DEPARTMENT OF
ECOLOGY
State of Washington

Yakima Railroad Area PCE Contamination

Groundwater Quality Performance Monitoring Data Summary 2014-2015

July 2016

Publication No. 16-03-031

Publication and Contact Information

This report is available on the Department of Ecology's website at
https://fortress.wa.gov/ecy/publications/SummaryPages/1603031.html

Data for this project are available at Ecology's Environmental Information Management (EIM) website www.ecy.wa.gov/eim/index.htm. Search Study ID: YRRA.

The Activity Tracker Code for this study is 12-049.

For more information contact:

Publications Coordinator
Environmental Assessment Program
P.O. Box 47600, Olympia, WA 98504-7600
Phone: (360) 407-6764

Washington State Department of Ecology - www.ecy.wa.gov

o	Headquarters, Olympia	(360) 407-6000
o	Northwest Regional Office, Bellevue	(425) 649-7000
o	Southwest Regional Office, Olympia	(360) 407-6300
o	Central Regional Office, Union Gap	(509) 575-2490
o	Eastern Regional Office, Spokane	(509) 329-3400

This report was prepared by a licensed hydrogeologist. A signed and stamped copy of the report is available upon request.

Yakima Railroad Area PCE Contamination

Groundwater Quality Performance Monitoring, Data Summary 2014-2015

by

Pamela B. Marti, LHG

Environmental Assessment Program
Washington State Department of Ecology
Olympia, Washington 98504-7710

Water Resource Inventory Area (WRIA) and 8-digit Hydrologic Unit Code (HUC) numbers for the study area:

WRIA
- 37

HUC number
- 17030003

This page is purposely left blank

Table of Contents

List of Figures and Tables

Page

Figures

Tables

Abstract

In 2014-2015, the Washington State Department of Ecology conducted semi-annual sampling of 34 wells in the Yakima Railroad Area (YRRA) groundwater monitoring network. The YRRA is a 6-square-mile area located along the railroad corridor in the cities of Yakima and Union Gap. Groundwater within the project area is contaminated with tetrachloroethene (PCE) that is attributed to numerous sources within the project boundary. Since the YRRA was defined in 1991, cleanup activities have occurred at several of the source areas and appear to have been effective in reducing contaminant concentrations.

Of the 34 wells sampled in 2014-2015, 16 wells (47%) had PCE concentrations above the Model Toxics Control Act (MTCA) cleanup level of 5 ug/L. Maximum PCE concentrations ranged from 5 to 18 ug/L.

Fourteen of the 16 wells are screened in the shallow water-bearing zone. Twelve are located at 5 source areas: Goodwill-City of Yakima, Washington Central Railroad Roundhouse (WCRR), Cameron Yakima, Fifth Wheel Truck Repair, and Agri-Tech/Yakima Steel. Two are Remedial Investigation (RI) wells located along the western edge of the YRRA. The source of contamination for the RI wells is in the process of being identified.

The remaining 2 wells with higher PCE concentrations are the deeper WCRR wells with a concentration range from 5 to 15 ug/L. PCE concentrations in these wells indicate the contaminant plume has a vertical component that reaches the deep water-bearing zone in this portion of the YRRA.

PCE breakdown products were also detected more frequently and at higher concentrations in wells located in the central portion of the YRRA than in other parts of the study area. Although concentrations of PCE breakdown products for most of the wells were below the MTCA cleanup levels, significant increases were observed at WCRR, Fifth Wheel Truck Repair and Cameron Yakima.

The 2014-2015 data confirm that PCE contamination continues to be detected throughout the project area. Concentrations have decreased at some of the identified source areas. However, high PCE concentrations are still detected at sites located in the central portion of the YRRA.

Introduction

The Yakima Railroad Area (YRRA) is approximately 6-square miles of mixed industrial/ commercial and residential properties located adjacent to the railroad corridor in the cities of Yakima and Union Gap (Figure 1). Groundwater within the YRRA project area is contaminated with tetrachloroethene (PCE) that is attributed to numerous sources within the project boundary.

During routine inspections of industrial facilities in the 1980s, PCE-contaminated soil and groundwater were discovered at multiple locations in the Yakima area (Secor, 1998). The U.S. Environmental Protection Agency (EPA) referred these findings to the State of Washington. After numerous investigations, the Washington State Department of Ecology (Ecology) defined the potentially affected area as the "Yakima Railroad Area" in 1991. Ecology identified 13 commercial or industrial facilities as potential sources of PCE to groundwater within the YRRA. The identified sources include dry cleaners, machine shops, a carbon regeneration facility, and a former pesticide formulation plant.

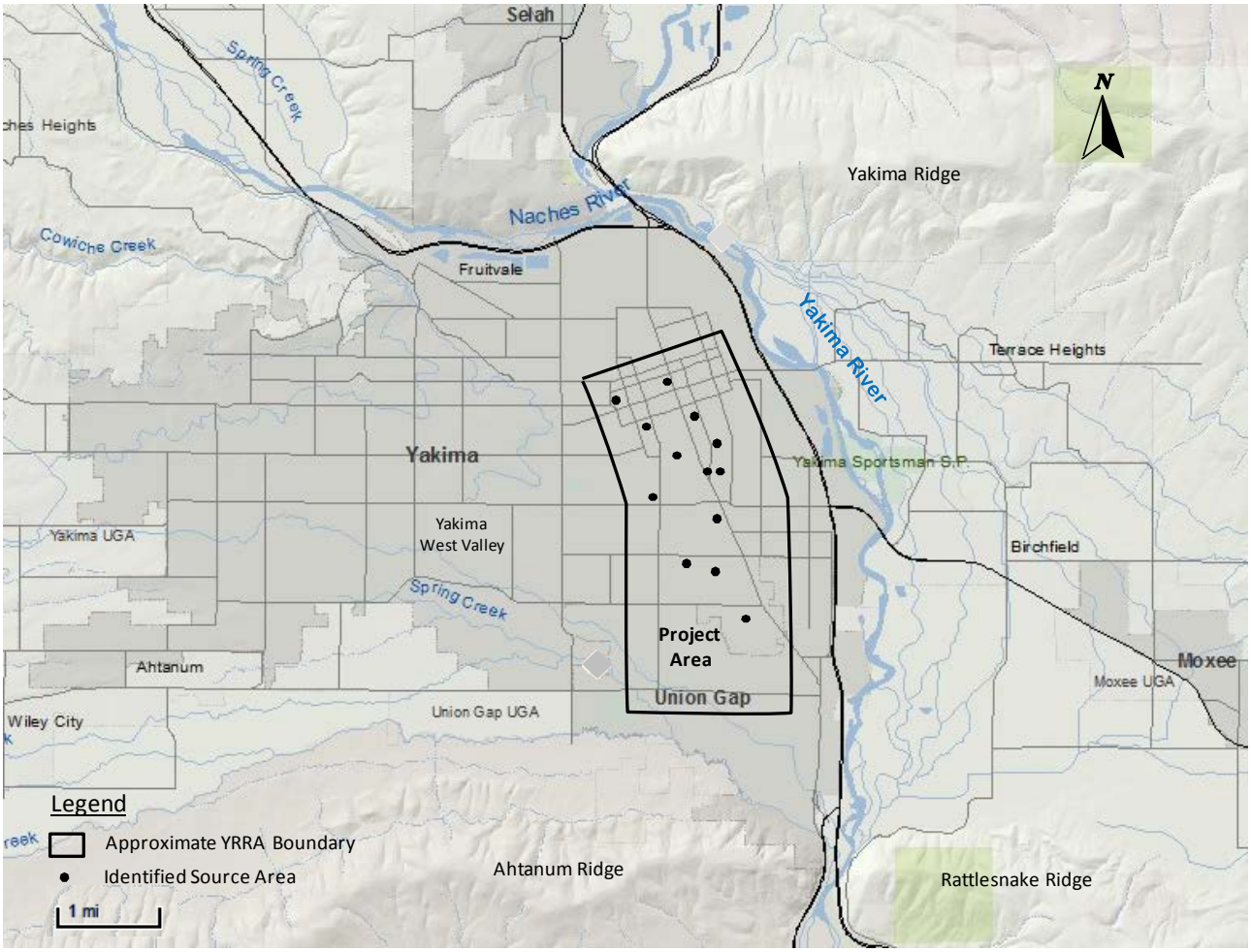


Figure 1. Yakima Railroad Area (YRRA) Project Location Map, Yakima, WA.

During the 1990s, cleanup activities were conducted at many of these source areas. An area-wide remedial investigation (RI) for the YRRA was completed in 1998 (Secor, 1998). From 1999 to 2012, 59 monitoring wells were routinely sampled as part of an ongoing program to characterize PCE groundwater concentrations throughout the YRRA. Results indicated that some of the highest PCE concentrations continued to be found near known source areas. There was also evidence that PCE was present in the shallow aquifer beneath areas where the source has yet to be identified.

Ecology's Environmental Assessment Program (EAP) took responsibility of the area-wide monitoring program in 2013. In consultation with Ecology's Toxics Cleanup Program (TCP), a subset of 36 wells was selected for continued monitoring. The selected subset of wells continues to provide monitoring points to evaluate groundwater conditions throughout the project area. The goal of the current work is to provide TCP with groundwater quality data to assist in evaluating the effectiveness of remedial actions taken at the identified source areas under the Model Toxics Control Act (MTCA). The data may also be used to identify additional areas of contamination within the YRRA that require further investigation and action.

Physical Setting

The YRRA is located within the western flood plain of the Yakima River and the eastern portion of Yakima West Valley (Figure 1). The geology of the project area consists primarily of Quaternary-age alluvial and terrace deposit sands and gravels. The alluvium is composed of unconsolidated silts, sands, gravels, and cobbles. It ranges in thickness from 0 to 120 feet, with an average thickness of 20 feet. The underlying terrace deposits consist of coarse-grained gravels with discontinuous layers of silts, clays, sands, or cemented gravels. The terrace gravels generally occur at the surface and beneath the alluvium. The thickness of this unit ranges from 0 to 350 feet, with an average thickness of 90 feet (USGS, 2009). The unconsolidated Quaternary deposits are overlain in some areas by man-made fill material that is present from the surface to depths of 20 feet, and is underlain by consolidated, Tertiary-age, continental sediments, primarily of the Upper Ellensburg Formation.

PCE monitoring in the YRRA focuses on groundwater in the upper portion of the shallow, unconfined aquifer in the unconsolidated sands and gravels. This portion of the aquifer is highly permeable in the vicinity of the Yakima River. However, fine-grained material and cemented gravels are more prevalent to the north and west, resulting in units of contrasting permeability. For this reason, both shallow and deep water-bearing zones were identified for the project area in the YRRA RI/Feasibility Study (Secor, 1998). The shallow and deep water-bearing zones appear to be hydraulically separate in the northern portion of the YRRA and interconnected in the southern portion of the project area.

Groundwater within the YRRA is encountered from about 3 to 30 feet below the ground surface, depending on the topography and seasonal irrigation practices. The depth to groundwater is greatest in the north and least in the southern part of the YRRA. The Yakima Valley is heavily irrigated from late March through early October. Because of this, the water table is typically

deeper in the spring before the start of the irrigation season and shallower in the summer and fall. Groundwater levels fluctuate seasonally between 1 and 12 feet.

At the time of the RI, the direction of groundwater flow in the shallow water-bearing zone was defined as being to the southeast, with an approximate gradient of 0.005 across the YRRA. The estimated direction of groundwater flow in the deep water-bearing zone is also primarily to the southeast, with an approximate gradient of 0.004 across the site. Overall, the vertical gradient across the project area is downward. The downward gradients between the shallow and deep water-bearing zones ranged from -0.278 feet per foot in the northern portion of the project area to -0.005 feet per foot in the southern portion of the project area (Secor, 1998).

Methods

Groundwater Sampling

When choosing 36 of the 59 wells for continued sampling (Figure 2), Ecology excluded wells if they had consistently shown low or no detections for chlorinated volatile organic compounds (cVOCs).

Ecology collected groundwater samples from 31 of the 36 wells in April 2014 and 32 wells in October 2014. Monitoring frequency was adjusted in 2015 based on PCE concentrations, seasonal patterns and time trends of each well. As a result, 19 wells were sampled in April 2015 and 17 wells in October 2015.

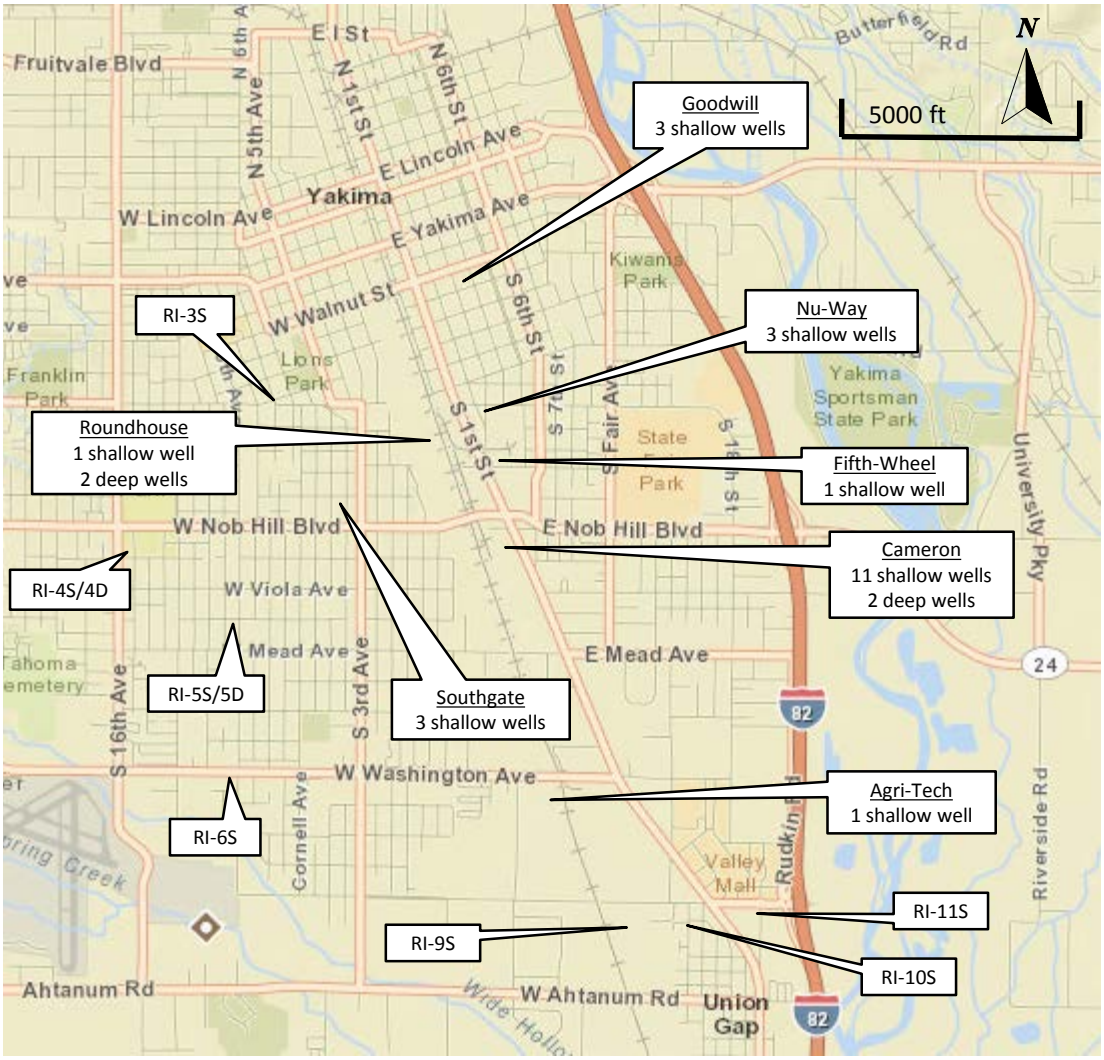


Figure 2. YRRA Sample Location Map.

Twenty-seven of the sampled wells are associated with the following facilities: Goodwill-City of Yakima, Nu-Way Cleaners, Southgate Laundry, Washington Central Railroad Roundhouse (WCRR), Fifth Wheel Truck Repair, Cameron Yakima, and Agri-Tech/Yakima Steel. Wells at these locations are monitored to evaluate the effectiveness of site-specific cleanup activities.

The remaining 9 wells were installed during the YRRA Remedial Investigation (RI). RI wells selected for continued monitoring are primarily located in the western and southern areas of the YRRA. Data collected from these wells may be used to identify areas of groundwater contamination that require further investigation and action within the YRRA.

Well construction details are provided in Appendix A, Table A-1.

Ecology sampled all wells in accordance with Ecology's SOPs EAP052 (Marti, 2009), EAP078 (Marti, 2014) and the site-specific Quality Assurance Project Plan (Marti, 2013).

Analysis

Samples were submitted to Ecology's Manchester Environmental Laboratory for analysis of volatile organic compounds (VOCs) to determine chlorinated VOCs concentrations throughout the YRRA project area. Samples were analyzed following a modification of EPA SW-846 Method 8260C.

Results

Field Observations

Ecology measured depth-to-water in each of the monitoring wells prior to purging. The end-of-purge pH, dissolved oxygen, ORP, and specific conductance readings are listed in Appendix A, Table A-2.

During the spring, depth-to-water below ground surface ranged from 40 feet at the northern end of the project area to 6 feet at the southern end. In the fall, depth-to-water ranged from 29 to 5 feet, respectively. The overall flow direction for the shallow groundwater appears to be consistently to the southeast, toward the Yakima River in both April and October. There were not enough measurement points during the monitoring period to determine the groundwater flow direction in the deep water-bearing zone, but previous investigations have described it as also being to the southeast (Kane, 2011).

Field measurement data are summarized in Table 1. All measurements were within expected ranges. Of special note are the dissolved oxygen measurements which ranged from 2.3 to 8.9 mg/L, indicating aerobic conditions in both the shallow and deep wells. In contrast, dissolved oxygen in the deeper WCRR wells (WDOE-3I and WDOE-3D) was only 0.2 to 0.76 mg/L. Dissolved oxygen values below 1 mg/L indicate an anaerobic environment.

Table 1. Summary of YRRA Stable Field Measurements, 2014 and 2015

Parameter	Number of Samples	Minimum	Maximum	25th Percentile	Median	75th Percentile
Temperature (°C)	99	13.7	18.9	15.2	15.9	16.9
pH (Std Units)	99	6.4	8.2	6.6	6.8	7.1
Conductivity (uS/cm@25°C)	99	136	760	251	289	338
Dissolved Oxygen (mg/L)	97	0.2	8.9	5.2	6.2	7.2
Oxidation Reduction Potential (mV)	99	-23	408	204	226	257

Analytical Results

The 2014-2015 analytical results are presented and discussed by contaminant source areas and are summarized in the associated site figures below. Analytes that were detected are presented in bold; those that exceed the applicable MTCA Method A cleanup levels for groundwater are shaded.

Analytical data quality assurance discussed in Appendix B. All data are considered of good quality and usable.

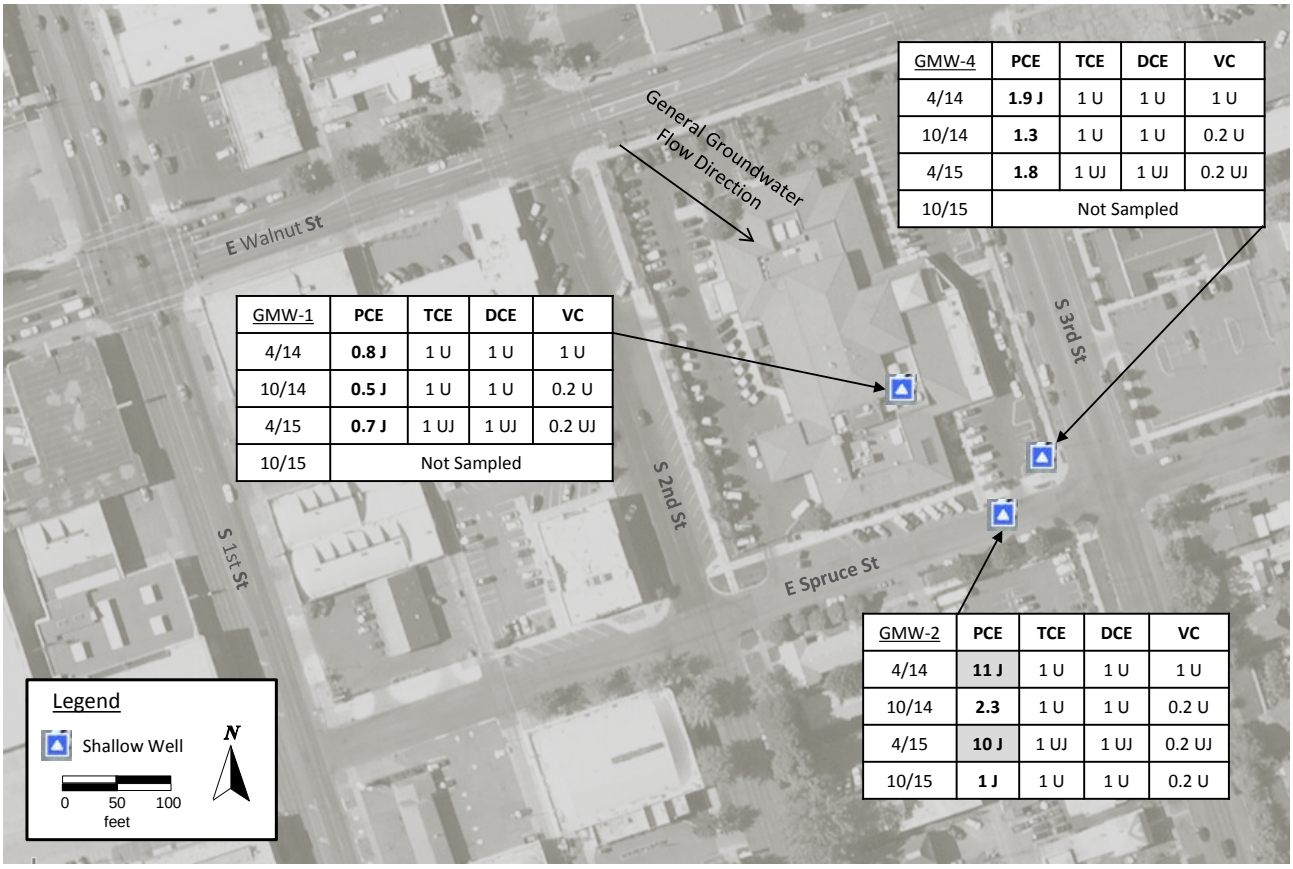
Goodwill-City of Yakima

The Goodwill-City of Yakima site is the present location of the City of Yakima Police and Justice Center (Figure 2). Contaminated soil was removed from this site as part of an interim action in 1995 (Huntingdon Engineering, 1995). The 3 wells located at this site are the most northern wells currently being sampled in the YRRA monitoring program. Groundwater monitoring data for these wells are available from 1997 to the present in Table C-1. Long-term project data are also presented as time series graphs.

Tetrachloroethene (PCE) was the only chlorinated solvent detected during the 2014-2015 monitoring period (Figure 3). The other contaminants of concern, trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride (VC) were not detected.

PCE was detected in downgradient well GMW-2 at concentrations above the MTCA Method A cleanup level of 5 ug/L during both the 2014 and 2015 spring sample events. Although PCE concentrations in this well fluctuate, they continue to exceed the cleanup level with no evident decrease in concentrations (Figure C-2).

PCE was detected at concentrations near the reporting limit of 1 ug/L in upgradient well GMW-1 and downgradient well GMW-4. PCE concentrations continue to be below the cleanup level in both of these wells (Figure C-1 and Figure C-3).



GMW-4	PCE	TCE	DCE	VC
4/14	**1.9 J**	1 U	1 U	1 U
10/14	**1.3**	1 U	1 U	0.2 U
4/15	**1.8**	1 UJ	1 UJ	0.2 UJ
10/15	Not Sampled			

GMW-1	PCE	TCE	DCE	VC
4/14	**0.8 J**	1 U	1 U	1 U
10/14	**0.5 J**	1 U	1 U	0.2 U
4/15	**0.7 J**	1 UJ	1 UJ	0.2 UJ
10/15	Not Sampled			

GMW-2	PCE	TCE	DCE	VC
4/14	**11 J**	1 U	1 U	1 U
10/14	**2.3**	1 U	1 U	0.2 U
4/15	**10 J**	1 UJ	1 UJ	0.2 UJ
10/15	**1 J**	1 U	1 U	0.2 U

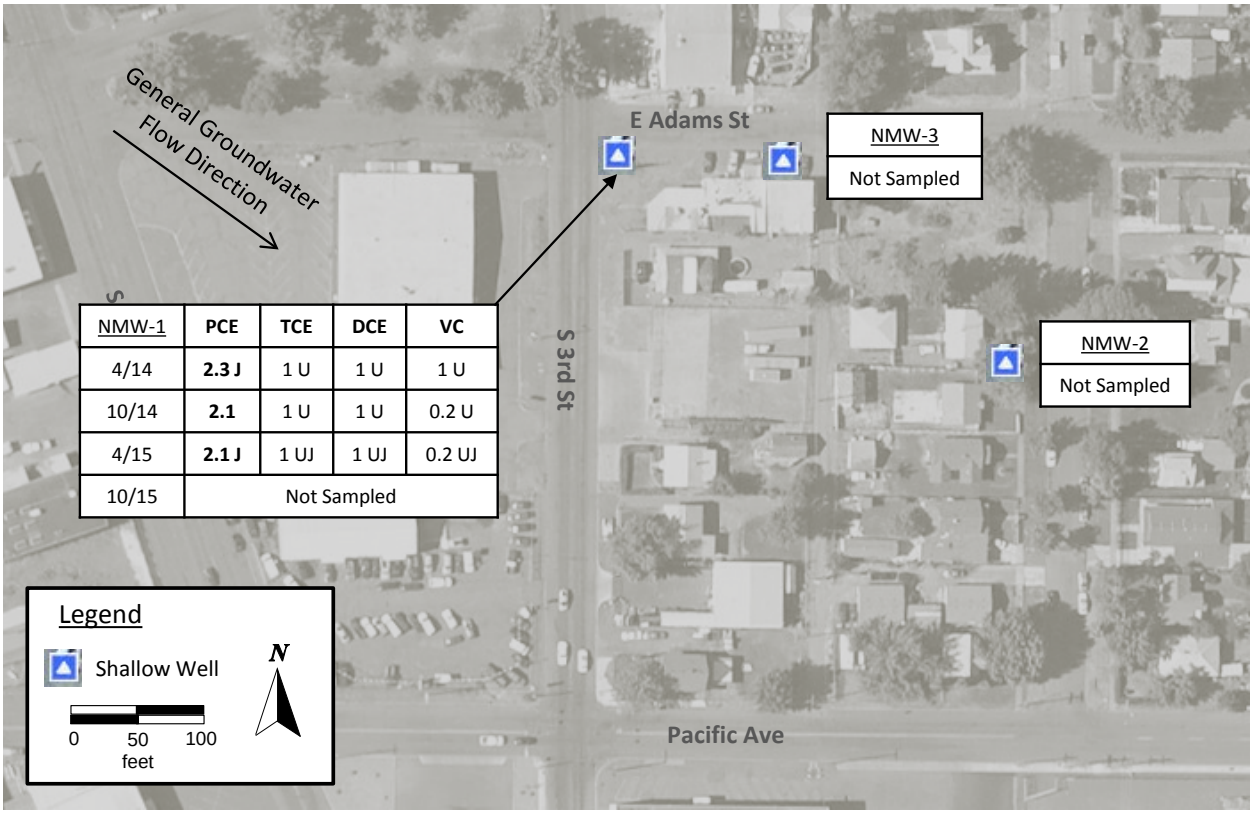
Figure 3. Goodwill-City of Yakima Well Locations and cVOC Results (ug/L) for 2014 and 2015.

Nu-Way Cleaners

Nu-Way Cleaners is located approximately 0.5 miles southeast of the Goodwill site (Figure 2). Source removal activities occurred at this site in 1996 (Enviros, 1996). Groundwater monitoring data for these wells are available from 1997 to the present in Table C-2.

During the 2014-2015 monitoring period only well NMW-1 was sampled. PCE was detected in this well at concentrations below the MTCA cleanup level of 5 ug/L in both April and October (Figure 4). No other cVOCs were detected.

In October 2014, well NMW-2 could not be located, therefore it was not sampled. Samples were not collected from this well during either spring event due to an insufficient volume of water. Well NMW-3 remains inaccessible due to a parked vehicle.



NMW-1	PCE	TCE	DCE	VC
4/14	**2.3 J**	1 U	1 U	1 U
10/14	**2.1**	1 U	1 U	0.2 U
4/15	**2.1 J**	1 UJ	1 UJ	0.2 UJ
10/15	Not Sampled			

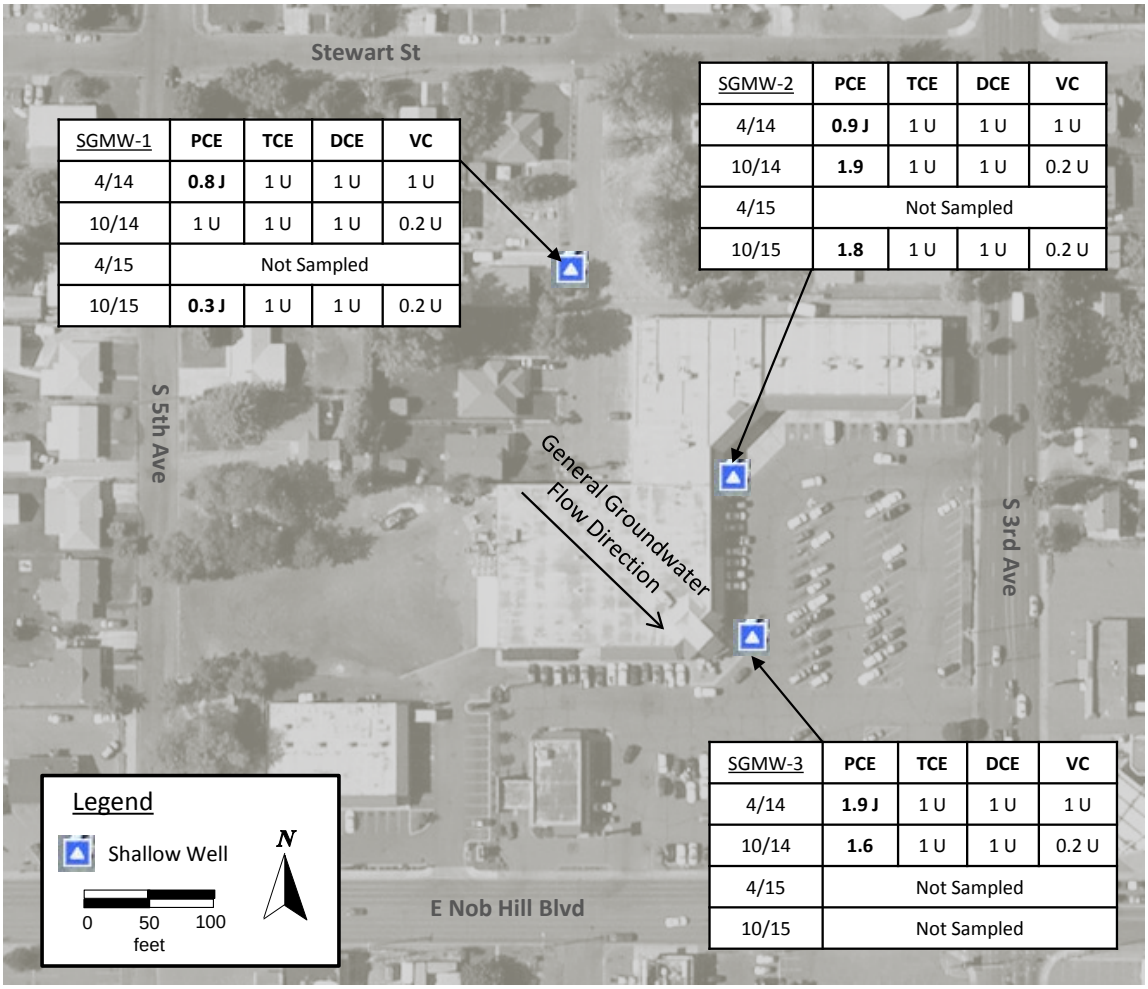
Figure 4. Nu-Way Cleaners Well Locations and cVOC Results (ug/L) for 2014 and 2015.

Since 1997, PCE concentrations in all 3 wells have continued to decrease (Figures C-4, C-5, and C-6), with concentrations ranging from less than 1 to 5.5 ug/L (Table C-2). Overall, PCE concentrations have been below the cleanup level at this site since 2003. Site data indicate that higher PCE concentrations tend to occur during the spring monitoring, while water levels are lower. Downgradient PCE concentrations at this site are consistent with upgradient conditions, indicating that this site no longer appears to pose a significant source of contamination to the larger YRRA plume.

Southgate Laundry

Southgate Laundry site is located west of the railroad tracks along Nob Hill Road (Figure 2). Contaminated soils were removed from the Southgate Laundry site in 1997 as part of an interim action (Maxim Technologies, 1998). Groundwater monitoring data from 1999 to the present are available in Table C-3.

Of the 3 wells sampled at Southgate Laundry in 2014 and 2015, PCE was the only contaminant detected (Figure 5). PCE was detected at concentrations near the reporting limit of 1 ug/L in upgradient well SGMW-1 and downgradient wells SGMW-2 and SGMW-3. All concentrations were below the MTCA cleanup level.



SGMW-1	PCE	TCE	DCE	VC
4/14	**0.8 J**	1 U	1 U	1 U
10/14	1 U	1 U	1 U	0.2 U
4/15	Not Sampled			
10/15	**0.3 J**	1 U	1 U	0.2 U

SGMW-2	PCE	TCE	DCE	VC
4/14	**0.9 J**	1 U	1 U	1 U
10/14	**1.9**	1 U	1 U	0.2 U
4/15	Not Sampled			
10/15	**1.8**	1 U	1 U	0.2 U

SGMW-3	PCE	TCE	DCE	VC
4/14	**1.9 J**	1 U	1 U	1 U
10/14	**1.6**	1 U	1 U	0.2 U
4/15	Not Sampled			
10/15	Not Sampled			

Figure 5. Southgate Laundry Well Locations and cVOC Results (ug/L) for 2014 and 2015.

PCE concentrations in upgradient well SGMW-1 (Figure C-7) have consistently been below MTCA cleanup levels. PCE concentrations in downgradient wells SGMW-2 (Figure C-8) and SGMW-3 (Figure C-9) were above the cleanup levels until 2005, with concentrations in both wells ranging from about 2 to 29 ug/L. Since 2006, PCE concentrations have decreased, ranging from less than 1 to 4.5 ug/L. This seems to indicate that past source-removal activities have been successful in reducing the PCE groundwater concentrations at the site.

Washington Central Railroad Roundhouse

The Washington Central Railroad Roundhouse (WCRR) is located in the central portion of the YRRA (Figure 2). There is no record of any direct remediation occurring at this site to address the PCE contamination. The 3 WCRR wells are a well cluster and are completed to approximately 30 feet (WDOE-3S), 58 feet (WDOE-3I), and 100 feet (WDOE-3D) depth. Some of the highest contaminant concentrations in the YRRA well network continue to be detected in these 3 wells. Groundwater monitoring data for WCRR is available from 1997 to the present in Table C-4.

PCE was detected above the cleanup level of 5 ug/L in all WCRR wells during the 2014-2015 monitoring period. Concentrations ranged from approximately 5 to 15 ug/L (Figure 6). Concentrations for 2014-2015 were within the range of historical data collected since 1997.

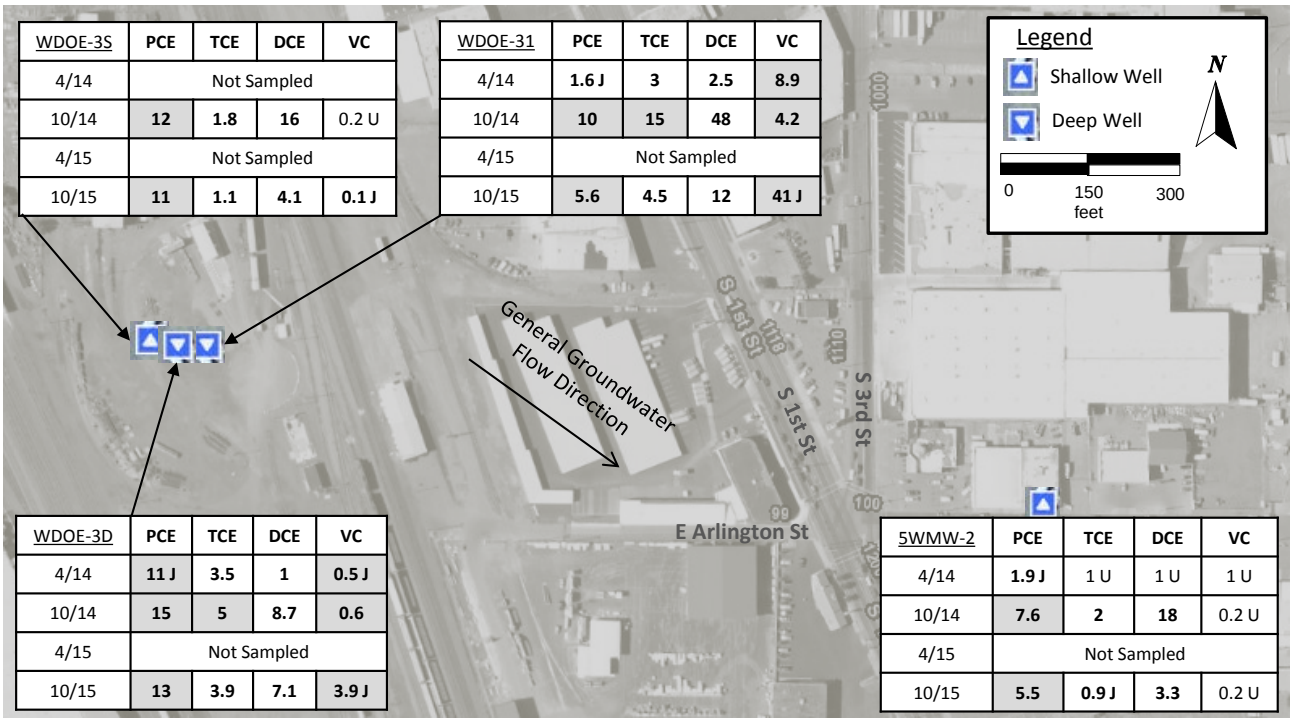


Figure 6. Washington Central Railroad Roundhouse and Fifth Wheel Truck Repair Well Locations and cVOC Results (ug/L) for 2014 and 2015.

Since 1997, PCE concentrations in the 3 wells have ranged from approximately 5 to 90 ug/L (WDOE-3S), 0.1 to 42 ug/L (WDOE-3I), and 2 to 16 ug/L (WDOE-3D). PCE concentrations decreased substantially in the shallow (WDOE-3S) and intermediate (WDOE-3I) wells after June 2000, to 5 to 19 ug/L and less than 1 to 18 ug/L, respectively. The reason for the decrease in concentrations is unknown, since no cleanup activities have occurred at this site. PCE concentrations in both wells continue to exceed the cleanup level in the fall (Figures C-10 and C-11), when higher PCE concentrations tend to occur. PCE concentrations in the deep well (WDOE-3D) have been more constant, ranging from about 6 to 16 ug/L (Figure C-12), with concentrations also slightly higher in the fall.

PCE metabolic breakdown products were also detected in all 3 wells. TCE, cis-1,2-DCE, and VC have consistently been detected in wells WDOE-3I and WDOE-3D, an indication that natural biodegradation is occurring.

TCE concentrations ranged from 1 to 15 ug/L, exceeding the cleanup level of 5 ug/L in the fall of 2014 in wells WDOE-3I (15 ug/L) and WDOE-3D (5 ug/L). With a few exceptions, TCE has been detected below the cleanup level in both wells (Table C-4). However, TCE concentrations in well WDOE-3I appear to be increasing (Figure C-13).

In 2014 and 2015, cis-1,2-DCE was detected in all 3 wells with a concentration range of 1 to 48 ug/L. Although concentrations were below the MTCA Method A cleanup level of 70 ug/L, concentrations in all wells increased significantly beginning in October 2014.

Vinyl chloride was also detected in all 3 wells in 2014-2015, exceeding the MTCA cleanup level of 0.2 ug/L in wells WDOE-3I and WDOE-3D. Concentrations ranged from approximately 4 to 41 ug/L (WDOE-3I) and 0.5 to 4 ug/L (WDOE-3D). Prior to 2014, vinyl chloride concentrations in well WDOE-3I ranged from non-detect to 7.5 ug/L. Wells WDOE-3I and WDOE-3D are the only 2 wells in the YRRA monitoring program that have had detectable concentrations of vinyl chloride.

The reason for the concentration increases in TCE, cis-1,2-DCE, and vinyl chloride is unknown.

Other cVOCs were detected at estimated concentrations below the reporting limit of 1 ug/L in wells WDOE-3I and WDOE-3D.

Contaminant concentrations in wells WDOE-3I and WDOE-3D indicate that the plume has a vertical component that reaches the deep water-bearing zone in this portion of the YRRA.

The data indicate that the WCRR facility continues to act as a significant source of chlorinated solvent contamination to groundwater, including to deeper portions of the aquifer system.

Fifth Wheel Truck Repair

Fifth Wheel Truck Repair is located approximately 0.3 miles east (cross-gradient) of the WCRR wells (Figure 2). Cleanup activities at this site occurred from 1991 to 2001 (Maxim Technologies, 1996).

Ecology sampled one downgradient well at the site. PCE was detected in both 2014 and 2015, with the October results above the MTCA cleanup level (Figure 6 above). Groundwater monitoring data are available for well 5WMW-2 from 1999 to 2015 (Table C-5). During that time PCE concentrations in the well have ranged from less than 1 to 11 ug/L, with higher concentrations consistently occurring in the fall. PCE concentrations appear to be gradually decreasing but still exceed the cleanup level on occasion (Figure C-14).

TCE and cis-1,2-DCE were also detected in this well at concentrations below their respective MTCA cleanup levels.

Cameron Yakima, Inc.

Cameron Yakima is located in the central portion of the YRRA, approximately 0.5 miles southeast (downgradient) of the WCRR wells (Figure 2). Cleanup activities occurred at this site from 1998 to 2001. Groundwater monitoring data for the site are available from 1997 to the present (Table C-6).

In 2014-2015, Ecology collected groundwater samples from 13 wells on the Cameron Yakima site. PCE was detected in all wells at concentrations that ranged from approximately 1 to 15 ug/L (Figure 7).

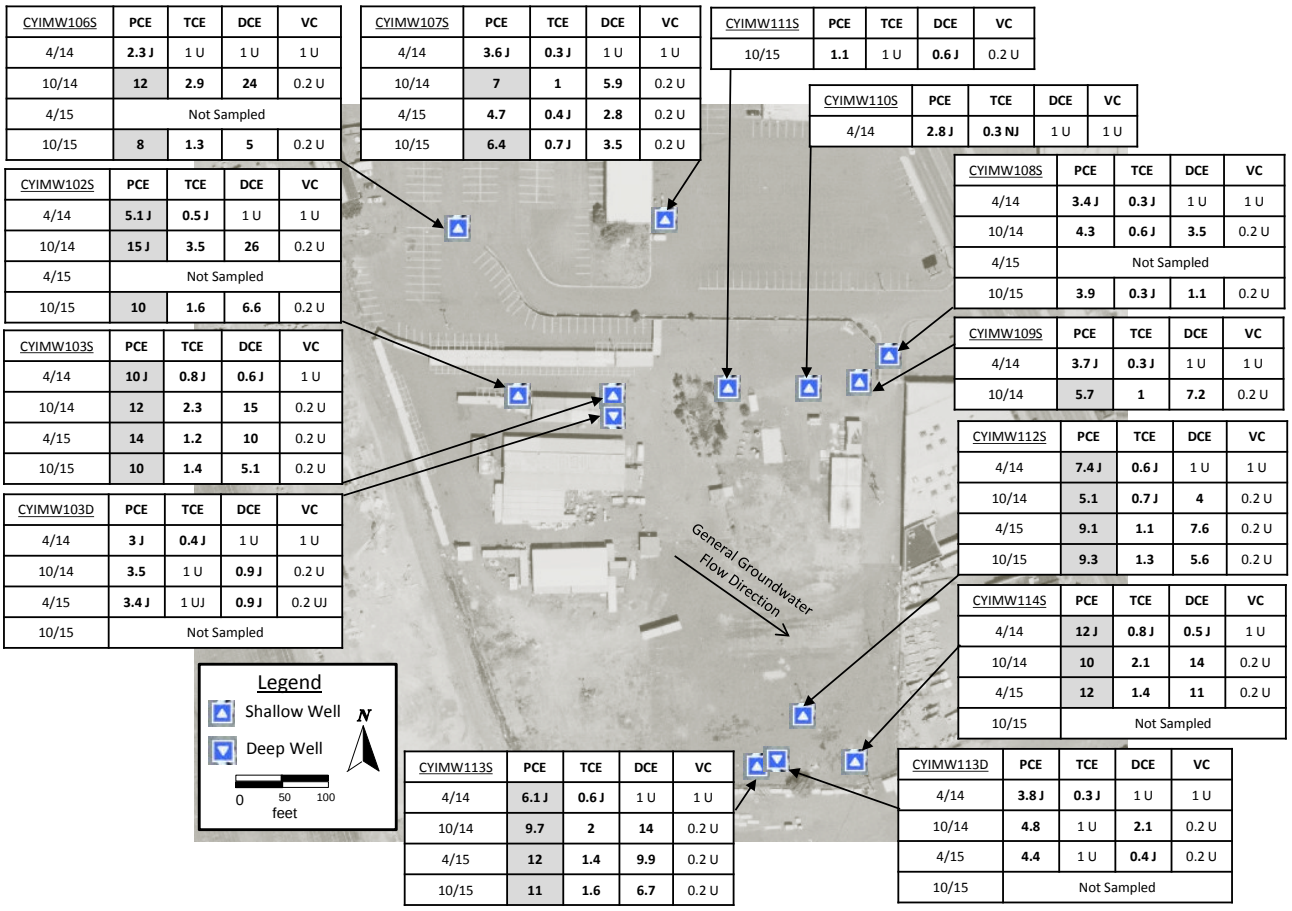


Figure 7. Cameron Yakima Well Locations and cVOC Results (ug/L) for 2014 and 2015.

PCE was detected in the 2 upgradient wells (CYIMW106S and CYIMW107S) at concentrations that ranged from approximately 2 to 12 ug/L during the 2014-2015 monitoring period. Concentrations exceeded the cleanup level of 5 ug/L in each well in both the 2014 and 2015 fall sample events. Since the 2000 cleanup activities, PCE concentrations have been decreasing but continue to exceed the cleanup level (Figures C-19 and C-20). PCE concentrations are consistently higher in the fall than spring in well CYIMW106S, but no seasonal concentration pattern is seen in well CYIMW107S. Since PCE concentrations in both upgradient wells continue to be elevated, this may indicate continued PCE contamination from sources upgradient of the Cameron site.

Wells CYIMW102S, CYIMW103S, and CYIMW103D are located in the northwest corner of the Cameron site. PCE concentrations in the two shallow wells ranged from 5 to 15 ug/L in 2014 and 2015, consistently exceeding the cleanup level. Prior to soil removal, these two wells had some of the highest PCE concentrations in the YRRA at 72 ug/L (CYIMW102S) and 139 ug/L (CYIMW103S) (Table C-6). PCE concentrations decreased substantially after 2000,

with maximum concentrations of 17 ug/L and 57 ug/L, respectively (Figures C-16 and C-17). Although PCE concentrations continue to exceed the cleanup level in the 2 shallow wells, concentrations have continued to decrease to near or below 10 ug/L since 2006. PCE concentrations in the deep well (CYIMW103D) are more constant at approximately 3 ug/L in 2014 and 2015. Since monitoring began in 1997, the PCE range has been 1.9 to 5.2 ug/L (Figure C-18).

Wells CYIMW108S, CYIMW109S, CYIMW110S, and CYIMW111S are located in the northeast corner of the site. PCE concentrations in these wells have always been low compared to the rest of the site (Table C-6). Concentrations have mostly deceased to below or near the cleanup level of 5 ug/L since the interim action in 2000, including the 2014 and 2015 data (Figures C-21, C-22, C-23, C-24).

Wells CYIMW112S, CYIMW113S, CYIMW113D, and CYIMW114S are located in the southeast corner of the property. PCE concentrations in the 3 shallow wells ranged from approximately 5 to 12 ug/L, consistently exceeding the cleanup level. Contaminant concentrations in these 3 wells gradually decreased after the 2000 cleanup activities but have displayed an increasing trend since 2009 (Figures C-25, C-26, C-28). PCE concentrations are now consistently above the MTCA cleanup level of 5 ug/L. The elevated PCE concentrations along the downgradient boundary of the site indicate possible off-site migration of the contaminant plume. PCE concentrations in the deep well (CYIMW113D) have remained within the range of 3 to 6 ug/L from 1998 to 2015 (Figure C-27).

TCE and cis-1,2-DCE were detected in the Cameron wells more frequently and at higher concentrations beginning in October 2014. Prior to 2014, TCE concentrations ranged from non-detect to 2.5 ug/L, with a slight but more consistent concentration of 1.2 to 3.5 ug/L in 2014-2015. Cis-1,2-DCE saw a greater change in concentrations, increasing from a range of non-detect to 4.4 ug/L prior to 2014, to 1.1 to 26 ug/L in 2014-2015. The reason for the concentration increases for these analytes is unknown.

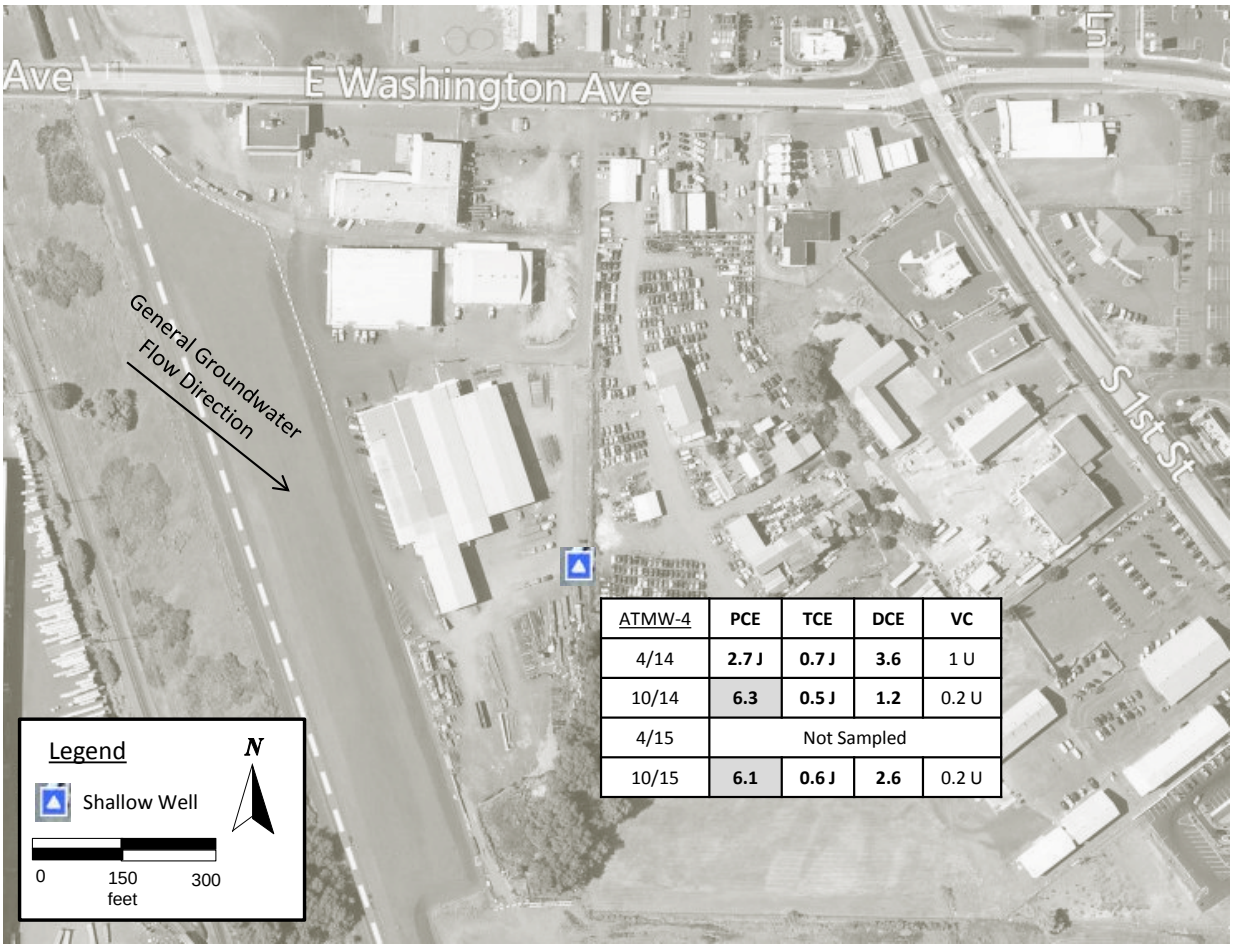
Vinyl chloride remained undetected at this site since sampling began in the 1997 (Table C-6).

Agri-Tech\Yakima Steel

The Agri-Tech\Yakima Steel site is located in the south-central end of the YRRA (Figure 2). A remedial investigation was completed in 2004. A variety of contaminants were identified in the site soils and groundwater, including solvents, pesticides, petroleum and heavy metals (Farallon, 2011). Groundwater monitoring data have been collected from well AT-MW4 since 1999 (Table C-5).

PCE was detected in both 2014 and 2015, with October results slightly exceeding the cleanup level of 5 ug/L (Figure 8). Concentrations were within the range of historical data which have remained fairly consistent since 1999 (Figure C-15).

TCE and cis-1,2-DCE were also detected in the Agri-Tech well at concentrations below their respective cleanup levels.



ATMW-4	PCE	TCE	DCE	VC
4/14	2.7 J	0.7 J	3.6	1 U
10/14	6.3	0.5 J	1.2	0.2 U
4/15	Not Sampled			
10/15	6.1	0.6 J	2.6	0.2 U

Figure 8. Agri-Tech\Yakima Steel Well Location and cVOC Results (ug/L) for 2014 and 2015.

YRRA Remedial Investigation Wells

Nine Remedial Investigation (RI) wells were sampled in 2014-2015: 7 shallow and 2 deep wells. These wells were installed throughout the YRRA to determine the extent of the PCE contaminated groundwater away from known source areas. The YRRA RI wells were installed as shallow and deep pairs to characterize groundwater quality in the upper and lower water-bearing zones. The 9 wells selected for continued monitoring are primarily located along the western and southern edges of the YRRA (Figure 2). Groundwater monitoring data for these wells is presented in Table C-7.

PCE was detected in all 9 RI wells in 2014 and 2015. Concentrations in 5 of the shallow wells and the 2 deep wells were near the reporting limit of 1 ug/L (Figure 9). No other cVOCs were detected in the YRRA RI wells.

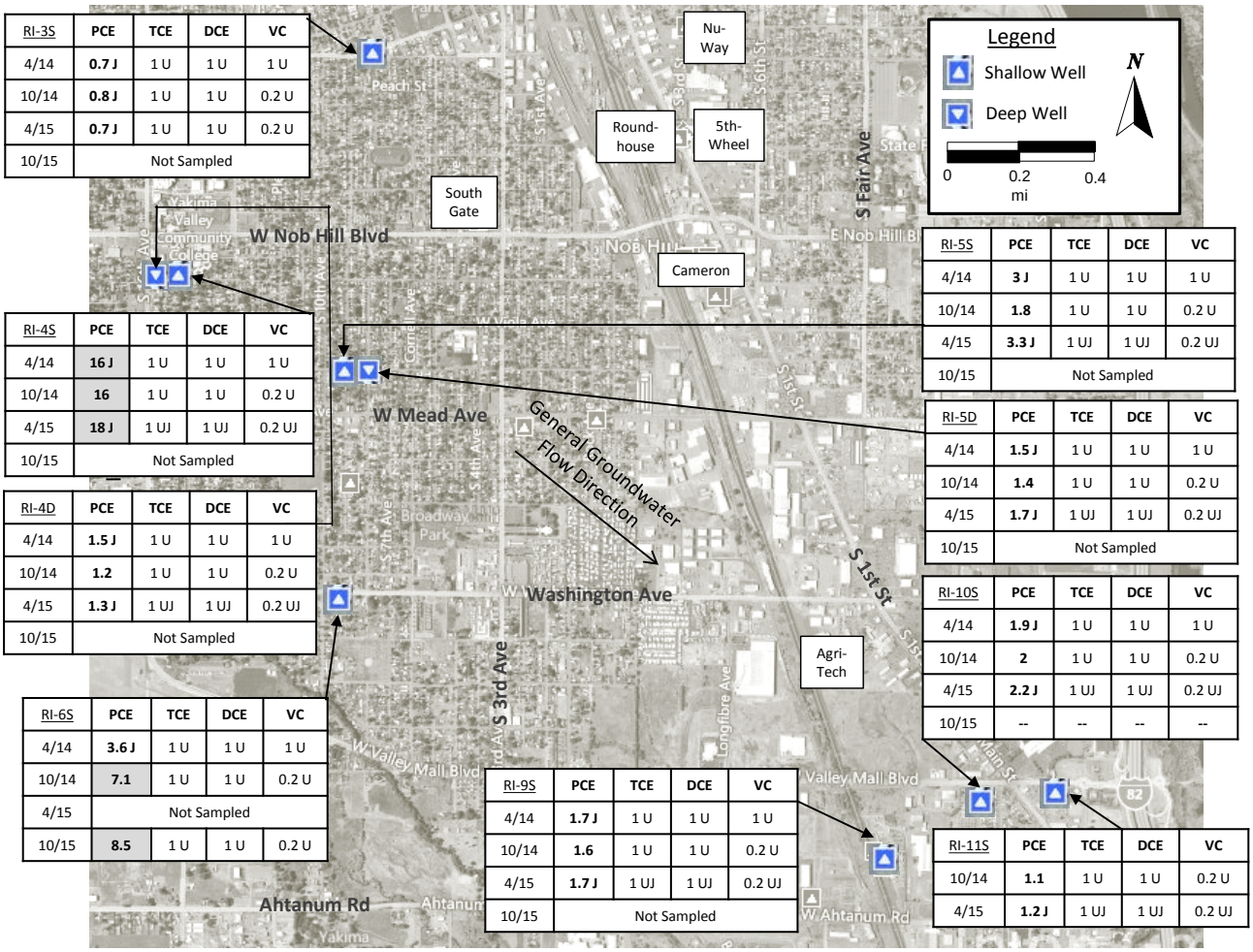


Figure 9. YRRA Remedial Investigation Well Locations and cVOC Results (ug/L) for 2014 and 2015.

Well RI-3S is the farthest upgradient RI well currently being sampled. PCE was detected in this well at concentrations below the reporting limit of 1 ug/L. Low concentrations of PCE (ranging from 0.2 to 2.5 ug/L) have been detected in this well since monitoring began in 1999 (Figure C-29). Because PCE is not naturally occurring, the low concentrations detected in this well indicate that a low level source of PCE to the shallow aquifer continues to exist at the upgradient end of the YRRA.

Wells RI-4S and RI-4D are located on the western edge of the YRRA. Well RI-4S continues to have the highest PCE concentrations of all the RI wells, ranging from 16 to 18 ug/L in both the spring and fall sample rounds of 2014 and 2015. Although concentrations have been fairly stable over most of the monitoring period, they appear to be increasing since 2009 (Figure C-30). PCE was also detected in the deep well (RI-4D) at concentrations near the reporting limit of 1 ug/L (Figure C-31). Fine-grained materials identified in this portion of the project area may be preventing the downward migration of the contaminants. The source area for contamination in these wells is in the process of being identified. Data from these wells indicate that the western extent of the YRRA PCE plume is still undefined.

Wells RI-5S and RI-5D are located in a residential area, approximately 0.7 miles southeast (downgradient) of wells RI-4S/4D. Low levels of PCE continue to be detected in both wells, with a range of 0.41 to 3.3 ug/L (Figures C-32 and C-33). Concentrations are typically slightly higher in the shallow well, which exhibits a seasonal pattern of spring maximums. Concentrations in both wells appear to be increasing. Because these wells are in a residential area, the low PCE levels are most likely from an upgradient source.

Well RI-6S is located in the southeast portion of the project area. PCE was detected above the cleanup level in the fall samples with reported concentrations of 7.1 ug/L (2014) and 8.5 ug/L (2015). PCE concentrations in this well appear to be increasing and have seasonal pattern with higher concentrations occurring in the fall (Figure C-34). Currently there is no known source area for the contamination in this well. The extent of PCE contamination in the shallow aquifer needs to be better characterized in this portion of the YRRA.

Wells RI-9S, RI-10S, and RI-11S are located at the southern boundary of the study area and are the farthest downgradient wells being sampled. These wells continue to have low levels of PCE, ranging from about 0.5 to 3 ug/L between 1999 and 2015 (Figures C-35, C-36, C-37).

Results Summary

Of the 34 wells sampled in 2014-2015, 16 wells (47%) had PCE concentrations above the cleanup level of 5 ug/L (Table 2). These wells are located at Goodwill-City of Yakima, Washington Central Railroad Roundhouse (WCRR), Fifth Wheel Truck Repair, Cameron Yakima, and Agri-Tech/Yakima Steel. Two of the YRRA RI wells along the western edge of the study area also had elevated PCE concentrations.

Figure 10 shows maximum PCE concentration in shallow groundwater for the 2014-2015 monitoring period. Fourteen of the wells with elevated PCE are screened in the shallow water-bearing zone and range in depth from approximately 26 to 40 feet below ground surface (bgs). The maximum PCE concentrations in these wells ranged from about 5 to 18 ug/L.

The remaining 2 wells with elevated PCE concentrations are the deeper WCRR wells, WDOE-3I (58 feet) and WDOE-3D (100 feet). PCE concentrations above the cleanup level in these wells ranged from about 6 to 15 ug/L. These wells, which exhibit anaerobic groundwater conditions, consistently have PCE metabolic breakdown products; TCE, cis-1,2-DCE, and VC. The vinyl chloride concentrations are consistently above the cleanup level of 0.2 ug/L in these 2 wells.

PCE breakdown products were also detected more frequently and at higher concentrations in the central portion of the YRRA during the 2014 and 2015 monitoring period. Although concentrations of PCE breakdown products in most of the wells were below the MTCA cleanup levels, significant increases were observed in the two deeper WCRR wells, the Fifth Wheel Truck Repair well, and at Cameron Yakima. The increases first occurred in October 2014. The reason for the change in analyte detections and increased concentrations is unknown.

Results from the WCRR and Cameron wells confirm that the shallow groundwater in the central portion of the YRRA continues to be contaminated with elevated concentrations of PCE (Table 2, Figure 10). It is not clear whether the contaminant plumes are separate or co-mingled.

Although not part of Ecology's current monitoring program, Frank Wear Cleaners is another source area identified in the YRRA (Figure 10). The site, approximately 0.7 miles upgradient of the WCRR wells, is a substantial source of PCE contamination to the project area. It is currently undergoing active remediation that includes the operation of a soil vapor extraction system since 2012 and a groundwater remediation system that started in 2014. Since operation of the cleanup systems began, there has been a substantial reduction in the contaminant mass. There is evidence that PCE has been mobilized from the soil matrix and that moderate reducing conditions have been generated to stimulate complete reductive dechlorination.

Groundwater at Frank Wear Cleaners is being monitored separately as part of the remediation. As of 2015, high concentrations of PCE, TCE and vinyl chloride continue to be detected in both the shallow onsite and downgradient off-site wells. Groundwater concentrations continue to exceed their applicable cleanup levels at this site (Hart Crowser, 2015).

Table 2. Wells with cVOC Concentrations (ug/L) above MTCA Method A Cleanup Levels for Groundwater for Monitoring Results from 2014 and 2015.

Analyte:	PCE		TCE		Cis-1,2-DCE		VC	
MTCA Cleanup Level:	5 ug/L		5 ug/L		70 ug/L		0.2 ug/L	
Date:	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Goodwill-City of Yakima								
GMW-2	1 U	**10J-11**	1 U	1 U	1 U	1 U	0.2 U	0.2 U
Washington Central Railroad Roundhouse								
WDOE-3S	--	**11-12**	--	1.1-1.8	--	4.1-16	--	0.1J-0.2U
WDOE-3I	**1.6**	**5.6-10**	**3**	**4.5-15**	**2.5**	**12-48**	**8.9**	**4.2-41J**
WDOE-3D	**11**	**13-15**	**3.5**	**3.9-5**	**1**	**7.1-8.7**	**0.5 J**	**0.6-3.9J**
Fifth Wheel Truck Repair								
5WMW-2	**1.9**	**5.5-7.6**	1 U	**0.9J-2**	1 U	**3.3-18**	1 U	0.2 U
Cameron Yakima								
CYIMW102S	**5.1 J**	**10-15J**	**0.5 J**	**1.6-3.5**	1 U	**6.6-26**	1 U	0.2 U
CYIMW103S	**10-14**	**10-12**	**0.8J-1.2**	**1.4-2.3**	**0.6J-10**	**5.1-15**	0.2 U	0.2 U
CYIMW106S	**2.3**	**8-12**	1 U	**1.3-2.9**	1 U	**5-24**	1 U	0.2 U
CYIMW107S	**3.6-4.7**	**6.4-7**	**0.3J-0.4J**	**0.7J-1**	1 U-**2.8**	**3.5-5.9**	1 U	0.2 U
CYIMW109S	**3.7**	**5.7**	**0.3J**	**1**	1 U	**7.2**	1 U	0.2 U
CYIMW112S	**7.4-9.1**	**5.1-9.3**	**0.6J-1.1**	**0.7J-1.3**	1U-**7.6**	**4-5.6**	0.2 U	0.2 U
CYIMW113S	**6.1-12**	**9.7-11**	**0.6J-1.4**	**1.6-2**	1U-**9.9**	**6.7-14**	0.2 U	0.2 U
CYIMW114S	**12**	**10**	**0.8J-1.4**	**2.1**	**0.5J-11**	**14**	0.2 U	0.2 U
Agri-Tech\Yakima Steel								
ATMW-4	**2.7**	**6.1-6.3**	**0.7 J**	**0.5J-0.6J**	**3.6**	**1.2-2.6**	1 U	0.2 U
Remedial Investigation Wells								
RI-4S	**16-18J**	**16**	1 U	1 U	1 U	1 U	0.2 U	0.2 U
RI-6S	**3.6**	**7.1-8.5**	1 U	1 U	1 U	1 U	1 U	0.2 U

U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
Bold: Analyte was detected.
Shade: Values are greater than MTCA cleanup levels.

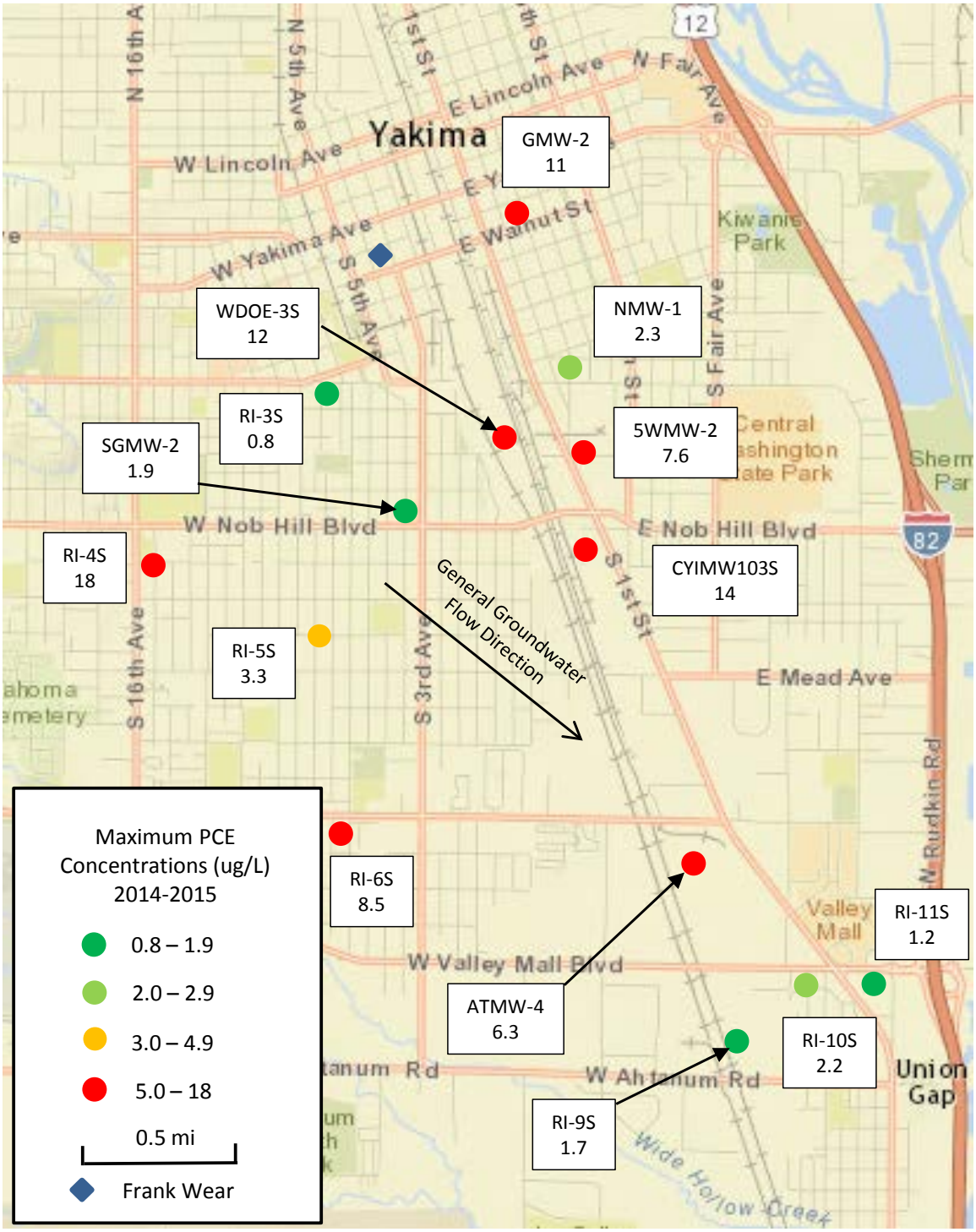


Figure 10. Shallow Zone Maximum PCE Concentrations (ug/L), 2014-2015.

Discussion and Conclusions

Dissolved tetrachloroethene (PCE) continues to be present in the shallow unconfined aquifer throughout the YRRA project area. Cleanup activities over the years appear to have been effective in reducing contaminant concentrations in groundwater at many of the identified source areas. However, there are still areas where contaminant concentrations continue to exceed (not meet) the MTCA cleanup levels.

There are 59 monitoring wells in the YRRA long-term monitoring program. In 2013, Ecology selected a subset of 36 wells for continued monitoring. Wells were removed from the active monitoring program if they consistently showed low or no detections of the contaminants of concern, primarily PCE. In 2014-2015, Ecology collected groundwater samples from 34 of the 36 wells. The selected subset of wells continues to provide monitoring points to evaluate groundwater conditions throughout the project area.

Of the 36 wells selected for continued monitoring, 27 are associated with 7 identified source areas. Five of the source areas have undergone some level of cleanup to address the PCE contamination: Goodwill-City of Yakima, Nu-Way Cleaners, Southgate Laundry, Fifth Wheel Truck Repair, and Cameron Yakima. Cleanup activities at Nu-Way Cleaners, Southgate Laundry, and Fifth Wheel Truck Repair appear to have eliminated or reduced these areas as ongoing sources of PCE contamination.

There is no record of any direct remediation at the Washington Central Railroad Roundhouse site. The 3 wells at this site, which were installed as a well cluster of varying depths, have some of the highest contaminant concentrations in the YRRA. PCE concentrations in the shallow to deep wells indicate that the contaminant plume has a vertical component that reaches the deep water-bearing zone in this portion of the YRRA. As in the past, PCE metabolic breakdown products were also present at this site in the two deeper wells, indicating that natural biodegradation is occurring. TCE and cis-1,2-DCE are typically detected at low concentrations, while vinyl chloride has consistently been detected at concentrations above the cleanup level. However, beginning in October 2014 PCE breakdown products appeared in all 3 wells at significantly higher concentrations. The reason for the increases is unknown. The Washington Central Railroad Roundhouse facility continues to act as a significant source of chlorinated solvent contamination to groundwater, including to deeper portions of the aquifer system.

The increase in PCE breakdown products was also observed in Fifth Wheel Truck Repair and Cameron Yakima wells. TCE and cis-1,2-DCE were detected more frequently and at higher concentrations starting in October 2014 than in the past. The greatest increase was in cis-1,2-DCE.

The 2014-2015 data show that the highest contaminant concentrations are still found at sites located in the central portion of the YRRA. These include Washington Central Railroad Roundhouse, Cameron Yakima, and Frank Wear Cleaners. Although cleanup activities have occurred at 2 of these locations, the lateral and vertical extent of the contaminant plumes is still poorly defined. Further investigation is needed at each of these sites to determine the full extent

of the PCE plumes and whether the plumes have co-mingled, as possibly indicated by the groundwater flow direction.

In 1997, 29 wells were installed for the YRRA Remedial Investigation. The wells were installed as shallow and deep pairs at 14 locations throughout the project area to characterize aquifer properties and determine the lateral and vertical extent of PCE contamination in the groundwater. Nine of these wells were sampled during the 2014-2015 monitoring period. The 9 wells selected for continued monitoring are primarily located along the western and southern edges of the YRRA.

PCE was detected at concentrations far below the cleanup level in 7 of the 9 RI wells. Because PCE is not naturally occurring, the low concentrations detected in these wells indicate that low level sources of PCE continue to exist and contribute to the contamination of the YRRA.

The other two wells, RI-4S and RI-6S, which are located on the western edge of project area, consistently have elevated PCE concentrations that appear to be increasing. The data from these wells show there are areas in the YRRA that are contaminated with PCE, where the source areas are still being identified and that require remedial actions. In addition to source identification and remedial action, the western extent of the YRRA PCE contamination still needs to be defined in this part of the study area.

Of the 34 wells sampled, 6 are screened in the deeper zone (60-120 feet). Only the 2 wells at the Washington Central Railroad Roundhouse site have contaminant concentrations that exceeded the MTCA cleanup levels. PCE concentrations in the 4 other deep wells are consistently below the cleanup levels and have remained fairly constant over the monitoring period, 1997 to 2015. Two of these wells are located at the Cameron site, and 2 are RI wells located in the western portion of the project area.

Because groundwater within the YRRA continues to be contaminated by both identified and unidentified source areas, cleanup activities and investigations continue to be conducted across the project area.

Recommendations

Based on the 2014-2015 monitoring results for the YRRA, the following recommendations are provided:

- Additional investigations at the Washington Central Railroad Roundhouse and Cameron Yakima sites to determine the full lateral and vertical extent of the contaminant plumes, since off-site contaminant migration at these two sites is most likely occurring.
- Continued investigation of the Frank Wear Cleaners site, because the PCE contaminant plume extends beyond the current site monitoring well network.
- Continued investigation into the potential source areas for PCE contamination detected in Remedial Investigation wells RI-4S/4D and RI-6S.
- Continued monitoring of the 36 YRRA well network based on seasonal PCE concentrations. The reduction in the sample frequency will continue to improve the cost effectiveness of the program while still providing the necessary data to evaluate groundwater conditions throughout the project area.

References

Ecology, 2008. Manchester Environmental Laboratory Lab Users Manual, Ninth Edition. Manchester Environmental Laboratory, Washington State Department of Ecology, Manchester, WA.

Enviros, 1996. Remedial Action and Feasibility Study, Nu-Way Cleaners, 801 South Third Street Yakima, WA. June 30, 1996 E1/950109.

Farallon Consulting, 2011. Feasibility Study Work Plan, Agri-Tech and Yakima Steel Fabricators, Yakima Washington. PN: 765-001. May 2011.

Hart Crowser, 2015. Annual Performance Report, Former Frank Wear Cleaners Site, Yakima Washington. PN: 17800-23/Task 9. April 2, 2015.

Huntingdon Engineering and Environmental, 1995. Phase III Environmental Remediation, Yakima Goodwill Industries Site. Project No: 194-1969 and 194-1969-1. February 1995.

Kane, 2011. YRRA June 2011 Ground Water and PCE Data. Memo to Jason Shira (Washington State Department of Ecology). PF-YRRA 29044-54506.

Marti, P., 2009. Standard Operating Procedure for Manual Well-Depth and Depth-to-Water Measurements. Washington State Department of Ecology, Olympia, WA. SOP Number EAP052, Version 1.0. www.ecy.wa.gov/programs/eap/quality.html.

Marti, P., 2013. Quality Assurance Project Plan: Yakima Railroad Area Groundwater Performance Monitoring. Washington State Department of Ecology, Olympia, WA. Publication No. 13-03-113. https://fortress.wa.gov/ecy/publications/SummaryPages/1303113.html

Marti, P., 2014. Standard Operating Procedure for Purging and Sampling Monitoring Wells plus *Guidance on Collecting Samples for Volatile and other Organic Compounds.* Washington State Department of Ecology, Environmental Assessment Program, EAP078, Version 2.0. www.ecy.wa.gov/programs/eap/quality.html.

Maxim Technologies, Inc., 1996. Environmental Investigation and Remediation, Fifth Wheel Truck Repair Facility, Yakima Washington. Project No. 5609500619. May 1996

Maxim Technologies, Inc., 1998. Yakima Railroad Area Remedial Investigation Interim Action Soil Removal/ Groundwater Investigation, Southgate Laundry South Third Avenue and Nob Hill Blvd. Yakima WA. January 1998.

Secor, 1998. Draft Remedial Investigation Yakima Railroad Area; Yakima, Washington. Secor PN: 00378-001-02. December 1998.

U.S. Geological Survey (USGS), 2009. Hydrogeologic Framework of the Yakima River Basin Aquifer System, Washington. Prepared in cooperation with the U.S. Bureau of Reclamation, Washington State Department of Ecology, and Yakama Nation. Scientific Investigation Report 2009-5152.

Appendices

Appendix A. Well Details and Field Measurements

Table A-1. Well Construction Details.

Well ID	Well Installation Date	Well Tag ID	Latitude (decimal degrees)	Longitude (decimal degrees)	TOC Elevation (feet)	TOC Stickup (feet)	Ground Surface Elevation (feet)	Casing Diameter (inches)	Well Depth from TOC (feet)	Screen Depth (from TOC)	
										Top (feet)	Bottom (feet)
GMW-1	4/1994	ABJ993	46.59949	-120.5019	1063.00	-1.44	1064.44	2	23	13	23
GMW-2	4/1994	ABJ994	46.59911	-120.50169	1055.42	-0.27	1055.69	2	23	13	23
GMW-4	1/1996	BIN804	46.59924	-120.50151	1056.94	-0.34	1057.28	2	30	10	30
NMW-1	6/1995	ABJ918	46.59366	-120.49867	1044.00	-0.29	1044.29	2	24.1	15	25
NMW-2	6/1995	ABJ919	46.59322	-120.49748	1044.21	-0.23	1044.44	2	23.6	10	25
NMW-3	6/1995	ABJ920	46.59362	-120.49820	1043.83	--	--	2	23.8	15	25
SGMW-1	4/1996	BIN801	46.58660	-120.51086	1056.90	-0.26	1057.16	2	43.7	15	45
SGMW-2	4/1996	BIN803	46.58617	-120.51034	1056.47	-0.35	1056.82	2	44.2	15	45
SGMW-3	4/1996	BIN802	46.58583	-120.51027	1054.77	-0.49	1055.26	2	45	15	45
WDOE-3S	--	BIN819	46.58963	-120.50341	1053.32	2.82	1050.50	2	29.9	--	--
WDOE-3I	--	BIN817	46.58963	-120.50325	1053.27	2.87	1050.40	2	58.5	--	--
WDOE-3D	--	BIN818	46.58962	-120.50332	1053.12	2.81	1050.31	2	100	--	--
5WMW-2	2/1995	BIN808	46.58887	-120.49778	1039.22	-0.55	1039.77	2	33.6	15	35
CYIMW102S	--	BIN810	46.58388	-120.49798	1030.74	-0.29	1031.03	2	30	10	30
CYIMW103S	--	BIN809	46.58388	-120.49757	1030.65	-0.54	1031.19	2	29.5	10	30
CYIMW103D	1/2003	AHR176	46.58386	-120.49757	1030.66	-0.35	1031.01	2	60	50	60
CYIMW106S	--	BIN806	46.58439	-120.49839	1033.46	-0.46	1033.92	2	29.2	10	30
CYIMW107S	8/1998	BIN805	46.58436	-120.49738	1033.85	-0.15	1034.00	2	29.3	10	30
CYIMW108S	8/1998	BIN807	46.58405	-120.49637	1031.45	-0.64	1032.09	2	30	10	30
CYIMW109S	8/1998	BIN815	46.58394	-120.49649	1029.19	-0.97	1030.16	2	29	10	30
CYIMW110S	8/1998	--	46.58389	-120.49678	1028.50	--	--	2	29	10	30
CYIMW111S	8/1998	--	46.58389	-120.49711	1029.33	--	--	2	31	10	30
CYIMW112S	8/1998	BIN811	46.58298	-120.49679	1028.84	-0.69	1029.53	2	29	10	30
CYIMW113S	8/1998	BIN814	46.58275	-120.49690	1028.38	-1.15	1029.53	2	30	11	31
CYIMW113D	8/1998	BIN813	46.58276	-120.49689	1028.19	-0.89	1029.08	2	59.5	50	60
CYIMW114S	8/1998	BIN812	46.58275	-120.49652	1028.18	-1.34	1029.52	2	30.7	10	30

Well ID	Well Installation Date	Well Tag ID	Latitude (decimal degrees)	Longitude (decimal degrees)	TOC Elevation (feet)	TOC Stickup (feet)	Ground Surface Elevation (feet)	Casing Diameter (inches)	Well Depth from TOC (feet)	Screen Depth (from TOC)	
										Top (feet)	Bottom (feet)
ATMW-4	10/1997	BIN816	46.56834	-120.48978	1000.82	-0.27	1001.09	2	30	10	30
RI-3S	10/1997	AEB112	46.59247	-120.51698	1071.39	-0.72	1072.11	2	47.2	33	48
RI-4S	11/1997	AEB126	46.58349	-120.52999	1051.91	-0.89	1052.80	6	35	20	35
RI-4D	11/1997	AEB125	46.58349	-120.53005	1052.48	-0.30	1052.78	6	126	116	126
RI-5S	10/1997	AEB114	46.57982	-120.51812	1044.51	-0.41	1044.92	2	38.4	24	39
RI-5D	10/1997	AEB113	46.57982	-120.51819	1044.54	-0.32	1044.86	2	119	109	119
RI-6S	11/1997	AEB122	46.57047	-120.51879	1033.50	-0.37	1033.87	2	38.9	25	40
RI-9S	10/1997	AEB116	46.56028	-120.48761	988.30	-0.54	988.84	2	28.8	15	30
RI-10S	11/1997	AEB128	46.56235	-120.48152	989.05	-0.62	989.67	2	33.3	20	35
RI-11S	11/1997	AEB130	46.56268	-120.47698	988.53	-0.41	988.94	2	38.6	23	38

-- Information not available.
VERTICAL DATUM: NAVD88. Vertical accuracy measure +/- 10 ft (3m).
HORIZONTAL DATUM: NAD83 HARN. Horizontal accuracy measure +/- 10 ft (3m).
TOC: Top of well casing.

Table A-2. Field Parameter Measurements, 2014 and 2015.

Well ID	Well Tag ID	Sample Date	Depth to Groundwater (ft below ground surface)	Temp (deg C)	pH (standard units)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Conductivity (umhos/cm)
Goodwill-City of Yakima								
GMW-1	ABJ993	4/22/2014	19.96	16.4	7.1	7.7	212	170
		10/21/2014	18.08	18.7	6.8	7.1	229	164
		4/29/2015	19.87	14.1	7.0	8.8	254	136
GMW-2	ABJ994	4/23/2014	18.00	16.0	6.9	--	220	173
		10/21/2014	16.29	17.7	6.8	5.3	204	142
		4/28/2015	18.05	15.8	7.2	8.9	233	141
		10/27/2015	16.48	17.6	6.7	5.4	407	164
GMW-4	BIN804	4/23/2014	18.63	15.9	6.8	--	229	221
		10/21/2014	16.96	17.6	6.7	7.0	212	230
		4/28/2015	18.66	16.2	7.0	8.7	242	202
Nu-Way Cleaners								
NMW-1	ABJ918	4/23/2014	20.49	15.1	6.7	7.8	224	264
		10/21/2014	16.28	17.2	6.4	5.9	208	238
		4/27/2015	19.73	16.2	6.8	8.8	216	212
Southgate Laundry								
SGMW-1	BIN801	4/21/2014	34.94	14.7	6.7	6.4	182	341
		10/20/2014	25.29	15.2	6.7	7.8	199	248
		10/26/2015	26.16	15.9	7.1	7.7	204	293
SGMW-2	BIN803	4/21/2014	35.25	15.1	7.2	6.7	185	335
		10/20/2014	26.34	15.6	6.7	7.9	183	248
		10/26/2015	27.18	15.9	7.1	8.0	190	291
SGMW-3	BIN802	4/21/2014	33.36	14.6	6.8	6.7	227	342
		10/20/2014	24.61	15.5	6.7	8.3	184	254
Washington Central Railroad Roundhouse								
WDOE-3S	BIN819	10/23/2014	21.33	17.0	6.9	7.1	214	244
		10/28/2015	21.85	17.3	6.5	7.2	386	302
WDOE-3I	BIN817	4/25/2014	29.91	15.7	7.0	0.47	-23	344
		10/23/2014	21.84	16.3	7.1	0.23	153	264
		10/28/2015	22.4	15.7	6.7	0.76	266	321
WDOE-3D	BIN818	4/25/2014	30.47	15.3	7.1	0.24	-15	288
		10/23/2014	23.87	16.1	7.4	0.2	9.7	241
		10/28/2015	24.45	16.2	7.1	0.44	-14	291
Fifth Wheel Truck Repair								
5WMW-2	BIN808	4/21/2014	21.41	16.0	7.2	4.4	174	291
		10/21/2014	16.99	17.8	6.5	4.5	225	296
		10/27/2015	16.93	18.5	6.5	4.6	408	342

Well ID	Well Tag ID	Sample Date	Depth to Groundwater (ft below ground surface)	Temp (deg C)	pH (standard units)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Conductivity (umhos/cm)
Cameron Yakima Inc.								
CYIMW102S	BIN810	4/23/2014	19.75	15.0	6.7	7.7	252	268
		10/22/2014	15.17	17.3	6.5	5.5	295	326
		10/27/2015	15.73	16.8	6.5	5.6	329	388
CYIMW103S	BIN809	4/22/2014	20.66	15.2	6.9	5.2	226	362
		10/22/2014	15.83	17.9	6.5	6.0	289	325
		4/29/2015	20.07	15.7	6.4	6.0	276	356
		10/27/2015	16.49	18.3	6.5	6.5	361	393
CYIMW103D	AHR176	4/22/2014	21.26	15.6	7.1	3.5	204	332
		10/22/2014	16.51	16.1	6.8	4.0	226	265
		4/29/2015	20.55	16.8	6.8	4.1	246	310
CYIMW106S	BIN806	4/23/2014	22.24	15.6	6.8	8.0	229	217
		10/21/2014	17.28	17.5	6.5	5.1	270	325
		10/26/2015	17.8	18.2	6.9	5.4	290	384
CYIMW107S	BIN805	4/23/2014	23.4	15.1	6.8	8.4	238	198
		10/21/2014	18.49	16.7	6.6	6.3	261	260
		4/29/2015	22.83	15.8	6.6	8.4	250	199
		10/26/2015	19.24	16.9	6.9	6.3	284	324
CYIMW108S	BIN807	4/22/2014	22.09	15.3	7.0	5.7	212	289
		10/21/2014	17.15	17.5	6.7	6.8	247	250
		10/26/2015	17.87	17.4	7.1	6.1	219	286
CYIMW109S	BIN815	4/22/2014	20.15	15.6	7.1	5.7	223	283
		10/22/2014	15.25	17.6	6.6	6.4	271	264
CYIMW110S	--	4/23/2014	18.28	14.7	6.8	8.3	242	210
CYIMW111S	--	10/27/2015	15.47	17.3	6.7	6.5	393	285
CYIMW112S	BIN811	4/22/2014	19.56	15.3	6.9	6.8	251	289
		10/22/2014	14.89	16.0	6.6	6.4	264	236
		4/29/2015	18.89	15.7	6.4	7.8	257	285
		10/27/2015	15.48	17.1	6.5	6.0	381	371
CYIMW113S	BIN814	4/22/2014	19.26	14.8	7.0	7.7	248	240
		10/22/2014	14.55	16.7	6.6	6.1	296	272
		4/29/2015	18.60	15.7	6.4	5.8	266	314
		10/27/2015	15.18	17.3	6.5	5.8	392	375
CYIMW113D	BIN813	4/22/2014	20.65	15.7	7.1	4.9	217	290
		10/22/2014	15.94	16.1	6.9	5.1	249	247

Well ID	Well Tag ID	Sample Date	Depth to Groundwater (ft below ground surface)	Temp (deg C)	pH (standard units)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Conductivity (umhos/cm)
		4/29/2015	19.94	16.5	6.9	5.3	238	273
CYIMW114S	BIN812	4/22/2014	19.96	15.3	6.9	6.2	261	326
		10/22/2014	15.14	17.3	6.5	6.1	292	269
		4/29/2015	19.24	15.8	6.4	7.2	260	288
Agri-Tech Yakima Steel Fabricators								
ATMW-4	BIN816	4/24/2014	8.65	14.8	6.8	3.0	235	331
		10/23/2014	5.28	18.2	6.7	4.3	237	296
		10/28/2015	5.34	18.1	6.4	4.3	397	355
YRRA Remedial Investigation Wells								
RI-3S	AEB112	4/24/2014	39.99	14.7	6.9	6.3	227	395
		10/20/2014	29.13	15.9	6.9	8.0	181	282
		4/27/2015	39.45	15.2	7.1	7.2	226	384
RI-4S	AEB126	4/24/2014	15.41	15.3	7.4	4.7	193	739
		10/24/2014	11.01	15.9	7.6	5.5	209	679
		4/28/2015	15.06	16.3	7.5	5.1	215	729
RI-4D	AEB125	4/24/2014	13.97	15.3	7.6	6.9	184	290
		10/24/2014	10.31	15.6	8.2	6.4	196	268
		4/28/2015	13.60	16.7	8.2	8.0	187	285
RI-5S	AEB114	4/21/2014	18.46	14.6	7.2	7.3	183	412
		10/20/2014	14.08	16.1	6.7	7.7	190	263
		4/27/2015	18.87	15.0	7.0	7.8	214	404
RI-5D	AEB113	4/21/2014	26.22	15.0	7.6	6.0	122	502
		10/20/2014	20.21	15.2	7.5	5.8	161	423
		4/27/2015	23.88	15.2	7.6	6.3	202	511
RI-6S	AEB122	4/21/2014	10.69	14.5	7.4	5.3	165	760
		10/20/2014	7.80	14.8	7.2	6.5	172	579
		10/26/2014	8.07	15.0	7.2	6.2	203	658
RI-9S	AEB116	4/24/2014	6.74	13.7	6.8	4.7	215	317
		10/23/2014	5.66	15.7	6.9	2.3	238	252
		4/28/2015	6.64	15.1	6.7	4.6	220	310
RI-10S	AEB128	4/24/2014	10.96	14.6	6.8	6.5	242	313
		10/23/2014	10.16	17.9	6.6	3.9	257	264
		4/28/2015	10.82	16.0	6.6	6.5	233	291
RI-11S	AEB130	10/23/2014	13.06	18.9	6.6	5.6	220	241
		4/27/2015	13.43	16.5	6.6	8.2	216	269

-- Not measured.

Appendix B. Quality Assurance Review

Data Quality Assessment

To ensure data of good quality, all wells were sampled using standard procedures as specified in the project's quality assurance plan (Marti, 2013) and Ecology's SOP EAP078 (Marti, 2014). Monitoring wells were sampled with a stainless steel bladder pump with dedicated Teflon-lined tubing using standard low-flow sampling techniques. Samples were collected in pre-preserved 40-mL glass vials supplied by the Manchester Environmental Laboratory. Samples were labeled and stored in clean ice-filled coolers pending their arrival at the laboratory. Sample chain-of-custody procedures were followed throughout the project.

Samples were submitted to Ecology's Manchester Environmental Laboratory for analysis of volatile organic compounds (VOCs) to determine chlorinated VOCs concentrations throughout the YRRA project area. Samples were analyzed following a modification of EPA SW-846 Method 8260C.

Field quality control samples for this project consisted of blind field replicates, equipment blanks and transport blanks.

Over the 2014-2015 monitoring period field replicates were collected from wells GMW-2, SGMW-2, WDOE-3I, WDOE-3D, CYIMW103S, RI-4S, RI-6S, and RI-10S. These wells were selected because they represent the range of concentrations found over the YRRA study area.

All replicate results met the measurement quality objectives established in the QAPP (Marti, 2013) and are considered good and usable as qualified (Table B-1).

Equipment blanks collected from the bladder pump following decontamination procedures and transport blanks were also submitted for analysis. Neither of the blank types contained detectable levels of the target analytes.

The Manchester Environmental Laboratory follows strict quality assurance procedures to both ensure and later evaluate the quality of their analytical results (Ecology, 2008). A review of the data quality control and quality assurance from laboratory case narratives indicates that overall analytical performance was good. The reviews include descriptions of analytical methods, holding times, instrument calibration checks, blank results, surrogate recoveries, and laboratory control samples.

The April 2014 matrix spike/matrix spike duplicate recoveries for PCE were low; therefore, the PCE data is reported as estimates. The continuing calibration and surrogate recovery exceeded the QC limits for PCE and cis-1,2-DCE for select samples in April 2015 and for vinyl chloride in October 2015. The associated data are reported as estimates. None of the reported problems compromised the usefulness or validity of the sample results. All results are usable as qualified.

Quality assurance case narratives and laboratory reporting sheets are available upon request.

All field measurements and analytical result data are available in electronic format from Ecology's EIM data management system: www.ecy.wa.gov/eim/index.htm. Search Study ID: YRRA.

Table B-1. Summary of field replicate data quality for the Yakima Railroad Area study.

Laboratory Analyte:		PCE		TCE		Cis-1,2-DCE		VC	
Field Replicate RPD Limits[1]:		≤ 30%		≤ 30%		≤ 30%		≤ 30%	
Site	Date	Relative Percent Difference or Absolute Difference[2]							
RI-10S	4/24/2014	1.9	0.1	1.0 U	0.00	1.0 U	0.00	1.0 U	0.00
RI-10SR	4/24/2014	2.0		1.0 U		1.0 U		1.0 U	
CYIMW103S	4/22/2014	10	0%	0.78 J	0.01	0.60 J	0.01	1.0 U	0.00
CYIMW103SR	4/22/2014	10		0.79 J		0.59 J		1.0 U	
RI-4S	4/24/2014	16	0%	1.0 U	0.00	1.0 U	0.00	1.0 U	0.00
RI-4SR	4/24/2014	16		1.0 U		1.0 U		1.0 U	
WDOE-3I	4/25/2014	1.6	0.00	3.0	0.1	2.5	0.00	8.9	3%
WDOE-3IR	4/25/2014	1.6		2.9		2.5		8.6	
RI-10S	10/22/2014	2.0	0.1	1.0 U	0.00	1.0 U	0.00	0.20 U	0.00
QA2	10/22/2014	2.1		1.0 U		1.0 U		0.20 U	
CYIMW103S	10/22/2014	12	8%	2.3	0.1	15	0%	0.20 U	0.00
QA1	10/22/2014	13		2.4		15		0.20 U	
RI-4S	10/24/2014	16	6%	1.0 U	0.00	1.0 U	0.00	0.20 U	0.00
QA4	10/24/2014	17		1.0 U		1.0 U		0.20 U	
WDOE-3D	10/23/2014	15	6%	5	0%	8.7	2%	0.56	0.00
QA3	10/23/2014	16		5		8.5		0.56	
RI-10S	4/28/2015	2.2 J	0.4	1.0 UJ	0.00	1.0 UJ	0.00	0.2 UJ	0.00
QA3	4/28/2015	1.8		1.0 U		1.0 U		0.2 U	
GMW-2	4/28/2015	10 J	18%	1.0 UJ	0.00	1.0 UJ	0.00	0.2 UJ	0.00
QA1	4/28/2015	12		1.0 U		1.0 U		0.2 U	
CYIMW103S	4/29/2015	14	0%	1.2	0.1	10	0%	0.2 U	0.00
QA2	4/29/2015	14		1.1		10		0.2 U	
SGMW-2	10/26/2015	1.8	0.00	1.0 U	0.00	1.0 U	0.00	0.2 U	0.00
SGMW-2R	10/26/2015	1.8		1.0 U		1.0 U		0.2 U	
RI-6S	10/26/2015	8.5	0%	1.0 U	0.00	1.0 U	0.00	0.2 U	0.00
RI-6SR	10/26/2015	8.5		1.0 U		1.0 U		0.2 U	
WDOE-3D	10/28/2015	13	0%	3.9	0.1	7.1	4%	3.9 J	0.1
WDOE-3DR	10/28/2015	13		3.8		6.8		3.8 J	

[1]RPD limits are applicable if concentrations are greater than 5 times the method reporting limit (MRL). For results less than 5 times the MRL, the absolute difference between the sample and replicate must be less than the MRL. MRL may vary depending on dilutions performed by the laboratory during analysis.

[2]Shaded cells indicate absolute difference values.

U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.

Appendix C. Project Results, December 1997 to October 2015

Table C-1: Summary of Analytical Results (ug/L) for Goodwill-City of Yakima, December 1997 to October 2015.

Date	GMW-1				GMW-2				GMW-4			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	**1.4**	**0.18**	2 U	2 U	**9.8**	2 U	2 U	2 U	**7**	2 U	2 U	2 U
3/3/98	**0.92 J**	1 U	1 U	1 U	**12**	1 U	1 U	1 U	**1.9**	1 U	1 U	1 U
6/1/98	**1.6**	1 U	1 U	1 UJ	**7.7**	1 U	1 U	1 UJ	**7.3**	1 U	1 U	1 UJ
8/31/98	**0.56 J**	**0.34 J**	1 U	1 UJ	**8.2 J**	**0.44 J**	1 UJ	1 UJ	**130 E**	**0.22 J**	**0.061 J**	1 UJ
6/2/99	**3.43**	0.15 U	0.1 U	0.14 U	**5.36**	0.15 U	0.1 U	0.14 U	**4.18**	0.15 U	0.1 U	0.14 U
9/8/99	0.25 U	0.15 U	0.1 U	0.14 U	**8.01**	0.15 U	0.1 U	0.14 U	**15.4**	0.15 U	0.1 U	0.14 U
12/7/99	**0.77 J**	0.15 U	0.1 U	0.14 U	**14.2**	0.15 U	0.1 U	0.14 U	**2.23**	0.15 U	0.1 U	0.14 U
3/9/00	**1**	0.15 U	0.1 U	0.14 U	**10.4**	0.15 U	0.1 U	0.14 U	**1.7**	0.15 U	0.1 U	0.14 U
6/7/00	--	--	--	--	**4.4**	0.15 U	0.1 U	0.14 U	**5.6**	0.15 U	0.1 U	0.14 U
8/30/00	--	--	--	--	**8.3**	0.15 U	0.1 U	0.14 U	**68**	**0.39**	0.1 U	0.14 U
12/12/00	--	--	--	--	**11**	0.15 U	0.1 U	0.14 U	**2.5**	0.15 U	0.1 U	0.14 U
3/6/01	**3.6**	0.15 U	0.1 U	0.14 U	**14**	0.15 U	0.1 U	0.14 U	**2.2**	0.15 U	0.1 U	0.14 U
9/10/01	**4.7**	0.2 U	0.2 U	0.2 U	**6.8**	0.2 U	0.2 U	0.2 U	**19**	**0.22**	0.2 U	0.2 U
3/4/02	**3**	0.2 U	0.2 U	0.2 U	**12**	0.2 U	0.2 U	0.2 U	**1.9**	0.2 U	0.2 U	0.2 U
9/9/02	**4.3**	0.2 U	0.2 U	0.2 U	**11**	0.2 U	0.2 U	0.2 U	**8.3**	0.2 U	0.2 U	0.2 U
3/11/03	**3.3**	0.2 U	0.2 U	0.2 U	**10**	0.2 U	0.2 U	0.2 U	**2.6**	0.2 U	0.2 U	0.2 U
9/9/03	**4.6**	0.2 U	0.2 U	0.2 U	**8.4**	0.2 U	0.2 U	0.2 U	**6.4**	0.2 U	0.2 U	0.2 U
3/9/04	**2.4**	0.2 U	0.2 U	0.2 U	**16**	0.2 U	0.2 U	0.2 U	**2.3**	0.2 U	0.2 U	0.2 U
10/5/04	**2.6**	0.2 U	0.2 U	0.2 U	**5**	0.2 U	0.2 U	0.2 U	**3.8**	0.2 U	0.2 U	0.2 U
3/15/05	**2.8**	0.2 U	0.2 U	0.2 U	**18**	**0.29**	0.2 U	0.2 U	**2.4**	0.2 U	0.2 U	0.2 U
10/12/05	REJ				**25**	0.2 U	0.2 U	0.2 U	**11**	0.2 U	0.2 U	0.2 U
12/14/05	**1.5**	0.2 U	0.2 U	0.2 U	--	--	--	--	--	--	--	--
4/19/06	**12**	0.2 U	0.2 U	0.2 U	**1.7**	0.2 U	0.2 U	0.2 U	**2.1**	0.2 U	0.2 U	0.2 U
10/18/06	**1.9**	0.2 U	0.2 U	0.2 U	**11**	0.2 U	0.2 U	0.2 U	**2.1**	0.2 U	0.2 U	0.2 U
4/18/07	**11**	0.2 U	0.2 U	0.2 U	**2**	0.2 U	0.2 U	0.2 U	**2.1**	0.2 U	0.2 U	0.2 U
10/17/07	**2.4**	0.2 U	0.2 U	0.2 U	**11**	0.2 U	0.2 U	0.2 U	**2.2**	0.2 U	0.2 U	0.2 U
4/15/08	**8.7**	0.2 U	0.2 U	0.2 U	**11**	0.2 U	0.2 U	0.2 U	**2**	0.2 U	0.2 U	0.2 U
10/14/08	--	--	--	--	**7.5**	**7.5**	1 U	0.2 U	**2.6**	1 U	1 U	0.2 U
4/7/09	**7.5**	1 U	1 U	0.2 U	**1.1**	1 U	1 U	0.2 U	**1.7**	1 U	1 U	0.2 U
10/6/09	**3**	1 U	1 U	0.2 U	**6.6**	1 U	1 U	0.2 U	**1.9**	1 U	1 U	0.2 U
4/21/10	**1.1**	1 U	1 U	1 U	**11**	1 U	1 U	0.2 U	**1.8**	1 U	1 U	1 U
6/7/11	**3.4**	1 U	1 U	0.2 U	**11**	1 U	1 U	0.2 U	**1.8**	1 U	1 U	0.2 U
10/11/11	**1**	0.2 U	0.2 U	0.2 U	**6.9**	0.2 U	0.2 U	0.2 U	**1.2**	0.2 U	0.2 U	0.2 U
4/23/12	**1.5**	0.2 U	0.2 U	0.2 U	**9.4**	0.2 U	0.2 U	0.2 U	**1.4**	0.2 U	0.2 U	0.2 U
10/11/12	**1.3**	0.2 U	0.2 U	0.2 U	**2.6**	0.2 U	0.2 U	0.2 U	**1.3**	0.2 U	0.2 U	0.2 U
5/2013	1 U	1 U	1 U	1 U	**10**	1 U	1 U	1 U	**1.5**	1 U	1 U	1 U
10/2013	1 U	1 U	1 U	1 U	**14**	1 U	1 U	1 U	**1.1**	1 U	1 U	1 U
4/2014	0.77 J	1 U	1 U	1 U	11 J	1 U	1 U	1 U	1.9 J	1 U	1 U	1 U

Date	GMW-1				GMW-2				GMW-4			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
10/2014	0.54 J	1 U	1 U	0.2 U	2.3	1 U	1 U	0.2 U	1.3	1 U	1 U	0.2 U
4/2015	0.68 J	1 UJ	1 UJ	0.2 UJ	10 J	1 UJ	1 UJ	0.2 UJ	1.8	1 U	1 U	0.2 U
10/2015	--	--	--	--	0.98 J	1 U	1 U	0.2 U	--	--	--	--

U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
UJ: The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
E: Reported result is an estimate because it exceeds the calibration range.
REJ: Rejected. Result considered suspect due to possible cross-contamination. Well re-sampled in December 2005.
Bold: Analyte was detected.
Shade: Values are greater than MTCA cleanup levels.
-- Not Sampled.

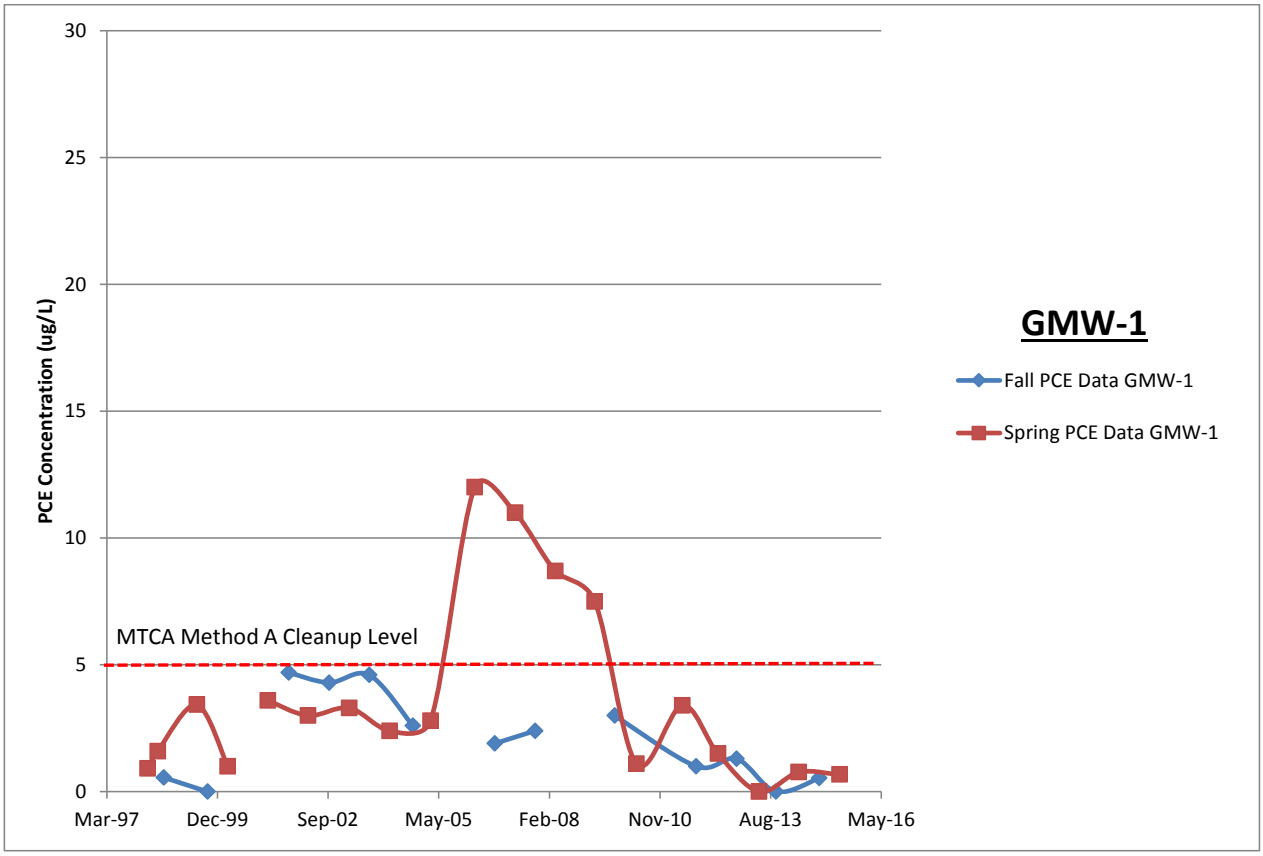


Figure C-1. Goodwill, Well GMW-1 PCE Results (ug/L), March 1998 to October 2015.

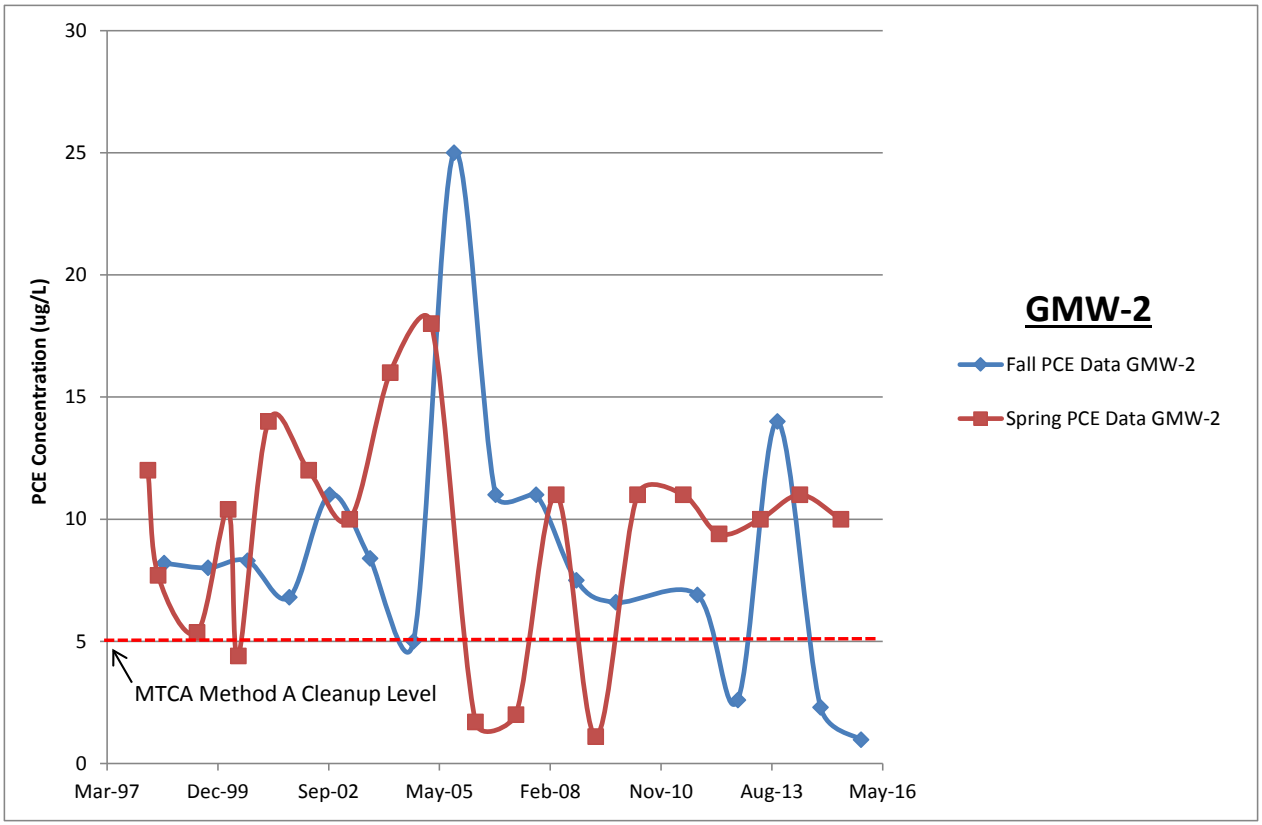


Figure C-2. Goodwill, Well GMW-2 PCE Results (ug/L), March 1998 to October 2015.

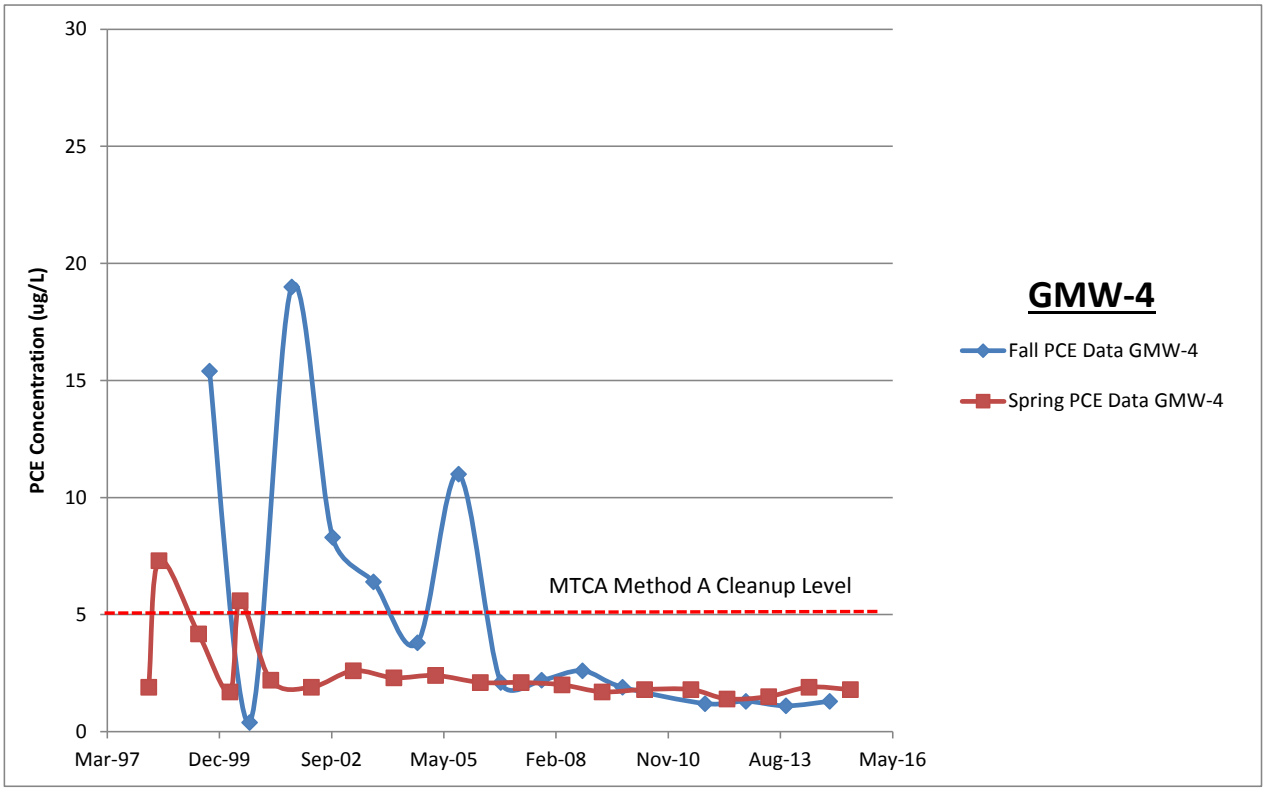


Figure C-3. Goodwill, Well GMW-4 PCE Results (ug/L), March 1998 to October 2015.

Table C-2: Summary of Analytical Results (ug/L) for Nu-Way Cleaners, December 1997 to October 2015.

Date	NMW-1				NMW-2				NMW-3			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	**1.8**	2 U	2 U	2 U	**2**	2 U	2 U	2 U	**3**	2 U	2 U	2 U
3/3/98	**4.4**	1 U	1 U	1 U	**3.4**	1 U	1 U	1 U	**3.7**	1 U	1 U	1 U
6/1/98	**4.4**	1 U	1 U	1 UJ	1 U	1 U	1 U	1 UJ	**3.8**	1 U	1 U	1 UJ
8/31/98	**1.7 J**	1 U	1 U	1 UJ	**1.1 J**	1 UJ	1 UJ	1 UJ	**2.3 J**	1 UJ	1 UJ	1 UJ
6/2/99	**5.28**	0.15 U	0.1 U	0.14 U	**2.9**	0.15 U	0.1 U	0.14 U	0.25U	0.15 U	0.1 U	0.14 U
9/8/99	**2.72**	0.15 U	0.1 U	0.14 U	**1.1**	0.15 U	0.1 U	0.14 U	**3.17**	0.15 U	0.1 U	0.14 U
12/7/99	**3.28**	0.15 U	0.1 U	0.14 U	**3.31**	0.15 U	0.1 U	0.14 U	**5.11**	0.15 U	0.1 U	0.14 U
3/7/00	**2.63**	0.15 U	0.1 U	0.14 U	**2.9**	0.15 U	0.1 U	0.14 U	**5.36**	0.15 U	0.1 U	0.14 U
6/7/00	**4.2**	0.15 U	0.1 U	0.14 U	**2.7**	0.15 U	0.1 U	0.14 U	**3.2**	0.15 U	0.1 U	0.14 U
8/30/00	**1.8**	0.15 U	0.1 U	0.14 U	**1.5**	0.15 U	0.1 U	0.14 U	**2.1**	0.15 U	0.1 U	0.14 U
12/12/00	**3.2**	0.15 U	0.1 U	0.14 U	**3.1**	0.15 U	0.1 U	0.14 U	**5.3**	0.15 U	0.1 U	0.14 U
3/6/01	**2.1**	0.15 U	0.1 U	0.14 U	**2.3**	0.15 U	0.1 U	0.14 U	**3.6**	0.15 U	0.1 U	0.14 U
9/10/01	**1.5**	0.2 U	0.2 U	0.2 U	**1.1**	0.2 U	0.2 U	0.2 U	**1.8**	0.2 U	0.2 U	0.2 U
3/4/02	**1.1**	0.2 U	0.2 U	0.2 U	**1.5**	0.2 U	0.2 U	0.2 U	**2.3**	0.2 U	0.2 U	0.2 U
9/9/02	**2**	0.2 U	0.2 U	0.2 U	**1.6**	0.2 U	0.2 U	0.2 U	**1.8**	0.2 U	0.2 U	0.2 U
3/11/03	**4.1**	0.2 U	0.2 U	0.2 U	**3.3**	0.2 U	0.2 U	0.2 U	**5.5**	0.2 U	0.2 U	0.2 U
9/9/03	**2**	0.2 U	0.2 U	0.2 U	**1.5**	0.2 U	0.2 U	0.2 U	**2.1**	0.2 U	0.2 U	0.2 U
3/9/04	**3.3**	0.2 U	0.2 U	0.2 U	**3.4**	0.2 U	0.2 U	0.2 U	**3.5**	0.2 U	0.2 U	0.2 U
10/5/04	**0.99**	0.2 U	0.2 U	0.2 U	**1.1**	0.2 U	0.2 U	0.2 U	**1.3**	0.2 U	0.2 U	0.2 U
3/15/05	**2.1**	**0.24**	0.2 U	0.2 U	**2.4**	0.2 U	0.2 U	0.2 U	**3.6**	0.2 U	0.2 U	0.2 U
10/11/05	REJ				REJ				REJ			
12/13/05	**2.4**	0.2 U	0.2 U	0.2 U	**1.8**	0.2 U	0.2 U	0.2 U	**2.2**	0.2 U	0.2 U	0.2 U
4/18/06	**3.2**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**2.2**	0.2 U	0.2 U	0.2 U
10/17/06	**0.63**	0.2 U	0.2 U	0.2 U	**0.67**	0.2 U	0.2 U	0.2 U	**0.9**	0.2 U	0.2 U	0.2 U
4/17/07	**0.79**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.47**	0.2 U	0.2 U	0.2 U
10/16/07	**1.3**	0.2 U	0.2 U	0.2 U	**0.66**	0.2 U	0.2 U	0.2 U	**1.3**	0.2 U	0.2 U	0.2 U
4/15/08	**0.38**	0.2 U	0.2 U	0.2 U	0.2U	0.2 U	0.2 U	0.2 U	**0.24**	0.2 U	0.2 U	0.2 U
10/13/08	**0.63**	1 U	1 U	0.2 U	0.8 U	1 U	1 U	0.2 U	**1.7**	1 U	1 U	0.2 U
4/7/09	**1.8**	1 U	1 U	0.2 U	**1.9**	1 U	1 U	0.2 U	**1.3**	1 U	1 U	0.2 U
10/5/09	**1.7**	1 U	1 U	0.2 U	**1.3**	1 U	1 U	0.2 U	**1.8**	1 U	1 U	0.2 U
4/19/10	**2.3**	1 U	1 U	0.2 U	**2.4**	1 U	1 U	0.2 U	**4.8**	1 U	1 U	0.2 U
6/7/11	**5.5**	1 U	1 U	0.2 U	**4**	1 U	1 U	0.2 U	**3.7**	1 U	1 U	0.2 U
10/11/11	**1.1**	0.2 U	0.2 U	0.2 U	**0.93**	0.2 U	0.2 U	0.2 U	**1.2**	0.2 U	0.2 U	0.2 U
4/24/12	**2.1**	0.2 U	0.2 U	0.2 U	**1.5**	0.2 U	0.2 U	0.2 U	**2.7**	0.2 U	0.2 U	0.2 U
10/10/12	**1.6**	0.2 U	0.2 U	0.2 U	**1.2**	0.2 U	0.2 U	0.2 U	**1.3**	0.2 U	0.2 U	0.2 U
5/2013	**1.6**	1 U	1 U	1 U	NS				--	--	--	--
10/2013	**2.3**	1 U	1 U	1 U	**1.6**	1 U	1 U	1 U	--	--	--	--

Date	NMW-1				NMW-2				NMW-3			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	2.3 J	1 U	1 U	1 U	NS				--	--	--	--
10/2014	2.1	1 U	1 U	0.2 U	--	--	--	--	--	--	--	--
4/2015	2.1 J	1 UJ	1 UJ	0.2 UJ	NS				--	--	--	--
10/2015	--	--	--	--	--	--	--	--	--	--	--	--

U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
UJ: The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
REJ: Rejected. Result considered suspect due to possible cross-contamination. Well re-sampled in December 2005.
NS: Not sampled due to a low water level and/or insufficient volume of water.
Bold: Analyte was detected.
Shade: Values are greater than MTCA cleanup levels.
-- Not Sampled. Well was inaccessible.

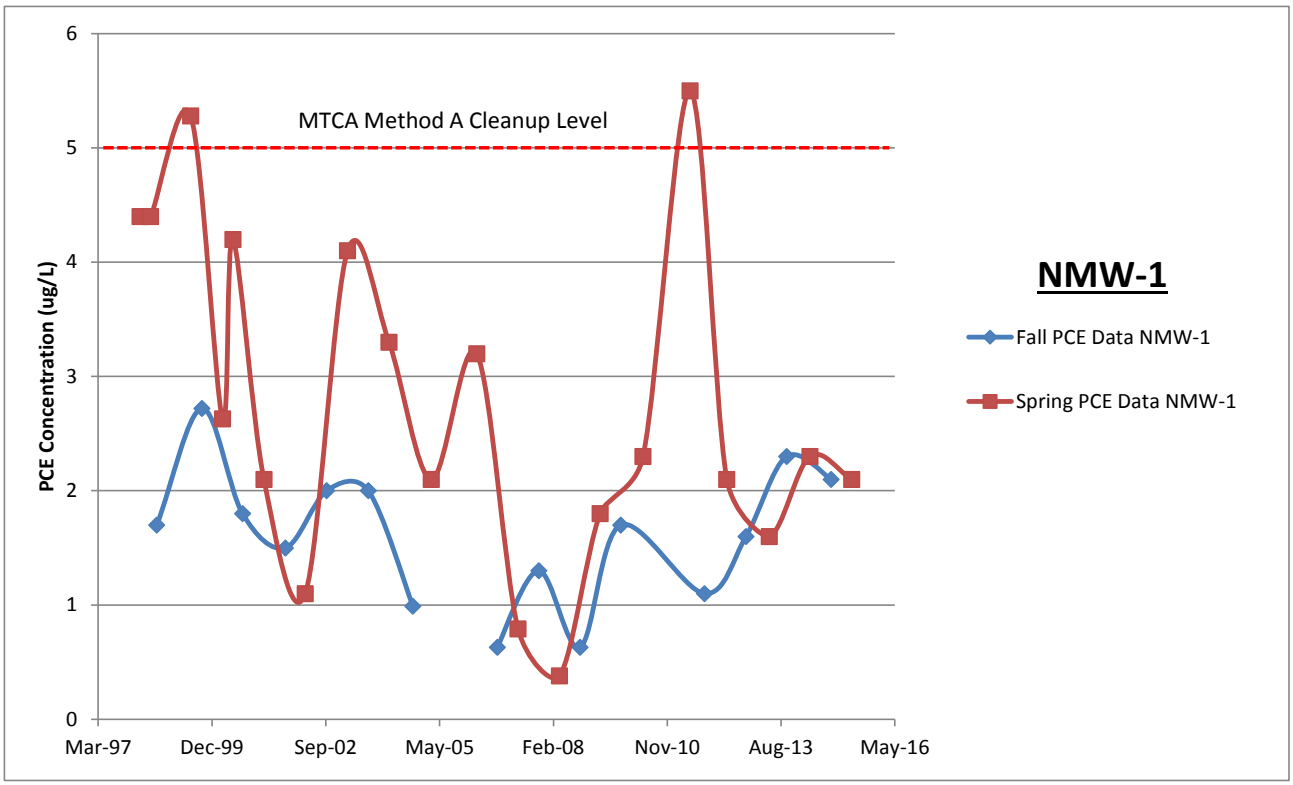


Figure C-4. Nu-Way Cleaners, Well NMW-1 PCE Results (ug/L), March 1998 to October 2015.

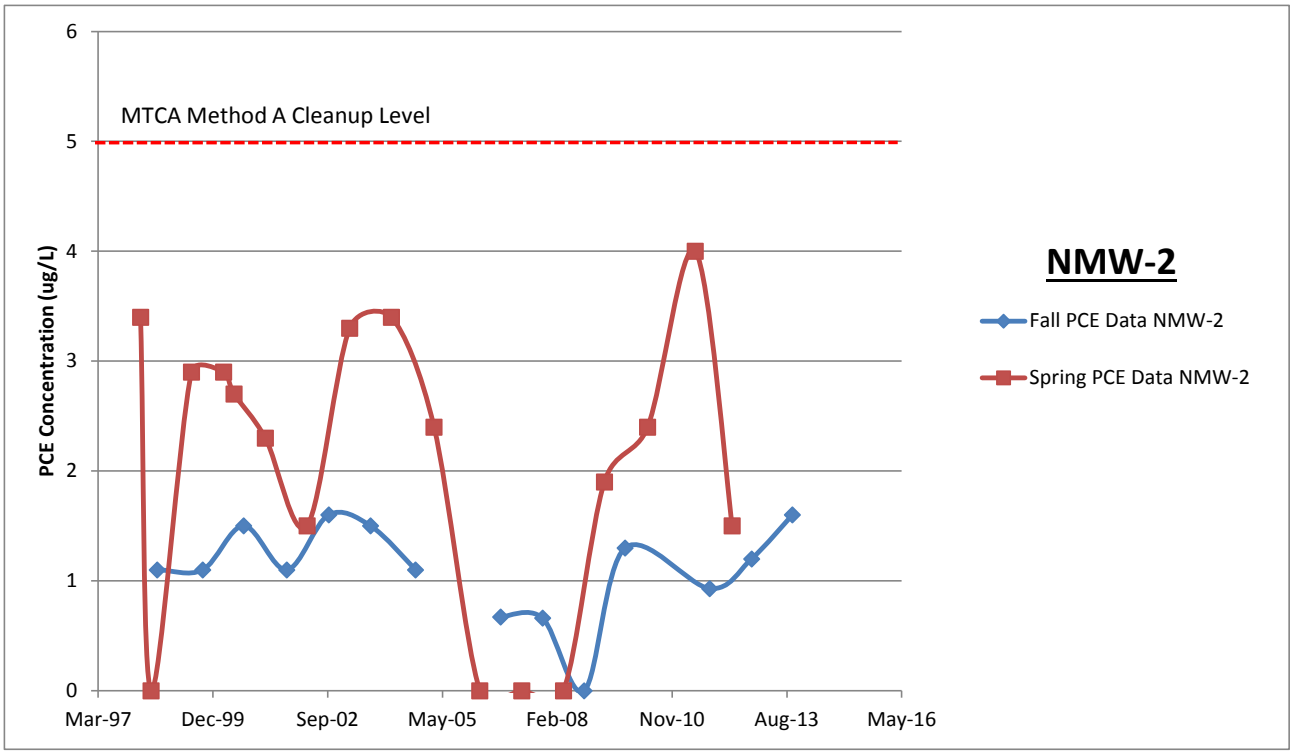


Figure C-5. Nu-Way Cleaners, Well NMW-2 PCE Results (ug/L), March 1998 to October 2015.

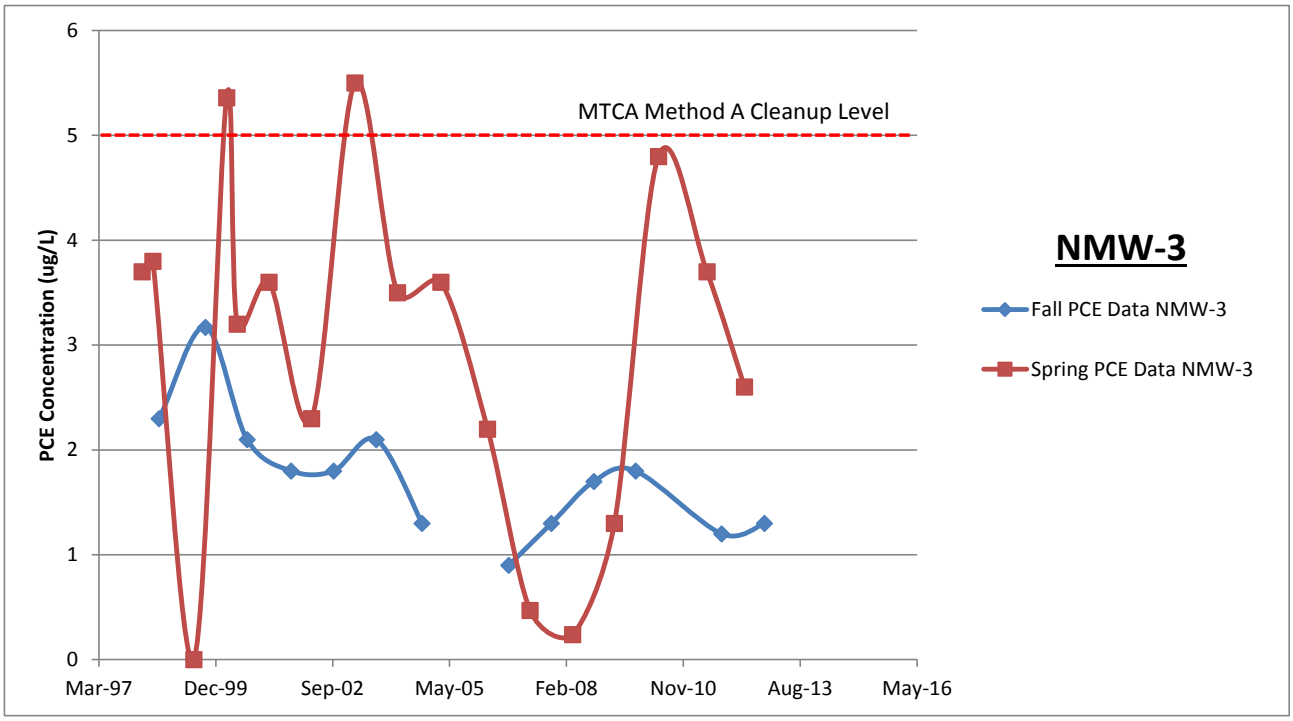


Figure C-6. Nu-Way Cleaners, Well NMW-3 PCE Results (ug/L), March 1998 to October 2012.

Table C-3: Summary of Analytical Results (ug/L) for Southgate Laundry, June 1999 to October 2015.

Date	SGMW-1				SGMW-2				SGMW-3			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--	--	--	--	--	--	--	--	--
3/3/98	--	--	--	--	--	--	--	--	--	--	--	--
6/1/98	--	--	--	--	--	--	--	--	--	--	--	--
8/31/98	--	--	--	--	--	--	--	--	--	--	--	--
6/2/99	**2.23**	0.15 U	0.1 U	0.14 U	**27.4**	0.15 U	0.1 U	0.14 U	**21.2**	0.15 U	0.1 U	0.14 U
9/8/99	0.25 U	0.15 U	0.1 U	0.14 U	**8.54**	0.15 U	0.1 U	0.14 U	**6.35**	0.15 U	0.1 U	0.14 U
12/7/99	**1.54**	0.15 U	0.1 U	0.14 U	**4.72**	**0.65 J**	0.1 U	0.14 U	**4.39**	**0.37 J**	0.1 U	0.14 U
3/9/00	**0.34 J**	0.15 U	0.1 U	0.14 U	**2.13**	0.15 U	0.1 U	0.14 U	**10.2**	0.15 U	0.1 U	0.14 U
6/7/00	**1.2**	0.15 U	0.1 U	0.14 U	**26**	0.15 U	0.1 U	0.14 U	**29**	0.15 U	0.1 U	0.14 U
8/30/00	**0.37**	0.15 U	0.1 U	0.14 U	**7.1**	0.15 U	0.1 U	0.14 U	**21**	0.15 U	0.1 U	0.14 U
12/12/00	**0.82**	0.15 U	0.1 U	0.14 U	**5.5**	0.15 U	0.1 U	0.14 U	**3.5**	0.15 U	0.1 U	0.14 U
3/6/01	**0.87**	0.15 U	0.1 U	0.14 U	**2.4**	0.15 U	0.1 U	0.14 U	**5.6**	0.15 U	0.1 U	0.14 U
9/10/01	**0.34**	0.2 U	0.2 U	0.2 U	**8.6**	0.2 U	0.2 U	0.2 U	**15**	0.2 U	0.2 U	0.2 U
3/4/02	**0.29**	0.2 U	0.2 U	0.2 U	**2.5**	0.2 U	0.2 U	0.2 U	**4.6**	0.2 U	0.2 U	0.2 U
9/9/02	**0.38**	0.2 U	0.2 U	0.2 U	**11**	0.2 U	0.2 U	0.2 U	**16**	0.2 U	0.2 U	0.2 U
3/11/03	**0.38**	0.2 U	0.2 U	0.2 U	**1.5**	0.2 U	0.2 U	0.2 U	**4.7**	0.2 U	0.2 U	0.2 U
9/9/03	**0.51**	0.2 U	0.2 U	0.2 U	**8.1**	0.2 U	0.2 U	0.2 U	**22**	0.2 U	0.2 U	0.2 U
3/9/04	**1.6**	0.2 U	0.2 U	0.2 U	**1.6**	0.2 U	0.2 U	0.2 U	**7.6**	0.2 U	0.2 U	0.2 U
10/5/04	**0.34**	0.2 U	0.2 U	0.2 U	**5.2**	0.2 U	0.2 U	0.2 U	**2.1**	0.2 U	0.2 U	0.2 U
3/15/05	**4.8**	0.2 U	0.2 U	0.2 U	**6.4**	**0.23**	0.2 U	0.2 U	**8.1**	**0.21**	0.2 U	0.2 U
10/12/05	REJ				**10**	0.2 U	0.2 U	0.2 U	**4**	0.2 U	0.2 U	0.2 U
12/14/05	**0.35**	0.2 U	0.2 U	0.2 U	--	--	--	--	--	--	--	--
4/19/06	**0.33**	0.2 U	0.2 U	0.2 U	**0.79**	0.2 U	0.2 U	0.2 U	**2.4**	0.2 U	0.2 U	0.2 U
10/18/06	**0.35**	0.2 U	0.2 U	0.2 U	**2.6**	0.2 U	0.2 U	0.2 U	**3.8**	0.2 U	0.2 U	0.2 U
4/18/07	**0.49**	0.2 U	0.2 U	0.2 U	**0.82**	0.2 U	0.2 U	0.2 U	**4**	0.2 U	0.2 U	0.2 U
10/17/07	**0.38**	0.2 U	0.2 U	0.2 U	**2.6**	0.2 U	0.2 U	0.2 U	**4.4**	0.2 U	0.2 U	0.2 U
4/15/08	**0.31**	0.2 U	0.2 U	0.2 U	**0.5**	0.2 U	0.2 U	0.2 U	**1.9**	0.2 U	0.2 U	0.2 U
10/14/08	0.8 U	1 U	1 U	0.2 U	**2.7**	1 U	1 U	0.2 U	**1.8**	1 U	1 U	0.2 U
4/7/09	1 U	1 U	1 U	0.2 U	**0.6 J**	1 U	1 U	0.2 U	**3.2**	1 U	1 U	0.2 U
10/6/09	1 U	1 U	1 U	0.2 U	**2.3**	1 U	1 U	0.2 U	**1.6**	1 U	1 U	0.2 U
4/21/10	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	0.2 U	**2.8**	1 U	1 U	0.2 U
6/7/11	1 U	1 U	1 U	0.2 U	**4.5**	1 U	1 U	0.2 U	**3.4**	1 U	1 U	0.2 U
10/11/11	0.2 U	0.2 U	0.2 U	0.2 U	**2.1**	0.2 U	0.2 U	0.2 U	**1.7**	0.2 U	0.2 U	0.2 U
4/23/12	**0.23**	0.2 U	0.2 U	0.2 U	**0.34**	0.2 U	0.2 U	0.2 U	**1.9**	0.2 U	0.2 U	0.2 U
10/11/12	0.2 U	0.2 U	0.2 U	0.2 U	**2**	0.2 U	0.2 U	0.2 U	--	--	--	--
5/2013	1 U	1 U	1 U	1 U	**1.5**	1 U	1 U	1 U	**1.7**	1 U	1 U	1 U
10/2013	1 U	1 U	1 U	1 U	**1.9**	1 U	1 U	1 U	**2.4**	1 U	1 U	1 U

Date	SGMW-1				SGMW-2				SGMW-3			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	0.83 J	1 U	1 U	1 U	0.89 J	1 U	1 U	1 U	1.9 J	1 U	1 U	1 U
10/2014	1 U	1 U	1 U	0.2 U	1.9	1 U	1 U	0.2 U	1.6	1 U	1 U	0.2 U
4/2015	--	--	--	--	--	--	--	--	--	--	--	--
10/2015	0.34 J	1 U	1 U	0.2 U	1.8	1 U	1 U	0.2 U	--	NS	--	--

U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
REJ: Rejected. Result considered suspect due to possible cross-contamination. Well re-sampled in December 2005.
Bold: Analyte was detected. Shade: Values are greater than MTCA cleanup levels.
-- Not Sampled.

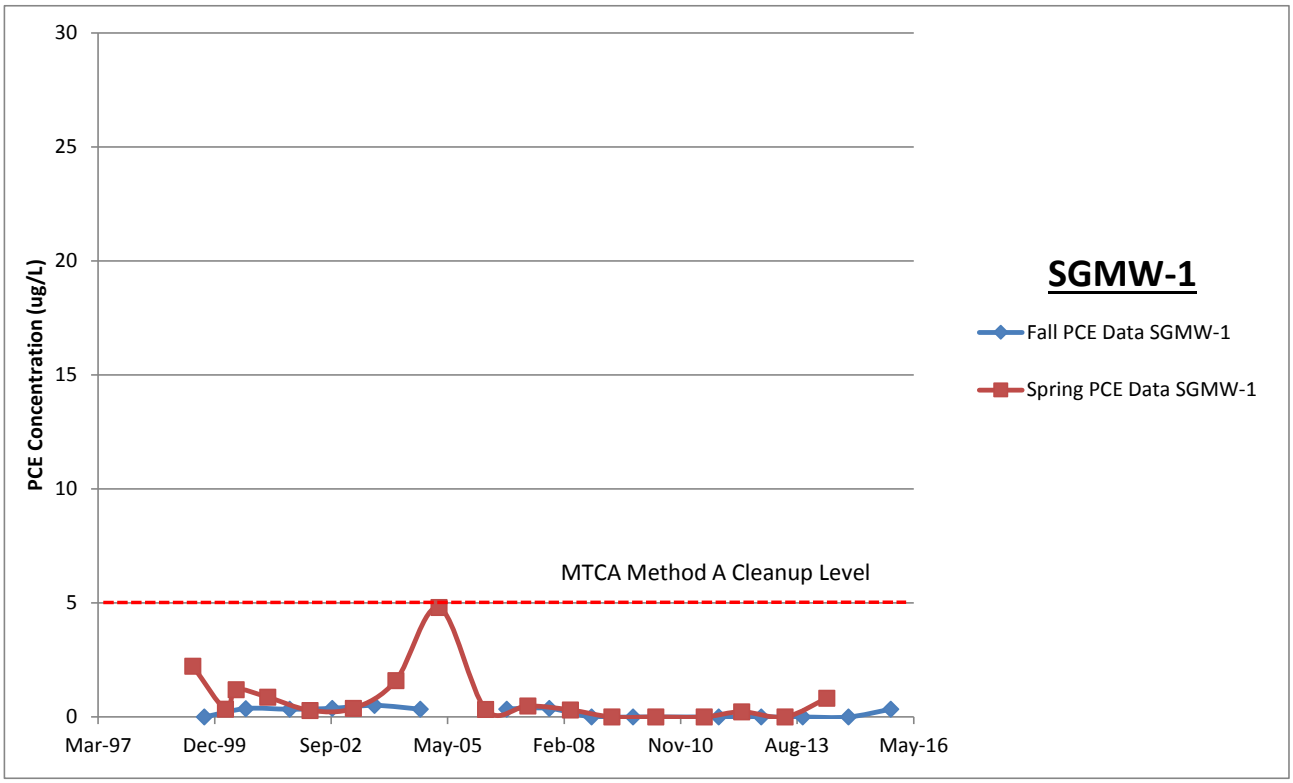


Figure C-7. Southgate Laundry, Well SGMW-1 PCE Results (ug/L), June 1999 to October 2015.

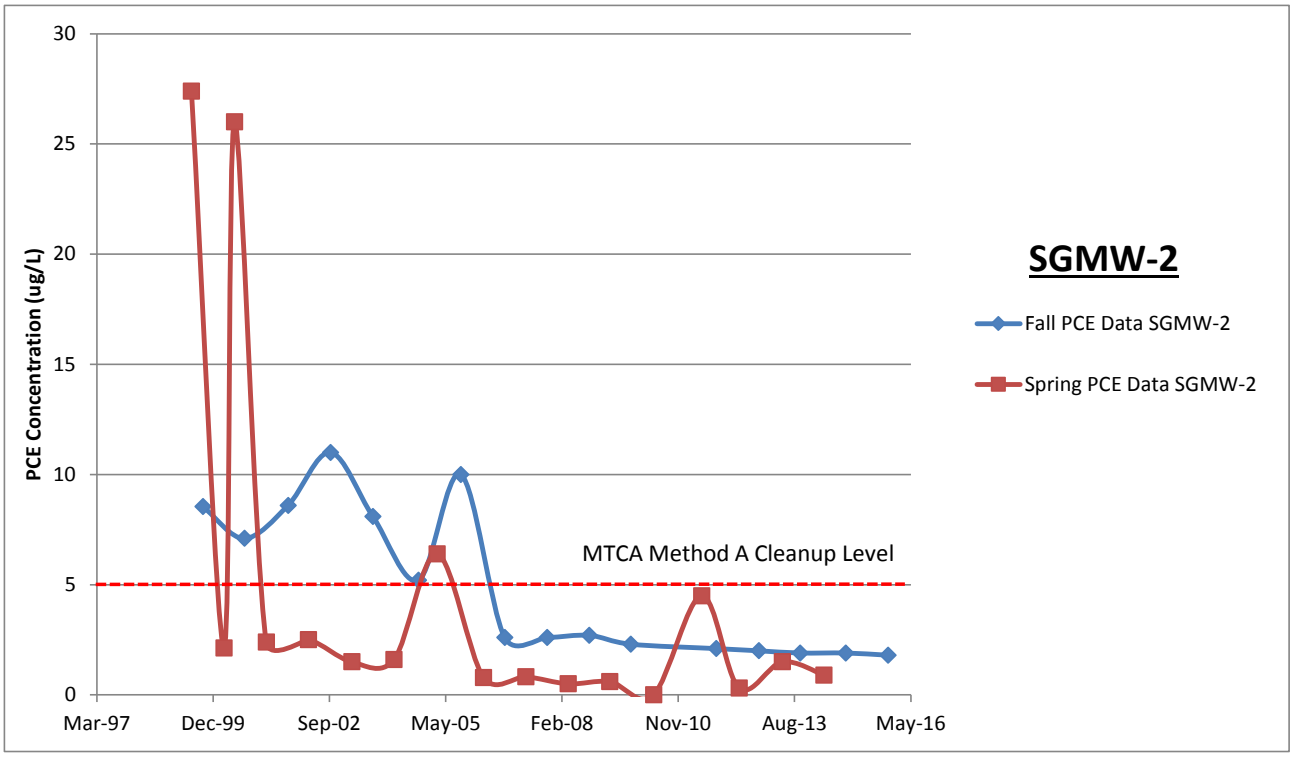


Figure C-8. Southgate Laundry, Well SGMW-2 PCE Results (ug/L), June 1999 to October 2015.

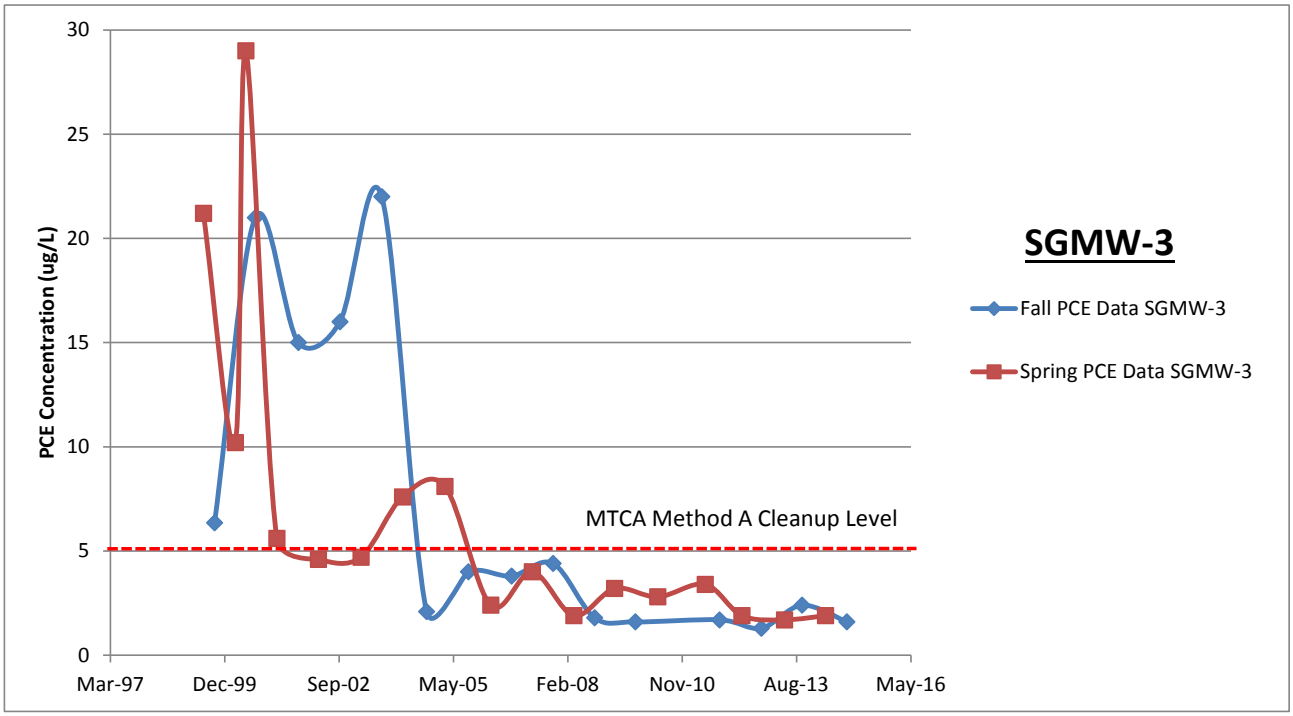


Figure C-9. Southgate Laundry, Well SGMW-3 PCE Results (ug/L), June 1999 to October 2015.

Table C-4: Summary of Analytical Results (ug/L) for Washington Central Railroad Roundhouse, December 1997 to October 2015.

Date	WDOE-3S				WDOE-3I				WDOE-3D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--	**11**	**1.2 J**	**0.25 J**	**0.59 J**	--	--	--	--
3/3/98	--	--	--	--	**4.1**	**1.3**	**0.88 J**	**2.7**	--	--	--	--
6/1/98	--	--	--	--	**20**	**1.3**	1 U	1 UJ	--	--	--	--
8/31/98	--	--	--	--	**18**	**0.88 J**	**0.04 J**	1 UJ	--	--	--	--
6/2/99	**50.9**	ND	ND	ND	**35.1**	**2.17**	ND	**0.23 J**	**16.4**	**1.76**	ND	**0.98 J**
9/8/99	**21.2**	ND	ND	ND	**28.2**	**0.93 J**	ND	ND	**13.3**	**1.75**	ND	**1.19**
12/7/99	**40.8**	ND	ND	ND	**17.4**	**2.86**	**0.91 J**	**2.03**	**15.3**	**2.23**	**0.77 J**	**1.55**
3/7/00			NS		**0.61 J**	ND	**0.68 J**	**3.24**	**7.99**	**1.54**	ND	**2.03**
6/7/00	**90**	**0.71**	ND	ND	**42**	**1.9**	**0.27**	**0.36**	**1.6**	**3.2**	**0.3**	**0.62**
8/30/00	**11**	ND	ND	ND	**20**	**1.1**	**0.2**	**0.21**	**12**	**2**	**0.59**	**1.2**
12/12/00	--	--	--	--	--	--	--	--	--	--	--	--
3/6/01	--	--	--	--	**1.2**	**0.45**	**0.54**	**7.5**	**8.1**	**1.7**	**0.61**	**3.6**
9/10/01	**9.3**	< 0.2	< 0.2	< 0.2	**15**	**1.6**	**0.33**	**0.5**	**9.4**	**1.8**	**0.46**	**1.1**
3/4/02			NS		**0.74**	**0.51**	**0.35**	**3**	**7.3**	**1.6**	**0.38**	**1.4**
9/9/02	**8.7**	< 0.2	< 0.2	< 0.2	**15**	**1.2**	**0.27**	**0.26**	**9.4**	**1.7**	**0.48**	**0.74**
3/11/03			NS		< 0.2	**1**	**0.58**	**2.2**	**7.8**	**1.7**	**0.35**	**1.1**
9/9/03	**9.1**	< 0.2	< 0.2	< 0.2	**15**	**1.8**	**0.34**	**0.64**	**12**	**1.9**	**0.32**	**0.89**
3/9/04			NS		< 0.2	**0.47**	**0.32**	**2.8**	**9.1**	**1.8**	**0.4**	**1**
10/5/04	**5.5**	< 0.2	< 0.2	< 0.2	**8.8**	**1.9**	**0.47**	**0.99**	**7.7**	**1.9**	**0.38**	**1.1**
3/15/05			NS		**0.32**	**0.35**	**0.37**	**3.5**	**11**	**1.9**	**0.48**	**1.1**
10/11/05	**13**	< 0.2	< 0.2	< 0.2	**18**	**1.1**	**0.36**	**0.65**	**9**	**1.4**	**0.39**	**0.92**
12/13/05	--	--	--	--	--	--	--	--	--	--	--	--
4/18/06			NS		**0.22**	**0.46**	**0.45**	**4.5**	**5.8**	**1.8**	**0.5**	**1.5**
10/17/06	**4.5**	< 0.2	< 0.2	< 0.2	**9.1**	**1.3**	**0.42**	**0.47**	**7.3**	**1.6**	**0.39**	**0.62**
4/17/07			NS		**0.5**	**0.74**	**0.76**	**4.4**	**6.5**	**2**	**0.56**	**0.87**
10/16/07	**5.5**	< 0.2	< 0.2	< 0.2	**11**	**1.1**	**0.41**	**0.41**	**8.5**	**1.7**	**0.41**	**0.59**
4/15/08			NS		**0.61**	**0.53**	**0.69**	**5.7**	**6.3**	**1.7**	**0.45**	**0.92**
10/13/08	**7.9**	1 U	1 U	0.2 U	**11**	**1.3**	1 U	0.2 U	**8.8**	**1.7**	1 U	0.2 U
4/7/09			NS		**0.13 J**	**0.69 J**	**3.1**	0.2 U	**9.9**	**2.9**	**2.9**	0.2 U
10/8/09	**11**	1 U	1 U	0.2 U	**13**	**2.2**	1 U	**0.85**	**11**	**2.3**	1 U	**0.5**
4/19/10			NS		**2.4**	**1.1**	1 U	**3.8**	**8.9**	**2.5**	1 U	1 U
6/7/11			REJ				REJ				REJ	
10/11/11	**8.8**	0.2 U	0.2 U	0.2 U	**7.9**	**4.1**	**1.8**	**1.2**	**9.6**	**2**	**0.42**	0.2 U
4/24/12	--	--	--	--	**1.1**	**1.1**	**1.3**	**4.2**	**7.1**	**2.1**	**0.54**	**0.27**
10/10/12	**8.7**	0.2 U	0.2 U	0.2 U	**6.9**	**5.5**	**2.1**	**0.99**	**9.7**	**2.1**	**0.4**	0.2 U
5/2013			NS		**4.3**	**3.2**	**2.6**	**6.4**	**13**	**3.4**	**1**	**0.49 J**
10/2013	**19**	1 U	1 U	1 U	**8.2**	**4.8**	**3.5**	**3.1**	**15**	**2.5**	**0.36 J**	1 U

Date	WDOE-3S				WDOE-3I				WDOE-3D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	NS				1.6 J	3	2.5	8.9	11 J	3.5	1	0.46 J
10/2014	12	1.8	16	0.2 U	10	15	48	4.2	15	5	8.7	0.56
4/2015	--	--	--	--	--	--	--	--	--	--	--	--
10/2015	11	1.1	4.1	0.11 J	5.6	4.5	12	41 J	13	3.9	7.1	3.9 J

Notes for Table B-6:

ND: Analyte was not detected.
NS: Not sampled due to a low water level or insufficient volume of water.
U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
UJ: The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
Bold: Analyte was detected.
Shade: Values are greater than MTCA cleanup levels.
-- Not Sampled.

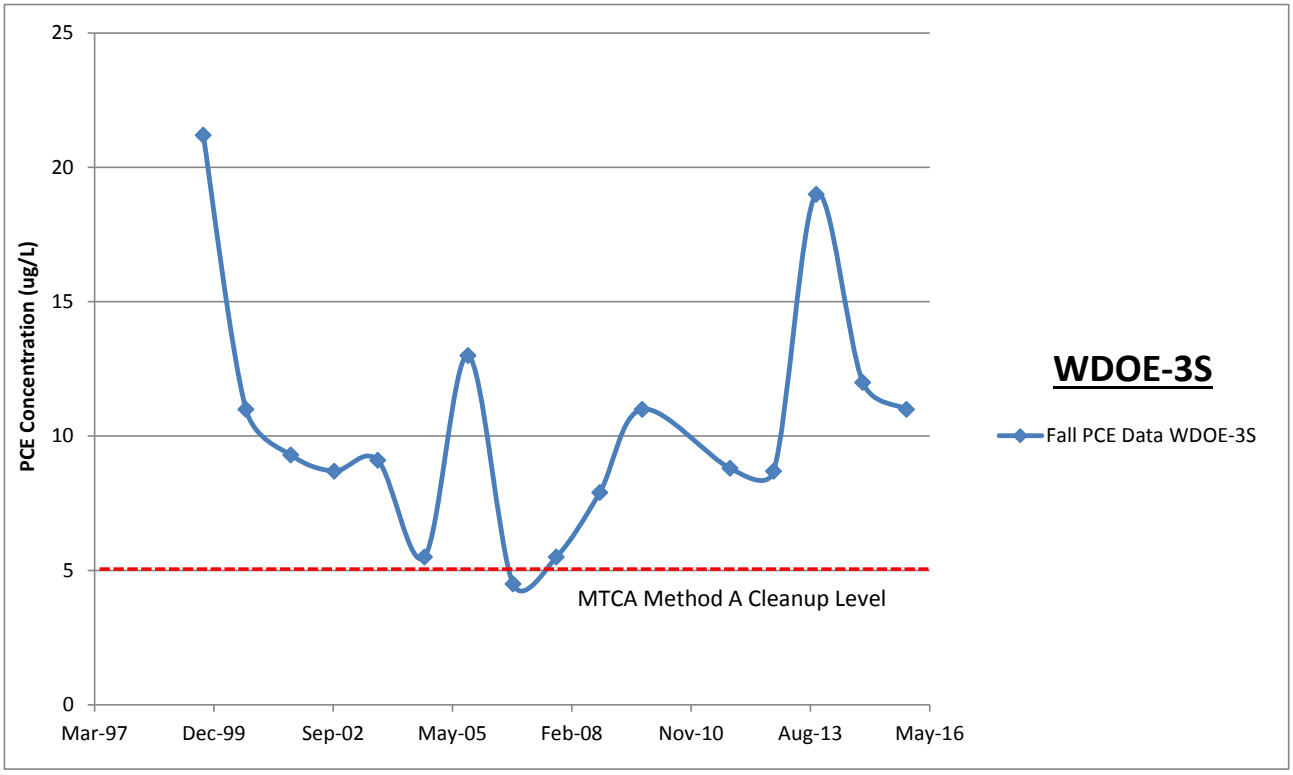


Figure C-10. Washington Central Railroad Roundhouse, Well WDOE-3S PCE Results (ug/L), September 1999 to October 2015.

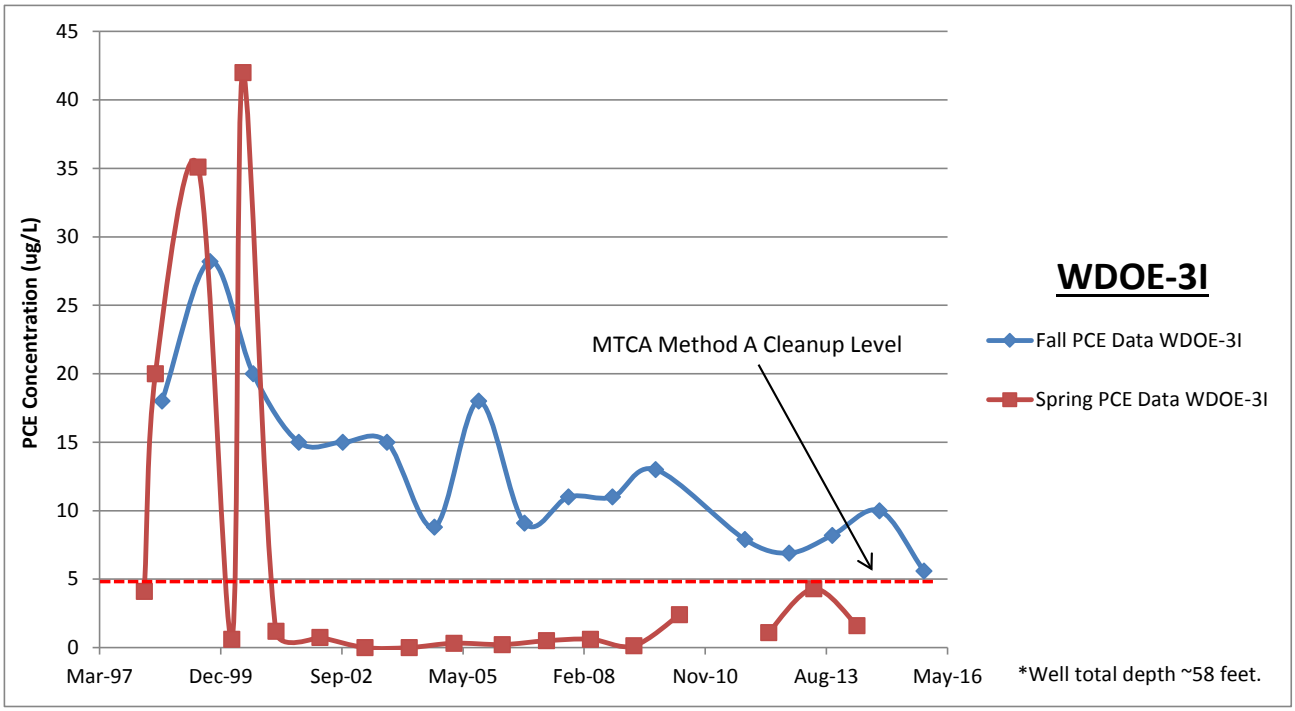


Figure C-11. Washington Central Railroad Roundhouse, Well WDOE-3I PCE Results (ug/L), March 1998 to October 2015.

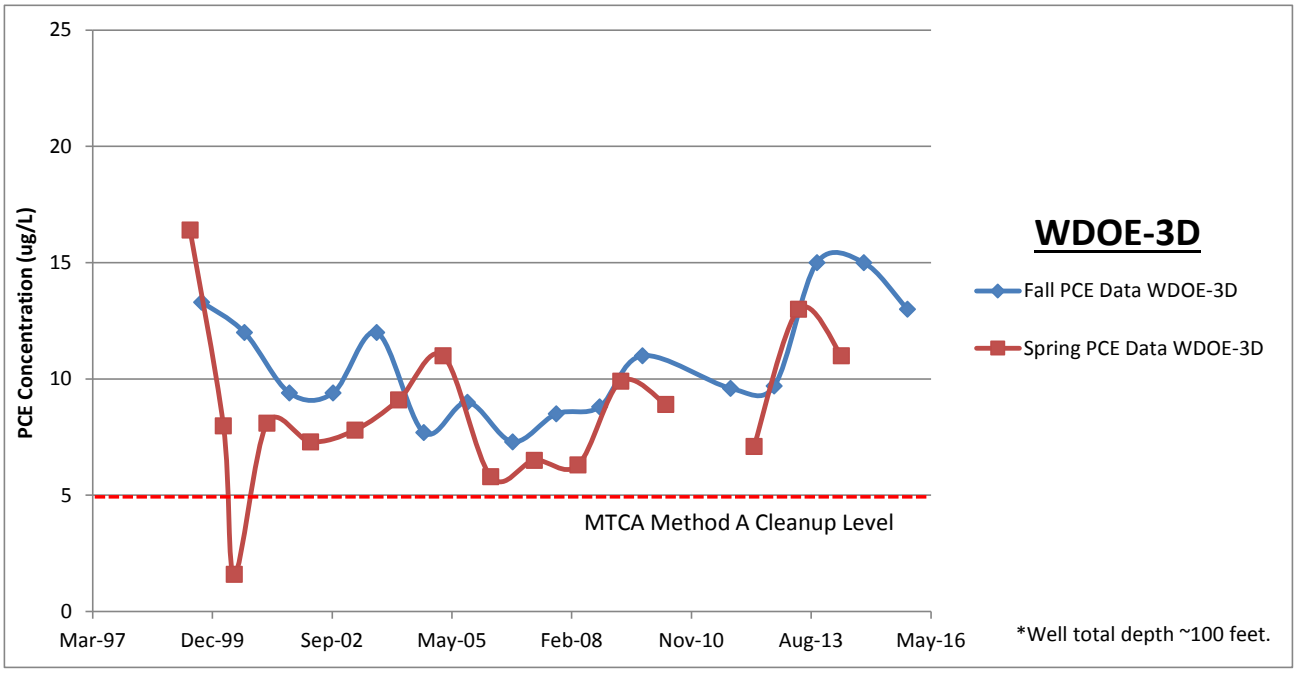


Figure C-12. Washington Central Railroad Roundhouse, Well WDOE-3D PCE Results (ug/L), June 1999 to October 2015.

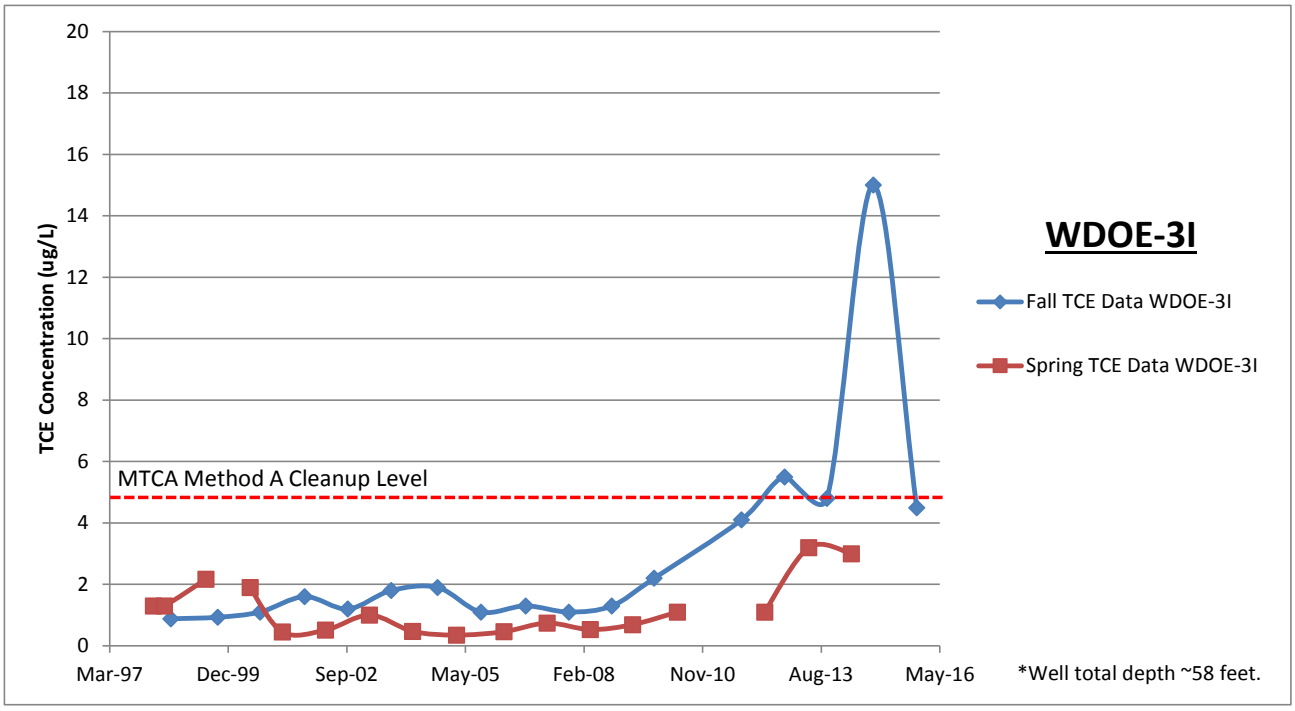


Figure C-13. Washington Central Railroad Roundhouse, Well WDOE-3I TCE Results (ug/L), June 1999 to October 2015.

Table C-5: Summary of Analytical Results (ug/L) for Fifth Wheel Truck Repair and Agri-Tech\ Yakima Steel, June 1999 to October 2015.

Date	5WMW-2				ATMW-4			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
6/2/99	**3.74**	ND	ND	ND	**2.04**	ND	**2.15**	ND
9/8/99	**11.3**	ND	ND	ND	**4.07**	**0.73 J**	**4.95**	ND
12/7/99	**8.1**	**0.19 J**	ND	ND	**3.93**	**0.94 J**	**4.77**	ND
3/7/00	**4.17**	ND	ND	ND	**3.11**	ND	**3.32**	ND
6/7/00	ND	ND	ND	ND	**4.3**	**0.66**	**2.8**	ND
8/30/00	**5.3**	ND	ND	ND	**3.8**	**1.1**	**5.7**	ND
12/12/00	**7.7**	ND	ND	ND	**5.7**	**1.3**	**1.4**	ND
3/6/01	**4.3**	ND	ND	ND	**4.1**	**0.94**	**1.5**	ND
9/10/01	**8.1**	< 0.2	< 0.2	< 0.2	**4.3**	**1.3**	**1.8**	< 0.2
3/4/02	**3.2**	< 0.2	< 0.2	< 0.2	**4**	**0.94**	**0.68**	< 0.2
9/9/02	**6.8**	< 0.2	< 0.2	< 0.2	**5.2**	**1.2**	**1**	< 0.2
3/11/03	**3.5**	< 0.2	< 0.2	< 0.2	**4.2**	**0.84**	**2**	< 0.2
9/9/03	**8.8**	< 0.2	< 0.2	< 0.2	**6.8**	**1.1**	**3**	< 0.2
3/9/04	**3.1**	**0.59**	< 0.2	< 0.2	**0.23**	< 0.2	**0.59**	< 0.2
10/5/04	**1.9**	< 0.2	< 0.2	< 0.2	**5.4**	**0.69**	**2.2**	< 0.2
3/15/05	**2.8**	< 0.2	< 0.2	< 0.2	**5**	**0.71**	**2.2**	< 0.2
10/11/05	REJ				REJ			
12/13/05	3.7	0.59	0.32	< 0.2	6.3	0.66	0.29	< 0.2
4/18/06	0.21	0.35	1.2	< 0.2	4.3	0.54	0.68	< 0.2
10/17/06	6.6	0.27	< 0.2	< 0.2	5	0.76	2.6	< 0.2
4/17/07	2	< 0.2	< 0.2	< 0.2	4.1	0.52	1.4	< 0.2
10/16/07	7.8	< 0.2	< 0.2	< 0.2	6	0.6	1.3	< 0.2
4/15/08	1.8	< 0.2	< 0.2	< 0.2	3.4	0.48	1.7	< 0.2
10/13/08	6.1	1 U	1 U	0.2 U	5.9	1 U	1 U	0.2 U
4/7/09	1.3	1 U	1 U	0.2 U	4.8	0.64 J	4.2	0.2 U
10/5/09	7.5	1 U	1 U	0.2 U	6.1	1 U	1.4	0.2 U
4/19/10	1.9	1 U	1 U	0.2 U	3.9	1 U	1 U	0.2 U
6/7/11	2.7	1 U	1 U	0.2 U	5.7	1 U	1	0.2 U
10/11/11	3.8	0.2 U	0.2 U	0.2 U	4.8	0.39	0.46	0.2 U
4/24/12	1.1	0.2 U	0.2 U	0.2 U	3.2	0.61	2.3	0.2 U
10/10/12	3.5	0.21	0.2 U	0.2 U	3	0.26	0.87	0.2 U
5/2013	1.5	1 U	1 U	1 U	3	0.52 J	3.1	1 U
10/2013	5.9	1 U	1 U	1 U	6.5	1 U	0.62 J	1 U
4/2014	1.9 J	1 U	1 U	1 U	2.7 J	0.67 J	3.6	1 U
10/2014	7.6	2	18	0.2 U	6.3	0.51 J	1.2	0.2 U
4/2015	--	--	--	--	--	--	--	--
10/2015	5.5	0.96 J	3.3	0.2 U	6.1	0.59 J	2.6	0.2 U

ND: Analyte was not detected. U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
REJ: Rejected. Result considered suspect due to possible cross-contamination. Well re-sampled in December 2005.
Bold: Analyte was detected. Shade: Values are greater than MTCA cleanup levels.

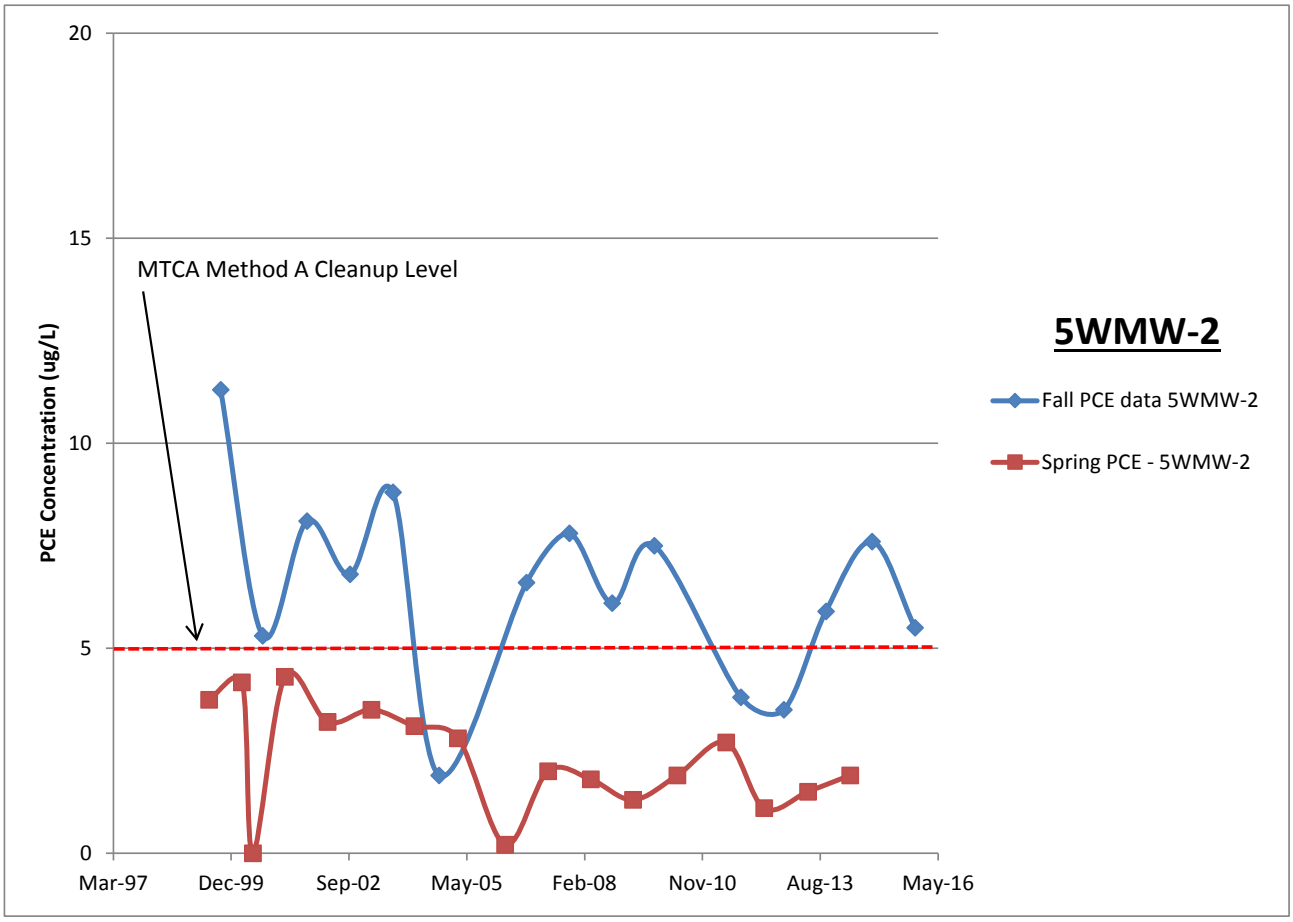


Figure C-14. Fifth Wheel Truck Repair, Well 5WMW-2 PCE Results (ug/L), June 1999 to October 2015.

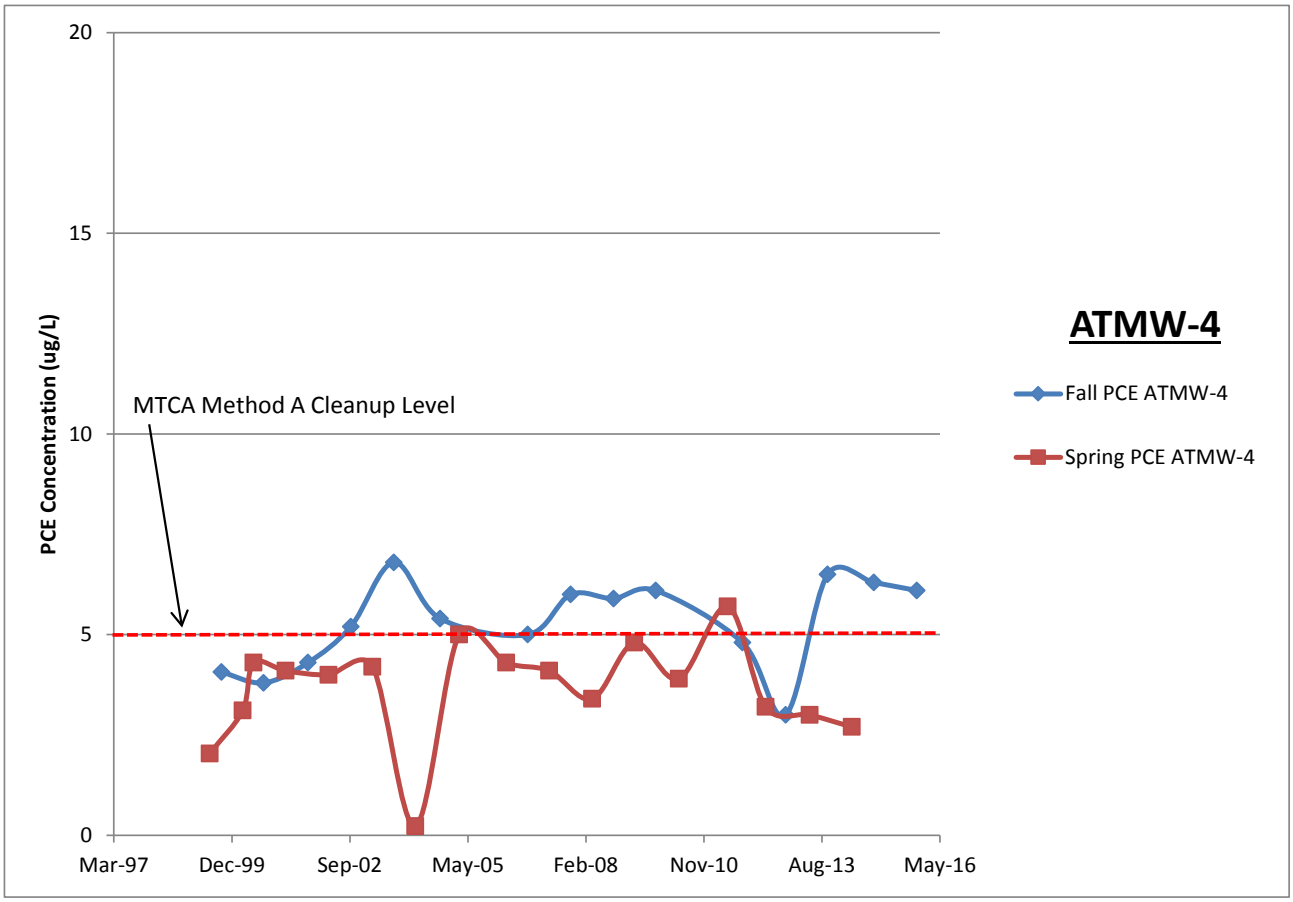


Figure C-15. Agri-Tech/Yakima Steel, Well AT-MW4 PCE Results (ug/L), June 1999 to October 2015.

Table C-6: Summary of Analytical Results (ug/L) for Cameron Yakima, Inc., December 1997 to October 2015.

Date	CYIMW102S				CYIMW103S				CYIMW103D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	**11**	**0.47 J**	2 U	2 U	**26**	**1.2 J**	**2.6**	2 U	**2.6**	2 U	2 U	2 U
3/3/98	**11**	**0.5 J**	**0.2 J**	1 U	**91 E**	**3.8**	**16**	1 U	**3.3**	1 U	1 U	1 U
6/1/98	**11**	**0.66 J**	**1.7**	1 U	**64 E**	**4.1**	**90 E**	1 U	**5**	**0.11 J**	**0.23 J**	1 U
8/31/98	**70 E**	**4.9 J**	**45**	2 UJ	**118 E**	**4 J**	**26 J**	1 UJ	**3.9 J**	1 UJ	1 UJ	1 UJ
6/2/99	**15.3**	**0.93 J**	**3.61**	ND	**55.3**	**3.9**	**31.3**	ND	**5.23**	**0.25 J**	ND	**0.23 J**
9/8/99	**71.6**	**3.4**	**12.6**	ND	**139**	**4.54**	**17**	ND	**4.85**	ND	ND	ND
12/7/99	--	--	--	--	--	--	--	--	--	--	--	--
3/7/00	--	--	--	--	--	--	--	--	--	--	--	--
6/7/00	**6.3**	**0.35**	ND	ND	**27**	ND	**2.6**	ND	**5.1**	ND	ND	ND
8/30/00	**16**	**0.55**	ND	ND	**6.8**	**0.27**	**0.55**	ND	**4.3**	ND	ND	ND
12/12/00	**17**	**0.48**	ND	ND	**30**	**1**	**1.1**	ND	**5**	ND	ND	ND
3/6/01	**12**	**0.48**	ND	ND	**57**	**2.5**	**4.4**	ND	**4.4**	ND	ND	ND
9/10/01	**13**	**0.49**	< 0.2	< 0.2	**33**	**1.2**	**0.98**	< 0.2	**4.1**	< 0.2	< 0.2	< 0.2
3/4/02	**7.9**	**0.33**	< 0.2	< 0.2	**31**	**1.6**	**1.6**	< 0.2	**3.7**	< 0.2	< 0.2	< 0.2
9/9/02	**12**	**0.41**	< 0.2	< 0.2	**21**	**0.76**	**0.57**	< 0.2	--	--	--	--
3/11/03	**6.8**	**0.29**	< 0.2	< 0.2	**26**	**1.2**	**0.92**	< 0.2	**4**	< 0.2	< 0.2	< 0.2
9/9/03	**12**	**0.42**	< 0.2	< 0.2	**16**	**0.57**	< 0.2	< 0.2	**4.4**	< 0.2	< 0.2	< 0.2
3/9/04	**8.6**	**0.32**	< 0.2	< 0.2	**25**	**0.8**	**0.69**	< 0.2	**3.7**	**0.2**	< 0.2	< 0.2
10/5/04	--	--	--	--	**15**	**0.35**	< 0.2	< 0.2	**3.8**	< 0.2	< 0.2	< 0.2
3/15/05	**11**	**0.47**	< 0.2	< 0.2	**18**	**0.8**	**0.71**	< 0.2	**3.8**	< 0.2	< 0.2	< 0.2
10/11/05	**15**	**0.29**	0.2 U	0.2 U	**16**	**0.32**	0.2 U	0.2 U	**4**	0.2 U	0.2 U	0.2 U
12/13/05	--	--	--	--	--	--	--	--	--	--	--	--
4/18/06	**6.6**	**0.28**	< 0.2	< 0.2	**13**	**0.52**	**0.44**	< 0.2	**3.3**	< 0.2	< 0.2	< 0.2
10/17/06	**8.3**	**0.24**	0.2 U	0.2 U	**9.7**	**0.26**	< 0.2	< 0.2	**3**	0.2 U	0.2 U	0.2 U
4/17/07	**5.2**	**0.22**	0.2 U	0.2 U	**13**	**0.52**	**0.47**	0.2 U	**3.5**	0.2 U	0.2 U	0.2 U
10/16/07	**9.3**	**0.27**	0.2 U	0.2 U	**9**	**0.26**	0.2 U	0.2 U	**3**	0.2 U	0.2 U	0.2 U
4/15/08	**5.1**	< 0.2	< 0.2	< 0.2	**10**	**0.38**	**0.38**	< 0.2	**2.3**	< 0.2	< 0.2	< 0.2
10/13/08	**6.3**	1 U	1 U	0.2 U	**5.9**	1 U	1 U	0.2 U	**2.7**	1 U	1 U	0.2 U
4/7/09	**5.8**	1 U	1 U	0.2 U	**12**	1 U	**2.7**	0.2 U	**3.1**	1 U	1 U	0.2 U
10/8/09	**11**	1 U	1 U	0.2 U	**12**	1 U	1 U	0.2 U	**3**	1 U	1 U	0.2 U
4/19/10	**8**	1 U	1 U	1 U	**7.2**	1 U	1 U	1 U	**2.5**	1 U	1 U	1 U
6/7/11	**7.7**	1 U	1 U	0.2 U	**3.6**	1 U	1 U	0.2 U	**4.8**	1 U	1 U	0.2 U
10/11/11	**8.5**	**0.22**	0.2 U	0.2 U	**8.3**	**0.37**	0.2 U	0.2 U	**2.3**	0.2 U	0.2 U	0.2 U
4/24/12	**5.8**	**0.24**	0.2 U	0.2 U	**8.7**	**0.44**	**0.23**	0.2 U	**1.9**	0.2 U	0.2 U	0.2 U
10/10/12	**9.3**	0.2 U	0.2 U	0.2 U	**7.9**	**0.3**	0.2 U	0.2 U	**2.6**	0.2 U	0.2 U	0.2 U
5/2013	**4.6**	1 U	1 U	1 U	**12**	**0.63 J**	**0.63 J**	1 U	**3.1**	1 U	1 U	1 U
10/2013	**11**	1 U	1 U	1 U	**10**	1 U	1 U	1 U	**2.9**	1 U	1 U	1 U

Date	CYIMW102S				CYIMW103S				CYIMW103D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	5.1 J	0.53 J	1 U	1 U	10 J	0.78 J	0.6 J	1 U	3 J	0.36 J	1 U	1 U
10/2014	15 J	3.5	26	0.2 U	12	2.3	15	0.2 U	3.5	1 U	0.91 J	0.2 U
4/2015	--	--	--	--	14	1.2	10	0.2 U	3.4 J	1 UJ	0.93 J	0.2 UJ
10/2015	10	1.6	6.6	0.2 U	10	1.4	5.1	0.2 U	--	--	--	--

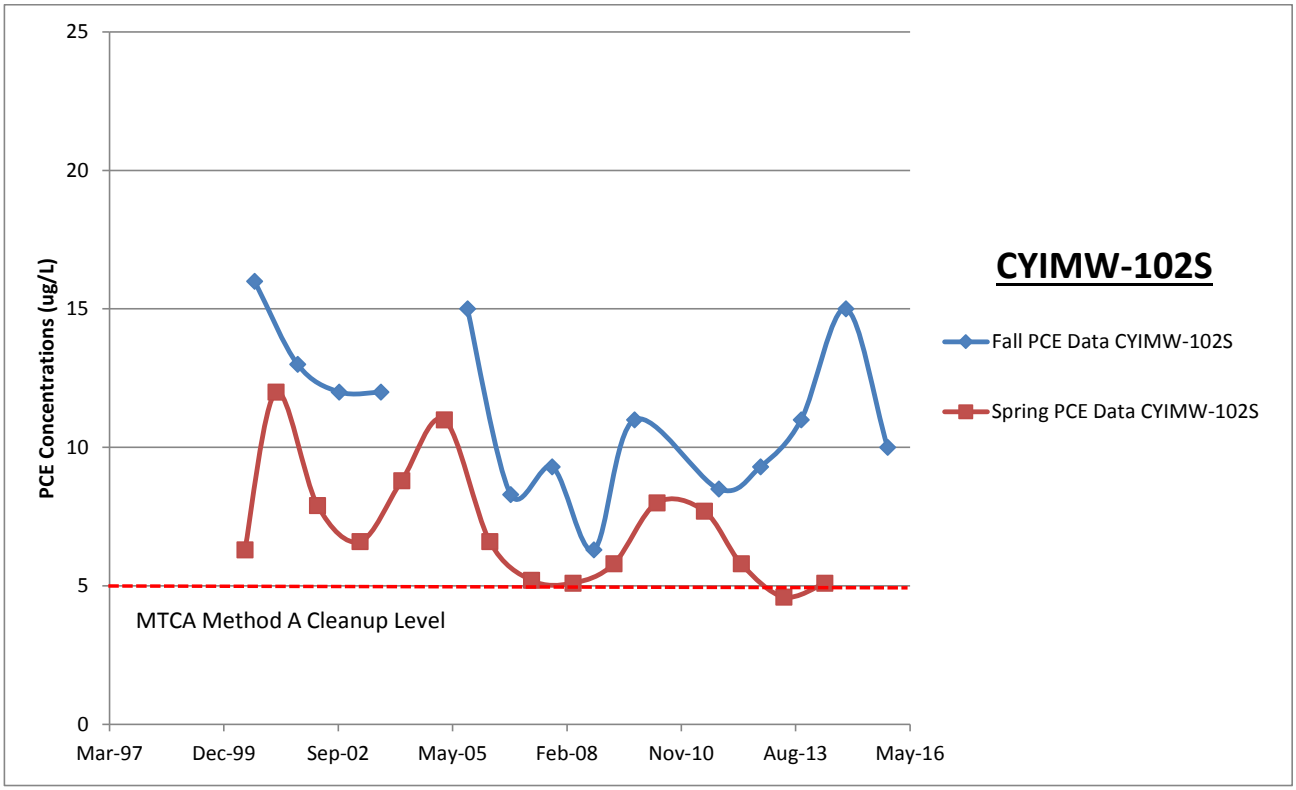


Figure C-16. Cameron Yakima, Well CYIMW-102S PCE Results (ug/L), June 2000 to October 2015.

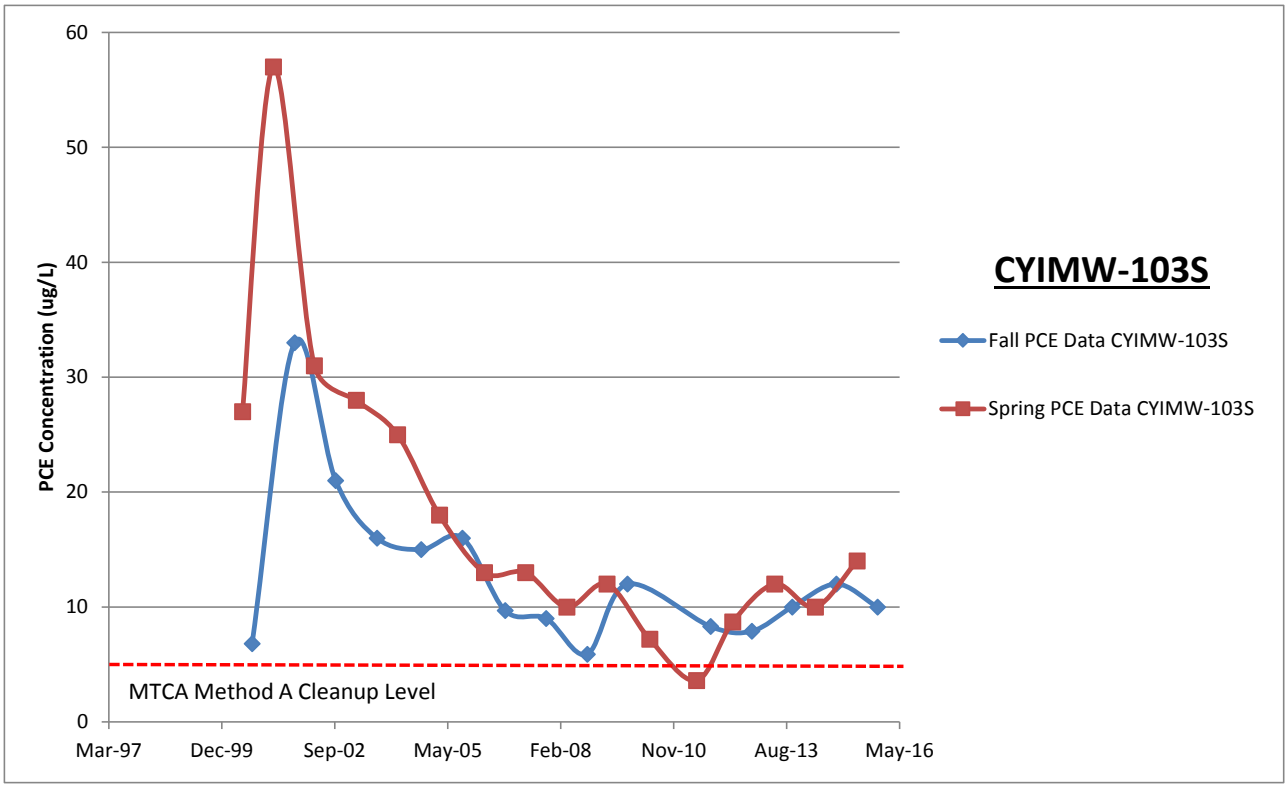


Figure C-17. Cameron Yakima, Well CYIMW-103S PCE Results (ug/L), June 2000 to October 2015.

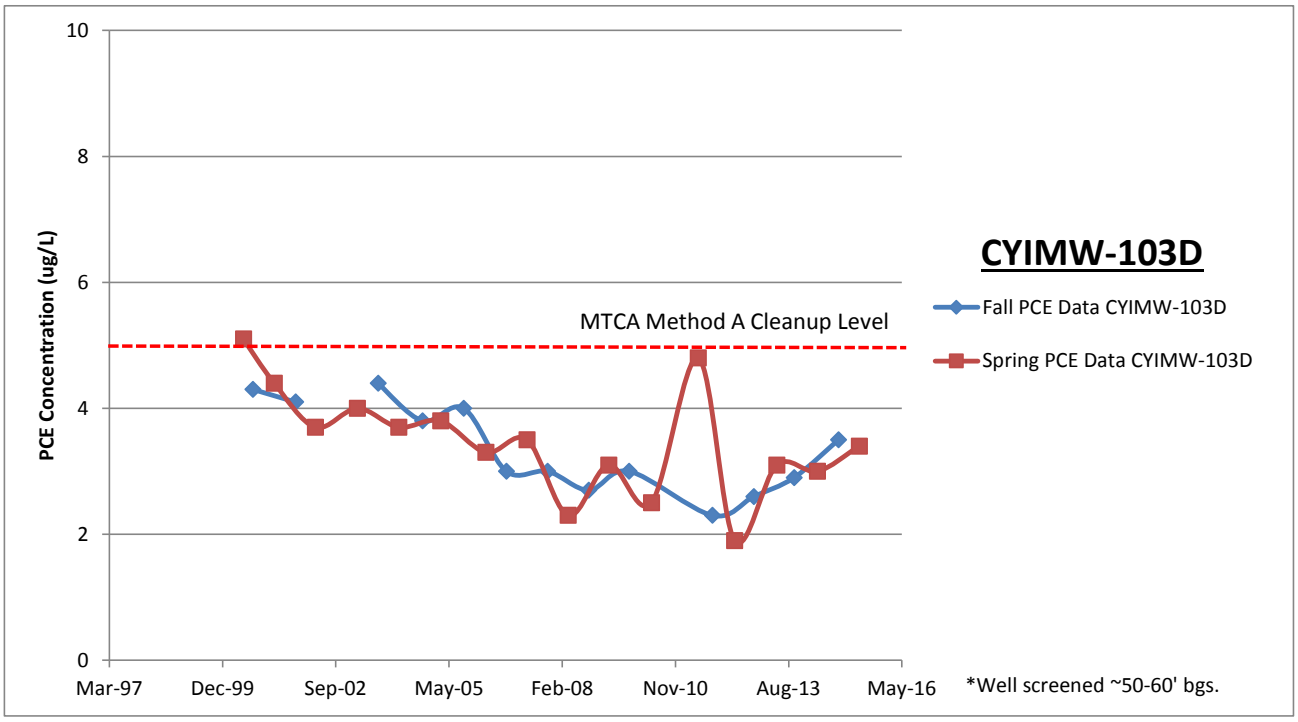


Figure C-18. Cameron Yakima, Well CYIMW-103D PCE Results (ug/L), June 2000 to October 2015.

Table C-6: Continued.

Date	CYIMW106S				CYIMW107S				CYIMW108S			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	**27 J**	**1.2 J**	**2.6**	2 U	--	--	--	--	--	--	--	--
3/3/98	**12**	**0.43 J**	**0.2 J**	1 U	--	--	--	--	--	--	--	--
6/1/98	**8.8**	**0.35 J**	**1.7**	1 UJ	--	--	--	--	--	--	--	--
8/31/98	**8.3 J**	**0.36 J**	**7.4 J**	1 UJ	**18 J**	**0.02 J**	**0.06 J**	1 UJ	**7.8 J**	1 UJ	1 UJ	1 UJ
6/2/99	**7.79**	**0.43 J**	ND	ND	**27**	**0.81 J**	**1.02**	ND	**2.88**	ND	ND	ND
9/8/99	**19**	**0.4 J**	ND	ND	**17.3**	**0.55 J**	ND	ND	**5.29**	ND	ND	ND
12/7/99	--	--	--	--	--	--	--	--	--	--	--	--
3/7/00	--	--	--	--	--	--	--	--	--	--	--	--
6/7/00	**6.2**	**0.28**	ND	ND	**10**	**0.22**	ND	ND	**1.4**	ND	ND	ND
8/30/00	**20**	**0.7**	ND	ND	**14**	**0.48**	**0.22**	ND	**3.8**	ND	ND	ND
12/12/00	**12**	**0.35**	ND	ND	**16**	**0.39**	ND	ND	**3**	ND	ND	ND
3/6/01	**11**	**0.3**	ND	ND	**12**	**0.35**	ND	ND	**0.97**	ND	ND	ND
9/10/01	**13**	**0.4**	< 0.2	< 0.2	**9.2**	**0.27**	< 0.2	< 0.2	**3.7**	< 0.2	< 0.2	< 0.2
3/4/02	**6.9**	**0.24**	< 0.2	< 0.2	**8.3**	**0.27**	< 0.2	< 0.2	**0.89**	< 0.2	< 0.2	< 0.2
9/9/02	**12**	**0.31**	< 0.2	< 0.2	**8.4**	< 0.2	< 0.2	< 0.2	**3.3**	< 0.2	< 0.2	< 0.2
3/11/03	**5.4**	< 0.2	< 0.2	< 0.2	**7.7**	**0.21**	< 0.2	< 0.2	**1.3**	< 0.2	< 0.2	< 0.2
9/9/03	**13**	**0.31**	< 0.2	< 0.2	**9.5**	< 0.2	< 0.2	< 0.2	**3.5**	< 0.2	< 0.2	< 0.2
3/9/04	**8.3**	**0.26**	< 0.2	< 0.2	**9.5**	**0.36**	< 0.2	< 0.2	**0.96**	< 0.2	< 0.2	< 0.2
10/5/04	**11**	**0.26**	< 0.2	< 0.2	**7**	< 0.2	< 0.2	< 0.2	**3.4**	< 0.2	< 0.2	< 0.2
3/15/05	**9.4**	**0.27**	< 0.2	< 0.2	**9.2**	**0.28**	< 0.2	< 0.2	**0.8**	< 0.2	< 0.2	< 0.2
10/11/05	**15**	**0.29**	0.2 U	0.2 U	**15**	0.2 U	0.2 U	0.2 U	**5.9**	0.2 U	0.2 U	0.2 U
12/13/05	--	--	--	--	--	--	--	--	--	--	--	--
4/18/06	**4.4**	< 0.2	< 0.2	< 0.2	**6.6**	< 0.2	< 0.2	< 0.2	**0.6**	< 0.2	< 0.2	< 0.2
10/17/06	**8.4**	**0.24**	0.2 U	0.2 U	**5**	0.2 U	0.2 U	0.2 U	**2.2**	< 0.2	< 0.2	< 0.2
4/17/07	**3.2**	**0.22**	0.2 U	0.2 U	**6.6**	0.2 U	0.2 U	0.2 U	**0.43**	0.2 U	0.2 U	0.2 U
10/16/07	**8.9**	**0.24**	0.2 U	0.2 U	**4.4**	0.2 U	0.2 U	0.2 U	**2.2**	0.2 U	0.2 U	0.2 U
4/15/08	**3.1**	< 0.2	< 0.2	< 0.2	**5.9**	< 0.2	< 0.2	< 0.2	**0.48**	< 0.2	< 0.2	< 0.2
10/13/08	**6.4**	1 U	1 U	0.2 U	**2.4**	1 U	1 U	0.2 U	**2.3**	1 U	1 U	0.2 U
4/7/09	**3.5**	1 U	1 U	0.2 U	**5.6**	1 U	1 U	0.2 U	**0.13 J**	1 U	1 U	0.2 U
10/8/09	**9.3**	1 U	1 U	0.2 U	**5.9**	1 U	1 U	0.2 U	**3.2**	1 U	1 U	0.2 U
4/19/10	**4.8**	1 U	1 U	1 U	**7.6**	1 U	1 U	1 U	**3.6**	1 U	1 U	1 U
6/7/11	**4**	1 U	1 U	0.2 U	**8.7**	1 U	1 U	0.2 U	**5.8**	1 U	1 U	0.2 U
10/11/11	**6.5**	**0.21**	0.2 U	0.2 U	**4.8**	0.2 U	0.2 U	0.2 U	**2.8**	0.2 U	0.2 U	0.2 U
4/24/12	**2.9**	0.2 U	0.2 U	0.2 U	**4.9**	0.2 U	0.2 U	0.2 U	**2.6**	0.2 U	0.2 U	0.2 U
10/10/12	**5.6**	0.2 U	0.2 U	0.2 U	**4.9**	0.2 U	0.2 U	0.2 U	**3.1**	0.2 U	0.2 U	0.2 U
5/2013	**3.6**	1 U	1 U	1 U	**3.4**	1 U	1 U	1 U	**3.5**	1 U	1 U	1 U
10/2013	**7.8**	1 U	1 U	1 U	**6.2**	1 U	1 U	1 U	**4.1**	1 U	1 U	1 U
4/2014	2.3 J	1 U	1 U	1 U	3.6 J	0.33 J	1 U	1 U	3.4 J	0.33 J	1 U	1 U
10/2014	12	2.9	24	0.2 U	7	1	5.9	0.2 U	4.3	0.58 J	3.5	0.2 U
4/2015	--	--	--	--	4.7	0.4 J	2.8	0.2 U	--	--	--	--
10/2015	8	1.3	5	0.2 U	6.4	0.74 J	3.5	0.2 U	3.9	0.27 J	1.1	0.2 U

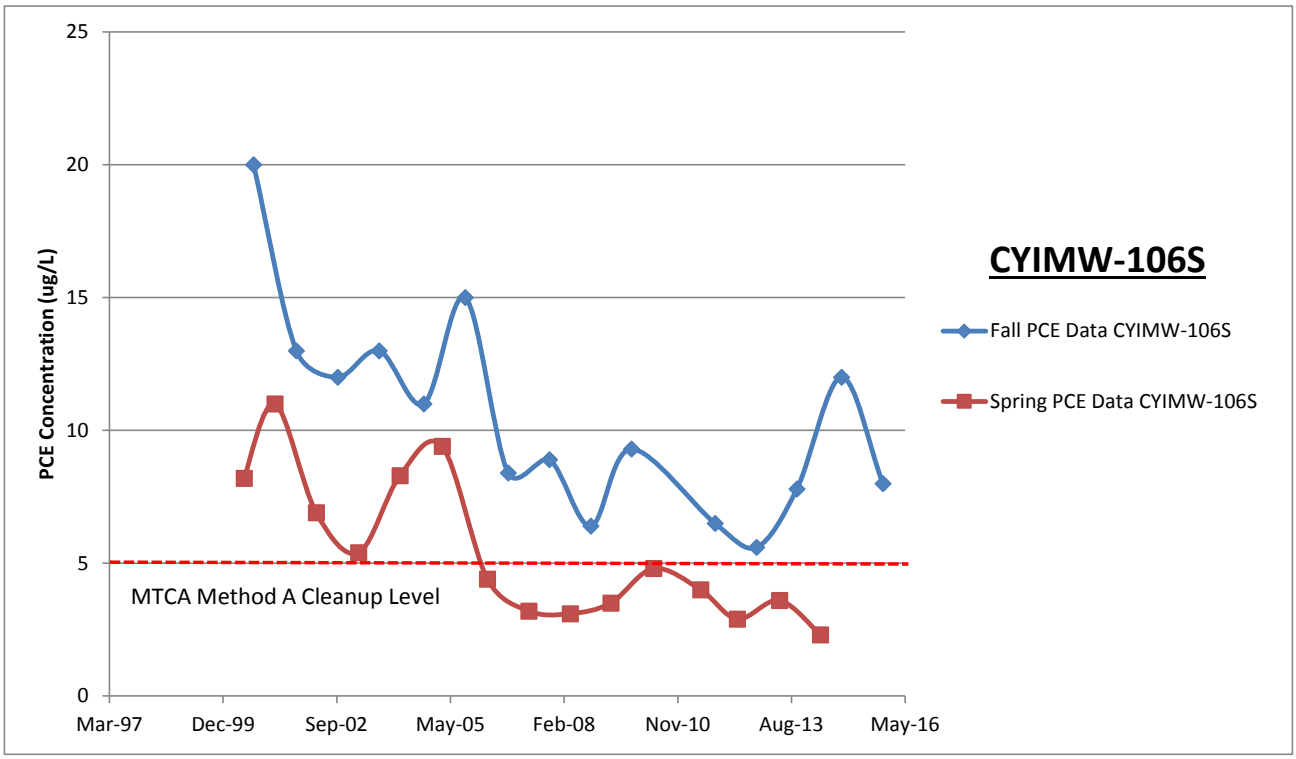


Figure C-19. Cameron Yakima, Well CYIMW-106S PCE Results (ug/L), June 2000 to October 2015.

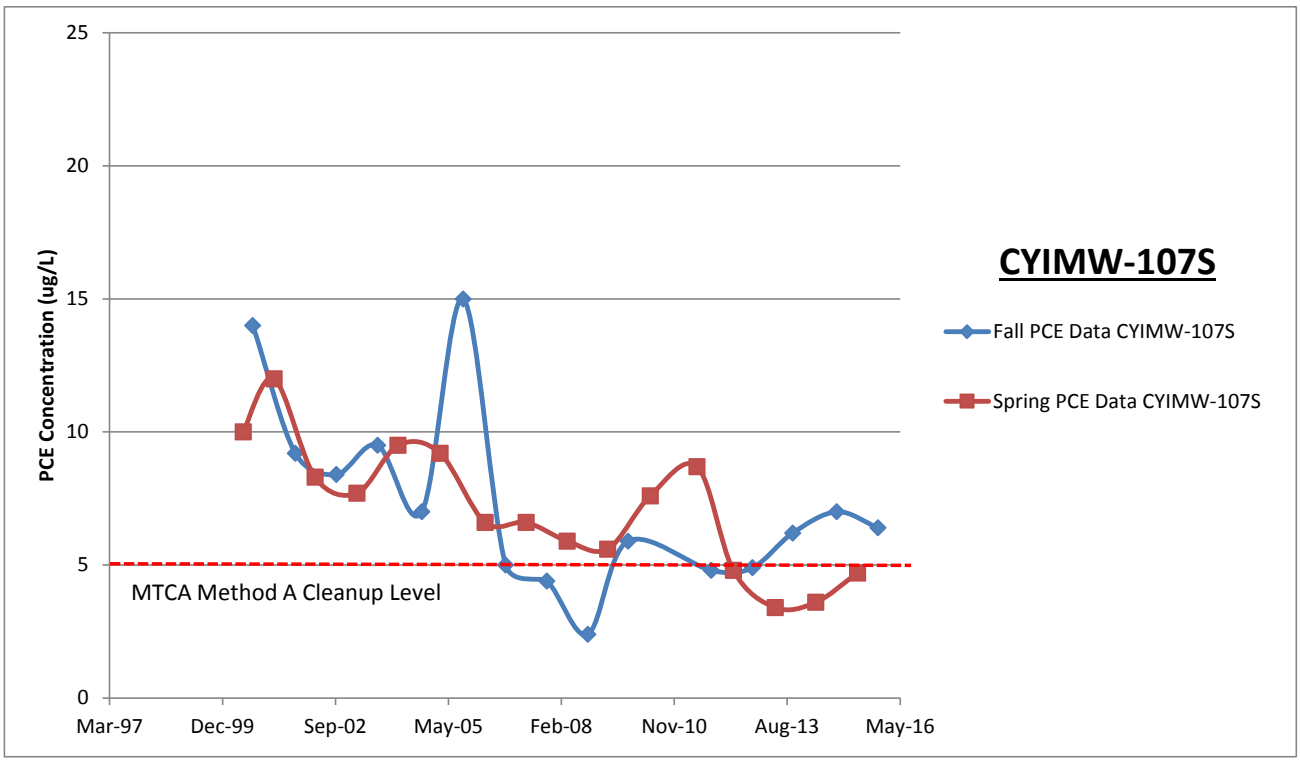


Figure C-20. Cameron Yakima, Well CYIMW-107S PCE Results (ug/L), June 2000 to October 2015.

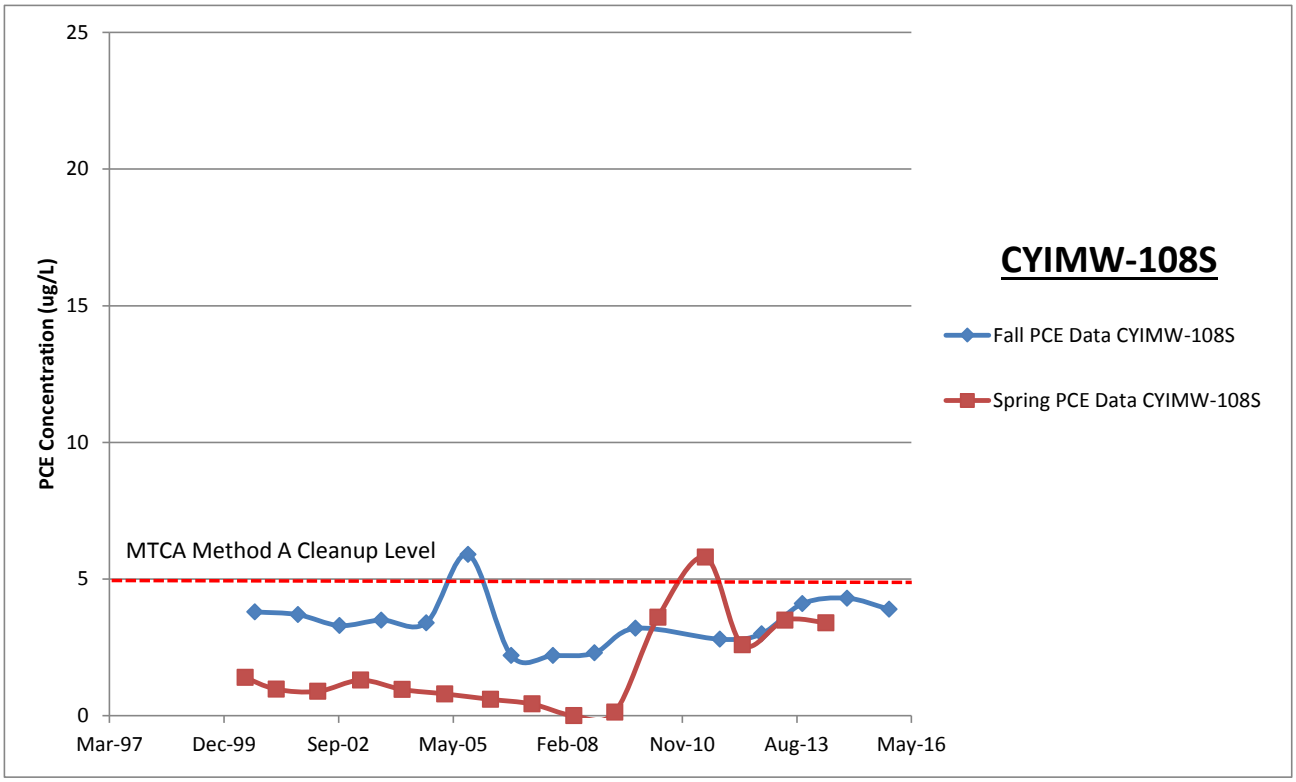


Figure C-21. Cameron Yakima, Well CYIMW-108S PCE Results (ug/L), June 2000 to October 2015.

Table C-6: Continued.

Date	CYIMW109S				CYIMW110S				CYIMW111S			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--	--	--	--	--	--	--	--	--
3/3/98	--	--	--	--	--	--	--	--	--	--	--	--
6/1/98	--	--	--	--	--	--	--	--	--	--	--	--
8/31/98	**7.1 J**	1 UJ	1 UJ	1 UJ	**8.3 J**	1 UJ	1 UJ	1 UJ	**9.4 J**	**0.19 J**	1 UJ	1 UJ
6/2/99	**3.77**	ND	ND	ND	**4.52**	ND	ND	ND	**6.1**	ND	ND	ND
9/8/99	**4.96**	ND	ND	ND	**5.86**	ND	ND	ND	**8.57**	ND	ND	ND
12/7/99	--	--	--	--	--	--	--	--	--	--	--	--
3/7/00	--	--	--	--	--	--	--	--	--	--	--	--
6/7/00	**2**	ND	ND	ND	**2.3**	ND	ND	ND	**3.9**	ND	ND	ND
8/30/00	**4**	ND	ND	ND	**5.6**	ND	ND	ND	**6.5**	ND	ND	ND
12/12/00	**3.8**	ND	ND	ND	**4.4**	ND	ND	ND	**5.1**	ND	ND	ND
3/6/01	**1.4**	ND	ND	ND	**2.2**	ND	ND	ND	**2.3**	ND	ND	ND
9/10/01	**3.6**	< 0.2	< 0.2	< 0.2	**4.3**	< 0.2	< 0.2	< 0.2	**5.7**	< 0.2	< 0.2	< 0.2
3/4/02	**1.1**	< 0.2	< 0.2	< 0.2	**1.7**	< 0.2	< 0.2	< 0.2	**1.5**	< 0.2	< 0.2	< 0.2
9/9/02	**2.9**	< 0.2	< 0.2	< 0.2	**3.6**	< 0.2	< 0.2	< 0.2	**5.4**	< 0.2	< 0.2	< 0.2
3/11/03	**1.7**	< 0.2	< 0.2	< 0.2	**2.4**	< 0.2	< 0.2	< 0.2	**2.2**	< 0.2	< 0.2	< 0.2
9/9/03	--	--	--	--	--	--	--	--	**5.8**	< 0.2	< 0.2	< 0.2
3/9/04	--	--	--	--	--	--	--	--	**1.7**	< 0.2	< 0.2	< 0.2
10/5/04	--	--	--	--	--	--	--	--	**0.65**	< 0.2	< 0.2	< 0.2
3/15/05	**1.2**	< 0.2	< 0.2	< 0.2	--	--	--	--	**1.7**	< 0.2	< 0.2	< 0.2
10/11/05	REJ				**4.1**	0.2 U	0.2 U	0.2 U	**4.4**	0.2 U	0.2 U	0.2 U
12/13/05	**1.4**	0.2 U	0.2 U	0.2 U	--	--	--	--	--	--	--	--
4/18/06	**0.62**	< 0.2	< 0.2	< 0.2	**1.2**	< 0.2	< 0.2	< 0.2	**0.4**	< 0.2	< 0.2	< 0.2
10/17/06	**2.3**	0.2 U	0.2 U	0.2 U	**3**	0.2 U	0.2 U	0.2 U	**2.2**	0.2 U	0.2 U	0.2 U
4/17/07	**0.55**	0.2 U	0.2 U	0.2 U	**0.96**	0.2 U	0.2 U	0.2 U	**0.68**	0.2 U	0.2 U	0.2 U
10/16/07	**2.9**	0.2 U	0.2 U	0.2 U	**3.7**	0.2 U	0.2 U	0.2 U	**3.3**	0.2 U	0.2 U	0.2 U
4/15/08	**0.5**	< 0.2	< 0.2	< 0.2	**0.75**	< 0.2	< 0.2	< 0.2	**0.6**	< 0.2	< 0.2	< 0.2
10/13/08	**1.8**	1 U	1 U	0.2 U	**1.9**	1 U	1 U	0.2 U	**1.8**	1 U	1 U	0.2 U
4/7/09	**0.29 J**	1 U	1 U	0.2 U	**0.59 J**	1 U	1 U	0.2 U	**0.43 J**	1 U	1 U	0.2 U
10/8/09	**3.3**	1 U	1 U	0.2 U	**3.7**	1 U	1 U	0.2 U	**5.5**	1 U	1 U	0.2 U
4/19/10	**4.2**	1 U	1 U	1 U	**5.2**	1 U	1 U	1 U	**1.3**	1 U	1 U	1 U
6/7/11	**4**	1 U	1 U	0.2 U	**5.8**	1 U	1 U	0.2 U	1 U	1 U	1 U	0.2 U
10/11/11	--	--	--	--	**3.4**	0.2 U	0.2 U	0.2 U	**4.4**	0.2 U	0.2 U	0.2 U
4/24/12	--	--	--	--	**1.3**	0.2 U	0.2 U	0.2 U	**0.52**	0.2 U	0.2 U	0.2 U
10/10/12	--	--	--	--	**3.9**	0.2 U	0.2 U	0.2 U	**2.3**	0.2 U	0.2 U	0.2 U
5/2013	**4.1**	1 U	1 U	1 U	**4.5**	1 U	1 U	1 U	**1.2**	1 U	1 U	1 U
10/2013	**4.2**	1 U	1 U	1 U	--	--	--	--	**0.93 J**	1 U	1 U	1 U

Date	CYIMW109S				CYIMW110S				CYIMW111S			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	3.7 J	0.34 J	1 U	1 U	2.8 J	0.28 NJ	1 U	1 U	--	--	--	--
10/2014	5.7	1	7.2	0.2 U	--	--	--	--	--	--	--	--
4/2015	--	--	--	--	--	--	--	--	--	--	--	--
10/2015	--	--	--	--	--	--	--	--	1.1	1 U	0.57 J	0.2 U

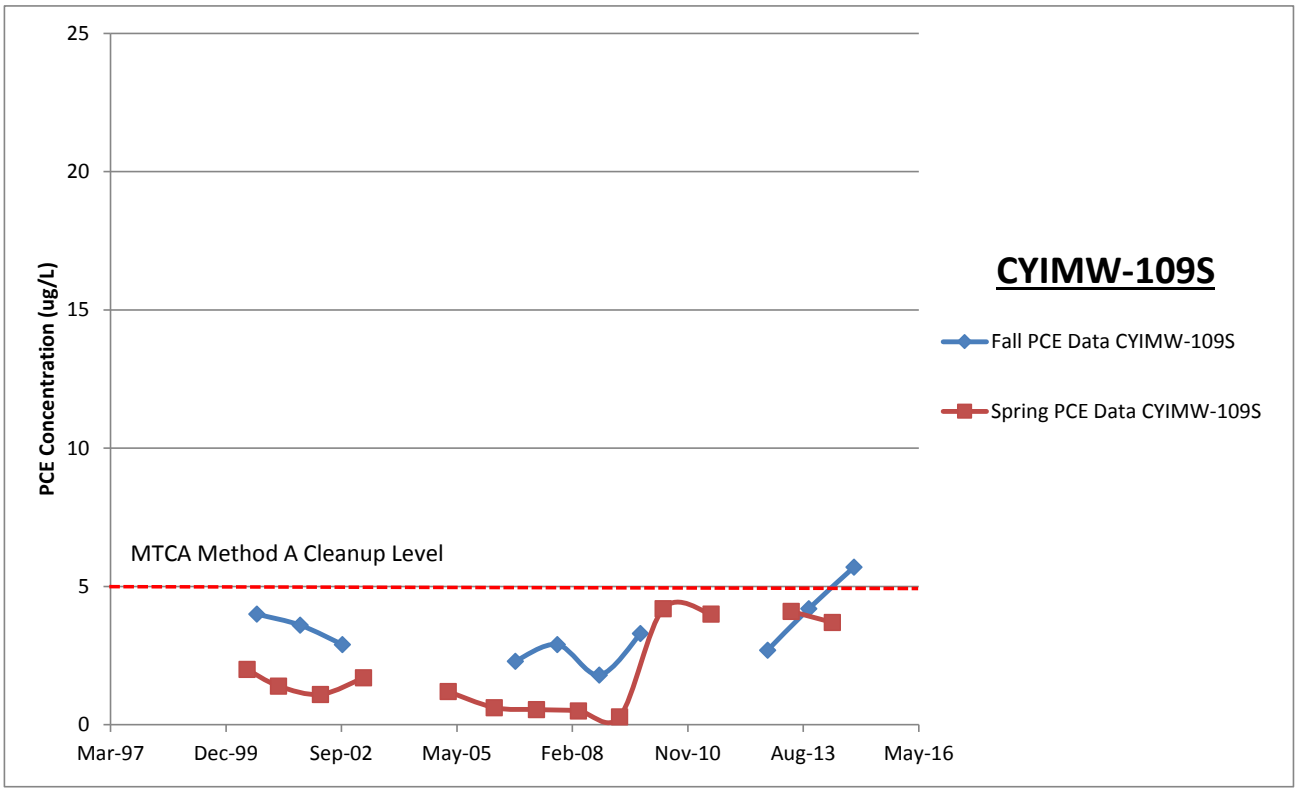


Figure C-22. Cameron Yakima, Well CYIMW-109S PCE Results (ug/L), June 2000 to October 2015.

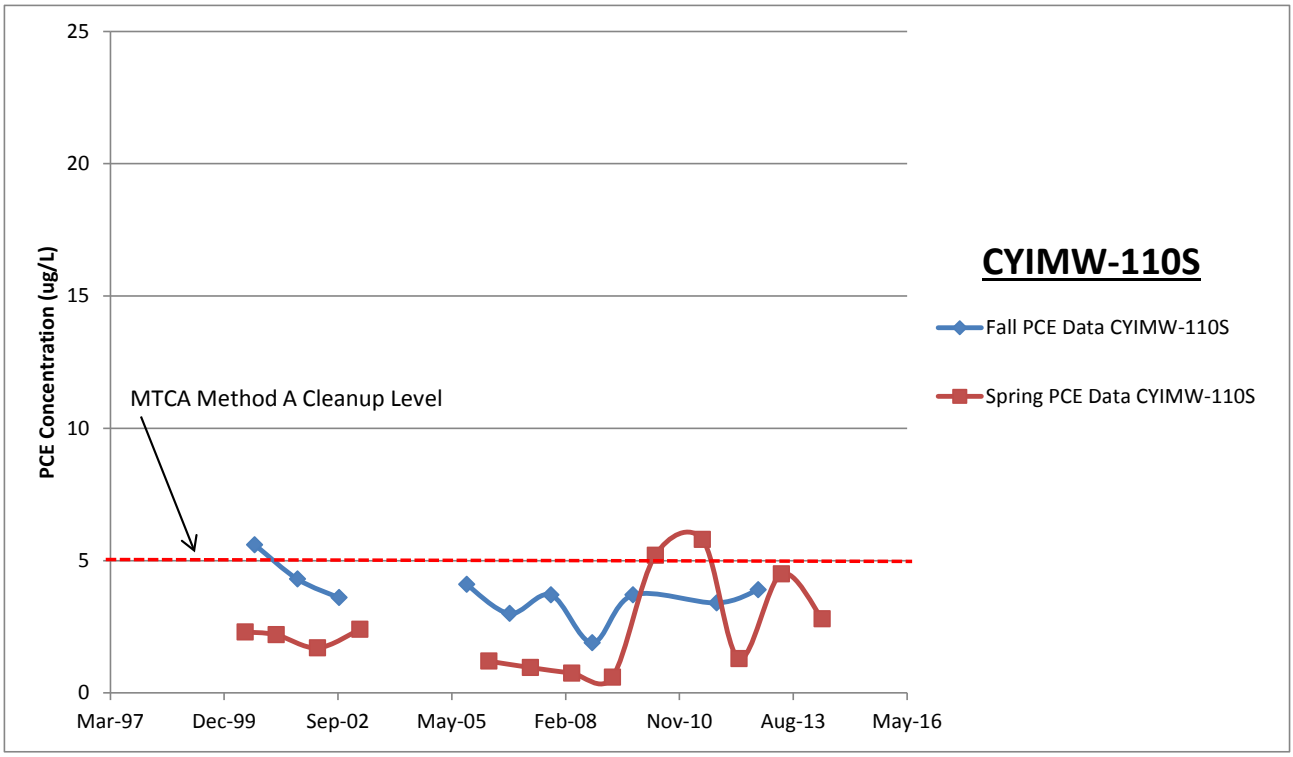


Figure C-23. Cameron Yakima, Well CYIMW-110S PCE Results (ug/L), June 2000 to May 2015.

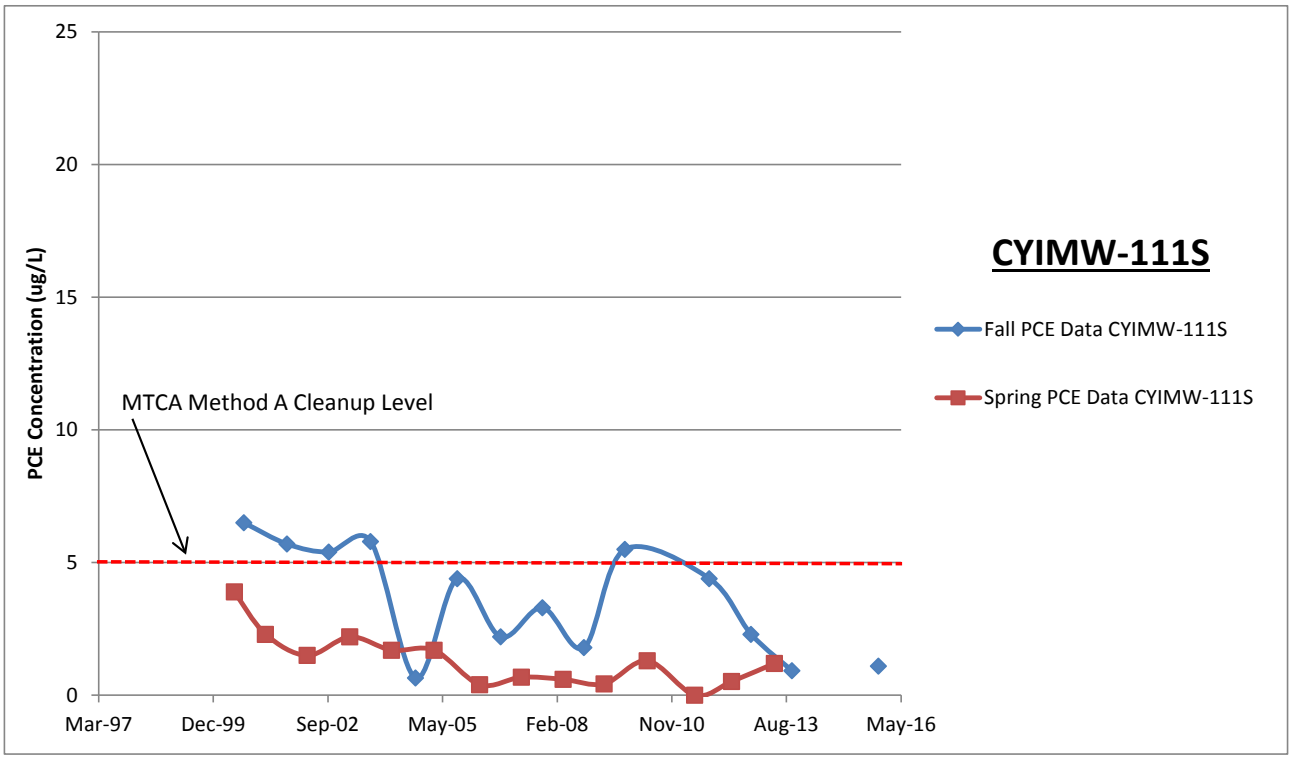


Figure C-24. Cameron Yakima, Well CYIMW-111S PCE Results (ug/L), June 2000 to October 2015.

Table C-6: Continued.

Date	CYIMW112S				CYIMW113S				CYIMW113D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--	--	--	--	--	--	--	--	--
3/3/98	--	--	--	--	--	--	--	--	--	--	--	--
6/1/98	--	--	--	--	--	--	--	--	--	--	--	--
8/31/98	**15 J**	**0.02 J**	**0.45 J**	1 UJ	**21 J**	**0.2 J**	**1.2 J**	1 UJ	**5 J**	1 UJ	1 UJ	1 UJ
6/2/99	**18.9**	**0.71 J**	**1.47**	ND	--	--	--	--	**5.34**	ND	ND	ND
9/8/99	**17.1**	**0.56 J**	**0.71 J**	ND	--	--	--	--	**5.46**	ND	ND	ND
12/7/99	--	--	--	--	--	--	--	--	--	--	--	--
3/7/00	--	--	--	--	--	--	--	--	--	--	--	--
6/7/00	**9.6**	**0.28**	ND	ND	--	--	--	--	**5.8**	ND	ND	ND
8/30/00	**11**	**0.37**	ND	ND	--	--	--	--	**5.1**	ND	ND	ND
12/12/00	**13**	**0.38**	ND	ND	--	--	--	--	**5.2**	ND	ND	ND
3/6/01	**6.5**	**0.24**	ND	ND	--	--	--	--	**4.4**	ND	ND	ND
9/10/01	**8.6**	**0.27**	< 0.2	< 0.2	--	--	--	--	**4.7**	< 0.2	< 0.2	< 0.2
3/4/02	**3.9**	< 0.2	< 0.2	< 0.2	--	--	--	--	**3.5**	< 0.2	< 0.2	< 0.2
9/9/02	**4**	< 0.2	< 0.2	< 0.2	--	--	--	--	**4.5**	< 0.2	< 0.2	< 0.2
3/11/03	**4.6**	**0.21**	< 0.2	< 0.2	--	--	--	--	**3.9**	< 0.2	< 0.2	< 0.2
9/9/03	--	--	--	--	--	--	--	--	--	--	--	--
3/9/04	--	--	--	--	--	--	--	--	--	--	--	--
10/5/04	--	--	--	--	--	--	--	--	--	--	--	--
3/15/05	**3.7**	< 0.2	< 0.2	< 0.2	--	--	--	--	**4**	< 0.2	< 0.2	< 0.2
10/11/05	**8.8**	0.2 U	0.2 U	0.2 U	**9.9**	0.2 U	0.2 U	0.2 U	**4.8**	< 0.2	< 0.2	< 0.2
12/13/05	--	--	--	--	--	--	--	--	--	--	--	--
4/18/06	**3**	< 0.2	< 0.2	< 0.2	--	--	--	--	**3.8**	< 0.2	< 0.2	< 0.2
10/17/06	**4.6**	0.2 U	0.2 U	0.2 U	**5.5**	0.2 U	0.2 U	0.2 U	**3.6**	0.2 U	0.2 U	0.2 U
4/17/07	**2.7**	0.2 U	0.2 U	0.2 U	**2.8**	0.2 U	0.2 U	0.2 U	**3.5**	0.2 U	0.2 U	0.2 U
10/16/07	**4.7**	0.2 U	0.2 U	0.2 U	**5.5**	0.2 U	0.2 U	0.2 U	**3.2**	0.2 U	0.2 U	0.2 U
4/15/08	**2**	< 0.2	< 0.2	< 0.2	--	--	--	--	**2.7**	< 0.2	< 0.2	< 0.2
10/13/08	**3.2**	1 U	1 U	0.2 U	**3.7**	1 U	1 U	0.2 U	**2.8**	1 U	1 U	0.2 U
4/7/09	**1.8**	1 U	1 U	0.2 U	**1.8**	1 U	1 U	0.2 U	**3**	1 U	1 U	0.2 U
10/8/09	**7.9**	1 U	1 U	0.2 U	**8.6**	1 U	1 U	0.2 U	**4.2**	1 U	1 U	0.2 U
4/19/10	**6.2**	1 U	1 U	1 U	**14**	1 U	1 U	1 U	**3.4**	1 U	1 U	1 U
6/7/11	**8.5**	1 U	1 U	0.2 U	**12**	1 U	1 U	0.2 U	**6.1**	1 U	1 U	0.2 U
10/11/11	**4.7**	0.2 U	0.2 U	0.2 U	**9**	**0.22**	0.2 U	0.2 U	**3.1**	0.2 U	0.2 U	0.2 U
4/24/12	**7.3**	**0.28**	0.2 U	0.2 U	**8.5**	**0.36**	0.2 U	0.2 U	**2.8**	0.2 U	0.2 U	0.2 U
10/10/12	**6.1**	0.2 U	0.2 U	0.2 U	**8.8**	**0.25**	0.2 U	0.2 U	**2.9**	0.2 U	0.2 U	0.2 U
5/2013	**9**	**0.44 J**	**0.45 J**	1 U	**12**	**0.58 J**	**0.51 J**	1 U	**4**	1 U	1 U	1 U
10/2013	**11**	1 U	1 U	1 U	**13**	1 U	1 U	1 U	**4.5**	1 U	1 U	1 U

Date	CYIMW112S				CYIMW113S				CYIMW113D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	7.4 J	0.6 J	1 U	1 U	6.1 J	0.55 J	1 U	1 U	3.8 J	0.33 J	1 U	1 U
10/2014	5.1	0.67 J	4	0.2 U	9.7	2	14	0.2 U	4.8	1 U	2.1	0.2 U
4/2015	9.1	1.1	7.6	0.2 U	12	1.4	9.9	0.2 U	4.4	1 U	0.38 J	0.2 U
10/2015	9.3	1.3	5.6	0.2 U	11	1.6	6.7	0.2 U	--	--	--	--

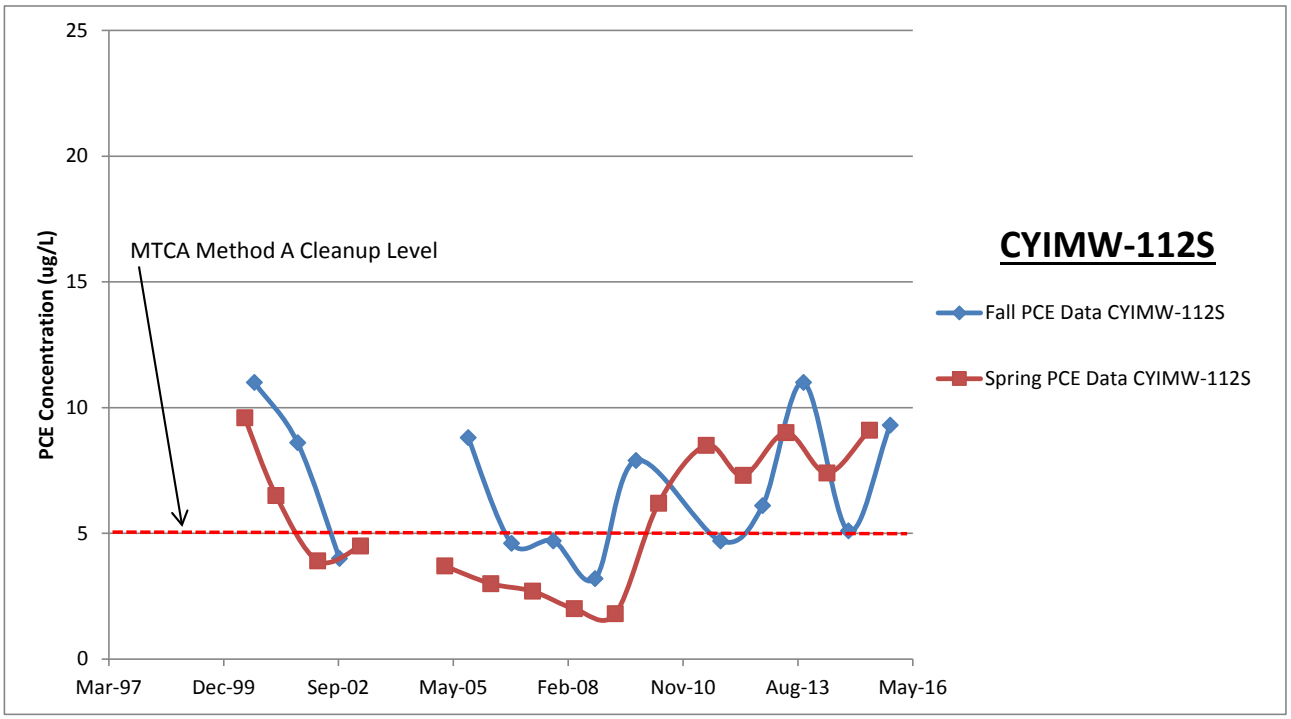


Figure C-25. Cameron Yakima, Well CYIMW-112S PCE Results (ug/L), June 2000 to October 2015.

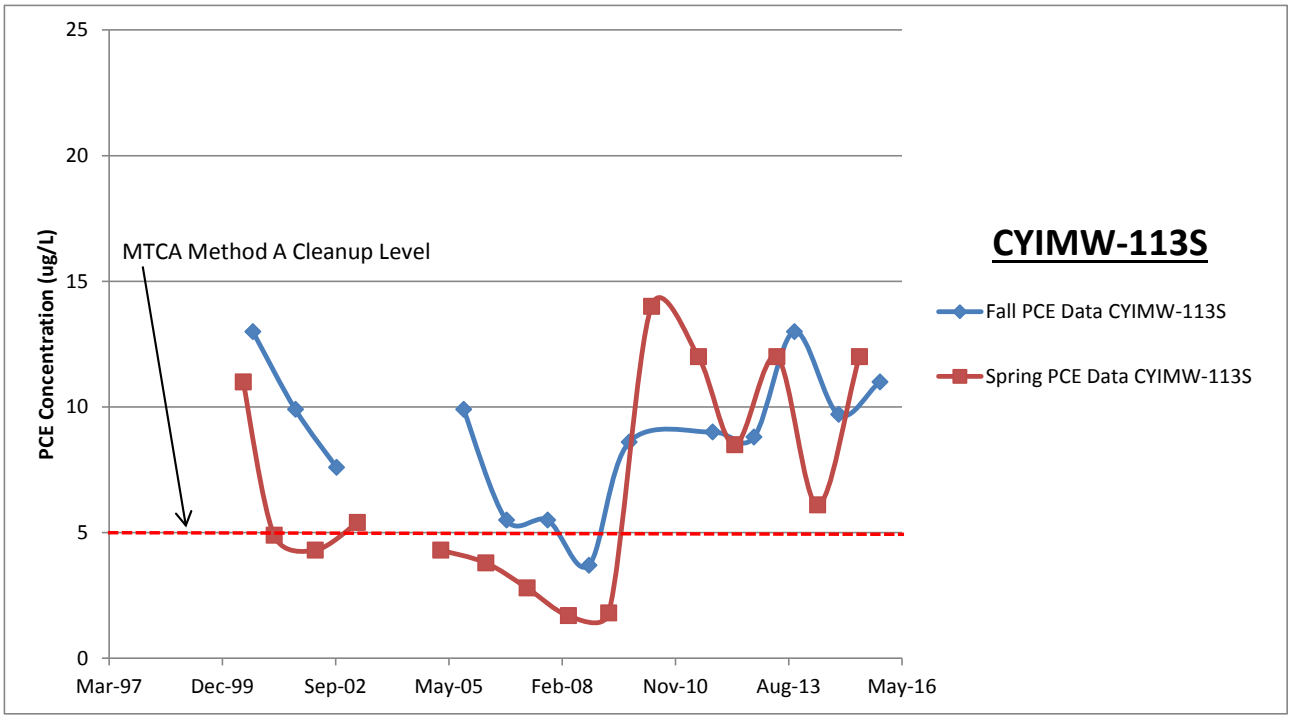


Figure C-26. Cameron Yakima, Well CYIMW-113S PCE Results (ug/L), June 2000 to October 2015.

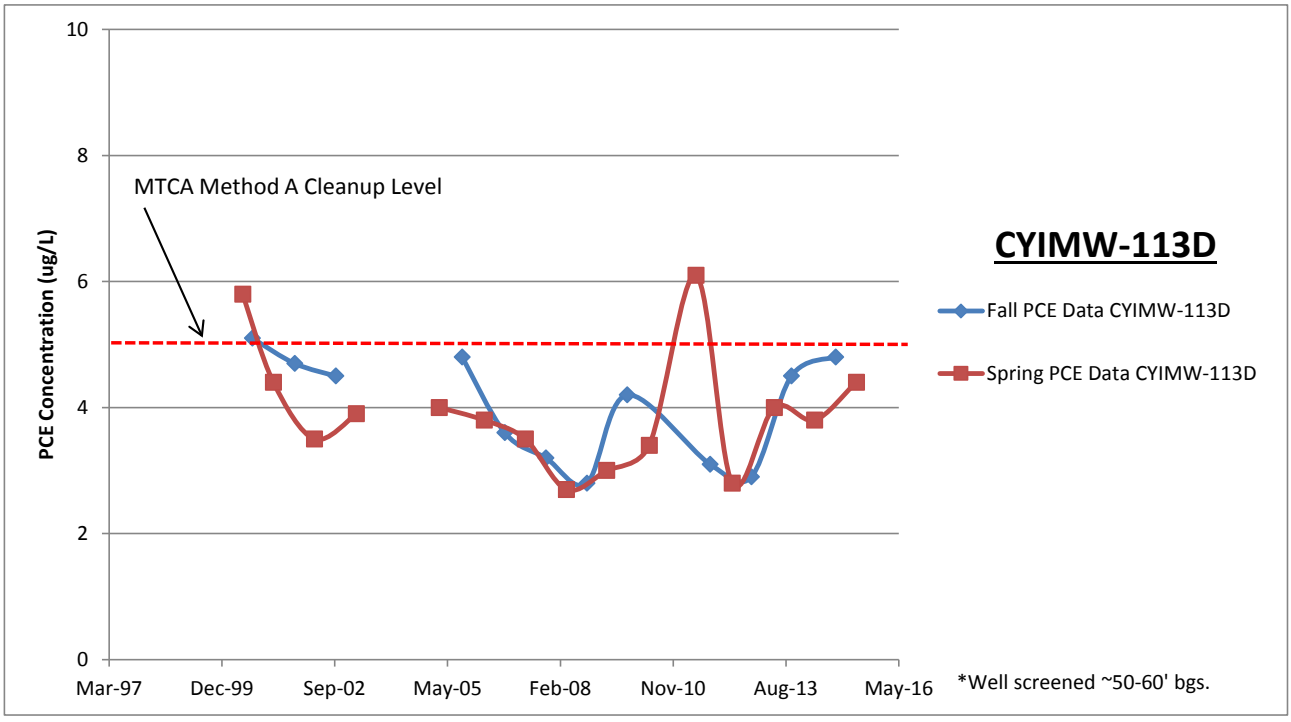


Figure C-27. Cameron Yakima, Well CYIMW-113D PCE Results (ug/L), June 2000 to October 2015.

Table C-6: Continued.

Date	CYIMW114S			
	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--
3/3/98	--	--	--	--
6/1/98	--	--	--	--
8/31/98	**15 J**	**0.03 J**	**0.72 J**	1 UJ
6/2/99	**19.1**	**0.65 J**	**1.59**	ND
9/8/99	**15.8**	**0.63 J**	**0.84 J**	ND
12/7/99	--	--	--	--
3/7/00	--	--	--	--
6/7/00	**9.9**	**0.28**	**0.2**	ND
8/30/00	**7.9**	**0.32**	ND	ND
12/12/00	**13**	**0.34**	ND	ND
3/6/01	**8.6**	**0.33**	ND	ND
9/10/01	**7.8**	**0.27**	< 0.2	< 0.2
3/4/02	**5.5**	**0.25**	< 0.2	< 0.2
9/9/02	**4.9**	< 0.2	< 0.2	< 0.2
3/11/03	**6.3**	< 0.2	< 0.2	< 0.2
9/9/03	--	--	--	--
3/9/04	--	--	--	--
10/5/04	--	--	--	--
3/15/05	**6.2**	**0.31**	< 0.2	< 0.2
10/11/05	**7.2**	0.2 U	0.2 U	0.2 U
12/13/05	--	--	--	--
4/18/06	**2.5**	< 0.2	< 0.2	< 0.2
10/17/06	**4.8**	0.2 U	0.2 U	0.2 U
4/17/07	**2.5**	0.2 U	0.2 U	0.2 U
10/16/07	**5**	0.2 U	0.2 U	0.2 U
4/15/08	**3.4**	< 0.2	< 0.2	< 0.2
10/13/08	**3.4**	1 U	1 U	0.2 U
4/7/09	**4.4**	1 U	**2.4**	0.2 U
10/8/09	**7.9**	1 U	1 U	0.2 U
4/19/10	**13**	1 U	1 U	1 U
6/7/11	**12**	1 U	1 U	0.2 U
10/11/11	**9.5**	**0.27**	0.2 U	0.2 U
4/24/12	**8.9**	**0.34**	0.2 U	0.2 U
10/10/12	**8.9**	**0.28**	0.2 U	0.2 U
5/2013	**12**	**0.41 J**	**0.46 J**	1 U
10/2013	**12**	1 U	1 U	1 U

Date	CYIMW114S			
	PCE	TCE	Cis-DCE	VC
4/2014	12 J	0.79 J	0.52 J	1 U
10/2014	10	2.1	14	0.2 U
4/2015	12	1.4	11	0.2 U
10/2015	--	--	--	--

U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
UJ: The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
E: Reported result is an estimate because it exceeds the calibration range.
ND: Analyte was not detected.
REJ: Rejected. Result considered suspect due to possible cross-contamination. Well re-sampled in December 2005.
Bold: Analyte was detected.
Shade: Values are greater than MTCA cleanup levels.
-- Not Sampled.

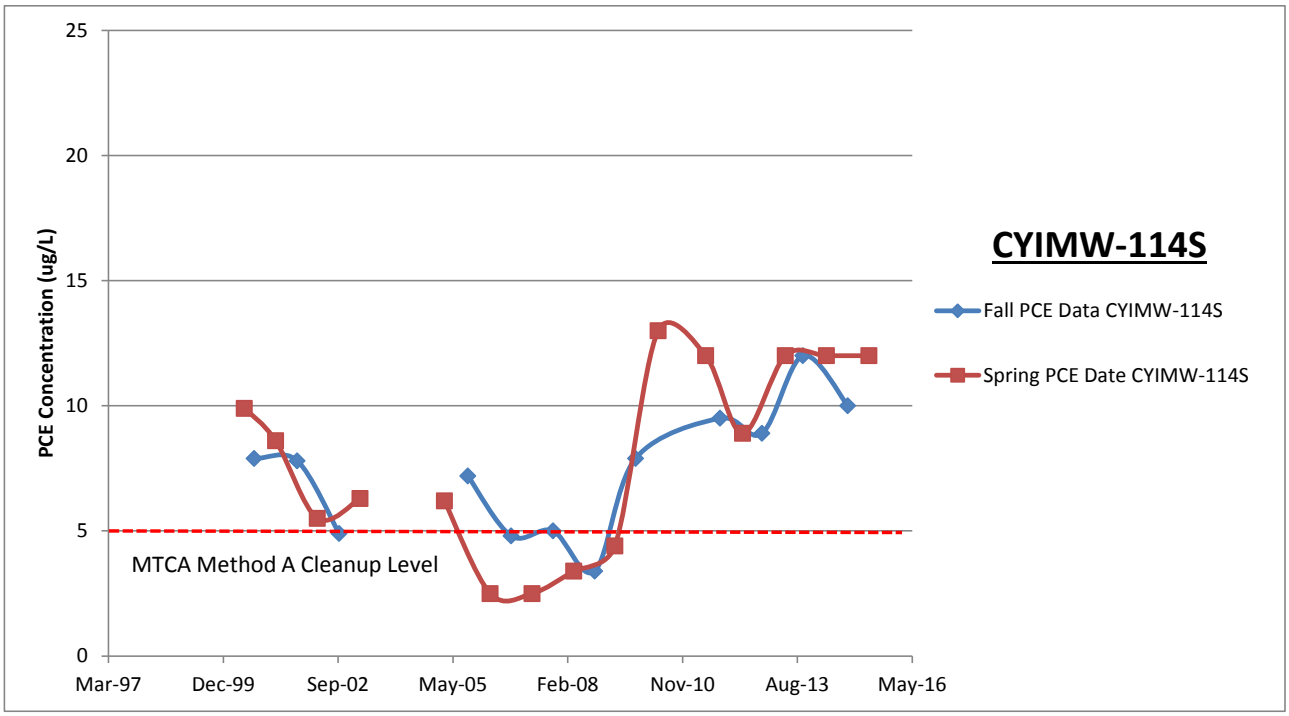


Figure C-28. Cameron Yakima, Well CYIMW-114S PCE Results (ug/L), June 2000 to October 2015.

Table C-7: Summary of Analytical Results (ug/L) for YRRA Remedial Investigation Wells, June 1999 to October 2015.

Date	RI-3S				RI-4S				RI-4D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--	--	--	--	--	--	--	--	--
3/3/98	--	--	--	--	--	--	--	--	--	--	--	--
6/1/98	--	--	--	--	--	--	--	--	--	--	--	--
8/31/98	--	--	--	--	--	--	--	--	--	--	--	--
6/2/99	**0.72 J**	0.15 U	0.1 U	0.14 U	**15.4**	0.15 U	0.1 U	0.14 U	0.25 U	0.15 U	0.1 U	0.14 U
9/8/99	**1.72**	0.15 U	0.1 U	0.14 U	**13.7**	0.15 U	0.1 U	0.14 U	**0.61 J**	0.15 U	0.1 U	0.14 U
12/7/99	**2.43**	0.15 U	**1.09**	0.14 U	**12.7**	**0.32 J**	0.1 U	0.14 U	**1.72**	**0.34 J**	0.1 U	0.14 U
3/7/00	**0.33 J**	0.15 U	0.1 U	0.14 U	**12.2**	0.15 U	0.1 U	0.14 U	**0.34 J**	0.15 U	0.1 U	0.14 U
6/7/00	**2**	**0.34**	**0.54**	0.14 U	**17**	0.15 U	0.1 U	0.14 U	**1.1**	0.15 U	0.1 U	0.14 U
8/30/00	**2.2**	**0.39**	**0.69**	0.14 U	**11**	0.15 U	0.1 U	0.14 U	**0.38**	0.15 U	0.1 U	0.14 U
12/12/00	**1.7**	**0.24**	**0.83**	0.14 U	**15**	0.15 U	0.1 U	0.14 U	**0.52**	0.15 U	0.1 U	0.14 U
3/6/01	**0.30**	0.15 U	0.1 U	0.14 U	**14**	0.15 U	0.1 U	0.14 U	**0.78**	0.15 U	0.1 U	0.14 U
9/10/01	**1.7**	**0.39**	**0.36**	<0.2	**11**	<0.2	<0.2	<0.2	**0.98**	<0.2	<0.2	<0.2
3/4/02	**1.2**	**0.24**	**0.4**	<0.2	**15**	<0.2	<0.2	<0.2	**1**	<0.2	<0.2	<0.2
9/9/02	**1.1**	**0.22**	**0.32**	<0.2	**11**	<0.2	<0.2	<0.2	**1**	<0.2	<0.2	<0.2
3/11/03	**0.68**	<0.2	**0.35**	<0.2	**13**	<0.2	<0.2	<0.2	**1.1**	<0.2	<0.2	<0.2
9/9/03	**1.6**	**0.26**	<0.2	<0.2	**14**	<0.2	<0.2	<0.2	**1.3**	<0.2	<0.2	<0.2
3/9/04	**0.21**	<0.2	<0.2	<0.2	**17**	<0.2	<0.2	<0.2	**1.4**	<0.2	<0.2	<0.2
10/5/04	**0.92**	**0.23**	<0.2	<0.2	**14**	<0.2	<0.2	<0.2	**1.4**	<0.2	<0.2	<0.2
3/15/05	**4.7**	<0.2	<0.2	<0.2	**16**	<0.2	<0.2	<0.2	**3.2**	<0.2	<0.2	<0.2
10/11/05	REJ				**18**	<0.2	<0.2	<0.2	**1.8**	<0.2	<0.2	<0.2
12/13/05	**1**	<0.2	<0.2	<0.2	--	--	--	--	--	--	--	--
4/18/06	**0.25**	<0.2	<0.2	<0.2	**14**	<0.2	<0.2	<0.2	**1.4**	<0.2	<0.2	<0.2
10/17/06	**0.75**	<0.2	<0.2	<0.2	**11**	<0.2	<0.2	<0.2	**1.3**	<0.2	<0.2	<0.2
4/17/07	**1.4**	**0.22**	**0.29**	<0.2	**13**	<0.2	<0.2	<0.2	**1.4**	<0.2	<0.2	<0.2
10/16/07	**0.61**	<0.2	<0.2	<0.2	**11**	<0.2	<0.2	<0.2	**1.2**	<0.2	<0.2	<0.2
4/15/08	**0.29**	<0.2	<0.2	<0.2	**13**	<0.2	<0.2	<0.2	**1.3**	<0.2	<0.2	<0.2
10/14/08	**1.2**	1 U	1 U	0.2 U	**11**	1 U	1 U	0.2 U	**1.6**	1 U	1 U	0.2 U
4/7/09	**1.2**	1 U	1 U	0.2 U	**18**	1 U	1 U	0.2 U	**1.3**	1 U	1 U	0.2 U
10/6/09	1 U	1 U	1 U	0.2 U	**13**	1 U	1 U	0.2 U	**2**	1 U	1 U	0.2 U
4/21/10	1 U	1 U	1 U	1 U	**19**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
6/7/11	**2.5**	1 U	1 U	0.2 U	**25**	1 U	1 U	0.2 U	**2.1**	1 U	1 U	0.2 U
10/11/11	**0.59**	0.2 U	0.2 U	0.2 U	**15**	0.2 U	0.2 U	0.2 U	**0.73**	0.2 U	0.2 U	0.2 U
4/23/12	0.2 U	0.2 U	0.2 U	0.2 U	**11**	0.2 U	0.2 U	0.2 U	**0.64**	0.2 U	0.2 U	0.2 U
10/11/12	**0.47**	0.2 U	0.2 U	0.2 U	**13**	0.2 U	0.2 U	0.2 U	**0.89**	0.2 U	0.2 U	0.2 U
5/2013	1 U	1 U	1 U	1 U	**18**	1 U	1 U	1 U	**1**	1 U	1 U	1 U
10/2013	**0.88 J**	1 U	1 U	1 U	**18**	1 U	1 U	1 U	**1.1**	1 U	1 U	1 U

Date	RI-3S				RI-4S				RI-4D			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	0.74 J	1 U	1 U	1 U	16 J	1 U	1 U	1 U	1.5 J	1 U	1 U	1 U
10/2014	0.82 J	1 U	1 U	0.2 U	16	1 U	1 U	0.2 U	1.2	1 U	1 U	0.2 U
4/2015	0.73 J	1 U	1 U	0.2 U	18 J	1 UJ	1 UJ	0.2 UJ	1.3 J	1 UJ	1 UJ	0.2 UJ
10/2015	--	--	--	--	--	--	--	--	--	--	--	--

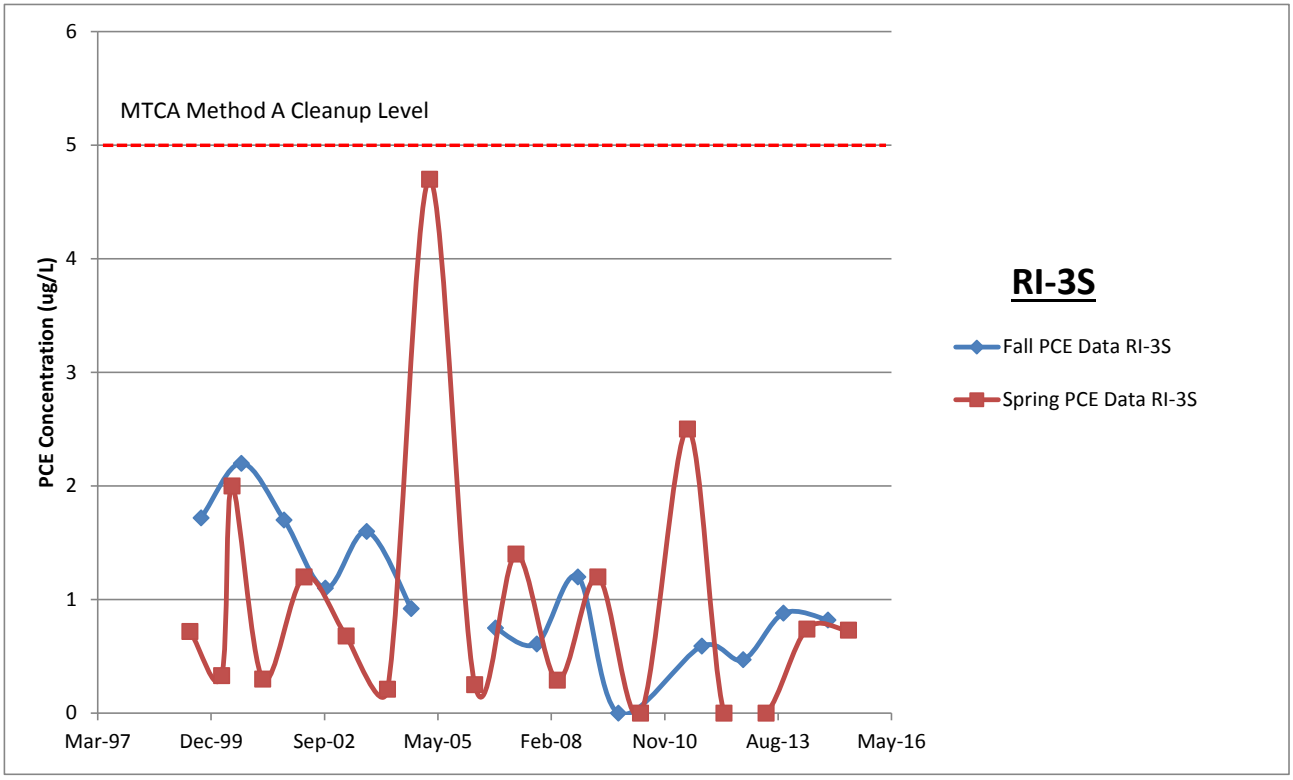


Figure C-29. YRRA Remedial Investigation Well RI-3S PCE Results, June 1999 to October 2015.

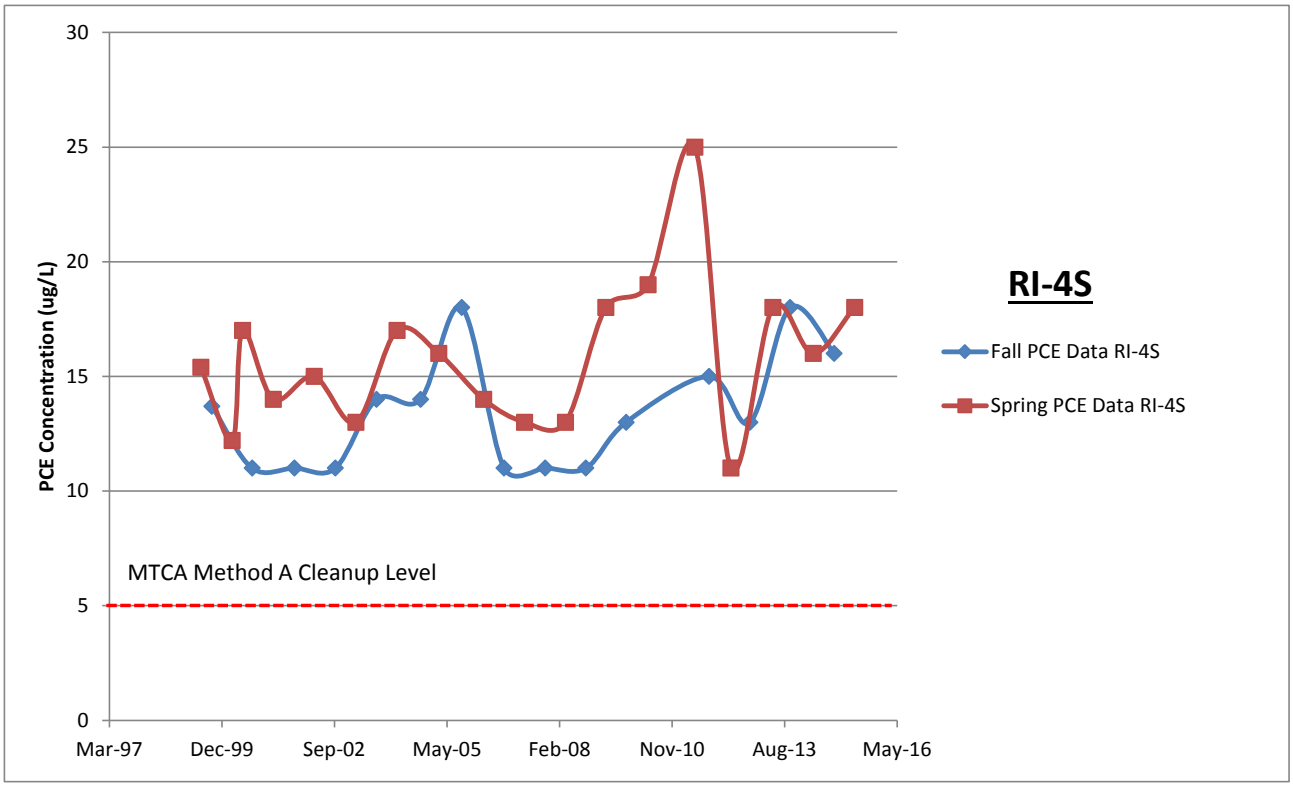


Figure C-30. YRRA Remedial Investigation Well RI-4S PCE Results, June 1999 to October 2015.

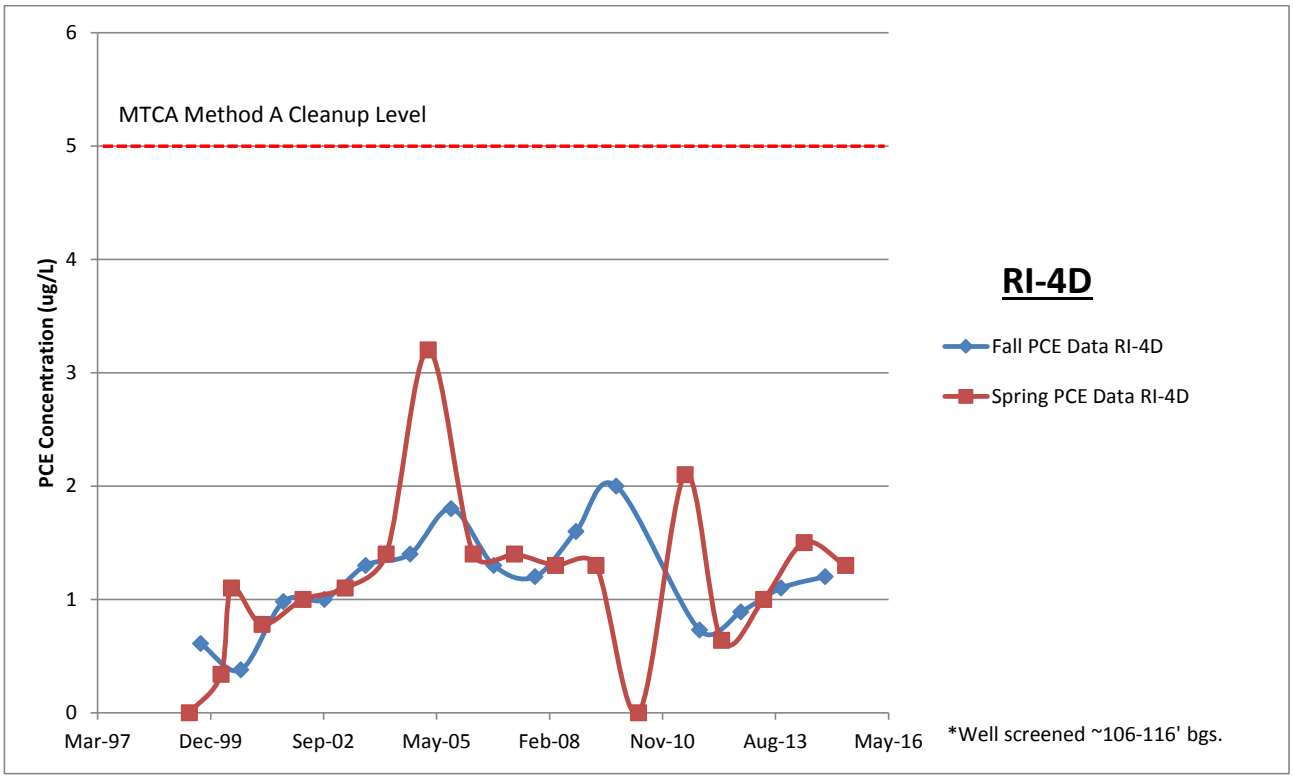


Figure C-31. YRRA Remedial Investigation Well RI-4D PCE Results, June 1999 to October 2015.

Table C-7: Continued.

Date	RI-5S				RI-5D				RI-6S			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--	--	--	--	--	--	--	--	--
3/3/98	--	--	--	--	--	--	--	--	--	--	--	--
6/1/98	--	--	--	--	--	--	--	--	--	--	--	--
8/31/98	--	--	--	--	--	--	--	--	--	--	--	--
6/2/99	**0.8 J**	0.15 U	0.1 U	0.14 U	0.25 U	0.15 U	0.1 U	0.14 U	**2.04**	0.15 U	0.1 U	0.14 U
9/8/99	**0.59 J**	0.15 U	0.1 U	0.14 U	0.25 U	0.15 U	0.1 U	0.14 U	**4.72**	0.15 U	0.1 U	0.14 U
12/7/99	**1.84**	0.15 U	0.1 U	0.14 U	**0.92 J**	0.15 U	0.1 U	0.14 U	**3.66**	0.15 U	0.1 U	0.14 U
3/7/00	**1.47**	0.15 U	0.1 U	0.14 U	**0.62 J**	0.15 U	0.1 U	0.14 U	**2.19**	0.15 U	0.1 U	0.14 U
6/7/00	**0.87**	0.15 U	0.1 U	0.14 U	**0.55**	0.15 U	0.1 U	0.14 U	**3.1**	0.15 U	0.1 U	0.14 U
8/30/00	**0.66**	0.15 U	0.1 U	0.14 U	**0.43**	0.15 U	0.1 U	0.14 U	**3.8**	0.15 U	0.1 U	0.14 U
12/12/00	**1.1**	0.15 U	0.1 U	0.14 U	**0.51**	0.15 U	0.1 U	0.14 U	**3.8**	0.15 U	0.1 U	0.14 U
3/6/01	**1.2**	0.15 U	0.1 U	0.14 U	**0.51**	0.15 U	0.1 U	0.14 U	**2.8**	0.15 U	0.1 U	0.14 U
9/10/01	**0.74**	<0.2	<0.2	<0.2	**0.41**	<0.2	<0.2	<0.2	**4.3**	<0.2	<0.2	<0.2
3/4/02	**1.2**	<0.2	<0.2	<0.2	**0.46**	<0.2	<0.2	<0.2	**2.9**	<0.2	<0.2	<0.2
9/9/02	**0.5**	<0.2	<0.2	<0.2	**0.46**	<0.2	<0.2	<0.2	**4**	<0.2	<0.2	<0.2
3/11/03	**1.2**	<0.2	<0.2	<0.2	**0.5**	<0.2	<0.2	<0.2	**2.5**	<0.2	<0.2	<0.2
9/9/03	**0.89**	<0.2	<0.2	<0.2	**0.59**	<0.2	<0.2	<0.2	**5.3**	<0.2	<0.2	<0.2
3/9/04	**1.4**	<0.2	<0.2	<0.2	**0.61**	<0.2	<0.2	<0.2	**3.7**	<0.2	<0.2	<0.2
10/5/04	**0.97**	<0.2	<0.2	<0.2	**0.68**	<0.2	<0.2	<0.2	**6**	<0.2	<0.2	<0.2
3/15/05	**1.6**	<0.2	<0.2	<0.2	**2.1**	<0.2	<0.2	<0.2	**3.5**	<0.2	<0.2	<0.2
10/11/05	REJ				**1.9**	<0.2	<0.2	<0.2	REJ			
12/13/05	**0.66**	<0.2	<0.2	<0.2	--	--	--	--	**4.1**	<0.2	<0.2	<0.2
4/18/06	**0.61**	<0.2	<0.2	<0.2	**0.61**	<0.2	<0.2	<0.2	**3.3**	<0.2	<0.2	<0.2
10/17/06	**0.76**	<0.2	<0.2	<0.2	**0.57**	<0.2	<0.2	<0.2	**4.9**	<0.2	<0.2	<0.2
4/17/07	**0.76**	<0.2	<0.2	<0.2	**0.60**	<0.2	<0.2	<0.2	**3.4**	<0.2	<0.2	<0.2
10/16/07	**1.1**	<0.2	<0.2	<0.2	**0.61**	<0.2	<0.2	<0.2	**6**	<0.2	<0.2	<0.2
4/15/08	**1.3**	<0.2	<0.2	<0.2	**0.55**	<0.2	<0.2	<0.2	**2.9**	<0.2	<0.2	<0.2
10/14/08	**1.3**	1 U	1 U	0.2 U	**1**	1 U	1 U	0.2 U	**5.9**	1 U	1 U	0.2 U
4/7/09	1 U	1 U	1 U	0.2 U	**0.48 J**	1 U	1 U	0.2 U	**3.9**	1 U	1 U	0.2 U
10/6/09	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	0.2 U	**6.9**	1 U	1 U	0.2 U
4/21/10	**2.4**	1 U	1 U	1 U	**1**	1 U	1 U	1 U	**3.9**	1 U	1 U	1 U
6/7/11	**2.4**	1 U	1 U	0.2 U	**1.7**	1 U	1 U	0.2 U	**4.4**	1 U	1 U	0.2 U
10/11/11	**1.6**	0.2 U	0.2 U	0.2 U	**0.78**	0.2 U	0.2 U	0.2 U	**6.1**	0.2 U	0.2 U	0.2 U
4/23/12	**2**	0.2 U	0.2 U	0.2 U	**0.69**	0.2 U	0.2 U	0.2 U	**2.7**	0.2 U	0.2 U	0.2 U
10/11/12	**1.4**	0.2 U	0.2 U	0.2 U	**0.77**	0.2 U	0.2 U	0.2 U	**5.7**	0.2 U	0.2 U	0.2 U
5/2013	**2.4**	1 U	1 U	1 U	**1.1**	1 U	1 U	1 U	**3.8**	1 U	1 U	1 U
10/2013	**2.1**	1 U	1 U	1 U	**1.2**	1 U	1 U	1 U	**8.2**	1 U	1 U	1 U

Date	RI-5S				RI-5D				RI-6S			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
4/2014	3 J	1 U	1 U	1 U	1.5 J	1 U	1 U	1 U	3.6 J	1 U	1 U	1 U
10/2014	1.8	1 U	1 U	0.2 U	1.4	1 U	1 U	0.2 U	7.1	1 U	1 U	0.2 U
4/2015	3.3 J	1 UJ	1 UJ	0.2 UJ	1.7 J	1 UJ	1 UJ	0.2 UJ	--	--	--	--
10/2015	--	--	--	--	--	--	--	--	8.5	1 U	1 U	0.2 U

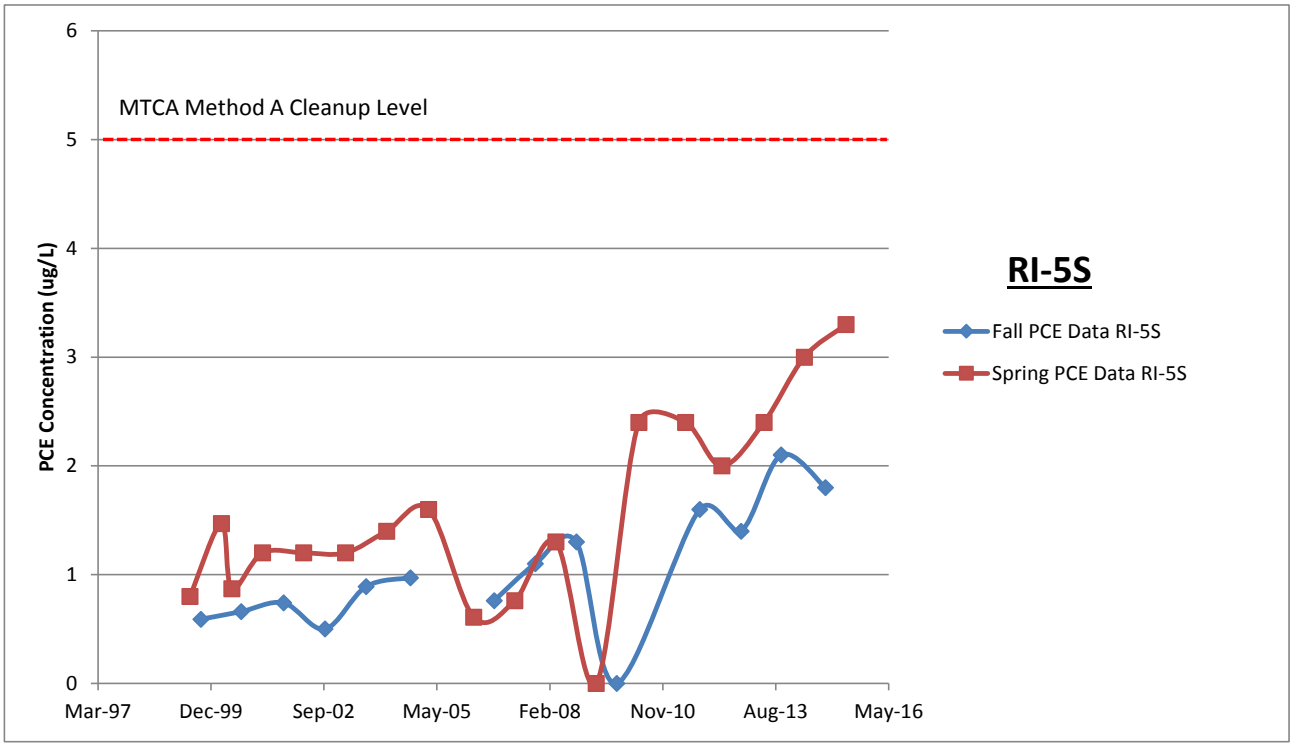


Figure C-32. YRRA Remedial Investigation Well RI-5S PCE Results, June 1999 to October 2015.

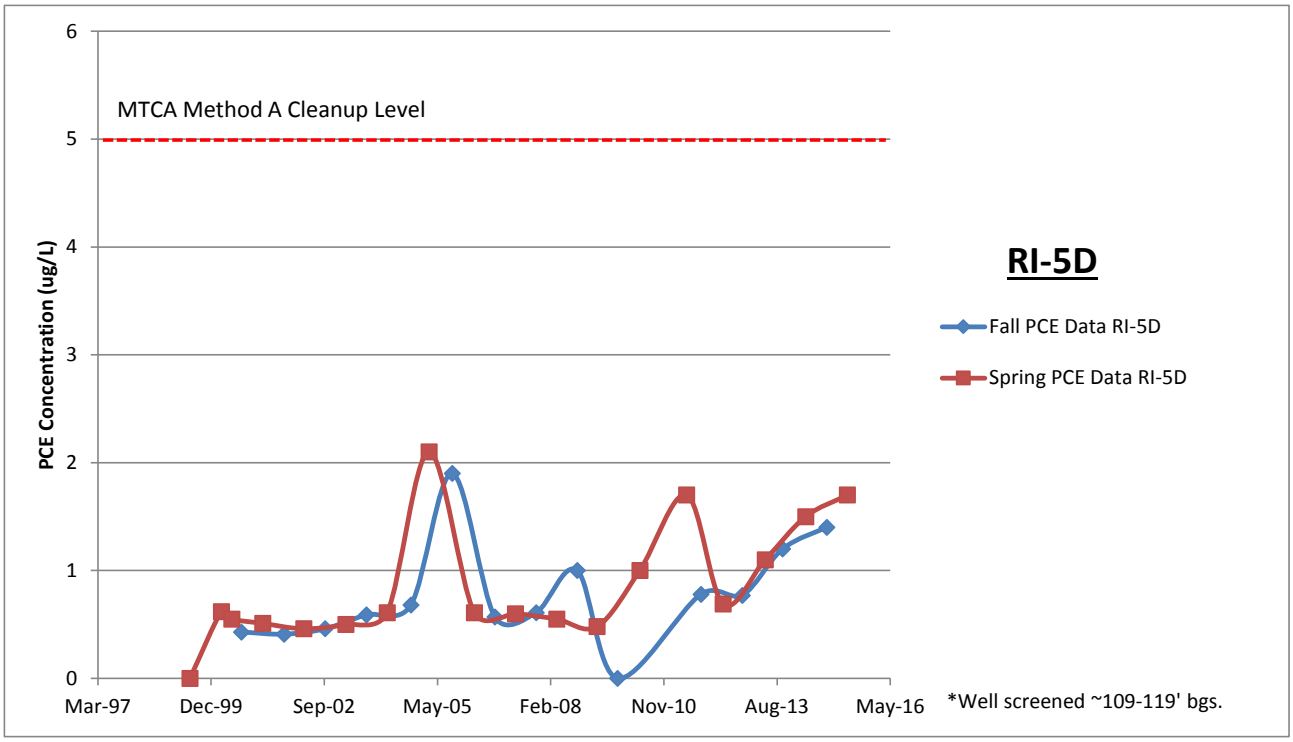


Figure C-33. YRRA Remedial Investigation Well RI-5D PCE Results, June 1999 to October 2015.

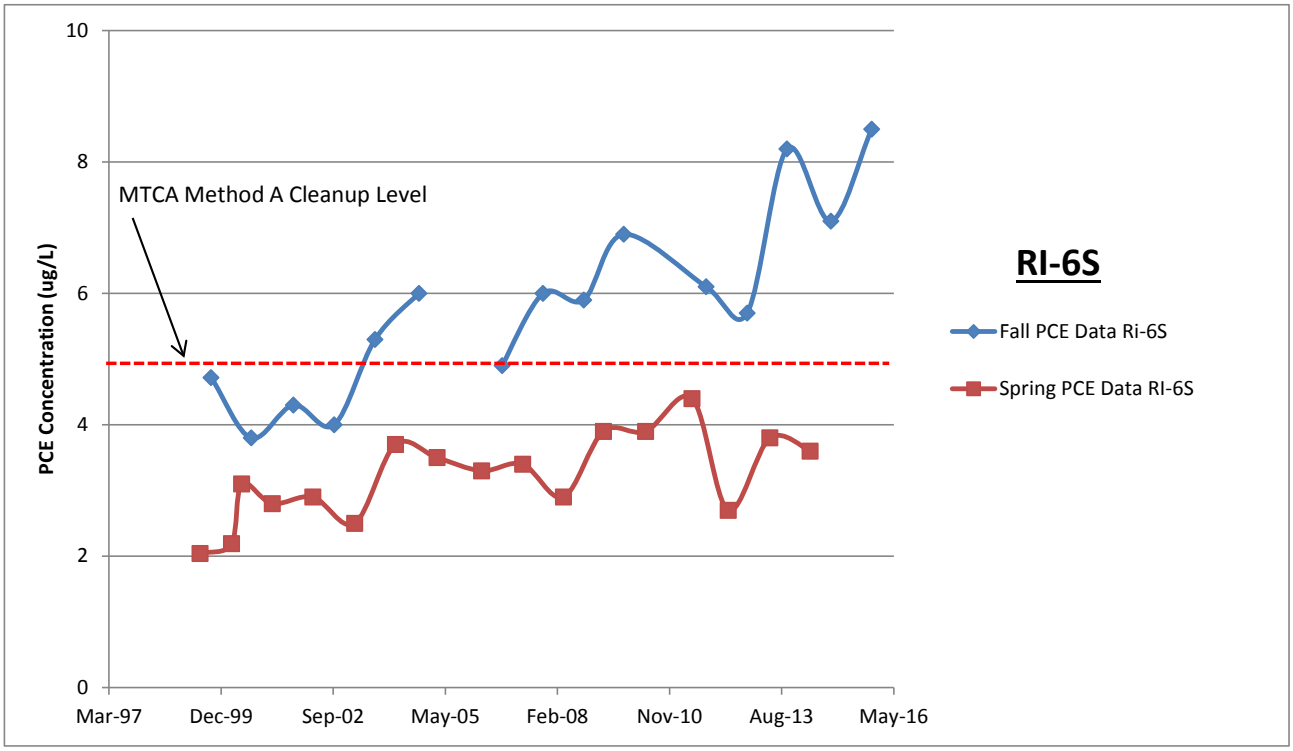


Figure C-34. YRRA Remedial Investigation Well RI-6S PCE Results, June 1999 to October 2015.

Table C-7: Continued.

Date	RI-9S				RI-10S				RI-11S			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
12/2/97	--	--	--	--	--	--	--	--	--	--	--	--
3/3/98	--	--	--	--	--	--	--	--	--	--	--	--
6/1/98	--	--	--	--	--	--	--	--	--	--	--	--
8/31/98	--	--	--	--	--	--	--	--	--	--	--	--
6/2/99	**1.86**	0.15 U	0.1 U	0.14 U	**2.53**	0.15 U	0.1 U	0.14 U	**1.4**	0.15 U	0.1 U	0.14 U
9/8/99	**1.44**	0.15 U	0.1 U	0.14 U	**2.51**	0.15 U	0.1 U	0.14 U	**1.63**	0.15 U	0.1 U	0.14 U
12/7/99	**1.33**	0.15 U	0.1 U	0.14 U	**2.33**	0.15 U	0.1 U	0.14 U	**1.15**	0.15 U	0.1 U	0.14 U
3/7/00	**1.18**	0.15 U	0.1 U	0.14 U	**1.9**	0.15 U	0.1 U	0.14 U	**1.01**	0.15 U	0.1 U	0.14 U
6/7/00	**1.4**	0.15 U	0.1 U	0.14 U	**2**	0.15 U	0.1 U	0.14 U	**0.99**	0.15 U	0.1 U	0.14 U
8/30/00	**1.4**	0.15 U	0.1 U	0.14 U	**1.8**	0.15 U	0.1 U	0.14 U	**1**	0.15 U	0.1 U	0.14 U
12/12/00	**1.9**	**0.23**	0.1 U	0.14 U	**2.7**	0.15 U	0.1 U	0.14 U	**1.6**	0.15 U	0.1 U	0.14 U
3/6/01	**1.9**	**0.25**	0.1 U	0.14 U	**2.2**	0.15 U	0.1 U	0.14 U	**1.1**	0.15 U	0.1 U	0.14 U
9/10/01	--	--	--	--	**2.3**	<0.2	<0.2	<0.2	**1.1**	<0.2	<0.2	<0.2
3/4/02	**1.8**	**0.21**	<0.2	<0.2	**2**	<0.2	<0.2	<0.2	**1.2**	<0.2	<0.2	<0.2
9/9/02	**1.7**	**0.26**	<0.2	<0.2	**1.8**	<0.2	<0.2	<0.2	**1**	<0.2	<0.2	<0.2
3/11/03	**1.6**	**0.23**	<0.2	<0.2	**1.8**	<0.2	<0.2	<0.2	**1**	<0.2	<0.2	<0.2
9/9/03	**1.7**	<0.2	<0.2	<0.2	**2.8**	<0.2	<0.2	<0.2	**1.4**	<0.2	<0.2	<0.2
3/9/04	**2**	**0.25**	<0.2	<0.2	**1.9**	<0.2	<0.2	<0.2	**1.1**	<0.2	<0.2	<0.2
10/5/04	**1.5**	<0.2	<0.2	<0.2	**1.8**	<0.2	<0.2	<0.2	**0.78**	<0.2	<0.2	<0.2
3/15/05	**2.2**	<0.2	<0.2	<0.2	**1.9**	<0.2	<0.2	<0.2	**1.4**	<0.2	<0.2	<0.2
10/11/05	REJ				REJ				REJ			
12/13/05	**2.2**	<0.2	<0.2	<0.2	**1.6**	<0.2	<0.2	<0.2	**0.83**	<0.2	<0.2	<0.2
4/18/06	**2.1**	**0.21**	<0.2	<0.2	**1.8**	<0.2	<0.2	<0.2	**0.89**	<0.2	<0.2	<0.2
10/17/06	--	--	--	--	**1.7**	<0.2	<0.2	<0.2	**0.94**	<0.2	<0.2	<0.2
4/17/07	**1.9**	<0.2	<0.2	<0.2	**1.9**	<0.2	<0.2	<0.2	**1.1**	<0.2	<0.2	<0.2
10/16/07	**2.1**	<0.2	<0.2	<0.2	**1.9**	<0.2	<0.2	<0.2	**1.1**	<0.2	<0.2	<0.2
4/15/08	**1.4**	<0.2	<0.2	<0.2	**1.4**	<0.2	<0.2	<0.2	**0.71**	<0.2	<0.2	<0.2
10/14/08	**1.4**	1 U	1 U	0.2 U	**1.5**	1 U	1 U	0.2 U	**1.1**	1 U	1 U	0.2 U
4/7/09	**1.7**	1 U	1 U	0.2 U	**1.5**	1 U	1 U	0.2 U	**0.43 J**	1 U	1 U	0.2 U
10/6/09	**1 U**	1 U	1 U	0.2 U	**2**	1 U	1 U	0.2 U	1 U	1 U	1 U	0.2 U
4/21/10	**1.9**	1 U	1 U	1 U	**1.9**	1 U	1 U	1 U	1 U	1 U	1 U	0.2 U
6/7/11	1 U	1 U	1 U	0.2 U	**1.8**	1 U	1 U	0.2 U	**1.3**	1 U	1 U	0.2 U
10/11/11	**1.3**	0.2 U	0.2 U	0.2 U	**1.3**	0.2 U	0.2 U	0.2 U	**0.87**	0.2 U	0.2 U	0.2 U
4/23/12	**0.97**	0.2 U	0.2 U	0.2 U	**1.3**	0.2 U	0.2 U	0.2 U	**0.59**	0.2 U	0.2 U	0.2 U
10/11/12	**1.1**	0.2 U	0.2 U	0.2 U	**1.6**	0.2 U	0.2 U	0.2 U	**0.71**	0.2 U	0.2 U	0.2 U
5/2013	**1.4**	1 U	1 U	1 U	**1.7**	1 U	1 U	1 U	**0.83 J**	1 U	1 U	1 U
10/2013	**1.8**	1 U	1 U	1 U	**2.1**	1 U	1 U	1 U	**1**	1 U	1 U	1 U
4/2014	1.7 J	1 U	1 U	1 U	1.9 J	1 U	1 U	1 U	--	--	--	--
10/2014	1.6	1 U	1 U	0.2 U	2	1 U	1 U	0.2 U	1.1	1 U	1 U	0.2 U
4/2015	1.7 J	1 UJ	1 UJ	0.2 UJ	2.2 J	1 UJ	1 UJ	0.2 UJ	1.2 J	1 UJ	1 UJ	0.2 UJ
10/2015	--	--	--	--	--	--	--	--	--	--	--	--

Notes for Table C-7 above

U: Analyte was not detected at or above the reported value.
J: Analyte was positively identified. The associated numerical result is an estimate.
ND: Analyte was not detected.
REJ: Rejected. Result considered suspect due to possible cross-contamination. Well re-sampled in December 2005.
Bold: Analyte was detected.
Shade: Values are greater than MTCA cleanup levels.
-- Not Sampled.

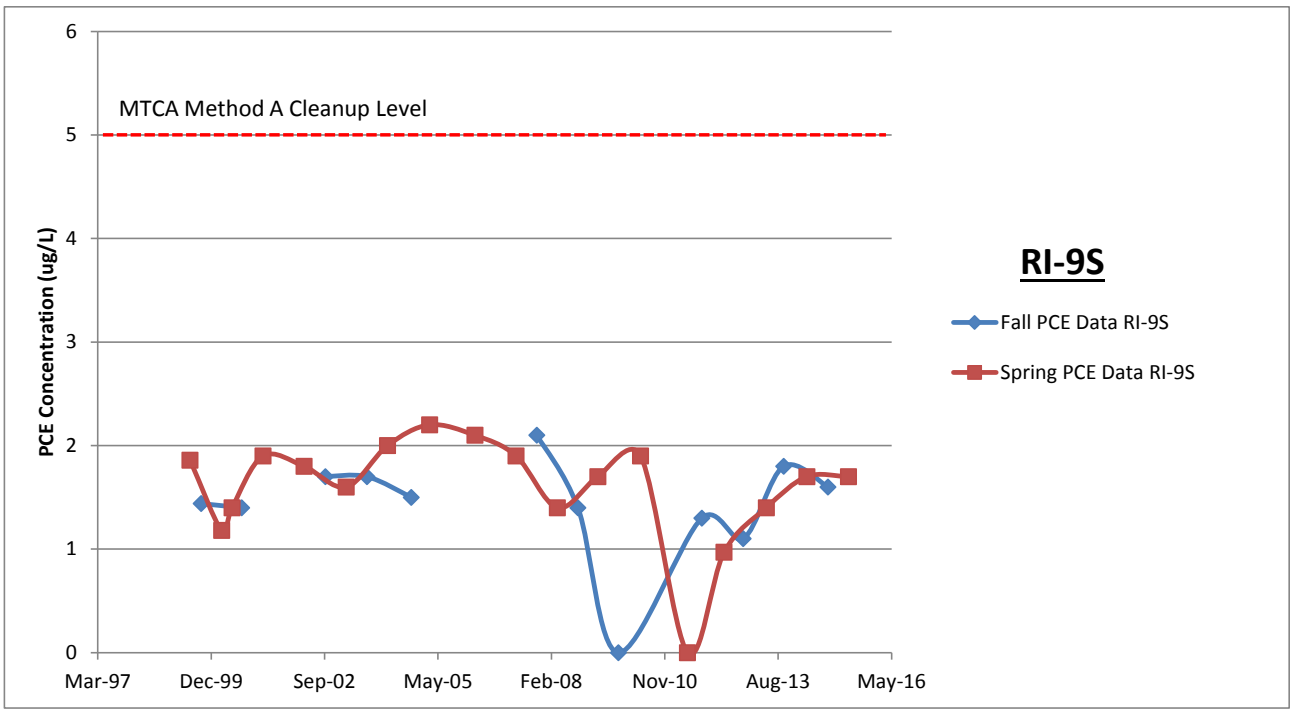


Figure C-35. YRRA Remedial Investigation Well RI-9S PCE Results, June 1999 to October 2015.

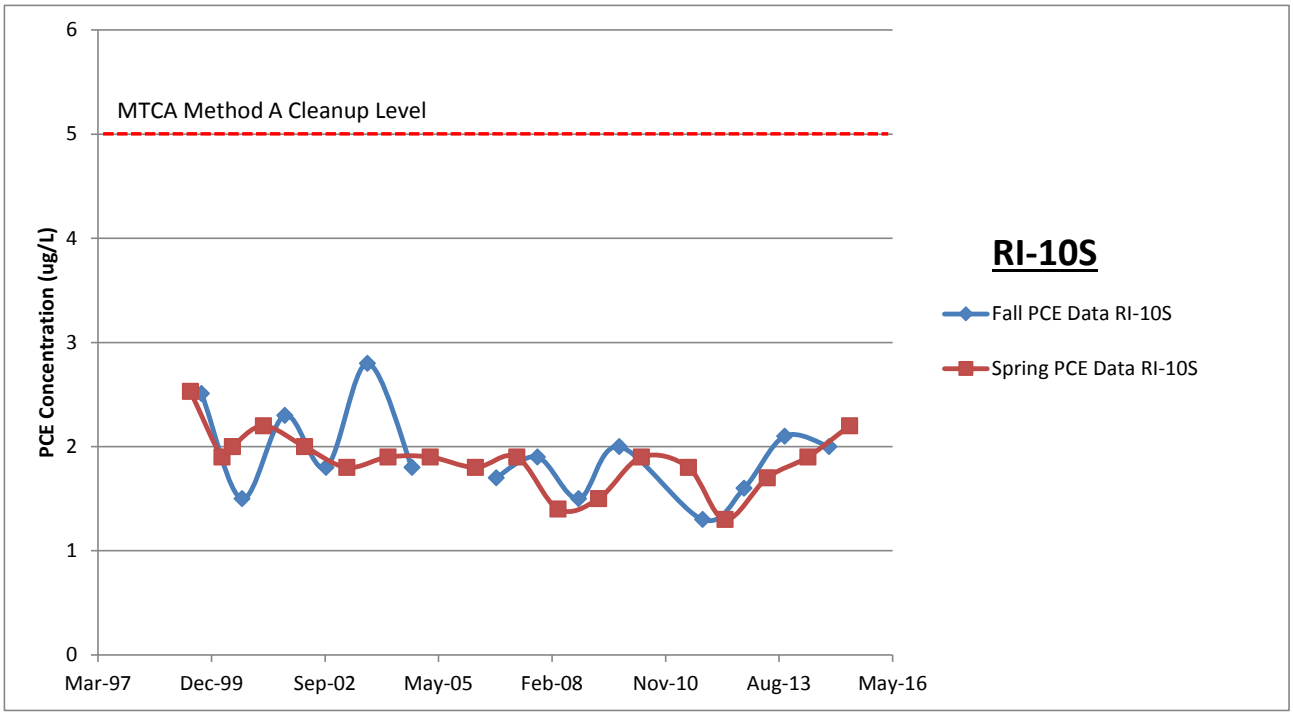


Figure C-36. YRRA Remedial Investigation Well RI-10S PCE Results, June 1999 to October 2015.

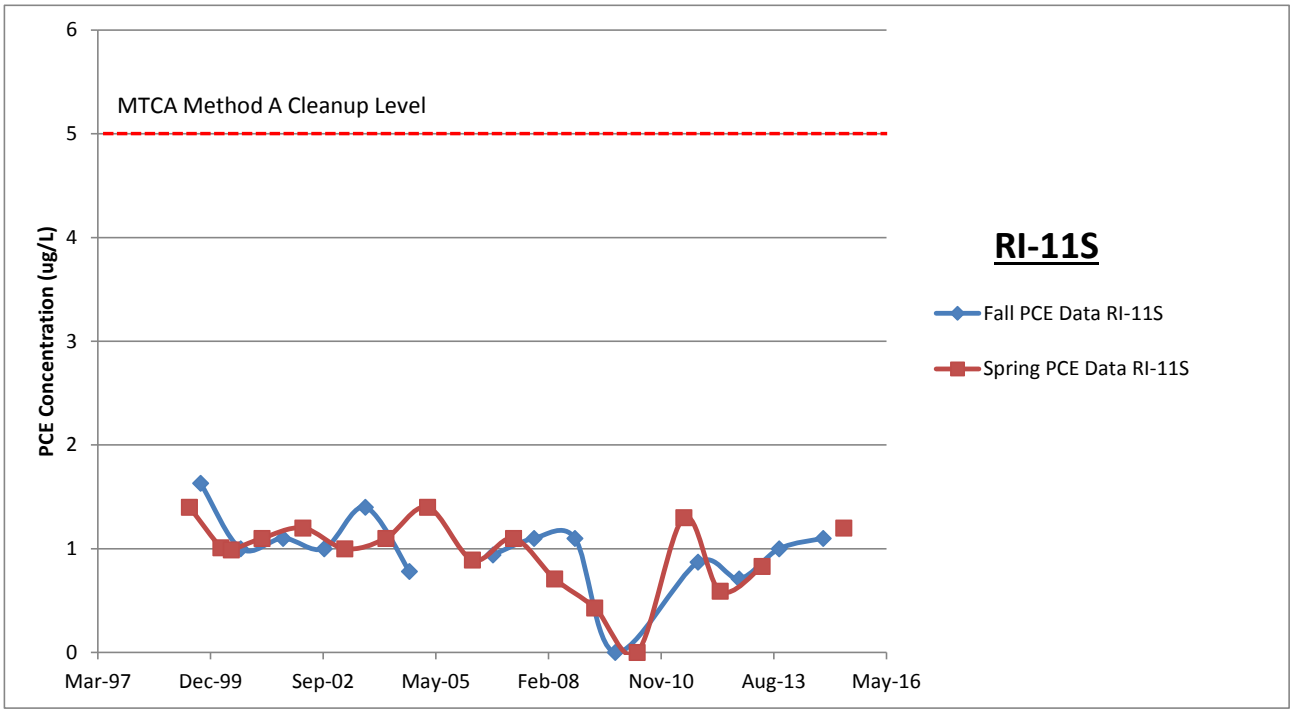


Figure C-37. YRRA Remedial Investigation Well RI-11S PCE Results, June 1999 to October 2015.

Appendix D. Glossary, Acronyms, and Abbreviations

Glossary

Analyte: Water quality constituent being measured (parameter).

Dissolved oxygen: A measure of the amount of oxygen dissolved in water.

Groundwater: Water in the subsurface that saturates the rocks and sediment in which it occurs. The upper surface of groundwater saturation is commonly termed the water table.

Method Detection Limit: This definition for detection was first formally advanced in 40CFR 136, October 26, 1984 edition. MDL is defined there as the minimum concentration of an analyte that, in a given matrix and with a specific method, has a 99% probability of being identified, and reported to be greater than zero. (Federal Register, October 26, 1984).

Parameter: Water quality constituent being measured (analyte). A physical, chemical, or biological property whose values determine environmental characteristics or behavior.

pH: A measure of the acidity or alkalinity of water. A low pH value (0 to 7) indicates that an acidic condition is present, while a high pH (7 to 14) indicates a basic or alkaline condition. A pH of 7 is considered to be neutral. Since the pH scale is logarithmic, a water sample with a pH of 8 is ten times more basic than one with a pH of 7.

Reporting limit: The minimum value of the calibration range. Analyte detections between the method detection limit and the reporting limit are reported as having estimated concentrations.

Specific conductance: A measure of water's ability to conduct an electrical current. Specific conductance is related to the concentration and charge of dissolved ions in water.

Unconfined aquifer: An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

Acronyms and Abbreviations

Cis-1,2-DCE	Cis-1,2-dichloroethene
FS	Feasibility study
Dup	Duplicate
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management database
EPA	U.S. Environmental Protection Agency
FS	Feasibility study
LDPE	Low Density Polyethylene
MEL	Manchester Environmental Laboratory
MSL	Mean Sea Level
MTCA	Model Toxics Control Act

MW	Monitoring well
ORP	Oxidation-reduction potential
PCE	Tetrachloroethene
PVC	Polyvinyl chloride
RI	Remedial investigation
RPD	Relative percent difference
SOP	Standard operating procedure
TCE	Trichloroethene
USGS	U.S. Geological Survey
VC	Vinyl chloride
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code
YRRA	Yakima Railroad Area (the project area)

Units of Measurement

°C	degrees centigrade
ft	feet
mg/L	milligrams per liter
mV	milli volts
s.u.	standard units
ug/L	micrograms per liter (parts per billion)
umhos/cm	micromhos per centimeter
uS/cm	microsiemens per centimeter, a unit of conductivity