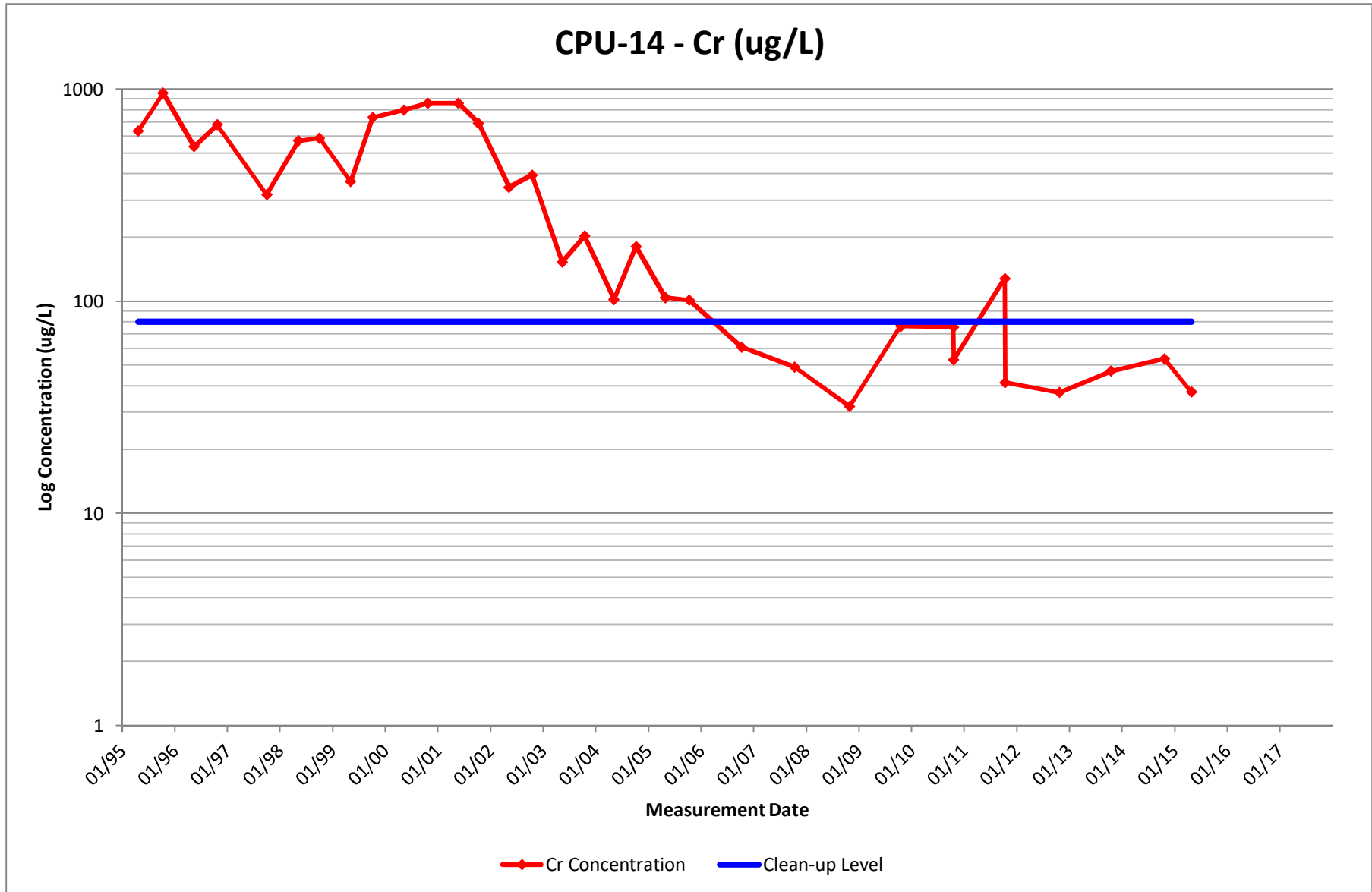


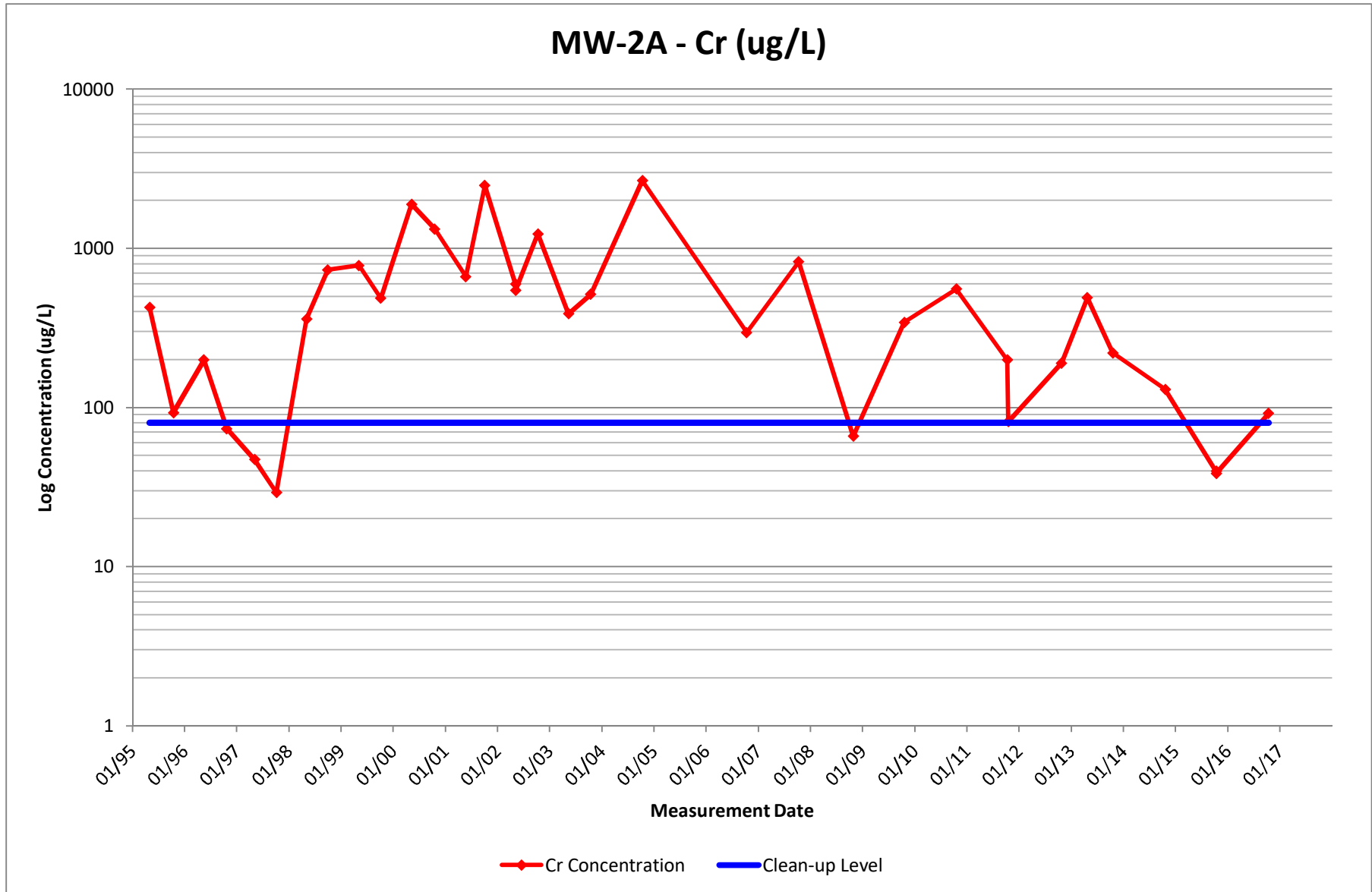


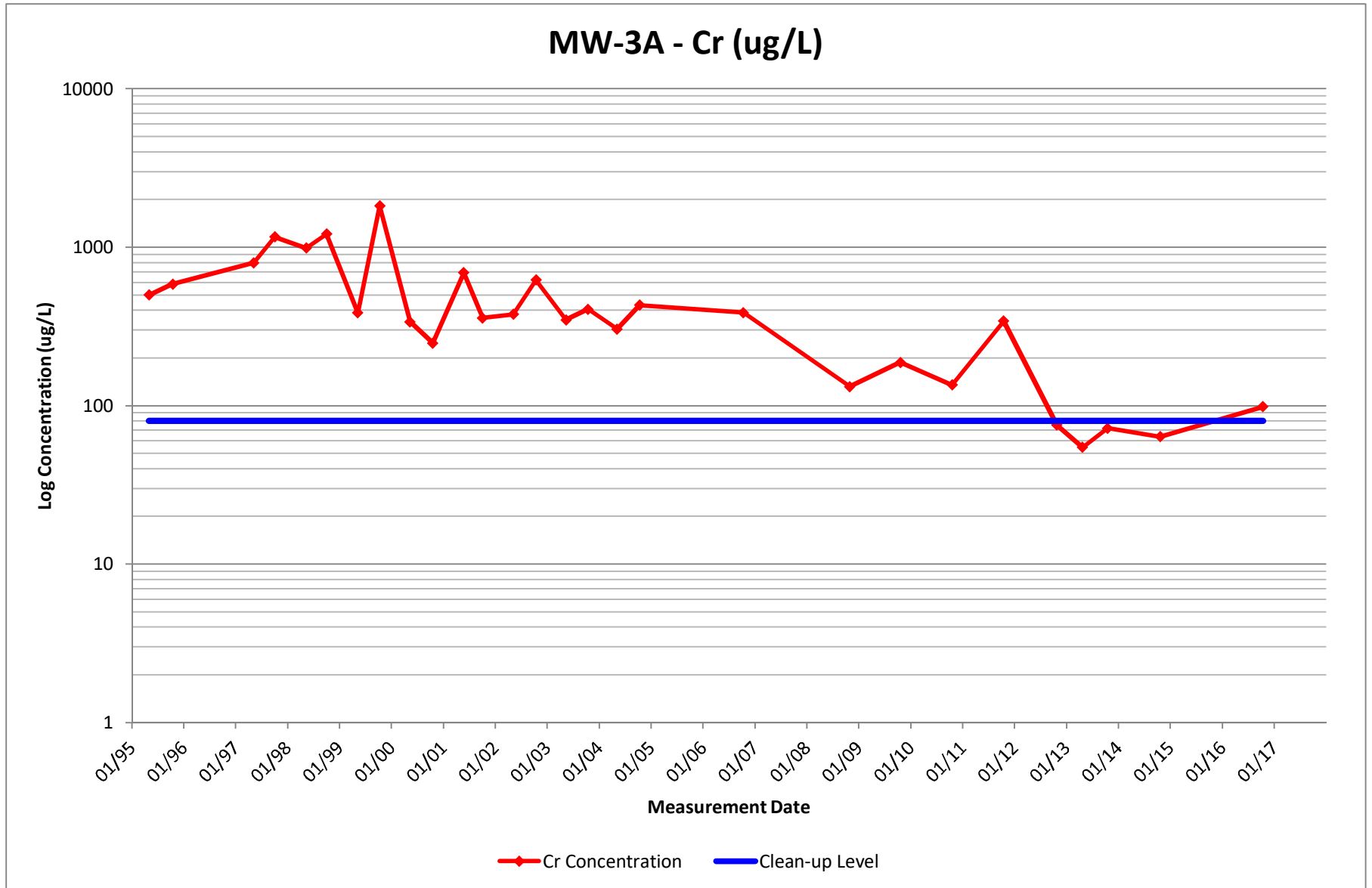


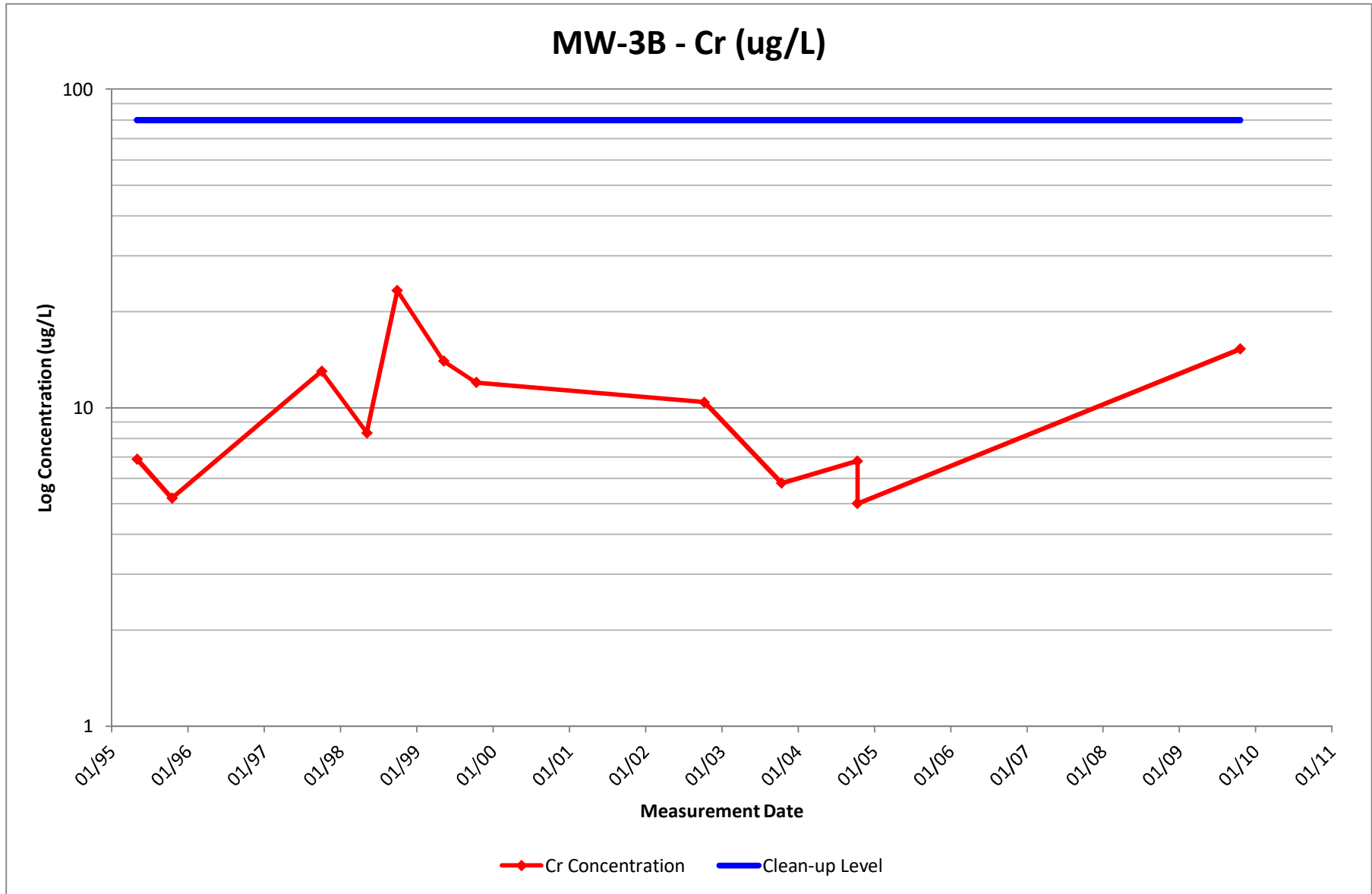


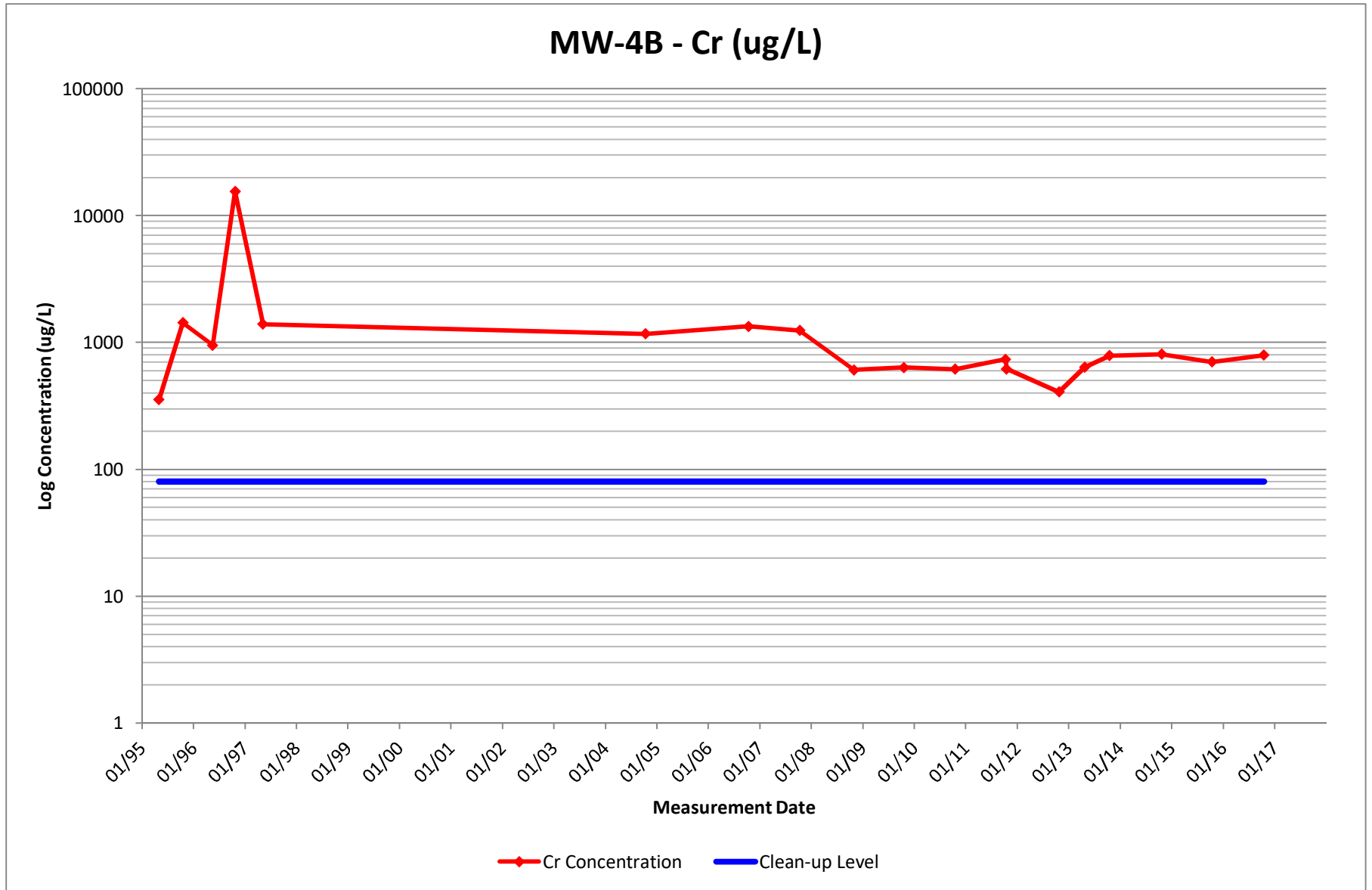


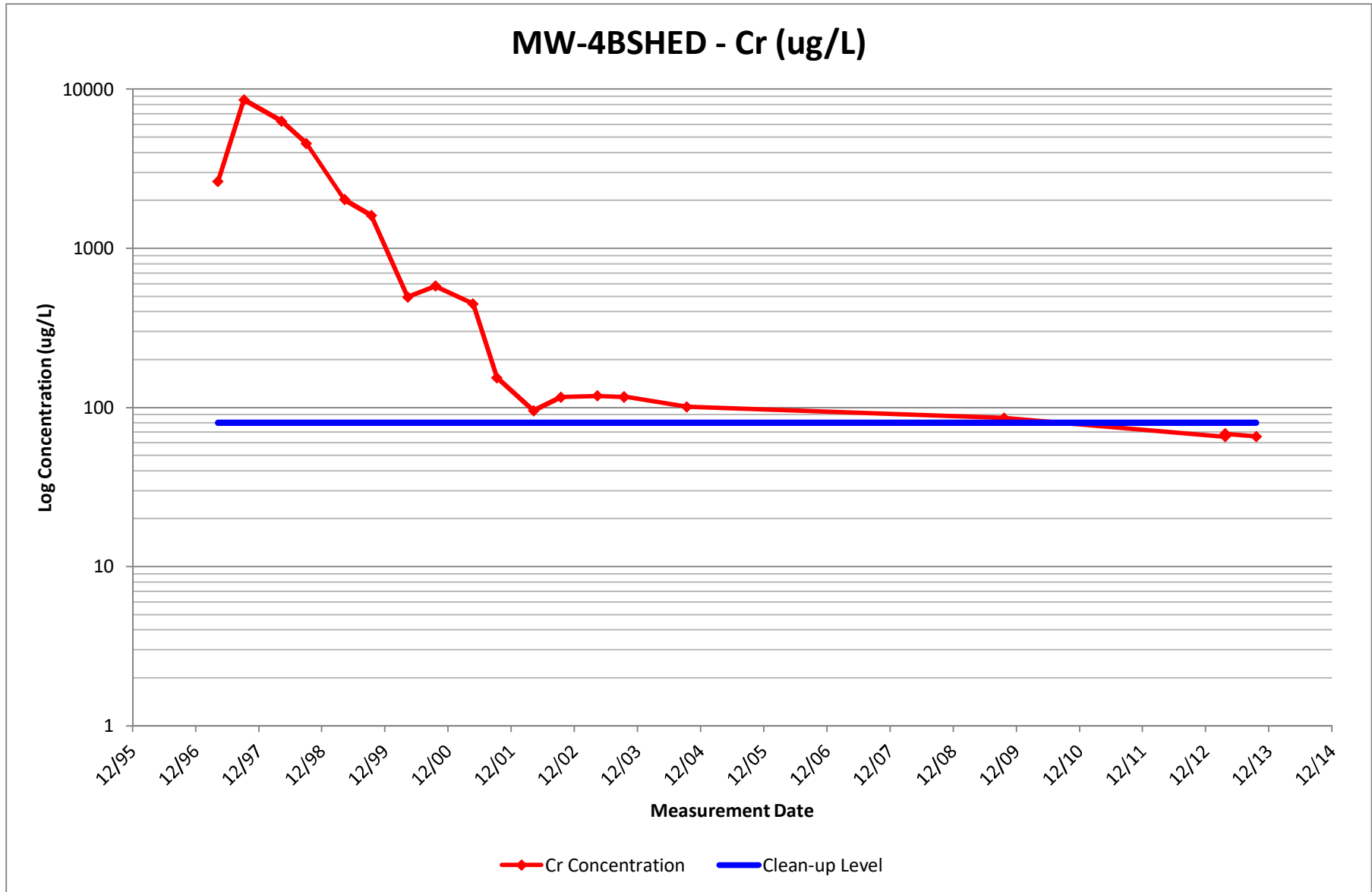


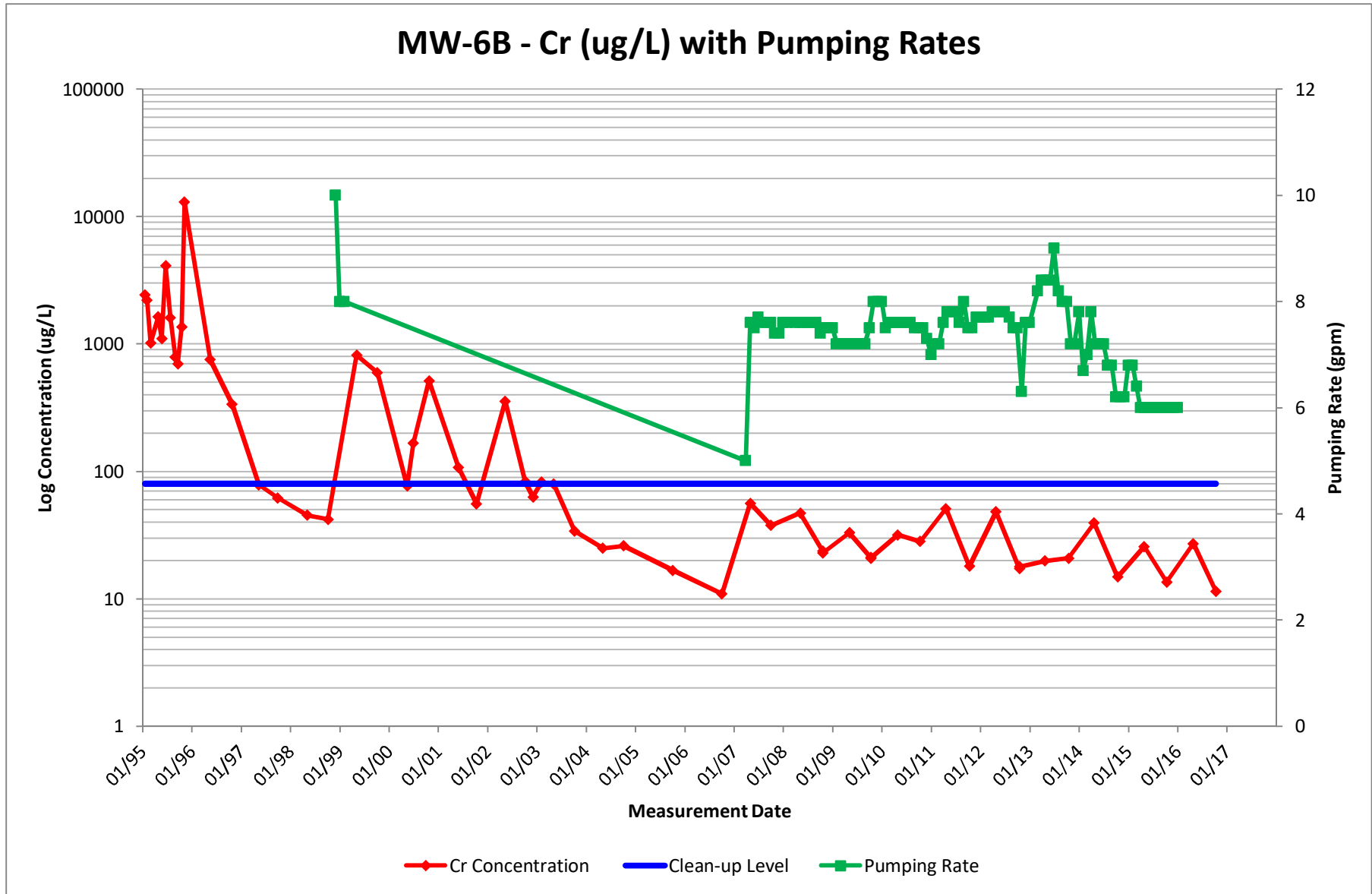


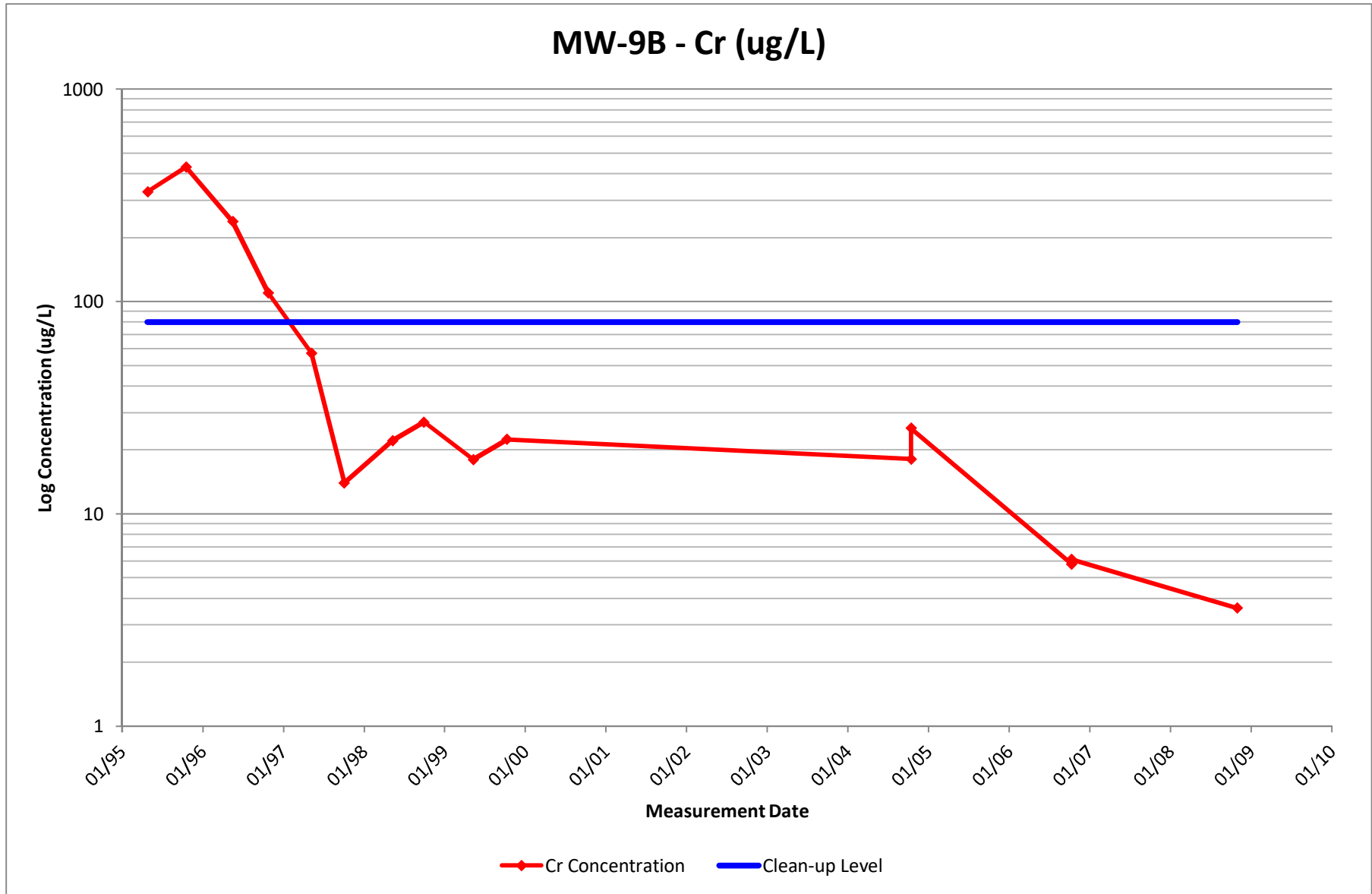


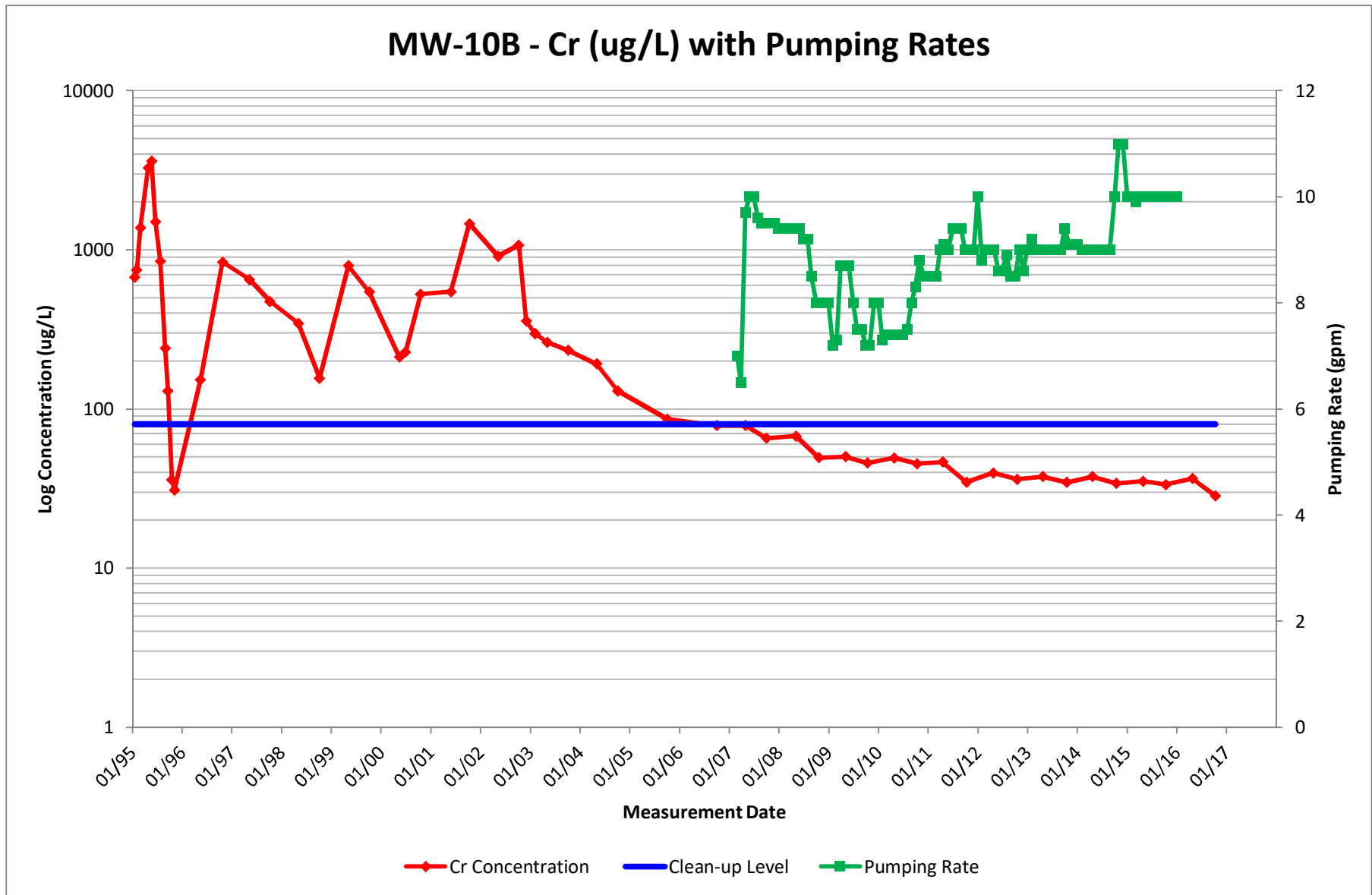


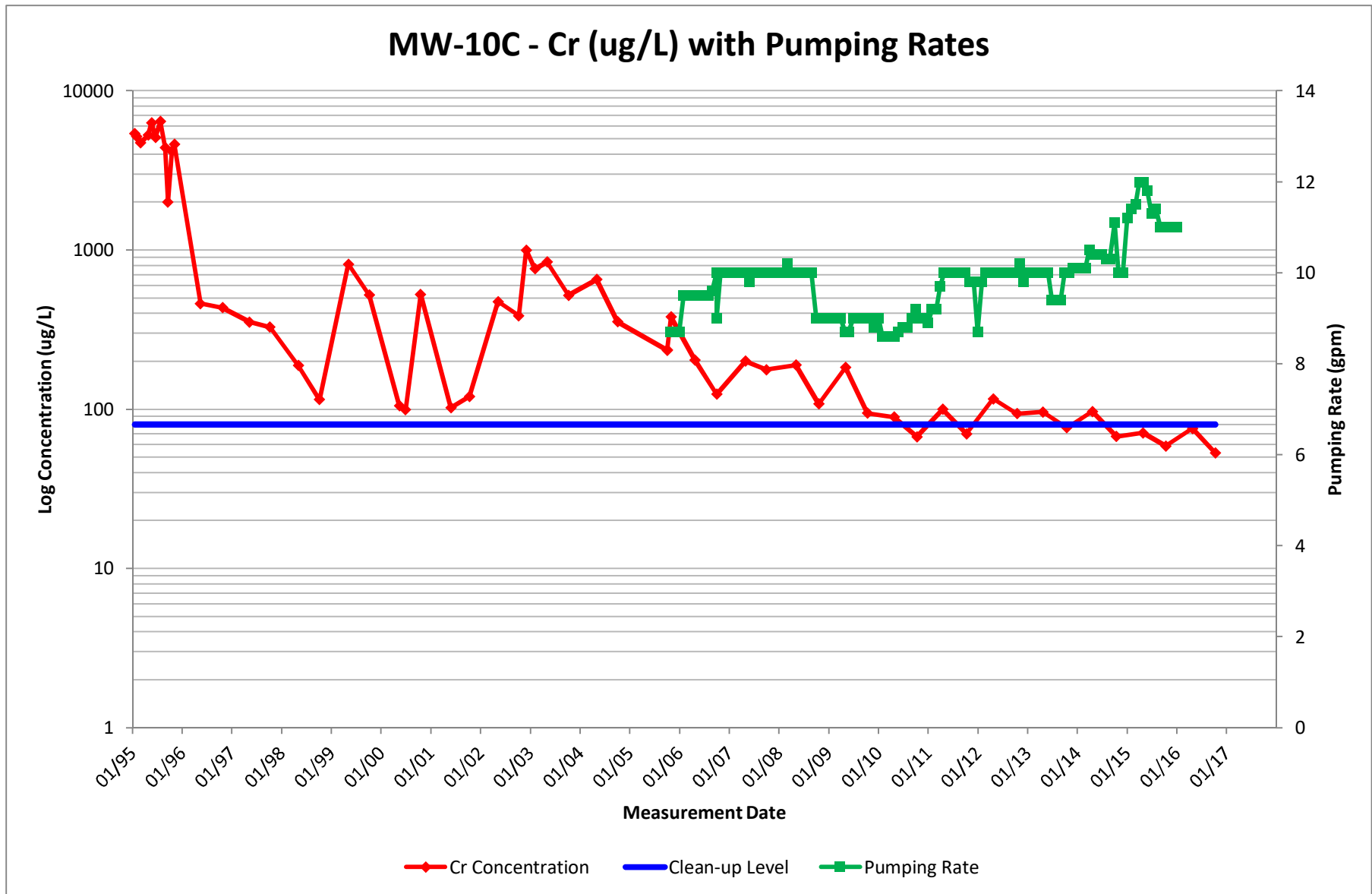


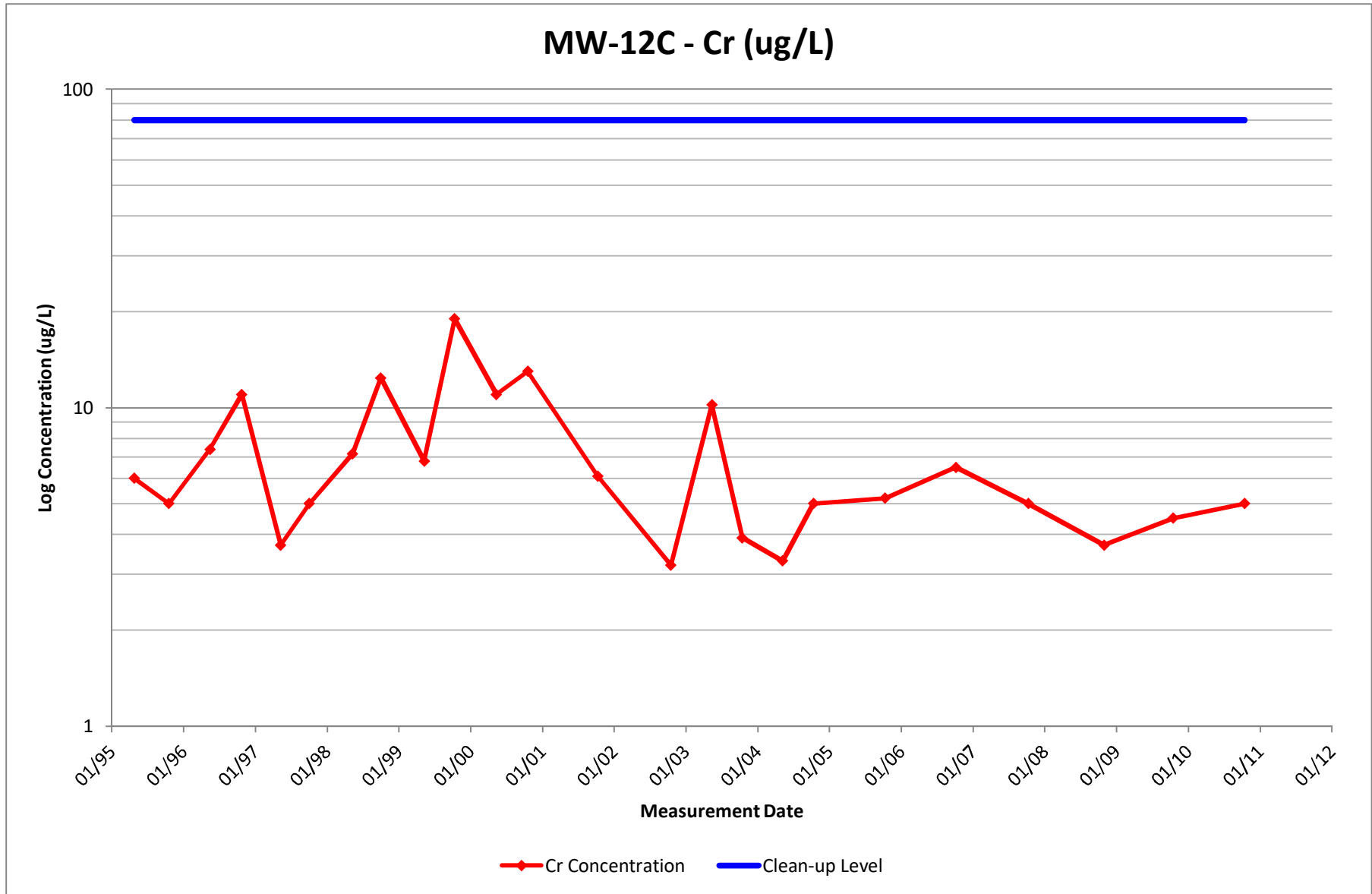


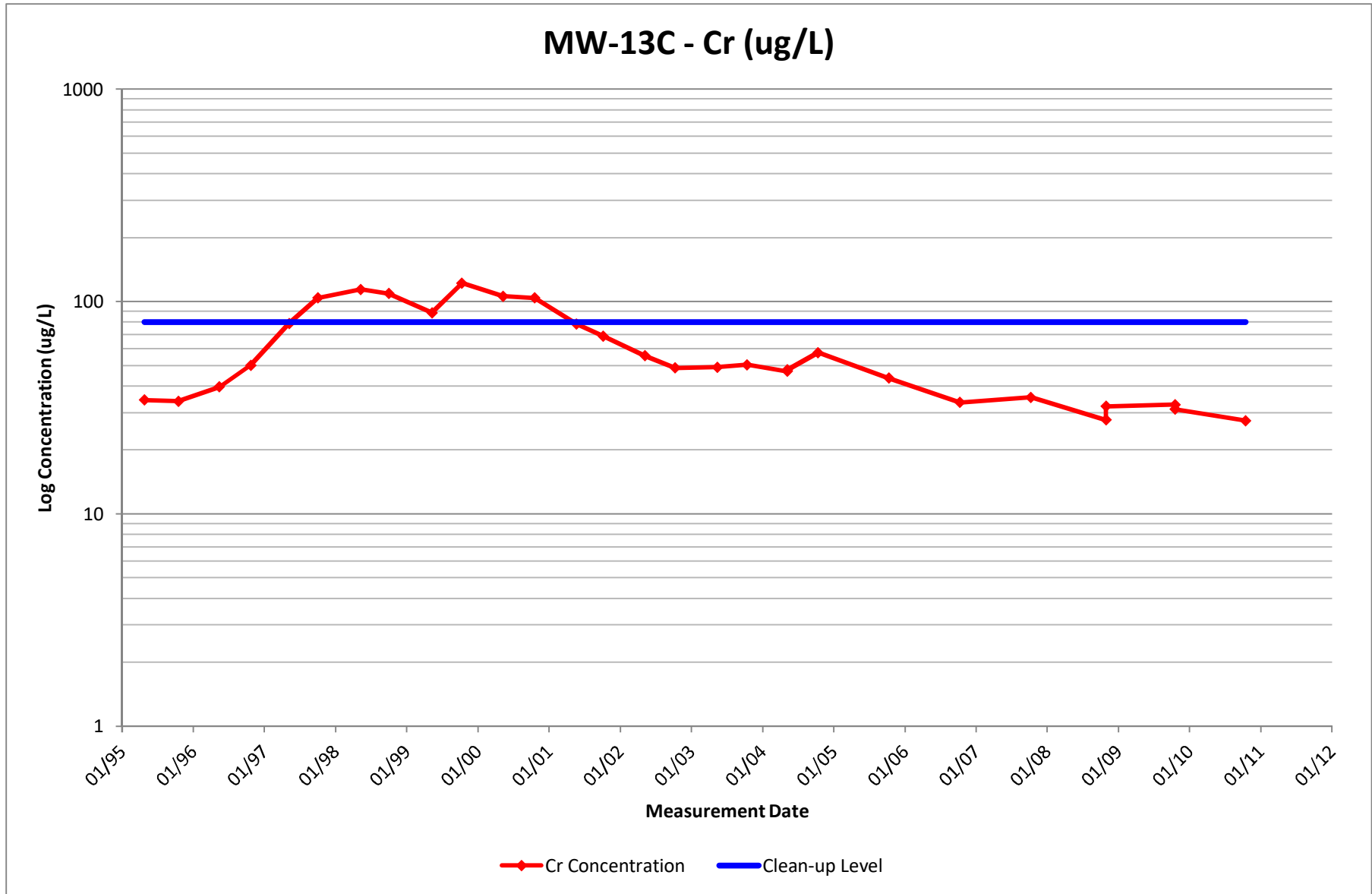


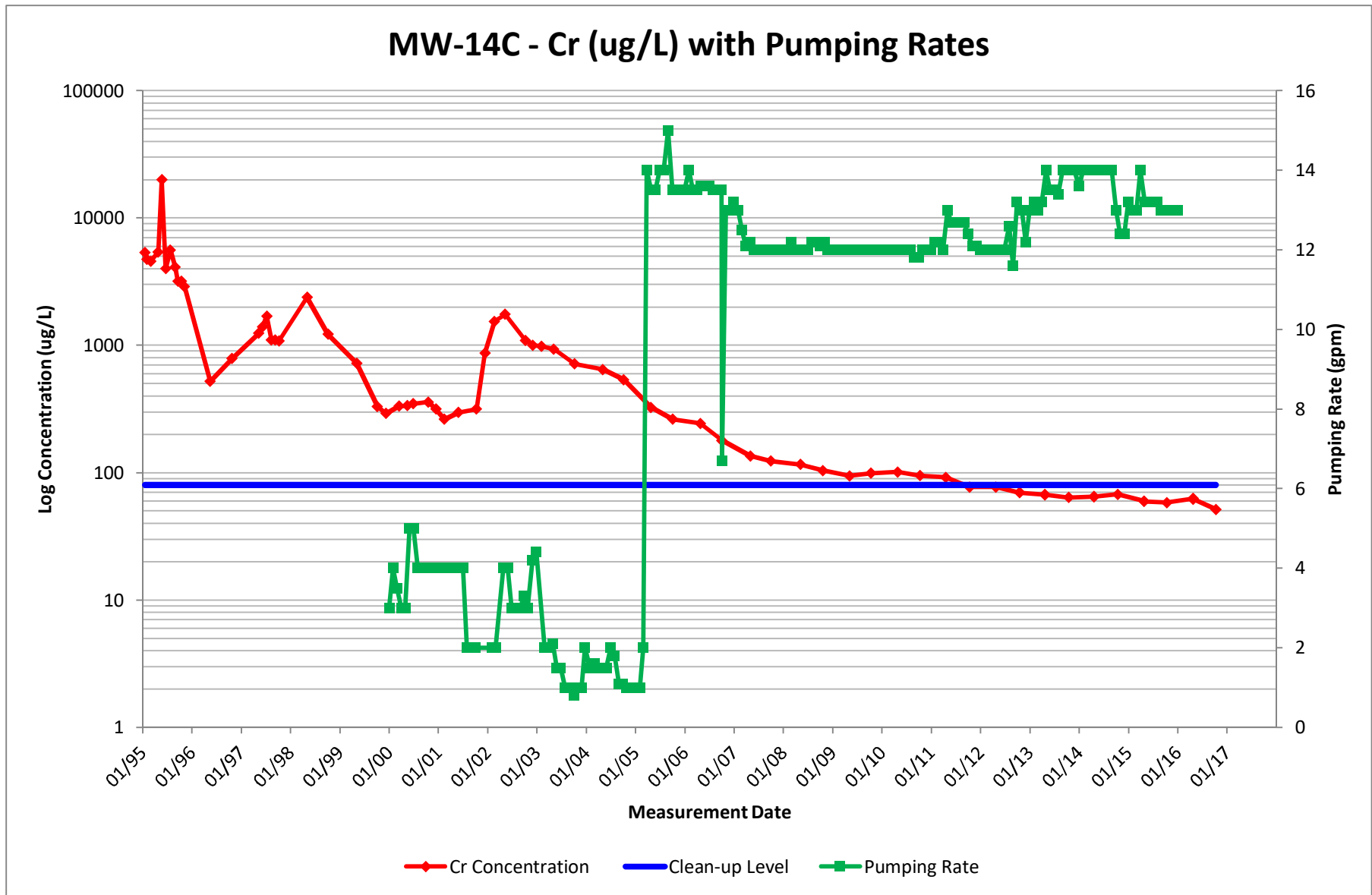


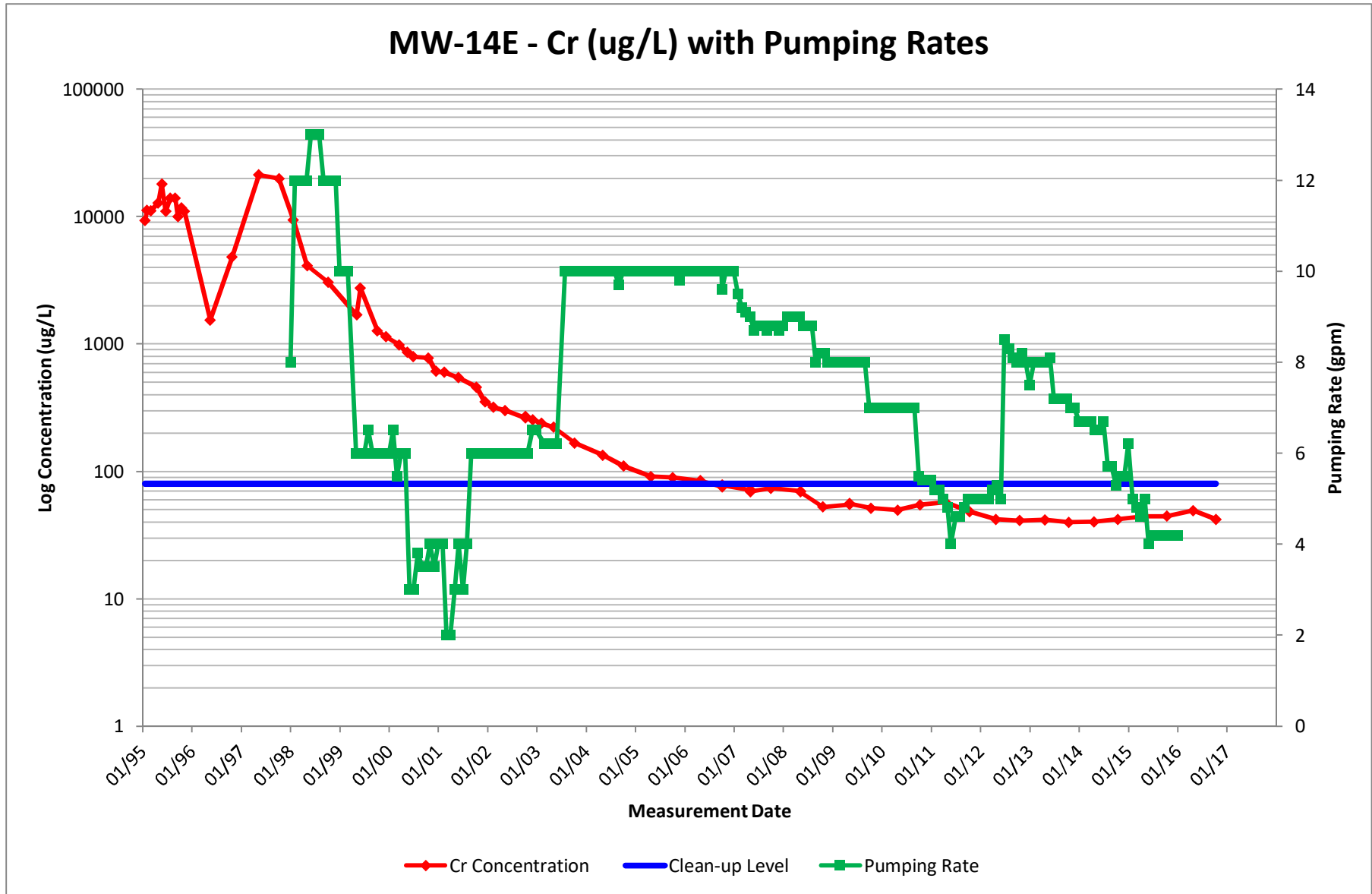


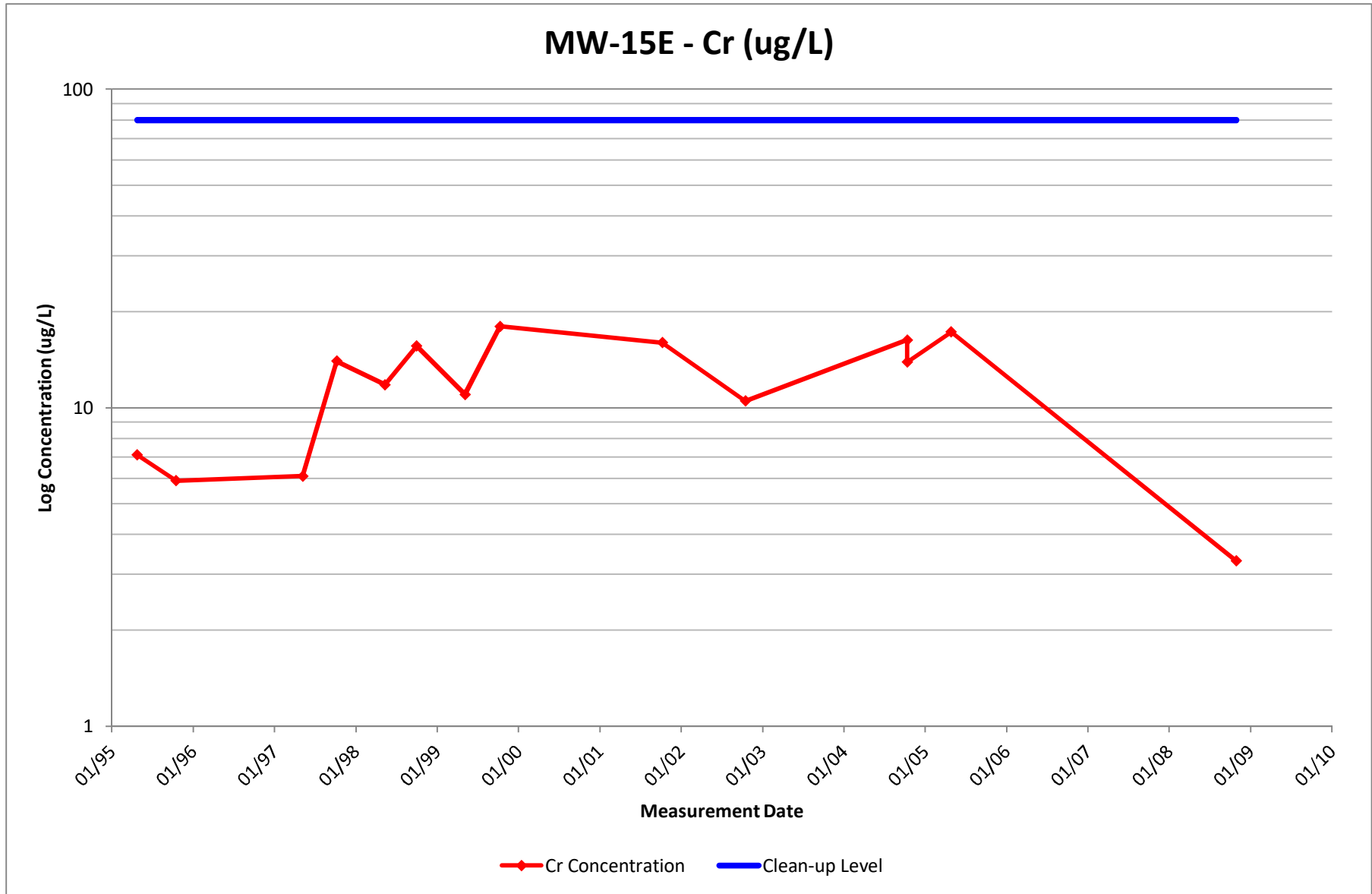


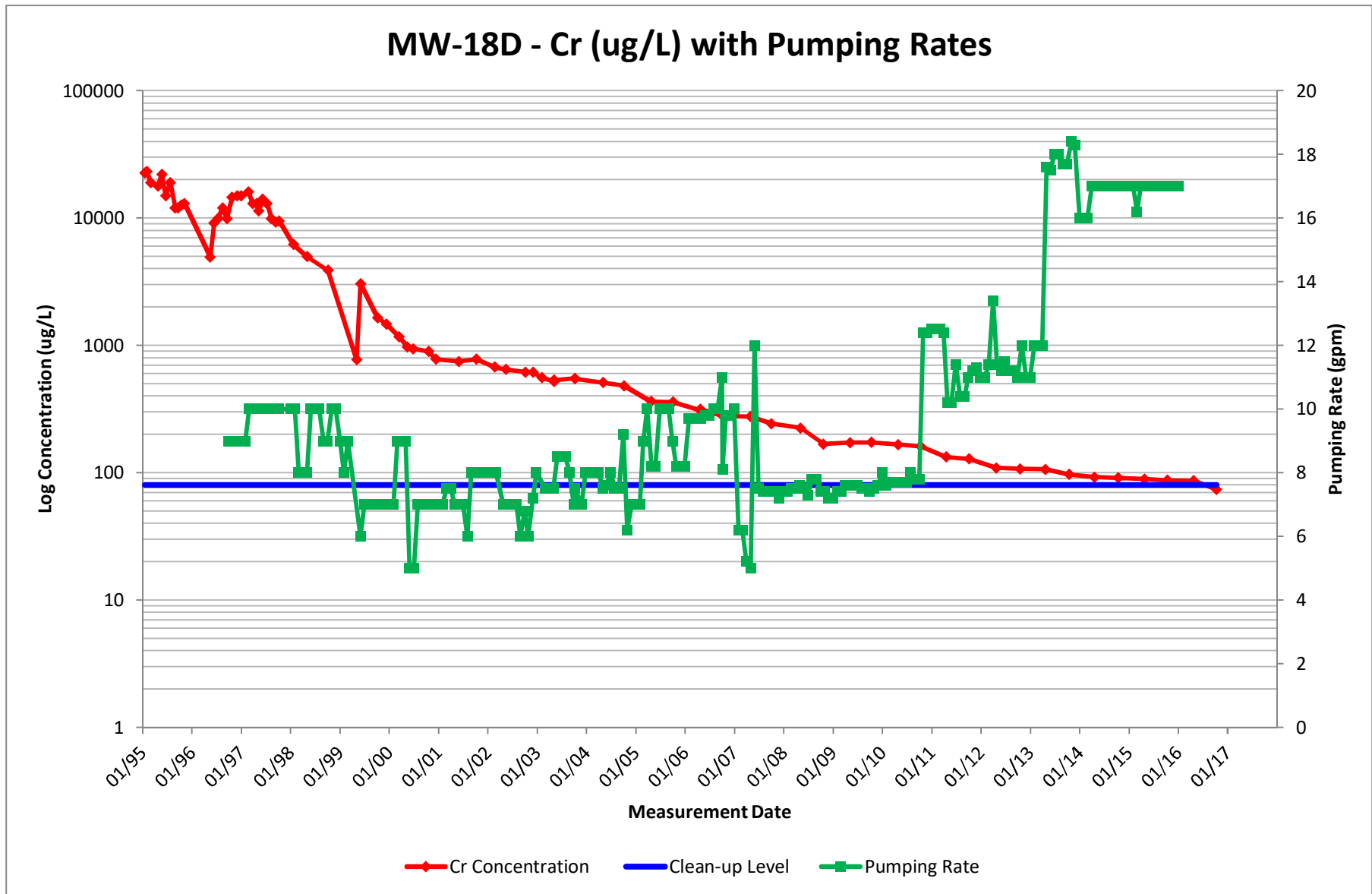


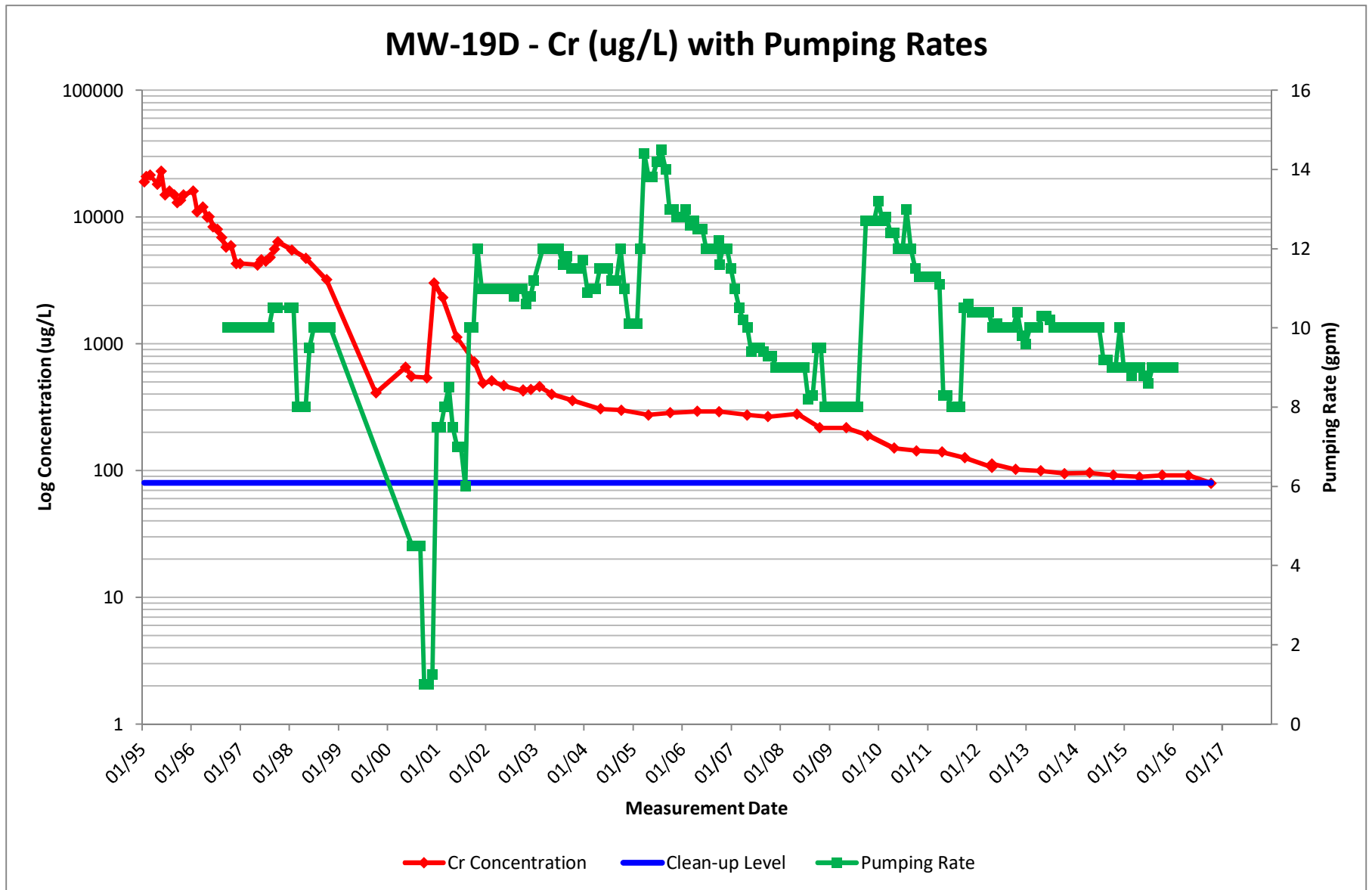


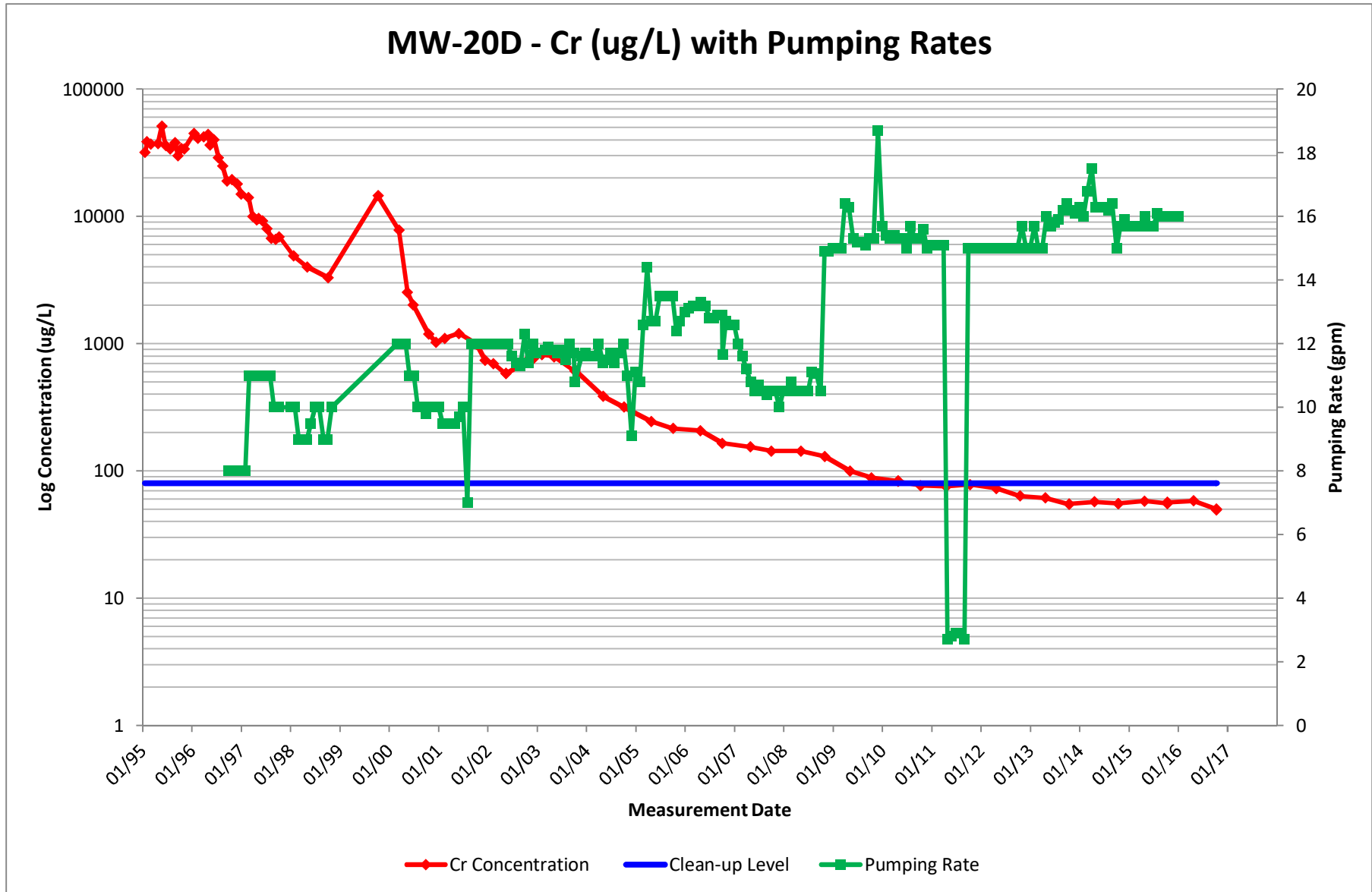


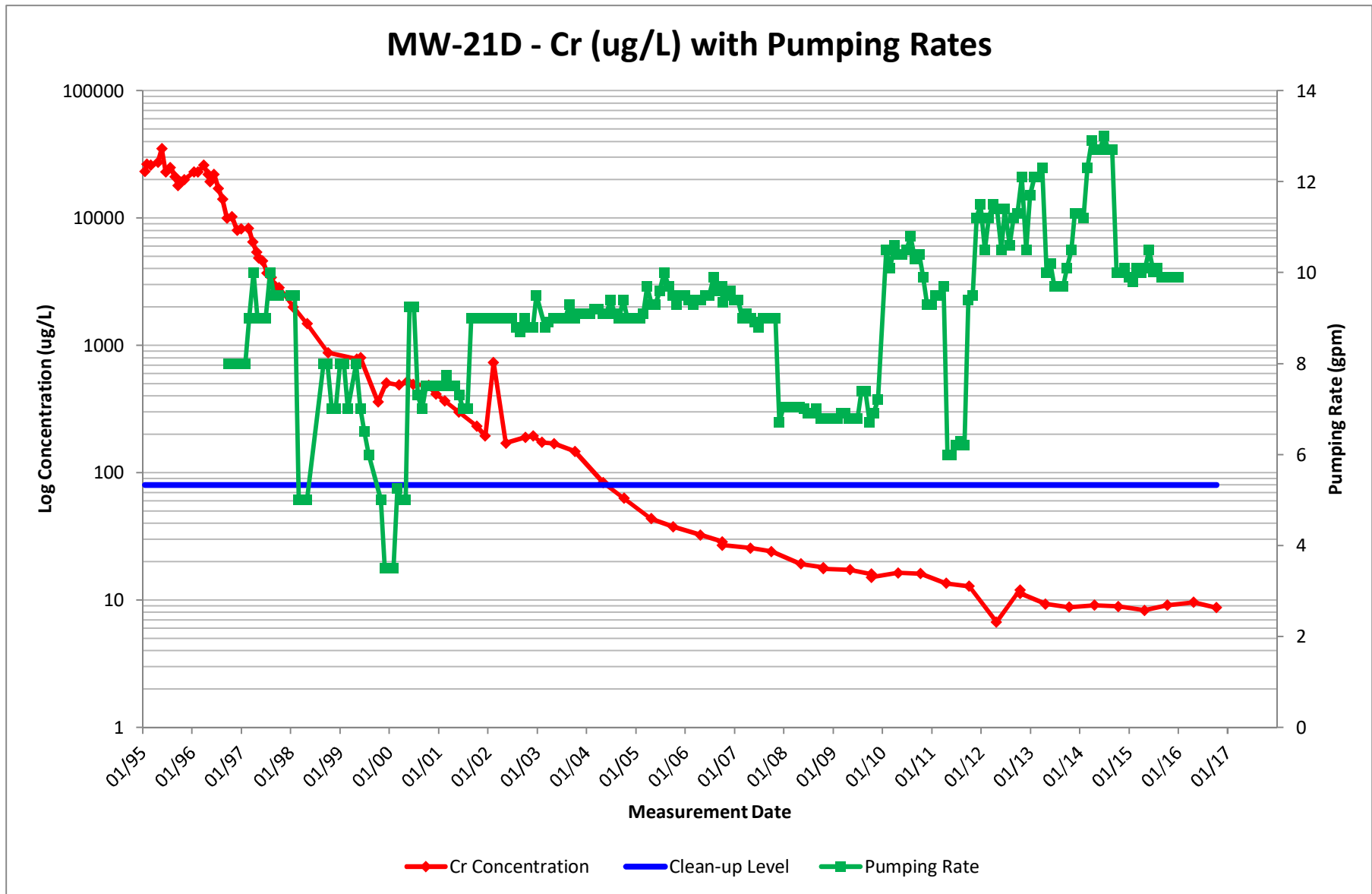


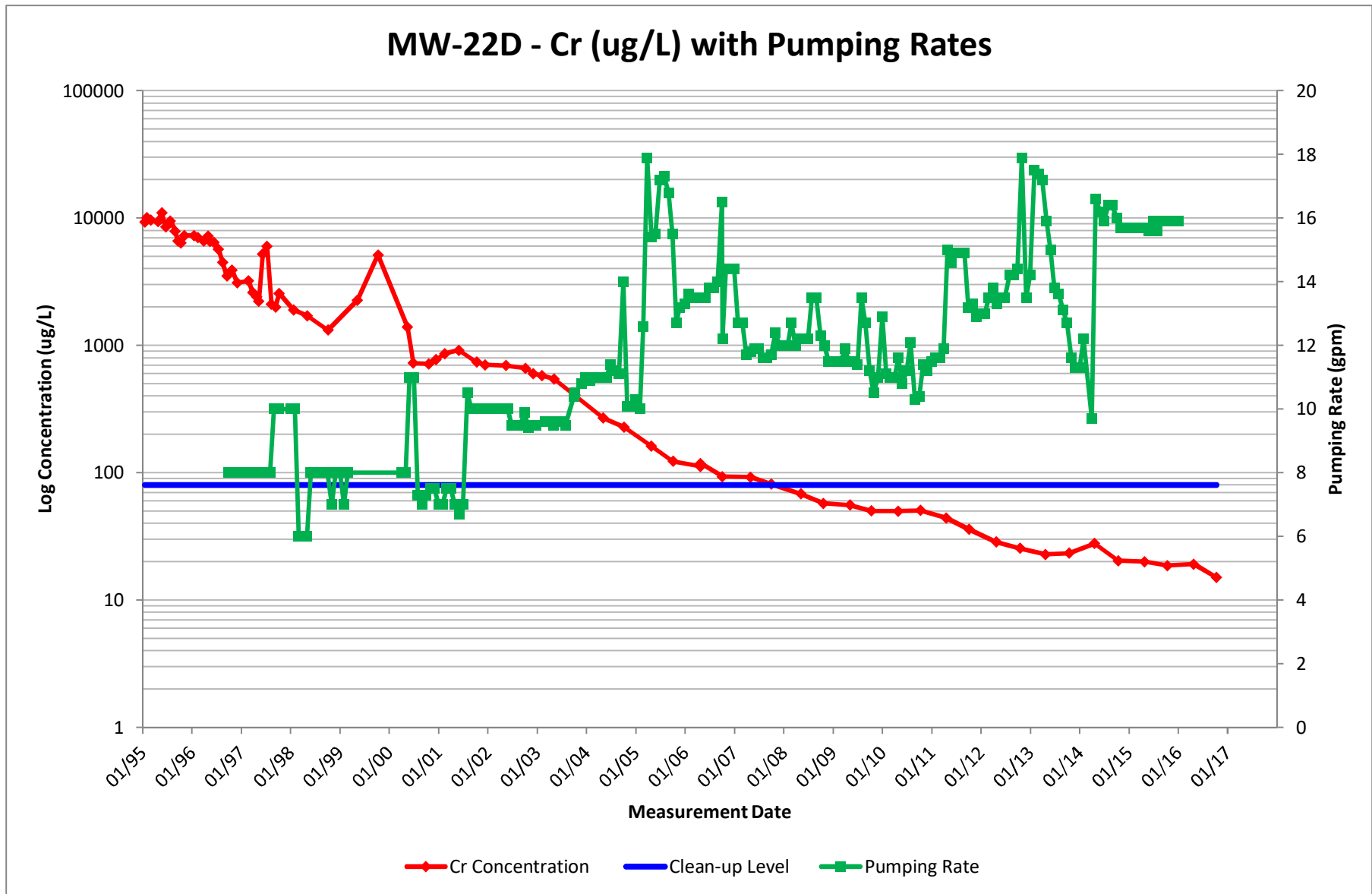


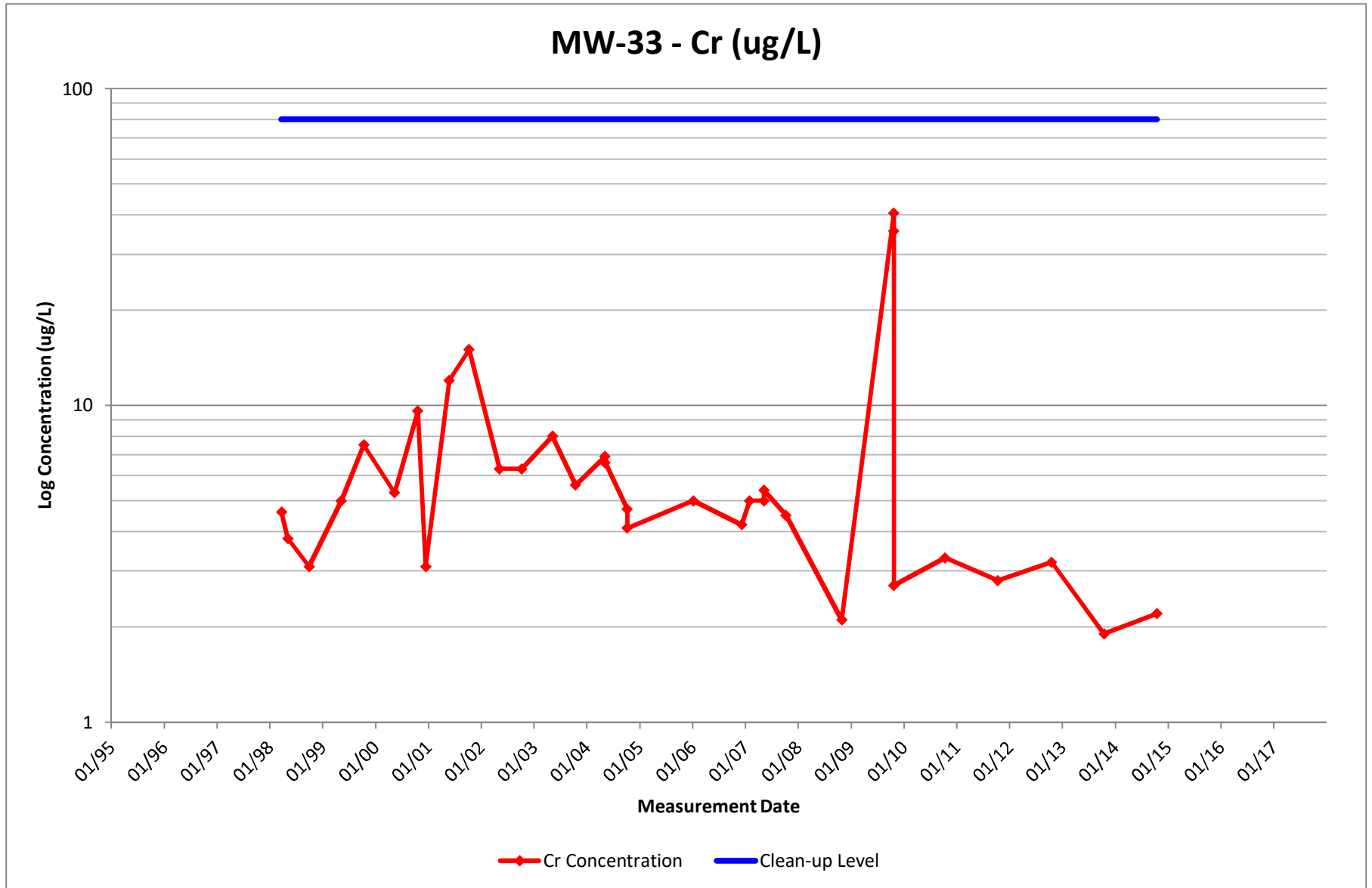


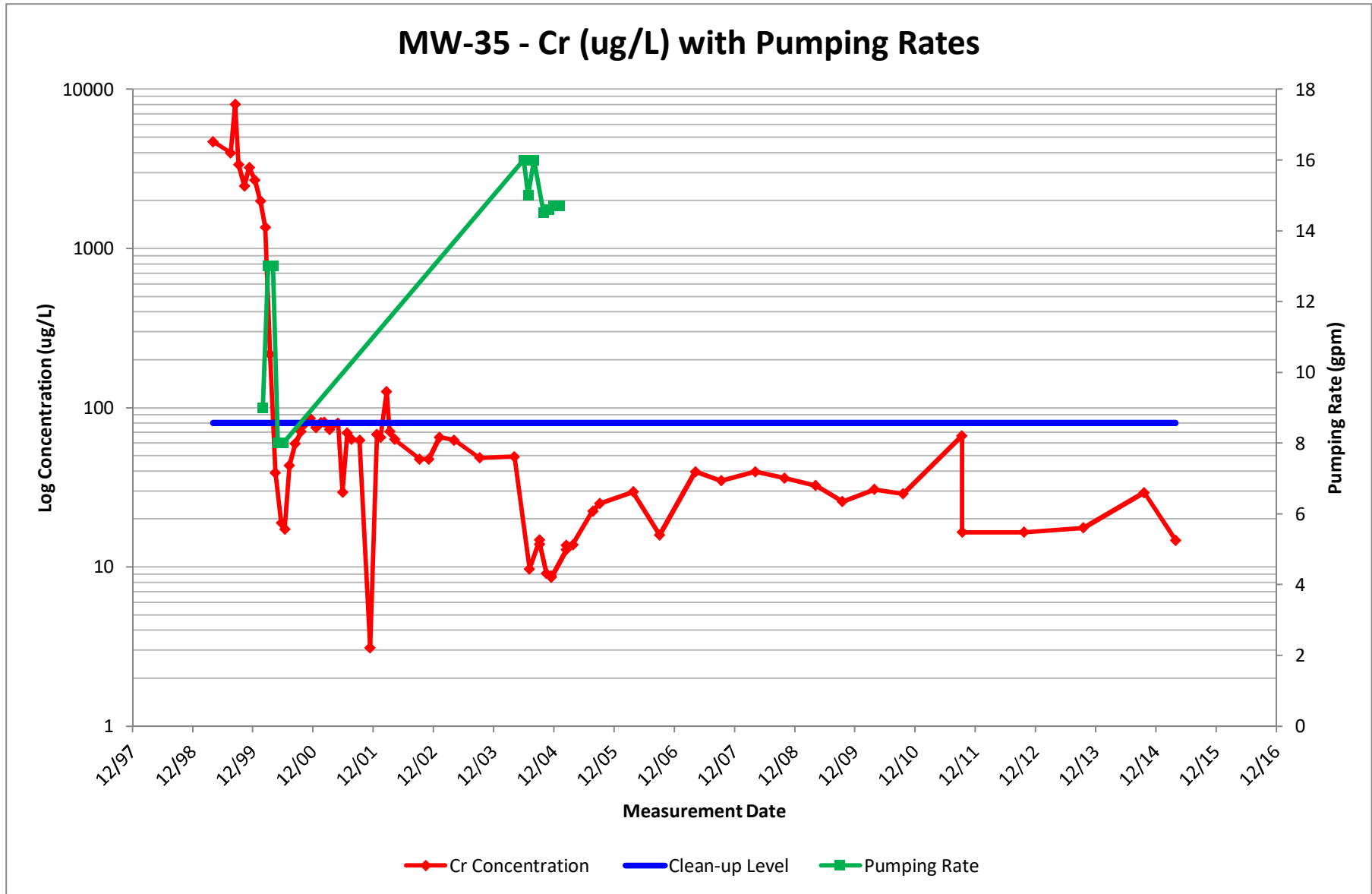


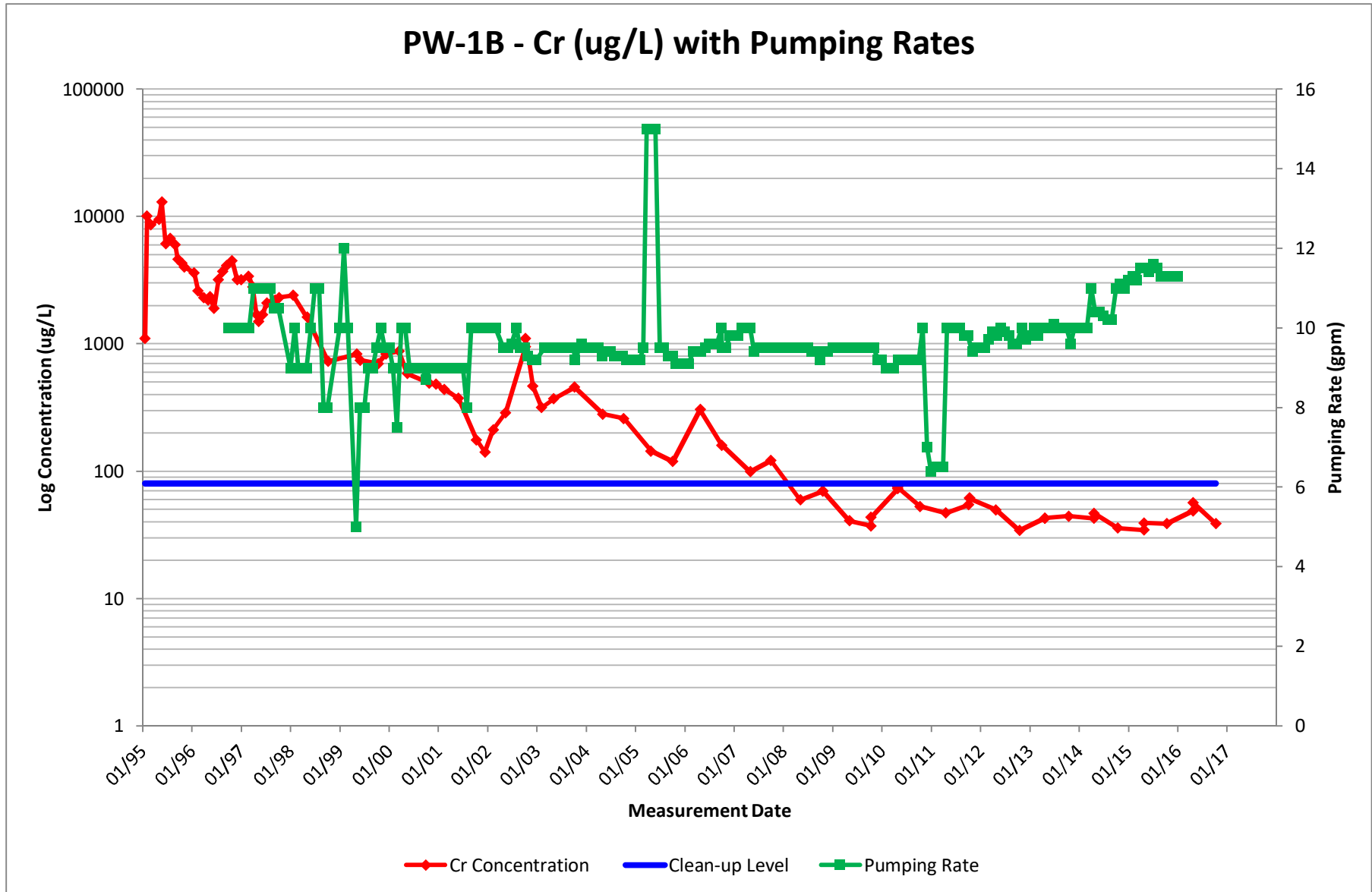












APPENDIX B

TCE CONCENTRATIONS IN GROUNDWATER

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APPENDIX B-1

**TCE CONCENTRATIONS –
SUMMARY TABLE**

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B-1. TCE Concentration Summary

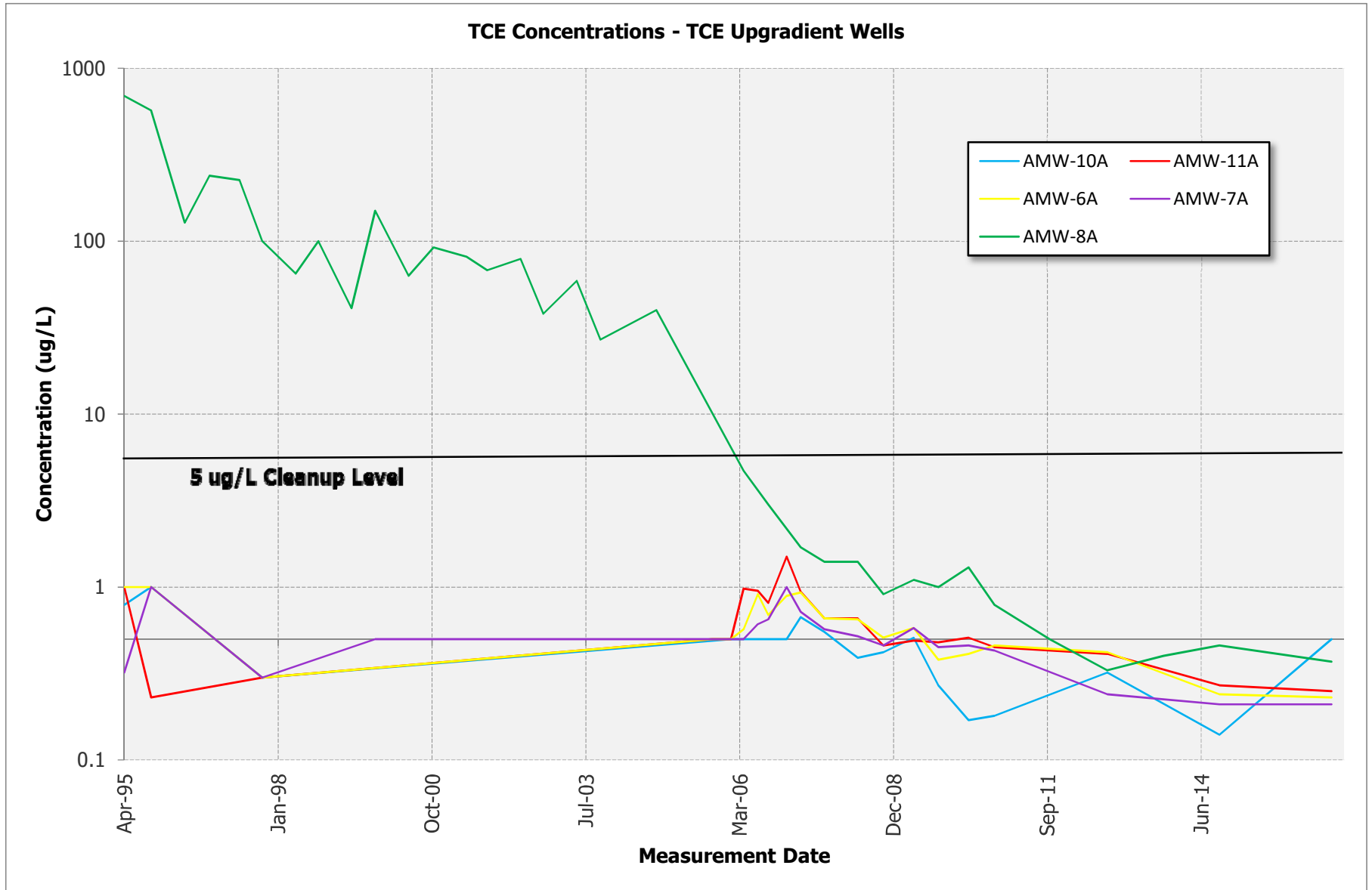
Well Group	Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
Upgradient	AMW-6A	--	--	--	0.23 J
	AMW-7A	--	--	--	0.21 J
	AMW-8A	--	--	--	0.37 J
	AMW-10A	--	--	--	0.50 U
	AMW-11A	--	--	--	0.25 J
TCE Source (OU-2)	AMW-1A	6.1	25	0.50 U	0.44 J
	AMW-2A	57	63	80	120
	AMW-12A	32	31	18	19
	AMW-53A	11	11	0.26 J	1.1
	MW-1A	5.9	5.6	2.2	51
Proximal	MW-2A	--	--	--	1.7
	MW-3B	--	--	--	1.4
	MW-4B	--	--	--	3.1
	MW-6B	4.5	4.6	3.3	3.6
	MW-9B	--	--	--	2.4
	MW-10B	13	11	10	10
	MW-10C	2.5	2.0	1.6	1.8
	MW-12C	--	--	--	0.69
	MW-13C	--	--	--	3.5
	PW-1B	2.3	2.3	1.8	2.9
Intermediate	AMW-59	--	--	--	56
	CPU-14	5.5	5.5	--	4.9
	MW-14C	14 J	11	10	9.2
	MW-14E	70	64	61	63
	MW-15E	--	2.4	--	2.1
	MW-18D	36	34	29	27
	MW-18E	--	69	--	76
	MW-19D	24	24	22	23
	MW-20D	32	31	26	23
	PZ-39	34	36	28	29
Northern Plume	AMW-16	94	80	71	67
	AMW-17*	120	110	64	96
	AMW-18	34	42	40	40
	AMW-23	--	--	--	0.50 U

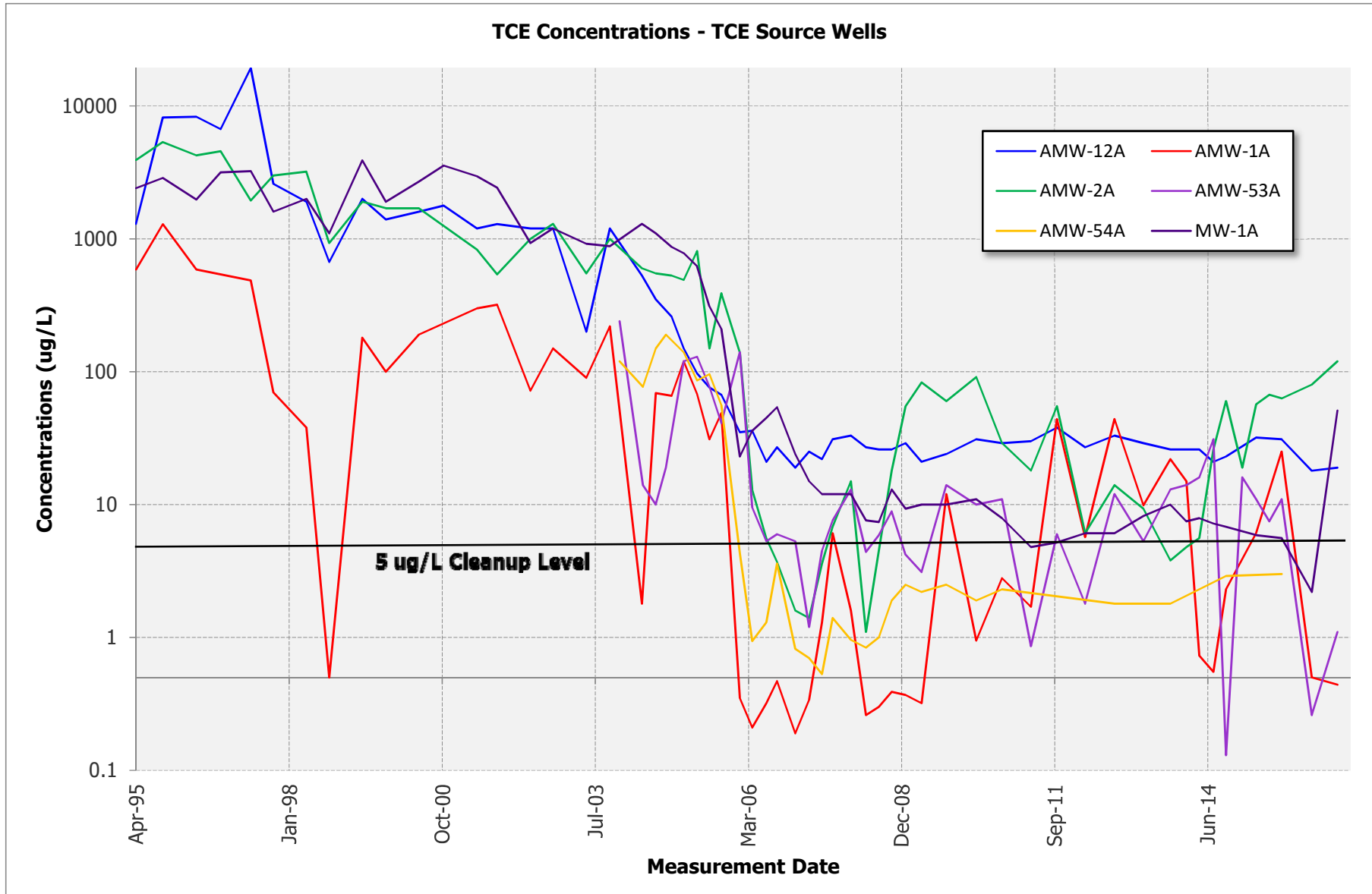
Well Group	Well	Spring 2015	Fall 2015	Spring 2016	Fall 2016
Northern Plume (Continued)	AMW-64	53	45	28	24
	MW-23D*	--	130	140	140
	MW-38	53	50	29	23
Church of God	AMW-27	4.2	3.3	3.2	3.0
	AMW-61	--	5.5	--	5.9
	CPU-12	4.0	2.2	--	2.5
	MW-21D	3.2	2.8	2.5	2.4
	MW-22D	3.3	2.8	2.7	2.3
Toe of Plume	MW-35	2.8	3.7	3.0	3.4
Troutdale Aquifer	AMW-24	--	9.9	--	-
	BENNETT	4.2	5.2	1.8	1.7
	MW-33	--	8.5	--	6.3
<p>NOTES:</p> <p>Only wells sampled for TCE during Fall 2016 are included in this table. Results are in micrograms per liter (µg/L). Results shown in red bold exceed the cleanup level of 5 µg/L.</p> <p>* = Two samplers were deployed in each well at different depths. The higher of the two results is presented on the table. AMW-17 (74 µg/L, 83-85 ft bgs; 96 µg/L, 87-89 ft bgs) MW-23D (140 µg/L, 78.65-80.65 ft bgs; 84 µg/L, 84-86 ft bgs)</p> <p>J = The result is an estimated concentration that is less than the method reporting limit but greater than or equal to the method detection limit.</p> <p>NS = Not Sampled. TCE = Trichloroethene. U = Analyte not detected above the specified reporting limit.</p>					

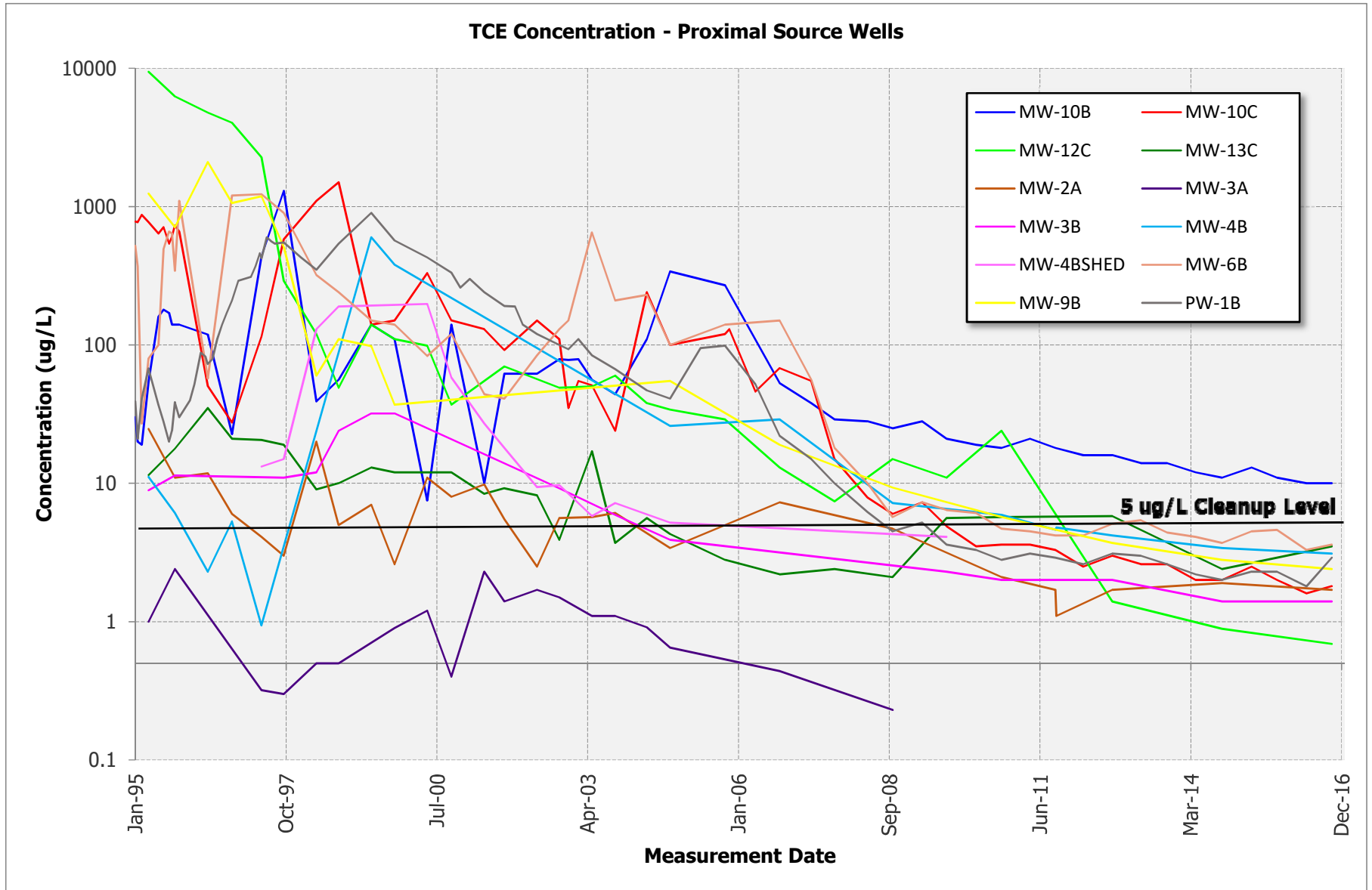
APPENDIX B-2

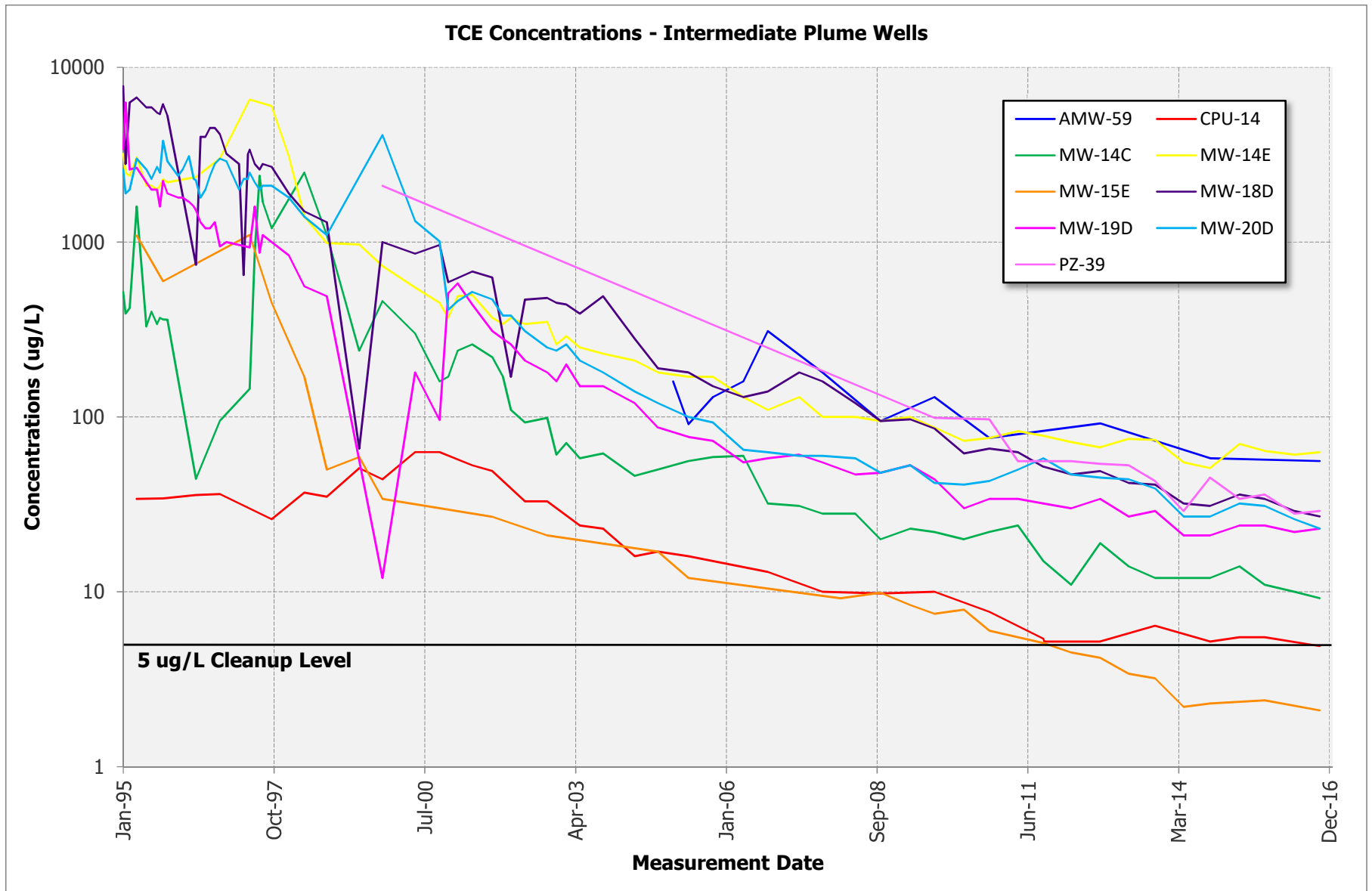
**TCE CONCENTRATIONS –
BY WELL GROUPING**

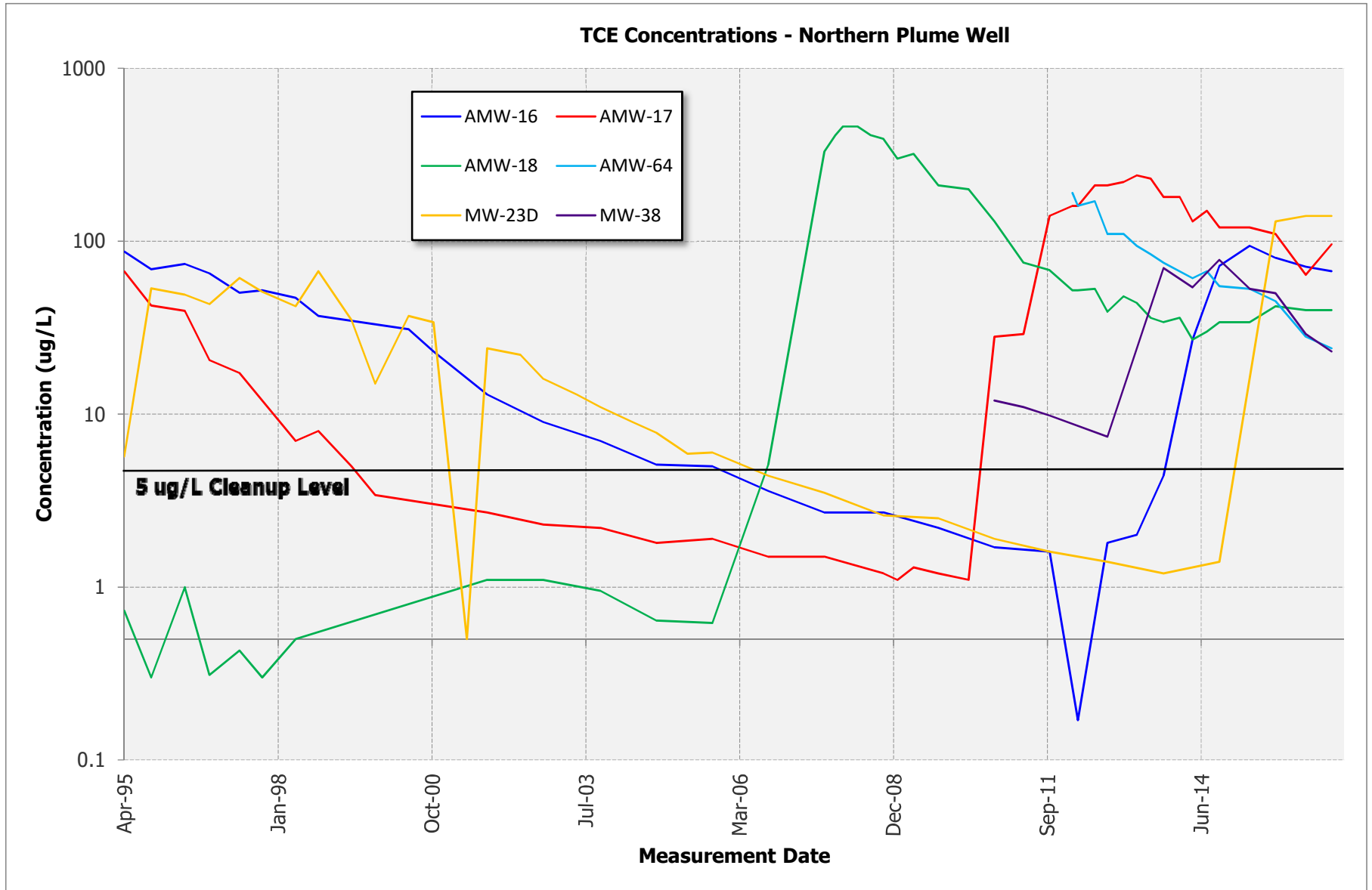
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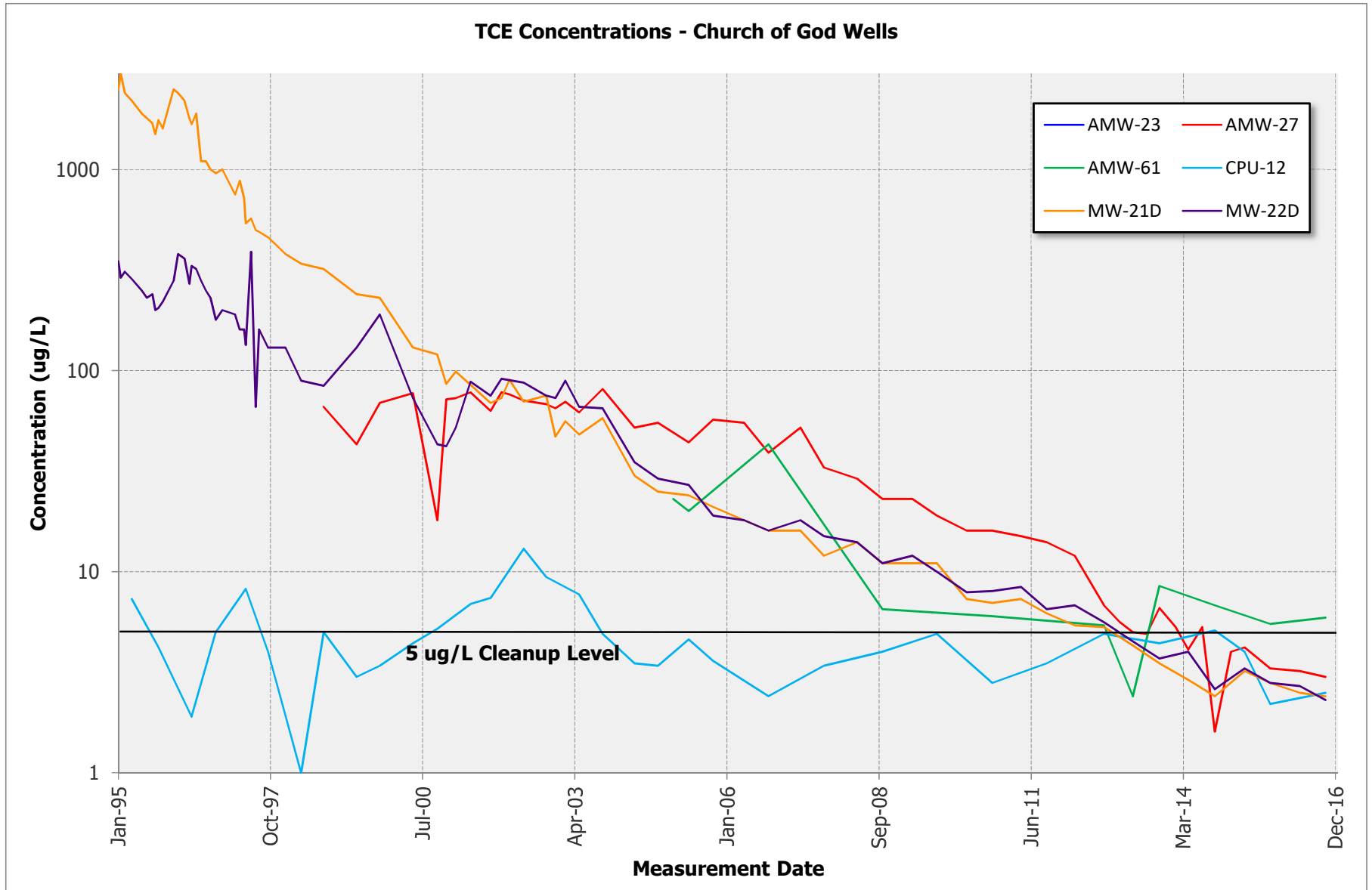


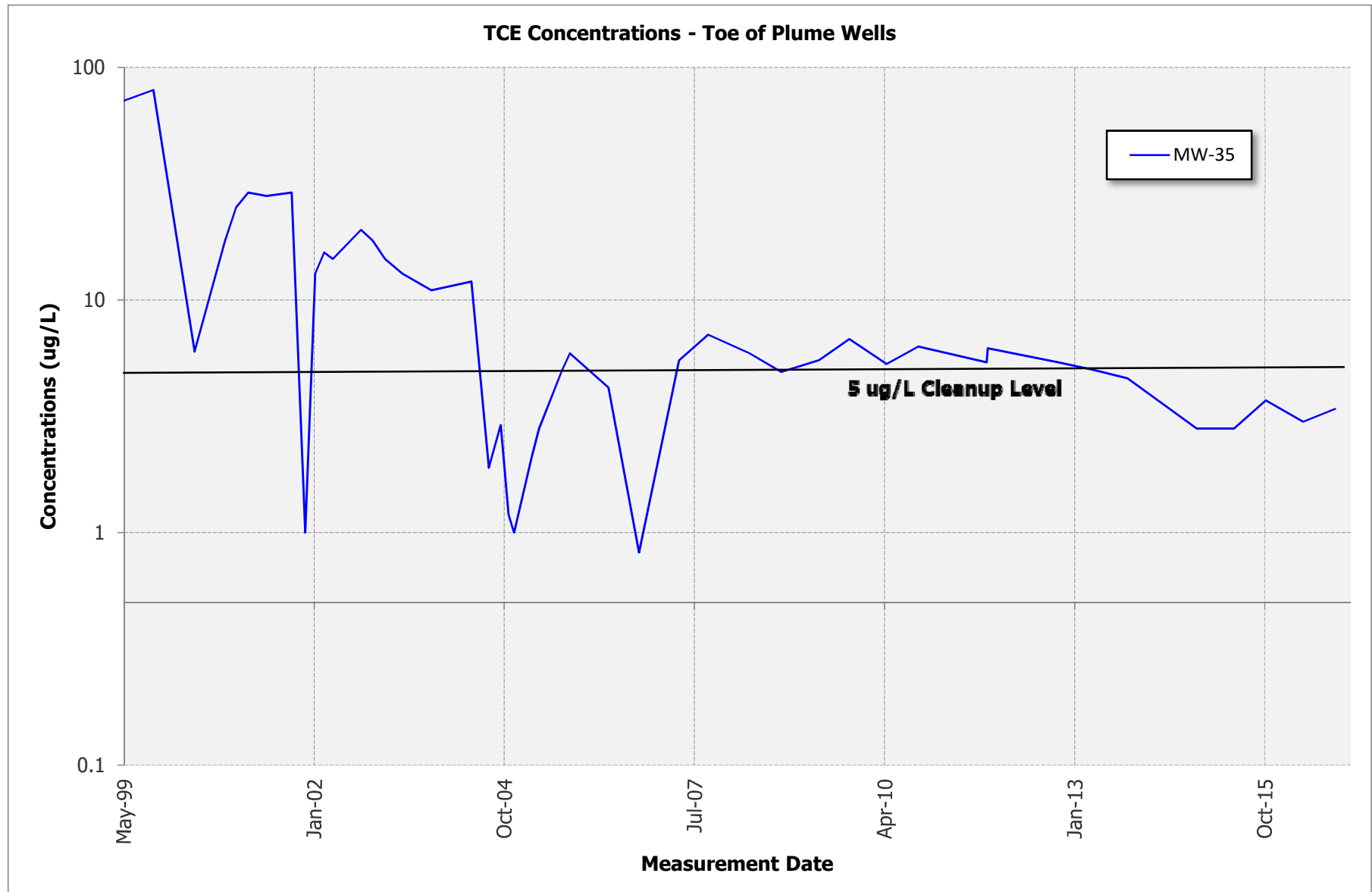


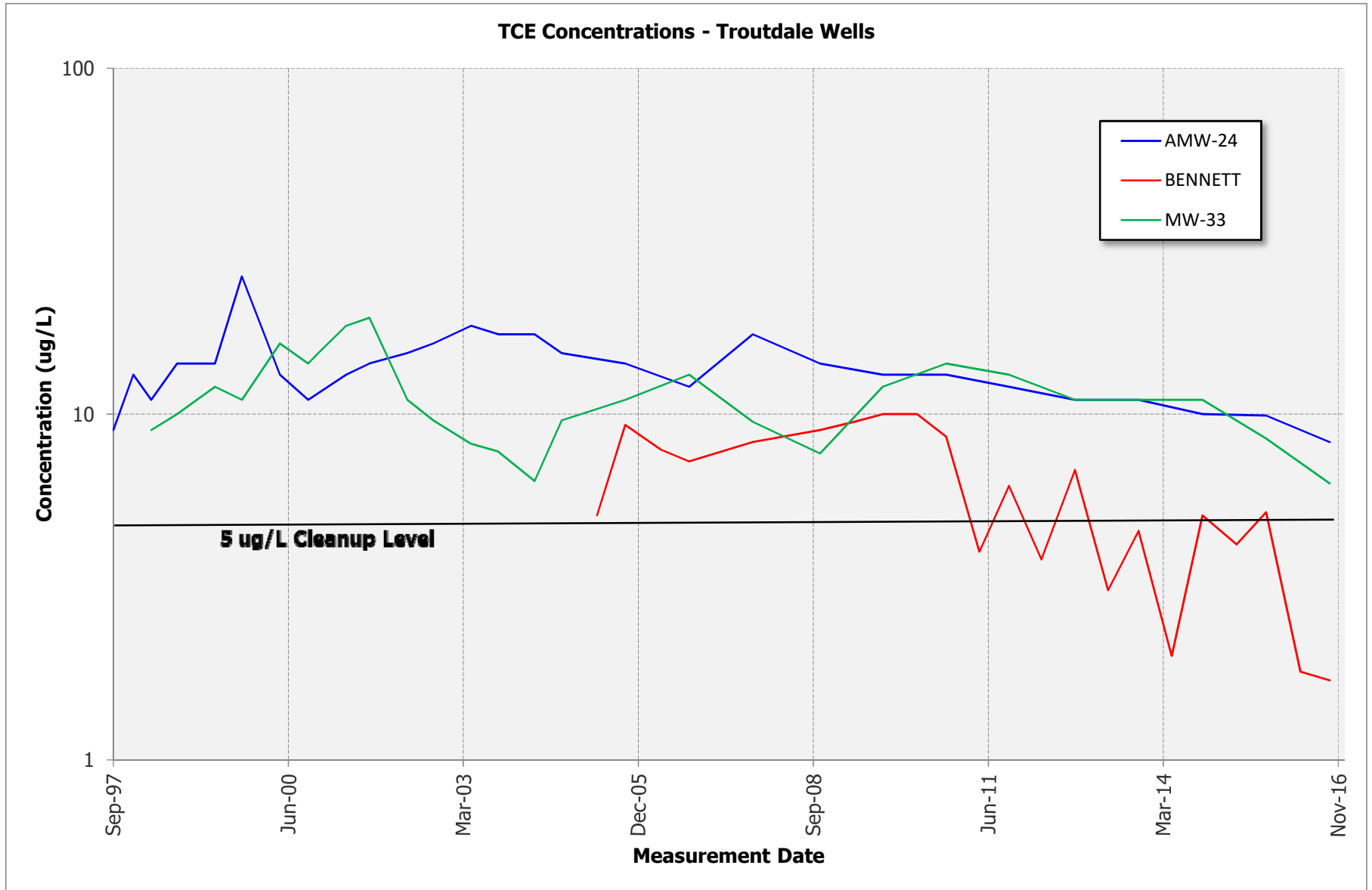








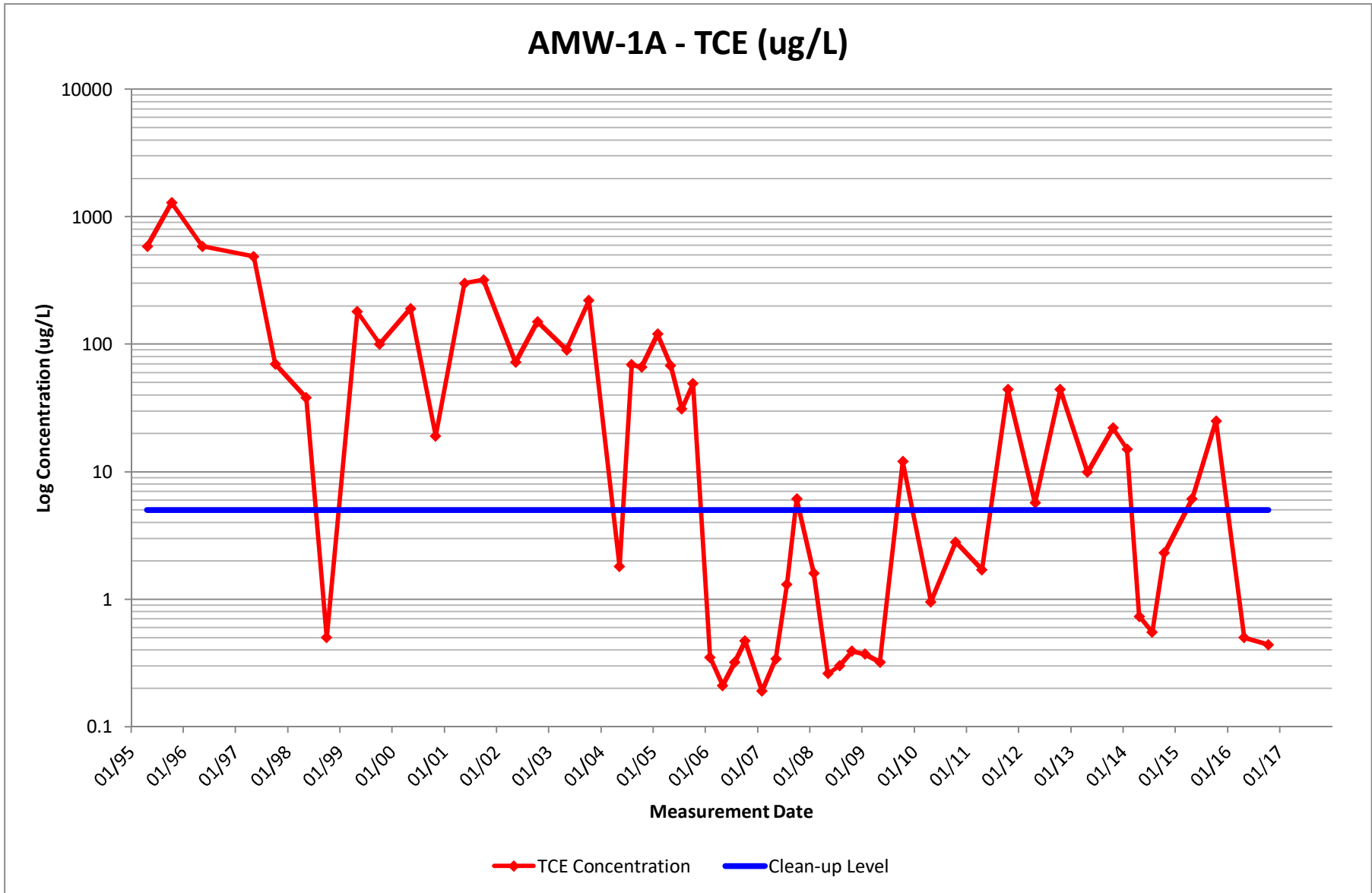


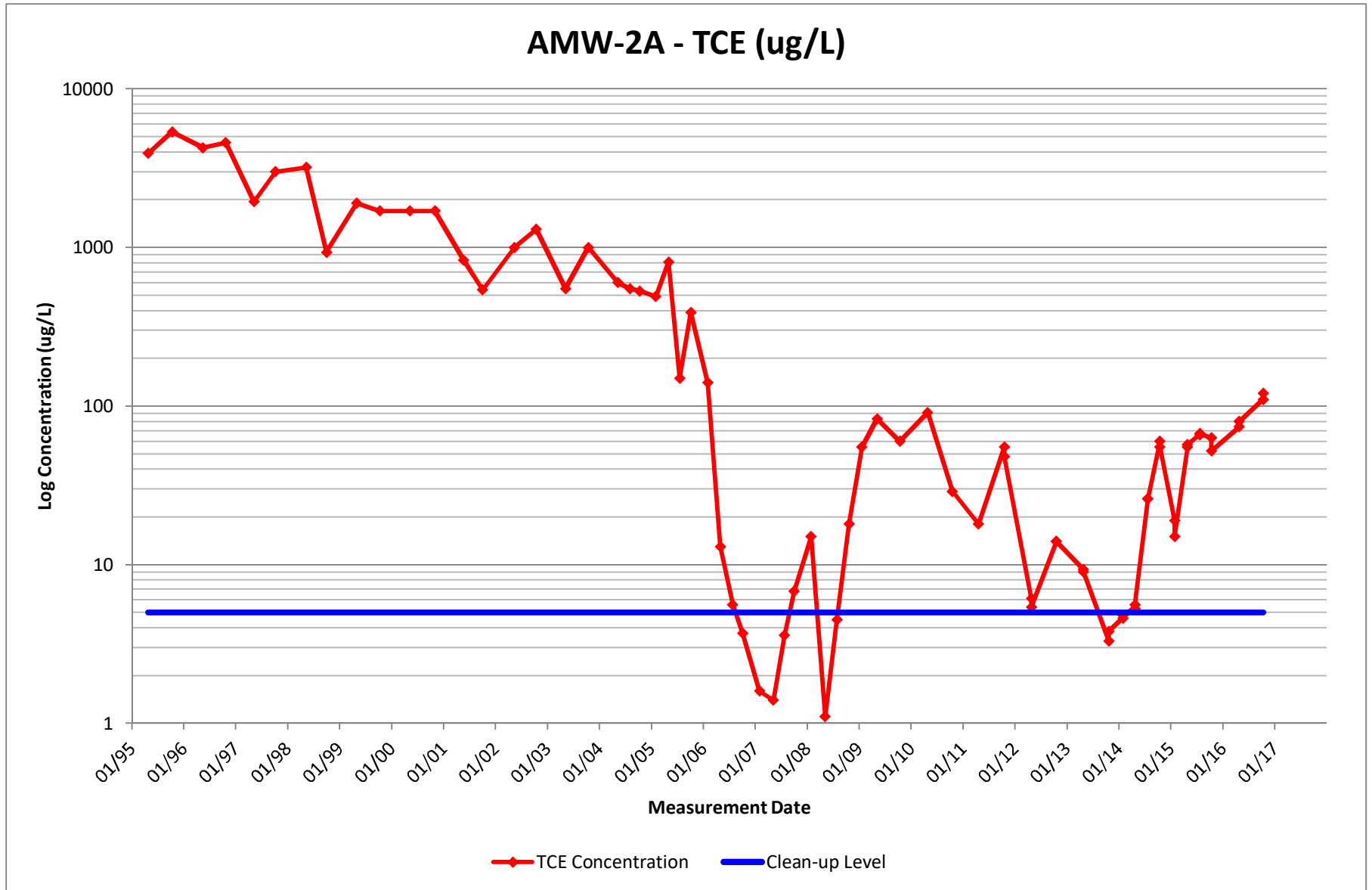


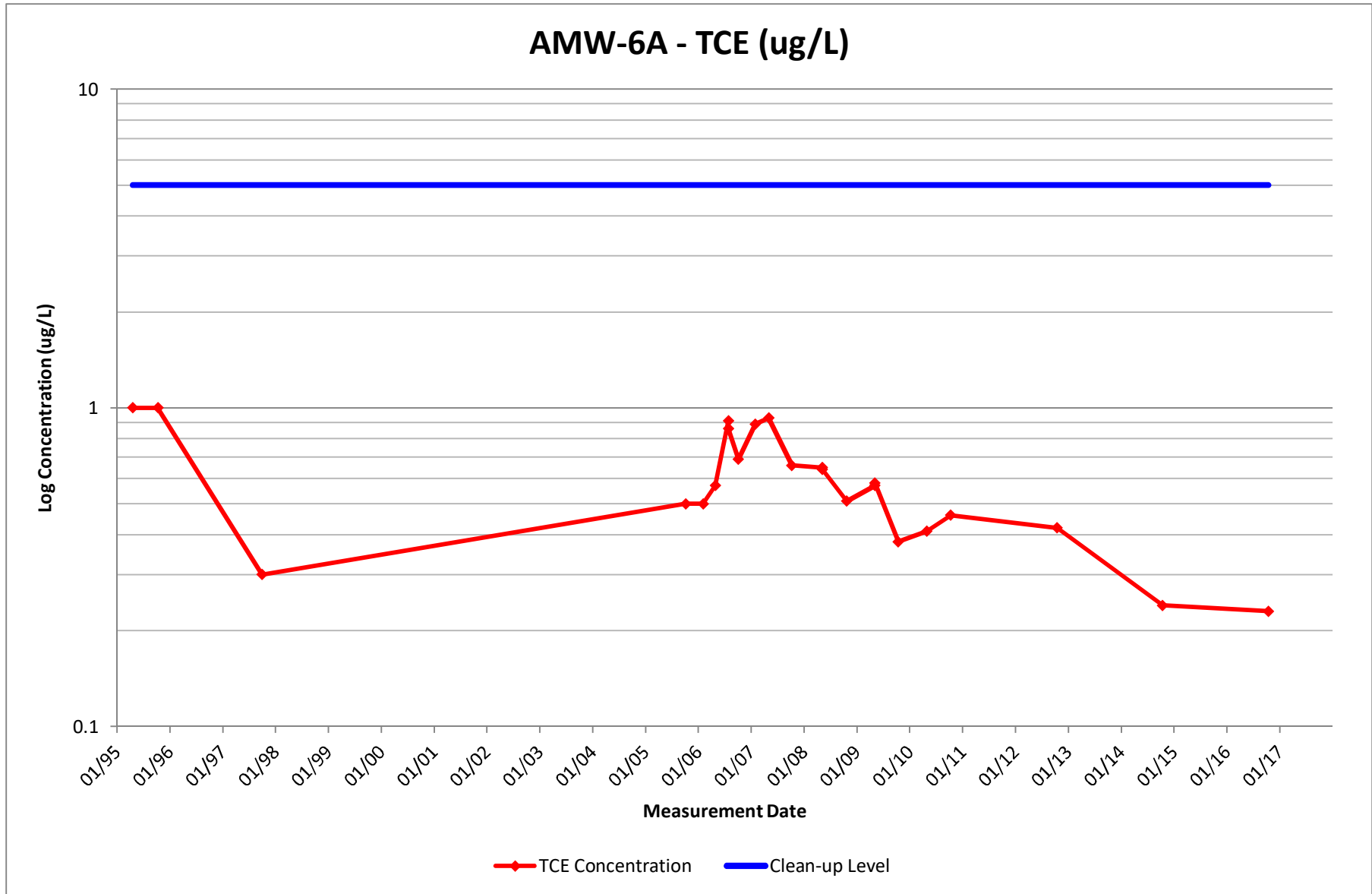
APPENDIX B-3

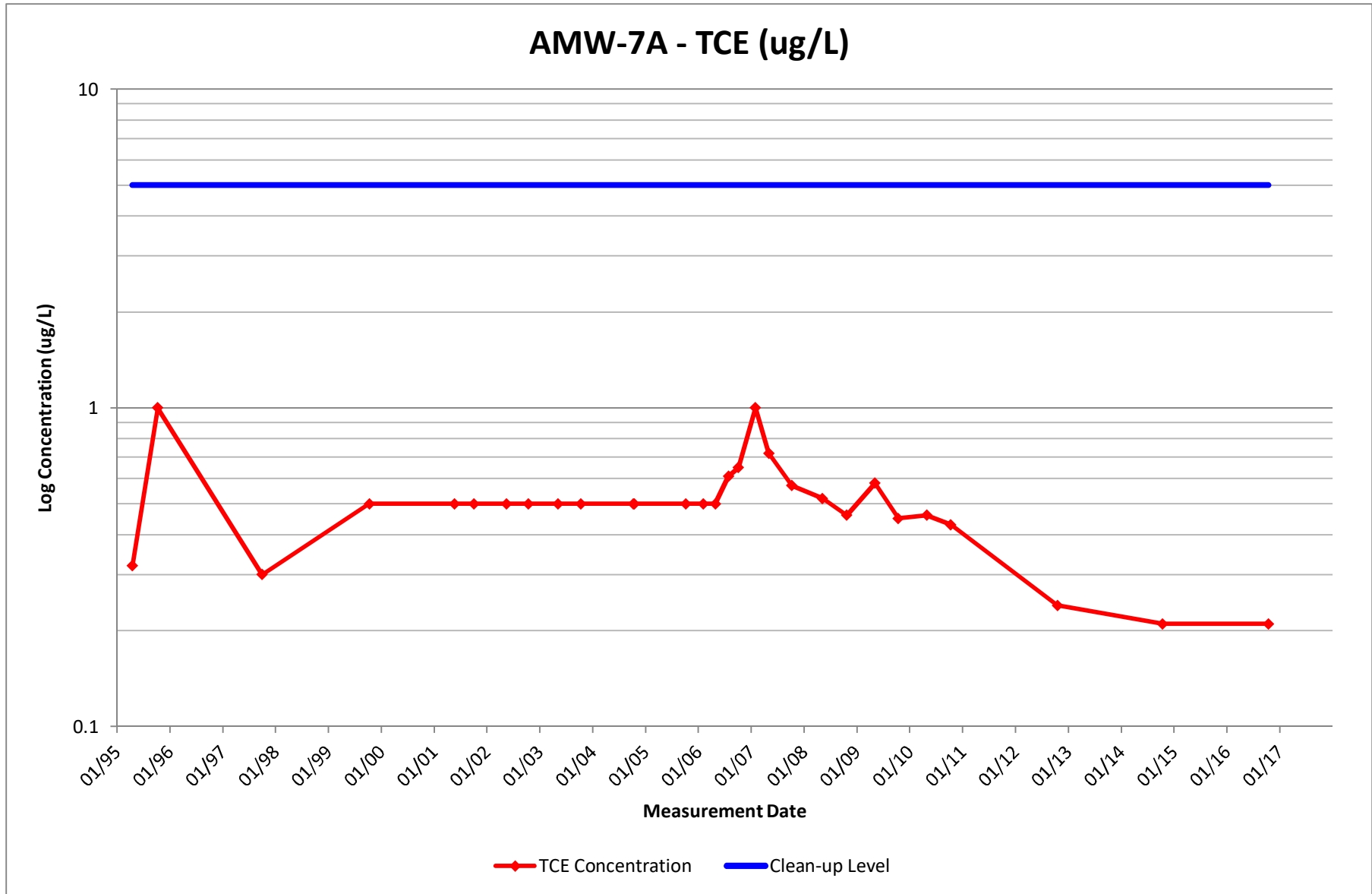
**TCE CONCENTRATIONS –
INDIVIDUAL WELLS**

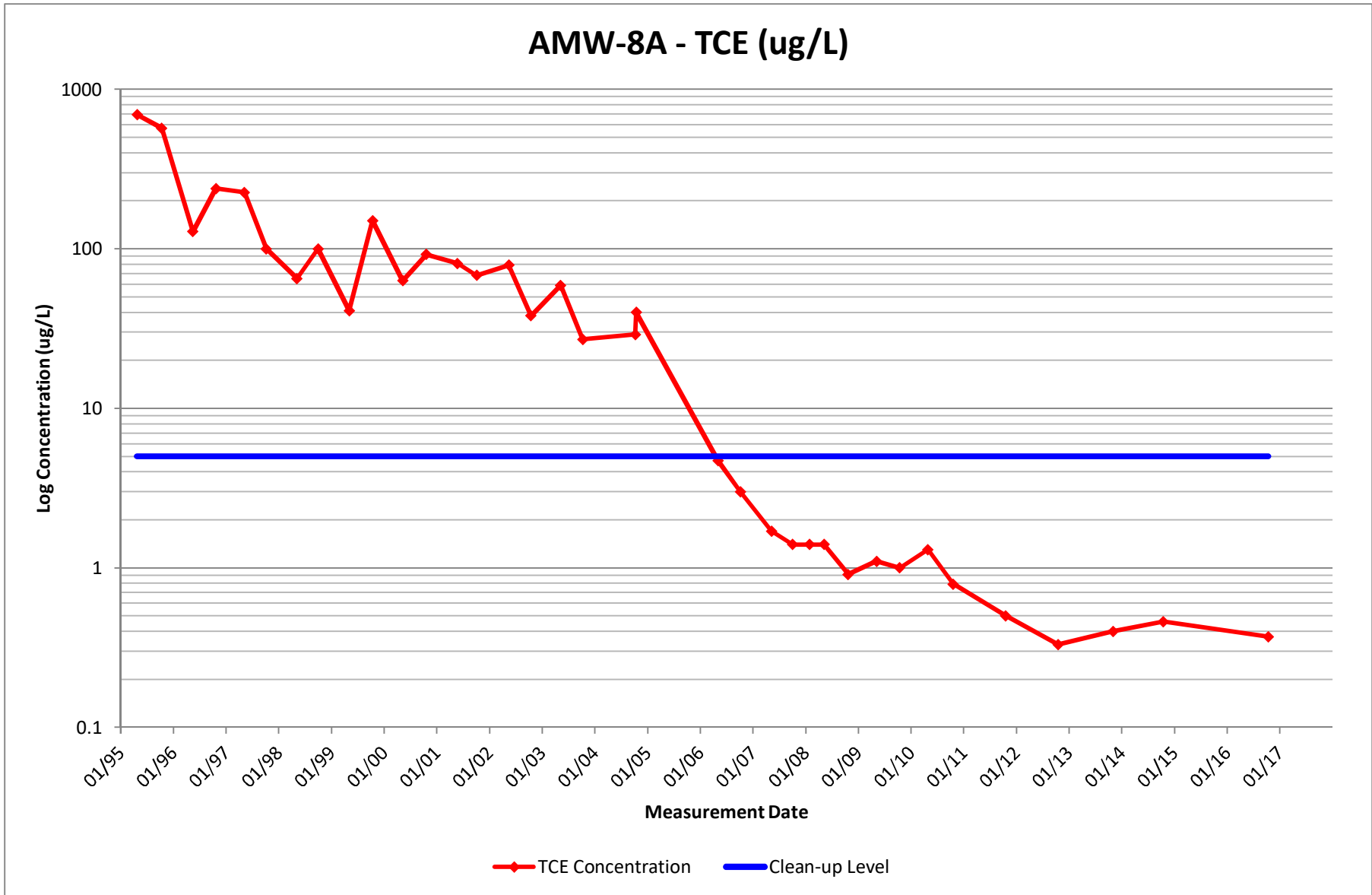
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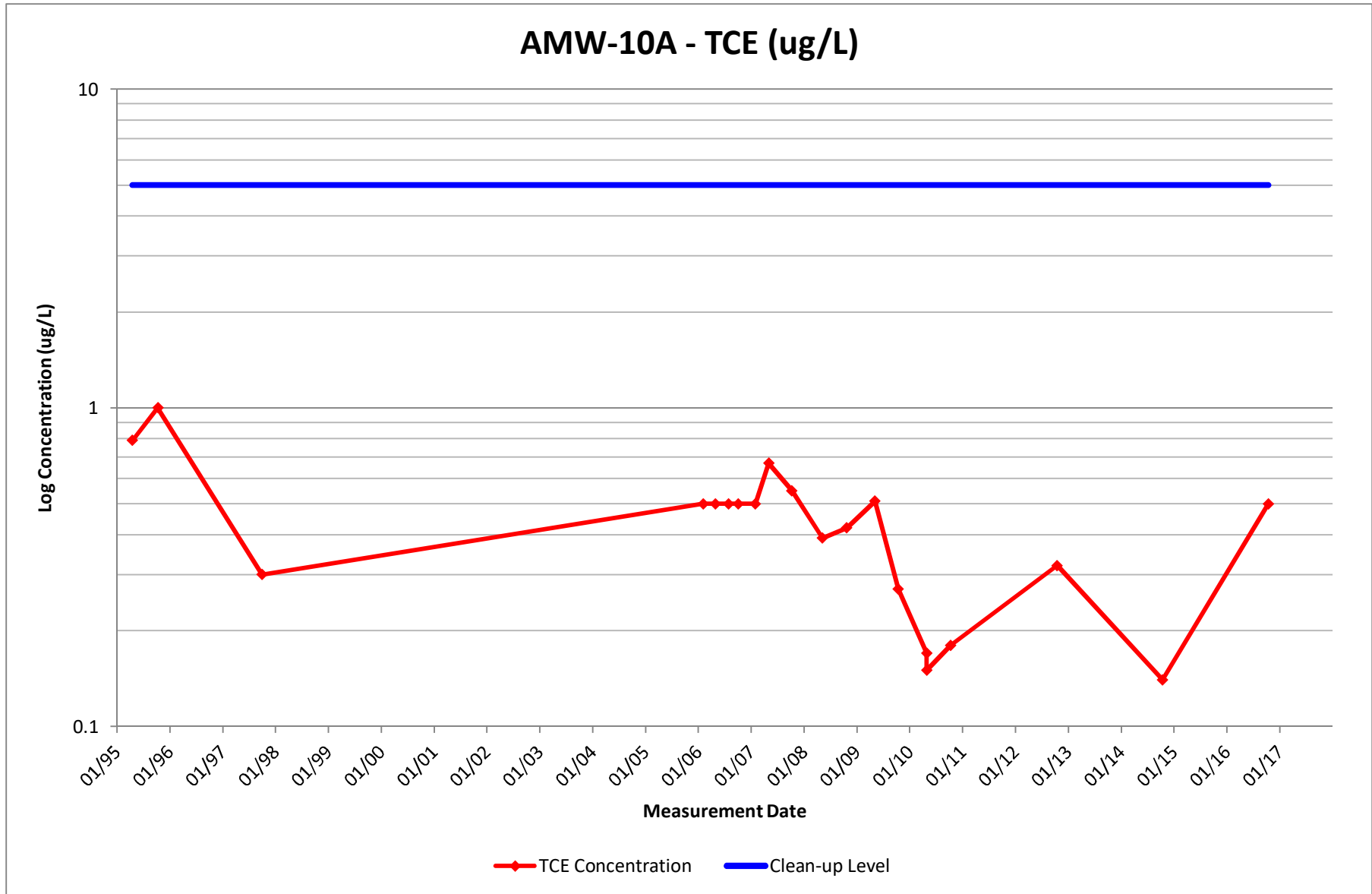


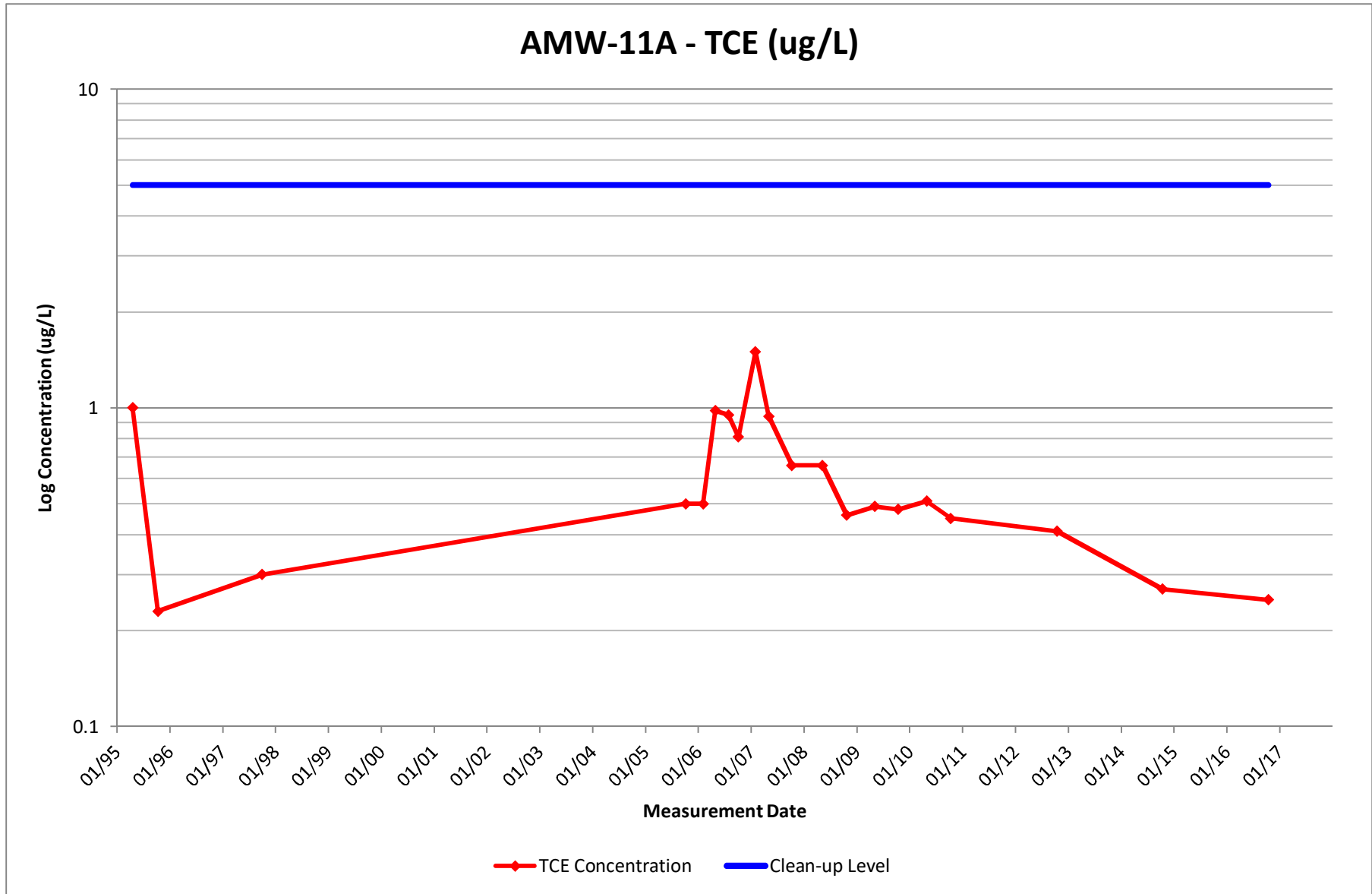


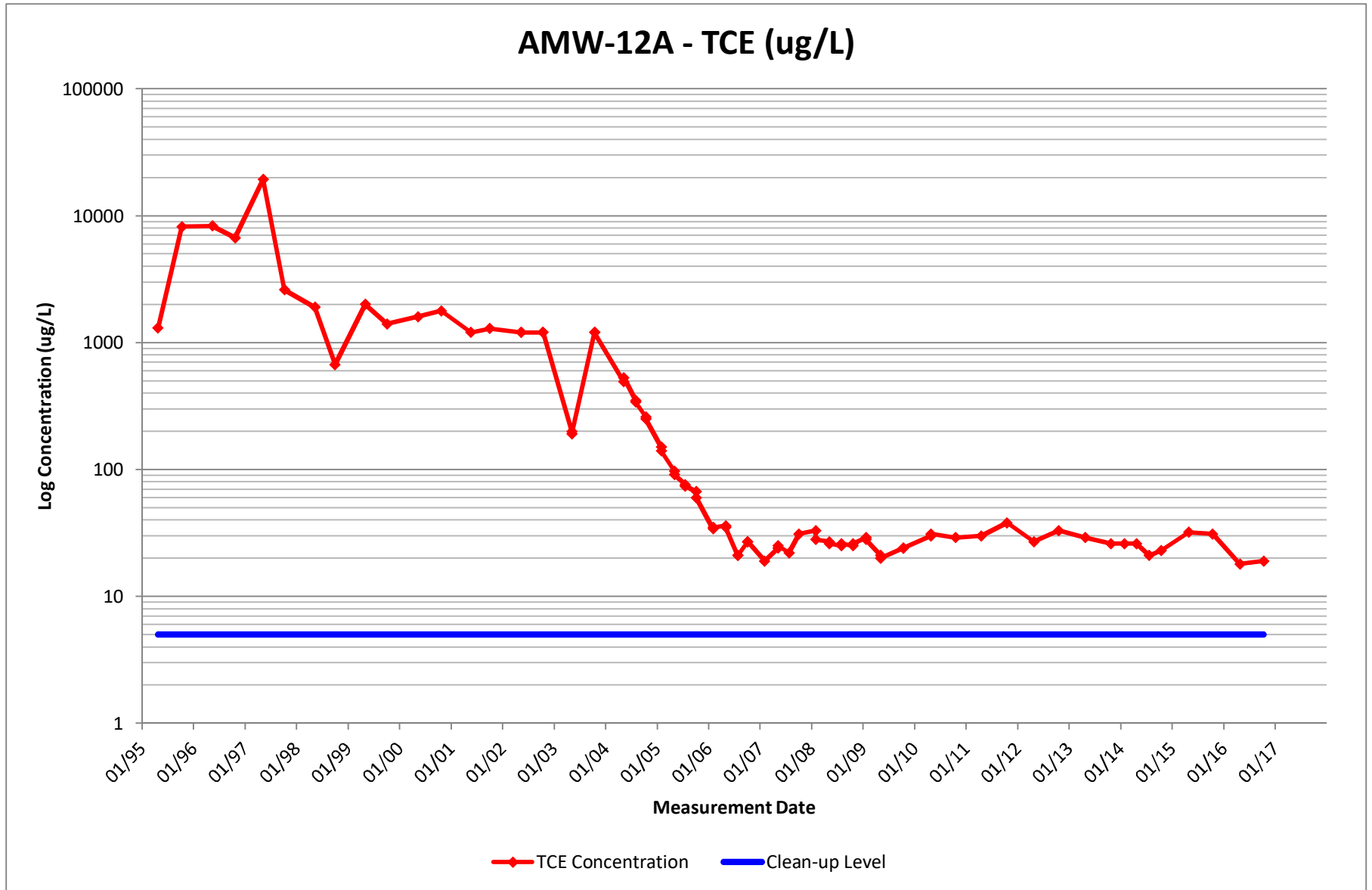


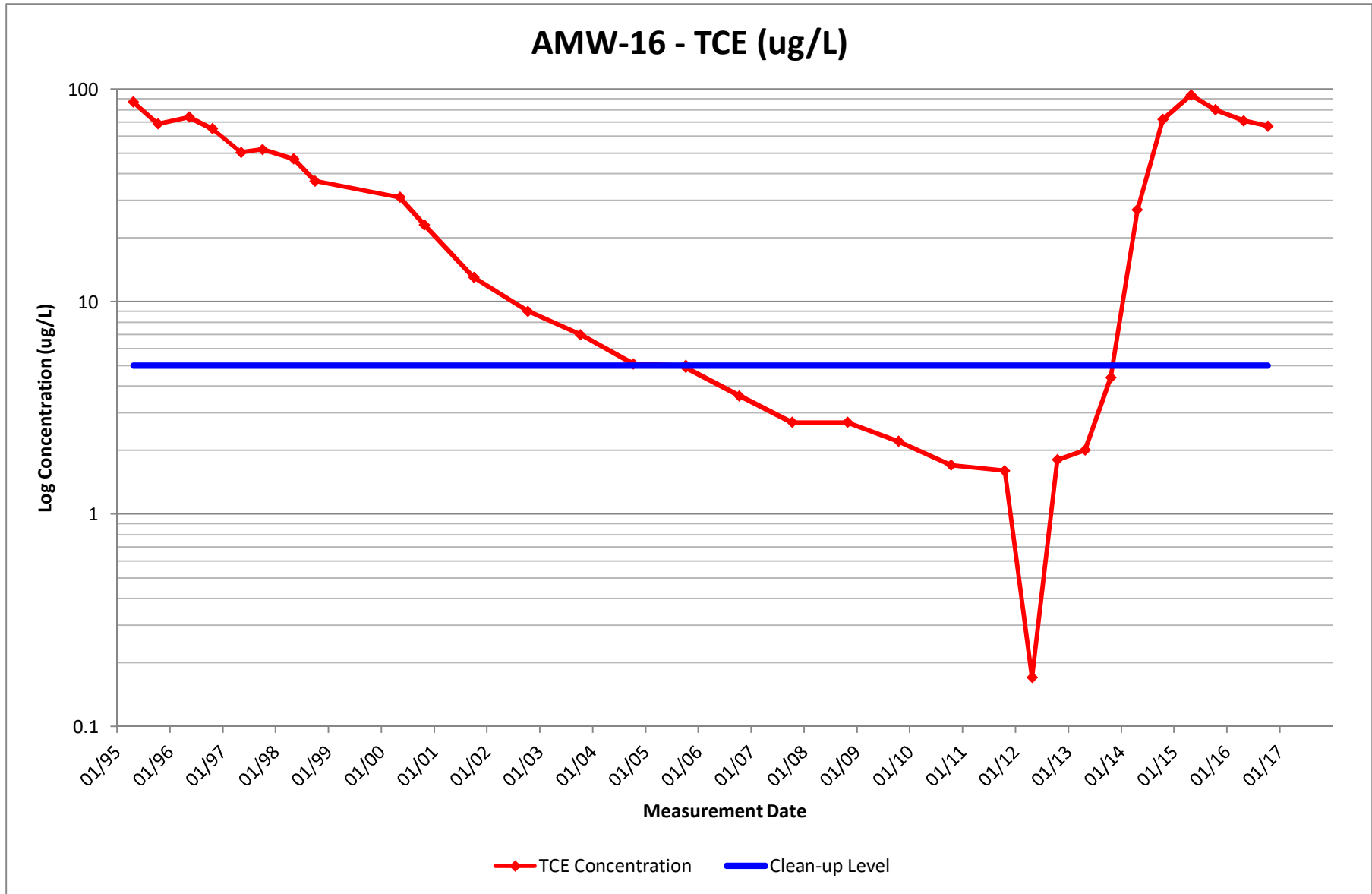


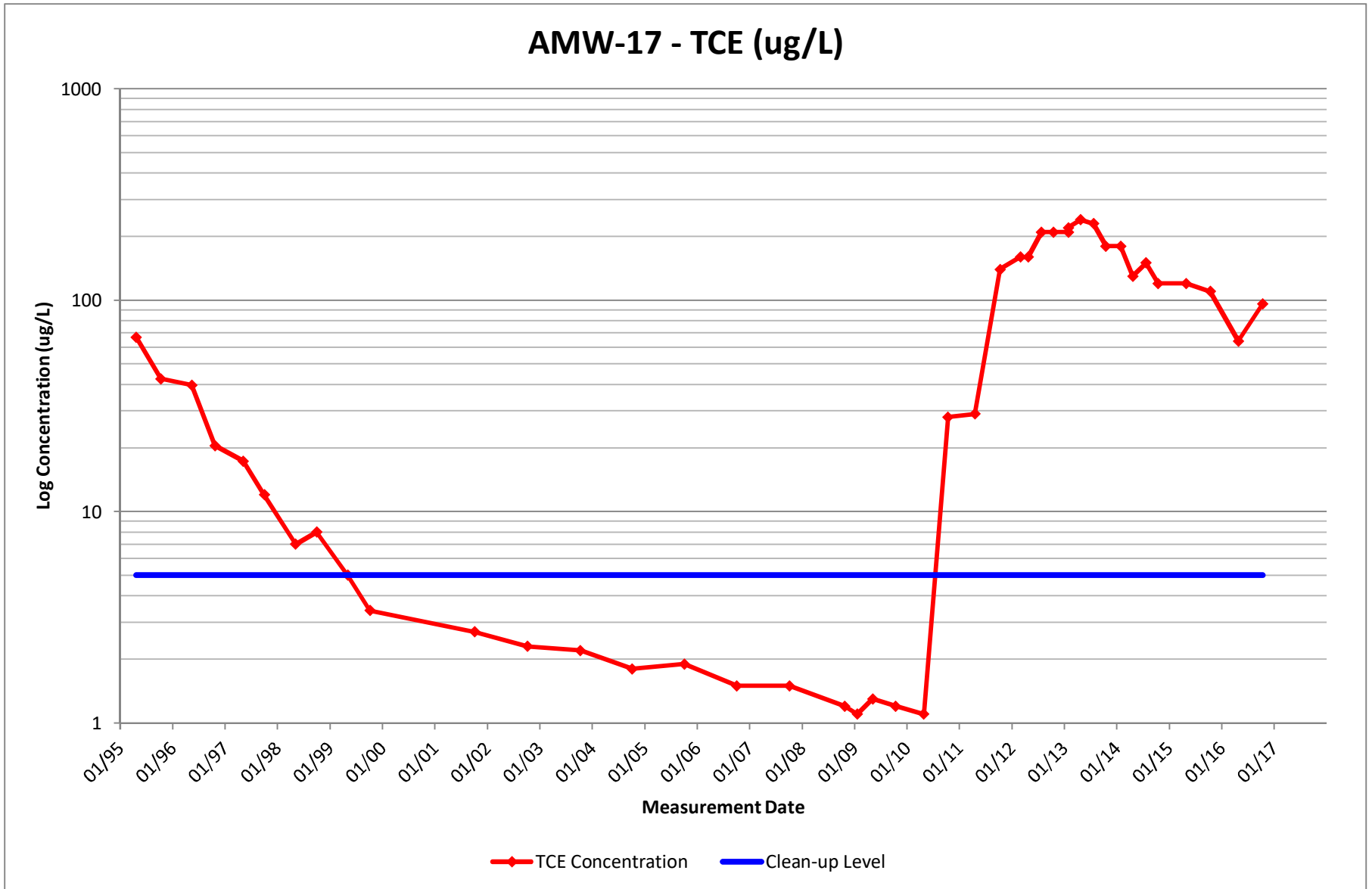


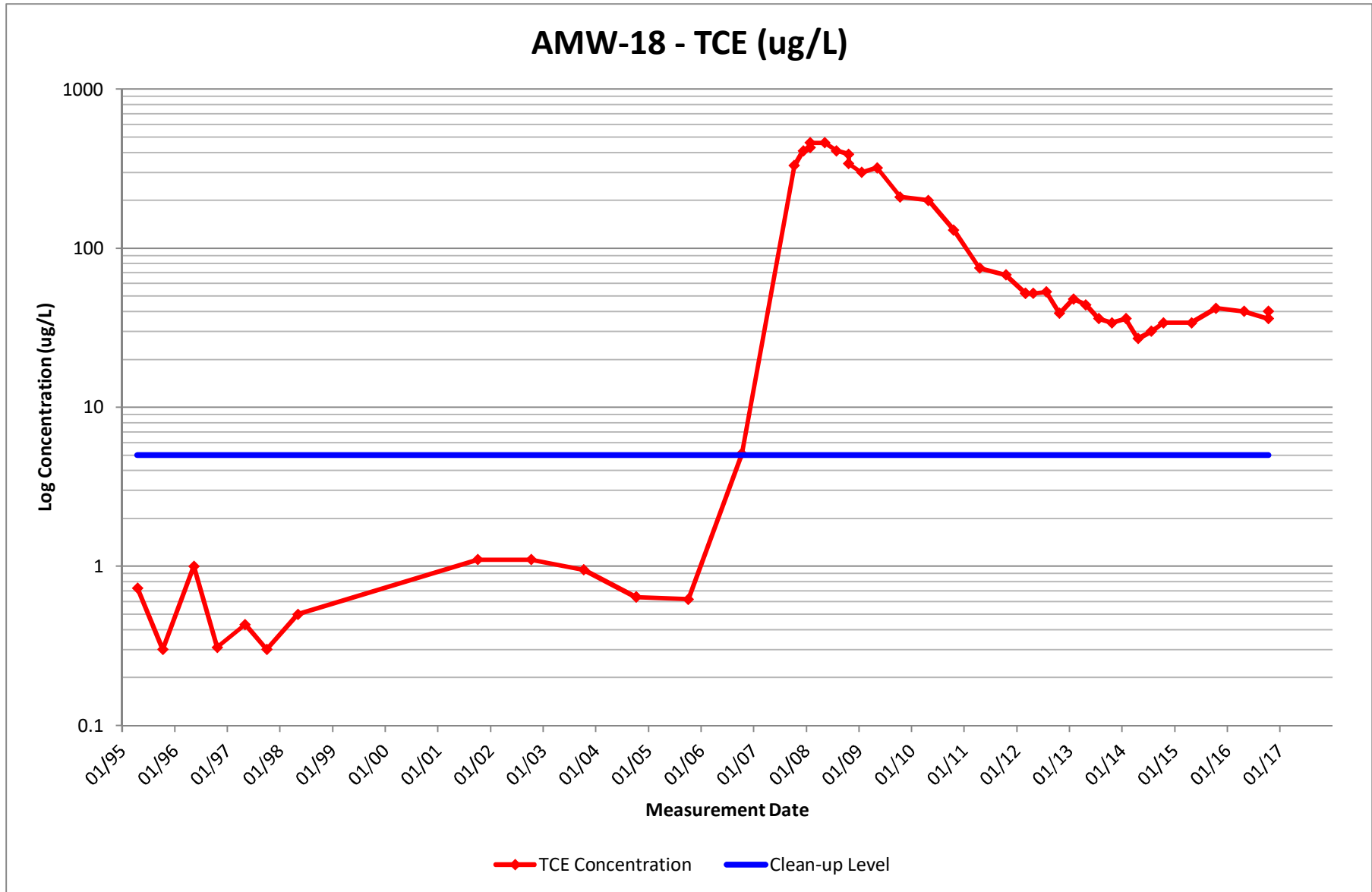


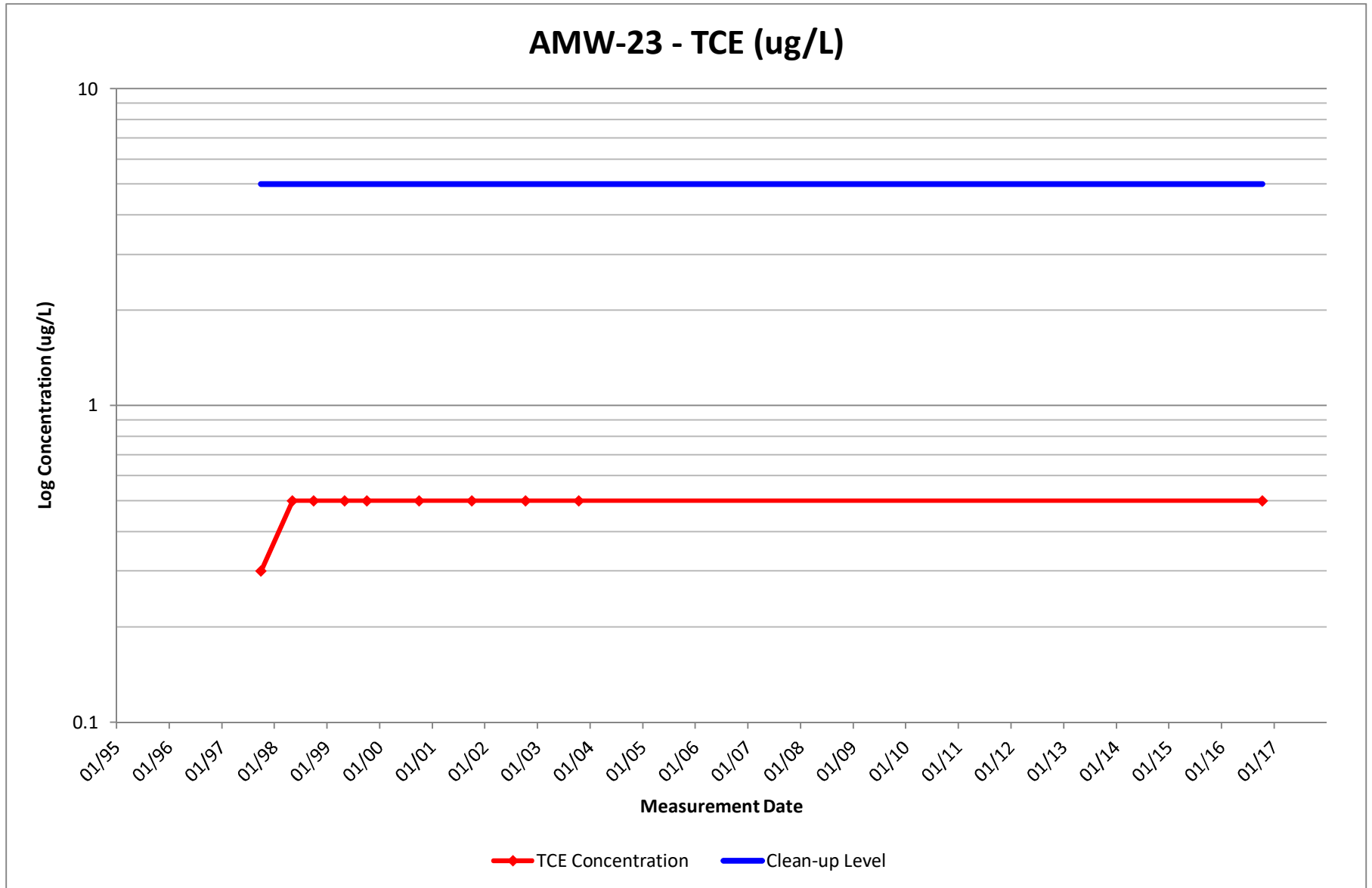


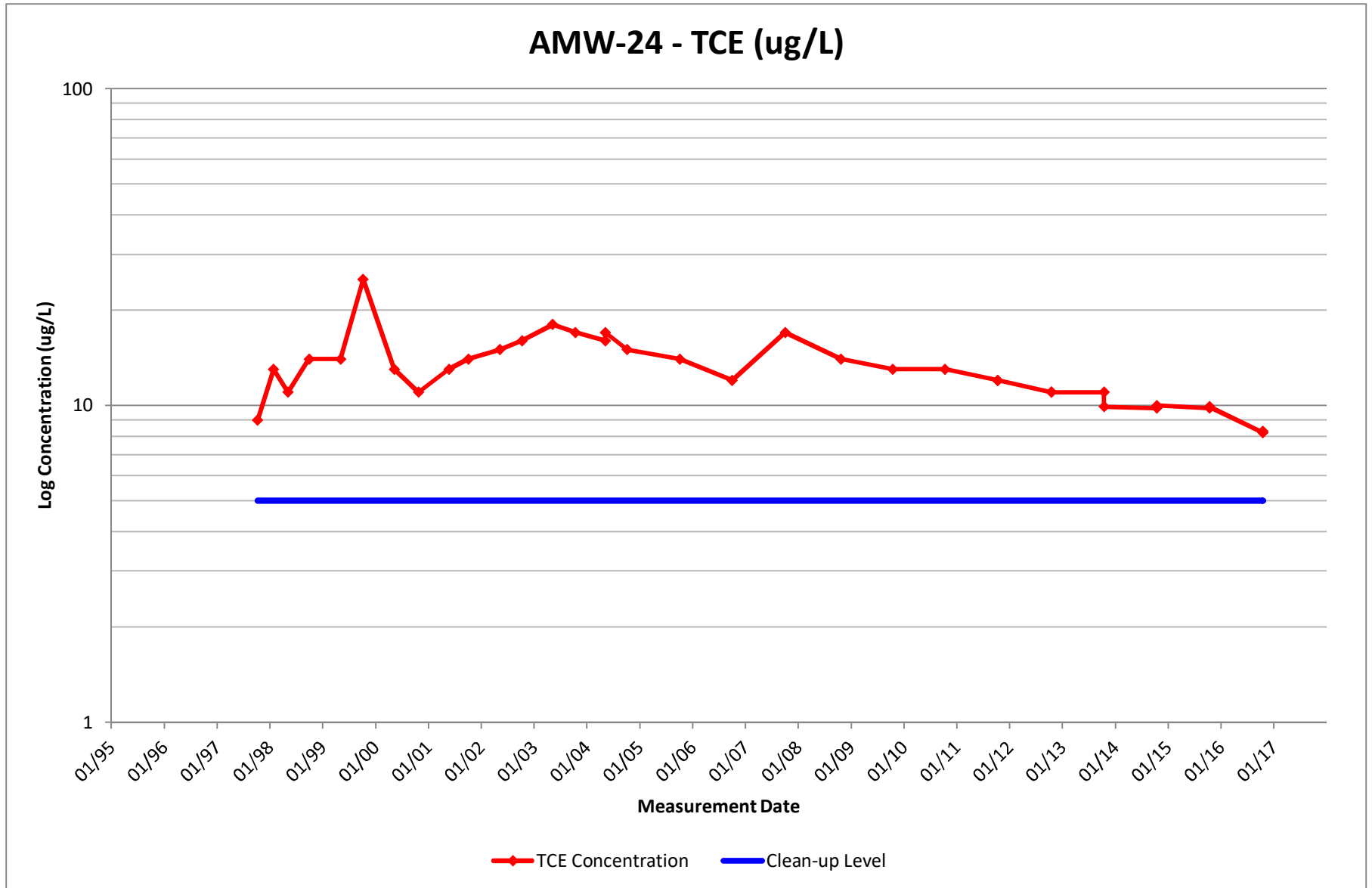


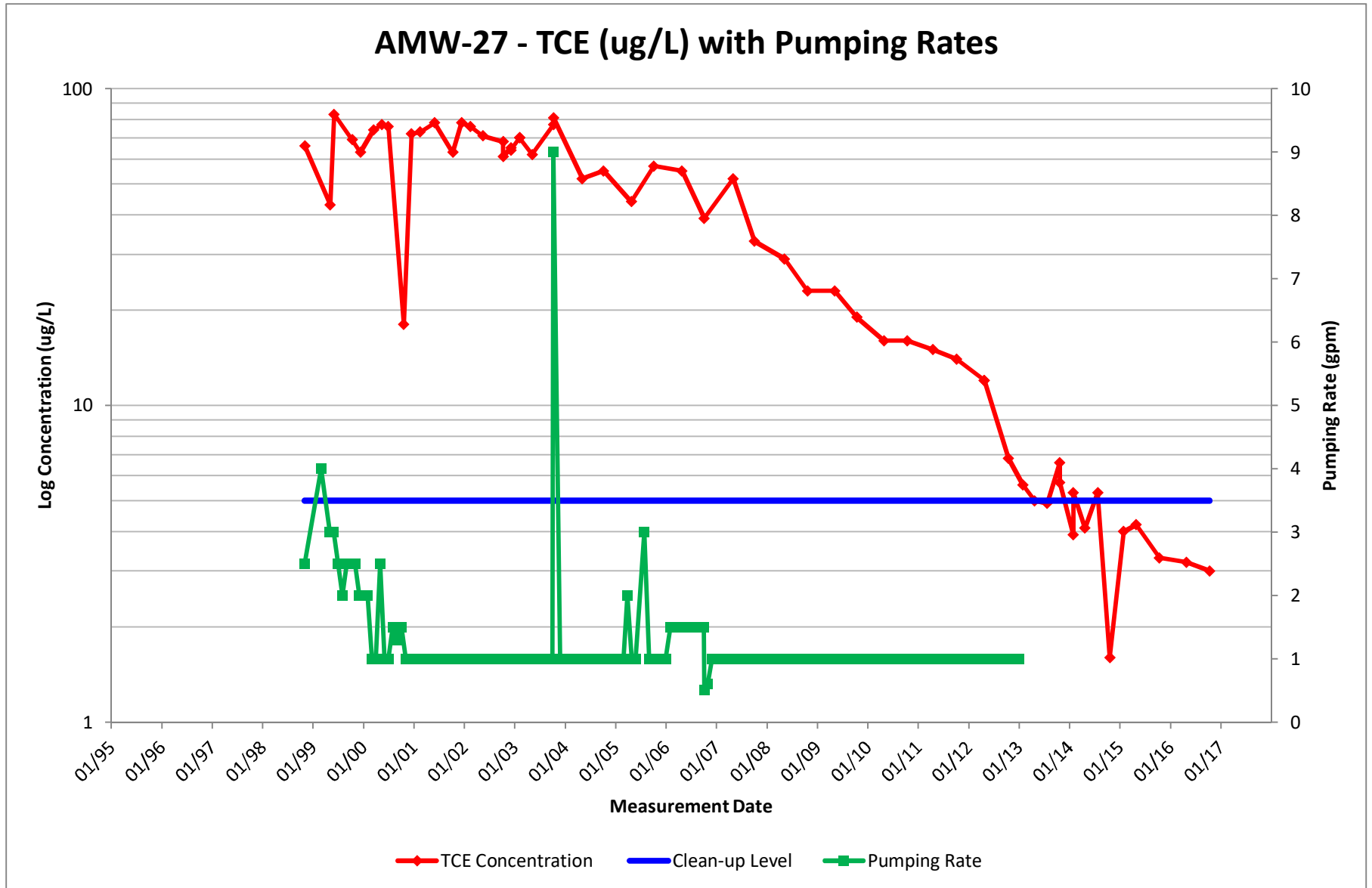


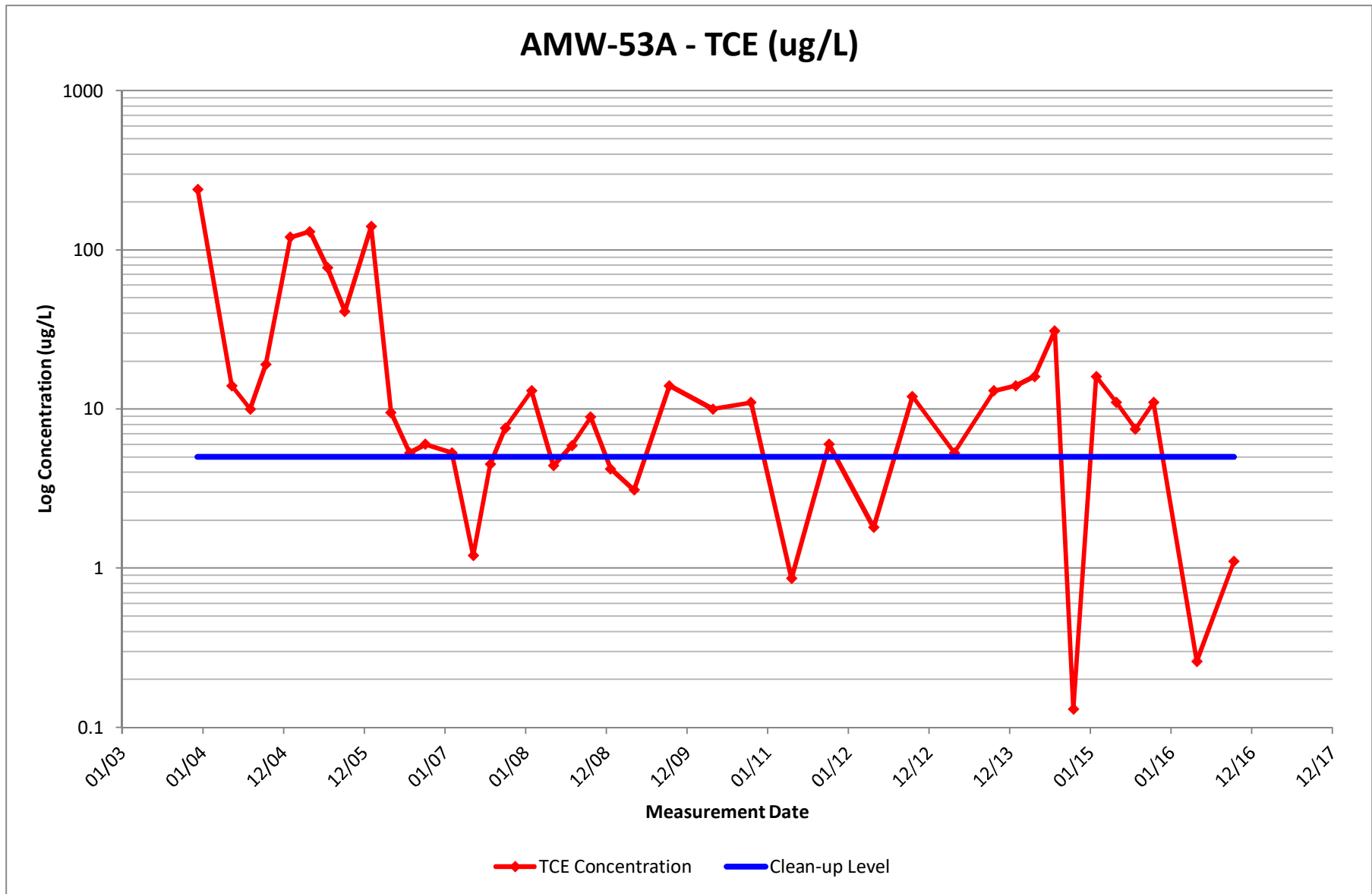


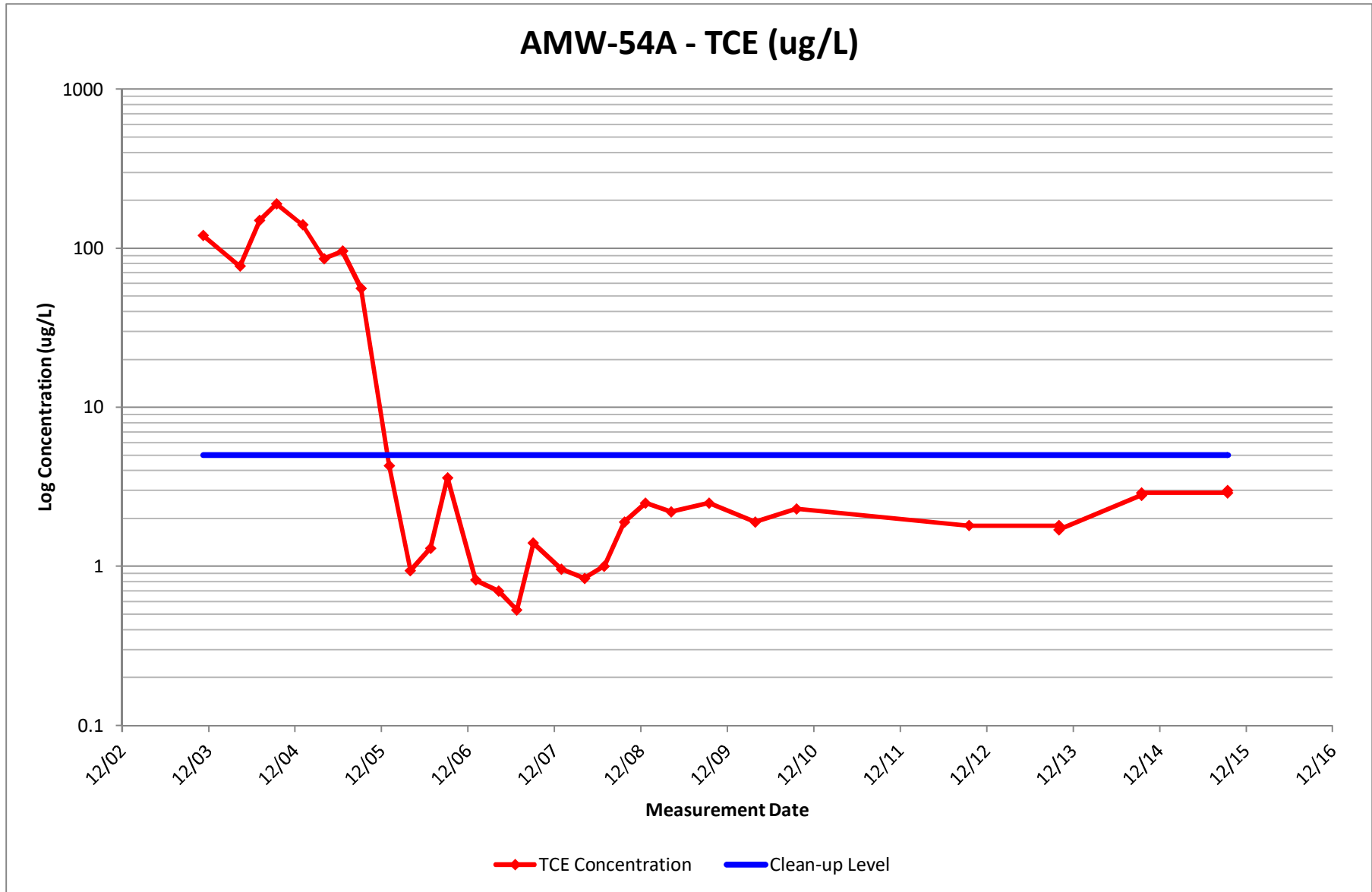


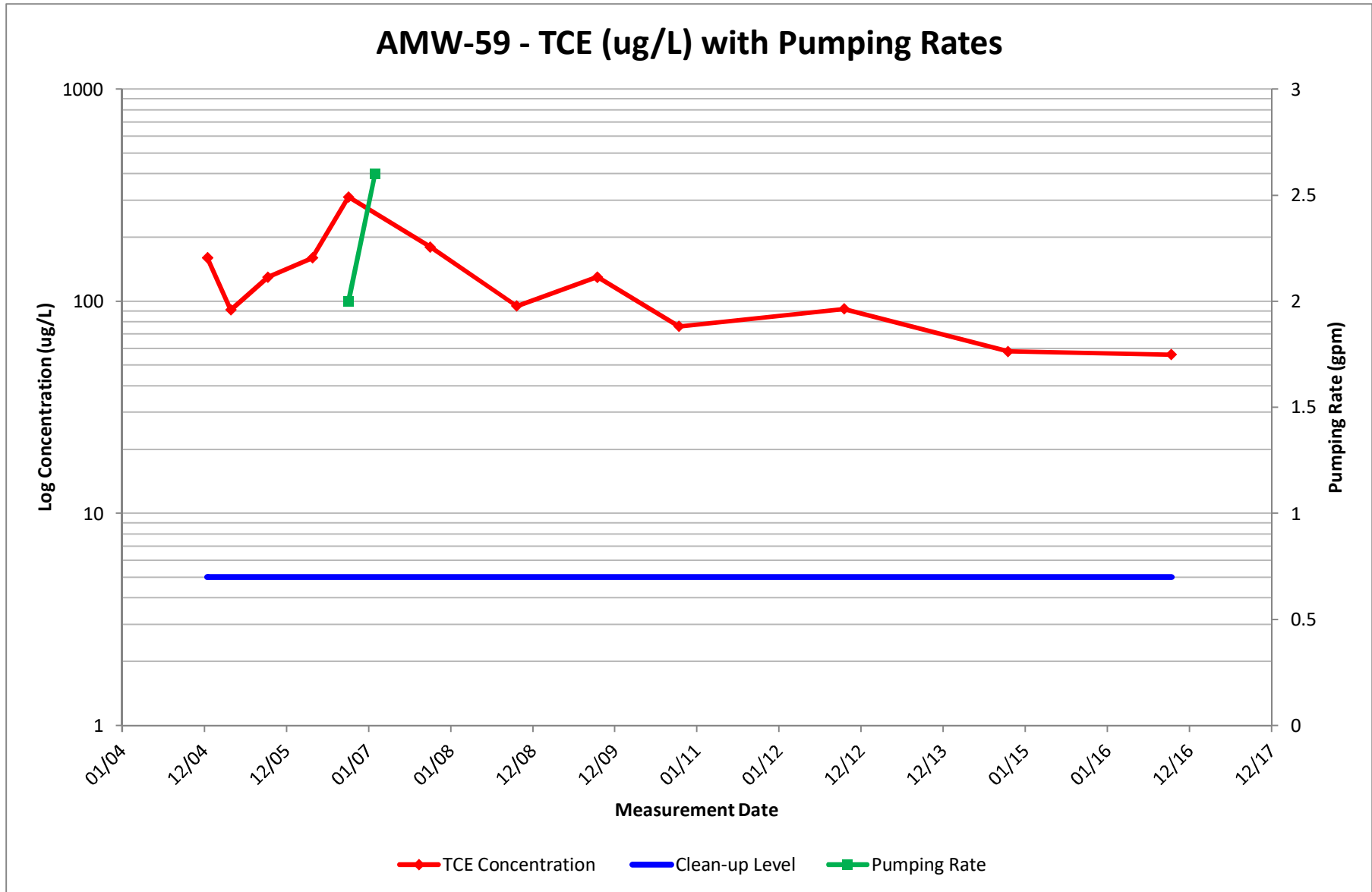


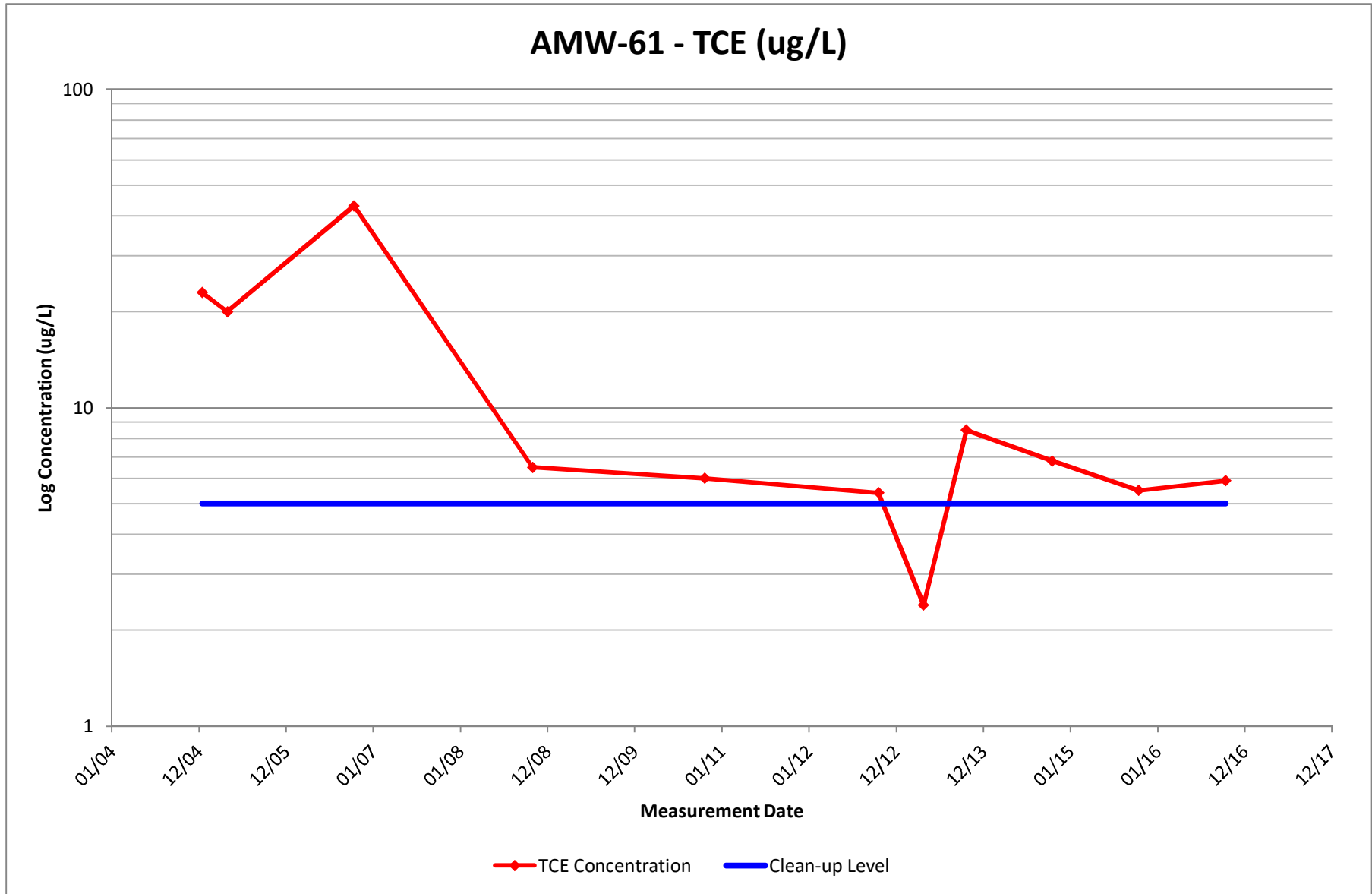


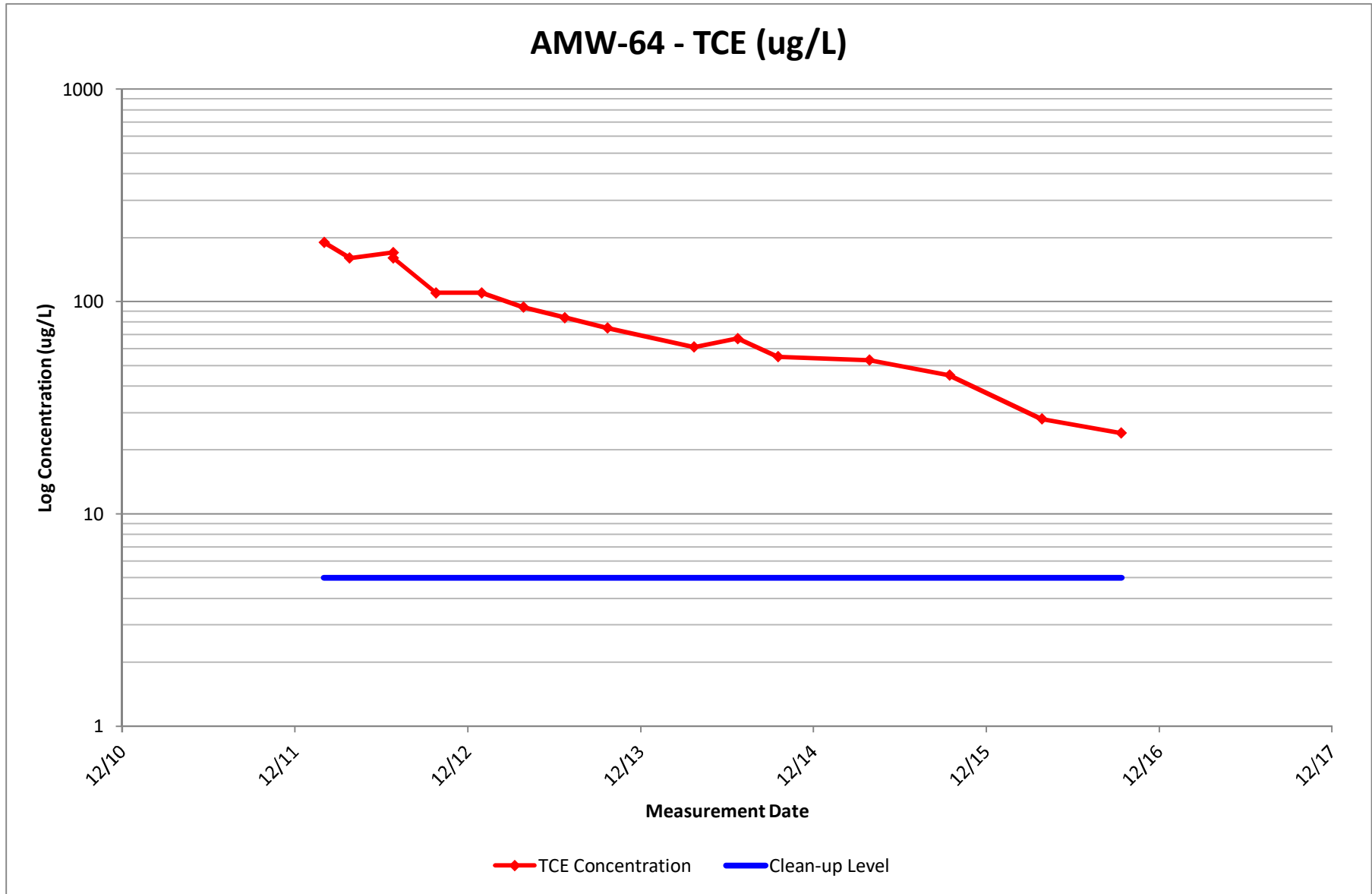


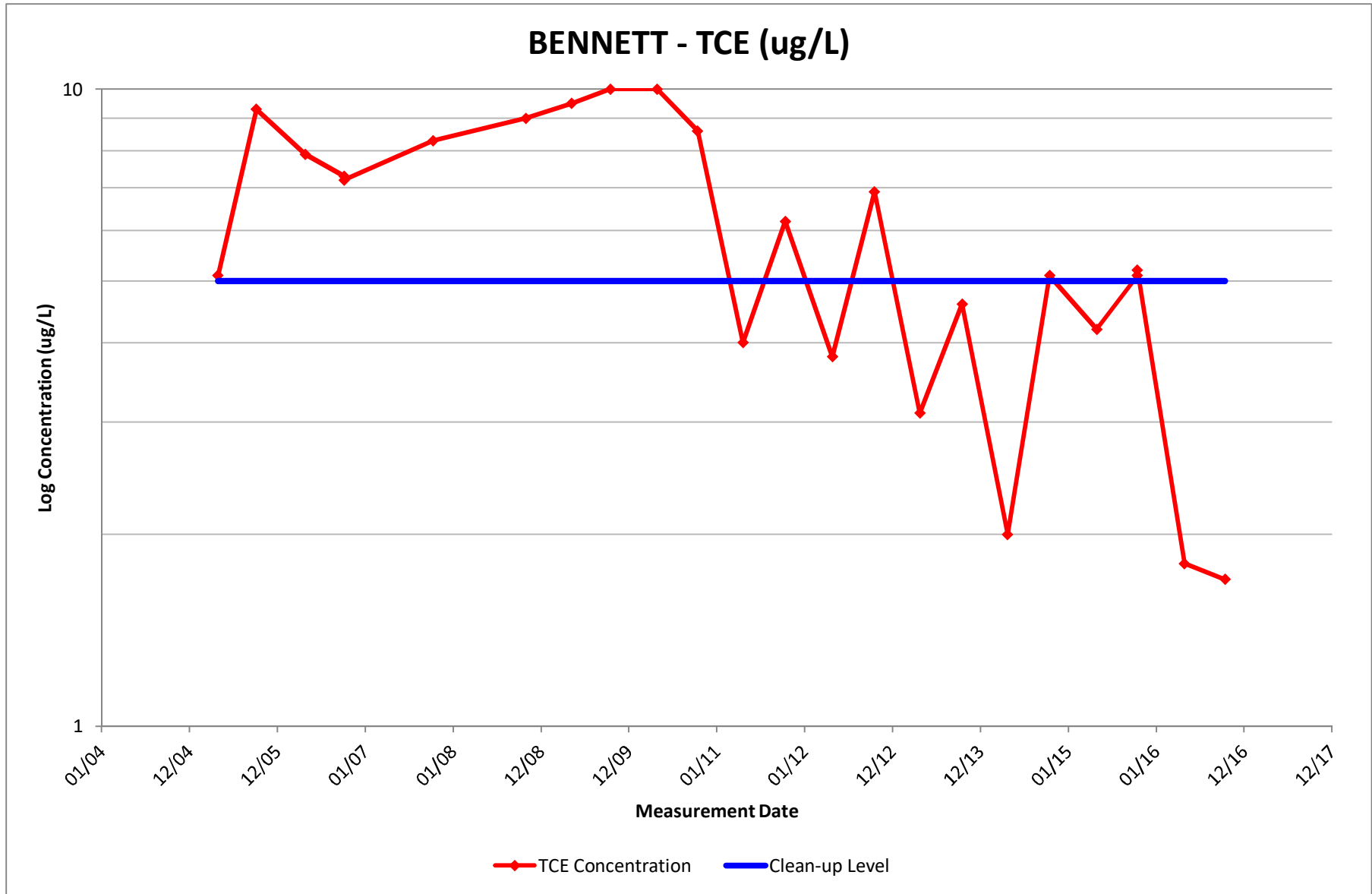


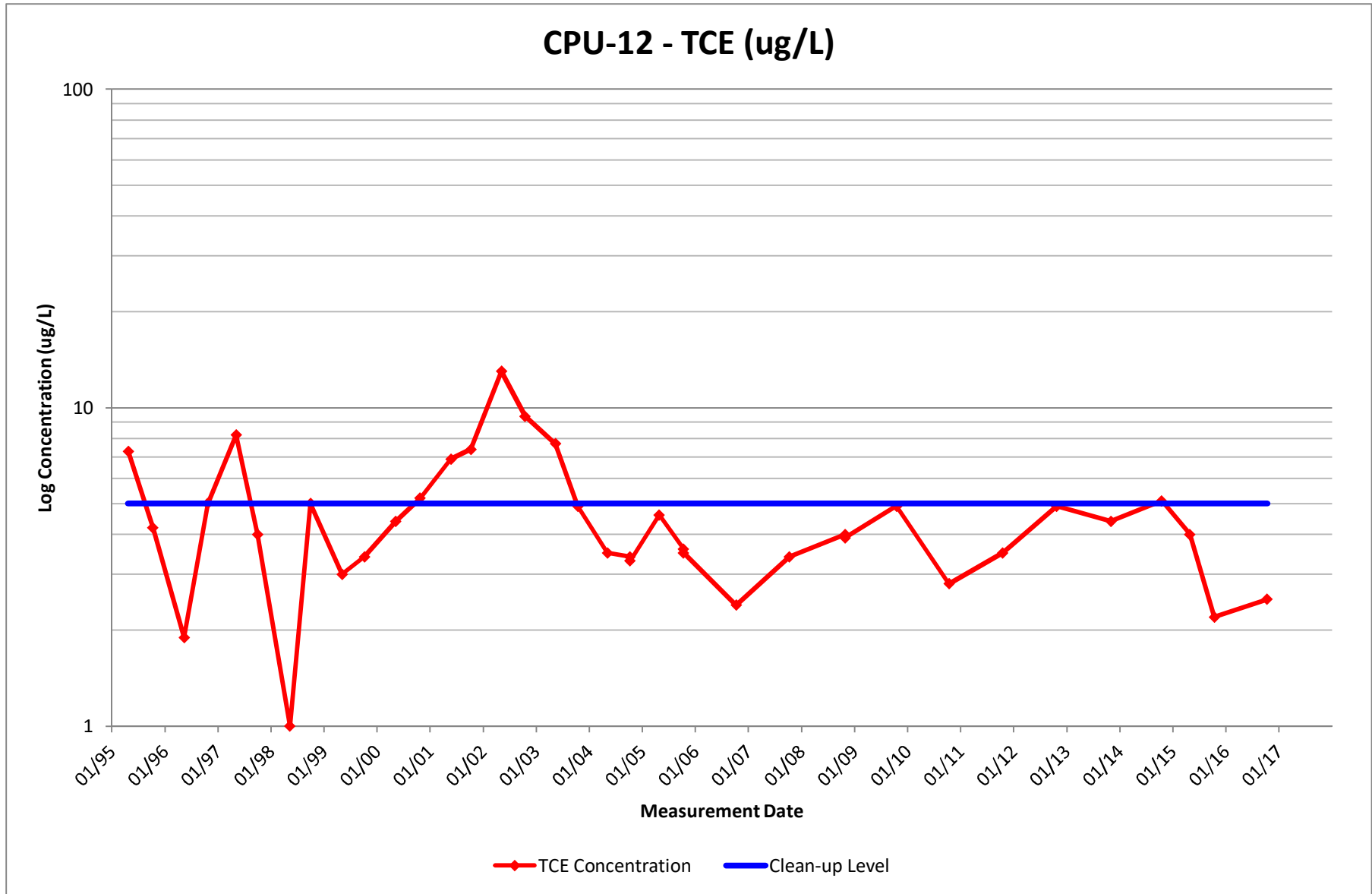


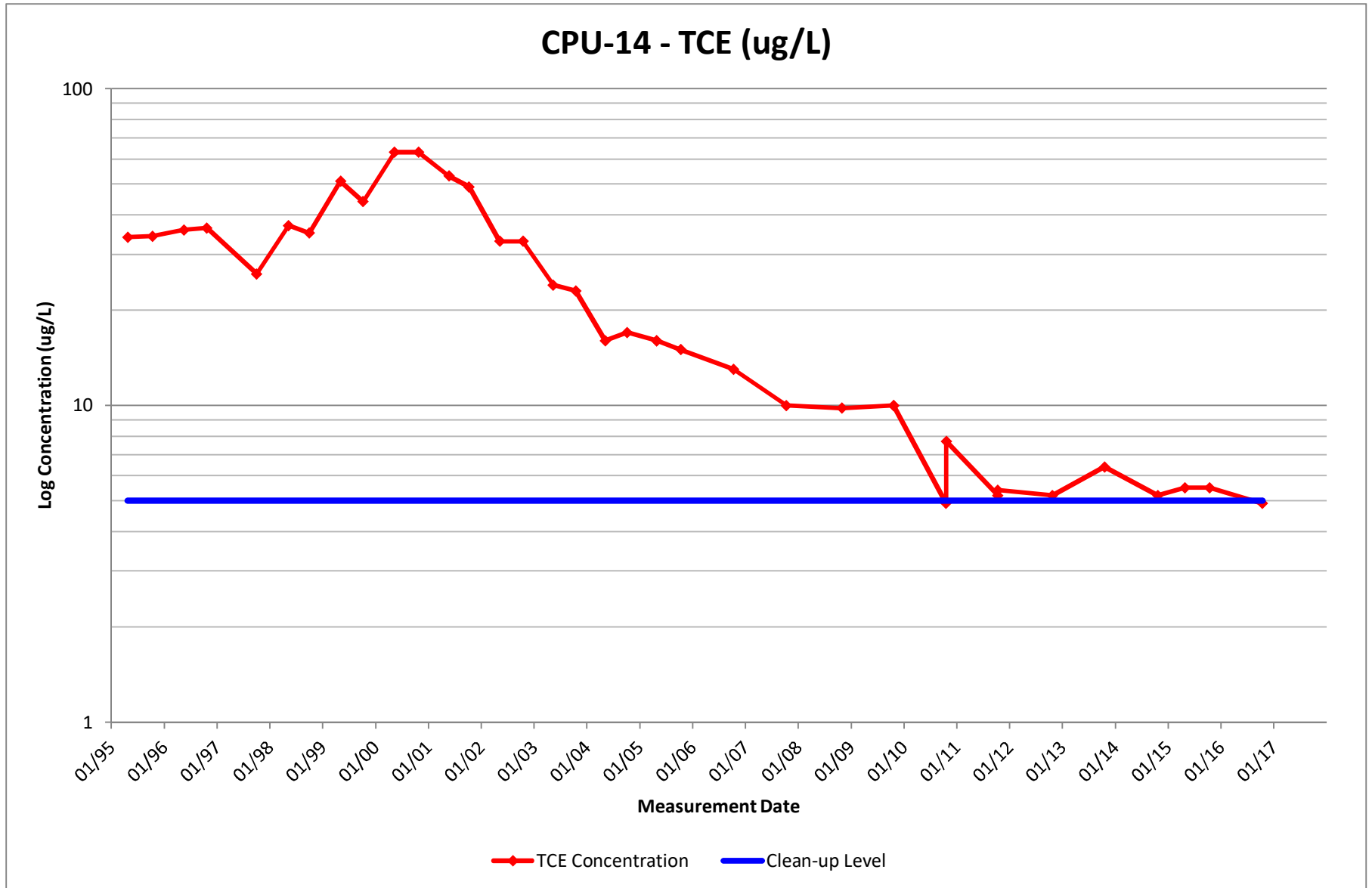


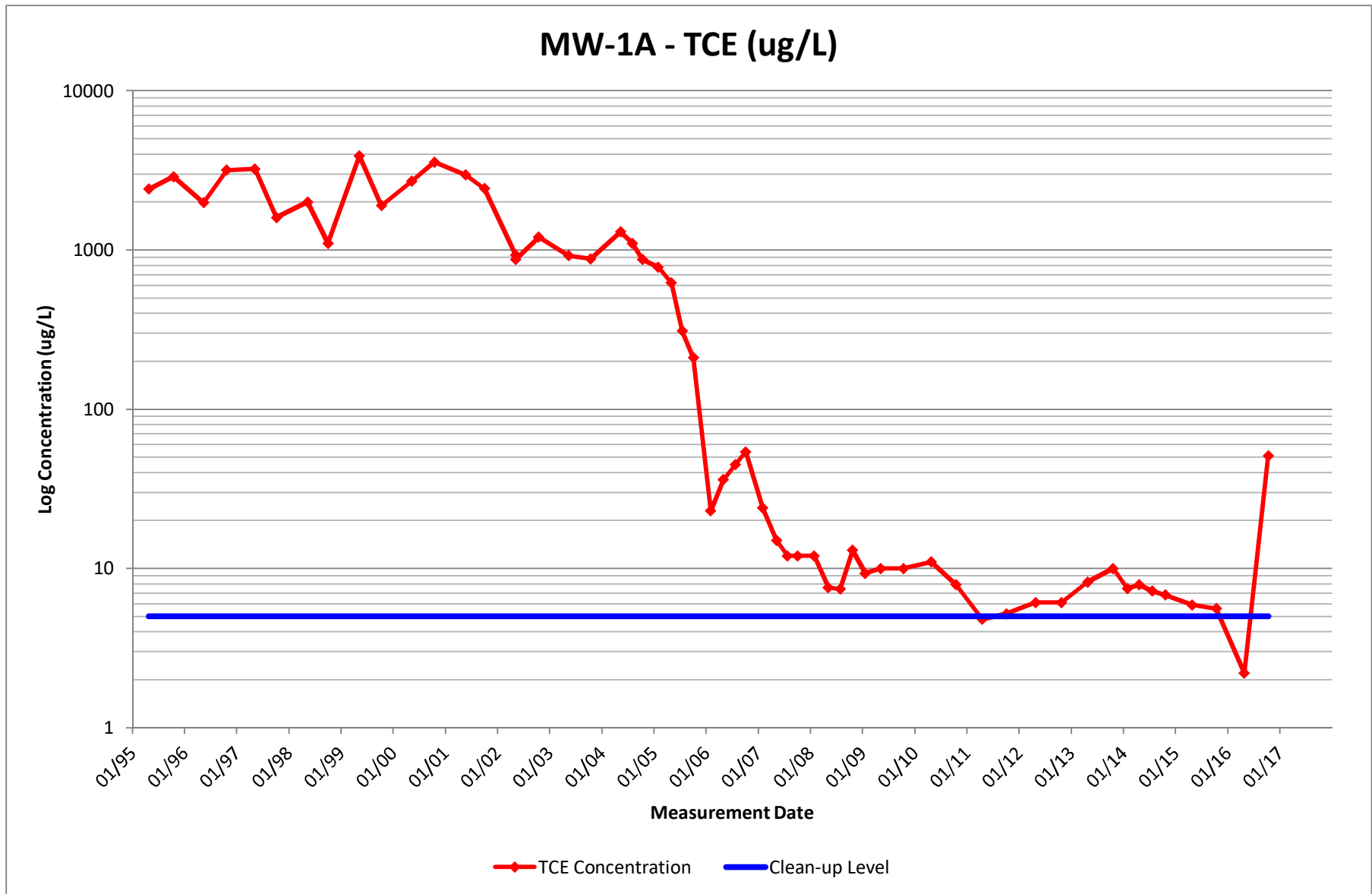


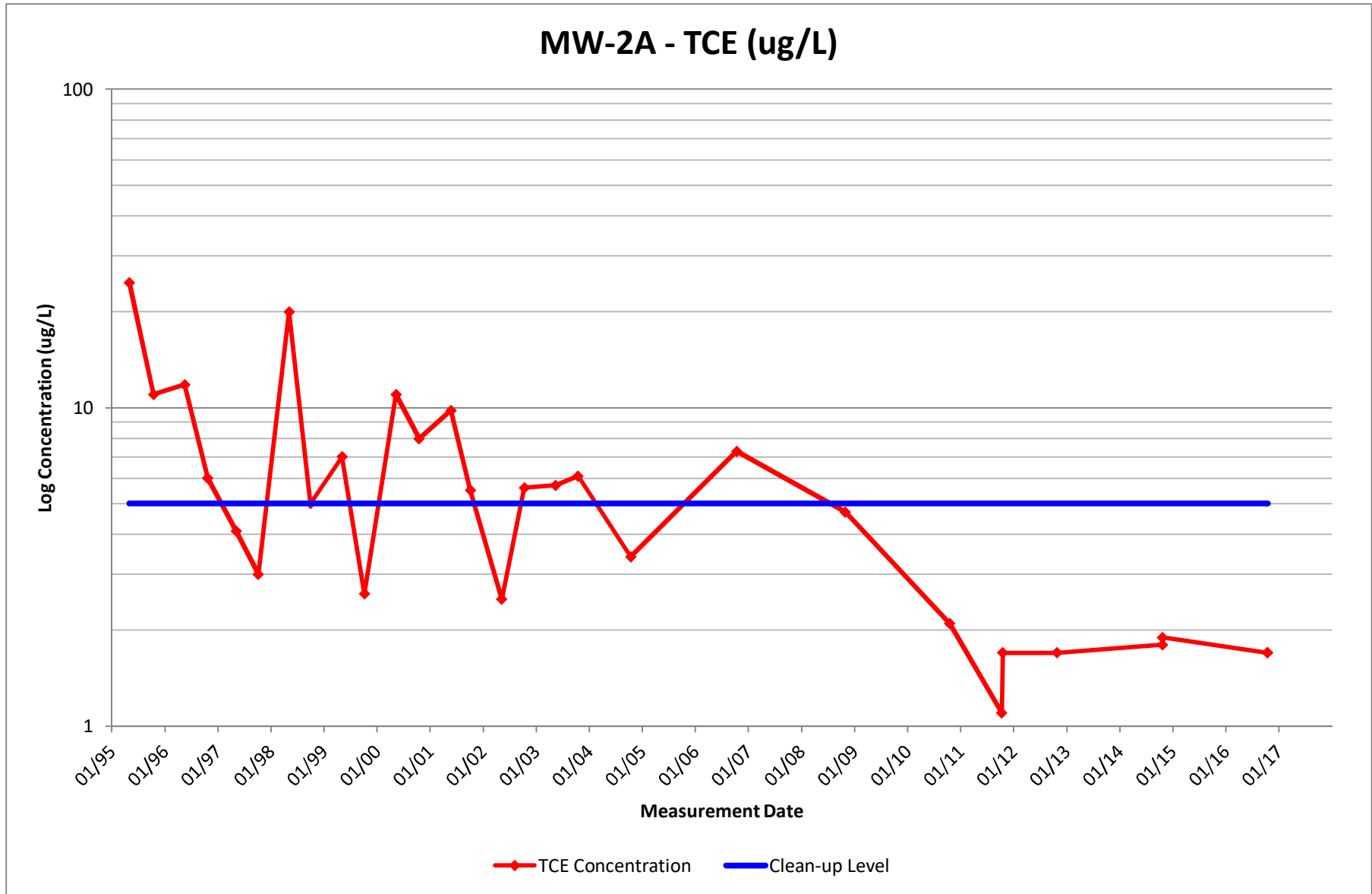


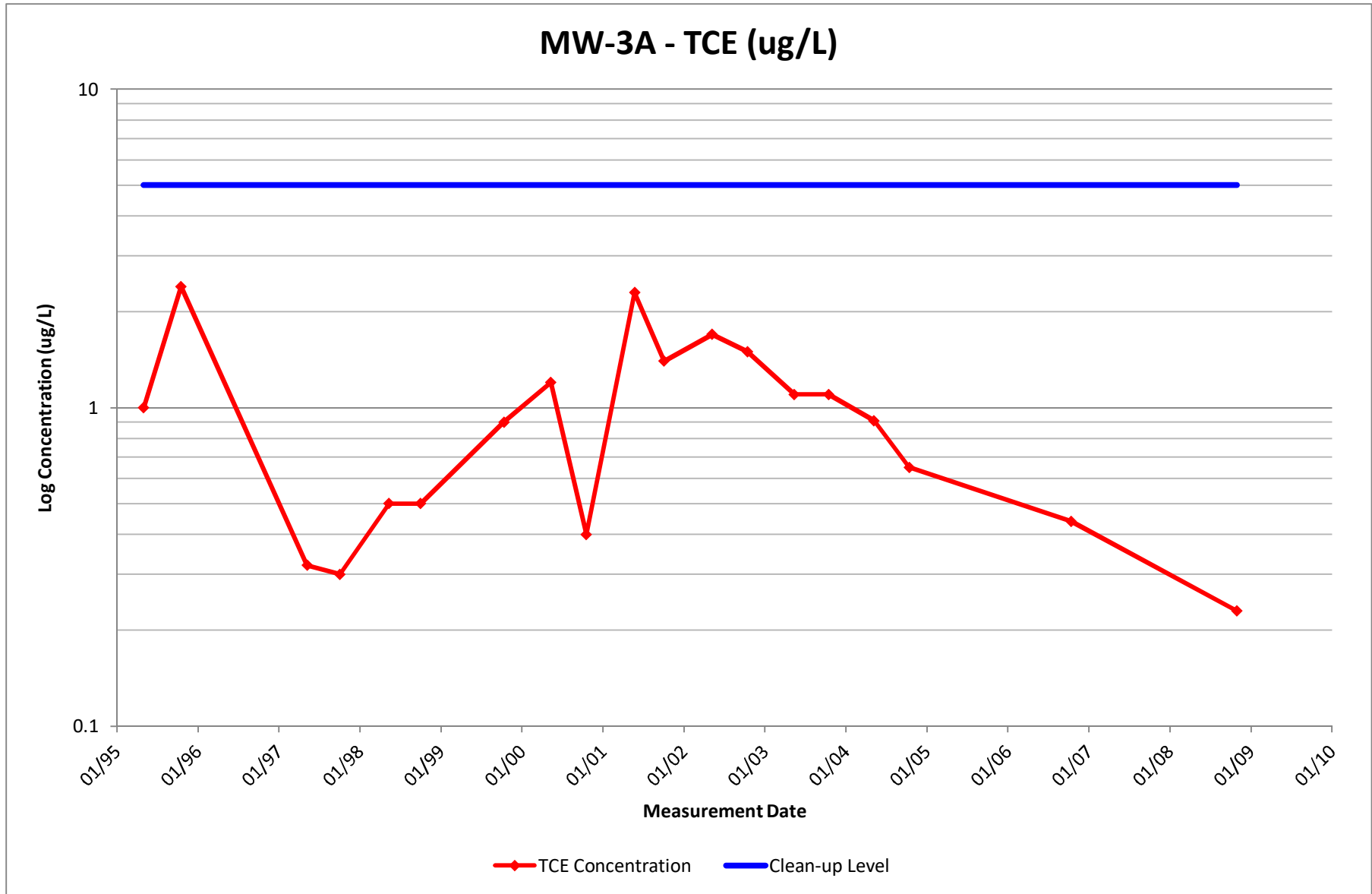


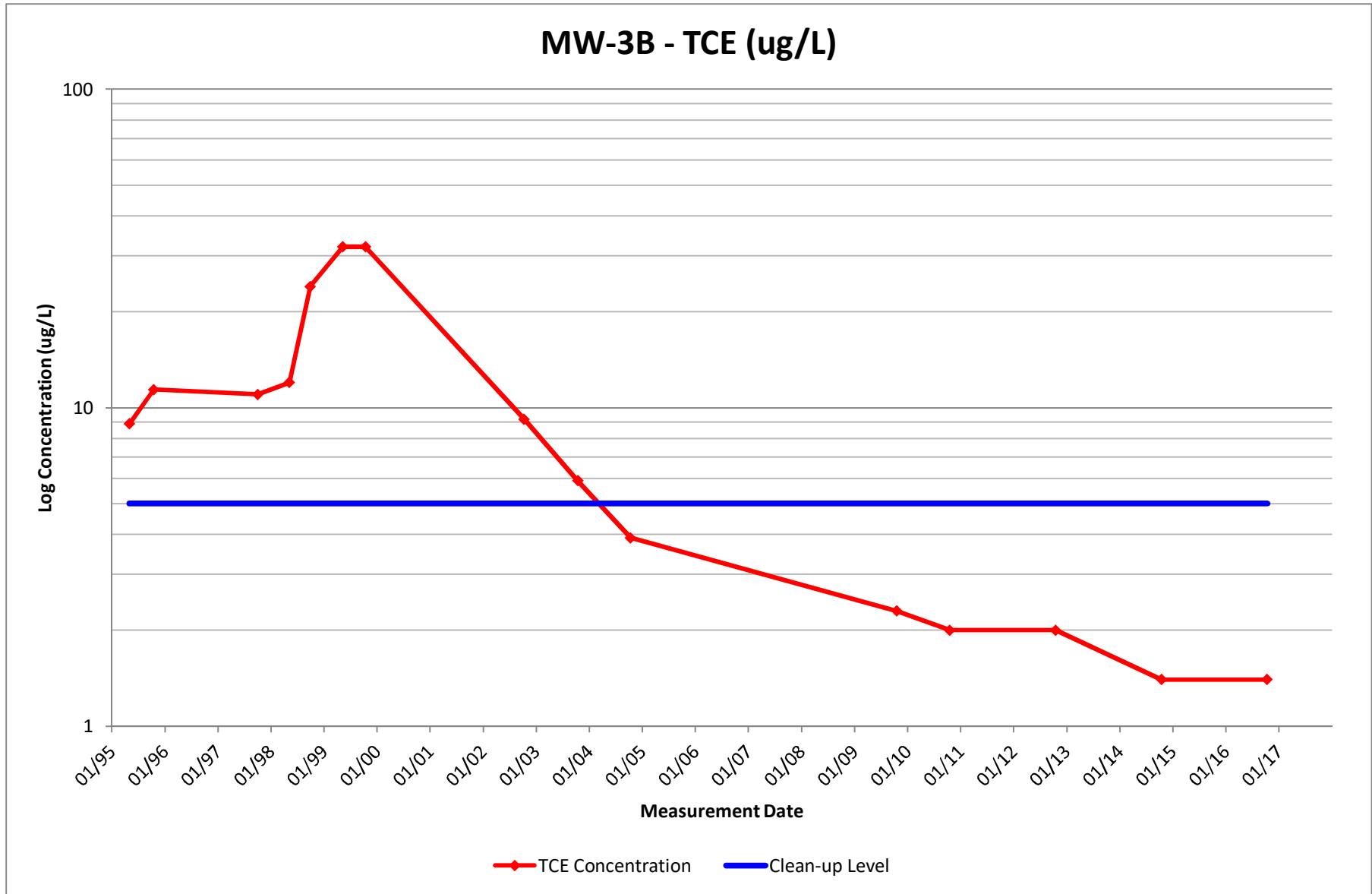


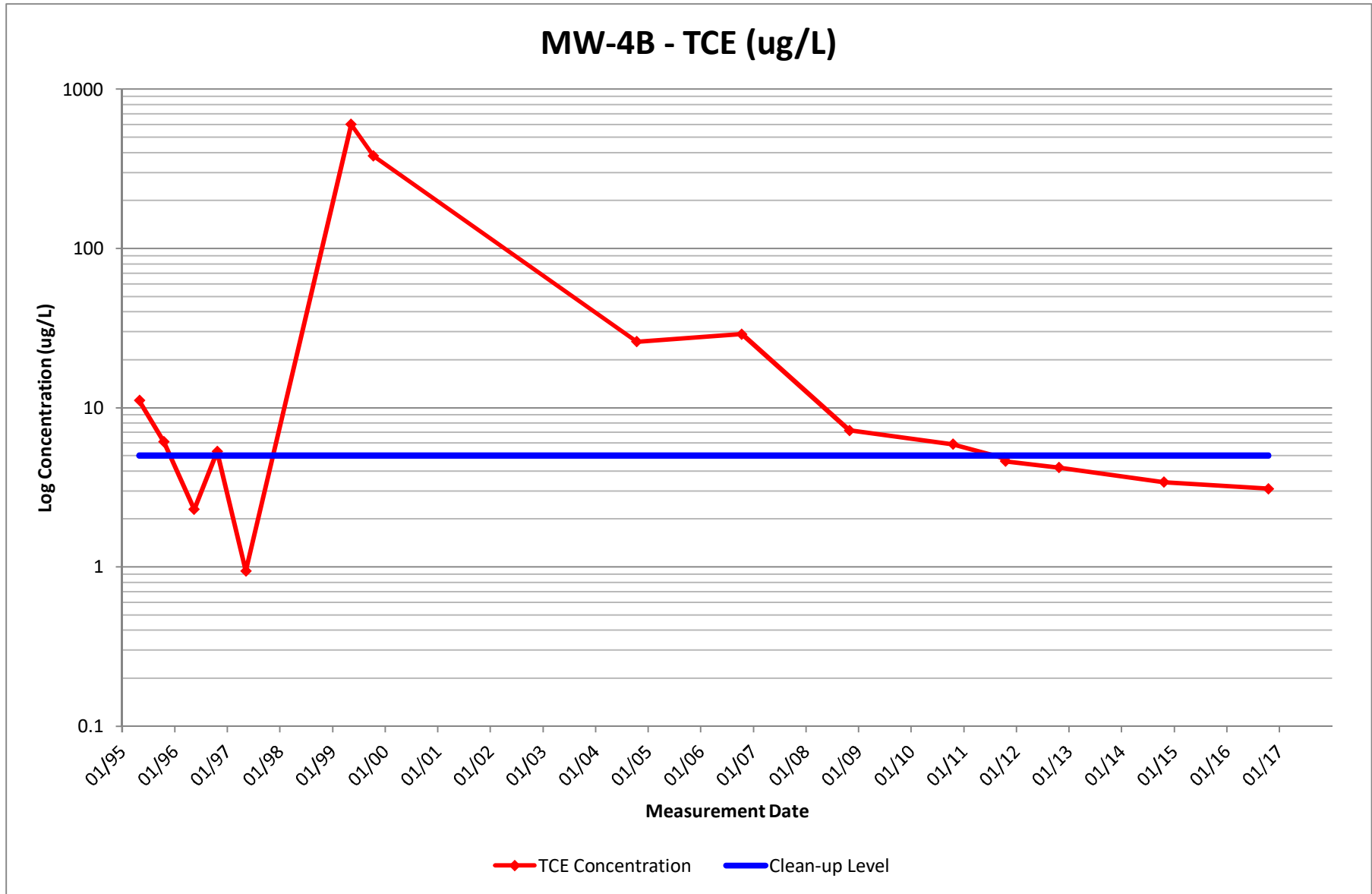


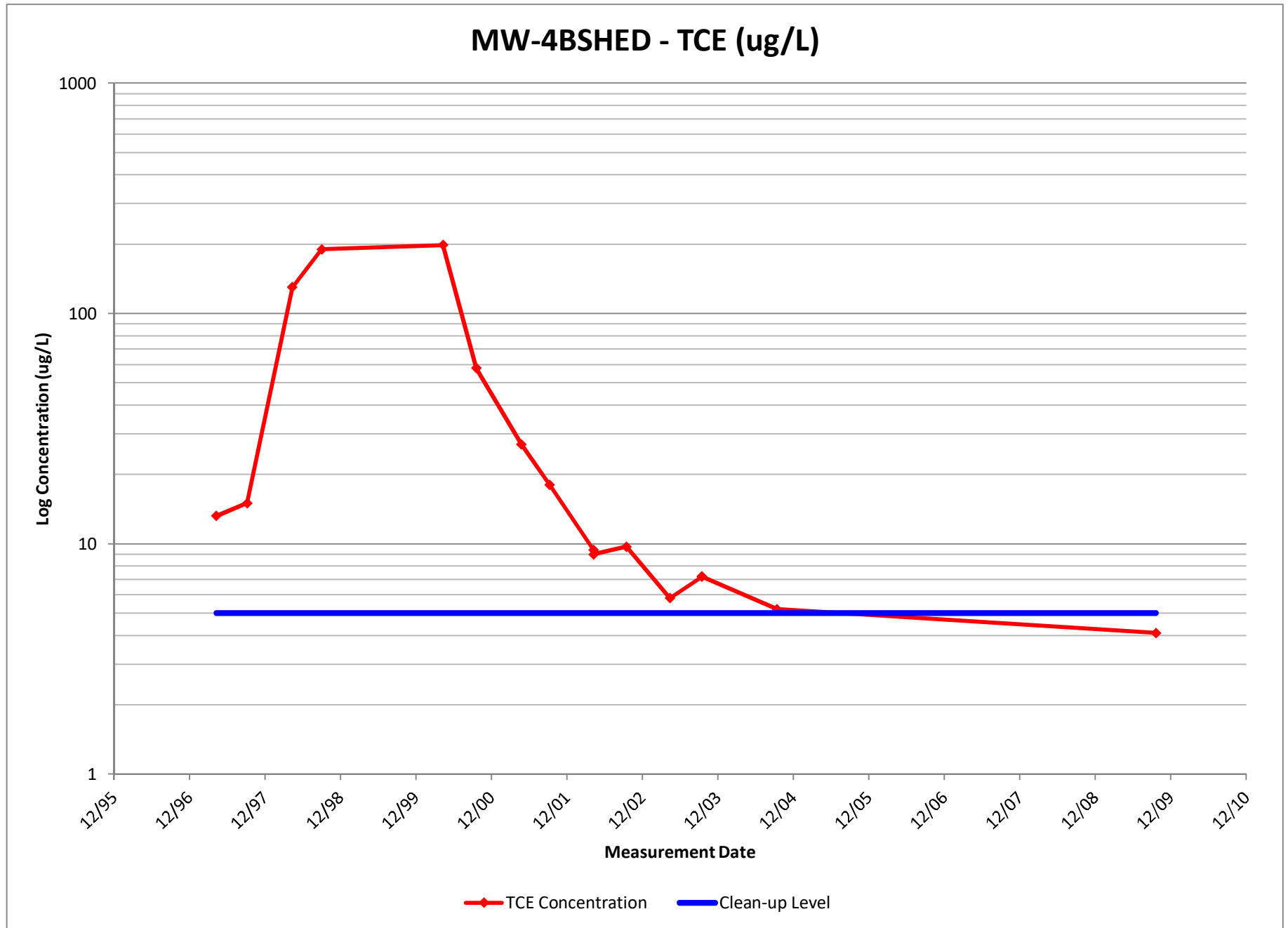


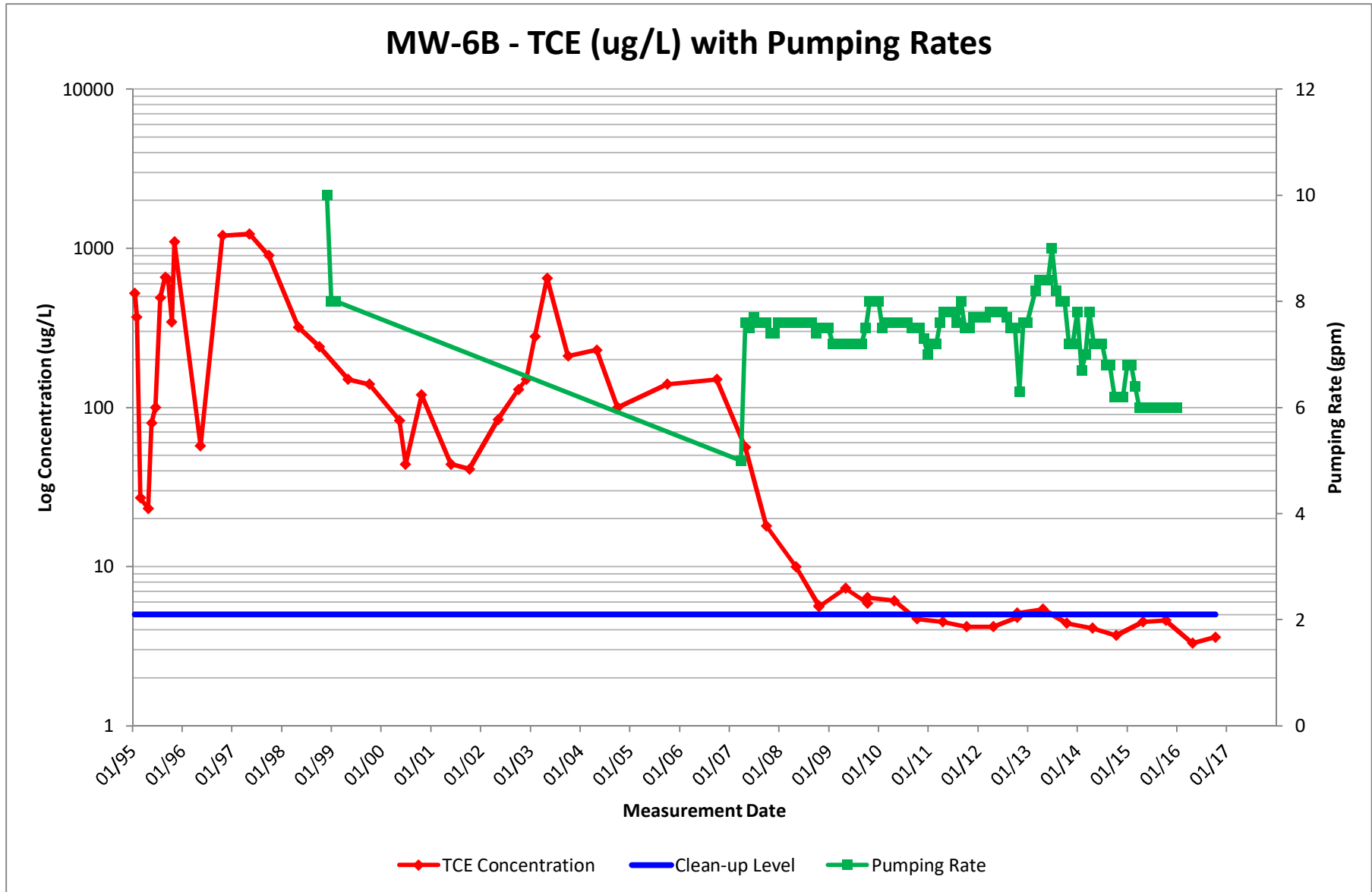


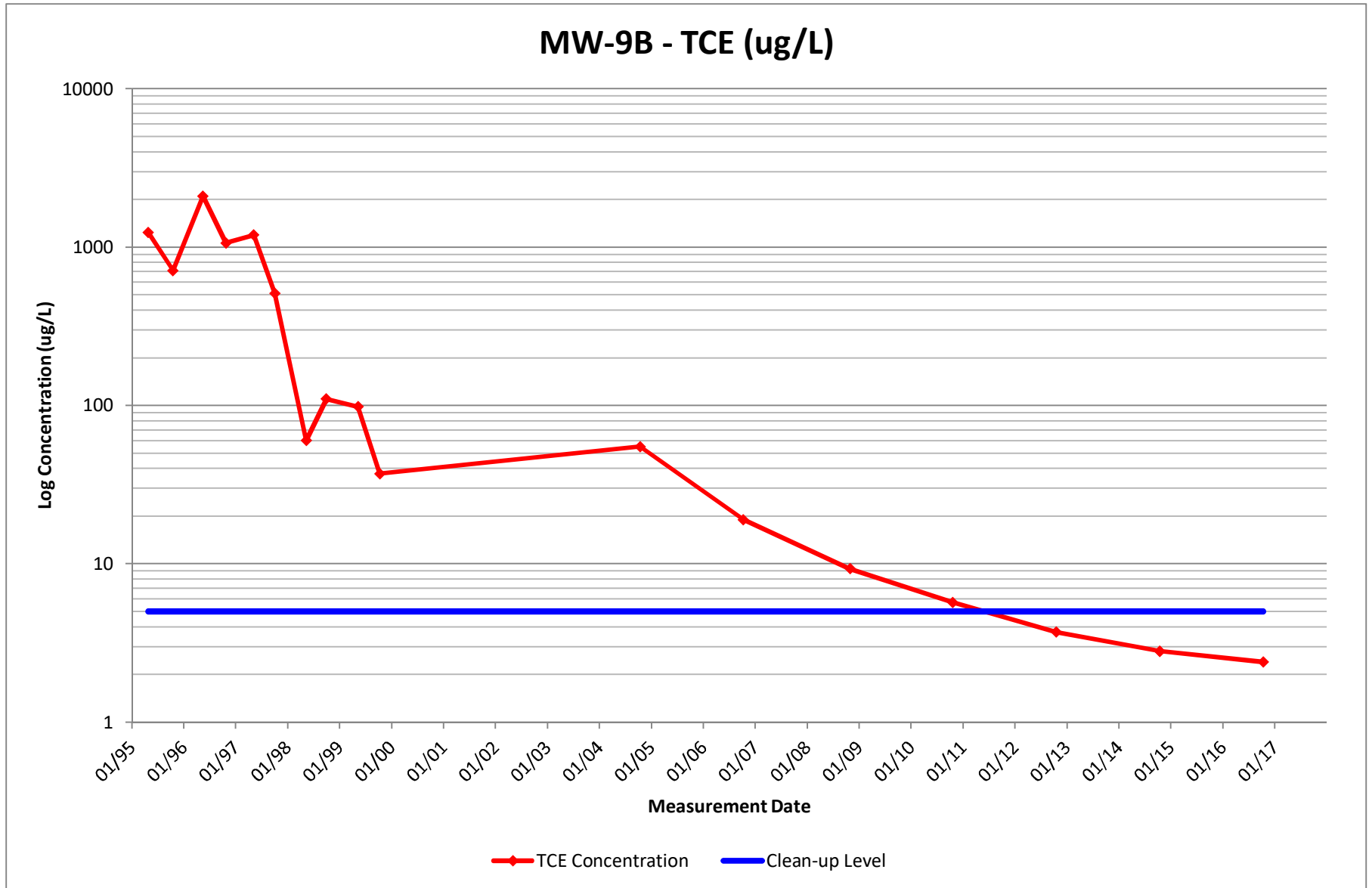


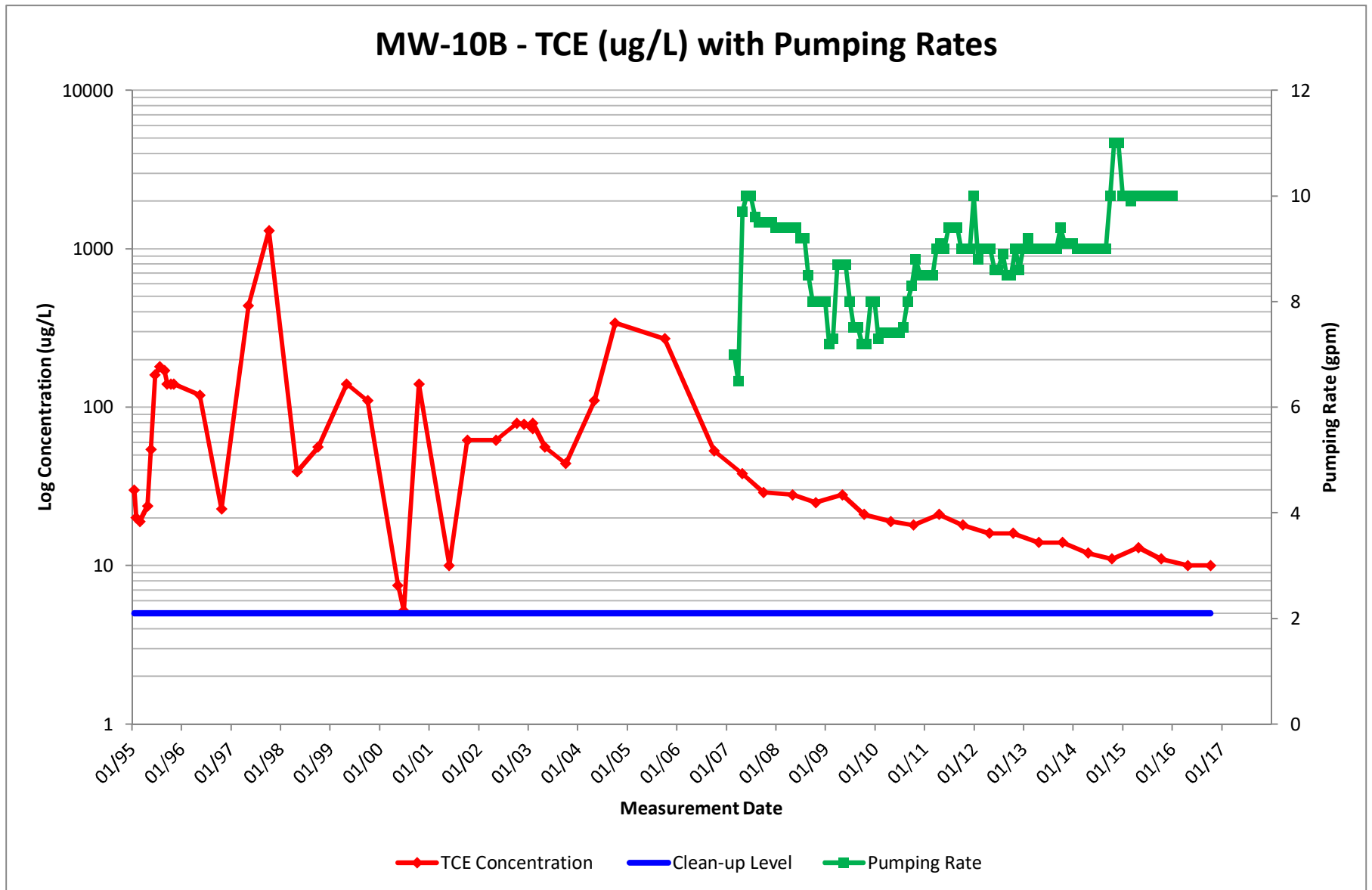


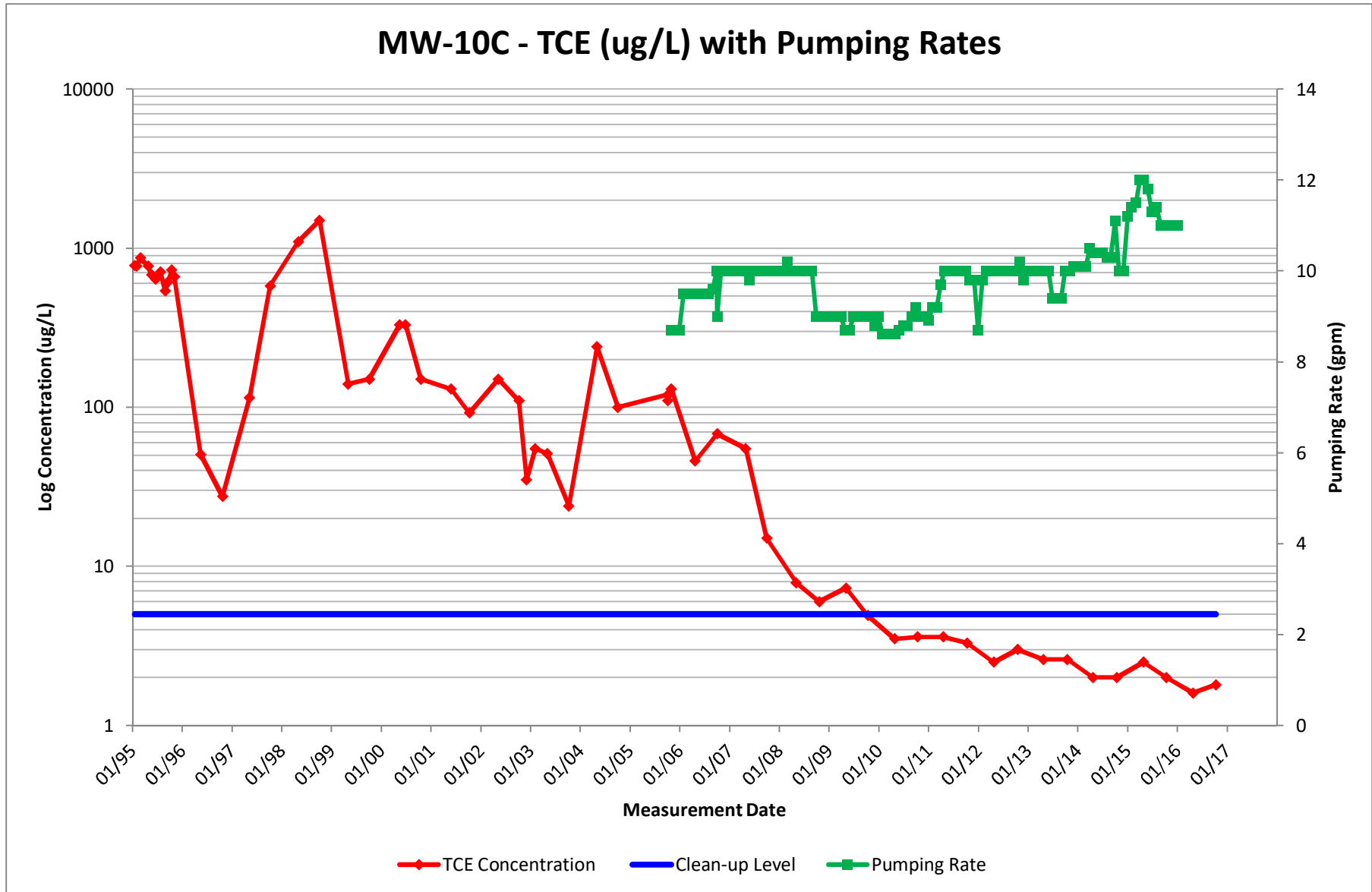


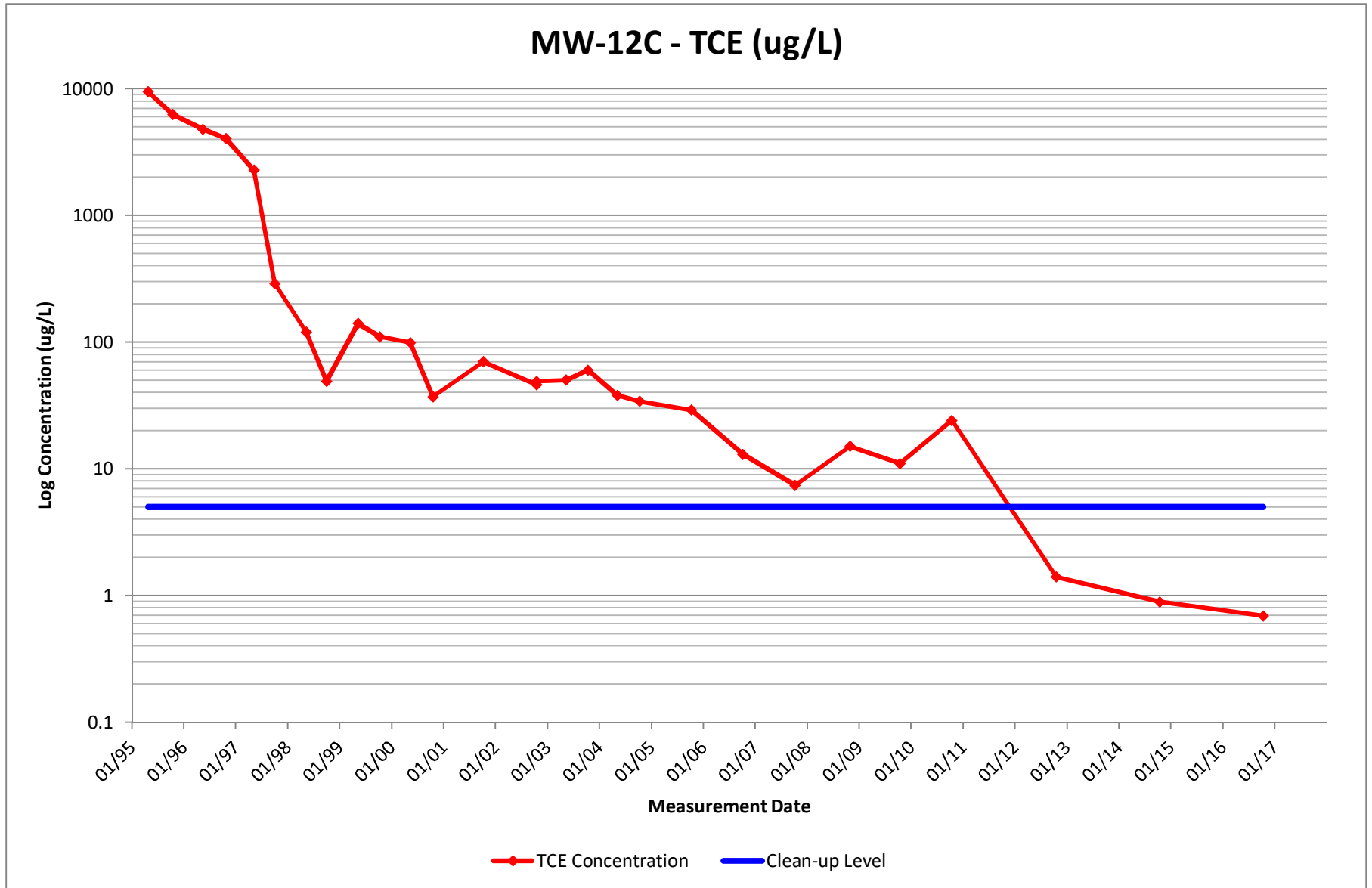


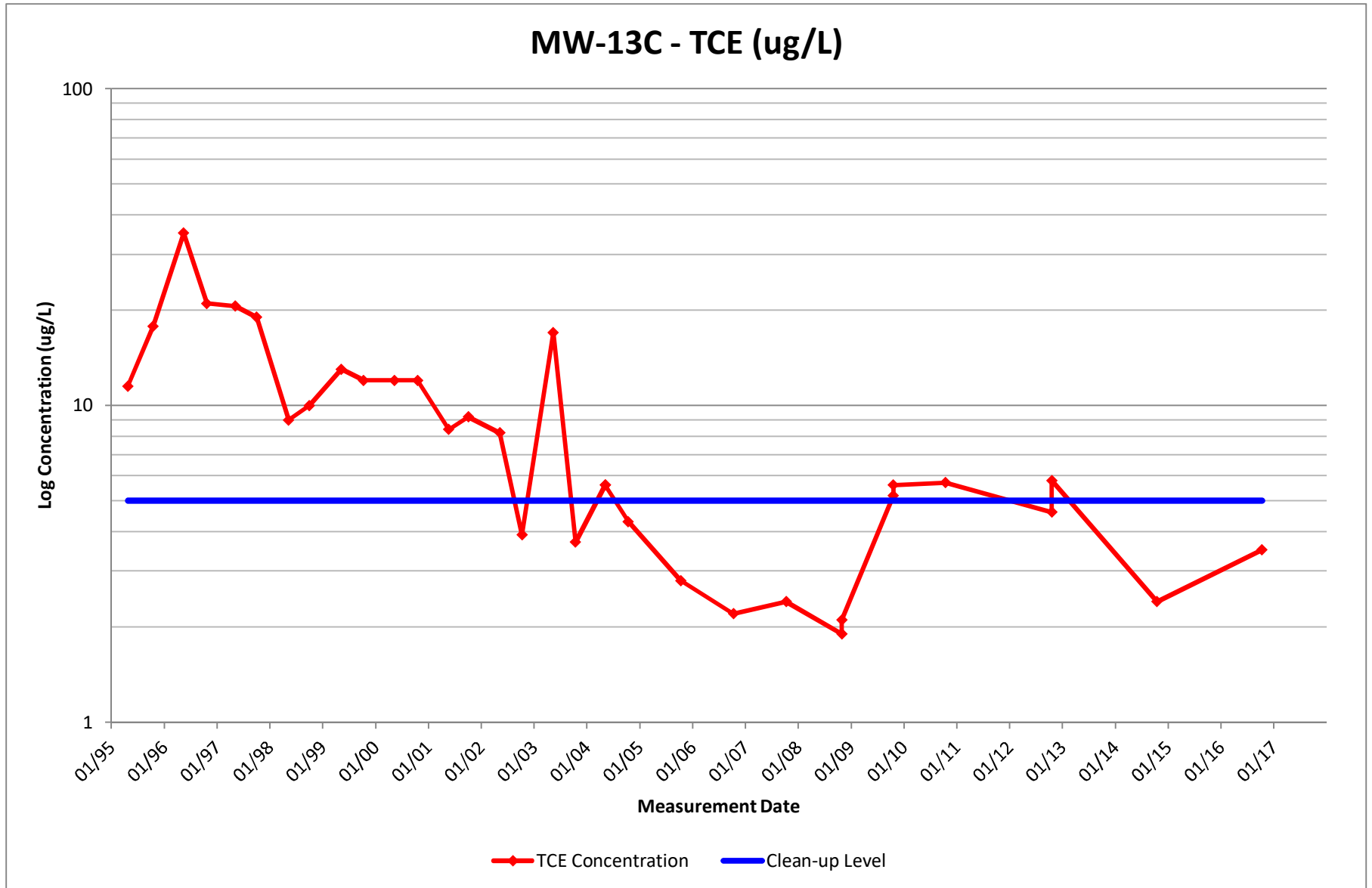


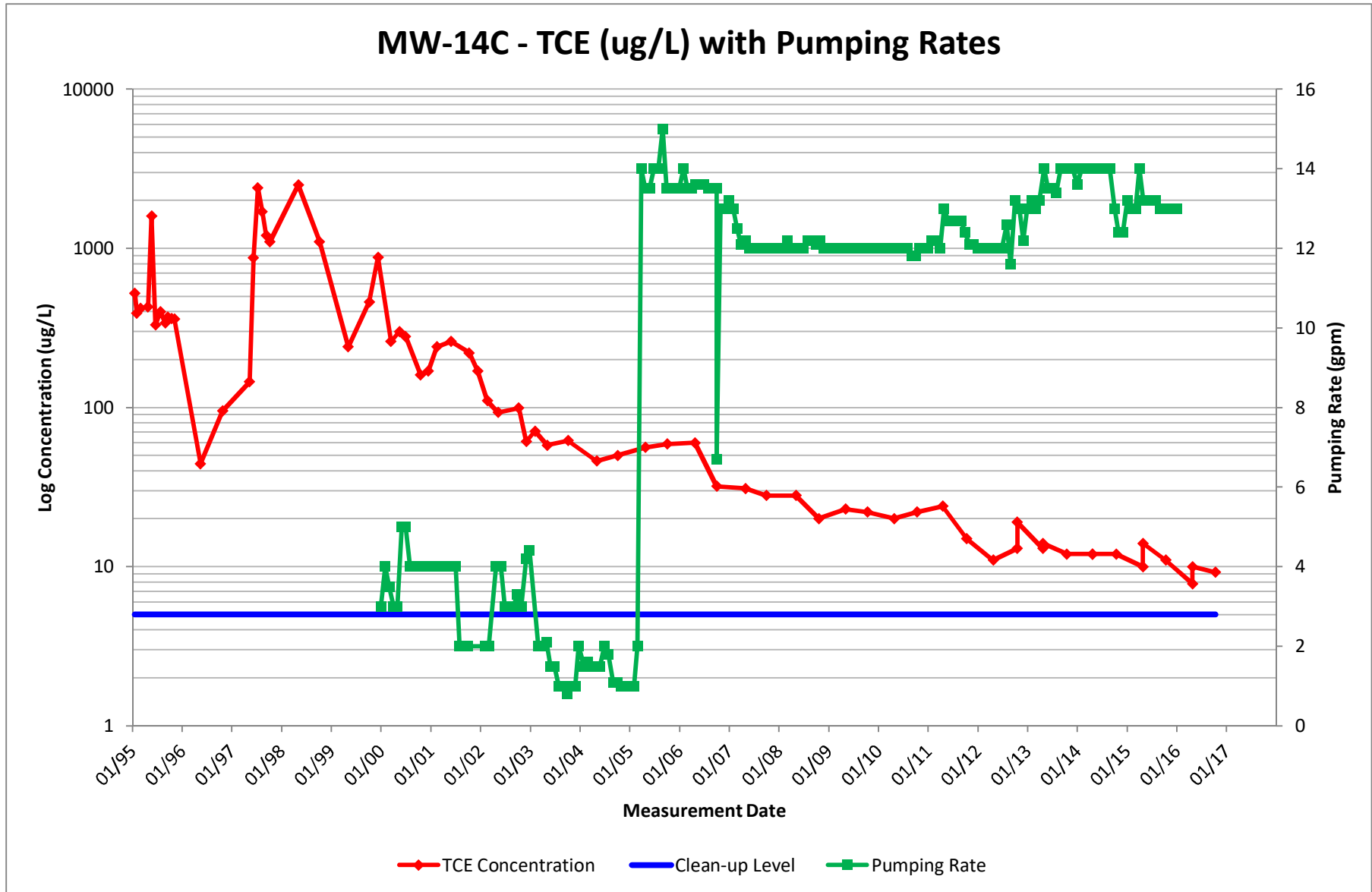


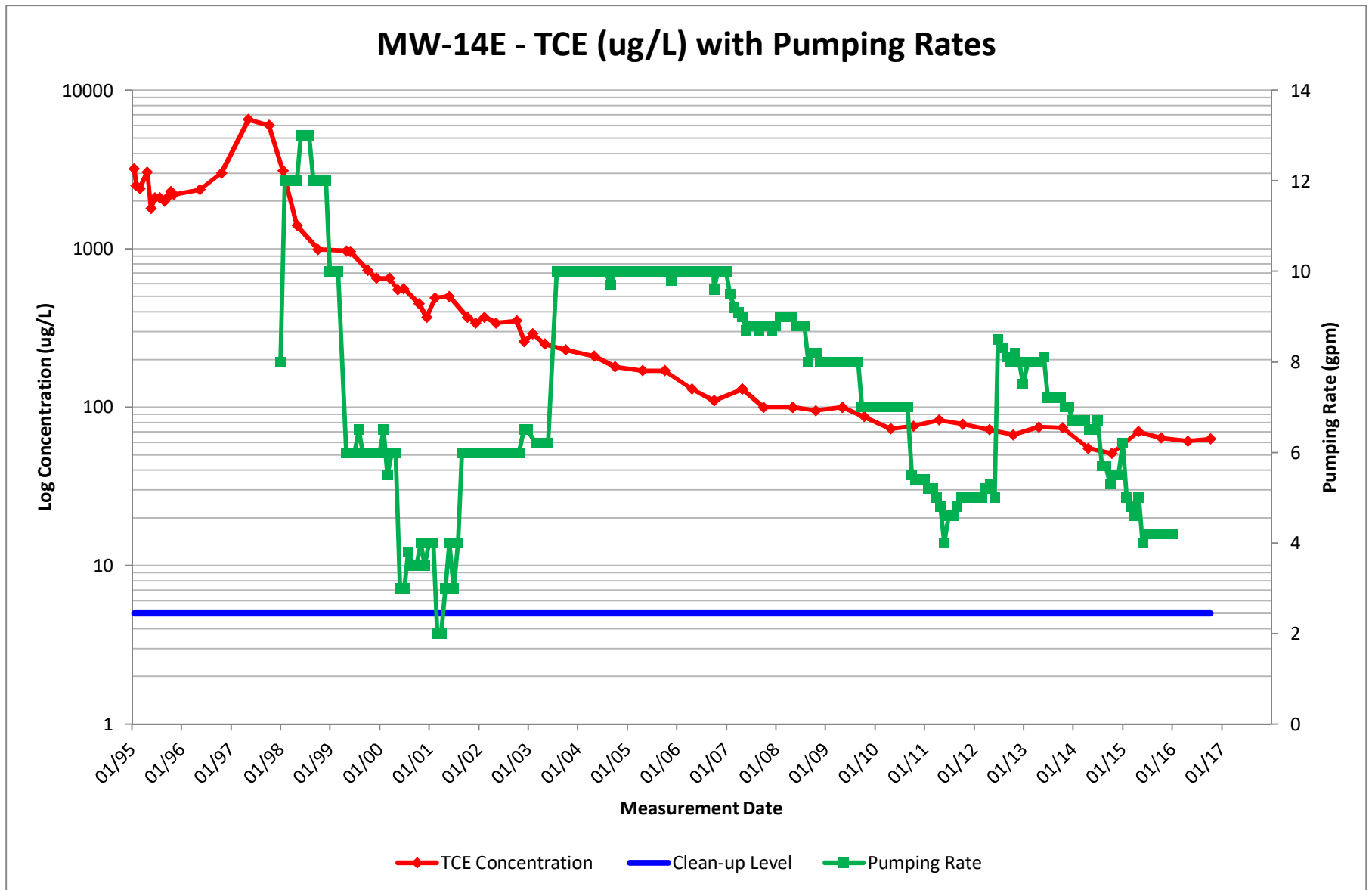


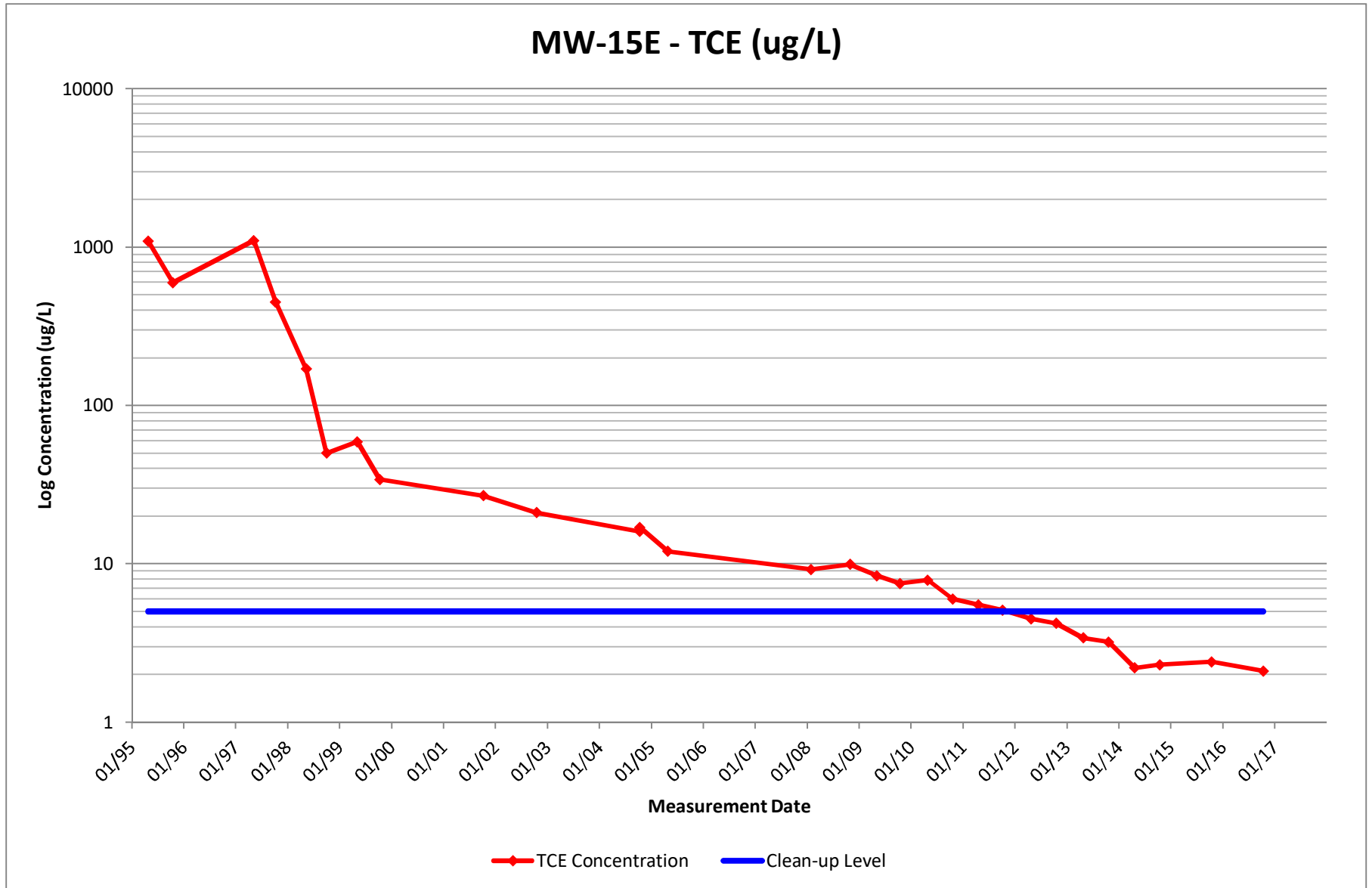


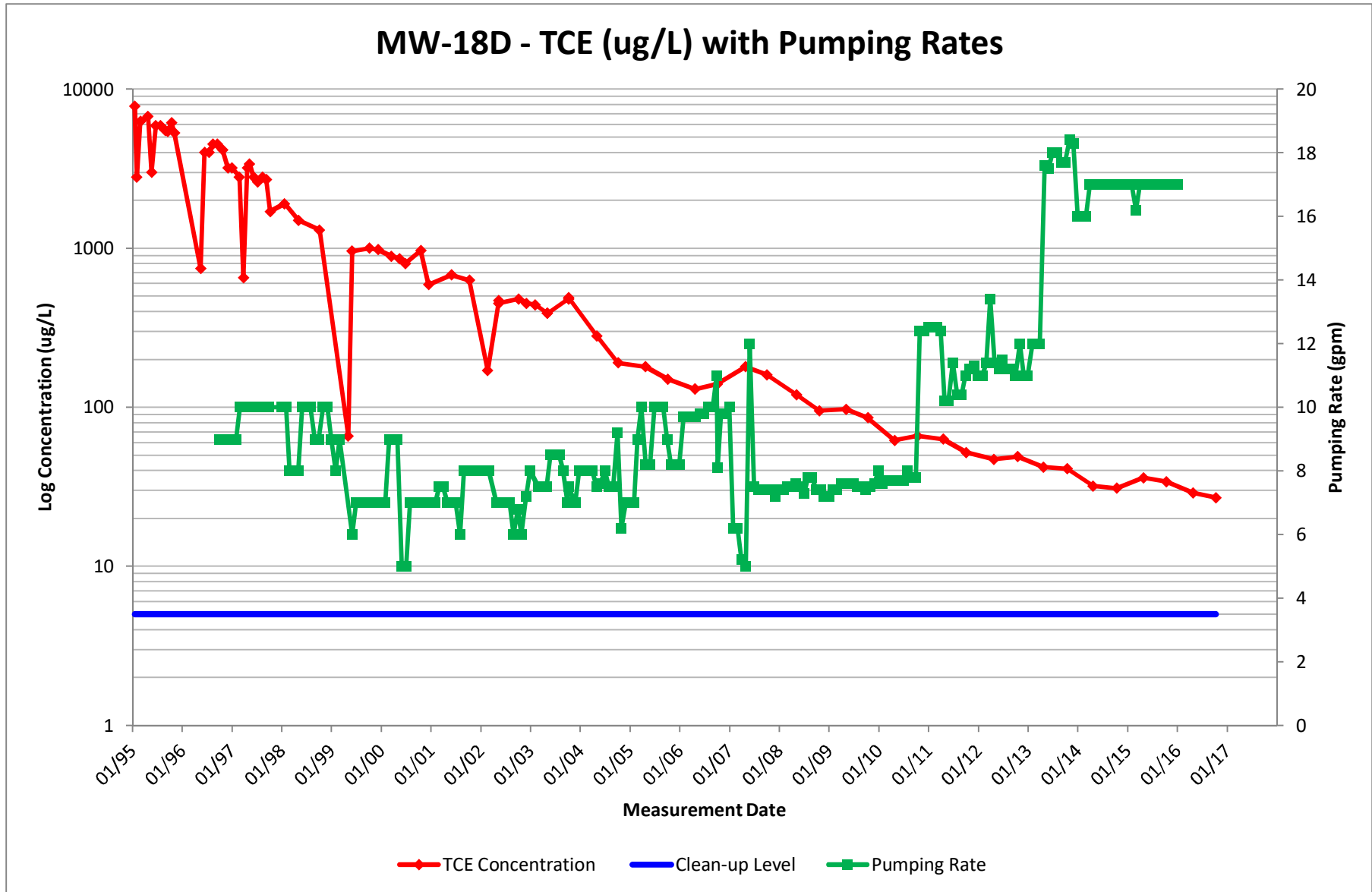


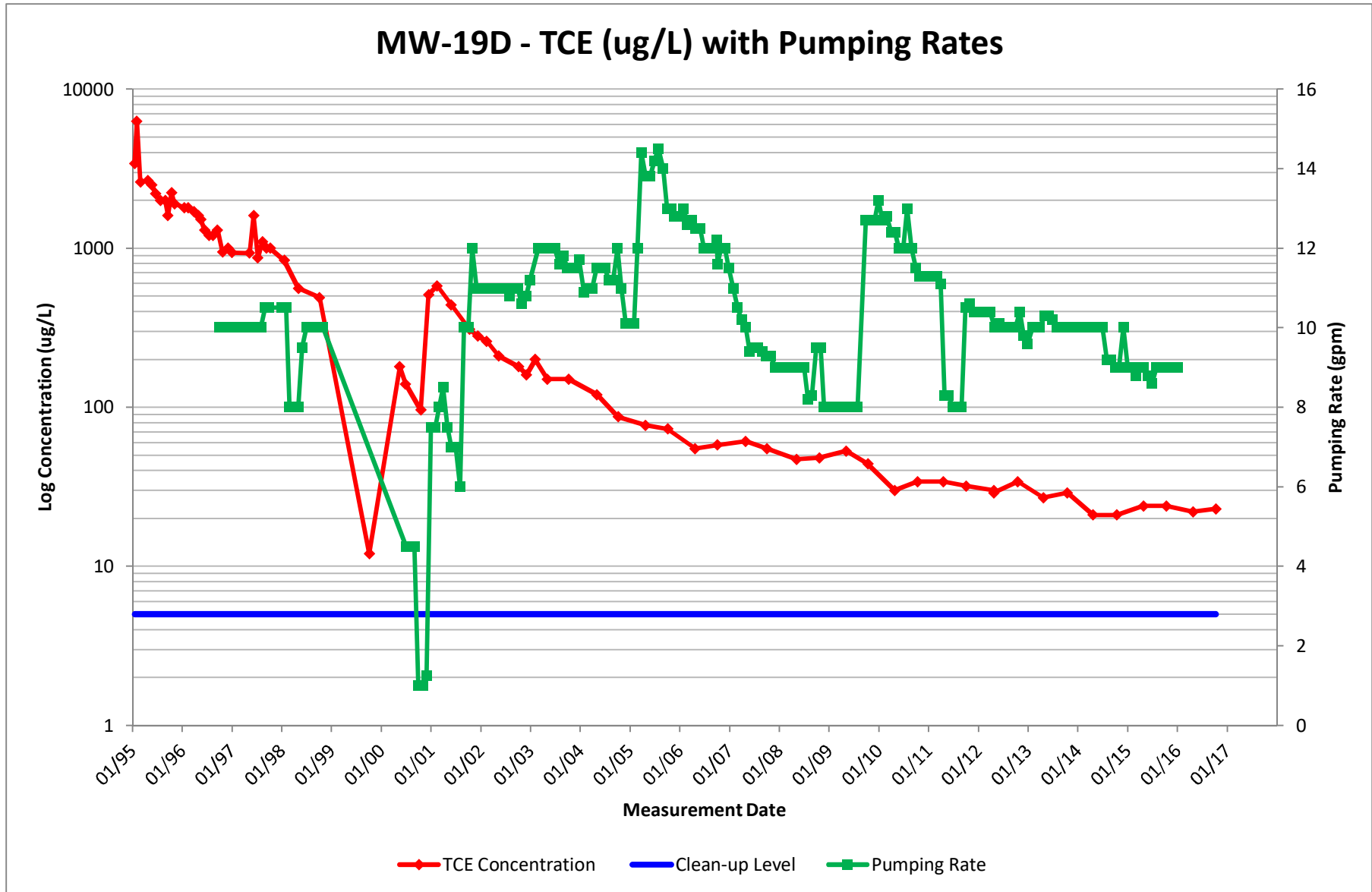


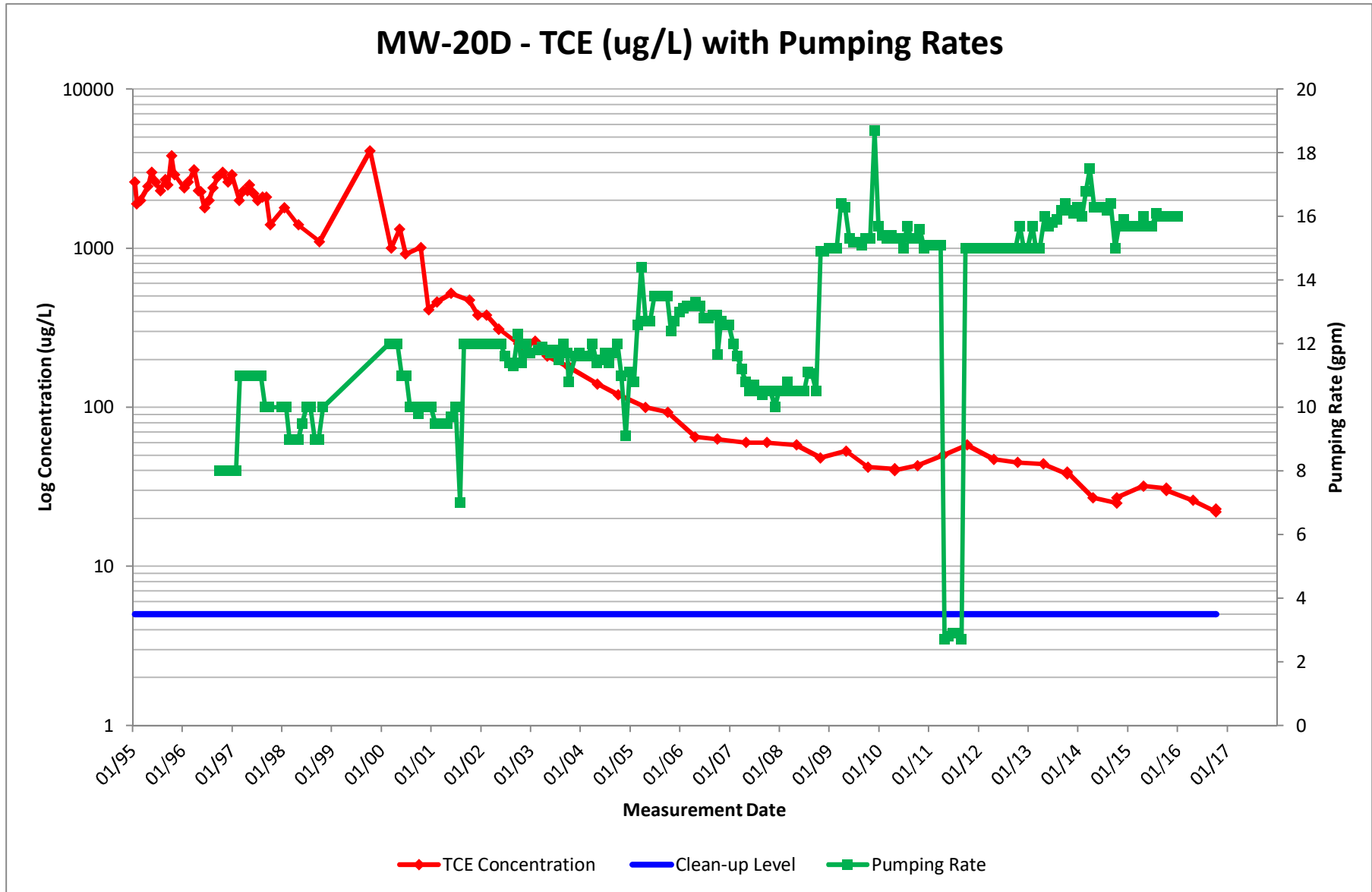


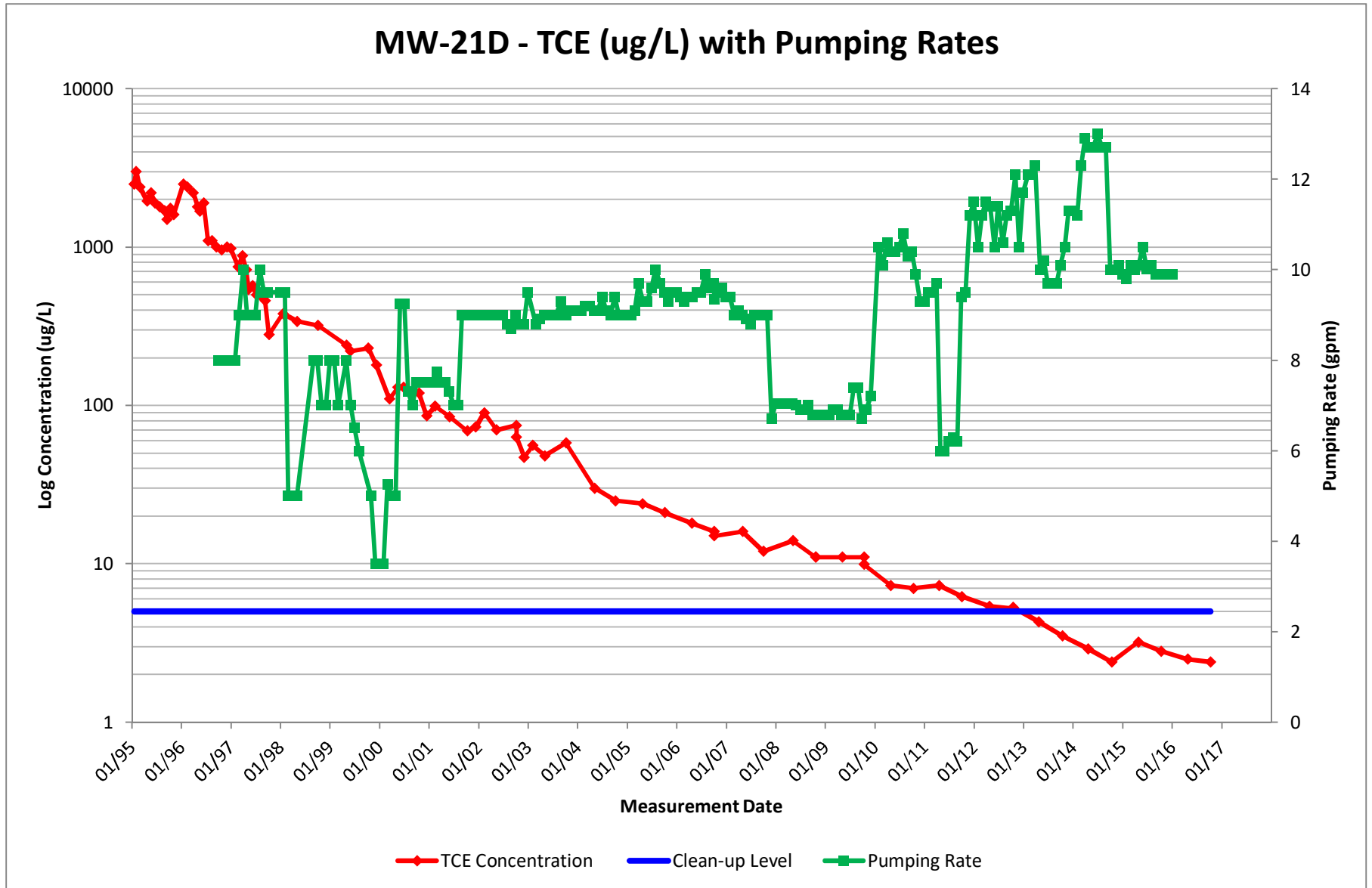


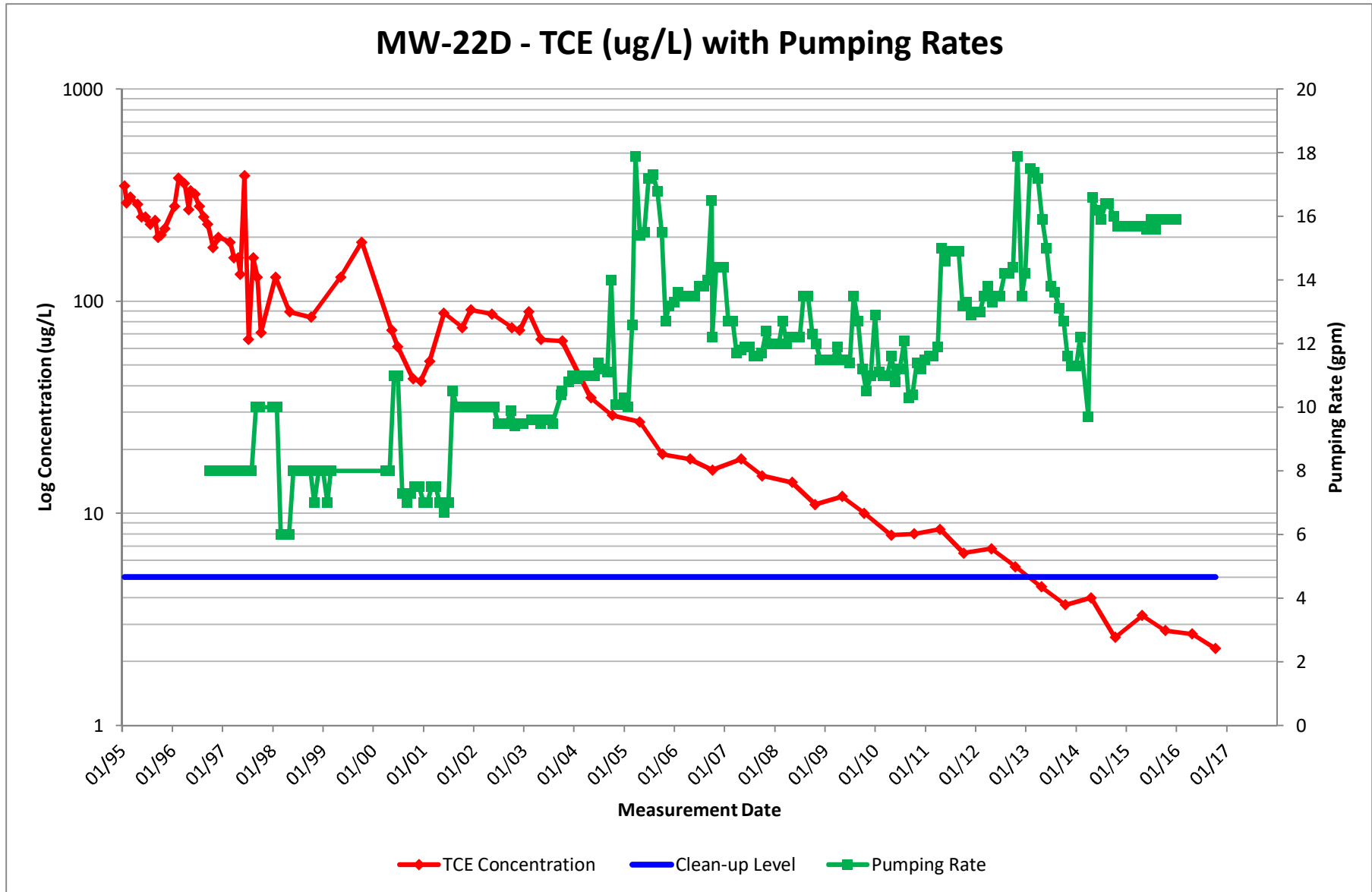


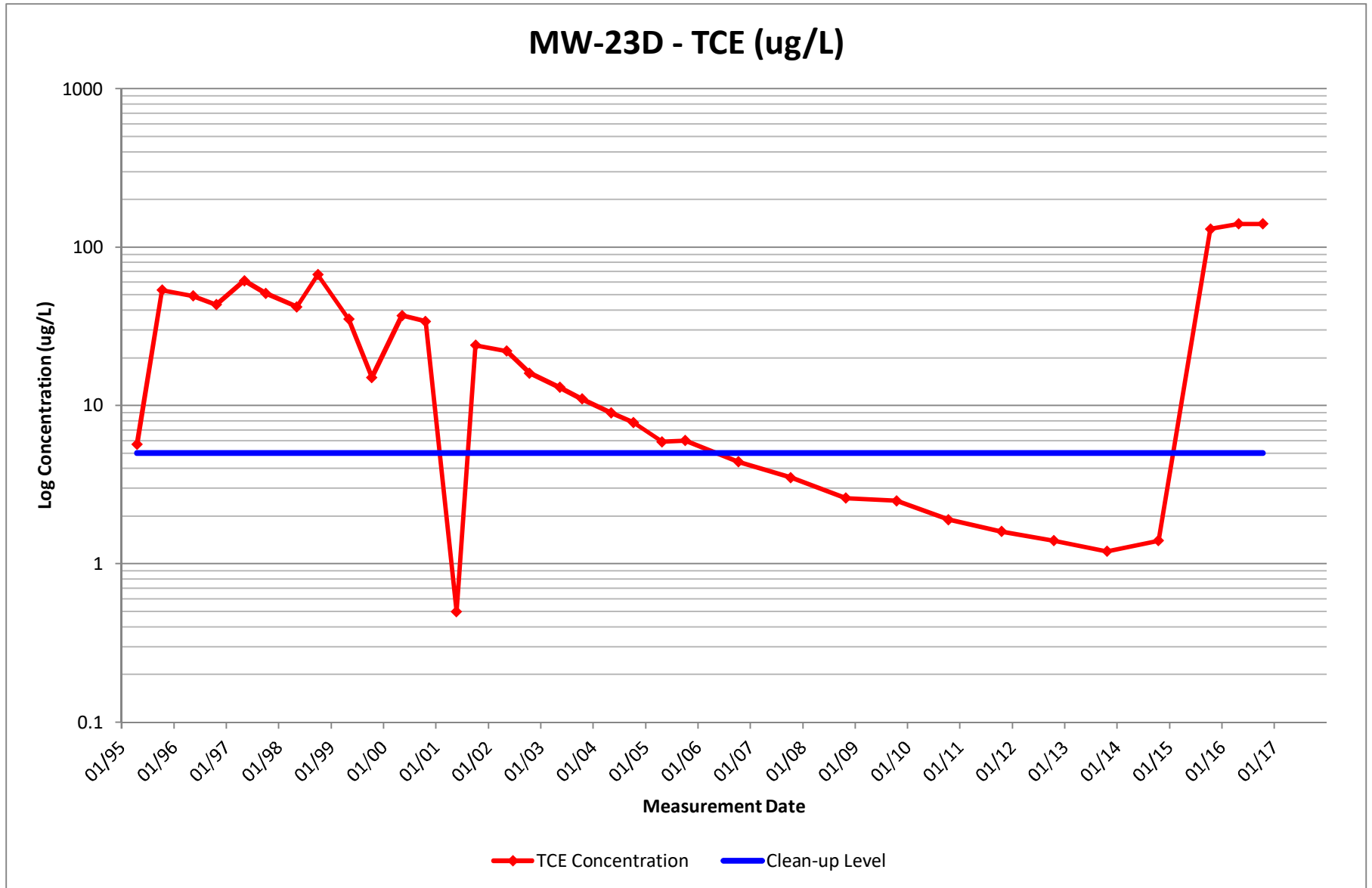


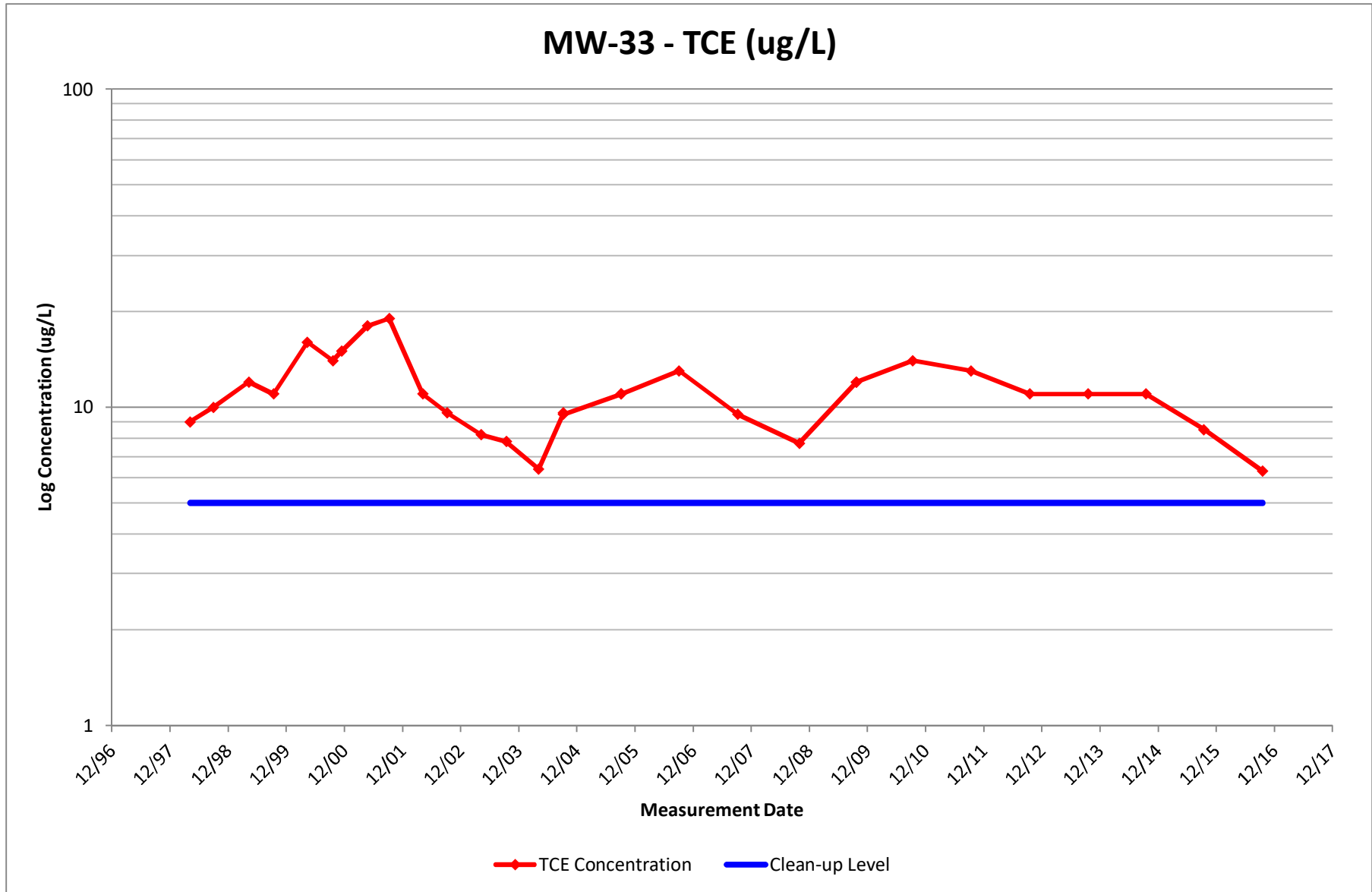


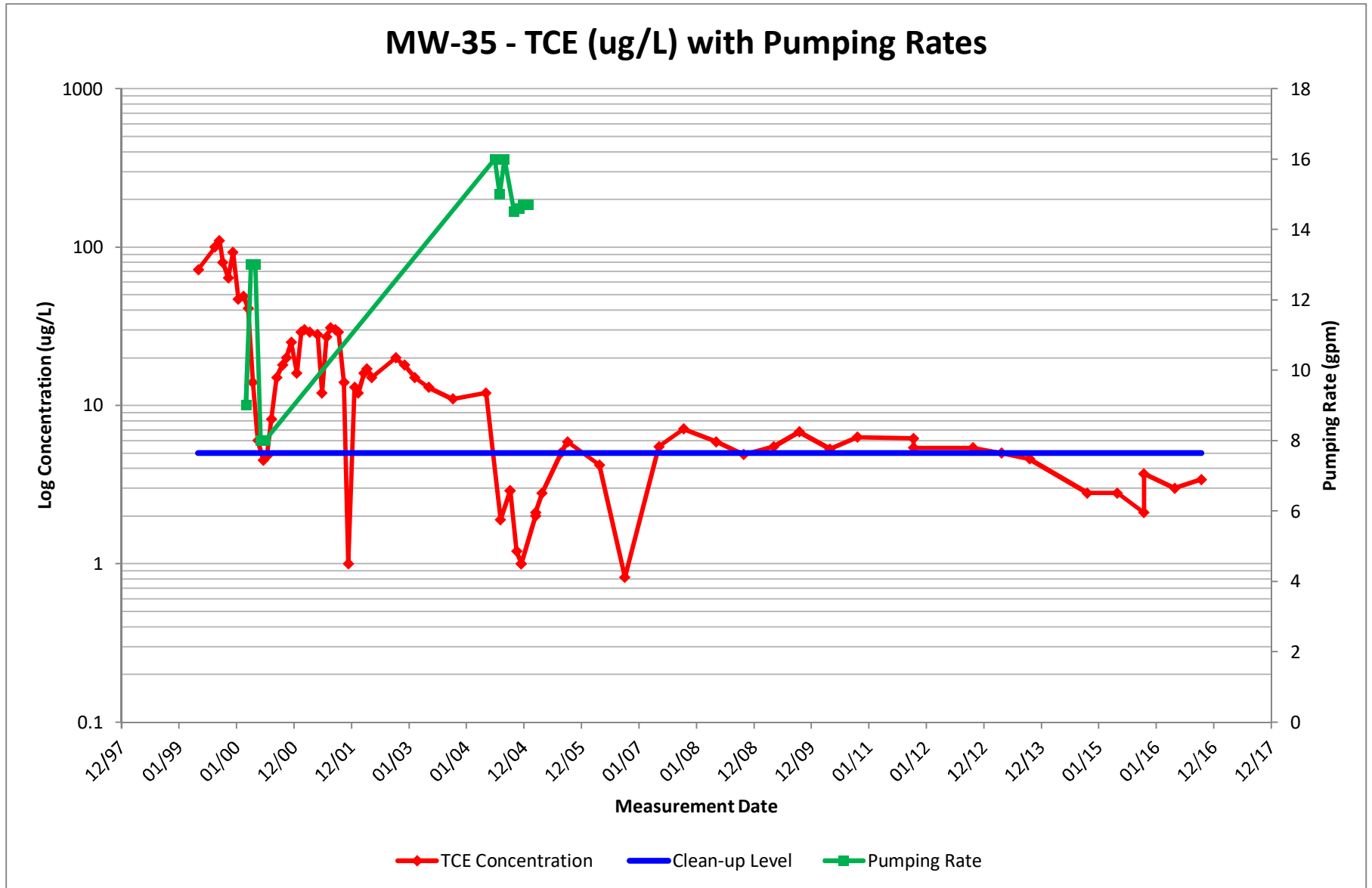


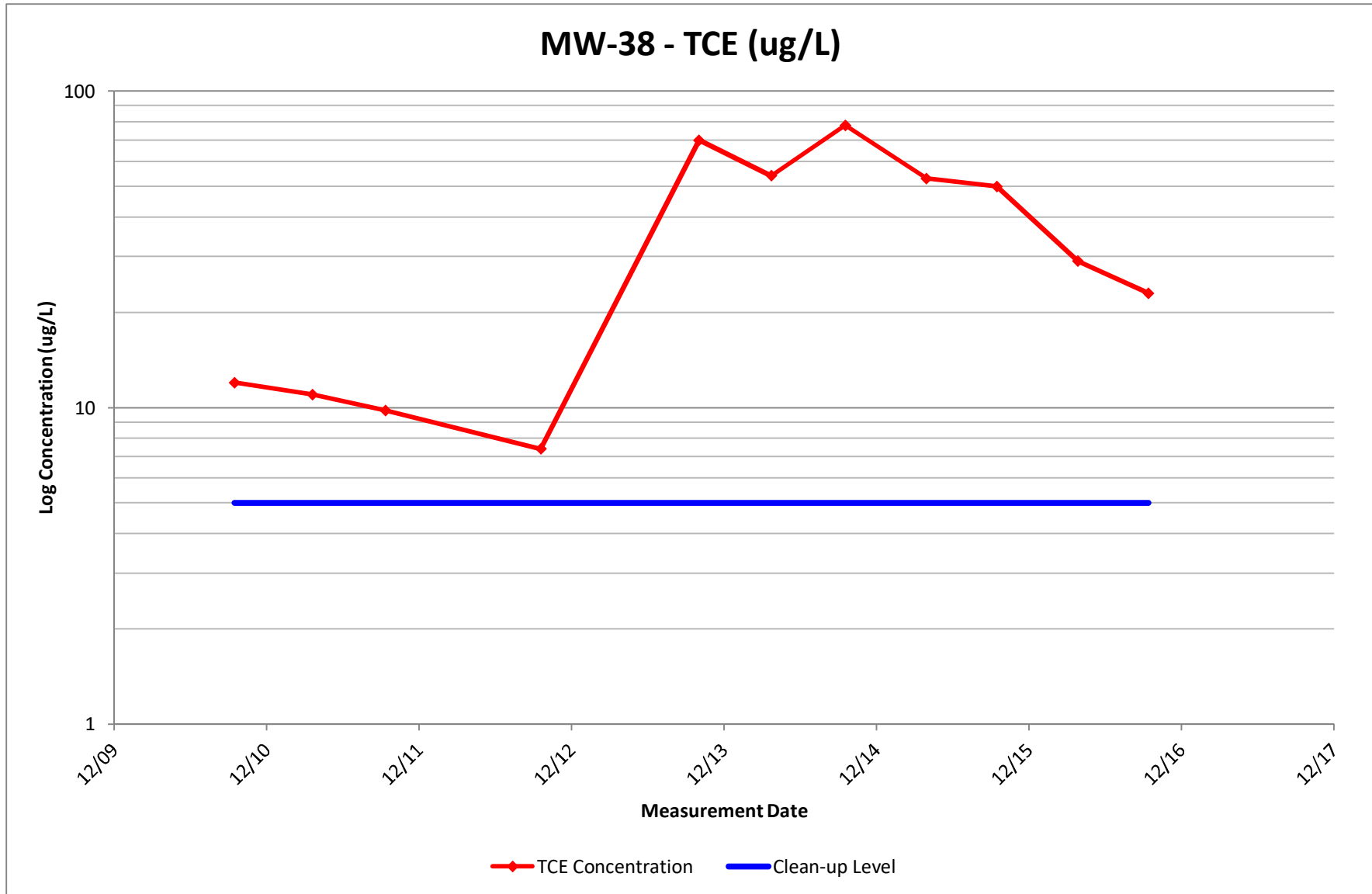


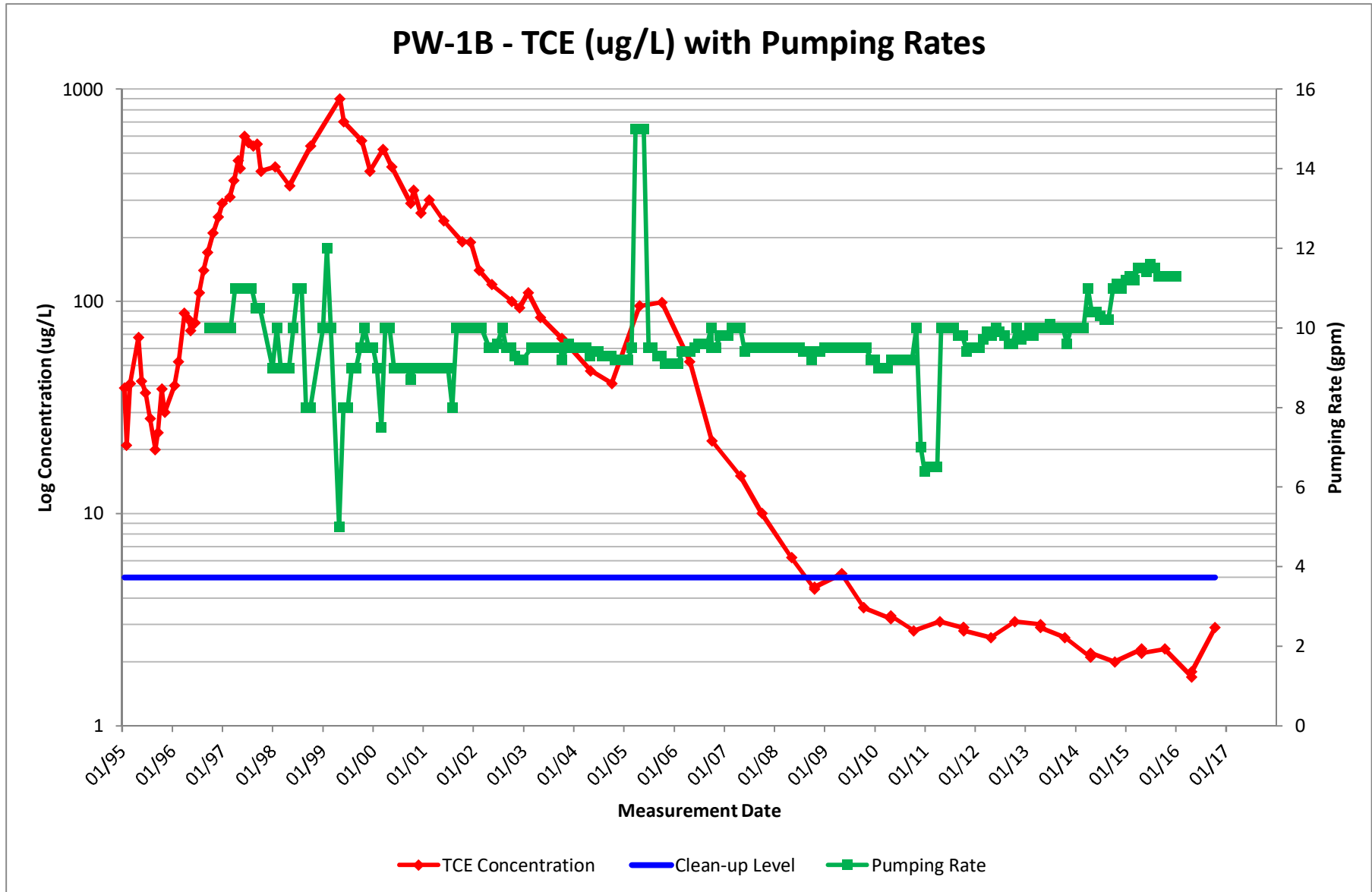


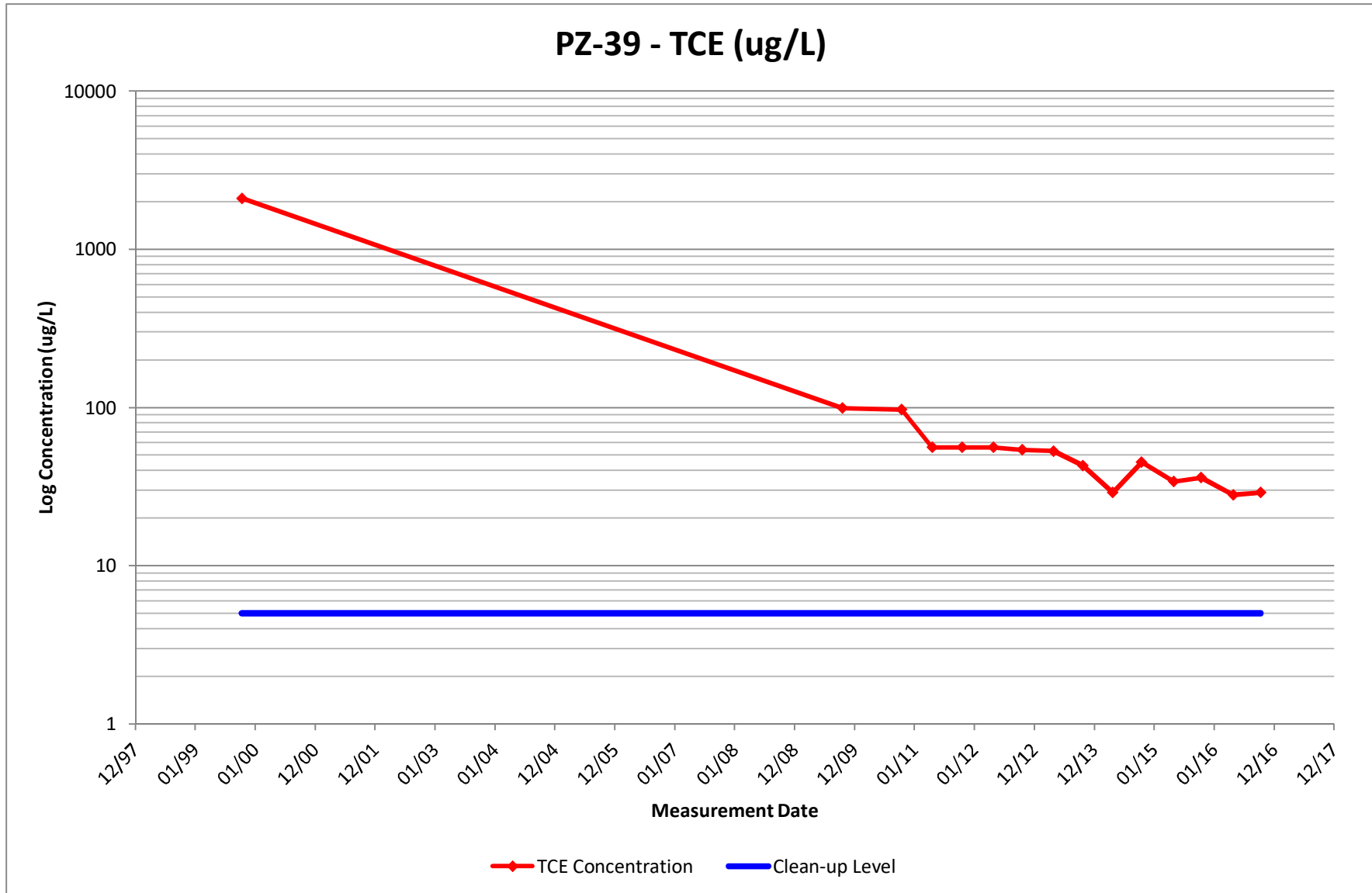












APPENDIX C

DATA FOR CLOSURE MONITORING

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APPENDIX C-1

**WELLS EXCLUDED FROM CLOSURE
MONITORING**

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Appendix C-1. Wells Excluded from the Closure Monitoring Program

Well Name	Justification	Well Name	Justification
RAMW-2C	COC never detected above CUL	IWS-1	Remediation Well
AMW-5A	COC never detected above CUL	IWS-1PZ	Remediation Well
AMW-6A*	COC never detected above CUL	IWS-2	Remediation Well
AMW-7A*	COC never detected above CUL	IWS-2PZ	Remediation Well
AMW-9A	COC never detected above CUL	IWS-3	Remediation Well
AMW-10A*	COC never detected above CUL	IWS-3PZ	Remediation Well
AMW-11A*	COC never detected above CUL	IWS-4	Remediation Well
AMW-14	Abandoned	IWS-4PZ	Remediation Well
AMW-15	Abandoned	IWS-5	Remediation Well
AMW-16	Impacted by Northern Plume	IWS-5PZ	Remediation Well
AMW-17	Impacted by Northern Plume	IWS-6	Remediation Well
AMW-18	Impacted by Northern Plume	IWS-6PZ	Remediation Well
AMW-19B	COC never detected above CUL	IWS-7	Remediation Well
AMW-20	COC never detected above CUL	IWS-7PZ	Remediation Well
AMW-21	COC never detected above CUL	IWS-8	Remediation Well
AMW-22	Abandoned	IWS-8PZ	Remediation Well
AMW-23	COC never detected above CUL	IWS-9	Remediation Well
AMW-25	COC never detected above CUL	IWS-9PZ	Remediation Well
AMW-43	COC never detected above CUL	LAVALLEY	Never in monitoring program
AMW-44	COC never detected above CUL	LV	Never in monitoring program
AMW-45	COC never detected above CUL	MILLER	Never in monitoring program
AMW-50	COC never detected above CUL	MW-1	Never in monitoring program (Clark County well)
AMW-51	COC never detected above CUL	MW-2	Never in monitoring program (Clark County well)
AMW-52C	COC never detected above CUL	MW-3	Never in monitoring program (Clark County well)
AMW-53B	COC never detected above CUL	MW-4	Never in monitoring program (Clark County well)
AMW-53C	COC never detected above CUL	MW-5	Never in monitoring program (Clark County well)
AMW-54C	COC never detected above CUL	MW-5A	Abandoned
AMW-55C	COC never detected above CUL	MW-5B	Abandoned
AMW-56C	COC never detected above CUL	MW-11A	Abandoned
AMW-57	COC never detected above CUL	MW-11B	Abandoned
AMW-62	COC never detected above CUL	MW-16E	Abandoned
AMW-63	COC never detected above CUL	MW-17E	COC never detected above CUL
AMW-64	Impacted by Northern Plume	MW-23D	Impacted by Northern Plume
COLF	Never in monitoring program	MW-24D	Abandoned
COLUMBIA VE	Never in monitoring program	MW-28	Abandoned
CPU-1D	Abandoned	MW-29	Abandoned
CPU-1S	Abandoned	MW-30	COC never detected above CUL
CPU-2	COC never detected above CUL	MW-32	COC never detected above CUL
CPU-3D	COC never detected above CUL	MW-34	COC never detected above CUL
CPU-3S	COC never detected above CUL	MW-36	Abandoned
CPU-4D	Water levels only, COC never detected above CUL	MW-37	COC never detected above CUL
CPU-4S	Water levels only, COC never detected above CUL	MW-38	Impacted by Northern Plume
CPU-10	COC never detected above CUL	MW-39	Never in monitoring program; pilot study well
CPU-16	Abandoned	MW-46	COC never detected above CUL
CROCKFORD	Never in monitoring program	MW-47	COC never detected above CUL
EC-1	COC never detected above CUL	PERMALUME	Never in monitoring program/abandoned
FERGUSON	Never in monitoring program	PZ-1	Water levels only, COC never detected above CUL
FITZGERALD	Never in monitoring program	PZ-2	Water levels only, COC never detected above CUL
GARRISON	Never in monitoring program	PZ-40	Water levels only, COC never detected above CUL
GRIMM	Never in monitoring program	SW-1	Abandoned
GWSW-1	Production well, COC never detected above CUL	WELCH	Never in monitoring program
GWSW-2	Production well, COC never detected above CUL	WILLIAMS	Never in monitoring program
HASTAY	Never in monitoring program	WOODAEGE	Never in monitoring program
HORN	Never in monitoring program	ZENT	Never in monitoring program
Notes: COC = Contaminant of Concern identified for the Site. CUL = Cleanup level identified in the Site Record of Decision. * = Well sampled as part of the Linde infiltration gallery monitoring.			

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APPENDIX C-2

REMEDIATION MONITORING ANALYSIS

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**Appendix C-2.1 - Remediation Monitoring Analysis
CHLORODIBROMOMETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed? ^a
Closure Monitoring Program Wells									
Troutdale Wells									
AMW-24	M/D	33	10/2015	10/2016	U	U	U	4	YES
MW-33	M/D	29	10/2013	10/2016	U	U	U	4	YES
BENNETT	Other	24	10/2015	10/2016	U	U	U	4	YES
Upgradient Wells									
AMW-8A	M	35	10/2012	10/2016	U	U	U	4	YES
TCE Source Wells									
AMW-1A	M	54	04/2015	10/2016	U	1.3	1.3	2	NO
AMW-1B	M	31	01/2009	10/2010	U	U	U	4	YES
AMW-1C	M	24	10/2007	10/2009	U	U	U	4	YES
AMW-2A	M	72	04/2016	10/2016	U	U	U	4	YES
AMW-2B	M	36	10/2012	10/2015	U	U	U	4	YES
AMW-3A	M	44	10/2012	10/2015	U	2.1	0.29	3	NO
AMW-4A	M	12	05/2004	10/2009	U	0.16	0.16	4	YES
AMW-12A	M	82	04/2015	10/2016	U	U	U	4	YES
AMW-13A	M	45	10/2012	10/2015	U	U	U	4	YES
AMW-19A	M	42	10/2012	10/2015	U	U	U	4	YES
AMW-26	M	28	10/2009	10/2014	U	U	U	4	YES
AMW-52A	M	28	10/2012	10/2015	U	0.29	U	4	YES
AMW-53A	M	41	07/2015	10/2016	U	0.53	0.53	4	YES
AMW-54A	M	32	10/2014	10/2015	U	U	U	4	YES
AMW-55A	M	23	10/2012	10/2015	U	U	U	4	YES
AMW-56A	M	48	10/2012	10/2015	U	U	U	4	YES
MW-1A	M	56	04/2015	10/2016	U	U	U	4	YES
MW-1B	M	25	10/2006	10/2009	U	U	U	4	YES
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES
Proximal Wells									
AMW-58	M	8	10/2006	10/2012	U	U	U	4	YES
MW-2A	M	27	10/2014	10/2016	U	0.32	0.32	4	YES
MW-2B	M	13	10/2002	10/2009	U	U	U	4	YES
MW-2C	M	8	10/2002	10/2009	U	U	U	4	YES
MW-3A	M	18	05/2004	10/2008	U	U	U	4	YES
MW-3B	M	15	10/2010	10/2016	U	U	U	4	YES
MW-3C	M	7	05/1995	10/2004	U	U	U	4	YES
MW-4A	M	19	10/2003	10/2009	U	U	U	4	YES
MW-4B	M	15	10/2011	10/2016	U	U	U	4	YES
MW-4BSHED	M	13	05/2003	10/2009	U	U	U	4	YES
MW-4C	M	8	05/1998	10/2009	U	U	U	4	YES
MW-6A	M	4	05/1995	10/2009	U	U	U	4	YES
MW-6B	E	50	04/2015	10/2016	U	U	U	4	YES
MW-6C	M	10	10/2002	10/2009	U	U	U	4	YES

**Appendix C-2.1 - Remediation Monitoring Analysis
CHLORODIBROMOMETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed? ^a
MW-6D	M	8	05/1999	10/2009	U	U	U	4	YES
MW-7B	M	7	04/1995	10/2014	U	U	U	4	YES
MW-7C	M	6	05/1995	10/2009	U	U	U	4	YES
MW-8B	M	14	10/2008	10/2014	U	U	U	4	YES
MW-9B	M	18	10/2012	10/2016	U	U	U	4	YES
MW-9C	M	9	10/1997	10/2009	U	U	U	4	YES
MW-10B	E	48	04/2015	10/2016	U	U	U	4	YES
MW-10C	E	50	04/2015	10/2016	U	U	U	4	YES
MW-12C	M	27	10/2010	10/2016	U	U	U	4	YES
MW-13C	M	32	10/2012	10/2016	U	U	U	4	YES
PW-1B	E	65	10/2015	10/2016	U	U	U	4	YES
Intermediate Wells									
AMW-59	M	14	10/2010	10/2016	U	U	U	4	YES
AMW-60	M	3	01/2005	10/2009	U	U	U	3	NO
CPU-14	M	35	10/2014	10/2016	U	U	U	4	YES
MW-14C	E	59	10/2015	10/2016	U	U	U	4	YES
MW-14E	E	60	04/2015	10/2016	U	U	U	4	YES
MW-15E	M	29	04/2014	10/2016	U	U	U	4	YES
MW-18D	E	59	04/2015	10/2016	U	U	U	4	YES
MW-18E	M	33	10/2013	10/2016	U	U	U	4	YES
MW-19D	E	54	04/2015	10/2016	U	U	U	4	YES
MW-20D	E	64	10/2015	10/2016	U	U	U	4	YES
MW-40	M	7	10/1999	10/2008	U	U	U	4	YES
PZ-39	PZ	15	04/2015	10/2016	U	U	U	4	YES
Church of God Wells									
AMW-27	M	58	04/2015	10/2016	U	U	U	4	YES
AMW-61	M	11	10/2013	10/2016	U	U	U	4	YES
CPU-12	M	36	10/2014	10/2016	U	U	U	4	YES
CPU-13	E	53	04/2013	10/2014	U	U	U	4	YES
CPU-15	M	14	10/2001	05/2004	U	U	U	4	YES
MW-21D	E	61	04/2015	10/2016	U	U	U	4	YES
MW-22D	E	52	04/2015	10/2016	U	U	U	4	YES
MW-25D	E	55	04/2013	10/2014	U	U	U	4	YES
MW-26D	E	51	10/2012	10/2014	U	U	U	4	YES
MW-27D	M	48	10/2013	10/2014	U	U	U	4	YES
MW-49	E/M	32	10/2012	10/2014	U	U	U	4	YES
Toe Wells									
AMW-42	M	39	10/2009	10/2014	U	U	U	4	YES
MW-31	M	25	10/2008	10/2012	U	U	U	4	YES
MW-35	M	44	10/2015	10/2016	U	U	U	4	YES
MW-41	M	47	10/2010	10/2014	U	U	U	4	YES
MW-48	M	30	10/2006	10/2009	U	U	U	4	YES

**Appendix C-2.1 - Remediation Monitoring Analysis
CHLORODIBROMOMETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed? ^a
Wells Excluded from Closure Monitoring Program									
Northern Plume Wells									
AMW-16	M	31	04/2015	10/2016	U	U	U	4	YES
AMW-17	M/D	44	04/2016	10/2016	U	U	U	4	YES
AMW-18	M	47	10/2015	10/2016	U	U	U	4	YES
AMW-23	M	10	10/2001	10/2016	U	U	U	4	YES
AMW-64	M	16	04/2015	10/2016	U	U	U	4	YES
MW-23D	M	35	04/2016	10/2016	U	U	U	4	YES
MW-38	M	11	04/2015	10/2016	U	U	U	4	YES
Toe Wells									
AMW-63	M	10	05/2009	10/2014	U	U	U	4	YES
Infiltration Gallery Wells									
AMW-6A	M/D	23	10/2010	10/2016	U	U	U	4	YES
AMW-7A	M/D	29	10/2010	10/2016	U	U	U	4	YES
AMW-10A	M/D	20	10/2010	10/2016	U	U	U	4	YES
AMW-11A	M/D	20	10/2010	10/2016	U	U	U	4	YES
<p>NOTES:</p> <p>^a The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>µg/L = Micrograms per liter.</p>									

**Appendix C-2.2 - Remediation Monitoring Analysis
1,1-DICHLOROETHENE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Closure Monitoring Program Wells									
Troutdale Wells									
AMW-24	M/D	39	10/2015	10/2016	0.94	1.1	1.1	1	NO
MW-33	M/D	32	10/2013	10/2016	0.71	1.5	0.71	2	NO
BENNETT	Other	24	10/2015	10/2016	0.24	0.73	0.31	4	YES
Upgradient Wells									
AMW-8A	M	37	10/2012	10/2016	U	U	U	4	YES
TCE Source Wells									
AMW-1A	M	57	04/2015	10/2016	U	0.34	U	4	YES
AMW-1B	M	31	01/2009	10/2010	U	U	U	4	YES
AMW-1C	M	24	10/2007	10/2009	U	U	U	4	YES
AMW-2A	M	83	04/2016	10/2016	0.35	0.98	0.98	4	YES
AMW-2B	M	36	10/2012	10/2015	U	U	U	4	YES
AMW-3A	M	45	10/2012	10/2015	U	U	U	4	YES
AMW-4A	M	12	05/2004	10/2009	U	U	U	4	YES
AMW-12A	M	96	04/2015	10/2016	0.2	0.45	0.21	4	YES
AMW-13A	M	46	10/2012	10/2015	U	U	U	4	YES
AMW-19A	M	43	10/2012	10/2015	U	U	U	4	YES
AMW-26	M	30	10/2009	10/2014	U	U	U	4	YES
AMW-52A	M	28	10/2012	10/2015	U	U	U	4	YES
AMW-53A	M	41	07/2015	10/2016	U	0.46	U	4	YES
AMW-54A	M	32	10/2014	10/2015	U	U	U	4	YES
AMW-55A	M	23	10/2012	10/2015	U	U	U	4	YES
AMW-56A	M	50	10/2012	10/2015	U	U	U	4	YES
MW-1A	M	63	04/2015	10/2016	U	0.36	0.36	4	YES
MW-1B	M	31	10/2006	10/2009	U	U	U	4	YES
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES
Proximal Wells									
AMW-58	M	8	10/2006	10/2012	U	0.22	U	4	YES
MW-2A	M	29	10/2014	10/2016	U	U	U	4	YES
MW-2B	M	14	10/2002	10/2009	U	U	U	4	YES
MW-2C	M	8	10/2002	10/2009	U	U	U	4	YES
MW-3A	M	19	05/2004	10/2008	U	U	U	4	YES
MW-3B	M	15	10/2010	10/2016	U	U	U	4	YES
MW-3C	M	7	05/1995	10/2004	U	U	U	4	YES
MW-4A	M	21	10/2003	10/2009	U	U	U	4	YES
MW-4B	M	16	10/2011	10/2016	U	U	U	4	YES
MW-4BSHED	M	14	05/2003	10/2009	U	0.22	U	4	YES
MW-4C	M	8	05/1998	10/2009	U	0.4	U	4	YES
MW-6A	M	5	05/1995	10/2009	U	U	U	4	YES
MW-6B	E	57	04/2015	10/2016	U	U	U	4	YES
MW-6C	M	11	10/2002	10/2009	U	1.5	U	3	NO

**Appendix C-2.2 - Remediation Monitoring Analysis
1,1-DICHLOROETHENE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
MW-6D	M	8	05/1999	10/2009	U	0.75	0.75	4	YES
MW-7B	M	7	04/1995	10/2014	U	6	U	3	NO
MW-7C	M	6	05/1995	10/2009	U	U	U	4	YES
MW-8B	M	15	10/2008	10/2014	U	U	U	4	YES
MW-9B	M	18	10/2012	10/2016	U	0.11	U	4	YES
MW-9C	M	9	10/1997	10/2009	U	0.6	U	4	YES
MW-10B	E	52	04/2015	10/2016	0.09	0.12	0.09	4	YES
MW-10C	E	54	04/2015	10/2016	U	U	U	4	YES
MW-12C	M	28	10/2010	10/2016	U	U	U	4	YES
MW-13C	M	34	10/2012	10/2016	U	U	U	4	YES
PW-1B	E	85	10/2015	10/2016	U	U	U	4	YES
Intermediate Wells									
AMW-59	M	14	10/2010	10/2016	5.2	18	5.2	None	NO
AMW-60	M	3	01/2005	10/2009	0.33	16	0.33	1	NO
CPU-14	M	38	10/2014	10/2016	0.12	0.19	0.19	4	YES
MW-14C	E	69	10/2015	10/2016	U	U	U	4	YES
MW-14E	E	76	04/2015	10/2016	2.5	3	2.7	None	NO
MW-15E	M	33	04/2014	10/2016	U	U	U	4	YES
MW-18D	E	75	04/2015	10/2016	0.38	0.56	0.38	4	YES
MW-18E	M	39	10/2013	10/2016	5.8	12	5.8	None	NO
MW-19D	E	61	04/2015	10/2016	0.91	1.2	0.91	3	NO
MW-20D	E	74	10/2015	10/2016	1.3	1.9	1.3	None	NO
MW-40	M	7	10/1999	10/2008	U	0.65	0.1	4	YES
PZ-39	PZ	15	04/2015	10/2016	1.8	2.4	1.9	None	NO
Church of God Wells									
AMW-27	M	68	04/2015	10/2016	0.08	0.13	0.11	4	YES
AMW-61	M	11	10/2013	10/2016	0.24	0.54	0.39	4	YES
CPU-12	M	40	10/2014	10/2016	U	U	U	4	YES
CPU-13	E	58	04/2013	10/2014	U	U	U	4	YES
CPU-15	M	15	10/2001	05/2004	U	U	U	4	YES
MW-21D	E	74	04/2015	10/2016	0.36	0.51	0.36	4	YES
MW-22D	E	56	04/2015	10/2016	U	0.13	U	4	YES
MW-25D	E	61	04/2013	10/2014	0.13	0.33	0.13	4	YES
MW-26D	E	60	10/2012	10/2014	U	U	U	4	YES
MW-27D	M	53	10/2013	10/2014	U	U	U	4	YES
MW-49	E/M	32	10/2012	10/2014	U	0.08	U	4	YES
Toe Wells									
AMW-42	M	55	10/2010	10/2014	U	U	U	4	YES
MW-31	M	30	10/2008	10/2012	U	U	U	4	YES
MW-35	M	45	10/2015	10/2016	U	0.08	0.08	4	YES
MW-41	M	52	10/2010	10/2014	U	U	U	4	YES
MW-48	M	35	10/2006	10/2009	U	U	U	4	YES

**Appendix C-2.2 - Remediation Monitoring Analysis
1,1-DICHLOROETHENE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Wells Excluded from Closure Monitoring Program									
Northern Plume Wells									
AMW-16	M	33	04/2015	10/2016	0.47	0.85	0.48	4	YES
AMW-17	M/D	45	04/2016	10/2016	0.15	0.27	0.15	4	YES
AMW-18	M	47	10/2015	10/2016	U	U	U	4	YES
AMW-23	M	12	10/2001	10/2016	U	U	U	4	YES
AMW-64	M	16	04/2015	10/2016	0.09	0.35	0.09	4	YES
MW-23D	M	37	04/2016	10/2016	2.3	3.3	2.9	None	NO
MW-38	M	11	04/2015	10/2016	0.15	0.3	0.15	4	YES
Toe Wells									
AMW-63	M	10	05/2009	10/2014	U	U	U	4	YES
Infiltration Gallery Wells									
AMW-6A	M/D	23	10/2010	10/2016	U	U	U	4	YES
AMW-7A	M/D	29	10/2010	10/2016	U	U	U	4	YES
AMW-10A	M/D	20	10/2010	10/2016	U	U	U	4	YES
AMW-11A	M/D	20	10/2010	10/2016	U	U	U	4	YES
<p>NOTES:</p> <p>^a The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>ug/L = Micrograms per liter.</p>									

**Appendix C-2.3 - Remediation Monitoring Analysis
1,2-DICHLOROETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Closure Monitoring Program Wells									
Troutdale Wells									
AMW-24	M/D	34	10/2015	10/2016	U	U	U	4	YES
MW-33	M/D	30	10/2013	10/2016	U	U	U	4	YES
BENNETT	Other	24	10/2015	10/2016	U	U	U	4	YES
Upgradient Wells									
AMW-8A	M	36	10/2012	10/2016	U	U	U	4	YES
TCE Source Wells									
AMW-1A	M	55	04/2015	10/2016	U	U	U	4	YES
AMW-1B	M	31	01/2009	10/2010	U	U	U	4	YES
AMW-1C	M	24	10/2007	10/2009	U	U	U	4	YES
AMW-2A	M	76	04/2016	10/2016	U	U	U	4	YES
AMW-2B	M	36	10/2012	10/2015	U	U	U	4	YES
AMW-3A	M	45	10/2012	10/2015	U	U	U	4	YES
AMW-4A	M	12	05/2004	10/2009	U	U	U	4	YES
AMW-12A	M	91	04/2015	10/2016	U	U	U	4	YES
AMW-13A	M	46	10/2012	10/2015	U	U	U	4	YES
AMW-19A	M	42	10/2012	10/2015	U	U	U	4	YES
AMW-26	M	28	10/2009	10/2014	U	U	U	4	YES
AMW-52A	M	28	10/2012	10/2015	U	U	U	4	YES
AMW-53A	M	41	07/2015	10/2016	U	U	U	4	YES
AMW-54A	M	32	10/2014	10/2015	U	U	U	4	YES
AMW-55A	M	23	10/2012	10/2015	U	U	U	4	YES
AMW-56A	M	48	10/2012	10/2015	U	U	U	4	YES
MW-1A	M	60	04/2015	10/2016	U	U	U	4	YES
MW-1B	M	26	10/2006	10/2009	U	U	U	4	YES
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES
Proximal Wells									
AMW-58	M	8	10/2006	10/2012	U	U	U	4	YES
MW-2A	M	28	10/2014	10/2016	U	U	U	4	YES
MW-2B	M	14	10/2002	10/2009	U	U	U	4	YES
MW-2C	M	8	10/2002	10/2009	U	U	U	4	YES
MW-3A	M	19	05/2004	10/2008	U	U	U	4	YES
MW-3B	M	15	10/2010	10/2016	U	U	U	4	YES
MW-3C	M	7	05/1995	10/2004	U	U	U	4	YES
MW-4A	M	20	10/2003	10/2009	U	U	U	4	YES
MW-4B	M	15	10/2011	10/2016	U	U	U	4	YES
MW-4BSHED	M	14	05/2003	10/2009	U	U	U	4	YES
MW-4C	M	8	05/1998	10/2009	U	U	U	4	YES
MW-6A	M	4	05/1995	10/2009	U	U	U	4	YES
MW-6B	E	51	04/2015	10/2016	U	U	U	4	YES
MW-6C	M	10	10/2002	10/2009	U	U	U	4	YES

**Appendix C-2.3 - Remediation Monitoring Analysis
1,2-DICHLOROETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Remediation Monitoring Phase is Completed ? ^a
MW-6D	M	8	05/1999	10/2009	U	U	U	4	YES
MW-7B	M	7	04/1995	10/2014	U	U	U	4	YES
MW-7C	M	6	05/1995	10/2009	U	U	U	4	YES
MW-8B	M	14	10/2008	10/2014	U	U	U	4	YES
MW-9B	M	18	10/2012	10/2016	U	U	U	4	YES
MW-9C	M	9	10/1997	10/2009	U	U	U	4	YES
MW-10B	E	49	04/2015	10/2016	U	U	U	4	YES
MW-10C	E	51	04/2015	10/2016	U	U	U	4	YES
MW-12C	M	28	10/2010	10/2016	U	U	U	4	YES
MW-13C	M	33	10/2012	10/2016	U	U	U	4	YES
PW-1B	E	68	10/2015	10/2016	U	U	U	4	YES
Intermediate Wells									
AMW-59	M	14	10/2010	10/2016	U	U	U	4	YES
AMW-60	M	3	01/2005	10/2009	U	0.11	0.11	3	NO
CPU-14	M	36	10/2014	10/2016	U	U	U	4	YES
MW-14C	E	60	10/2015	10/2016	U	U	U	4	YES
MW-14E	E	61	04/2015	10/2016	U	U	U	4	YES
MW-15E	M	30	04/2014	10/2016	U	U	U	4	YES
MW-18D	E	59	04/2015	10/2016	U	U	U	4	YES
MW-18E	M	37	10/2013	10/2016	U	U	U	4	YES
MW-19D	E	54	04/2015	10/2016	U	U	U	4	YES
MW-20D	E	66	10/2015	10/2016	U	U	U	4	YES
MW-40	M	7	10/1999	10/2008	U	U	U	4	YES
PZ-39	PZ	15	04/2015	10/2016	U	U	U	4	YES
Church of God Wells									
AMW-27	M	60	04/2015	10/2016	U	U	U	4	YES
AMW-61	M	11	10/2013	10/2016	U	U	U	4	YES
CPU-12	M	38	10/2014	10/2016	U	U	U	4	YES
CPU-13	E	54	04/2013	10/2014	U	U	U	4	YES
CPU-15	M	14	10/2001	05/2004	U	U	U	4	YES
MW-21D	E	65	04/2015	10/2016	U	U	U	4	YES
MW-22D	E	53	04/2015	10/2016	U	U	U	4	YES
MW-25D	E	57	04/2013	10/2014	U	U	U	4	YES
MW-26D	E	52	10/2012	10/2014	U	U	U	4	YES
MW-27D	M	49	10/2013	10/2014	U	U	U	4	YES
MW-49	E/M	32	10/2012	10/2014	U	U	U	4	YES
Toe Wells									
AMW-42	M	42	10/2009	10/2014	U	U	U	4	YES
MW-31	M	26	10/2008	10/2012	U	U	U	4	YES
MW-35	M	45	10/2015	10/2016	U	0.08	0.08	4	YES
MW-41	M	48	10/2010	10/2014	U	U	U	4	YES
MW-48	M	31	10/2006	10/2009	U	U	U	4	YES

**Appendix C-2.3 - Remediation Monitoring Analysis
1,2-DICHLOROETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Wells Excluded from Closure Monitoring Program									
Northern Plume Wells									
AMW-16	M	33	04/2015	10/2016	U	U	U	4	YES
AMW-17	M/D	44	04/2016	10/2016	U	U	U	4	YES
AMW-18	M	47	10/2015	10/2016	U	U	U	4	YES
AMW-23	M	10	10/2001	10/2016	U	U	U	4	YES
AMW-64	M	16	04/2015	10/2016	U	U	U	4	YES
MW-23D	M	36	04/2016	10/2016	U	U	U	4	YES
MW-38	M	11	04/2015	10/2016	U	U	U	4	YES
Toe Wells									
AMW-63	M	10	05/2009	10/2014	U	U	U	4	YES
Infiltration Gallery Wells									
AMW-6A	M/D	23	10/2010	10/2016	U	U	U	4	YES
AMW-7A	M/D	29	10/2010	10/2016	U	U	U	4	YES
AMW-10A	M/D	20	10/2010	10/2016	U	U	U	4	YES
AMW-11A	M/D	20	10/2010	10/2016	U	U	U	4	YES
<p>NOTES:</p> <p>^a The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>µg/L = Micrograms per liter.</p>									

**Appendix C-2.4 - Remediation Monitoring Analysis
1,1,1-TRICHLOROETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (200 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Closure Monitoring Program Wells									
Troutdale Wells									
AMW-24	M/D	37	10/2015	10/2016	0.14	0.17	0.17	4	YES
MW-33	M/D	32	10/2013	10/2016	0.08	0.19	0.08	4	YES
BENNETT	0	24	10/2015	10/2016	U	0.12	U	4	YES
Upgradient Wells									
AMW-8A	M	37	10/2012	10/2016	U	U	U	4	YES
TCE Source Wells									
AMW-1A	M	56	04/2015	10/2016	U	3.3	0.11	4	YES
AMW-1B	M	31	01/2009	10/2010	U	U	U	4	YES
AMW-1C	M	24	10/2007	10/2009	U	U	U	4	YES
AMW-2A	M	79	04/2016	10/2016	2.1	5.2	5.2	4	YES
AMW-2B	M	36	10/2012	10/2015	U	U	U	4	YES
AMW-3A	M	45	10/2012	10/2015	U	U	U	4	YES
AMW-4A	M	12	05/2004	10/2009	U	U	U	4	YES
AMW-12A	M	92	04/2015	10/2016	0.19	0.31	0.31	4	YES
AMW-13A	M	46	10/2012	10/2015	U	0.11	U	4	YES
AMW-19A	M	43	10/2012	10/2015	U	U	U	4	YES
AMW-26	M	29	10/2009	10/2014	U	0.19	0.13	4	YES
AMW-52A	M	28	10/2012	10/2015	U	U	U	4	YES
AMW-53A	M	41	07/2015	10/2016	U	1.4	U	4	YES
AMW-54A	M	32	10/2014	10/2015	U	0.12	0.12	4	YES
AMW-55A	M	23	10/2012	10/2015	U	U	U	4	YES
AMW-56A	M	49	10/2012	10/2015	U	0.12	U	4	YES
MW-1A	M	62	04/2015	10/2016	U	1.6	1.6	4	YES
MW-1B	M	28	10/2006	10/2009	U	U	U	4	YES
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES
Proximal Wells									
AMW-58	M	8	10/2006	10/2012	U	U	U	4	YES
MW-2A	M	28	10/2014	10/2016	U	U	U	4	YES
MW-2B	M	14	10/2002	10/2009	U	0.21	U	4	YES
MW-2C	M	8	10/2002	10/2009	U	0.25	U	4	YES
MW-3A	M	19	05/2004	10/2008	U	U	U	4	YES
MW-3B	M	15	10/2010	10/2016	U	U	U	4	YES
MW-3C	M	7	05/1995	10/2004	U	2	0.17	4	YES
MW-4A	M	20	10/2003	10/2009	0.08	0.22	0.08	4	YES
MW-4B	M	16	10/2011	10/2016	U	0.09	0.09	4	YES
MW-4BSHED	M	14	05/2003	10/2009	U	0.21	U	4	YES
MW-4C	M	8	05/1998	10/2009	U	0.62	U	4	YES
MW-6A	M	4	05/1995	10/2009	U	3.4	U	4	YES
MW-6B	E	55	04/2015	10/2016	U	0.19	0.12	4	YES
MW-6C	M	10	10/2002	10/2009	U	3.9	U	4	YES

**Appendix C-2.4 - Remediation Monitoring Analysis
1,1,1-TRICHLOROETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (200 ug/L)	Remediation Monitoring Phase is Completed ? ^a
MW-6D	M	8	05/1999	10/2009	U	0.4	U	4	YES
MW-7B	M	7	04/1995	10/2014	U	8.8	U	4	YES
MW-7C	M	6	05/1995	10/2009	U	0.8	U	4	YES
MW-8B	M	15	10/2008	10/2014	U	0.14	U	4	YES
MW-9B	M	18	10/2012	10/2016	0.19	0.29	0.19	4	YES
MW-9C	M	9	10/1997	10/2009	U	2	U	4	YES
MW-10B	E	50	04/2015	10/2016	U	U	U	4	YES
MW-10C	E	52	04/2015	10/2016	U	0.09	0.08	4	YES
MW-12C	M	28	10/2010	10/2016	U	U	U	4	YES
MW-13C	M	33	10/2012	10/2016	U	0.13	U	4	YES
PW-1B	E	79	10/2015	10/2016	U	0.15	0.15	4	YES
Intermediate Wells									
AMW-59	M	14	10/2010	10/2016	U	U	U	4	YES
AMW-60	M	3	01/2005	10/2009	U	U	U	3	NO
CPU-14	M	37	10/2014	10/2016	0.19	0.25	0.25	4	YES
MW-14C	E	64	10/2015	10/2016	U	U	U	4	YES
MW-14E	E	65	04/2015	10/2016	0.09	0.12	0.11	4	YES
MW-15E	M	32	04/2014	10/2016	0.13	0.41	0.24	4	YES
MW-18D	E	69	04/2015	10/2016	U	0.12	U	4	YES
MW-18E	M	36	10/2013	10/2016	U	U	U	4	YES
MW-19D	E	59	04/2015	10/2016	U	0.09	0.09	4	YES
MW-20D	E	70	10/2015	10/2016	U	0.1	0.1	4	YES
MW-40	M	7	10/1999	10/2008	0.26	0.92	0.26	4	YES
PZ-39	PZ	15	04/2015	10/2016	0.27	0.5	0.35	4	YES
Church of God Wells									
AMW-27	M	61	04/2015	10/2016	U	0.16	0.16	4	YES
AMW-61	M	11	10/2013	10/2016	U	0.09	U	4	YES
CPU-12	M	39	10/2014	10/2016	U	0.12	0.12	4	YES
CPU-13	E	54	04/2013	10/2014	U	U	U	4	YES
CPU-15	M	14	10/2001	05/2004	U	U	U	4	YES
MW-21D	E	69	04/2015	10/2016	U	0.1	0.1	4	YES
MW-22D	E	54	04/2015	10/2016	U	U	U	4	YES
MW-25D	E	57	04/2013	10/2014	0.1	0.17	0.11	4	YES
MW-26D	E	54	10/2012	10/2014	U	U	U	4	YES
MW-27D	M	51	10/2013	10/2014	U	U	U	4	YES
MW-49	E/M	32	10/2012	10/2014	U	0.09	U	4	YES
Toe Wells									
AMW-42	M	42	10/2009	10/2014	U	0.14	U	4	YES
MW-31	M	26	10/2008	10/2012	U	0.26	U	4	YES
MW-35	M	45	10/2015	10/2016	U	U	U	4	YES
MW-41	M	48	10/2010	10/2014	U	U	U	4	YES
MW-48	M	31	10/2006	10/2009	U	U	U	4	YES

**Appendix C-2.4 - Remediation Monitoring Analysis
1,1,1-TRICHLOROETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (200 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Wells Excluded from Closure Monitoring Program									
Northern Plume Wells									
AMW-16	M	33	04/2015	10/2016	0.19	0.53	0.19	4	YES
AMW-17	M/D	45	04/2016	10/2016	0.28	0.35	0.28	4	YES
AMW-18	M	47	10/2015	10/2016	0.09	0.17	0.09	4	YES
AMW-23	M	10	10/2001	10/2016	U	0.78	U	4	YES
AMW-64	M	16	04/2015	10/2016	U	0.12	U	4	YES
MW-23D	M	37	04/2016	10/2016	2.1	3.6	2.5	4	YES
MW-38	M	11	04/2015	10/2016	0.25	0.4	0.25	4	YES
Toe Wells									
AMW-63	M	10	05/2009	10/2014	U	U	U	4	YES
Infiltration Gallery Wells									
AMW-6A	M/D	23	10/2010	10/2016	U	U	U	4	YES
AMW-7A	M/D	29	10/2010	10/2016	U	U	U	4	YES
AMW-10A	M/D	20	10/2010	10/2016	U	U	U	4	YES
AMW-11A	M/D	20	10/2010	10/2016	U	U	U	4	YES
<p>NOTES:</p> <p>^a The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>µg/L = Micrograms per liter.</p>									

**Appendix C-2.5 - Remediation Monitoring Analysis
CARBON TETRACHLORIDE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Closure Monitoring Program Wells									
Troutdale Wells									
AMW-24	M/D	34	10/2015	10/2016	U	U	U	4	YES
MW-33	M/D	30	10/2013	10/2016	U	U	U	4	YES
BENNETT	Other	24	10/2015	10/2016	U	U	U	4	YES
Upgradient Wells									
AMW-8A	M	36	10/2012	10/2016	U	U	U	4	YES
TCE Source Wells									
AMW-1A	M	55	04/2015	10/2016	U	U	U	4	YES
AMW-1B	M	31	01/2009	10/2010	U	U	U	4	YES
AMW-1C	M	24	10/2007	10/2009	U	U	U	4	YES
AMW-2A	M	73	04/2016	10/2016	U	U	U	4	YES
AMW-2B	M	36	10/2012	10/2015	U	U	U	4	YES
AMW-3A	M	45	10/2012	10/2015	U	U	U	4	YES
AMW-4A	M	12	05/2004	10/2009	U	U	U	4	YES
AMW-12A	M	82	04/2015	10/2016	U	U	U	4	YES
AMW-13A	M	46	10/2012	10/2015	U	U	U	4	YES
AMW-19A	M	42	10/2012	10/2015	U	U	U	4	YES
AMW-26	M	28	10/2009	10/2014	U	U	U	4	YES
AMW-52A	M	28	10/2012	10/2015	U	U	U	4	YES
AMW-53A	M	41	07/2015	10/2016	U	U	U	4	YES
AMW-54A	M	32	10/2014	10/2015	U	U	U	4	YES
AMW-55A	M	23	10/2012	10/2015	U	U	U	4	YES
AMW-56A	M	48	10/2012	10/2015	U	U	U	4	YES
MW-1A	M	57	04/2015	10/2016	U	U	U	4	YES
MW-1B	M	26	10/2006	10/2009	U	U	U	4	YES
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES
Proximal Wells									
AMW-58	M	8	10/2006	10/2012	U	U	U	4	YES
MW-2A	M	28	10/2014	10/2016	U	U	U	4	YES
MW-2B	M	14	10/2002	10/2009	U	U	U	4	YES
MW-2C	M	8	10/2002	10/2009	U	U	U	4	YES
MW-3A	M	19	05/2004	10/2008	U	U	U	4	YES
MW-3B	M	15	10/2010	10/2016	U	U	U	4	YES
MW-3C	M	7	05/1995	10/2004	U	U	U	4	YES
MW-4A	M	20	10/2003	10/2009	U	U	U	4	YES
MW-4B	M	15	10/2011	10/2016	U	U	U	4	YES
MW-4BSHED	M	14	05/2003	10/2009	U	U	U	4	YES
MW-4C	M	8	05/1998	10/2009	U	U	U	4	YES
MW-6A	M	4	05/1995	10/2009	U	U	U	4	YES
MW-6B	E	51	04/2015	10/2016	U	U	U	4	YES
MW-6C	M	10	10/2002	10/2009	U	U	U	4	YES

**Appendix C-2.5 - Remediation Monitoring Analysis
CARBON TETRACHLORIDE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
MW-6D	M	8	05/1999	10/2009	U	U	U	4	YES
MW-7B	M	7	04/1995	10/2014	U	U	U	4	YES
MW-7C	M	6	05/1995	10/2009	U	U	U	4	YES
MW-8B	M	14	10/2008	10/2014	U	U	U	4	YES
MW-9B	M	18	10/2012	10/2016	U	U	U	4	YES
MW-9C	M	9	10/1997	10/2009	U	U	U	4	YES
MW-10B	E	49	04/2015	10/2016	U	U	U	4	YES
MW-10C	E	51	04/2015	10/2016	U	U	U	4	YES
MW-12C	M	28	10/2010	10/2016	U	U	U	4	YES
MW-13C	M	33	10/2012	10/2016	U	U	U	4	YES
PW-1B	E	66	10/2015	10/2016	U	U	U	4	YES
Intermediate Wells									
AMW-59	M	14	10/2010	10/2016	U	U	U	4	YES
AMW-60	M	3	01/2005	10/2009	U	U	U	3	NO
CPU-14	M	36	10/2014	10/2016	U	U	U	4	YES
MW-14C	E	60	10/2015	10/2016	U	U	U	4	YES
MW-14E	E	62	04/2015	10/2016	U	U	U	4	YES
MW-15E	M	29	04/2014	10/2016	U	U	U	4	YES
MW-18D	E	58	04/2015	10/2016	U	U	U	4	YES
MW-18E	M	34	10/2013	10/2016	U	U	U	4	YES
MW-19D	E	54	04/2015	10/2016	U	U	U	4	YES
MW-20D	E	65	10/2015	10/2016	U	U	U	4	YES
MW-40	M	7	10/1999	10/2008	U	U	U	4	YES
PZ-39	PZ	15	04/2015	10/2016	U	U	U	4	YES
Church of God Wells									
AMW-27	M	59	04/2015	10/2016	U	U	U	4	YES
AMW-61	M	11	10/2013	10/2016	U	U	U	4	YES
CPU-12	M	37	10/2014	10/2016	U	U	U	4	YES
CPU-13	E	54	04/2013	10/2014	U	U	U	4	YES
CPU-15	M	14	10/2001	05/2004	U	U	U	4	YES
MW-21D	E	64	04/2015	10/2016	U	U	U	4	YES
MW-22D	E	53	04/2015	10/2016	U	U	U	4	YES
MW-25D	E	56	04/2013	10/2014	U	U	U	4	YES
MW-26D	E	52	10/2012	10/2014	U	U	U	4	YES
MW-27D	M	49	10/2013	10/2014	U	U	U	4	YES
MW-49	E/M	32	10/2012	10/2014	U	U	U	4	YES
Toe Wells									
AMW-42	M	40	10/2009	10/2014	U	U	U	4	YES
MW-31	M	26	10/2008	10/2012	U	U	U	4	YES
MW-35	M	45	10/2015	10/2016	U	U	U	4	YES
MW-41	M	48	10/2010	10/2014	U	U	U	4	YES
MW-48	M	31	10/2006	10/2009	U	U	U	4	YES

**Appendix C-2.5 - Remediation Monitoring Analysis
CARBON TETRACHLORIDE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Wells Excluded from Closure Monitoring Program									
Northern Plume Wells									
AMW-16	M	33	04/2015	10/2016	U	U	U	4	YES
AMW-17	M/D	44	04/2016	10/2016	U	U	U	4	YES
AMW-18	M	47	10/2015	10/2016	U	U	U	4	YES
AMW-23	M	10	10/2001	10/2016	U	U	U	4	YES
AMW-64	M	16	04/2015	10/2016	U	U	U	4	YES
MW-23D	M	36	04/2016	10/2016	U	U	U	4	YES
MW-38	M	11	04/2015	10/2016	U	U	U	4	YES
Toe Wells									
AMW-63	M	10	05/2009	10/2014	U	U	U	4	YES
Infiltration Gallery Wells									
AMW-6A	M/D	23	10/2010	10/2016	U	U	U	4	YES
AMW-7A	M/D	29	10/2010	10/2016	U	U	U	4	YES
AMW-10A	M/D	20	10/2010	10/2016	U	U	U	4	YES
AMW-11A	M/D	20	10/2010	10/2016	U	U	U	4	YES
<p>NOTES:</p> <p>^a The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>µg/L = Micrograms per liter.</p>									

**Appendix C-2.6 - Remediation Monitoring Analysis
BROMODICHLOROMETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Closure Monitoring Program Wells									
Troutdale Wells									
AMW-24	M/D	33	10/2015	10/2016	U	U	U	4	YES
MW-33	M/D	29	10/2013	10/2016	U	U	U	4	YES
BENNETT	Other	24	10/2015	10/2016	U	U	U	4	YES
Upgradient Wells									
AMW-8A	M	35	10/2012	10/2016	U	U	U	4	YES
TCE Source Wells									
AMW-1A	M	54	04/2015	10/2016	U	2.4	2.3	2	NO
AMW-1B	M	31	01/2009	10/2010	U	U	U	4	YES
AMW-1C	M	24	10/2007	10/2009	U	0.25	U	4	YES
AMW-2A	M	72	04/2016	10/2016	U	0.1	U	4	YES
AMW-2B	M	36	10/2012	10/2015	U	U	U	4	YES
AMW-3A	M	44	10/2012	10/2015	U	3.2	U	3	NO
AMW-4A	M	12	05/2004	10/2009	U	1.6	1.6	2	NO
AMW-12A	M	84	04/2015	10/2016	U	U	U	4	YES
AMW-13A	M	45	10/2012	10/2015	0.17	0.28	0.23	4	YES
AMW-19A	M	42	10/2012	10/2015	U	0.12	0.12	4	YES
AMW-26	M	28	10/2009	10/2014	U	U	U	4	YES
AMW-52A	M	28	10/2012	10/2015	U	0.71	U	4	YES
AMW-53A	M	41	07/2015	10/2016	U	2.6	2.6	3	NO
AMW-54A	M	32	10/2014	10/2015	U	U	U	4	YES
AMW-55A	M	23	10/2012	10/2015	U	U	U	4	YES
AMW-56A	M	48	10/2012	10/2015	U	U	U	4	YES
MW-1A	M	57	04/2015	10/2016	U	U	U	4	YES
MW-1B	M	25	10/2006	10/2009	U	U	U	4	YES
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES
Proximal Wells									
AMW-58	M	8	10/2006	10/2012	U	U	U	4	YES
MW-2A	M	27	10/2014	10/2016	U	0.65	0.65	4	YES
MW-2B	M	13	10/2002	10/2009	U	U	U	4	YES
MW-2C	M	8	10/2002	10/2009	U	U	U	4	YES
MW-3A	M	18	05/2004	10/2008	U	U	U	4	YES
MW-3B	M	15	10/2010	10/2016	U	U	U	4	YES
MW-3C	M	7	05/1995	10/2004	U	0.09	U	4	YES
MW-4A	M	19	10/2003	10/2009	U	U	U	4	YES
MW-4B	M	15	10/2011	10/2016	U	0.1	0.1	4	YES
MW-4BSHED	M	13	05/2003	10/2009	U	U	U	4	YES
MW-4C	M	8	05/1998	10/2009	U	U	U	4	YES
MW-6A	M	4	05/1995	10/2009	U	U	U	4	YES
MW-6B	E	50	04/2015	10/2016	U	U	U	4	YES
MW-6C	M	10	10/2002	10/2009	U	0.13	0.13	4	YES

**Appendix C-2.6 - Remediation Monitoring Analysis
BROMODICHLOROMETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
MW-6D	M	8	05/1999	10/2009	U	U	U	4	YES
MW-7B	M	7	04/1995	10/2014	U	U	U	4	YES
MW-7C	M	6	05/1995	10/2009	U	U	U	4	YES
MW-8B	M	14	10/2008	10/2014	U	U	U	4	YES
MW-9B	M	18	10/2012	10/2016	U	0.1	0.1	4	YES
MW-9C	M	9	10/1997	10/2009	U	U	U	4	YES
MW-10B	E	48	04/2015	10/2016	U	0.1	U	4	YES
MW-10C	E	50	04/2015	10/2016	U	0.45	0.45	4	YES
MW-12C	M	27	10/2010	10/2016	U	U	U	4	YES
MW-13C	M	32	10/2012	10/2016	U	0.13	0.13	4	YES
PW-1B	E	72	10/2015	10/2016	U	U	U	4	YES
Intermediate Wells									
AMW-59	M	14	10/2010	10/2016	U	U	U	4	YES
AMW-60	M	3	01/2005	10/2009	U	U	U	3	NO
CPU-14	M	35	10/2014	10/2016	U	U	U	4	YES
MW-14C	E	59	10/2015	10/2016	U	0.15	0.12	4	YES
MW-14E	E	60	04/2015	10/2016	U	U	U	4	YES
MW-15E	M	29	04/2014	10/2016	U	U	U	4	YES
MW-18D	E	60	04/2015	10/2016	U	0.1	U	4	YES
MW-18E	M	33	10/2013	10/2016	U	U	U	4	YES
MW-19D	E	55	04/2015	10/2016	U	0.31	0.31	4	YES
MW-20D	E	65	10/2015	10/2016	U	U	U	4	YES
MW-40	M	7	10/1999	10/2008	U	0.15	0.15	4	YES
PZ-39	PZ	15	04/2015	10/2016	U	U	U	4	YES
Church of God Wells									
AMW-27	M	58	04/2015	10/2016	U	U	U	4	YES
AMW-61	M	11	10/2013	10/2016	U	U	U	4	YES
CPU-12	M	36	10/2014	10/2016	U	U	U	4	YES
CPU-13	E	53	04/2013	10/2014	U	0.1	U	4	YES
CPU-15	M	14	10/2001	05/2004	U	U	U	4	YES
MW-21D	E	61	04/2015	10/2016	U	U	U	4	YES
MW-22D	E	52	04/2015	10/2016	U	U	U	4	YES
MW-25D	E	55	04/2013	10/2014	U	U	U	4	YES
MW-26D	E	51	10/2012	10/2014	U	U	U	4	YES
MW-27D	M	48	10/2013	10/2014	U	U	U	4	YES
MW-49	E/M	32	10/2012	10/2014	U	U	U	4	YES
Toe Wells									
AMW-42	M	39	10/2009	10/2014	U	U	U	4	YES
MW-31	M	25	10/2008	10/2012	U	U	U	4	YES
MW-35	M	44	10/2015	10/2016	U	U	U	4	YES
MW-41	M	47	10/2010	10/2014	U	U	U	4	YES
MW-48	M	30	10/2006	10/2009	U	U	U	4	YES

**Appendix C-2.6 - Remediation Monitoring Analysis
BROMODICHLOROMETHANE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Wells Excluded from Closure Monitoring Program									
Northern Plume Wells									
AMW-16	M	31	04/2015	10/2016	U	U	U	4	YES
AMW-17	M/D	44	04/2016	10/2016	U	U	U	4	YES
AMW-18	M	47	10/2015	10/2016	0.12	0.23	0.15	4	YES
AMW-23	M	10	10/2001	10/2016	U	U	U	4	YES
AMW-64	M	16	04/2015	10/2016	U	U	U	4	YES
MW-23D	M	35	04/2016	10/2016	U	U	U	4	YES
MW-38	M	11	04/2015	10/2016	U	U	U	4	YES
Toe Wells									
AMW-63	M	10	05/2009	10/2014	U	U	U	4	YES
Infiltration Gallery Wells									
AMW-6A	M/D	23	10/2010	10/2016	U	U	U	4	YES
AMW-7A	M/D	29	10/2010	10/2016	U	U	U	4	YES
AMW-10A	M/D	20	10/2010	10/2016	U	U	U	4	YES
AMW-11A	M/D	20	10/2010	10/2016	U	U	U	4	YES
<p>NOTES:</p> <p>^a The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>µg/L = Micrograms per liter.</p>									

**Appendix C-2.7 - Remediation Monitoring Analysis
TETRACHLOROETHENE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Closure Monitoring Program Wells									
Troutdale Wells									
AMW-24	M/D	36	10/2015	10/2016	0.11	0.16	0.16	4	YES
MW-33	M/D	32	10/2013	10/2016	0.12	0.2	0.2	4	YES
BENNETT	Other	24	10/2015	10/2016	U	U	U	4	YES
Upgradient Wells									
AMW-8A	M	36	10/2012	10/2016	U	U	U	4	YES
TCE Source Wells									
AMW-1A	M	56	04/2015	10/2016	U	0.5	U	4	YES
AMW-1B	M	31	01/2009	10/2010	U	U	U	4	YES
AMW-1C	M	24	10/2007	10/2009	U	U	U	4	YES
AMW-2A	M	79	04/2016	10/2016	0.85	1.2	1.2	4	YES
AMW-2B	M	36	10/2012	10/2015	U	U	U	4	YES
AMW-3A	M	45	10/2012	10/2015	0.27	0.4	0.31	4	YES
AMW-4A	M	12	05/2004	10/2009	U	U	U	4	YES
AMW-12A	M	91	04/2015	10/2016	0.45	0.72	0.56	4	YES
AMW-13A	M	46	10/2012	10/2015	U	0.11	0.11	4	YES
AMW-19A	M	43	10/2012	10/2015	0.29	0.33	0.33	4	YES
AMW-26	M	29	10/2009	10/2014	U	1.5	0.1	4	YES
AMW-52A	M	28	10/2012	10/2015	U	0.12	0.1	4	YES
AMW-53A	M	41	07/2015	10/2016	U	1.1	0.27	4	YES
AMW-54A	M	32	10/2014	10/2015	0.22	0.4	0.4	4	YES
AMW-55A	M	23	10/2012	10/2015	0.21	0.34	0.34	4	YES
AMW-56A	M	50	10/2012	10/2015	0.38	0.61	0.51	4	YES
MW-1A	M	63	04/2015	10/2016	0.22	1.2	1.2	4	YES
MW-1B	M	27	10/2006	10/2009	U	U	U	4	YES
MW-1C	M	20	10/2006	10/2009	U	U	U	4	YES
Proximal Wells									
AMW-58	M	8	10/2006	10/2012	U	U	U	4	YES
MW-2A	M	29	10/2014	10/2016	0.78	1.1	1.1	4	YES
MW-2B	M	14	10/2002	10/2009	0.77	3.3	0.77	4	YES
MW-2C	M	8	10/2002	10/2009	0.29	1.5	0.29	4	YES
MW-3A	M	19	05/2004	10/2008	0.21	0.4	0.21	4	YES
MW-3B	M	15	10/2010	10/2016	0.54	0.89	0.67	4	YES
MW-3C	M	7	05/1995	10/2004	1.6	4	1.6	4	YES
MW-4A	M	20	10/2003	10/2009	0.72	1.1	0.72	4	YES
MW-4B	M	16	10/2011	10/2016	0.5	0.64	0.62	4	YES
MW-4BSHED	M	14	05/2003	10/2009	1.4	2.7	1.4	4	YES
MW-4C	M	8	05/1998	10/2009	0.84	2.8	0.84	4	YES
MW-6A	M	4	05/1995	10/2009	U	0.83	U	4	YES
MW-6B	E	61	04/2015	10/2016	0.44	0.57	0.44	4	YES
MW-6C	M	10	10/2002	10/2009	0.19	6.8	0.19	3	NO

**Appendix C-2.7 - Remediation Monitoring Analysis
TETRACHLOROETHENE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Remediation Monitoring Phase is Completed ? ^a
MW-6D	M	8	05/1999	10/2009	U	0.11	0.11	4	YES
MW-7B	M	7	04/1995	10/2014	0.52	4.3	0.52	4	YES
MW-7C	M	6	05/1995	10/2009	0.12	0.5	0.12	4	YES
MW-8B	M	15	10/2008	10/2014	0.81	2.9	0.81	4	YES
MW-9B	M	18	10/2012	10/2016	0.98	2	0.98	4	YES
MW-9C	M	9	10/1997	10/2009	0.35	2.1	0.35	4	YES
MW-10B	E	56	04/2015	10/2016	0.81	1.2	0.81	4	YES
MW-10C	E	58	04/2015	10/2016	0.63	0.98	0.63	4	YES
MW-12C	M	28	10/2010	10/2016	0.3	0.7	0.3	4	YES
MW-13C	M	34	10/2012	10/2016	0.58	0.86	0.86	4	YES
PW-1B	E	103	10/2015	10/2016	0.47	0.53	0.47	4	YES
Intermediate Wells									
AMW-59	M	14	10/2010	10/2016	U	U	U	4	YES
AMW-60	M	3	01/2005	10/2009	U	0.09	0.09	3	NO
CPU-14	M	38	10/2014	10/2016	U	0.12	0.12	4	YES
MW-14C	E	75	10/2015	10/2016	0.68	0.79	0.68	4	YES
MW-14E	E	75	04/2015	10/2016	2.5	3.2	2.5	4	YES
MW-15E	M	31	04/2014	10/2016	0.24	0.38	0.36	4	YES
MW-18D	E	89	04/2015	10/2016	1.2	1.6	1.2	4	YES
MW-18E	M	35	10/2013	10/2016	U	U	U	4	YES
MW-19D	E	82	04/2015	10/2016	1.1	1.4	1.1	4	YES
MW-20D	E	95	10/2015	10/2016	0.69	0.95	0.69	4	YES
MW-40	M	7	10/1999	10/2008	U	0.18	U	4	YES
PZ-39	PZ	15	04/2015	10/2016	0.91	1.1	0.94	4	YES
Church of God Wells									
AMW-27	M	61	04/2015	10/2016	0.92	1	1	4	YES
AMW-61	M	11	10/2013	10/2016	1.9	3.3	2	4	YES
CPU-12	M	37	10/2014	10/2016	U	U	U	4	YES
CPU-13	E	60	04/2013	10/2014	0.68	0.87	0.87	4	YES
CPU-15	M	14	10/2001	05/2004	U	U	U	4	YES
MW-21D	E	92	04/2015	10/2016	U	0.1	U	4	YES
MW-22D	E	79	04/2015	10/2016	0.77	1.2	0.77	4	YES
MW-25D	E	80	04/2013	10/2014	U	U	U	4	YES
MW-26D	E	80	10/2012	10/2014	0.2	0.86	0.2	4	YES
MW-27D	M	57	10/2013	10/2014	U	U	U	4	YES
MW-49	E/M	36	10/2012	10/2014	0.27	0.49	0.49	4	YES
Toe Wells									
AMW-42	M	53	10/2009	10/2014	U	U	U	4	YES
MW-31	M	40	10/2008	10/2012	U	0.19	0.12	4	YES
MW-35	M	72	10/2015	10/2016	0.42	0.51	0.48	4	YES
MW-41	M	61	10/2010	10/2014	U	U	U	4	YES
MW-48	M	38	10/2006	10/2009	U	U	U	4	YES

**Appendix C-2.7 - Remediation Monitoring Analysis
TETRACHLOROETHENE (Last 4 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Four Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Remediation Monitoring Phase is Completed ? ^a
Wells Excluded from Closure Monitoring Program									
Northern Plume Wells									
AMW-16	M	32	04/2015	10/2016	U	U	U	4	YES
AMW-17	M/D	44	04/2016	10/2016	0.34	0.44	0.35	4	YES
AMW-18	M	47	10/2015	10/2016	0.1	0.15	0.1	4	YES
AMW-23	M	10	10/2001	10/2016	U	U	U	4	YES
AMW-64	M	16	04/2015	10/2016	0.18	0.21	0.18	4	YES
MW-23D	M	36	04/2016	10/2016	U	U	U	4	YES
MW-38	M	11	04/2015	10/2016	0.85	1.3	0.85	4	YES
Toe Wells									
AMW-63	M	10	05/2009	10/2014	U	U	U	4	YES
Infiltration Gallery Wells									
AMW-6A	M/D	23	10/2010	10/2016	U	U	U	4	YES
AMW-7A	M/D	29	10/2010	10/2016	U	U	U	4	YES
AMW-10A	M/D	20	10/2010	10/2016	U	U	U	4	YES
AMW-11A	M/D	20	10/2010	10/2016	U	U	U	4	YES
<p>NOTES:</p> <p>^a The "Remediation Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent four sample data points for each COC. The remediation monitoring phase is completed when the last four sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>µg/L = Micrograms per liter.</p>									

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APPENDIX C-3

ATTAINMENT MONITORING ANALYSIS

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**Appendix C-3.1 - Attainment Monitoring Analysis
CHLORODIBROMOMETHANE (Last 8 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Eight Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Attainment Monitoring Phase is Completed? ^a
TCE Source Wells									
AMW-54A	M	32	10/2010	10/2015	U	U	U	8	YES
AMW-55A	M	23	01/2009	10/2015	U	U	U	8	YES
AMW-56A	M	48	10/2009	10/2015	U	U	U	8	YES
Church of God Wells									
AMW-27	M	58	04/2014	10/2016	U	U	U	8	YES
CPU-13	E	53	04/2011	10/2014	U	U	U	8	YES
CPU-15	M	14	10/1997	05/2004	U	U	U	8	YES
MW-25D	E	55	04/2011	10/2014	U	U	U	8	YES
MW-26D	E	51	10/2010	10/2014	U	U	U	8	YES
MW-27D	M	48	10/2010	10/2014	U	U	U	8	YES
MW-49	E/M	32	04/2010	10/2014	U	U	U	8	YES
Toe Wells									
AMW-42	M	39	10/2006	10/2014	U	U	U	8	YES
MW-31	M	25	10/2004	10/2012	U	U	U	8	YES
MW-35	M	44	04/2013	10/2016	U	U	U	8	YES
MW-41	M	47	05/2008	10/2014	U	U	U	8	YES
MW-48	M	30	04/2005	10/2009	U	U	U	8	YES

NOTES:

^a The "Attainment Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent eight sample data points for each COC. The attainment monitoring phase occurs after the remediation monitoring phase and is completed when the last eight sample concentrations are lower than the cleanup level.

COC = Contaminant of Concern.

E = Extraction well.

E/M = Extraction well with pump pulled; now sampled as a monitoring well.

EPA = U.S. Environmental Protection Agency.

M = Monitoring well.

M/D = Monitoring well with dedicated pump installed.

U = Analyte not detected above the specified reporting limit.

µg/L = Micrograms per liter.

**Appendix C-3.2 - Attainment Monitoring Analysis
1,1-DICHLOROETHYLENE (Last 8 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Eight Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Attainment Monitoring Phase is Completed? ^a
TCE Source Wells									
AMW-54A	M	32	10/2010	10/2015	U	U	U	8	YES
AMW-55A	M	23	01/2009	10/2015	U	U	U	8	YES
AMW-56A	M	48	10/2009	10/2015	U	U	U	8	YES
Church of God Wells									
AMW-27	M	63	04/2014	10/2016	U	0.19	0.11	8	YES
CPU-13	E	54	04/2011	10/2014	U	U	U	8	YES
CPU-15	M	14	10/1997	05/2004	U	U	U	8	YES
MW-25D	E	56	04/2011	10/2014	0.13	0.33	0.13	8	YES
MW-26D	E	53	10/2010	10/2014	U	U	U	8	YES
MW-27D	M	51	10/2010	10/2014	U	U	U	8	YES
MW-49	E/M	32	04/2010	10/2014	U	0.08	U	8	YES
Toe Wells									
AMW-42	M	41	10/2006	10/2014	U	U	U	8	YES
MW-31	M	26	10/2004	10/2012	U	U	U	8	YES
MW-35	M	45	04/2013	10/2016	U	0.16	0.08	8	YES
MW-41	M	48	05/2008	10/2014	U	U	U	8	YES
MW-48	M	31	04/2005	10/2009	U	U	U	8	YES

NOTES:

^a The "Attainment Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent eight sample data points for each COC. The attainment monitoring phase occurs after the remediation monitoring phase and is completed when the last eight sample concentrations are lower than the cleanup level.

COC = Contaminant of Concern.

E = Extraction well.

E/M = Extraction well with pump pulled; now sampled as a monitoring well.

EPA = U.S. Environmental Protection Agency.

M = Monitoring well.

M/D = Monitoring well with dedicated pump installed.

U = Analyte not detected above the specified reporting limit.

ug/L = Micrograms per liter.

**Appendix C-3.3 - Attainment Monitoring Analysis
1,2-DICHLOROETHANE (Last 8 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Eight Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Attainment Monitoring Phase is Completed ? ^a
TCE Source Wells									
AMW-54A	M	32	10/2010	10/2015	U	U	U	8	YES
AMW-55A	M	23	01/2009	10/2015	U	U	U	8	YES
AMW-56A	M	48	10/2009	10/2015	U	U	U	8	YES
Church of God Wells									
AMW-27	M	60	04/2014	10/2016	U	0.08	U	8	YES
CPU-13	E	54	04/2011	10/2014	U	U	U	8	YES
CPU-15	M	14	10/1997	05/2004	U	U	U	8	YES
MW-25D	E	57	04/2011	10/2014	U	U	U	8	YES
MW-26D	E	52	10/2010	10/2014	U	U	U	8	YES
MW-27D	M	49	10/2010	10/2014	U	0.09	U	8	YES
MW-49	E/M	32	04/2010	10/2014	U	U	U	8	YES
Toe Wells									
AMW-42	M	42	10/2006	10/2014	U	U	U	8	YES
MW-31	M	26	10/2004	10/2012	U	U	U	8	YES
MW-35	M	45	04/2013	10/2016	U	0.08	0.08	8	YES
MW-41	M	48	05/2008	10/2014	U	U	U	8	YES
MW-48	M	31	04/2005	10/2009	U	U	U	8	YES
<p>NOTES:</p> <p>^a The "Attainment Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent eight sample data points for each COC. The attainment monitoring phase occurs after the remediation monitoring phase and is completed when the last eight sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern. E = Extraction well. E/M = Extraction well with pump pulled; now sampled as a monitoring well. EPA = U.S. Environmental Protection Agency. M = Monitoring well. M/D = Monitoring well with dedicated pump installed. U = Analyte not detected above the specified reporting limit. µg/L = Micrograms per liter.</p>									

**Appendix C-3.4 - Attainment Monitoring Analysis
1,1,1-TRICHLOROETHANE (Last 8 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Eight Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (200 ug/L)	Attainment Monitoring Phase is Completed ? ^a
TCE Source Wells									
AMW-54A	M	32	10/2010	10/2015	U	0.12	0.12	8	YES
AMW-55A	M	23	01/2009	10/2015	U	U	U	8	YES
AMW-56A	M	49	10/2009	10/2015	U	0.12	U	8	YES
Church of God Wells									
AMW-27	M	61	04/2014	10/2016	U	0.16	0.16	8	YES
CPU-13	E	54	04/2011	10/2014	U	U	U	8	YES
CPU-15	M	14	10/1997	05/2004	U	0.9	U	8	YES
MW-25D	E	57	04/2011	10/2014	0.1	0.17	0.11	8	YES
MW-26D	E	54	10/2010	10/2014	U	U	U	8	YES
MW-27D	M	51	10/2010	10/2014	U	0.11	U	8	YES
MW-49	E/M	32	04/2010	10/2014	U	0.09	U	8	YES
Toe Wells									
AMW-42	M	42	10/2006	10/2014	U	0.14	U	8	YES
MW-31	M	26	10/2004	10/2012	U	0.26	U	8	YES
MW-35	M	45	04/2013	10/2016	U	0.08	U	8	YES
MW-41	M	48	05/2008	10/2014	U	U	U	8	YES
MW-48	M	31	04/2005	10/2009	U	U	U	8	YES
<p>NOTES:</p> <p>^a The "Attainment Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent eight sample data points for each COC. The attainment monitoring phase occurs after the remediation monitoring phase and is completed when the last eight sample concentrations are lower than the cleanup level.</p> <p>COC = Contaminant of Concern.</p> <p>E = Extraction well.</p> <p>E/M = Extraction well with pump pulled; now sampled as a monitoring well.</p> <p>EPA = U.S. Environmental Protection Agency.</p> <p>M = Monitoring well.</p> <p>M/D = Monitoring well with dedicated pump installed.</p> <p>U = Analyte not detected above the specified reporting limit.</p> <p>ug/L = Micrograms per liter.</p>									

**Appendix C-3.5 - Attainment Monitoring Analysis
CARBON TETRACHLORIDE (Last 8 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Eight Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Attainment Monitoring Phase is Completed ? ^a
TCE Source Wells									
AMW-54A	M	32	10/2010	10/2015	U	U	U	8	YES
AMW-55A	M	23	01/2009	10/2015	U	U	U	8	YES
AMW-56A	M	48	10/2009	10/2015	U	U	U	8	YES
Church of God Wells									
AMW-27	M	59	04/2014	10/2016	U	U	U	8	YES
CPU-13	E	54	04/2011	10/2014	U	U	U	8	YES
CPU-15	M	14	10/1997	05/2004	U	U	U	8	YES
MW-25D	E	56	04/2011	10/2014	U	U	U	8	YES
MW-26D	E	52	10/2010	10/2014	U	U	U	8	YES
MW-27D	M	49	10/2010	10/2014	U	U	U	8	YES
MW-49	E/M	32	04/2010	10/2014	U	U	U	8	YES
Toe Wells									
AMW-42	M	40	10/2006	10/2014	U	U	U	8	YES
MW-31	M	26	10/2004	10/2012	U	U	U	8	YES
MW-35	M	45	04/2013	10/2016	U	U	U	8	YES
MW-41	M	48	05/2008	10/2014	U	U	U	8	YES
MW-48	M	31	04/2005	10/2009	U	U	U	8	YES

NOTES:

^a The "Attainment Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent eight sample data points for each COC. The attainment monitoring phase occurs after the remediation monitoring phase and is completed when the last eight sample concentrations are lower than the cleanup level.

COC = Contaminant of Concern.

E = Extraction well.

E/M = Extraction well with pump pulled; now sampled as a monitoring well.

EPA = U.S. Environmental Protection Agency.

M = Monitoring well.

M/D = Monitoring well with dedicated pump installed.

U = Analyte not detected above the specified reporting limit.

ug/L = Micrograms per liter.

**Appendix C-3.6 - Attainment Monitoring Analysis
BROMODICHLOROMETHANE (Last 8 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Eight Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (1 ug/L)	Attainment Monitoring Phase is Completed ? ^a
TCE Source Wells									
AMW-54A	M	32	10/2010	10/2015	U	U	U	8	YES
AMW-55A	M	23	01/2009	10/2015	U	U	U	8	YES
AMW-56A	M	48	10/2009	10/2015	U	U	U	8	YES
Church of God Wells									
AMW-27	M	58	04/2014	10/2016	U	U	U	8	YES
CPU-13	E	53	04/2011	10/2014	U	0.1	U	8	YES
CPU-15	M	14	10/1997	05/2004	U	U	U	8	YES
MW-25D	E	55	04/2011	10/2014	U	U	U	8	YES
MW-26D	E	51	10/2010	10/2014	U	U	U	8	YES
MW-27D	M	48	10/2010	10/2014	U	U	U	8	YES
MW-49	E/M	32	04/2010	10/2014	U	U	U	8	YES
Toe Wells									
AMW-42	M	39	10/2006	10/2014	U	U	U	8	YES
MW-31	M	25	10/2004	10/2012	U	U	U	8	YES
MW-35	M	44	04/2013	10/2016	U	U	U	8	YES
MW-41	M	47	05/2008	10/2014	U	U	U	8	YES
MW-48	M	30	04/2005	10/2009	U	U	U	8	YES

NOTES:

^a The "Attainment Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent eight sample data points for each COC. The attainment monitoring phase occurs after the remediation monitoring phase and is completed when the last eight sample concentrations are lower than the cleanup level.

COC = Contaminant of Concern.

E = Extraction well.

E/M = Extraction well with pump pulled; now sampled as a monitoring well.

EPA = U.S. Environmental Protection Agency.

M = Monitoring well.

M/D = Monitoring well with dedicated pump installed.

U = Analyte not detected above the specified reporting limit.

µg/L = Micrograms per liter.

**Appendix C-3.7 - Attainment Monitoring Analysis
TETRACHLOROETHENE (Last 8 Samples)**

Well Name	Well Type	Total Number of Datapoints	Date of First of the Most Recent Eight Samples	Most Recent Sample Date	Min. Conc. (ug/L)	Max. Conc. (ug/L)	Most Recent Conc. (ug/L)	Number of Conc. < Cleanup Goal (5 ug/L)	Attainment Monitoring Phase is Completed ? ^a
TCE Source Wells									
AMW-54A	M	32	10/2010	10/2015	0.13	0.4	0.4	8	YES
AMW-55A	M	23	01/2009	10/2015	0.21	0.34	0.34	8	YES
AMW-56A	M	50	10/2009	10/2015	0.1	0.61	0.51	8	YES
Church of God Wells									
AMW-27	M	61	04/2014	10/2016	0.18	1.3	1	8	YES
CPU-13	E	60	04/2011	10/2014	0.54	0.87	0.87	8	YES
CPU-15	M	14	10/1997	05/2004	U	U	U	8	YES
MW-25D	E	80	04/2011	10/2014	U	U	U	8	YES
MW-26D	E	80	10/2010	10/2014	0.2	0.86	0.2	8	YES
MW-27D	M	57	10/2010	10/2014	U	U	U	8	YES
MW-49	E/M	36	04/2010	10/2014	0.27	0.66	0.49	8	YES
Toe Wells									
AMW-42	M	53	10/2006	10/2014	U	U	U	8	YES
MW-31	M	40	10/2004	10/2012	U	0.21	0.12	8	YES
MW-35	M	72	04/2013	10/2016	0.4	0.51	0.48	8	YES
MW-41	M	61	05/2008	10/2014	U	U	U	8	YES
MW-48	M	38	04/2005	10/2009	U	U	U	8	YES

NOTES:

^a The "Attainment Monitoring Phase is Completed" determinations are per EPA Guidance (EPA 2013) based on the most recent eight sample data points for each COC. The attainment monitoring phase occurs after the remediation monitoring phase and is completed when the last eight sample concentrations are lower than the cleanup level.

COC = Contaminant of Concern.

E = Extraction well.

E/M = Extraction well with pump pulled; now sampled as a monitoring well.

EPA = U.S. Environmental Protection Agency.

M = Monitoring well.

M/D = Monitoring well with dedicated pump installed.

U = Analyte not detected above the specified reporting limit.

µg/L = Micrograms per liter.

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