DEPARTMENT OF
ECOLOGY
State of Washington

Addendum to Quality Assurance Project Plan

Yakima Railroad Area Groundwater Performance Monitoring

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Publication Information

Addendum

This addendum is on the Department of Ecology's website at
https://fortress.wa.gov/ecy/publications/SummaryPages/1703112.html

This addendum is being filed to document the addition of new sampling locations to the Yakima Railroad Area project. Refer to the original QAPP Yakima Railroad Area Groundwater Performance Monitoring for detailed project sampling and laboratory procedures.

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

More details about this project are available at:
https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=6338

Activity Tracker code

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Addendum to
Quality Assurance Project Plan

Yakima Railroad Area
Groundwater Performance Monitoring

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EAP: Environmental Assessment Program
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3.0 Background

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). After numerous investigations, the Washington State Department of 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 contamination to groundwater within the Yakima Railroad Area (YRRA). The YRRA encompasses approximately 6 square miles of mixed industrial/commercial and residential property adjacent to the rail corridor in the cities of Yakima and Union Gap (Figure 1). The identified sources include dry cleaners, machine shops, a carbon regeneration facility, and a former pesticide formulation plant.

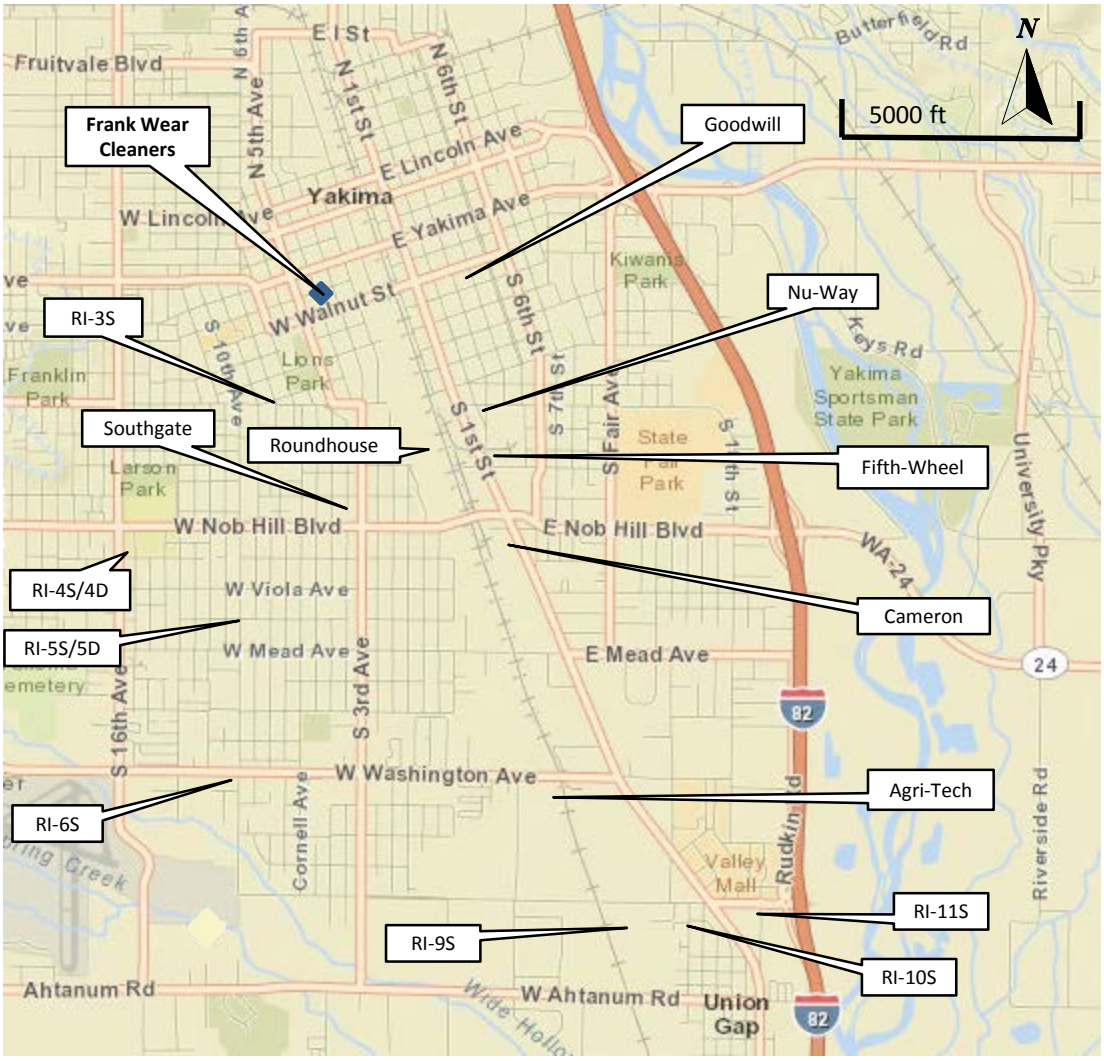

Figure 1. Yakima Railroad Area Sample Location Map.

During the 1990s, cleanup activities were conducted at many of the facilities. From 1999 to 2012, project monitoring wells were routinely sampled during an ongoing program to characterize groundwater PCE concentrations within the YRRA. Ecology's Environmental Assessment Program (EAP) assumed responsibility for the area-wide monitoring program in 2013.

This addendum is to document the addition of one of the identified sites, Frank Wear Cleaners, to the monitoring program.

3.2.1 History of study area

The Frank Wear Cleaners Site was a dry cleaning facility in a commercial area of Yakima. The Site is a sub-facility of the larger YRRA (Figure 1).

Dry cleaning businesses have operated at the former Frank Wear Site from the early 1940s to 2000. In the 1970s, the dry cleaning facility began using solvents containing PCE. Spills, overflows, leaks from equipment, and the on-site disposal of sludges from the spent solvent reclamation process resulted in PCE contamination in soil and groundwater at the Site.

The Site was discovered in 1985 after Ecology investigated an anonymous complaint regarding illegal dumping of PCE at Frank Wear Cleaners. Multiple dangerous waste violations were noted. Subsequent site inspections by Ecology in 1987 and 1989 confirmed the presence of PCE in the soil.

A number of environmental investigations and interim cleanup activities have occurred at the Site since 1989. In 1994, Frank Wear Cleaners and Ecology signed an Agreed Order for a remedial investigation, which resulted in an interim action to remove contaminated soil. During 1997 and 1998, a groundwater sparging system was installed and operated intermittently. The Frank Wear Cleaners building was eventually demolished in 2001, and additional contaminated soil was removed.

In July 2011, Ecology learned a day care center was operating on the Site. Results of indoor air sampling indicated PCE vapors were present in the building and had impacted indoor air quality. A soil vapor extraction (SVE) system was installed in April 2012 as a mitigation and interim cleanup measure. To further remediate the site a groundwater recirculation system (GRS) began operating in March 2014. The GRS was designed to extract groundwater from downgradient extraction wells and convey it to a remediation building where it was periodically amended with various bioremediation substrates. Due to financial constraints the system was shut down in 2016.

3.2.2 Summary of previous studies and existing data

Existing data for the Frank Wear wells to be sampled are presented in Appendix A. These wells are being added to the YRRA monitoring network.

4.0 Project Description

The project goal remains the same; EAP will provide Ecology's Toxics Cleanup Program (TCP) with groundwater quality data to monitor the effectiveness of remedial actions at the Frank Wear Cleaners site.

4.1 Project goals

Collect groundwater quality data for the target analytes of tetrachloroethene (PCE) and its by-products that are representative of the Sites groundwater conditions.

4.2 Project objectives

Monitor groundwater quality from 10 site wells on a semi-annual basis. Collect water level measurements from 2 addition wells (MW-23, MW-25) on a semi-annual basis.

5.0 Organization and Schedule

5.5 Budget and funding

Analytical costs for one year of sampling is shown in Table 1. Laboratory costs will be paid for from the YRRA fund.

Table 1. Annual Project Analytical Costs.

Parameter	Number of Samples			Cost per Sample [1]	Cost per Event
	Field	QC	Total		
cVOCs (April)	10	1	11	$163	$1793
cVOCs (October)	10	1	11	$163	$1793
Total Project Cost					$3586

[1] Assumes MEL *planned* price (50% discount)
cVOCs: chlorinated volatile organic compounds

7.0 Study Design

7.2.1 Sampling location and frequency

Groundwater samples will be collected semi-annually from 10 of the Site monitoring wells. The location and historic monitoring results for these wells are shown in Figure 2 and Appendix A.

15.0 References

Hart Crowser, 2015. Groundwater Remediation System Draft Action Plan – Former Frank Wear Cleaners Site, Yakima, Washington. File No. 17800-23/Task 6, March 28, 2013.

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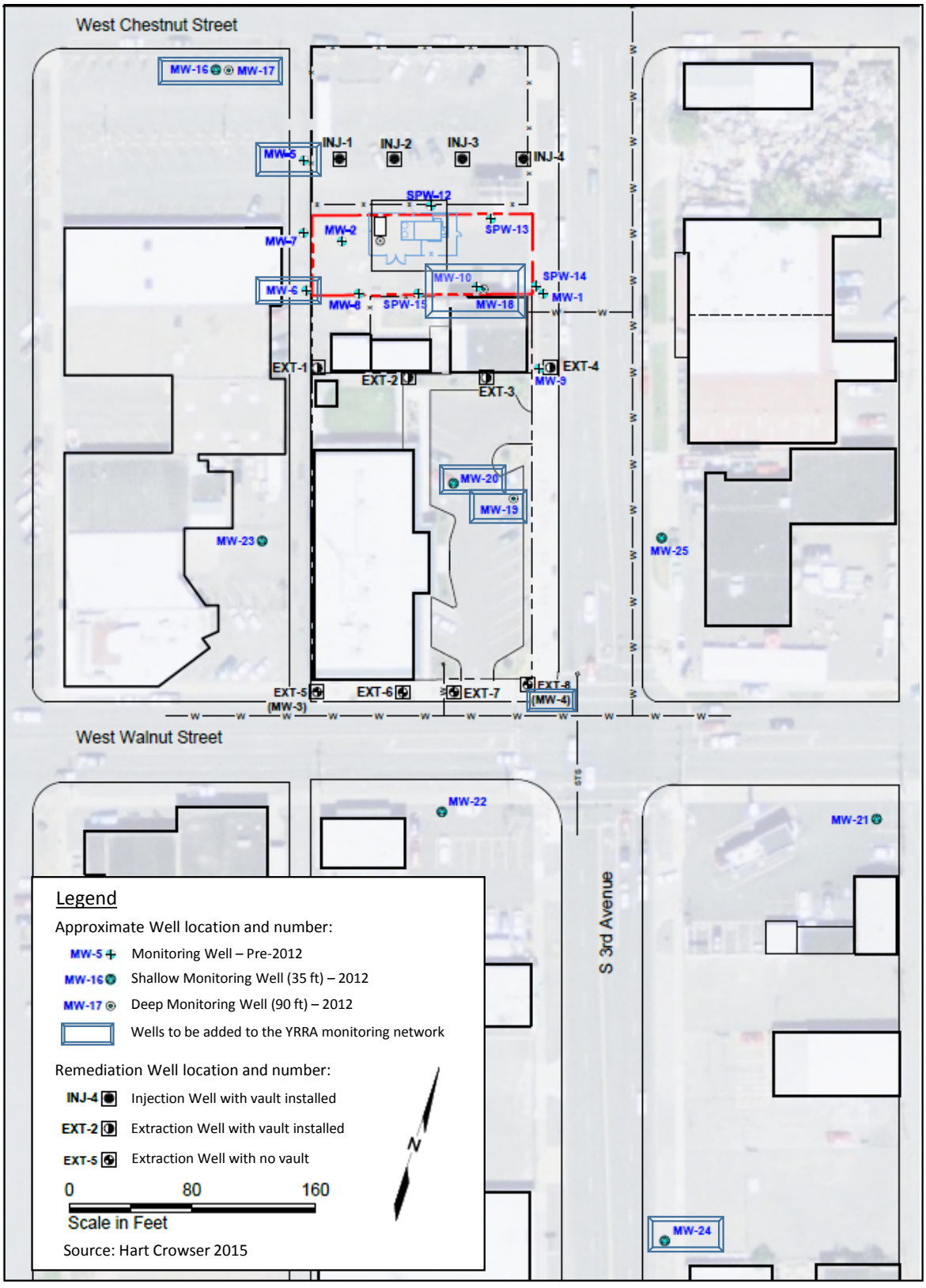

Figure 2. Frank Wear Site and Well Locations.

Appendix A. Frank Wear Site Wells to be added to the Yakima Railroad Area Monitoring Network

Table A-1: Summary of Analytical Results (ug/L) for Frank Wear Cleaners Shallow Wells, September 2012 to March 2016.

Date	FWMW-4				FWMW-5				FWMW-6			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
9/2012	**6.3**	1 U	1 U	1 U	**2.1**	1 U	1 U	1 U	**1.7**	1 U	1 U	1 U
12/2012	**9.1**	1 U	1 U	1 U	**8.8**	1 U	1 U	1 U	**2.2**	1 U	1 U	1 U
3/2013	**740**	1 U	1 U	1 U	**2.4**	1 U	1 U	1 U	**3.4**	1 U	1 U	1 U
1/2014	**150**	1 U	1 U	1 U	**1.5**	1 U	1 U	1 U	**1.5**	1 U	1 U	1 U
5/2014	**940**	10 U	10 U	0.02 U	**17000**	**220**	**520**	**0.052**	**1700**	**69**	**140**	0.02 U
8/2014	**320**	**150**	**200**	**0.2**	**76**	**15000**	**7700**	1 U	**570**	**5000**	**5000**	**0.83**
11/2014	**9.4**	**4.7**	**300**	**77**	5 U	5 U	**3200**	**620**	**19**	**8.6**	**390**	**26**
2/2015	**1500**	**39**	**41**	**60**	**37**	**60**	**230**	**250**	**31**	**19**	**130**	**7.2**
5/2015	**4.8**	**0.97**	**10**	**2**	**13**	**160**	**540**	**42**	**45**	**24**	**85**	**7.3**
8/2015	**12**	**5.9**	**55**	**1.3**	**98**	**150**	**1100**	**210**	**61**	**43**	**93**	**2.6**
12/2015	**11**	**6.3**	**52**	**2.2**	**61**	**220**	**350**	**83**	**7.1**	**18**	**51**	0.2 U
3/2016	**0.73**	**1.7**	**190**	**210**	50 U	20 U	**200**	**90**	**7.6**	**4.2**	**15**	**0.28**
MTCA CL	5	5	70	0.2	5	5	70	0.2	5	5	70	0.2

Date	FWMW-10				FWMW-16				FWMW-20			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
9/2012	**11000**	**1.8**	**1.2**	1 U	**63**	1 U	1 U	1 U	**9.2**	1 U	1 U	1 U
12/2012	**44000**	**7.5**	**3**	1 U	**110**	1 U	1 U	1 U	**7**	1 U	1 U	1 U
3/2013	**1100**	1 U	**2.7**	1 U	**93**	1 U	1 U	1 U	**10**	1 U	1 U	1 U
1/2014	**3300**	1 U	1 U	1 U	**84**	1 U	1 U	1 U	**5.8**	1 U	1 U	1 U
5/2014	**1900**	**470**	**900**	**0.18**	**73**	**0.21**	0.1 U	0.02 U	**610**	**49**	**110**	0.02 U
8/2014	**3000**	**5500**	**5700**	2 U	**52**	**0.13**	0.1 U	0.02 U	**84**	**35**	**78**	0.02 U
11/2014	**370**	**190**	**3600**	**400**	**70**	**0.15**	0.1 U	0.02 U	**200**	**16**	**170**	**3.8**
2/2015	**2000**	**290**	**620**	**70**	**78**	0.2 U	0.2 U	0.02 U	**37**	**19**	**160**	**14**
5/2015	**2200**	**780**	**940**	**71**	**100**	**0.23**	**0.73**	0.02 U	**71**	**26**	**180**	**7.5**
8/2015	**330**	**320**	**880**	**28**	**72**	**0.21**	**0.57**	**0.073**	**340**	**23**	**95**	**2.1**
12/2015	**5200**	**850**	**990**	**110**	**66**	0.2 U	**1**	0.02 U	**310**	**29**	**120**	**1.1**
3/2016	**3400**	**500**	**340**	**16**	**71**	20 U	20 U	2 U	**29**	**17**	**64**	**0.86**
MTCA CL	5	5	70	0.2	5	5	70	0.2	5	5	70	0.2

Date	FWMW-24			
	PCE	TCE	Cis-DCE	VC
9/2012	**110**	1 U	1 U	1 U
12/2012	**170**	1 U	1 U	1 U
3/2013	**75**	1 U	1 U	1 U
1/2014	**34**	1 U	1 U	1 U
5/2014	**1000**	**140**	**330**	**0.024**
8/2014	**61**	**59**	**150**	0.02 U
11/2014	**27**	**18**	**440**	**21**
2/2015	**20**	**12**	**100**	**3**
5/2015	**32**	**17**	**120**	**13**
8/2015	**19**	**6.6**	**23**	**2**
12/2015	**82**	**37**	**130**	**12**
3/2016	**11**	**19**	**140**	**4.4**
MTCA CL	5	5	70	0.2

Table A-2: Summary of Analytical Results (ug/L) for Frank Wear Cleaners Deep Wells, September 2012 to March 2016.

Date	FWMW-17				FWMW-18				FWMW-19			
	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC	PCE	TCE	Cis-DCE	VC
9/2012	1 U	1 U	1 U	1 U	**5.7**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
12/2012	1 U	1 U	1 U	1 U	**1.1**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
3/2013	**1.1**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1/2014	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
5/2014	**0.19**	0.1 U	0.1 U	0.02 U	**0.56**	0.1 U	0.1 U	0.02 U	**0.12**	0.1 U	0.1 U	0.02 U
8/2014	**0.17**	0.1 U	0.1 U	0.02 U	**0.34**	**0.15**	**0.11**	0.02 U	0.1 U	0.1 U	0.1 U	0.02 U
11/2014	0.1 U	0.1 U	**0.52**	0.02 U	**0.31**	0.1 U	**0.44**	0.02 U	**0.11**	0.1 U	0.1 U	0.02 U
2/2015	0.5 U	0.2 U	0.2 U	**0.086**	0.5 U	0.2 U	**2.1**	0.02 U	0.5 U	0.2 U	0.2 U	0.02 U
5/2015	0.5 U	0.2 U	**1.9**	0.02 U	0.5 U	0.2 U	**0.42**	**2.9**	0.5 U	0.2 U	0.2 U	0.02 U
8/2015	5 U	2 U	2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.02 U	**0.62**	**0.37**	**0.54**	0.02 U
12/2015	**2**	**0.2**	**1.9**	0.02 U	0.5 U	0.2 U	**0.23**	0.02 U	0.5 U	0.2 U	0.2 U	0.02 U
3/2016	100 U	40 U	40 U	4 U	0.5 U	0.2 U	**0.55**	0.02 U	0.5 U	0.2 U	0.2 U	**0.053**
MTCA CL	5	5	70	0.2	5	5	70	0.2	5	5	70	0.2

Table A-3. Construction Details for Frank Wear Cleaners Wells.

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)
Shallow Wells											
FWMW-4	2/1995	NA	46.598239	-120.511674	1064.45	-0.5	1064.95	2	35	10	35
FWMW-5	1997	NA	46.598980	-120.512588	1067.68	-0.48	1068.16	2	35	15	35
FWMW-6	5/2005	AKN055	46.598796	-120.512500	1066.99	-0.2	1067.19	2	35	15	35
FWMW-10	5/2005	AKN059	46.598930	-120.512011	1066.00	-0.44	1066.44	2	35	15	35
FWMW-16	5/2012	BHH289	46.599146	-120.512846	1068.92	-0.54	1069.46	2	35	30	35
FWMW-20	6/2012	BHH293	46.598578	-120.511961	1063.97	-0.28	1064.25	4	35	30	35
FWMW-24	6/2012	BHH293	46.597386	-120.510840	1062.22	0.0	1062.22	4	35	25	35
Deep Wells											
FWMW-17	5/2012	BHH290	46.599155	-120.512816	1069.10	-0.34	1069.44	2	93	88	93
FWMW-18	6/2012	BHH291	46.598908	-120.512083	1066.07	2.14	1063.93	2	92	87	92
FWMW-19	6/2012	BHH292	46.598569	-120.511805	1064.07	2.05	1062.02	2	93	88	93