Aspect
A Geosyntec Company

December 20, 2023

Mr. Tim Mullin, LHG
Washington State Department of Ecology – Southwest Regional Office
Toxics Cleanup Program
PO Box 47775
Olympia WA, 98504

Re: VCP Project Status Request for Morrells Dry Cleaners Site (VCP #SW1039)
Project No. AS080190

Dear Mr. Mullin:

This letter has been prepared to provide an update on the status of remedial activities at the Morrells Dry Cleaner Site (Site) located at 608 North First Street in Tacoma, Washington. The Site is currently enrolled in the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP) as project SW1039. This letter serves as a response to your request for information on project status dated December 12, 2023.

Work completed at the Site in 2022 and 2023 was in accordance with the Sitewide Remedial Investigation (RI)/ Feasibility Study (FS) Work Plan (Aspect, 2021) and modified per Ecology requests contained in the Further Action Opinion Letter (Ecology, 2021), a technical meeting conducted between Aspect and Ecology on September 29, 2021, and follow-up email communication dated November 11, 2021 (Appendix A). As previously documented, the Site includes soil and groundwater primarily impacted by chlorinated solvents from historical dry cleaning operations. Previous remediation work at the Site has included a biostimulation injection, a reduction/bioaugmentation injection pilot test, and ongoing operation of a soil vapor extraction (SVE) system that also serves as a subslab depressurization system for the Morrell's building. Ongoing activities include implementation of the Sitewide RI/FS Work Plan to complete Site characterization and eventual evaluation of remedial actions via a FS. An update on these Site characterization activities completed in 2022 and 2023 is provided below.

Monitoring Well Installation with Soil Sampling

In accordance with the November 2, 2021, email (Appendix A), three new monitoring wells were installed in 2022 and 2023. Monitoring well locations are included on Figure 1. MW-36 is located hydraulically upgradient from MW-33 beyond the extents of the advance outwash groundwater. MW-37 is located hydraulically upgradient from MW-27/28. MW-15D is located downgradient from the advance outwash groundwater impacts, screened in the deeper aquifer. Soil samples were collected from borings drilled for monitoring well installation, included in Table 1.

Groundwater Monitoring

An additional groundwater sampling event was performed to monitor advance outwash and deeper water-bearing zone water quality for both chlorinated solvents and monitored natural attenuation geochemical parameters. The groundwater sampling occurred in July 2023. Groundwater quality data is included in Tables 2, 3, and 4.

Off-Property Vapor Intrusion Investigation

The remaining outstanding data gap identified in the Further Action Opinion Letter is the off-Property vapor intrusion risk. We have been working with the Client's environmental attorney to obtain access agreements with the northern property owners (4 The Boys Company, LLC, and Stadium, LLC) to collect subslab soil gas samples. This work will be completed once access agreements are obtained.

Sitewide Remedial Alternatives Evaluation

We are currently reviewing the feasibility of additional remedial actions to address source-area contamination at the Site to the maximum extent practicable. Remedial options may include a combination of ex situ (e.g., soil excavation and off-Site disposal) and in situ (e.g., thermal or SVE) components to remove chlorinated solvents from the source area. This evaluation is pending completion of the RI by conducting a vapor intrusion evaluation on northern properties impacted by the Site. However, the FS is anticipated to be completed and submitted to Ecology with a request for opinion in 2024.

Limitations

Work for this project was performed for the Thriftway Properties LLC (Client), and this letter was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This letter does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Sincerely,

Aspect consulting

12/20/2023

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Attachments:
Table 1 – Soil Quality
Table 2 – Advance Outwash Groundwater Quality
Table 3 – Advance Outwash Groundwater Natural Attenuation Parameters
Table 4 – Groundwater Quality and Natural Attenuation Parameter, Deeper Water Bearing Zones
Figure 1 – Site Plan
Appendix A – Ecology email communication dated November 2, 2021

cc: Tony Wickham, Thriftway Properties, LLC

Karen Gillmer, Thriftway Properties, LLC

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TABLES

Table 1. Soil Quality

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Sample Location	Sample Date	Sample Depth (feet bgs)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Naphthalene
PB-2	8/31/06	4	**0.16**	0.02 U	0.05 U
PB-3	8/31/06	8	**0.16**	0.02 U	0.05 U
A-5	2/26/19	22.5	0.025 U	0.02 U	0.05 U
		32	0.025 U	0.02 U	0.05 U
A-6	2/27/19	13	**0.47**	0.02 U	0.05 U
		36	0.025 U	0.02 U	0.05 U
	2/28/19	57.5	0.025 U	0.02 U	0.05 U
A-7	2/28/19	9.5	**1.4**	**0.16**	0.05 U
	3/1/19	22	**120**	**1.5**	**0.44**
		37	0.025 U	0.02 U	0.05 U
A-8	2/26/19	14	**0.089**	0.02 U	**0.1**
	2/27/19	34	**7.3**	**0.15**	0.05 U
		47	**0.047**	0.02 U	0.05 U
AB-1	12/20/13	15	--	--	0.05 U
		25	--	--	0.05 U
		45	--	--	0.05 U
		61.5	--	--	0.05 U
AB-2	4/6/15	16.5	0.025 U	0.02 U	**0.12**
AB-2D	3/4/16	10	0.025 U	0.02 U	0.05 U
		15	0.025 U	0.02 U	0.05 U
		27.5	0.025 U	0.02 U	0.05 U
		37.5	0.025 U	0.02 U	0.05 U
		52.5	0.025 U	0.02 U	0.05 U
AB-3	4/6/15	16.5	0.025 U	0.02 U	**0.77**
AB-4	4/6/15	16.5	0.025 U	0.02 U	
B-1	06/29/07	0-2	**0.04**	0.02 U	--
		2-3	**0.04**	0.02 U	--
B-10	02/25/16	4.5	0.025 U	0.02 U	0.05 U
B-11	02/25/16	5.5	**0.16**	0.04 U	0.1 U
B-12	02/25/16	5	0.025 U	0.02 U	0.05 U
		9	0.025 U	0.02 U	0.05 U
B-14	02/25/16	4.5	0.025 U	0.02 U	0.05 U
		5.5	0.025 U	0.02 U	0.05 U
		10.5	0.025 U	0.02 U	0.05 U
B-15	02/25/16	6.5	0.025 U	0.02 U	0.05 U
B-16	02/25/16	6	0.025 U	0.02 U	0.05 U
B-17	05/11/16	2	0.025 U	0.02 U	0.05 U
B-18	05/11/16	3	0.025 U	0.02 U	0.05 U
B-19	05/11/16	6	0.025 U	0.02 U	0.05 U
B-20	05/11/16	4.5	0.025 U	0.02 U	0.05 U
B-21	05/11/16	9.5	0.025 U	0.02 U	**0.23**
DC1	08/31/06	8	0.02 U	0.02 U	0.05 U
DP-1	10/21/10	1	**2.1**	0.03 U	0.05 U
		2	**1**	0.03 U	0.05 U
DP-2	10/21/10	1	**0.8**	0.03 U	0.05 U
DP-4	10/20/10	2	**1.8**	0.03 U	0.05 U
DP-5	10/20/10	3	**1.4**	0.03 U	0.05 U
		6	**0.54**	0.03 U	0.05 U

Table 1. Soil Quality

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Sample Location	Sample Date	Sample Depth (feet bgs)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Naphthalene
DP-7	10/21/10	2	**2.7**	0.03 U	0.05 U
		2.5	**36**	**0.14**	0.05 U
DP-8	10/20/10	3	0.025 U	0.03 U	**28**
		4.5	0.025 U	0.03 U	**0.22**
DP-9	10/20/10	3	0.025 U	0.03 U	0.05 U
		6	**0.13**	0.03 U	0.05 U
DP-10	02/08/12	8.5	**0.24**	0.03 U	0.05 U
DP-12	02/08/12	5.5	0.025 U	0.03 U	0.05 U
DP-13	02/08/12	7	0.025 U	0.03 U	0.05 U
DP-14	02/08/12	7	0.025 U	0.03 U	0.05 U
F-12	07/31/07	1	**1.5**	0.02 U	--
F-20	07/31/07	1.7	**2.1**	0.02 U	--
MW-9	05/11/09	Composite	0.025 U	0.03 U	0.05 U
MW-10	05/11/09	Composite	0.025 U	0.03 U	0.05 U
MW-11	05/11/09	Composite	0.025 U	0.03 U	0.05 U
MW-21	10/11/13	11	**0.63**	0.03 U	0.05 U
		15.5	**44**	**0.57**	0.05 U
		25	0.025 U	0.03 U	0.05 U
		40	0.025 U	0.03 U	0.05 U
		55	**0.095**	**0.032**	0.05 U
MW-23[3]	02/06/19	5.5	0.025 U	0.02 U	0.05 U
		10.5	**0.4**	**0.18**	0.05 U
		20.5	**0.045**	0.02 U	0.05 U
		25.5	**2.3**	0.02 U	0.05 U
		55.5	**0.095**	0.02 U	0.05 U
MW-24	1/30/19 & 1/31/19	5.5	0.025 U	0.02 U	0.05 U
		30.5	0.025 U	0.02 U	0.05 U
		50.5	0.025 U	0.02 U	0.05 U
MW-25	1/28/19 & 1/29/19	5.5	0.025 U	0.02 U	0.05 U
		30.5	0.025 U	0.02 U	0.05 U
		50.5	0.025 U	0.02 U	0.05 U
MW-26	1/29/19 & 1/30/19	5.5	0.025 U	0.02 U	0.05 U
		30.5	0.025 U	0.02 U	0.05 U
		50.5	0.025 U	0.02 U	0.05 U
MW-27	1/31/19 & 2/1/19	5.5	0.025 U	0.02 U	0.05 U
		30.5	0.025 U	0.02 U	0.05 U
		50.5	0.025 U	0.02 U	0.05 U
MW-28	03/14/19	30.5	**0.038**	0.02 U	0.05 U
		55.5	0.025 U	0.02 U	0.05 U
MW-29	03/11/19	15	**0.043**	0.02 U	0.05 U
		50	**0.043**	0.02 U	0.05 U
MW-30	02/07/19	10.5	**0.084**	**0.021**	0.05 U
		35.5	**0.1**	0.02 U	0.05 U
		60.5	**0.026**	0.02 U	0.05 U

Table 1. Soil Quality

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Sample Location	Sample Date	Sample Depth (feet bgs)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Naphthalene
MW-31	02/05/19	5.5	0.025 U	0.02 U	0.05 U
		40.5	0.025 U	0.02 U	0.05 U
		55.5	**0.058**	0.02 U	0.05 U
		60.5	**0.058**	0.02 U	0.05 U
MW-32	03/13/19	15.5	0.025 U	0.02 U	0.05 U
		55.5	0.025 U	0.02 U	0.05 U
MW-33	3/12/19 & 3/13/19	10	0.025 U	0.02 U	0.05 U
		55.5	0.025 U	0.02 U	0.05 U
MW-36	05/26/23	20	0.025 U	0.02 U	--
		65	0.025 U	0.02 U	--
MW-37	11/7/22 & 11/8/22	15	0.025 U	0.02 U	--
		45	0.025 U	0.02 U	--
MW-8D	05/11/19	Composite	0.025 U	0.03 U	0.05 U
MW-12D	10/27/10	Composite	0.025 U	0.03 U	0.05 U
MW-13D	10/28/10	Composite	0.025 U	0.03 U	0.05 U
MW-15D	6/20/23 & 6/21/23 & 6/22/23	38.5	0.025 U	0.02 U	--
		63	0.025 U	0.02 U	--
		92	0.025 U	0.02 U	--
		109.5	0.025 U	0.02 U	--
		116	0.025 U	0.02 U	--
		148	0.025 U	0.02 U	--
R-12	07/31/07	1	**1.9**	**0.28**	--
R-18	07/31/07	1.5	**18**	**0.85**	--
S-1	08/31/06	15	0.02 U	0.02 U	0.1 U
T-1	06/29/07	0-1.75	**0.04**	0.02 U	--
TRENCH-BT-C	12/09/13	4.5	**0.26**	0.03 U	0.05 U
TRENCH-BT-E	12/09/13	4.5	**0.16**	0.03 U	0.05 U
TRENCH-BT-W	12/09/13	4.5	**0.25**	0.03 U	0.05 U
VE-5	02/26/19	15.9	0.025 U	0.02 U	0.05 U
		22.6	0.025 U	0.02 U	0.05 U
VE-6	02/28/19	9.2	**0.47**	0.02 U	0.05 U
		26.9	0.025 U	0.02 U	0.05 U
		40.3	0.025 U	0.02 U	0.05 U
VE-7	03/01/19	6.7	**1.4**	**0.16**	0.05 U
		15.6	**120**	**1.5**	**0.44**
		26.2	0.025 U	0.02 U	0.05 U
VE-8	02/27/19	9.9	**0.089**	0.02 U	**0.1**
		24.0	**7.3**	**0.15**	0.05 U
		33.2	**0.047**	0.02 U	0.05 U
Screening Level[4]			0.05	0.03	5

-- Not analyzed
U Analyte not detected at the indicated detection limit
bgs below ground surface

Notes:

1) All concentrations are in milligrams per kilogram (mg/kg). Only Site Contaminants of Concern (COCs) are included in this table. Detections are bolded. Screening level exceedances are shaded.

2) Soil sampling was also conducted for the purpose of profiling soil for off-site disposal. Those sampling results are not included in this table.

3) Methylene chloride was detected above its screening level of 0.02 mg/kg (MTCA Method A soil cleanup level) in three soil samples collected from MW-23. The laboratory report noted that those detections were likely due to laboratory contamination.

4) The screening levels are Model Toxics Control Act (MTCA) Method A soil cleanup levels.

Table 2. Advance Outwash Groundwater Quality

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Sample Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-Dichloroethene (cDCE)	Vinyl Chloride (VC)	2-Hexanone	Iron, total (mg/L)
MW-2	08/28/07	**2,900**	**1,800**	**7,100**	**19**	--	--
	01/30/08	**1,400**	**520**	**2,000**	0.2 U	--	--
	10/02/08	**1,900**	**880**	**2,300**	**3.1**	10 U	--
	05/12/09	**1,600**	**930**	**2,400**	**2.7**	10 U	--
	12/22/10	**2,100**	**1,100**	**2,100**	**2.7 J**	10 U	--
	02/07/12	**1,600**	**810**	**1,400**	0.2 U	1000 U	--
	12/12/13	**1,600**	**830**	**1,200**	**0.84**	10 U	**6.17**
	*** Biostimulants injected in June 2014 ***						
	01/21/15	**19**	**25**	**150**	**0.77**	**22**	**294**
	07/30/15	**17**	**46**	**600**	**15**	**--**	**--**
	09/08/15	**18**	**77**	**610**	**17**	**--**	**--**
	02/02/16	**22**	**190**	**640**	**15**	**--**	**--**
	09/22/16	**16**	**110**	**480**	**7.8**	**--**	**--**
	01/04/17	**18**	**80**	**520**	**7.4**	**--**	**--**
	11/28/18	**28**	**14**	**490**	**5.9**	**120**	**--**
	03/26/20	**24**	**7.1**	**540**	**5.6**	--	**38**
	07/25/23	**12**	5 U	**280**	**2.8**	200 U	**44.3**
MW-5[3]	01/22/08	**67**	**3**	**13**	0.2 U	--	--
	01/30/08	**31**	**1.1**	**4.5**	0.2 U	--	--
	10/02/08	**75**	**3.2**	**17**	0.2 U	10 U	--
	05/11/09	**17**	**1.1**	**44**	0.2 U	10 U	--
	12/22/10	**190**	**14**	**41**	0.2 U	10 U	--
	02/07/12	**140**	**8.7**	**25**	0.2 U	10 U	--
	01/09/14	0.2 U	**0.46**	0.2 U	0.2 U	5 U	**11.5**
	04/28/15	**67**	**6.2**	**6.4**	0.2 U	10 U	--
	09/09/15	**31**	**3.6**	**3.6**	0.2 U	--	--
	02/02/16	**27**	**2.7**	**2.5**	0.2 U	--	--
	09/07/16	**12**	**1.4**	**1.4**	0.2 U	--	--
	01/04/17	**14**	**1.4**	**1.3**	0.2 U	--	--
	11/28/18	**13**	**1.4**	1 U	0.2 U	10 U	--
	03/25/20	**9.6**	1 U	1 U	0.2 U	--	**4.03**
	07/26/23	**7.4**	**0.72**	1 U	0.02 U	20 U	**0.17**
MW-7[3]	01/22/08	**6.6**	1 U	1 U	0.2 U	--	--
	01/30/08	**1.5**	1 U	1 U	0.2 U	--	--
	10/02/08	1 U	1 U	1 U	0.2 U	10 U	--
	05/11/09	**1.1**	1 U	1 U	0.2 U	10 U	--
	12/22/10	**1.4**	1 U	1 U	0.2 U	10 U	--
	02/06/12	1 U	1 U	1 U	0.2 U	10 U	--
	01/07/14	**1.4**	1 U	1 U	0.2 U	10 U	**14.5**
	03/26/20	1 U	1 U	1 U	0.2 U	--	**21.1**
MW-8	04/22/08	**1,300**	**780**	**2,400**	0.2 U	--	--
	10/02/08	**680**	**390**	**3,600**	**6.9**	10 U	--
	05/12/09	**780**	**370**	**2,600**	**2**	10 U	--
	12/22/10	**470**	**150**	**1,800**	**1.4**	10 U	--
	02/07/12	**960**	**610**	**1,600**	20 U	1000 U	--
	12/17/13	**940**	**560**	**1,300**	10 U	500 U	**77.3**
	*** Biostimulants injected in June 2014 ***						
	01/20/15	**14**	**8.5**	**1,200**	**9.4**	50 U	**89.1**
	07/30/15	**41**	**17**	**740**	**8.9**	--	--
	09/10/15	**18**	**13**	**1,000**	**12**	--	--
	02/01/16	**21**	**13**	**830**	**7.1**	--	--
	09/07/16	50 U	50 U	**560**	10 U	--	--
	09/22/16	**16**	**11**	**500**	**5.4**	--	--
	01/05/17	**19**	**12**	**480**	**5.6**	--	--
	11/28/18	**14**	**5.2**	**280**	**3.7**	**56**	--
	03/25/20	**8.4**	**2.9**	**210**	**2.4**	--	**20.3**
	07/25/23	**4.5**	**2**	**110**	**3.7**	20 U	**47.2**
MW-15	12/17/13	**460**	**110**	**380**	2 U	100 U	**0.97**
	*** Biostimulants injected in June 2014 ***						
	09/08/15	**86**	**53**	**220**	**4**	--	--
	02/01/16	**43**	**25**	**290**	**7.4**	--	--
	09/07/16	**15**	**8.4**	**330**	**4**	--	--
	01/04/17	**6.6**	**3.3**	**520**	**4.9**	--	--
	11/28/18	**3.3**	**1.6**	**65**	**0.78**	10 U	--
	03/23/20	**1.2**	1 U	**67**	**7.9**	--	**3.63**
	07/25/23	1 U	0.5 U	**3.7**	**1**	20 U	**4.64**
MW-16	12/13/13	**450**	**98**	**360**	**0.49**	10 U	**4.13**
	*** Biostimulants injected in June 2014 ***						
	01/21/15	**14**	**6.3**	**180**	**2.2**	50 U	**62.5**
	11/28/18	**11**	**2.8**	**230**	**2.6**	10 U	**--**
	03/25/20	**3.7**	1 U	**74**	**0.83**	**--**	**21.5**

Table 2. Advance Outwash Groundwater Quality

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Sample Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-Dichloroethene (cDCE)	Vinyl Chloride (VC)	2-Hexanone	Iron, total (mg/L)
MW-17	12/13/13	170	24	81	0.2 U	10 U	32.8
	*** Biostimulants injected in June 2014 ***						
	11/28/18	9.7	2.1	83	0.72	31	--
	03/24/20	5.4	1 U	77	0.86	--	36.4
	07/26/23	1.3	0.65	13	0.53	20 U	29.2
MW-18	12/12/13	460	57	360	0.53	10 U	0.22
	*** Biostimulants injected in June 2014 ***						
	07/26/23	1 U	0.5 U	94	2.6	20 U	42.8
MW-19	01/08/14	62	4.8	20	0.2 U	10 U	113
	*** Biostimulants injected in June 2014 ***						
	01/21/15	9.7	5 U	45	1 U	73	59.4
	09/09/15	7.6	3.9	35	1.5	--	--
	02/02/16	8.5	5.1	43	1.5	--	--
	09/07/16	20 U	20 U	20 U	4 U	--	--
	09/22/16	8.5	4.1	16	0.43	--	--
	01/04/17	12	4.6	36	0.97	--	--
	11/28/18	2.5	1.6	53	0.56	19	--
	03/24/20	1 U	1 U	46	0.51	--	89
	07/25/23	1.8	0.8	1.6	0.49	20 U	28.4
MW-20	01/08/14	140	16	43	0.2 U	10 U	40.8
	*** Biostimulants injected in June 2014 ***						
	01/20/15	7.4	5.3	79	1.8	25	50.6
	09/09/15	11	5.8	150	1.5	--	--
	02/02/16	1 U	1 U	250	1.9	--	--
	09/07/16	20 U	20 U	250	4 U	--	--
	09/22/16	4.9	1.7	250	1.8	--	--
	01/04/17	6.2	2	240	2.5	--	--
	11/28/18	4.9	1 U	59	0.84	32	--
	*** Remediation products and microorganisms injected in July 2019 ***						
	08/27/19	(Unable to collect water sample due to pump screen biofouling)					
	12/12/19	1 U	1 U	14	1.5	58 J	114
	03/24/20	1.5	1 U	9.8	0.65	--	73
MW-21	12/17/13	500	130	460	2 U	100 U	79.1
	*** Biostimulants injected in June 2014 ***						
	01/20/15	15	12	270	1 U	50 U	42.2
	09/08/15	7.1	9.2	510	7.4	--	--
	02/01/16	18	17	650	9.7	--	--
	09/22/16	12	13	320	4.1	--	--
	01/04/17	15	14	340	4.2	--	--
	11/28/18	14	7.6	190	2.3	27	--
	03/25/20	19	9.6	230	1.5	--	34.3
	07/26/23	34	9.8	33	1	20 U	20.1
MW-23	03/14/19	100	25	18	0.2 U	10 U	--
	03/26/20	140	23	20	0.2 U	--	4.95
MW-24	02/13/19	66	12	5.4	0.2 U	10 U	3.64
	08/27/19	42	10	5.1	0.2 U	10 U	41.4
	12/12/19	50	11	4.2	0.2 U	10 U	4.07
	03/26/20	58	11	4.1	0.2 U	--	3.47
MW-25	02/13/19	37	3.6	3.0	0.2 U	10 U	1.67
	03/26/20	36	3.2	3.0	0.2 U	--	0.83
MW-26	02/13/19	20	2.4	2.1	0.2 U	10 U	4.24
	08/28/19	20	2.7	2.2	0.2 U	10 U	49.4
	12/13/19	19	2.3	2.0	0.2 U	10 U	51.7
	03/25/20	15	1.4	1 U	0.2 U	--	45.3
MW-27	02/13/19	9.4	1.6	1 U	0.2 U	10 U	3.22
	03/24/20	9.3	1.5	1 U	0.2 U	--	6.94
MW-28	03/26/19	20	5.1	2.1	0.2 U	10 U	--
	03/25/20	20	2.7	1.8	0.2 U	--	3.06
	08/01/23	9.9	2.1	1.4	0.02 U	20 U	0.96
MW-29	03/26/19	12	1.1	1 U	0.2 U	10 U	--
	03/25/20	14	1.4	1 U	0.2 U	--	17.2
MW-30	02/25/19	27	6.2	6.3	0.2 U	10 UJ	4.53
	03/26/20	1 U	1 U	1 U	0.2 U	--	6.92
MW-31	02/25/19	150	45	28	0.2 U	10 UJ	8.68
	03/26/20	160	40	34	0.2 U	--	8.82
MW-32	03/26/19	36	8.7	2.8	0.2 U	10 U	--
	03/26/20	45	9.1	4.9	0.2 U	--	2.76
	07/26/23	5.6	0.65	1 U	0.02 U	20 U	1.29

Table 2. Advance Outwash Groundwater Quality

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Sample Date	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-Dichloroethene (cDCE)	Vinyl Chloride (VC)	2-Hexanone	Iron, total (mg/L)
MW-33	03/26/19	**28**	**3.9**	**1.6**	0.2 U	10 U	--
	03/26/20	**34**	**5.4**	**2.4**	0.2 U	--	**5.28**
	08/01/23	**16**	**1.4**	1 U	0.02 U	20 U	**0.81**
MW-34	07/15/19	**18**	**1.4**	1 U	0.2 U	10 U	**3.65**
	08/27/19	**25**	**2.2**	**1.3**	0.2 U	10 U	**6.09**
	12/13/19	**11**	**1.4**	**20**	0.2 U	10 U	**7.32**
	03/25/20	**17**	**2.5**	**10**	0.2 U	--	**2.37**
MW-35	08/28/19	**39**	**4.9**	**2.8**	0.2 U	**15 J**	**6.17**
	12/13/19	**23**	**3.2**	**7.2**	0.2 U	10 U	**4.66**
	03/25/20	**22**	**3.6**	**4.9**	0.2 U	--	**2.22**
MW-36	07/25/23	1 U	0.5 U	1 U	0.02 U	20 U	**12.4**
MW-37	07/26/23	1 U	0.5 U	1 U	0.02 U	20 U	**2.1**
Screening Level[2]		5	5	16	0.2	40	11

U not detected at the indicated detection limit

Notes:

1) All concentrations are in micrograms per liter (µg/L). Only anSite COCs are included in this table. Detections are bolded. Screening level exceedances (see Note 2) are shaded.

2) Screening levels are Model Toxics Control Act (MTCA) Method A groundwater cleanup levels, or Method B groundwater cleanup level when A not available (for cDCE and iron).

3) Potential impacts from Tully's Coffee water leak. An estimated 600,000 gallons of drinking water were released between May 2006 and Sept 2007 (per analysis of water bills).

Table 3. Advance Outwash Groundwater Natural Attenuation Parameters

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Date	DO (mg/L)	pH	ORP (mV)	Chloride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	Iron, total (mg/L)	Ferrous Iron (mg/L)	TOC (mg/L)	Methane (mg/L)	Ethene (mg/L)	Ethane (mg/L)	Dhc Assay[2]
MW-1	10/2/08	4.27	6.49	28.4											
	5/11/09	2.05	5.91	-220.1											
	2/7/12	8.14	6.8	162											
	1/10/14	0.4	6.41	114		0.2	<0.1	8.8	4.07		<1.5				
MW-2	10/2/08	2.04	6.51	75.4											
	5/11/09	3.79	7.02	43.3											
	2/7/12	5.27	7.06	215											
	12/12/13	4.4	6.74	141		0.959	NA	9.26	6.17		<0.25				
	*** Biostimulants injected in June 2014 ***														
	1/21/15	1.6	6.25	33					294						
	9/8/15	0.17	5.78	44.7											
	2/2/16	0.45	5.74	7.2											
	9/22/16	0.22	5.6	11.2											
	1/4/17	0.41	5.62	11.2											
	11/28/18	3.45	5.36	68.8											
	2/27/19	0.5	5.5	58	50.6	<0.1	0.675	1.22	49.2	2.5	209				
	3/26/20	0.51	5.09	59.3		0.452	0.726	<0.6	38		209				
	7/25/23	3.15	5.85	23.4		< 0.5 U	1.2	< 3 U	44.3		324				
MW-5	10/2/08	4.77	6.86	-773											
	5/11/09	6.63	7.28	-49.1											
	2/7/12	6.2	6.78	87											
	1/9/14	2.1	6.51	74		0.7	<0.1	20.6	11.5		<1.5				
	4/28/15	4.2	6.4	106.4											
	9/9/15	7.06	6.5	116.3											
	2/2/16	6.73	6.44	14.2											
	9/6/16	8.67	6.27	100.8											
	1/4/17	8.55	6.72	76.7											
	11/28/18	8.74	6.32	90.6											
	3/25/20	8.11	6.39	51.6		0.492	<0.1	6.84	4.03		2.66				
	7/25/23	10.02	6.13	178.7		0.805	< 0.6 U	14.3	0.173		0.913				
MW-7	10/2/08	3.61	6.68	-21											
	5/11/09	2.22	7.06	-175.2											
	2/6/12	3.03		93.8											
	1/7/14	8.5	6.87	53		1.39	0.006	28.4	14.3		<0.25				
	3/26/20	5.68	6.5	97.6		1.75	<0.2	29.6	21.1		<0.5				

Table 3. Advance Outwash Groundwater Natural Attenuation Parameters

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Date	DO (mg/L)	pH	ORP (mV)	Chloride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	Iron, total (mg/L)	Ferrous Iron (mg/L)	TOC (mg/L)	Methane (mg/L)	Ethene (mg/L)	Ethane (mg/L)	Dhc Assay[2]
MW-8	10/2/08	0.82	6.47	-88.5											
	5/12/09	0.47	7.41	-62.7											
	2/7/12	1.34	6.81	-55											
	12/17/13	0.4		23		0.33	0.004	20.9	77.3		<0.25				
	*** Biostimulants injected in June 2014 ***														
	1/20/15	0.4	5.68	36					89.1						
	9/10/15	0.25	5.22	49.1											
	2/1/16	0.22	5.17	71.4											
	9/9/16	0.26	5.26	-11.8											
	9/22/16	0.22	5.4	19.5											
	1/5/17	0.18	5.34	49.7											
	11/28/18	0.61	5.75	12.5											
	3/25/20	0.58	5.95	27.7		<0.1	<0.1	0.557	20.3		157				
	7/25/23	0.06	5.57	10.5		< 0.2 U	0.616	1.97	47.2		142				
MW-15	12/17/13	4.1		75		2.08	<0.002	15.4	0.968		<0.25				
	*** Biostimulants injected in June 2014 ***														
	09/08/15	0.23	6.23	8.30											
	02/01/26	0.50	6.43	18.90											
	09/09/16	0.17	6.56	-87.50											
	01/04/17	0.24	6.76	-21.10											
	11/28/18	0.37	6.57	-30.80											
	03/23/20	0.38	6.42	4.8		<0.1	<0.1	16	3.63		6.59				
	07/25/23	0.5	6.68	-14		< 0.5 U	< 0.6 U	< 3 U	4.64		10.6				
MW-16	12/13/13	2.4	6.83	50		1.76	0.004	17	4.13		<0.25				
	*** Biostimulants injected in June 2014 ***														
	1/21/15	4.4	6.3	-3					62.5						
	11/28/18	0.33	6.1	-40.6											
	3/25/20	7.79	6.86	-0.8		0.122	<0.1	2.09	21.5		63.4				
MW-17	12/13/13	1.7	7.09	63		1.51	0.004	14.9	32.8		<0.25				
	*** Biostimulants injected in June 2014 ***														
	11/28/18	0.26	5.88	79.90											
	03/24/20	0.9	6.31	23		0.222	0.402	1.93	36.4		258				
	07/26/23	0.17	6.36	129.4		< 0.2 U	< 0.24 U	< 1.2 U	29.2		291				
MW-18	12/12/13	3.8	6.67	122		0.681	NA	17.8	0.216		0.639				
	*** Biostimulants injected in June 2014 ***														
	7/25/23					< 0.1 U	< 0.12 U	< 0.6 U	42.8		33.9				

Table 3. Advance Outwash Groundwater Natural Attenuation Parameters

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Date	DO (mg/L)	pH	ORP (mV)	Chloride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	Iron, total (mg/L)	Ferrous Iron (mg/L)	TOC (mg/L)	Methane (mg/L)	Ethene (mg/L)	Ethane (mg/L)	Dhc Assay[2]
MW-19	1/8/14	2.4	6.57	97		2.66	0.006	22.7	113		0.254				
	*** Biostimulants injected in June 2014 ***														
	1/21/15	0.4	5.62	42					59.4						
	9/9/15	0.22	5.78	96.6											
	2/2/16	0.56	5.98	13.7											
	9/7/16	0.33	5.8	38.5											
	9/22/16	0.32	5.53	-23.2											
	1/4/17	3.29	5.69	42.1											
	11/28/18	0.79	5.83	35.5											
	3/24/20	0.4	6.41	-52.6		<0.5	<0.5	<0.6	89		142				
	7/26/23	0.12	6.36	-45		< 0.5 U	< 0.6 U	6.48	28.4		24.6				
MW-20	1/8/14	5.9	6.65	114		2.02	0.007	16.9	40.8		<0.25				
	*** Biostimulants injected in June 2014 ***														
	1/20/15	2.3	5.8	47					50.6						
	9/9/15	1.95	5.93	100.4											
	2/2/16	0.39	6.2	-7.8											
	9/7/16	0.22	5.75	69.4											
	9/22/16	0.15	5.54	18.8											
	1/4/17	1.17	5.92	40.4											
	11/28/18	0.39	6.1	-47.3											
	2/27/19	3.6	6.51	73	31.4	<0.1	0.128	<0.3	71	1.5	179				
	7/15/19	0.12	5.75	-11								10.2	<0.015	<0.016	<1 x 10^4
	*** Remediation products and microorganisms injected in July 2019 ***														
	8/27/19	(Unable to collect water sample due to pump screen biofouling)													
	12/12/19	1.05	6.0	-44		0.252	2.74	<0.3	114		809	3.73	<0.015	<0.016	<1 x 10^4
	3/23/20	0.29	5.9	-3.5		<0.2	1.3	<0.3	73		304				
MW-21	12/17/13	2.6		56		2.12	0.005	13.9	79.1		<0.25				
	*** Biostimulants injected in June 2014 ***														
	1/20/15	1.1	6.0	45					42.2						
	9/8/15	0.1	5.4	116.5											
	2/1/16	0.1	5.4	64.6											
	9/22/16	0.0	5.1	28.7											
	1/4/17	0.1	5.2	44.4											
	11/28/18	0.3	5.1	-9.4											
	3/25/20	0.6	5.6	56		0.566	1.1	8.42	34.3		241				
	7/26/23	0.1	6.5	14.8		< 0.5 U	< 0.6 U	12.1	20.1		165				
MW-23	3/14/19	8.5	6.9	56.1											
	3/26/20	6.9	6.9	46.3		0.912	<0.2	24.9	9.95		<0.5				
MW-24	2/13/19	1.2	7.2	44	32.9	0.606	0.186	12.6	3.64	<0.5	0.751				
	8/27/19	7.0	7.0	26		0.566	<0.2	11.6	41.4		3.36	0.028	<0.015	<0.016	
	12/12/19	1.1	6.9	28		0.307	<0.1	9.69	4.07		2.43	2.3	<0.015	<0.016	
	3/26/20	2.0	6.9	49		<0.1	<0.1	8.86	3.47		3.25				

Table 3. Advance Outwash Groundwater Natural Attenuation Parameters

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Date	DO (mg/L)	pH	ORP (mV)	Chloride (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	Iron, total (mg/L)	Ferrous Iron (mg/L)	TOC (mg/L)	Methane (mg/L)	Ethene (mg/L)	Ethane (mg/L)	Dhc Assay[2]
MW-25	2/13/19	0.5	7.04	55	48.5	0.624	0.308	16.1	1.67	<0.5	0.862				
	3/26/20	0.38	6.37	66		0.556	<0.1	13.3	0.829		<0.5				
MW-26	2/13/19	7.6	7.03	53	46.9	1.78	0.154	14.4	4.24	<0.5	<0.5				
	8/27/19	7.7	6.5	75		1.92	<0.2	13.7	49.4		<0.5				
	12/13/19	7.0	6.7	17		1.85	<0.1	12.9	51.7		<1.0				
	3/25/20	7.5	6.3	34		1.69	<0.1	13.4	45.3		<1.0				
MW-27	2/13/19	3.7	6.94	72	298	2.41	<1	18.9	3.22	<0.5	0.719				
	3/24/20	5.57	6.52	24		2.01	<0.2	23.1	6.94		0.506				
MW-28	3/26/19	6.24	7.06	121.3											
	3/25/20	4.07	6.43	55.3		1.76	<0.2	18.5	3.06		<0.5				
	8/1/23	9.19	7.00	213.5		1.77	< 0.24 U	20.2	0.956		0.791				
MW-29	3/26/19	3.96	7.14	92.8											
	3/25/20	7.16	6.94	35.8		1.29	<0.1	14.6	17.2		<0.5				
MW-30	2/25/19	8.3	6.99	70	10.1	1.17	<0.2	24.2	4.53	<0.5	1.24				
	3/26/20	7.54	6.28	65		1.71	<0.2	35.3	6.92		<0.5				
MW-31	2/25/19	3.6	6.9	75	23.7	1.09	0.166	13.3	8.68	<0.5	0.723				
	3/26/20	3.64	6.79	51		0.462	<0.2	13.3	8.82		0.541				
MW-32	3/26/19	8	6.9	85.1											
	3/26/20	7.87	6.37	83.4		2.95	<0.2	17	2.76		<0.5				
	7/26/23	10.27	6.46	295.2		0.946	< 0.24 U	17.9	1.29		1.34				
MW-33	3/26/19	6.85	6.8	117.5											
	3/26/20	7.34	6.5	95.3		11.4	<0.2	27.3	5.28		<0.5				
	8/1/23	9.53	6.65	224.2		1.49	< 0.24 U	19.9	0.806		0.857				
MW-34	7/15/19	0.96	6.74	9		0.484	0.125	15.1	3.65		3.9	0.031	<0.015	<0.016	$<1 \times 10^4$
	8/27/19	0.94	7.0	13		0.285	<0.4	7.48	6.09		20.5	<0.0086	<0.015	<0.016	$<4 \times 10^3$
	12/13/19	0.52	7.1	53		<0.1	<0.1	4.26	7.32		6.76	0.065	<0.015	<0.016	$<3 \times 10^3$
	3/25/20	1.3	6.6	6.6		0.445	<0.1	8.65	2.37		1.23				
MW-35	8/27/19	0.65	6.6	-28		0.268	1.17	7.27	6.17		132				
	12/13/19	1.5	6.8	-38		0.388	<0.1	13.2	4.66		3.66	<0.0086	<0.015	<0.016	$<6 \times 10^3$
	3/25/20	2.0	6.5	72		0.611	<0.1	13.1	2.22		0.699				
MW-36	7/26/23					1.22	< 0.6 U	20.3	12.4		1.71				
MW-37	7/26/23	10.1	6.7	273.3		0.818	< 0.24 U	14.6	2.1		0.756				

bgs below ground surface
DO dissolved oxygen
mg/L milligrams per liter
mV millivolts
NA natural attenuation
ORP oxidation-reduction potential
TOC total organic carbon

Notes:

1) Blank cell indicates sample was not analyzed for that parameter.

2) Gene-Trac® dehalococcoides (Dhc) assay based on quantification of Dhc 16S rRNA gene copies. Dhc are generally reported to contain one 16S rRNA gene copy per cell; therefore, this number is often interpreted to represent the number of Dhc cells present in the 1-liter sample.

Table 4. Groundwater Quality and Natural Attenuation Parameters, Deeper Water-Bearing Zones

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Sample Date	Tetrachloroethene (PCE)	cis-1,2-Dichloroethene (cDCE)	2-Hexanone	Iron, total (mg/L)	DO (mg/L)	pH	ORP (mV)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	TOC (mg/L)
MW-8D	05/11/09	1 U	**11**	10 U	--	5.15	6.31	-209.5				
	12/22/10	1 U	**21**	10 U	--							
	02/06/12	1 U	**26**	10 U	--	5.31	3.47	126.5				
	01/10/14	0.2 U	**42**	5 U	**0.79**	7.6	6.67	112	1.6	<0.1	22.8	< 1.5 U
	04/28/15	1 U	**54**	10 U	--	5.2	6.61	145				
	09/08/15	1 U	**65**	--	--	5.2	6.62	55				
	02/02/16	1 U	**62**	--	--	4.2	6.69	18				
	09/07/16	1 U	**69**	--	--	5	6.61	15				
	01/12/17	1 U	**77**	--	--							
	04/09/19	1 U	**97**	--	--	8.36	6.62	76				
	03/23/20	1 U	**110**	--	**0.502**	4.95	6.71	75.4	2.13	<0.1	21.2	< 0.5 U
	08/01/23	**4**	**84**	20 U	**0.282**	6.5	6.51	225.2	1.79	<0.24	19	0.942
MW-12D	12/22/10	**6.1**	**22**	10 U	--							
	02/06/12	1 U	**17**	10 U	--	7.26	6.09	139.3				
	01/10/14	**0.7**	**22**	10 U	--	8.8	7.35	114				
	04/29/15	1 U	**13**	5 U	--	8.3	7.63	130				
	09/10/15	1 U	**9.1**	10 U	--	8	7.52	23				
	02/02/16	1 U	**9.2**	--	--	7.8	7.58	18				
	09/07/16	1 U	**3.4**	--	--	0.8	7.87	-9				
	01/12/17	1 U	**3.0**	--	--							
	03/24/20	1 U	**8.9**	--	**6.42**	8.02	7.75	61.5	4.06	<0.1	19.1	< 0.5 U
MW-13D	12/22/10	**14**	**30**	10 U	--							
	02/07/12	**4.2**	**28**	10 U	--	5.98	6.93	252				
	12/16/13	**5.9**	**32**	10 U	--	5.4	6.59	85				
	04/29/15	1 U	**14**	10 U	--	7.9	6.88	152				
	09/09/15	**4.1**	**22**	--	--	6	6.66	138				
	02/02/16	**2.2**	**23**	--	--	6.8	6.72	17				
	09/07/16	**2.3**	**13**	--	--	4.5	6.48	19				
	01/12/17	**11**	**16**	--	--							
	04/09/19	**3.1**	**12**	--	--	8.65	6.31	126				
	03/24/20	**3.7**	**13**	--	**26.9**	6.53	6.76	67.4	3.45	< 0.1 U	19.8	0.538
	07/26/23	**6.1**	**6**	20 U	**1.35**				2.91	< 0.24 U	17.4	0.719

Table 4. Groundwater Quality and Natural Attenuation Parameters, Deeper Water-Bearing Zones

Project No. AS080190, Morrell's Dry Cleaners (VCP No. SW1039), Tacoma, Washington

Well ID	Sample Date	Tetrachloroethene (PCE)	cis-1,2-Dichloroethene (cDCE)	2-Hexanone	Iron, total (mg/L)	DO (mg/L)	pH	ORP (mV)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	TOC (mg/L)
MW-14D	02/06/12	**4.2**	**28**	10 U	--	5.45						
	01/23/14	**2.4**	**4.5**	10 U	--	5.26	6.37	720				
	04/29/15	**2.2**	**2.5**	10 U	--	6.2	6.6	143				
	09/09/15	**9.2**	**15**	--	--	5	6.54	99				
	02/02/16	**1.8**	**2.2**	--	--	5.8	6.9	-24				
	09/07/16	**3.2**	**3.6**	--	--	5.1	6.33	74				
	01/12/17	**7.4**	**4.8**	--	--							
	04/09/19[3]	1 U	1 U	--	--	6.26	6.58	100.1				
	03/25/20	**1.8**	**1.8**	--	**8.65**	5.93	6.51	80.8	3.38 J	< 0.1 U	20.2	< 0.5 U
	08/01/23	**1.3**	1 U	20 U	**0.102**	7.68	6.26	231.6	3.13	<0.24 U	17.5	< 0.7 U
MW-15D	08/01/23	1 U	1 U	20 U	**0.0694**	5.11	7.1	114.2	2.84	<0.24 U	18.6	< 0.7 U
Screening Level[2]		5	16	40	11							

U not detected at the indicated detection limit

Notes:

1) All concentrations are in micrograms per liter (µg/L). Only analytes with concentrations exceeding their respective screening levels in at least one sample are included in this table. Detections are bolded. Screening level exceedances are shaded.

2) Screening levels are Model Toxics Control Act (MTCA) Method A groundwater cleanup levels, or Method B groundwater cleanup level when A not available (for cDCE and iron).

3) Extensive Sound Transit construction in North First St adjacent to MW-14D may have impacted concentrations at that well on 04/09/19.

FIGURE

TACOMA AVENUE

NORTH FIRST STREET

4 THE BOYS COMPANY, LLC
T.P.N. 2030-12-0012
(NORTHERN BUILDING)

T.P.N. 2030-12-0012

STADIUM, LLC
T.P.N. 2030-12-0013

T.P.N. 2030-12-0013

ALLEY

MORRELL'S
DRY CLEANERS

MORRELL'S
BUILDING PARCEL
T.P.N. 2030-12-0031

MORRELL'S
PARKING LOT PARCEL
T.P.N. 2030-12-0033

FORMER WALKER CHEVROLET SITE
(VCP NO. SW1040)
T.P.N. 2030-12-0032

T.P.N. 2031-12-0050

13-0025

MW-15D
MW-13D
MW-4 (DRY)
MW-12D
MW-3 (DRY)
MW-30 (DRY)
MW-36
MW-6 (DRY)
MW-1
MW-21
MW-31
MW-8
MW-33
MW-30
MW-16
MW-17
MW-2
MW-18
MW-23
MW-32
MW-29
MW-7
VP-5
MW-25
MW-19
MW-20
MW-24
MW-35
MW-34
MW-28
MW-26
MW-27
MW-37
MW-5
MW-3 (DRY)
VE-33
VE-1
VE-2
VE-3
VE-4
VE-5
VE-6
VE-7

0 30 60 Feet

DRAFT

Blue Halo Indicates Injection of Biostimulants in June 2014
Yellow Halo Indicates Remediation Injection in July 2019

Horizontal Projection
Screened Interval

- Existing Vertical Monitoring Well
- Existing Angled Monitoring Well Existing
- Angled SVE Well
- Existing Sub-Slab Suction Pit
- Existing Vapor Point
- Proposed Vapor Point
- Groundwater Sample Collected in July-Aug 2023
- Estimated Extent of Groundwater in Advance Outwash
- Parcel Bounday
- Property Boundary
- On-Property Parcel Boundary
- Estimated Extent of Soil with Cleanup Level Exceedances
- Estimated Extent of Advance Outwash Groundwater with Cleanup Level Exceedances

APPR.	DATE	DESCRIPTION

REVISED BY: BBC
DRAWN BY: SCC
DESIGNED BY: BMG
PROJECT NUMBER: 080190
REVISION: -
DATE: Sep 2023

Aspect CONSULTING

Site Plan

Sitewide Remedial Investigation and Feasibility Study Report
Morrell's Dry Cleaner (VCP No. SW1039)
608 North 1st Street, Tacoma, Washington

FIGURE NO.
1

CAD Path: Q:_Geo\tech\080190 Stadium Thriftway\2023-09\Sitewide RI and FS Report\080190002 05 07 09 Site Plans.dwg|01 Site Plan || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: Sep 19, 2023 5:12pm || User: scadd

APPENDIX A

Ecology email communication dated November 2, 2021

Breeyn Greer

From: Breeyn Greer (Aspect)
Sent: Tuesday, November 2, 2021 5:03 PM
To: Acklam, Nicholas (ECY)
Cc: Doug Hillman; Jeremy Porter (Aspect)
Subject: RE: Morell's Sitewide RI/FS Work Plan / Ecology Opinion
Attachments: Data Gaps Mark-Up_10.27.21_BMG.pdf

Good evening Nick,

We want to thank you for your thorough review of our Sitewide RI/FS Work Plan (Aspect, June 4, 2021) and providing your Opinion on the Proposed Cleanup (Ecology, September 23, 2021). The letter was encouraging to us and seems like we are primarily in agreement on additional characterization efforts needed to complete a Sitewide RI/FS, which Aspect is eager to complete in the coming months. There are some points presented in the Ecology Opinion that have practical implementation limits, that we propose modifying slightly to accomplish a similar set of objectives.

Below I've outlined Aspect's Original proposal, Ecology's Opinion Proposal, and Aspect's revised hybrid proposal for your consideration.
We'd welcome additional dialogue on this topic if you'd like to hop on a conference call.

Aspect's original proposal in RI Work Plan

- Groundwater Investigation – One new Deep Water Bearing Zone (DWBZ) well to be installed in City of Tacoma (the City) right-of-way (ROW) (MW-15D). Additional groundwater monitoring at a total of 14 Site monitoring wells to support forthcoming FS. This requires a City Street Use Permit (SUP), and $10,000 financial assurance.
- Soil Investigation – Six soil samples to be collected from the single proposed additional deep well in the City ROW (MW-15D)
- Vapor Intrusion Investigation – Assess radius of influence of SVE system by a) placing two vapor pins in the public sidewalk and assessing vacuum or b) placing a series of vapor pins in the Parking Lot Parcel asphalt and measuring vacuum at each.

Ecology's Opinion proposal

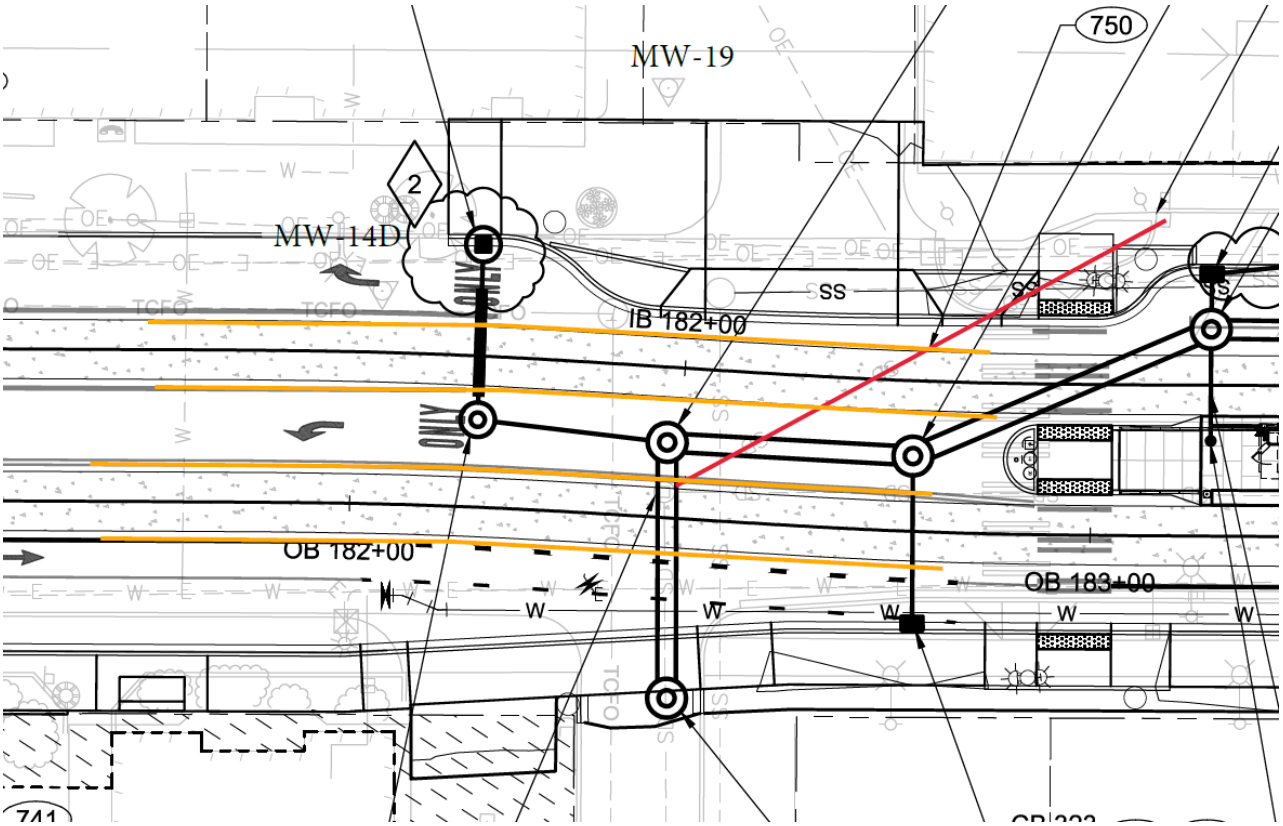
- Groundwater Investigation – One new DWBZ well to be installed in the City ROW (MW-15D). Three new Shallow Water Bearing Zone (SWBZ) wells installed both on and off the Parking Lot Parcel (MW-36, MW-37, MW-38). Additional groundwater monitoring at a total of 26 Site monitoring wells (including the four new wells). This would require a City SUP and $30,000 financial assurance.
- Soil Investigation – Soil samples to be collected from the proposed single additional DWBZ well, as well as the three additional SWBZ wells placed both on and off the Parking Lot Parcel.
- Vapor Intrusion Investigation – Sub-slab soil gas and indoor air samples in Morell's, Tease Chocolates, and each of the northern buildings. This proposal requires access agreements with both of the Northern Parcel Owners (4 The Boy Company, LLC and Stadium, LLC). Ecology also recommends completing a sub-slab depressurization study in the Morell's building to demonstrate continuous protection via the SVE system. Should access not be granted to the northern buildings, Ecology recommends collecting soil gas samples on all sides of the buildings as near to the foundations as possible. This alternate option would require a City SUP and a direct push drill rig.

Aspect revised hybrid proposal

- Groundwater Investigation – One new DWBZ well to be installed in City of Tacoma ROW (MW-15D) and one new shallow water bearing zone monitoring well on the Parking Lot Parcel (MW-37). Aspect agrees to attempt the additional SWBZ well in the City ROW (MW-36), contingent on locating utility free placement and the City SUP being granted. MW-38 is proposed in a utility network that does not appear to be

conducive to well installation, and Aspect does not propose to install it (screen shot of City plans below). We realize that this will have implications on the assumed extents of contamination and are interested in engaging in the ideas of 1) overdrilling MW-14-D and screening in the SWBZ (provides GW data but not soil data) or 2) making an assumption on the limits of soil contamination there.

- Aspect proposes that groundwater monitoring should remain at a total of 14 Site monitoring wells (including the new wells).
  The purpose of additional data collection is to support the forthcoming feasibility study including both active groundwater treatment and monitored natural attenuation cleanup alternatives. The vast majority of wells have demonstrated consistent concentrations since roughly 2016 (when the 2014 biostimulation injection effects were complete) and therefore the costs associated with additional sampling outweigh the benefit of sampling the requested 26 wells. Rather, wells with inconsistent or high concentrations and boundary wells will be focused on in addition to the proposed new wells. Aspect is happy to modify the list of wells to be sampled based on Ecology feedback, perhaps MW-33, MW-32, MW-29, MW-28, MW-27, MW-5, MW-21, MW-19, MW-17, MW-2, MW-15D, MW-36, MW-37, and MW-8D would be an agreeable list? MW-2 and M-17 would have ethane, ethene, and methane added to analyte list.
- Soil Investigation – Six soil samples to be collected from the proposed single additional DWBZ well, as well as two samples from any additional SWBZ wells (see conditions of well installation above).
- Vapor Intrusion Investigation – Sub-slab soil gas samples in Morell's, Tease Chocolates, and each of the northern buildings contingent on access agreements with both of the Northern Parcel Owners. Aspect agrees to complete a sub-slab depressurization study in the Morell's building to demonstrate protection via the SVE system. Aspect proposes that any indoor air sampling be in a second phase of investigation, should any of the sub-slab results warrant it. Aspect also proposes to not collect indoor air samples in the Morell's/Tease Chocolates building due to active dry cleaner use. The results of the sub-slab soil gas investigation will be compared against screening levels in Ecology's Implementation Memorandum No. 22: Vapor Intrusion Investigations and Short-Term Trichloroethylene Toxicity (Ecology, 2019).



Utilities shown in gray and black exist. The storm shown in red has been removed.
Also, based on my discussions with the City this spring, a min 5' is needed from the tracks (approx. offset shown in orange).

This leaves no space for additional drilling.

Please consider and let us know your thoughts on the proposed hybrid investigation approach.
We'd also be happy to set up a conference call to discuss.
Thank you for your efforts on this, ~Breeyn

Breeyn Greer, PE | Project Engineer | Direct: 206.812.4739 | Cell: 612.232.7343
Aspect Consulting LLC | 710 2nd Ave, Suite 550, Seattle, WA 98104 | www.aspectconsulting.com

Due to COVID and my remote work situation, I may be responding to emails at hours outside of a typical workday. Please feel free to respond during your workday.