Tables

Table 2-1. Interim Remedial Action Point-of-Entry Treatment Systems Monitoring Program Overview

					Carbon tetrachloride							Chloroform							Carbon disulfide						
				MTCA Method B Groundwater - CANCER				0.63			0.63				1.4			1.4				NE			NE
				MTCA Method B Groundwater - NON-CANCER				32			32				80			80				800			800
					Total	Detects			Non-Detects			Total	Detects			Non-Detects			Total	Detects			Non-Detects		
Location	Installation Date	Frequency (Before Feb 2019)	Frequency (Feb 2019 to Current)	Analyses	Samples	# Detects	Frequency (Percent)	Max Concentration (µg/L)	# Non-Detects	Frequency (Percent)	Max Concentration (µg/L)	Samples	# Detects	Frequency (Percent)	Max Concentration (µg/L)	# Non-Detects	Frequency (Percent)	Max Concentration (µg/L)	Samples	# Detects	Frequency (Percent)	Max Concentration (µg/L)	# Non-Detects	Frequency (Percent)	Max Concentration (µg/L)
Marlow Carbon Effluent	September 2016	Weekly	Bi-weekly	VOCs	150	3	2	0.97 (0.24)[a]	147	98	0.5 U	150	2	1.33	1.2	148	98.67	0.5 U	149	1	0.67	0.17 J	148	99.33	0.5 U
Marlow Carbon Influent	September 2016	Weekly	Bi-weekly	VOCs	149	147	98.66	99.9	2	1.34	0.2 U	149	146	97.99	9.9	3	2.01	0.5 U	148	62	41.89	3.5	86	58.11	1.9 U
Marlow Irrigation Carbon Effluent	June 2017	Weekly, when used	Bi-weekly, when used	VOCs	51	1	1.96	0.44 J	50	98.04	0.2 U	51	0	0	--	51	100	0.46 U	51	1	1.96	0.093 J	50	98.04	0.37 U
Marlow Irrigation Midpoint	June 2017	Weekly, when used	Bi-weekly, when used	VOCs	64	4	6.25	0.72	60	93.75	0.2 U	64	0	0	--	64	100	0.46 U	64	1	1.56	0.11 J	63	98.44	0.37 UJ
Marlow Midpoint	September 2016	Weekly	Bi-weekly	VOCs	241	4	1.66	141	237	98.34	0.5 U	241	4	1.66	9.6	237	98.34	1 U	240	3	1.25	1.4	237	98.75	1 U
Out-of-Use Marlow Well (No. 2) Carbon Effluent	May 2019	NA	Only when used	VOCs	10	0	0	--	10	100	0.19 U	10	0	0	--	10	100	0.45 U	10	0	0	--	10	100	0.19 U
Out-of-Use Marlow Well (No. 2) Carbon Influent	May 2019	NA	Only when used	VOCs	10	10	100	9.9	0	0	--	10	9	90	3.4	1	10	0.45 U	10	0	0	--	10	100	0.19 U
Out-of-Use Marlow Well (No. 2) Midpoint	May 2019	NA	Only when used	VOCs	10	0	0	--	10	100	0.19 U	10	0	0	--	10	100	0.45 U	10	0	0	--	10	100	0.19 U
Randall Carbon Effluent	September 2016	Weekly	Bi-weekly	VOCs	144	2	1.39	0.28	142	98.61	0.5 U	144	0	0	--	144	100	0.5 U	143	0	0	--	143	100	0.5 U
Randall Carbon Influent	September 2016	Weekly	Bi-weekly	VOCs	148	147	99.32	402	1	0.68	0.5 U	148	147	99.32	9.9	1	0.68	0.5 U	147	70	47.62	6.2	77	52.38	3.7 U
Randall Irrigation Carbon Effluent	June 2017	Weekly, when used	Bi-weekly, when used	VOCs	47	0	0	--	47	100	0.2 U	47	0	0	--	47	100	0.46 U	47	0	0	--	47	100	0.37 U
Randall Irrigation Midpoint	June 2017	Weekly, when used	Bi-weekly, when used	VOCs	45	0	0	--	45	100	0.2 U	45	0	0	--	45	100	0.46 U	45	0	0	--	45	100	0.37 U
Randall Midpoint	September 2016	Weekly	Bi-weekly	VOCs	151	1	0.66	0.16	150	99.34	0.5 U	151	0	0	--	151	100	0.5 U	150	0	0	--	150	100	0.5 U

Notes:

[a] Sampling date of 9/1/2016 during system installation. Sample taken the following day, 9/2/2016, has the second-highest detected value of 0.24 µg/L, below the screening criteria

-- = not applicable

µg/L = microgram(s) per liter

J = estimated result

MTCA = Model Toxics Control Act

NE = not established

U = not detected at or above the indicated reporting limit

UJ = not detected; indicated reporting limit is estimated

Table 3-1. Soil Boring Details

Location ID	Install Date	Total Depth (feet bgs)	Northing	Easting	Ground Surface Elevation (feet amsl)
BK01	4/22/2014	24	210732.54	2539652.31	2598
CHF Grain Facility Sump Area	2/6/2018	3	210933.90	2539475.72	2600
GSNE	11/2/2017	4	210758.42	2539681.24	2595
GSSW	11/2/2017	5	210724.99	2539659.50	2598
HA01	4/23/2014	13.5	211104.44	2539485.79	2598
HA02	4/23/2014	4	211089.20	2539518.67	2598
HA03	4/23/2014	9	211101.78	2539529.94	2599
HB-1-1	2/26/2019	10.5	210859.87	2539596.29	2598
HB-1-2	2/26/2019	10.5	210875.57	2539587.12	2598
HB-1-3	2/26/2019	10.5	210893.44	2539576.69	2598
HB-2-1	2/27/2019	10.5	210894.84	2539546.59	2598
HB-2-2	2/27/2019	10.5	210908.30	2539542.34	2598
HB-2-3	2/27/2019	10.5	210922.26	2539537.94	2598
HB-3-1	2/28/2019	10.5	210914.11	2539514.73	2598
HB-3-2	2/28/2019	10.5	210925.04	2539507.55	2598
HB-3-3	2/28/2019	10.5	210936.68	2539500.14	2598
MW-01	7/6/2016	47	211112.96	2539514.41	2599
MW-02	7/1/2016	150	210906.29	2539792.79	2598.09
MW-04	6/27/2016	34	209676.67	2539669.90	2576.44
MW-05	5/20/2016	60	210992.76	2538574.85	2627.62
MW-06	6/27/2016	53	209442.87	2539170.11	2590.03
MW-1S	7/6/2016	47	211100.56	2539516.89	2598.85
MW-2D	7/1/2016	150	210893.63	2539795.09	2598.09
MW-3D	5/10/2016	58.5	210902.90	2539415.04	2605.11
MW-4D (SB-16)	6/27/2016	34	209664.12	2539671.04	2576.44
MW-5D	5/20/2016	60	210981.24	2538577.23	2627.62
MW-6D	6/27/2016	53	209427.86	2539181.87	2590.03
PH-01	6/27/2018	1	210960.47	2539476.28	2597
PH-02	6/27/2018	1	210933.64	2539500.52	2598
PH-03	6/27/2018	1	210894.75	2539572.01	2598
PH-04	6/27/2018	1	210846.66	2539619.21	2599
PH-05	6/27/2018	1	210869.73	2539539.96	2600
PH-06	6/27/2018	1	210904.62	2539469.50	2604
PH-07	6/27/2018	1	210906.38	2539429.93	2605
PH-08	6/27/2018	1	210932.65	2539408.96	2605
RC-01	11/8/2018	62	210741.28	2539636.05	2598.6
RC-02	11/14/2018	230	210374.73	2539678.44	2625.1
RC-03	11/16/2018	250	209857.95	2539642.35	2585.1
RC-04	11/9/2018	390	209448.60	2539159.21	2589.3
SB01	4/21/2014	8	210902.68	2539474.06	2604
SB02	4/21/2014	8	210896.24	2539469.17	2604
SB03	4/21/2014	8	210888.95	2539461.85	2604
SB04	4/21/2014	8	210900.57	2539437.30	2605
SB05	4/21/2014	8	210911.67	2539417.24	2605
SB06	4/21/2014	12	210923.00	2539417.44	2605
SB07	4/21/2014	12	210911.41	2539396.22	2605
SB08	4/22/2014	12	210927.94	2539375.16	2608
SB09	4/22/2014	28	210874.52	2539488.75	2604
SB10	4/22/2014	24	210890.09	2539431.86	2605
SB11	4/23/2014	32	210902.68	2539474.06	2604
SB12	4/24/2014	32	210924.52	2539410.94	2605

Table 3-1. Soil Boring Details

Location ID	Install Date	Total Depth (feet bgs)	Northing	Easting	Ground Surface Elevation (feet amsl)
SB13	4/24/2014	30	210898.58	2539426.02	2605
SB14	4/24/2014	28	210856.55	2539479.46	2603
SB-01	7/1/2016	49	210972.94	2539474.13	2597.15
SB-02	5/10/2016	77.5	210998.98	2539415.97	2597.94
SB-03 (MW-7S)	5/16/2016	48.5	210955.57	2539557.15	2597.29
SB-04 (MW-9S)	5/17/2016	43	210780.61	2539597.39	2599.83
SB-05 (MW-8S)	5/18/2016	53	210903.10	2539489.88	2603.66
SB-06	5/18/2016	68	210704.71	2539349.13	2630.07
SB-07 (MW-10S)	7/8/2016	78	210671.54	2539514.59	2615.77
SB-08	5/23/2016	52	210886.14	2539459.38	2604.2
SB-09	5/23/2016	41	210821.03	2539634.72	2596.9
SB-10	5/24/2016	48	210914.78	2539626.91	2596.94
SB-11	5/25/2016	68	211044.12	2539337.85	2598.55
SB-12	5/25/2016	58	211068.43	2539277.95	2598.76
SB-13	5/26/2016	41	210945.20	2539363.16	2608.05
SB-14	5/26/2016	55	210815.82	2539246.70	2630.96
SB-15	6/30/2016	97	210835.79	2539380.38	2607.72
SB-17 (MW-11S)	6/29/2016	87	210233.89	2539508.31	2623.9
SB-18	6/30/2016	54	210738.94	2539540.15	2602.58
SB-19	6/30/2016	42	210623.98	2539684.20	2598.61
SB-20	7/6/2016	41	210722.67	2539657.99	2598.17
SB-21	7/7/2016	67	211592.73	2539756.25	2637.77
SB-22	7/20/2016	37	210685.92	2539739.02	2595.92
SB-23	7/20/2016	62	210844.47	2539091.32	2635.35
SB-24 (MW-12S)	7/21/2016	57	211048.44	2538992.88	2621.48
SB-25	11/19/2016	22.33	210872.60	2539629.11	2597.9
SB-26	11/19/2016	31.42	210840.37	2539572.71	2598.79
SB-27	11/20/2016	19	210905.09	2539565.82	2598.04
SB-28	11/20/2016	19.5	210934.13	2539476.75	2600.1
SB-29	11/20/2016	13.5	210975.15	2539392.51	2600.2
SB-30	11/20/2016	16	210878.46	2539524.36	2599.69
SB-31	11/20/2016	15	210840.37	2539508.98	2603.25
SB-32	11/21/2016	23	210714.38	2539750.71	2591.56
SB-33	11/21/2016	17	210786.90	2539693.57	2592.02
SB-34	1/19/2017	83	210608.30	2539831.95	2590.69
SB-35	1/12/2017	84	210466.48	2539718.04	2619.34
SB-36	1/11/2017	52	210460.01	2539236.69	2624.25
SB-37	1/11/2017	81	210484.76	2539492.13	2623.48
SB-40	2/13/2017	97	210427.29	2540100.51	2580.41
SB-41 (MW-13S)	2/17/2017	46	210221.07	2540405.33	2580.43
SB-43	1/20/2017	40	209027.47	2539632.47	2553.77
SB-101B	1/23/2018	37	210881.67	2539510.63	2603.151
SB-102B	1/24/2018	30	210856.90	2539530.19	2602.5
SB-103B	1/25/2018	27	210834.62	2539559.83	2600.978
SB-104B	1/25/2018	27	210766.76	2539611.61	2599.059
SB-201	12/13/2018	17	210842.66	2539675.21	2593.068
SB-202	12/13/2018	17	210824.15	2539709.80	2591.138
SB-203	12/13/2018	17	210810.83	2539734.81	2590.175
SB-204	12/13/2018	17	210795.80	2539758.86	2589.327
SB-205	12/13/2018	17	210774.82	2539777.20	2587.384
SB-206	6/19/2019	77	210477.80	2540037.40	2582.705
SB-207	6/21/2019	77	210416.14	2539583.71	2624.455

Table 3-1. Soil Boring Details

Location ID	Install Date	Total Depth (feet bgs)	Northing	Easting	Ground Surface Elevation (feet amsl)
SB-208	6/20/2019	92	210211.36	2539818.40	2614.552
SV-105	3/7/2018	3	210907.05	2539491.59	2604
SV-106	3/7/2018	3	210892.45	2539519.98	2604
SV-107	3/7/2018	3	210876.62	2539556.09	2598
SV-108	3/30/2018	3	210962.23	2539425.86	2600
SV-109	3/30/2018	3	210948.43	2539459.94	2600
SV-110	3/8/2018	3	210933.83	2539495.64	2598
SV-111	3/8/2018	3	210930.18	2539476.57	2600
SV-112	3/30/2018	3	210915.17	2539466.84	2600
SV-113	3/30/2018	1.5	210896.10	2539458.72	2602
SV-114	3/30/2018	3	210856.34	2539624.65	2598

Notes:

Northing/easting coordinates in North American Datum 1983 State Plane Washington North.

Elevation data in North American Vertical Datum of 1988.

Estimated ground surface elevation to nearest foot, from U.S. Geological Survey National Elevation Dataset

BK - background soil boring
CHF - Cenex Harvest States facility
GS - geophysics survey excavation (abandoned culvert)
HA - hand auger boring
HB - horizontal boring (listed depth is horizontal run)
MW - monitoring well / boring
PH - pothole
RC - rock core
SB - soil boring
SV - soil vapor boring

amsl = above mean sea level
bgs = below ground surface
ID = identification
NA = not available

Table 3-2. Well Construction and Survey Information

Well Type	Well Name	Installation Date	Abandon Date	Well Diameter (inches)	Northing (feet)	Easting (feet)	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Top of Screen (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen (ft bgs)	Bottom of Screen Elevation (ft amsl)
Monitoring Well	MW-1D	7/6/2016		2	211096.785498	2539524.621564	2598.99	2598.45	88	2,510.99	98	2,500.99
Monitoring Well	MW-1S	7/15/2016		2	211100.555028	2539516.892529	2598.85	2598.63	15	2,583.85	25	2,573.85
Monitoring Well	MW-2D	7/12/2016		2	210893.630861	2539795.087798	2598.09	2597.66	135	2,463.09	145	2,453.09
Monitoring Well	MW-3D	5/18/2016		2	210902.899704	2539415.035246	2605.11	2604.92	168	2,437.11	178	2,427.11
Monitoring Well	MW-4D	7/15/2016		2	209664.124360	2539671.043284	2576.44	2576.09	182.5	2,393.94	187.5	2,388.94
Monitoring Well	MW-5D	6/22/2016		2	210981.239924	2538577.229842	2627.62	2627.33	140	2,487.62	150	2,477.62
Monitoring Well	MW-6D	6/28/2016		2	209427.863856	2539181.874355	2590.03	2589.52	212	2,378.03	232	2,358.03
Monitoring Well	MW-6S	7/11/2016		2	209430.793490	2539171.035708	2590.45	2589.92	35	2,554.92	45	2,544.92
Observation Well	MW-6U	8/16/2017		2	209466.506032	2539140.532316	2591.07	2590.83	50	2,540.83	60	2,530.83
Monitoring Well	MW-7S	5/16/2016		2	210943.124682	2539559.497210	2597.29	2596.98	41	2,555.98	46	2,550.98
Monitoring Well	MW-8S	5/18/2016		2	210890.721225	2539492.175615	2603.66	2603.39	47	2,556.39	52	2,551.39
Monitoring Well	MW-9D	12/15/2016		2	210758.767598	2539617.724941	2599.28	2598.96	85	2,513.96	95	2,503.96
Monitoring Well	MW-9S	5/17/2016		2	210768.126530	2539599.562208	2599.83	2599.31	36	2,563.83	41	2,558.83
Observation Well	MW-9U	8/17/2017		2	210729.058208	2539653.736345	2598.12	2598.00	61	2,537.00	71	2,527.00
Monitoring Well	MW-10S	7/8/2016		2	210659.140137	2539516.672557	2615.77	2615.31	66	2,549.77	76	2,539.77
Monitoring Well	MW-11S	6/29/2016		2	210221.494775	2539509.983392	2623.90	2623.50	65	2,558.90	80	2,543.90
Monitoring Well	MW-12S	7/21/2016		2	211036.523022	2538995.317646	2621.48	2622.03	46	2,576.51	56	2,566.51
Monitoring Well	MW-13S	2/17/2017		2	210219.557616	2540408.479219	2580.43	2580.09	16	2,564.43	36	2,544.43
Monitoring Well	MW-14D	1/27/2017		2	210437.693783	2540106.310943	2579.96	2579.85	122	2,457.96	132	2,447.96
Monitoring Well	MW-15D	6/27/2017		2	209006.348980	2539355.881931	2551.70	2551.32	116	2,435.32	136	2,415.32
Monitoring Well	MW-16D	1/27/2017		2	206442.299390	2536284.241112	2566.22	2565.73	90	2,475.73	105	2,460.73
Monitoring Well	MW-17D	4/5/2017		2	210296.526607	2539046.307480	2613.82	2613.56	209	2,404.56	219	2,394.56
Monitoring Well	MW-18D	1/10/2017		2	206366.217189	2538415.462038	2513.35	2513.00	144	2,369.00	164	2,349.00
Monitoring Well	MW-19D	4/26/2017		2	210361.412706	2539694.656436	2624.34	2624.01	155	2,469.01	175	2,449.01
Monitoring Well	MW-20D	6/16/2017		2	209898.038157	2538322.439851	2616.45	2616.18	130	2,486.18	150	2,466.18
Monitoring Well	MW-21D	7/6/2017		2	208058.834473	2535784.669781	2523.07	2526.16	110	2,416.16	130	2,396.16
Monitoring Well	MW-22S	12/1/2017	2/9/2018	2	209184.944944	2539638.569256	2552.23	2554.83	--	--	--	--
Monitoring Well	MW-23S	12/1/2017	1/19/2018	2	209082.489113	2539482.733281	2550.18	2553.59	--	--	--	--
Monitoring Well	MW-24S	12/11/2018		2	210874.902000	2539842.527000	2602.48	2602.23	41	2,561.23	46	2,556.23
Monitoring Well	MW-25S	12/12/2018		2	210831.612000	2539877.747000	2601.26	2600.78	42	2,558.78	47	2,553.78
Monitoring Well	MW-26	5/16/2019		2	209840.576000	2539966.404000	2585.06	2584.76	215	2,369.76	225	2,359.76
Monitoring Well	MW-27	5/29/2019		2	210401.310000	2539988.802000	2625.10	2624.90	233	2,391.90	243	2,381.90
Monitoring Well	MW-28	5/31/2019		2	210393.677000	2539999.811000	2624.77	2624.57	180	2,444.57	190	2,434.57
Monitoring Well	MW-29	6/6/2019		2	210396.667000	2540009.783000	2624.16	2623.96	120	2,503.96	140	2,483.96
Monitoring Well	MW-30	6/24/2019		2	210403.479000	2539999.684000	2624.36	2624.02	80	2,544.02	100	2,524.02
Monitoring Well	MW-31	6/28/2019		2	209450.281000	2539515.378000	2589.28	2588.90	380	2,208.90	385	2,203.90
Monitoring Well	MW-32	7/3/2019		2	209456.499000	2539508.760000	2589.54	2589.10	284	2,305.10	294	2,295.10
Monitoring Well	MW-33	7/10/2019		2	209462.505000	2539501.975000	2589.99	2589.63	254	2,335.63	274	2,315.63
Monitoring Well	MW-34	7/15/2019		2	209468.224000	2539494.824000	2590.01	2589.63	165	2,424.63	185	2,404.63
Extraction Well	MW-35	7/24/2019		6	209843.746000	2539973.328000	2585.73	2585.40	145	2,440.40	165	2,420.40
Monitoring Well	MW-36	8/8/2019		2	209847.546000	2539983.496000	2585.61	2585.21	60	2,525.21	75	2,510.21
Extraction Well	EW-6U	8/22/2017	9/27/2017	2	209449.737394	2539155.803161	2590.76	2591.76	47[b]	2543.76[b]	65[b]	2525.76[b]
Extraction Well	EW-9U	8/24/2017	10/6/2017	2	210744.909400	2539634.500000	2597.90	2598.70	42[b]	2555.9[b]	72[b]	2525.9[b]
Staff Gauge	SG-01	12/1/2017		--	209178.918054	2539673.008163	--	2554.36	--	--	--	--
Staff Gauge	SG-02	12/1/2017		--	209060.964877	2539498.230954	--	2550.52	--	--	--	--
Domestic Well	Asher Well	--		--	206559 [a]	2536290 [a]	--	--	--	--	--	--
Domestic Well	Atwood Well (Home)	9/15/2011		--	206772 [a]	2540055 [a]	--	--	--	--	--	--
Domestic Well	Atwood Well (Shop)	--		--	206835 [a]	2540484 [a]	--	--	--	--	--	--
Domestic Well	Davey Well (W46)	11/16/2011		--	210166 [a]	2540027 [a]	2599.00 [a]	--	--	--	--	--
Domestic Well	Freeman Store Well	--		--	211345 [a]	2538045 [a]	2655.00 [a]	--	--	--	--	--
Domestic Well	Lang Well	--		--	211479 [a]	2538430 [a]	--	--	149	--	280	--
Domestic Well	Lashaw Agricultural	--		--	209248 [a]	2538782 [a]	--	--	--	--	--	--

Table 3-2. Well Construction and Survey Information

Well Type	Well Name	Installation Date	Abandon Date	Well Diameter (inches)	Northing (feet)	Easting (feet)	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Top of Screen (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen (ft bgs)	Bottom of Screen Elevation (ft amsl)
Domestic Well	Lashaw Well (W11)	8/30/1987		--	208031 [a]	2538467 [a]	--	--	59	--	200	--
Domestic Well	Marlow Well	5/5/1988		--	210011.74	2539783.61	2593.42	2596.52	65	2531.52	99	2497.52
Domestic Well	Out-of-Use Marlow Well (No. 2)	7/15/1980		--	210226.57	2539848.66	2614.34	2608.32	60	2548.32	84	2524.32
Domestic Well	Randall Well	--		--	210124.06	2539622.86	2612.53	--	71	2541.53	75	2537.53
Domestic Well	Silva Well	--		--	208512 [a]	2539431 [a]	--	--	--	--	--	--
Domestic Well	Thorson Well	9/6/1998		--	206741 [a]	2540917 [a]	--	--	110	--	210	--
Domestic Well	Brandt well (W10)	8/23/1987		--	206424 [a]	2537380 [a]	2564.00 [a]	--	44 [b, c]	2520 [b, c]	220 [b, c]	2344 [b, c]
Domestic Well	Stark Well (W15)	10/18/1999		--	206979 [a]	2539295 [a]	2557.00 [a]	--	28 [b, c]	2529 [b, c]	180 [b, c]	2377 [b, c]
Domestic Well	Marlow well (W20) (not in use)	3/11/1984		--	209820 [a]	2539985 [a]	2579.00 [a]	--	81 [b]	2515 [b]	100 [b]	2479 [b]
Domestic Well	Out of use Freeman School Well (W26) (former Marlow well)	5/5/1988		--	210700 [a]	2539289 [a]	2637.00 [a]	--	44 [b]	2593 [b]	140 [b]	2497 [b]
Domestic Well	Reed Well (W30)	9/28/1981		--	209242 [a]	2540536 [a]	2578.00 [a]	--	59 [b]	2519 [b]	180 [b]	2398 [b]
Domestic Well	Primary Freeman School District Well (WS5)	6/30/1980		--	209455 [a]	2539228 [a]	2586.00 [a]	2590.79	52 [b]	2534 [b]	215 [b]	2371 [b]

[a] Approximate location from Geographic Information System; ground surface elevation estimated from U.S. Geological Survey National Elevation Dataset, since well survey data are not available.

[b] Open hole.

[c] Screened/open interval unclear from well log.

Notes:
-- = not available
amsl = above mean sea level
bgs = below ground surface
ft = foot (feet)
NM = not measured

Table 3-3. Groundwater Elevation (head) Differences for Collocated Well Pairs

Well	Screen Depth (feet bgs)	Generalized Geologic Unit	Groundwater Elevation (December 2017)[A] (September 2019)[B]	Head Difference (feet)	Comments
1S	15-25	Upper unconsolidated sediment, silt-clay	2576.74 [A]	0.47	The screen for well 1D is 63 feet deeper than well 1S and completed in a different geologic unit (basalt absent at this location).
1D	88-98	Lower weathered granite	2576.27 [A]		Similar elevations suggest that the unconsolidated sediment is hydraulically connected to the lower weathered granite, with a slight downward vertical gradient.
9S	36-41	Upper unconsolidated sediment, clay	2566.31 [A]	0.16	The screen for well 9D is 44 feet deeper than well 9S and completed in a different geologic unit.
9D	85-95	Intermediate basalt	2566.15 [A]		Similar elevations suggest units are connected at this location, and the basalt unit is a relatively thin wedge and inferred to be sufficiently fractured to be connected to upper sedimentary unit in this area.
8S	47-52	Upper unconsolidated sediment, silt-clay immediately atop basalt unit	2566.41 [A]	-6.16	Negative value indicates upward vertical gradient. The interpretation from this head relationship is that (1) lower unit is hydraulically connected to recharge sources within the weathered granite unit further to the south, thus creating higher head than overlying units, and (2) the lower unit may be hydraulically separate from the overlying units, or if connected, flow would occur from the lower unit upward or laterally into the overlying sedimentary unit or adjacent basalt.
3D	168-178	Lower unit (weathered decomposed granite)	2572.57 [A]		
36	60-75	Upper fractured basalt	2564.82 [B]	98.04	Substantial head differences suggest upper fractured basalt unit not hydraulically connected to lower fractured basalt zone at this area due to presence of dense unfractured basalt interior. The basalt at this location thickens to nearly 200 feet.
4D	182.5-187.5	Lower fractured basalt	2466.78 [B]		
6S	35-45	Upper unconsolidated sediment, silt atop basalt	2553.71 [A]	90.89	Substantial head differences suggest upper unit not hydraulically connected to lower fractured basalt zone at this area due to presence of dense unfractured basalt interior. The basalt at this location continues to be nearly 200 feet thick.
6D	212-232	Lower fractured basalt	2462.82 [A]		

Notes:

[A] Values from December 2017

[B] Values from September 2019

Groundwater elevation (head) difference is calculated as upper (higher) well elevation minus lower/deeper well elevation. A positive value indicates a downward vertical gradient.

A negative value indicates upward vertical gradient. However, substantial head differences exceeding tens of feet may suggest hydraulic separation.

bgs = below ground surface

Table 4-1. Previous Actions and Investigations

Year, Contractor (Reference)	Action	Scope	Key Findings
2008, Washington State Department of Health (O'Garro, 2008)	Technical assistance consultation	Conducted a consultation in response to a notification by the Freeman School District to WDOH that carbon tetrachloride had been detected in their well at a concentration that exceeded the maximum contaminant level	WDOH determined that the concentrations of carbon tetrachloride present in this water would not result in any non-cancer adverse health effects, and that the estimated cancer risk ranged from insignificant to very low. Based on these findings, WDOH concluded that no apparent public health hazard existed for students, teachers, and other employees exposed to carbon tetrachloride present in Freeman School District drinking water.
2012., Washington State Department of Ecology (Leinart, 2012)	Historical carbon tetrachloride source evaluation	Conducted an evaluation of potential sources of carbon tetrachloride in the city of Freeman	In August 2012, Ecology completed a report summarizing the history of known carbon tetrachloride groundwater contamination in the city of Freeman. This report also identified businesses and features considered potential sources for this contamination. The report categorized the likelihood of each feature being a source from high to low. These features, and their presumed likelihood of being a source of contamination, were as follows: • High Likelihood – CHS, Freeman (formerly known as Rockford Grain Growers) • Medium Likelihood – UPRR main line and rail siding approximately 300 feet east of the Out-of-Use Freeman School District Well – The abandoned Old Freeman Clay Pit approximately 0.15 mile northeast of the Out-of-Use Freeman School District Well, which may have been used for illegal dumping or disposal – Freeman School District facilities that may have historically used carbon tetrachloride in welding/metal fabrication and automotive workshops, the school bus service/maintenance shop, and/or laboratory classrooms • Low Likelihood – Freeman School District underground storage tanks – Freeman School District surface water outfall – Freeman Store automotive gasoline service station underground storage tank – Former brick kiln – State Highway 27 – Former shops and outbuildings associated with the residential property acquired by the Freeman School District Features assigned a high or medium likelihood were those known to be associated with the use of carbon tetrachloride, those with a reasonable opportunity for improper waste disposal or storage practices, or those of sufficient scale to have possibly caused either a large release of carbon tetrachloride or ongoing small releases. Features assigned a low likelihood were those small in scale that would not ordinarily use, store, or dispose of carbon tetrachloride in a manner, or in quantities, that could result in regional aquifer contamination. At the time of this report, no specific data or information had been uncovered by Ecology documenting the use, storage, or disposal of carbon tetrachloride in the Freeman area.
2014, E&E (E&E, 2014)	Site inspection	Conducted soil and groundwater sampling to evaluate the threat to public or the environment posed by the site, determine the potential release of hazardous constitutes into the environment, and evaluate the placement of the site on the National Priorities List	The historic use of carbon tetrachloride at the GHFF was not confirmed during the site inspection document review or during interviews with facility operators. The presence of carbon tetrachloride, and its degradation product chloroform, was confirmed in subsurface soil samples collected at the GHFF. Samples from 6 of 14 soil borings were confirmed to contain soil concentrations of carbon tetrachloride and chloroform at depths ranging from 17.5 to 32 feet bgs. The concentrations of carbon tetrachloride detected in the soil samples ranged from 3.21 to 15 µg/kg. The highest concentration of carbon tetrachloride was detected from soil boring SB13 at 29.5 to 30 feet bgs. Chloroform was present in samples from two soil borings, SB13 and SB14. No soil samples were collected on the Freeman School District property. Carbon tetrachloride and chloroform were not detected in surface soil or near surface soil at the GHFF. Based on analytical data collected during this investigation, the vertical and horizontal extent of carbon tetrachloride and chloroform in soil has not been defined at this facility. Groundwater was not encountered during the investigation. Groundwater samples collected during the site inspection indicated the presence of carbon tetrachloride at concentrations in the Out-of-Use Freeman School District Well [W26]) at 23 µg/L and in Primary Freeman School District Well [WS5] (pre-treatment) at 8.8 µg/L. Chloroform was detected at concentrations in the Out-of-Use Freeman School District Well [W26]) at 1.9 µg/L and in Primary Freeman School District Well [WS5] (pre-treatment) at 0.52 µg/L.

Table 4-1. Previous Actions and Investigations

Year, Contractor (Reference)	Action	Scope	Key Findings
2016-2018, CH2M	Remedial investigation	Conducted a remedial investigation at the site and surrounding area to evaluate impacted soil, groundwater, and air (soil vapor, indoor air, and sub-slab)	**Soil Borings** Carbon tetrachloride was detected in soil samples from seven soil borings; three soil borings (SB -04, SB-05, and SB-08) are on the GHFF property, three soil borings (SB-20, SB-22, and SB-34) are in the UPRR ROW southeast of the GHFF, and one soil boring (SB-18) is in the State Highway 27 ROW across from the GHFF property. The maximum carbon tetrachloride detections from each of the 7 soil borings ranged from 17 µg/kg to 160 µg/kg at depths of 35 to 45 feet bgs. The shallowest detections of carbon tetrachloride occurred at 20 feet bgs within borings SB-20 and SB-22. Carbon tetrachloride detections were significantly below the MTCA Method B cancer screening level of 14,000 µg/kg. Chloroform was detected in soil samples from two soil borings (SB -20 and SB-22) in the UPRR ROW southeast of the GHFF. Chloroform detections ranged from 2.2 µg/kg to 10 µg/kg, significantly below the MTCA Method B cancer screening level of 32,000 µg/kg. Carbon tetrachloride and chloroform were not detected in soil on the Freeman School District, nor in most soil borings advanced in the UPRR ROW. **Sub-slab Soil Sampling** Carbon tetrachloride was detected in soil samples from three sub-slab locations (SV-106, SV-107, and SV-112). Two detections were just above the method detection limit. The highest detection was immediately beneath the slab between the two medium-sized silos. Carbon tetrachloride detections were significantly below the MTCA Method B cancer screening level of 14,000 µg/kg. Chloroform was detected in soil samples from two sub-slab locations (SV-106 and SV-107). Chloroform detections ranged from 0.97 µg/kg to 5.7 µg/kg, significantly below the MTCA Method B cancer screening level of 32,000 µg/kg. The highest detection was immediately beneath the slab between the two medium-sized silos. **Depth Specific Vadose Zone Soil Sampling** Carbon tetrachloride was detected in 13 of the 16 soil samples and detections ranged from 2.8 µg/kg to 20.6 µg/kg. The higher concentrations were located deeper in the vadose zone from 15 to 36 feet bgs. Carbon tetrachloride detections were significantly below the MTCA Method B cancer screening level of 14,000 µg/kg. Chloroform was detected in 15 of 16 soil samples and detections ranged from 1.8 µg/kg to 10.6 µg/kg. Chloroform concentrations were less variable as a function of depth. Chloroform detections ranged from 0.97 µg/kg to 5.7 µg/kg, significantly below the MTCA Method B cancer screening level of 32,000 µg/kg. **Air Sampling** Background carbon tetrachloride concentrations were found to range from 0.50 µg/m^3 to 0.71 µg/m^3. These results were used to better understand and interpret the indoor and outdoor air analytical data that were collected, as well as to provide screening levels for indoor and outdoor air in accordance with Washington Administrative Code 173 340 709. Carbon tetrachloride concentrations in the Freeman School District School buildings ranged from 0.42 µg/m^3 to 0.77 µg/m^3. Background level exceedances (0.68 µg/m^3) were observed in the elementary school office, the middle school north modular unit, and the middle school office. Chloroform exceeded the background level (0.08 µg/m^3) in all school buildings, except the middle school south modular unit. Carbon tetrachloride concentrations in outdoor air slightly exceeded the background level at the Marlow residence, middle school, and Randall residence. Carbon tetrachloride and chloroform concentrations in the indoor crawl spaces exceeded the background levels in both residences sampled. **Soil Vapor** Carbon tetrachloride and chloroform concentrations in the Freeman School District buildings sub-slab soil vapor did not exceed MTCA Sub-Slab Soil Vapor Method B Cancer screening levels of 14 µg/m^3 and 3.6 µg/m^3, respectively. Carbon tetrachloride and chloroform concentrations in the GHFF sub-slab soil vapor exceeded MTCA Sub-Slab Soil Vapor Method B Cancer screening levels of 14 µg/m^3 and 3.6 µg/m^3, respectively, at four locations.

Table 4-1. Previous Actions and Investigations

Year, Contractor (Reference)	Action	Scope	Key Findings
			Carbon tetrachloride and chloroform concentrations in soil vapor exceeded MTCA Soil Vapor Method B Cancer screening levels of 41.7 µg/m^3 and 10.9 µg/m^3, respectively, at 8 of the 9 sampling locations. The lowest screening level exceedances occurred at the 5-foot interval. The highest screening level exceedances occurred at the deepest interval sampled.
2016-present, CH2M	Groundwater monitoring	Conducted quarterly groundwater monitoring at up to approximately 31 domestic and monitoring wells	Carbon tetrachloride and chloroform have been detected in the shallow unconfined and intermediate basalt hydrostratigraphic units at the GHFF and immediately south of the GHFF on residential and Freeman School District property. Maximum concentrations at the GHFF were detected at 1,000 µg/L (well MW-9S), and in the intermediate basalt on the Freeman School District at 423 µg/L (well MW-19D). Carbon tetrachloride and chloroform were detected in the lower basalt hydrostratigraphic unit at the south end of the Freeman School District in wells MW-4D and MW-6D, and further south in the Lashaw agricultural well and Lashaw domestic well. Trend analysis indicates an increasing trend for two domestic wells (Freeman School District Well and Marlow Well), and no trend (stable) for eight wells (MW-7S, MW-8S, MW-10S, MW-4D, MW-6D, MW-9S, Out-of-Use Freeman School District Well (W26), and the Randall Well). Insufficient data were available for the remaining wells.
2015-2018, CH2M	Interim remedial action	Operated and maintained two domestic well treatment systems	GAC treatment systems were installed in September 2016 on two residential groundwater wells (Marlow and Randall) to remove constituents of concern (carbon tetrachloride and chloroform). Both treatment systems were expanded to include two 6-ft^3 GAC vessels (a lead and lag vessel) in June 2017. The two 6-ft^3 vessels were added in parallel to the 3-ft^3 vessels and are used exclusively for irrigation at both residences. A sample port was installed between the two vessels (midpoint) and after the two vessels (effluent). A third treatment system was installed in May 2019 on the second Marlow well. The system consists of two 3-ft^3 GAC vessels (lead and lag), with sample ports installed between the two vessels (midpoint) and after the two vessels (effluent). The two treatment systems installed in September 2016 have been routinely sampled (weekly basis until February 2019 and every other week thereafter) to evaluate if the water treatment system is functioning as designed (that is, removal of carbon tetrachloride and chloroform) and to determine when GAC vessels require replacing. The third treatment system is used infrequently and only sampled when the system has been used during the biweekly sampling interval. Samples are collected from the influent, midpoint, and effluent sample ports of each system. Samples are also collected from the midpoint and effluent sample ports from the larger 6-ft^3 irrigation vessels when irrigation is occurring (late spring to early fall).

Sources:

CH2M HILL, Inc. (CH2M). 2016. *Remedial Investigation/Feasibility Study Work Plan, Grain Handling Facility at Freeman,* Freeman, Washington. April.
Ecology and Environment, Inc. (E&E). 2014. Site Inspection, Freeman Groundwater Contamination, Freeman, Washington. Contract Number EP-S7-13-07, Technical Direction Document Number 13-07-0005. July.
Leinart. 2012. Freeman School Wells, Contaminated Ground Water Status Report with Recommendations. August 16.
O'Garro, Lendford. 2008. "Technical Assistance Consultations, Freeman School District TA." Site Assessment Section. Washington State Department of Health, Environmental Health Division, Office of Environmental Hea

Notes:
µg/kg = microgram(s) per kilogram
µg/L = microgram(s) per liter
µg/m^3 = microgram(s) per cubic meter
bgs = below ground surface
CH2M = CH2M HILL, Inc.
CHS = CHS, Inc.
Ecology = Washington State Department of Ecology
ft^3 = cubic foot (feet)
GAC = granular activated carbon
GHFF = Grain Handling Facility at Freeman
MTCA = Model Toxics Control Act
ROW = right-of-way
UPRR = Union Pacific Railroad
WDOH = Washington State Department of Health

Table 4-2. Screening Levels

Media	Draft Cleanup Level	Unit	Carbon Tetrachloride	Chloroform	Carbon Disulfide
Soil	Model Toxics Control Act, Soils, Method B	µg/kg	14,000[a]	32,000[a]	8,000,000[b]
	Model Toxics Control Act, Protection of Groundwater, Vadose at 13 degrees Celsius	µg/kg	42	74	5,000
	Model Toxics Control Act, Protection of Groundwater-Saturated	µg/kg	2.2	4.8	270
Groundwater	Model Toxics Control Act, Groundwater, Method B	µg/L	0.63[a]	1.4[a]	800[b]
Air	Model Toxics Control Act, Air, Method B	µg/m^3	0.42[a]	0.11[a]	320[b]
	Background air levels based on the methods in WAC 173-340-709	µg/m^3	0.68	0.08	--
Deep Soil Vapor	Model Toxics Control Act, Deep Soil Gas Screening Level Method B	µg/m^3	42[a]	11[a]	32,000[b]
Sub-slab Soil Vapor	Model Toxics Control Act, Sub-Slab Soil Gas Screening Level Method B	µg/m^3	14[a]	3.6[a]	11,000[b]
Surface Water	Model Toxics Control Act, Surface water, Method B	µg/L	4.9[a]	55[a]	--

Notes:
[a] = cancer
[b] = non cancer
-- = no value
µg/kg = microgram(s) per kilogram
µg/L = microgram(s) per liter
µg/m^3 = microgram(s) per cubic meter

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
Location	**Sample Date**	**Group**	**Type**	**Depth (ft)**	Analytical Data (µg/kg)		
BK01	4/22/2014	Soil Boring	N	3 - 3.5	4.7 U	4.7 U	4.7 U
	4/22/2014	Soil Boring	N	4 - 4.5	4.9 U	4.9 U	4.9 U
	4/22/2014	Soil Boring	N	12 - 12.5	4.7 U	4.7 U	4.7 U
CHF Grain Facility Sump Area	2/6/2018	Sub-Slab Soil	N	0	0.68 U	0.97 U	--
	2/6/2018	Sub-Slab Soil	N	3	0.5 U	0.71 U	--
GSNE	11/2/2017	Grab	N	4	22.7 U	23.3 U	--
GSSW	11/2/2017	Grab	N	5	28.2 U	28.9 U	--
HA01	4/23/2014	Soil Boring	N	13.5 - 14	6.2 U	6.2 U	6.2 U
HA02	4/23/2014	Soil Boring	N	2.5 - 3	5.5 U	5.5 U	5.5 U
HA03	4/23/2014	Soil Boring	N	9 - 9.5	4.7 U	4.7 U	4.7 U
HB-1-1	2/26/2019	Horizontal Soil Boring	N	10 - 10.5	27 U	29 U	--
HB-1-2	2/26/2019	Horizontal Soil Boring	N	10 - 10.5	**63 J**	**340**	--
HB-1-3	2/26/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	30 U	--
HB-2-1	2/27/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	30 U	--
HB-2-2	2/27/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	29 U	--
HB-2-3	2/27/2019	Horizontal Soil Boring	N	10 - 10.5	30 U	31 U	--
HB-3-1	2/28/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	30 U	--
HB-3-2	2/28/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	29 U	--
	2/28/2019	Horizontal Soil Boring	FD	10 - 10.5	30 U	31 U	--
HB-3-3	2/28/2019	Horizontal Soil Boring	N	10 - 10.5	30 U	31 U	--
MW-1D	7/6/2016	Soil Boring	N	5	2.3 U	2.3 U	--
	7/6/2016	Soil Boring	N	10	2.5 U	2.5 U	--
	7/6/2016	Soil Boring	N	15	3.3 U	3.3 U	--
	7/6/2016	Soil Boring	N	20	2.9 U	2.9 U	--
	7/6/2016	Soil Boring	N	25	3.1 U	3.1 U	--
	7/6/2016	Soil Boring	N	30	3.1 U	3.1 U	--
	7/6/2016	Soil Boring	N	35	1.7 U	1.7 U	--
	7/6/2016	Soil Boring	N	40	2.1 U	2.1 U	--
	7/6/2016	Soil Boring	N	45	2.1 U	2.1 U	--
MW-2D	7/1/2016	Soil Boring	N	5	24 U	24 U	--
	7/1/2016	Soil Boring	N	10	28 U	28 U	--
	7/1/2016	Soil Boring	N	15	24 U	24 U	--
	7/1/2016	Soil Boring	N	20	23 U	23 U	--
	7/1/2016	Soil Boring	N	25	23 U	23 U	--
	7/1/2016	Soil Boring	N	30	27 U	27 U	--
	7/1/2016	Soil Boring	N	35	26 U	26 U	--
	7/1/2016	Soil Boring	N	40	25 U	25 U	--
	7/1/2016	Soil Boring	N	45	27 U	27 U	--
	7/1/2016	Soil Boring	FD	45	26 U	26 U	--
	7/1/2016	Soil Boring	N	50	26 U	26 U	--
	7/1/2016	Soil Boring	N	55	24 U	24 U	--
	7/1/2016	Soil Boring	N	60	23 U	23 U	--
	7/1/2016	Soil Boring	N	65	26 U	26 U	--
	7/1/2016	Soil Boring	N	70	27 U	27 U	--
	7/1/2016	Soil Boring	N	75	29 U	29 U	--
	7/1/2016	Soil Boring	N	80	25 U	25 U	--
	7/1/2016	Soil Boring	N	85	24 U	24 U	--
MW-3D	5/10/2016	Soil Boring	N	5	24 U	24 U	--
	5/10/2016	Soil Boring	N	10	22 U	22 U	--
	5/10/2016	Soil Boring	N	15	22 U	22 U	--
	5/10/2016	Soil Boring	N	20	28 U	28 U	--
	5/10/2016	Soil Boring	N	25	34 U	34 U	--
	5/10/2016	Soil Boring	N	30	33 U	33 U	--
	5/10/2016	Soil Boring	N	35	26 U	26 U	--
	5/10/2016	Soil Boring	N	40	26 U	26 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
					Analytical Data (µg/kg)		
	5/10/2016	Soil Boring	N	45	26 U	26 U	--
	5/10/2016	Soil Boring	N	50	29 U	29 U	--
	5/10/2016	Soil Boring	N	55	24 U	24 U	--
MW-5D	5/20/2016	Soil Boring	N	5	23 U	23 U	--
	5/20/2016	Soil Boring	N	10	23 U	23 U	--
	5/20/2016	Soil Boring	N	15	24 U	24 U	--
	5/20/2016	Soil Boring	N	20	22 U	22 U	--
	5/20/2016	Soil Boring	N	25	25 U	25 U	--
	5/20/2016	Soil Boring	N	27	21 U	21 U	--
	5/20/2016	Soil Boring	N	30	23 U	23 U	--
	5/20/2016	Soil Boring	FD	30	26 U	26 U	--
	5/20/2016	Soil Boring	N	35	25 U	25 U	--
	5/20/2016	Soil Boring	N	40	25 U	25 U	--
	5/20/2016	Soil Boring	N	45	27 U	27 U	--
	5/20/2016	Soil Boring	N	50	23 U	23 U	--
	5/20/2016	Soil Boring	N	55	23 U	23 U	--
MW-6D	6/27/2016	Soil Boring	N	5	24 U	24 U	--
	6/27/2016	Soil Boring	N	10	22 U	22 U	--
	6/27/2016	Soil Boring	N	15	23 U	23 U	--
	6/27/2016	Soil Boring	N	20	22 U	22 U	--
	6/27/2016	Soil Boring	N	25	23 U	23 U	--
	6/27/2016	Soil Boring	N	30	28 U	28 U	--
	6/27/2016	Soil Boring	N	35	25 U	25 U	--
	6/27/2016	Soil Boring	N	40	27 U	27 U	--
	6/27/2016	Soil Boring	N	45	26 U	26 U	--
	6/27/2016	Soil Boring	FD	45	27 U	27 U	--
	6/27/2016	Soil Boring	N	50	26 U	26 U	--
MW-8S (SB-05)	5/17/2016	Soil Boring	N	5	23 U	23 U	--
	5/17/2016	Soil Boring	N	10	25 U	25 U	--
	5/17/2016	Soil Boring	N	15	24 U	24 U	--
	5/17/2016	Soil Boring	N	20	29 U	29 U	--
	5/17/2016	Soil Boring	N	25	25 U	25 U	--
	5/17/2016	Soil Boring	N	30	26 U	26 U	--
	5/17/2016	Soil Boring	FD	30	27 U	27 U	--
	5/17/2016	Soil Boring	N	35	26 U	26 U	--
	5/17/2016	Soil Boring	N	40	**27**	24 U	--
	5/17/2016	Soil Boring	N	45	**35**	26 U	--
	5/17/2016	Soil Boring	N	50	22 U	22 U	--
MW-9S (SB-04)	5/16/2016	Soil Boring	N	5	23 U	23 U	--
	5/16/2016	Soil Boring	N	10	23 U	23 U	--
	5/16/2016	Soil Boring	N	15	25 U	25 U	--
	5/16/2016	Soil Boring	N	20	37 U	37 U	--
	5/16/2016	Soil Boring	N	25	**28**	27 U	--
	5/16/2016	Soil Boring	N	30	**100**	27 U	--
	5/16/2016	Soil Boring	N	35	**160**	26 U	--
	5/16/2016	Soil Boring	N	40	**100**	26 U	--
	5/16/2016	Soil Boring	FD	40	**98**	26 U	--
P0101-01 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.8 U	2.8 U	--
P0101-02 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.8 U	2.8 U	--
P0101-03 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.9 U	2.9 U	--
P0101-04 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.4 U	2.4 U	--
P0101-06 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.8 U	2.8 U	--
P0302-01 (Marlow)	9/21/2016	Residential Surface Soil	N	0	2.3 U	2.3 U	--
P0302-02 (Marlow)	9/21/2016	Residential Surface Soil	N	0	2.3 U	2.3 U	--
P0303-01 (Marlow Garden	9/21/2016	Residential Surface Soil	N	0	2.2 U	2.2 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
		MTCA Method B Cancer			14,000	32,000	8,000,000
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
		MTCA Protection of Groundwater, Saturated			2.2	4.8	270
					Analytical Data (µg/kg)		
P0303-02 (Marlow Garden	9/21/2016	Residential Surface Soil	N	0	2.1 U	2.1 U	--
P0303-03 (Marlow Garden	9/21/2016	Residential Surface Soil	N	0	2.1 U	2.1 U	--
P0304-01 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.2 U	2.2 U	--
P0304-02 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.6 U	2.6 U	--
P0304-03 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.5 U	2.5 U	--
P0304-04 (Randall)	9/21/2016	Residential Surface Soil	N	0	2 U	2 U	--
P0304-05 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.2 U	2.2 U	--
PH-01	6/27/2018	N/A	N	1	8.3 U	34 U	--
PH-02	6/27/2018	N/A	N	1	5.9 U	24 U	--
PH-03	6/27/2018	N/A	N	1	**73**	26 U	--
PH-04	6/27/2018	N/A	N	1	5.1 U	21 U	--
PH-05	6/27/2018	N/A	N	1	5.4 UJ	22 UJ	--
PH-06	6/27/2018	N/A	N	1	5.8 U	24 U	--
PH-07	6/27/2018	N/A	N	1	5.8 U	24 U	--
PH-08	6/27/2018	N/A	N	1	6.1 U	25 U	--
SB-01	5/11/2016	Soil Boring	N	5	24 U	24 U	--
	5/11/2016	Soil Boring	FD	5	23 U	23 U	--
	5/11/2016	Soil Boring	N	10	28 U	28 U	--
	5/11/2016	Soil Boring	N	15	28 U	28 U	--
	5/11/2016	Soil Boring	N	20	27 U	27 U	--
	5/11/2016	Soil Boring	N	25	24 U	24 U	--
	5/11/2016	Soil Boring	N	30	28 U	28 U	--
	5/11/2016	Soil Boring	N	35	25 U	25 U	--
	5/11/2016	Soil Boring	N	40	24 U	24 U	--
	5/11/2016	Soil Boring	N	45	26 U	26 U	--
	5/11/2016	Soil Boring	N	47	25 U	25 U	--
	5/11/2016	Soil Boring	FD	47	26 U	26 U	--
SB01	4/21/2014	Soil Boring	N	1.5 - 2	4.3 U	4.3 U	4.3 U
	4/21/2014	Soil Boring	N	5 - 5.5	5.1 U	5.1 U	5.1 U
SB-02	5/12/2016	Soil Boring	N	5	23 U	23 U	--
	5/12/2016	Soil Boring	N	10	24 U	24 U	--
	5/12/2016	Soil Boring	N	15	26 U	26 U	--
	5/12/2016	Soil Boring	N	20	27 U	27 U	--
	5/12/2016	Soil Boring	N	25	28 U	28 U	--
	5/12/2016	Soil Boring	N	30	26 U	26 U	--
	5/12/2016	Soil Boring	N	35	27 U	27 U	--
	5/12/2016	Soil Boring	N	40	24 U	24 U	--
	5/12/2016	Soil Boring	N	45	25 U	25 U	--
	5/12/2016	Soil Boring	FD	45	25 U	25 U	--
	5/12/2016	Soil Boring	N	50	26 U	26 U	--
	5/12/2016	Soil Boring	N	55	27 U	27 U	--
	5/12/2016	Soil Boring	N	60	27 U	27 U	--
	5/12/2016	Soil Boring	N	65	29 U	29 U	--
	5/12/2016	Soil Boring	N	70	28 U	28 U	--
	5/12/2016	Soil Boring	N	75	26 U	26 U	--
SB02	4/21/2014	Soil Boring	N	1 - 1.5	2.05 U	--	--
	4/21/2014	Soil Boring	N	4.5 - 5	2.27 U	--	--
SB-03	5/13/2016	Soil Boring	N	5	25 U	25 U	--
	5/13/2016	Soil Boring	N	10	26 U	26 U	--
	5/13/2016	Soil Boring	N	15	26 U	26 U	--
	5/13/2016	Soil Boring	N	20	28 U	28 U	--
	5/13/2016	Soil Boring	N	25	27 U	27 U	--
	5/13/2016	Soil Boring	N	30	27 U	27 U	--
	5/13/2016	Soil Boring	N	35	26 U	26 U	--
	5/13/2016	Soil Boring	N	40	23 U	23 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
SB03	4/21/2014	Soil Boring	N	1 - 1.5	2.4 U	--	--
	4/21/2014	Soil Boring	N	4.5 - 5	2.38 U	--	--
SB04	4/21/2014	Soil Boring	N	4 - 4.5	6 U	6 U	6 U
	4/21/2014	Soil Boring	N	5 - 5.5	0.21 J	4.8 U	4.8 U
SB05	4/21/2014	Soil Boring	N	2.5 - 3	2.32 U	--	--
	4/21/2014	Soil Boring	N	3.5 - 4	2.29 U	--	--
SB-06	5/18/2016	Soil Boring	N	5	25 U	25 U	--
	5/18/2016	Soil Boring	N	10	24 U	24 U	--
	5/18/2016	Soil Boring	N	15	24 U	24 U	--
	5/18/2016	Soil Boring	N	21	28 U	28 U	--
	5/18/2016	Soil Boring	N	25	31 U	31 U	--
	5/18/2016	Soil Boring	N	30	25 U	25 U	--
	5/18/2016	Soil Boring	N	35	26 U	26 U	--
	5/18/2016	Soil Boring	FD	35	25 U	25 U	--
	5/18/2016	Soil Boring	N	40	26 U	26 U	--
	5/18/2016	Soil Boring	N	45	26 U	26 U	--
	5/18/2016	Soil Boring	N	50	22 U	22 U	--
	5/18/2016	Soil Boring	N	56	25 U	25 U	--
	5/19/2016	Soil Boring	N	61	24 U	24 U	--
	5/19/2016	Soil Boring	N	65	23 U	23 U	--
	5/19/2016	Soil Boring	N	70	27 U	27 U	--
	5/19/2016	Soil Boring	N	75	26 U	26 U	--
SB06	4/21/2014	Soil Boring	N	4.5 - 5	5.1 U	5.1 U	5.1 U
	4/21/2014	Soil Boring	N	6.5 - 7	4.5 U	4.5 U	4.5 U
	4/21/2014	Soil Boring	N	12 - 12.5	6 U	6 U	6 U
SB-07	5/20/2016	Soil Boring	N	5	22 U	22 U	--
	5/20/2016	Soil Boring	N	10	27 U	27 U	--
	5/20/2016	Soil Boring	N	15	28 U	28 U	--
	5/20/2016	Soil Boring	N	20	27 U	27 U	--
	5/20/2016	Soil Boring	N	25	27 U	27 U	--
	5/20/2016	Soil Boring	N	30	25 U	25 U	--
	5/20/2016	Soil Boring	FD	30	26 U	26 U	--
	5/20/2016	Soil Boring	N	35	26 U	26 U	--
	5/20/2016	Soil Boring	N	40	25 U	25 U	--
	5/20/2016	Soil Boring	N	45	32 U	32 U	--
	5/20/2016	Soil Boring	N	50	26 U	26 U	--
	5/20/2016	Soil Boring	N	55	27 U	27 U	--
	5/20/2016	Soil Boring	N	60	33 U	33 U	--
	5/20/2016	Soil Boring	N	65	26 U	26 U	--
	5/20/2016	Soil Boring	N	70	24 U	24 U	--
	5/20/2016	Soil Boring	N	75	24 U	24 U	--
SB07	4/21/2014	Soil Boring	N	2.5 - 3	2.46 U	--	--
	4/21/2014	Soil Boring	N	3.5 - 4	2.4 U	--	--
SB-08	5/23/2016	Soil Boring	N	5	22 U	22 U	--
	5/23/2016	Soil Boring	N	10	25 U	25 U	--
	5/23/2016	Soil Boring	N	15	26 U	26 U	--
	5/23/2016	Soil Boring	N	20	27 U	27 U	--
	5/23/2016	Soil Boring	N	25	25 U	25 U	--
	5/23/2016	Soil Boring	N	30	26 U	26 U	--
	5/23/2016	Soil Boring	N	35	27 U	27 U	--
	5/23/2016	Soil Boring	N	40	25 U	25 U	--
	5/23/2016	Soil Boring	FD	40	36	26 U	--
	5/23/2016	Soil Boring	N	45	28	26 U	--
	5/23/2016	Soil Boring	N	50	24 U	24 U	--
SB08	4/22/2014	Soil Boring	N	4 - 4.5	3.96 U	--	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
					Analytical Data (µg/kg)		
	4/22/2014	Soil Boring	N	5 - 5.5	3.95 U	--	--
SB-09	5/23/2016	Soil Boring	N	5	23 U	23 U	--
	5/23/2016	Soil Boring	N	10	26 U	26 U	--
	5/23/2016	Soil Boring	N	15	26 U	26 U	--
	5/23/2016	Soil Boring	N	20	24 U	24 U	--
	5/23/2016	Soil Boring	N	25	27 U	27 U	--
	5/23/2016	Soil Boring	FD	25	27 U	27 U	--
	5/23/2016	Soil Boring	N	30	26 U	26 U	--
	5/23/2016	Soil Boring	N	35	27 U	27 U	--
	5/23/2016	Soil Boring	N	39	23 U	23 U	--
SB09	4/22/2014	Soil Boring	N	3.5 - 4	2 U	--	--
	4/22/2014	Soil Boring	N	15 - 15.5	**3.2 J**	**6.8 J**	7.1 U
	4/22/2014	Soil Boring	N	19.5 - 20	**3.8 J**	**7.6**	7.2 U
	4/22/2014	Soil Boring	N	25 - 25.5	**3.2 J**	**4.1 J**	6.9 U
SB-10	5/24/2016	Soil Boring	N	5	23 U	23 U	--
	5/24/2016	Soil Boring	N	10	27 U	27 U	--
	5/24/2016	Soil Boring	N	15	25 U	25 U	--
	5/24/2016	Soil Boring	N	20	26 U	26 U	--
	5/24/2016	Soil Boring	N	25	26 U	26 U	--
	5/24/2016	Soil Boring	N	30	28 U	28 U	--
	5/24/2016	Soil Boring	N	35	26 U	26 U	--
	5/24/2016	Soil Boring	FD	35	27 U	27 U	--
	5/24/2016	Soil Boring	N	40	25 U	25 U	--
	5/24/2016	Soil Boring	N	45	23 U	23 U	--
SB10	4/22/2014	Soil Boring	N	15.5 - 16	**0.88 J**	7.3 U	7.3 U
	4/22/2014	Soil Boring	N	18.5 - 19	**6.5 J**	**3.5 J**	7.8 U
	4/22/2014	Soil Boring	N	20.5 - 21	**4.4 J**	**4.5 J**	8.5 U
SB-11	5/25/2016	Soil Boring	N	5	22 U	22 U	--
	5/25/2016	Soil Boring	N	10	27 U	27 U	--
	5/25/2016	Soil Boring	N	15	22 U	22 U	--
	5/25/2016	Soil Boring	N	20	24 U	24 U	--
	5/25/2016	Soil Boring	FD	20	25 U	25 U	--
	5/25/2016	Soil Boring	N	25	26 U	26 U	--
	5/25/2016	Soil Boring	N	30	25 U	25 U	--
	5/25/2016	Soil Boring	N	35	24 U	24 U	--
	5/25/2016	Soil Boring	N	40	25 U	25 U	--
	5/25/2016	Soil Boring	N	45	25 U	25 U	--
	5/25/2016	Soil Boring	N	50	25 U	25 U	--
	5/25/2016	Soil Boring	N	55	25 U	25 U	--
	5/25/2016	Soil Boring	N	60	24 U	24 U	--
	5/25/2016	Soil Boring	N	65	23 U	23 U	--
SB11	4/23/2014	Soil Boring	N	16.5 - 17	3.43 U	--	--
	4/23/2014	Soil Boring	N	17.5 - 18	4.18 U	--	--
	4/23/2014	Soil Boring	N	18.6 - 19.1	**1.4 J**	**1.4 J**	8 U
	4/23/2014	Soil Boring	N	20 - 20.5	**1.9 J**	**0.94 J**	7.7 U
	4/23/2014	Soil Boring	N	21.5 - 22	**1.7 J**	**0.88 J**	8.4 U
	4/23/2014	Soil Boring	N	28 - 28.5	**0.71 J**	**0.59 J**	8.4 U
	4/23/2014	Soil Boring	N	32 - 32.5	7.5 U	7.5 U	7.5 U
SB-12	5/25/2016	Soil Boring	N	5	23 U	23 U	--
	5/25/2016	Soil Boring	N	10	26 U	26 U	--
	5/25/2016	Soil Boring	FD	10	25 U	25 U	--
	5/25/2016	Soil Boring	N	15	25 U	25 U	--
	5/25/2016	Soil Boring	N	20	23 U	23 U	--
	5/25/2016	Soil Boring	N	25	24 U	24 U	--
	5/25/2016	Soil Boring	N	30	25 U	25 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
MTCA Method B Cancer					14,000	32,000	8,000,000
MTCA Protection of Groundwater, Vadose at 13 C					42	74	5,000
MTCA Protection of Groundwater, Saturated					2.2	4.8	270
					Analytical Data (µg/kg)		
	5/25/2016	Soil Boring	N	35	25 U	25 U	--
	5/25/2016	Soil Boring	N	40	24 U	24 U	--
	5/25/2016	Soil Boring	N	45	25 U	25 U	--
	5/25/2016	Soil Boring	N	50	25 U	25 U	--
	5/25/2016	Soil Boring	N	55	24 U	24 U	--
SB12	4/24/2014	Soil Boring	N	20 - 20.5	**2.3 J**	**1.6 J**	8.9 U
	4/24/2014	Soil Boring	N	21.5 - 22	**1.9 J**	**1.4 J**	8.8 U
	4/24/2014	Soil Boring	N	28.5 - 29	**0.19 J**	7 U	7 U
SB-13	5/26/2016	Soil Boring	N	5	26 U	26 U	--
	5/26/2016	Soil Boring	N	10	23 U	23 U	--
	5/26/2016	Soil Boring	N	15	25 U	25 U	--
	5/26/2016	Soil Boring	N	20	25 U	25 U	--
	5/26/2016	Soil Boring	FD	20	25 U	25 U	--
	5/26/2016	Soil Boring	N	25	24 U	24 U	--
	5/26/2016	Soil Boring	N	30	27 U	27 U	--
	5/26/2016	Soil Boring	N	35	27 U	27 U	--
	5/26/2016	Soil Boring	N	40	31 U	31 U	--
	5/26/2016	Soil Boring	N	45	28 U	28 U	--
	5/26/2016	Soil Boring	N	50	27 U	27 U	--
	5/26/2016	Soil Boring	N	55	26 U	26 U	--
	5/26/2016	Soil Boring	N	60	25 U	25 U	--
	5/26/2016	Soil Boring	N	63	24 U	24 U	--
SB13	4/24/2014	Soil Boring	N	14 - 14.5	**1.2 J**	7 U	7 U
	4/24/2014	Soil Boring	N	20 - 20.5	**4.1 J**	**2.2 J**	8.2 U
	4/24/2014	Soil Boring	N	21.2 - 21.7	**9.7**	**4.4 J**	7.9 U
	4/24/2014	Soil Boring	N	23 - 23.5	**7.1 J**	**3.7 J**	7.1 U
	4/24/2014	Soil Boring	N	27.5 - 28	**4.9 J**	**3 J**	7 U
	4/24/2014	Soil Boring	N	30 - 30.5	**15**	**6.6 J**	7.3 U
SB-14	5/26/2016	Soil Boring	N	5	23 U	23 U	--
	5/26/2016	Soil Boring	N	10	24 U	24 U	--
	5/26/2016	Soil Boring	N	15	23 U	23 U	--
	5/26/2016	Soil Boring	FD	15	29 U	29 U	--
	5/26/2016	Soil Boring	N	20	22 U	22 U	--
	5/26/2016	Soil Boring	N	25	24 U	24 U	--
	5/26/2016	Soil Boring	N	30	30 U	30 U	--
	5/26/2016	Soil Boring	N	35	25 U	25 U	--
	5/26/2016	Soil Boring	N	40	27 U	27 U	--
	5/26/2016	Soil Boring	N	45	31 U	31 U	--
	5/26/2016	Soil Boring	N	50	31 U	31 U	--
	5/26/2016	Soil Boring	N	54	24 U	24 U	--
SB14	4/24/2014	Soil Boring	N	18 - 18.5	**6.8 J**	**8.5**	7.8 U
	4/24/2014	Soil Boring	N	21.5 - 22	**9.3**	**11**	8.7 U
	4/24/2014	Soil Boring	N	23.5 - 24	**9.8 J**	**12**	11 U
	4/24/2014	Soil Boring	N	28 - 28.5	**0.27 J**	**0.5 J**	5.6 U
SB-15	6/30/2016	Soil Boring	N	5	22 U	22 U	--
	6/30/2016	Soil Boring	N	10	23 U	23 U	--
	6/30/2016	Soil Boring	N	15	21 U	21 U	--
	6/30/2016	Soil Boring	N	20	24 U	24 U	--
	6/30/2016	Soil Boring	N	25	27 U	27 U	--
	6/30/2016	Soil Boring	FD	25	27 U	27 U	--
	6/30/2016	Soil Boring	N	30	25 U	25 U	--
	6/30/2016	Soil Boring	N	35	25 U	25 U	--
	6/30/2016	Soil Boring	N	40	25 U	25 U	--
	6/30/2016	Soil Boring	N	45	26 U	26 U	--
	6/30/2016	Soil Boring	N	50	24 U	24 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	6/30/2016	Soil Boring	N	55	24 U	24 U	--
	6/30/2016	Soil Boring	N	60	23 U	23 U	--
	6/30/2016	Soil Boring	N	65	26 U	26 U	--
	6/30/2016	Soil Boring	FD	65	25 U	25 U	--
	6/30/2016	Soil Boring	N	70	27 U	27 U	--
	6/30/2016	Soil Boring	N	75	23 U	23 U	--
	6/30/2016	Soil Boring	N	80	25 U	25 U	--
	6/30/2016	Soil Boring	N	85	26 U	26 U	--
	6/30/2016	Soil Boring	N	90	22 U	22 U	--
	6/30/2016	Soil Boring	N	95	24 U	24 U	--
SB-16	6/27/2016	Soil Boring	N	5	22 U	22 U	--
	6/27/2016	Soil Boring	N	10	23 U	23 U	--
	6/27/2016	Soil Boring	N	15	23 U	23 U	--
	6/27/2016	Soil Boring	N	20	23 U	23 U	--
	6/27/2016	Soil Boring	N	25	25 U	25 U	--
	6/27/2016	Soil Boring	FD	25	24 U	24 U	--
	6/27/2016	Soil Boring	N	30	26 U	26 U	--
SB-17	6/28/2016	Soil Boring	N	5	22 U	22 U	--
	6/28/2016	Soil Boring	N	10	26 U	26 U	--
	6/28/2016	Soil Boring	N	15	23 U	23 U	--
	6/28/2016	Soil Boring	N	20	24 U	24 U	--
	6/28/2016	Soil Boring	N	25	23 U	23 U	--
	6/28/2016	Soil Boring	N	30	22 U	22 U	--
	6/28/2016	Soil Boring	N	35	26 U	26 U	--
	6/28/2016	Soil Boring	FD	35	25 U	25 U	--
	6/28/2016	Soil Boring	N	40	20 U	20 U	--
	6/28/2016	Soil Boring	N	45	21 U	21 U	--
	6/28/2016	Soil Boring	N	50	26 U	26 U	--
	6/28/2016	Soil Boring	N	55	25 U	25 U	--
	6/28/2016	Soil Boring	N	60	28 U	28 U	--
	6/28/2016	Soil Boring	N	65	29 U	29 U	--
	6/28/2016	Soil Boring	N	70	26 U	26 U	--
	6/28/2016	Soil Boring	N	75	26 U	26 U	--
	6/28/2016	Soil Boring	N	80	25 U	25 U	--
SB-18	6/30/2016	Soil Boring	N	5	24 U	24 U	--
	6/30/2016	Soil Boring	N	10	23 U	23 U	--
	6/30/2016	Soil Boring	N	15	25 U	25 U	--
	6/30/2016	Soil Boring	N	20	25 U	25 U	--
	6/30/2016	Soil Boring	N	25	24 U	24 U	--
	6/30/2016	Soil Boring	N	30	26 U	26 U	--
	6/30/2016	Soil Boring	N	35	**43**	28 U	--
	6/30/2016	Soil Boring	N	40	**35**	26 U	--
	6/30/2016	Soil Boring	N	45	27 U	27 U	--
	6/30/2016	Soil Boring	N	50	26 U	26 U	--
SB-19	6/30/2016	Soil Boring	N	5	24 U	24 U	--
	6/30/2016	Soil Boring	N	10	24 U	24 U	--
	6/30/2016	Soil Boring	N	15	24 U	24 U	--
	6/30/2016	Soil Boring	N	20	27 U	27 U	--
	6/30/2016	Soil Boring	N	25	28 U	28 U	--
	6/30/2016	Soil Boring	N	30	29 U	29 U	--
	6/30/2016	Soil Boring	N	35	26 U	26 U	--
	6/30/2016	Soil Boring	FD	35	25 U	25 U	--
	6/30/2016	Soil Boring	N	40	26 U	26 U	--
SB-20	7/6/2016	Soil Boring	N	5	1.8 U	1.8 U	--
	7/6/2016	Soil Boring	N	10	1.5 U	1.5 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
					Analytical Data (µg/kg)		
	7/6/2016	Soil Boring	N	15	1.5 U	1.5 U	--
	7/6/2016	Soil Boring	N	20	**5.4**	**6.3**	--
	7/6/2016	Soil Boring	N	25	**6.2**	**7.2**	--
	7/6/2016	Soil Boring	N	30	**10**	**8.8**	--
	7/6/2016	Soil Boring	N	35	**14**	**9.1**	--
	7/6/2016	Soil Boring	FD	35	0.21 U	**0.53 J**	--
	7/6/2016	Soil Boring	N	39	**17**	**10**	--
SB-21	7/7/2016	Soil Boring	N	5	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	10	0.26 U	0.26 U	--
	7/7/2016	Soil Boring	N	15	0.31 U	0.31 U	--
	7/7/2016	Soil Boring	N	20	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	25	0.25 U	0.25 U	--
	7/7/2016	Soil Boring	N	30	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	FD	30	0.28 U	0.28 U	--
	7/7/2016	Soil Boring	N	35	0.31 U	0.31 U	--
	7/7/2016	Soil Boring	N	40	0.26 U	0.26 U	--
	7/7/2016	Soil Boring	N	45	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	50	0.32 U	0.32 U	--
	7/7/2016	Soil Boring	N	55	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	60	0.33 U	0.33 U	--
	7/7/2016	Soil Boring	N	65	0.3 U	0.3 U	--
SB-22	7/20/2016	Soil Boring	N	5	0.25 U	0.25 U	--
	7/20/2016	Soil Boring	N	20	**2.5**	**2.2**	--
	7/20/2016	Soil Boring	N	25	**7.2**	**6.1**	--
	7/20/2016	Soil Boring	N	30	**9.1**	**7.4**	--
	7/20/2016	Soil Boring	N	35	**20**	**8.3**	--
SB-23	7/20/2016	Soil Boring	N	5	0.34 U	0.34 U	--
	7/20/2016	Soil Boring	N	10	0.27 U	0.27 U	--
	7/20/2016	Soil Boring	N	15	0.28 U	0.28 U	--
	7/20/2016	Soil Boring	N	20	0.26 U	0.26 U	--
	7/20/2016	Soil Boring	N	25	0.31 U	0.31 U	--
	7/20/2016	Soil Boring	N	30	0.31 U	0.31 U	--
	7/20/2016	Soil Boring	N	35	0.36 U	0.36 U	--
	7/20/2016	Soil Boring	N	40	0.32 U	0.32 U	--
	7/20/2016	Soil Boring	N	45	0.37 U	0.37 U	--
	7/20/2016	Soil Boring	N	50	0.32 U	0.32 U	--
	7/20/2016	Soil Boring	N	55	0.38 U	0.38 U	--
	7/20/2016	Soil Boring	N	60	0.26 U	0.26 U	--
SB-24	7/21/2016	Soil Boring	N	5	0.27 U	0.27 U	--
	7/21/2016	Soil Boring	N	10	0.3 U	0.3 U	--
	7/21/2016	Soil Boring	N	15	0.29 U	0.29 U	--
	7/21/2016	Soil Boring	N	20	0.29 U	0.29 U	--
	7/21/2016	Soil Boring	FD	20	0.28 U	0.28 U	--
	7/21/2016	Soil Boring	N	25	0.25 U	0.25 U	--
	7/21/2016	Soil Boring	N	30	0.26 U	0.26 U	--
	7/21/2016	Soil Boring	N	35	0.25 U	0.25 U	--
	7/21/2016	Soil Boring	N	40	0.27 U	0.27 U	--
	7/21/2016	Soil Boring	FD	40	0.29 U	0.29 U	--
	7/21/2016	Soil Boring	N	45	0.28 U	0.28 U	--
	7/21/2016	Soil Boring	N	50	0.25 U	0.25 U	--
	7/21/2016	Soil Boring	N	55	0.32 U	0.32 U	--
SB-25	11/19/2016	Soil Boring	N	4	0.18 U	0.068 U	--
	11/19/2016	Soil Boring	N	8	0.15 U	0.057 U	--
	11/19/2016	Soil Boring	N	12	0.14 U	0.055 U	--
	11/19/2016	Soil Boring	N	16	0.24 U	0.092 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
					Analytical Data (µg/kg)		
	11/19/2016	Soil Boring	N	20	0.24 U	0.094 U	--
	11/19/2016	Soil Boring	N	22	0.24 U	0.092 U	--
SB-26	11/19/2016	Soil Boring	N	5	0.2 U	0.078 U	--
	11/19/2016	Soil Boring	N	10	0.24 U	0.092 U	--
	11/19/2016	Soil Boring	N	15	0.25 U	0.097 U	--
	11/19/2016	Soil Boring	N	20	0.26 U	0.099 U	--
	11/19/2016	Soil Boring	N	25	0.26 U	0.099 U	--
	11/19/2016	Soil Boring	N	30	0.25 U	0.097 U	--
	11/19/2016	Soil Boring	N	31	0.26 U	0.099 U	--
SB-27	11/20/2016	Soil Boring	N	5	0.22 U	0.084 U	--
	11/20/2016	Soil Boring	N	10	0.21 U	0.079 U	--
	11/20/2016	Soil Boring	N	15	0.22 U	0.084 U	--
	11/20/2016	Soil Boring	N	19	0.25 U	0.096 U	--
SB-28	11/20/2016	Soil Boring	N	5	0.2 U	0.076 U	--
	11/20/2016	Soil Boring	N	10	0.2 U	0.078 U	--
	11/20/2016	Soil Boring	N	15	0.25 U	0.095 U	--
	11/20/2016	Soil Boring	N	19	0.26 U	0.099 U	--
SB-29	11/20/2016	Soil Boring	N	5	0.2 U	0.078 U	--
	11/20/2016	Soil Boring	N	10	0.2 U	0.076 U	--
	11/20/2016	Soil Boring	N	13	0.26 U	0.099 U	--
SB-30	11/20/2016	Soil Boring	N	5	0.21 U	0.081 U	--
	11/20/2016	Soil Boring	N	10	0.21 U	0.08 U	--
	11/20/2016	Soil Boring	N	15	0.2 U	0.077 U	--
SB-31	11/20/2016	Soil Boring	N	5	0.21 U	0.079 U	--
	11/20/2016	Soil Boring	N	10	0.21 U	0.081 U	--
	11/20/2016	Soil Boring	N	15	0.2 U	0.078 U	--
SB-32	11/21/2016	Soil Boring	N	5	0.2 U	0.077 U	--
	11/21/2016	Soil Boring	N	10	0.26 UR	0.1 UR	--
	11/21/2016	Soil Boring	N	15	0.27 UR	0.11 UR	--
	11/21/2016	Soil Boring	N	20	0.24 UR	0.092 UR	--
	11/21/2016	Soil Boring	N	23	0.24 UR	0.094 UR	--
SB-33	11/21/2016	Soil Boring	N	5	0.21 UR	0.082 UR	--
	11/21/2016	Soil Boring	N	10	0.2 UR	0.076 UR	--
	11/21/2016	Soil Boring	N	15	0.25 UR	0.095 UR	--
	11/21/2016	Soil Boring	N	17	0.26 UR	0.1 UR	--
SB-34	1/9/2017	Soil Boring	N	5	18.2 U	28.1 U	--
	1/9/2017	Soil Boring	N	10	20.2 U	31.3 U	--
	1/9/2017	Soil Boring	N	15	24.7 U	38.2 U	--
	1/9/2017	Soil Boring	N	20	23 U	35.7 U	--
	1/9/2017	Soil Boring	N	25	21.1 U	32.7 U	--
	1/9/2017	Soil Boring	N	30	**30.2 J**	39.9 U	--
	1/9/2017	Soil Boring	N	35	**58.2 J**	32.4 U	--
	1/9/2017	Soil Boring	N	40	24.2 U	37.5 U	--
	1/9/2017	Soil Boring	N	45	21.1 U	32.7 U	--
	1/9/2017	Soil Boring	N	50	24.6 U	38.1 U	--
	1/9/2017	Soil Boring	N	55	23.2 U	35.9 U	--
	1/9/2017	Soil Boring	N	60	23 U	35.6 U	--
	1/10/2017	Soil Boring	N	65	18.8 U	29.2 U	--
	1/10/2017	Soil Boring	FD	65	17.3 U	26.8 U	--
SB-35	1/12/2017	Soil Boring	N	10	19.8 U	30.7 U	--
	1/12/2017	Soil Boring	FD	10	17.7 U	27.4 U	--
	1/12/2017	Soil Boring	N	20	20.5 U	31.7 U	--
	1/12/2017	Soil Boring	N	25	19.8 U	30.7 U	--
	1/13/2017	Soil Boring	N	30	21.8 U	33.7 U	--
	1/13/2017	Soil Boring	N	35	22.5 U	34.7 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
					Analytical Data (µg/kg)		
	1/13/2017	Soil Boring	N	40	20.8 U	32.2 U	--
	1/13/2017	Soil Boring	N	45	20.1 U	31.2 U	--
	1/13/2017	Soil Boring	N	50	20.5 U	31.7 U	--
	1/13/2017	Soil Boring	N	55	19.1 U	29.6 U	--
	1/13/2017	Soil Boring	N	60	23.7 U	36.7 U	--
	1/13/2017	Soil Boring	N	65	23.7 U	36.6 U	--
	1/13/2017	Soil Boring	N	70	24.4 U	37.8 U	--
	1/13/2017	Soil Boring	N	75	25.5 U	39.5 U	--
	1/13/2017	Soil Boring	N	80	21.8 U	33.7 U	--
SB-36	1/11/2017	Soil Boring	N	5	18.7 U	29 U	--
	1/11/2017	Soil Boring	N	10	19.3 U	29.9 U	--
	1/11/2017	Soil Boring	N	15	21.7 U	33.6 U	--
	1/11/2017	Soil Boring	N	20	18.3 U	28.3 U	--
	1/11/2017	Soil Boring	N	25	17.6 U	27.3 U	--
	1/11/2017	Soil Boring	N	30	22.2 U	34.3 U	--
	1/11/2017	Soil Boring	N	35	21.5 U	33.3 U	--
	1/11/2017	Soil Boring	FD	35	20.4 U	31.5 U	--
	1/11/2017	Soil Boring	N	40	20.6 U	31.9 U	--
	1/11/2017	Soil Boring	N	45	23.4 U	36.3 U	--
	1/11/2017	Soil Boring	N	50	21 U	32.6 U	--
SB-37	1/11/2017	Soil Boring	N	5	18 U	27.8 U	--
	1/11/2017	Soil Boring	N	10	19.2 U	29.7 U	--
	1/11/2017	Soil Boring	N	15	18.3 U	28.3 U	--
	1/11/2017	Soil Boring	N	20	18.6 U	28.8 U	--
	1/11/2017	Soil Boring	N	25	19.1 U	29.6 U	--
	1/11/2017	Soil Boring	N	30	21.8 U	33.7 U	--
	1/11/2017	Soil Boring	N	35	19.2 U	29.7 U	--
	1/11/2017	Soil Boring	FD	35	21.6 U	33.4 U	--
	1/12/2017	Soil Boring	N	40	23.6 U	36.6 U	--
	1/12/2017	Soil Boring	N	45	23.9 U	37 U	--
	1/12/2017	Soil Boring	N	50	25.4 U	39.4 U	--
	1/12/2017	Soil Boring	N	55	26.4 U	40.8 U	--
	1/12/2017	Soil Boring	N	60	23.8 U	36.8 U	--
	1/12/2017	Soil Boring	N	65	22.4 U	34.7 U	--
	1/12/2017	Soil Boring	N	70	24.6 U	38 U	--
	1/12/2017	Soil Boring	N	75	20.5 U	31.7 U	--
	1/12/2017	Soil Boring	N	80	19.6 U	30.3 U	--
SB-40	2/13/2017	Soil Boring	N	5	18.9 U	29.2 U	--
	2/13/2017	Soil Boring	N	10	18.8 U	29.2 U	--
	2/13/2017	Soil Boring	N	15	24.7 U	38.2 U	--
	2/13/2017	Soil Boring	N	20	21.5 U	33.3 U	--
	2/13/2017	Soil Boring	N	25	25.7 U	39.8 U	--
	2/13/2017	Soil Boring	N	30	17.3 U	26.8 U	--
	2/13/2017	Soil Boring	N	35	17.3 U	26.8 U	--
	2/13/2017	Soil Boring	N	40	19.3 U	29.9 U	--
	2/13/2017	Soil Boring	N	45	23 U	35.6 U	--
	2/13/2017	Soil Boring	N	50	22.8 U	35.3 U	--
	2/13/2017	Soil Boring	N	55	23.1 U	35.8 U	--
	2/13/2017	Soil Boring	N	60	22.6 U	35 U	--
	2/13/2017	Soil Boring	FD	60	20.8 U	32.3 U	--
	2/13/2017	Soil Boring	N	65	22.9 U	35.5 U	--
	2/13/2017	Soil Boring	N	70	21.9 U	33.9 U	--
	2/13/2017	Soil Boring	N	75	19.7 U	30.5 U	--
	2/13/2017	Soil Boring	N	80	19.5 U	30.2 U	--
	2/13/2017	Soil Boring	FD	80	18.1 U	27.9 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	2/13/2017	Soil Boring	N	85	15.4 U	23.8 U	--
	2/13/2017	Soil Boring	N	90	15.2 U	23.5 U	--
	2/13/2017	Soil Boring	N	95	19.4 U	30 U	--
SB-41	2/14/2017	Soil Boring	N	5	17.9 U	27.8 U	--
	2/14/2017	Soil Boring	N	10	19.3 U	29.8 U	--
	2/14/2017	Soil Boring	N	15	20.3 U	31.4 U	--
	2/14/2017	Soil Boring	N	20	25.7 U	39.7 U	--
	2/14/2017	Soil Boring	N	25	26.5 U	41 U	--
	2/14/2017	Soil Boring	N	30	22.4 U	34.6 U	--
	2/14/2017	Soil Boring	FD	30	22.6 U	35 U	--
	2/14/2017	Soil Boring	N	35	23.5 U	36.4 U	--
	2/14/2017	Soil Boring	N	40	16.2 U	25.1 U	--
	2/14/2017	Soil Boring	N	45	17.3 U	26.8 U	--
SB-44	4/7/2017	Soil Boring	N	5	17.9 U	27.7 U	--
	4/7/2017	Soil Boring	N	10	19.5 U	30.2 U	--
	4/7/2017	Soil Boring	N	15	20 U	31 U	--
	4/7/2017	Soil Boring	N	20	22.7 U	35.2 U	--
	4/7/2017	Soil Boring	N	25	18.9 U	29.3 U	--
	4/7/2017	Soil Boring	N	30	21.1 U	32.7 U	--
	4/7/2017	Soil Boring	N	35	20.5 U	31.8 U	--
	4/7/2017	Soil Boring	N	40	19.7 U	30.4 U	--
	4/7/2017	Soil Boring	N	45	20.4 U	31.5 U	--
	4/7/2017	Soil Boring	FD	45	35.3 U	54.7 U	--
	4/7/2017	Soil Boring	N	50	22.9 U	35.5 U	--
	4/7/2017	Soil Boring	N	55	21.9 U	33.8 U	--
	4/7/2017	Soil Boring	N	60	21.5 U	33.3 U	--
	4/7/2017	Soil Boring	N	65	22.9 U	35.4 U	--
	4/7/2017	Soil Boring	N	70	24.6 U	38.1 U	--
	4/7/2017	Soil Boring	N	72.5	54.6 U	84.4 U	--
SB101B	1/23/2018	Soil Boring	N	5	0.59 U	0.83 U	--
	1/23/2018	Soil Boring	N	15	0.52 U	**4.9**	--
	1/23/2018	Soil Boring	N	25	**4.2 J**	**5.5**	--
	1/23/2018	Soil Boring	N	36	**20.6**	**9.4**	--
SB102B	1/24/2018	Soil Boring	N	5	**5.7**	**8.7**	--
	1/24/2018	Soil Boring	N	15	**8.7**	**10.6**	--
	1/24/2018	Soil Boring	N	25	**7.6**	**8.4**	--
	1/24/2018	Soil Boring	N	30	**10.7**	**10.2**	--
SB103B	1/25/2018	Soil Boring	N	5	**2.8 J**	**6.1**	--
	1/25/2018	Soil Boring	N	15	**4 J**	**4 J**	--
	1/25/2018	Soil Boring	N	22	**2.8 J**	**1.8 J**	--
	1/25/2018	Soil Boring	N	27	**7.2 J**	**3.8 J**	--
	1/25/2018	Soil Boring	FD	27	**10.6 J**	**5.5 J**	--
SB104B	1/25/2018	Soil Boring	N	5	0.57 U	0.8 U	--
	1/25/2018	Soil Boring	N	15	**13.7**	**5.1 J**	--
	1/25/2018	Soil Boring	N	22	**4.5 J**	**4.1 J**	--
	1/25/2018	Soil Boring	N	27	**7.2**	**3.6 J**	--
SB-201	12/13/2018	Soil Boring	N	5	30 U	31 U	--
	12/13/2018	Soil Boring	N	15	35 U	36 U	--
SB-202	12/13/2018	Soil Boring	N	5	28 U	30 U	--
	12/13/2018	Soil Boring	N	15	37 U	39 U	--
SB-203	12/13/2018	Soil Boring	N	5	30 U	31 U	--
	12/13/2018	Soil Boring	N	15	39 U	41 U	--
SB-204	12/13/2018	Soil Boring	N	5	31 U	32 U	--
	12/13/2018	Soil Boring	N	15	41 U	43 U	--
	12/13/2018	Soil Boring	FD	15	41 U	42 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
				MTCA Method B Cancer	14,000	32,000	8,000,000
				MTCA Protection of Groundwater, Vadose at 13 C	42	74	5,000
				MTCA Protection of Groundwater, Saturated	2.2	4.8	270
					Analytical Data (µg/kg)		
SB-205	12/13/2018	Soil Boring	N	5	29 U	31 U	--
	12/13/2018	Soil Boring	N	15	36 U	38 U	--
SB-206	6/19/2019	Soil Boring	N	5	28 U	29 U	--
	6/19/2019	Soil Boring	N	10	28 U	29 U	--
	6/19/2019	Soil Boring	N	15	37 U	39 U	--
	6/19/2019	Soil Boring	N	20	38 U	39 U	--
	6/19/2019	Soil Boring	N	25	34 U	35 U	--
	6/19/2019	Soil Boring	N	30	34 U	36 U	--
	6/19/2019	Soil Boring	N	35	34 U	36 U	--
	6/19/2019	Soil Boring	N	40	33 U	35 U	--
	6/19/2019	Soil Boring	N	45	36 U	38 U	--
	6/19/2019	Soil Boring	N	50	37 U	39 U	--
	6/19/2019	Soil Boring	N	55	33 U	35 U	--
	6/19/2019	Soil Boring	N	60	34 U	35 U	--
	6/19/2019	Soil Boring	N	65	32 U	34 U	--
	6/19/2019	Soil Boring	N	70	33 U	34 U	--
	6/19/2019	Soil Boring	FD	70	35 U	37 U	--
	6/19/2019	Soil Boring	N	77	33 U	34 U	--
	6/19/2019	Soil Boring	FD	77	29 U	30 U	--
SB-207	6/21/2019	Soil Boring	N	5	30 U	31 U	--
	6/21/2019	Soil Boring	N	10	28 U	30 U	--
	6/21/2019	Soil Boring	N	15	30 U	31 U	--
	6/21/2019	Soil Boring	N	20	28 U	30 U	--
	6/21/2019	Soil Boring	N	25	29 U	30 U	--
	6/21/2019	Soil Boring	N	30	29 U	30 U	--
	6/21/2019	Soil Boring	N	35	29 U	31 U	--
	6/21/2019	Soil Boring	N	40	30 U	32 U	--
	6/21/2019	Soil Boring	N	45	36 U	38 U	--
	6/21/2019	Soil Boring	N	50	34 U	35 U	--
	6/21/2019	Soil Boring	N	55	38 U	40 U	--
	6/21/2019	Soil Boring	N	60	46 U	48 U	--
	6/21/2019	Soil Boring	N	65	36 U	38 U	--
	6/21/2019	Soil Boring	FD	65	36 U	38 U	--
	6/21/2019	Soil Boring	N	70	37 U	39 U	--
	6/21/2019	Soil Boring	N	75	35 U	36 U	--
SB-208	6/20/2019	Soil Boring	N	5	30 U	31 U	--
	6/20/2019	Soil Boring	N	10	33 U	34 U	--
	6/20/2019	Soil Boring	N	15	32 U	**39 J**	--
	6/20/2019	Soil Boring	N	20	30 U	**35 J**	--
	6/20/2019	Soil Boring	N	25	29 U	30 U	--
	6/20/2019	Soil Boring	N	30	32 U	34 U	--
	6/20/2019	Soil Boring	N	35	37 U	39 U	--
	6/20/2019	Soil Boring	N	40	38 U	39 U	--
	6/20/2019	Soil Boring	N	45	36 U	38 U	--
	6/20/2019	Soil Boring	N	50	32 U	33 U	--
	6/20/2019	Soil Boring	FD	50	42 U	44 U	--
	6/20/2019	Soil Boring	N	55	39 U	40 U	--
	6/20/2019	Soil Boring	N	60	39 U	**43 J**	--
	6/20/2019	Soil Boring	N	65	38 U	40 U	--
	6/20/2019	Soil Boring	N	70	36 U	37 U	--
	6/20/2019	Soil Boring	N	75	35 U	37 U	--
	6/20/2019	Soil Boring	N	80	36 U	37 U	--
	6/20/2019	Soil Boring	N	85	34 U	36 U	--
	6/20/2019	Soil Boring	N	90	35 U	37 U	--
SV-105	3/7/2018	Sub-slab Soil	N	0	0.7 U	0.99 U	--

Table 4-3. Summary of Analytical Soil Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/kg)		
		MTCA Method B Cancer			14,000	32,000	8,000,000
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
		MTCA Protection of Groundwater, Saturated			2.2	4.8	270
					Analytical Data (µg/kg)		
	3/7/2018	Sub-slab Soil	N	3	0.59 U	0.83 U	--
SV-106	3/7/2018	Sub-slab Soil	N	0	**8.3**	**5.7**	--
	3/7/2018	Sub-slab Soil	N	3	0.66 U	0.94 U	--
SV-107	3/7/2018	Sub-slab Soil	N	0	**1.4 J**	**0.97 J**	--
	3/7/2018	Sub-slab Soil	N	2	**1.7 J**	**1.1 J**	--
SV-108	3/30/2018	Sub-slab Soil	N	0	0.7 U	0.99 U	--
	3/30/2018	Sub-slab Soil	N	3	0.8 U	1.1 U	--
SV-109	3/30/2018	Sub-slab Soil	N	0	0.59 U	0.84 U	--
	3/30/2018	Sub-slab Soil	N	3	0.81 U	1.1 U	--
SV-110	3/8/2018	Sub-slab Soil	N	0	0.56 U	0.79 U	--
	3/8/2018	Sub-slab Soil	N	3	0.59 U	0.83 U	--
SV-112	3/30/2018	Sub-slab Soil	N	0	0.6 U	0.85 U	--
	3/30/2018	Sub-slab Soil	N	3	**1.1 J**	0.83 U	--
SV-113	3/30/2018	Sub-slab Soil	N	0	0.64 U	0.9 U	--
	3/30/2018	Sub-slab Soil	FD	0	0.55 U	0.78 U	--
	3/30/2018	Sub-slab Soil	N	1.5	0.56 U	0.8 U	--
	3/30/2018	Sub-slab Soil	FD	1.5	0.6 U	0.85 U	--
SV-114	3/30/2018	Sub-slab Soil	N	3	0.53 U	0.75 U	--

Notes:
Detections in **bold**
-- = not analyzed
µg/kg = microgram(s) per kilogram
C = degrees centigrade
FD = field duplicate
ft = feet
J = estimated result
MTCA = Model Toxics Control Act
N = normal sample
U = not detected at or above the indicated reporting limit
UJ = not detected; indicated reporting limit is estimated
UR = not detected; result was rejected and is not usable

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
BK01	4/22/2014	Soil Boring	N	3 - 3.5	4.7 U	4.7 U	4.7 U
	4/22/2014	Soil Boring	N	4 - 4.5	4.9 U	4.9 U	4.9 U
	4/22/2014	Soil Boring	N	12 - 12.5	4.7 U	4.7 U	4.7 U
CHF Grain Facility Sump Area	2/6/2018	Sub-Slab Soil	N	0	0.68 U	0.97 U	--
	2/6/2018	Sub-Slab Soil	N	3	0.5 U	0.71 U	--
GSNE	11/2/2017	Grab	N	4	22.7 U	23.3 U	--
GSSW	11/2/2017	Grab	N	5	28.2 U	28.9 U	--
HA01	4/23/2014	Soil Boring	N	13.5 - 14	6.2 U	6.2 U	6.2 U
HA02	4/23/2014	Soil Boring	N	2.5 - 3	5.5 U	5.5 U	5.5 U
HA03	4/23/2014	Soil Boring	N	9 - 9.5	4.7 U	4.7 U	4.7 U
HB-1-1	2/26/2019	Horizontal Soil Boring	N	10 - 10.5	27 U	29 U	--
HB-1-2	2/26/2019	Horizontal Soil Boring	N	10 - 10.5	**63 J**	**340**	--
HB-1-3	2/26/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	30 U	--
HB-2-1	2/27/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	30 U	--
HB-2-2	2/27/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	29 U	--
HB-2-3	2/27/2019	Horizontal Soil Boring	N	10 - 10.5	30 U	31 U	--
HB-3-1	2/28/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	30 U	--
HB-3-2	2/28/2019	Horizontal Soil Boring	N	10 - 10.5	28 U	29 U	--
	2/28/2019	Horizontal Soil Boring	FD	10 - 10.5	30 U	31 U	--
HB-3-3	2/28/2019	Horizontal Soil Boring	N	10 - 10.5	30 U	31 U	--
MW-1D	7/6/2016	Soil Boring	N	5	2.3 U	2.3 U	--
	7/6/2016	Soil Boring	N	10	2.5 U	2.5 U	--
	7/6/2016	Soil Boring	N	15	3.3 U	3.3 U	--
	7/6/2016	Soil Boring	N	20	2.9 U	2.9 U	--
	7/6/2016	Soil Boring	N	25	3.1 U	3.1 U	--
	7/6/2016	Soil Boring	N	30	3.1 U	3.1 U	--
MW-2D	7/1/2016	Soil Boring	N	5	24 U	24 U	--
	7/1/2016	Soil Boring	N	10	28 U	28 U	--
	7/1/2016	Soil Boring	N	15	24 U	24 U	--
	7/1/2016	Soil Boring	N	20	23 U	23 U	--
	7/1/2016	Soil Boring	N	25	23 U	23 U	--
	7/1/2016	Soil Boring	N	30	27 U	27 U	--
MW-3D	5/10/2016	Soil Boring	N	5	24 U	24 U	--
	5/10/2016	Soil Boring	N	10	22 U	22 U	--
	5/10/2016	Soil Boring	N	15	22 U	22 U	--
	5/10/2016	Soil Boring	N	20	28 U	28 U	--
	5/10/2016	Soil Boring	N	25	34 U	34 U	--
	5/10/2016	Soil Boring	N	30	33 U	33 U	--
MW-5D	5/20/2016	Soil Boring	N	5	23 U	23 U	--
	5/20/2016	Soil Boring	N	10	23 U	23 U	--
	5/20/2016	Soil Boring	N	15	24 U	24 U	--
	5/20/2016	Soil Boring	N	20	22 U	22 U	--
	5/20/2016	Soil Boring	N	25	25 U	25 U	--
	5/20/2016	Soil Boring	N	27	21 U	21 U	--
	5/20/2016	Soil Boring	N	30	23 U	23 U	--
	5/20/2016	Soil Boring	FD	30	26 U	26 U	--
MW-6D	6/27/2016	Soil Boring	N	5	24 U	24 U	--
	6/27/2016	Soil Boring	N	10	22 U	22 U	--
	6/27/2016	Soil Boring	N	15	23 U	23 U	--
	6/27/2016	Soil Boring	N	20	22 U	22 U	--
	6/27/2016	Soil Boring	N	25	23 U	23 U	--
	6/27/2016	Soil Boring	N	30	28 U	28 U	--
MW-8S (SB-05)	5/17/2016	Soil Boring	N	5	23 U	23 U	--
	5/17/2016	Soil Boring	N	10	25 U	25 U	--
	5/17/2016	Soil Boring	N	15	24 U	24 U	--
	5/17/2016	Soil Boring	N	20	29 U	29 U	--
	5/17/2016	Soil Boring	N	25	25 U	25 U	--

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	5/17/2016	Soil Boring	N	30	26 U	26 U	--
	5/17/2016	Soil Boring	FD	30	27 U	27 U	--
MW-9S (SB-04)	5/16/2016	Soil Boring	N	5	23 U	23 U	--
	5/16/2016	Soil Boring	N	10	23 U	23 U	--
	5/16/2016	Soil Boring	N	15	25 U	25 U	--
	5/16/2016	Soil Boring	N	20	37 U	37 U	--
	5/16/2016	Soil Boring	N	25	**28**	27 U	--
	5/16/2016	Soil Boring	N	30	**100**	27 U	--
P0101-01 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.8 U	2.8 U	--
P0101-02 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.8 U	2.8 U	--
P0101-03 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.9 U	2.9 U	--
P0101-04 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.4 U	2.4 U	--
P0101-06 (Davey)	9/21/2016	Residential Surface Soil	N	0	2.8 U	2.8 U	--
P0302-01 (Marlow)	9/21/2016	Residential Surface Soil	N	0	2.3 U	2.3 U	--
P0302-02 (Marlow)	9/21/2016	Residential Surface Soil	N	0	2.3 U	2.3 U	--
P0303-01 (Marlow Garden	9/21/2016	Residential Surface Soil	N	0	2.2 U	2.2 U	--
P0303-02 (Marlow Garden	9/21/2016	Residential Surface Soil	N	0	2.1 U	2.1 U	--
P0303-03 (Marlow Garden	9/21/2016	Residential Surface Soil	N	0	2.1 U	2.1 U	--
P0304-01 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.2 U	2.2 U	--
P0304-02 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.6 U	2.6 U	--
P0304-03 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.5 U	2.5 U	--
P0304-04 (Randall)	9/21/2016	Residential Surface Soil	N	0	2 U	2 U	--
P0304-05 (Randall)	9/21/2016	Residential Surface Soil	N	0	2.2 U	2.2 U	--
PH-01	6/27/2018	Pothole	N	1	8.3 U	34 U	--
PH-02	6/27/2018	Pothole	N	1	5.9 U	24 U	--
PH-03	6/27/2018	Pothole	N	1	**73**	26 U	--
PH-04	6/27/2018	Pothole	N	1	5.1 U	21 U	--
PH-05	6/27/2018	Pothole	N	1	5.4 UJ	22 UJ	--
PH-06	6/27/2018	Pothole	N	1	5.8 U	24 U	--
PH-07	6/27/2018	Pothole	N	1	5.8 U	24 U	--
PH-08	6/27/2018	Pothole	N	1	6.1 U	25 U	--
SB-01	5/11/2016	Soil Boring	N	5	24 U	24 U	--
	5/11/2016	Soil Boring	FD	5	23 U	23 U	--
	5/11/2016	Soil Boring	N	10	28 U	28 U	--
	5/11/2016	Soil Boring	N	15	28 U	28 U	--
	5/11/2016	Soil Boring	N	20	27 U	27 U	--
	5/11/2016	Soil Boring	N	25	24 U	24 U	--
	5/11/2016	Soil Boring	N	30	28 U	28 U	--
SB01	4/21/2014	Soil Boring	N	1.5 - 2	4.3 U	4.3 U	4.3 U
	4/21/2014	Soil Boring	N	5 - 5.5	5.1 U	5.1 U	5.1 U
SB-02	5/12/2016	Soil Boring	N	5	23 U	23 U	--
	5/12/2016	Soil Boring	N	10	24 U	24 U	--
	5/12/2016	Soil Boring	N	15	26 U	26 U	--
	5/12/2016	Soil Boring	N	20	27 U	27 U	--
	5/12/2016	Soil Boring	N	25	28 U	28 U	--
	5/12/2016	Soil Boring	N	30	26 U	26 U	--
SB02	4/21/2014	Soil Boring	N	1 - 1.5	2.05 U	--	--
	4/21/2014	Soil Boring	N	4.5 - 5	2.27 U	--	--
SB-03	5/13/2016	Soil Boring	N	5	25 U	25 U	--
	5/13/2016	Soil Boring	N	10	26 U	26 U	--
	5/13/2016	Soil Boring	N	15	26 U	26 U	--
	5/13/2016	Soil Boring	N	20	28 U	28 U	--
	5/13/2016	Soil Boring	N	25	27 U	27 U	--
	5/13/2016	Soil Boring	N	30	27 U	27 U	--
SB03	4/21/2014	Soil Boring	N	1 - 1.5	2.4 U	--	--
	4/21/2014	Soil Boring	N	4.5 - 5	2.38 U	--	--
SB04	4/21/2014	Soil Boring	N	4 - 4.5	6 U	6 U	6 U

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	4/21/2014	Soil Boring	N	5 - 5.5	0.21 J	4.8 U	4.8 U
SB05	4/21/2014	Soil Boring	N	2.5 - 3	2.32 U	--	--
	4/21/2014	Soil Boring	N	3.5 - 4	2.29 U	--	--
SB-06	5/18/2016	Soil Boring	N	5	25 U	25 U	--
	5/18/2016	Soil Boring	N	10	24 U	24 U	--
	5/18/2016	Soil Boring	N	15	24 U	24 U	--
	5/18/2016	Soil Boring	N	21	28 U	28 U	--
	5/18/2016	Soil Boring	N	25	31 U	31 U	--
	5/18/2016	Soil Boring	N	30	25 U	25 U	--
SB06	4/21/2014	Soil Boring	N	4.5 - 5	5.1 U	5.1 U	5.1 U
	4/21/2014	Soil Boring	N	6.5 - 7	4.5 U	4.5 U	4.5 U
	4/21/2014	Soil Boring	N	12 - 12.5	6 U	6 U	6 U
SB-07	5/20/2016	Soil Boring	N	5	22 U	22 U	--
	5/20/2016	Soil Boring	N	10	27 U	27 U	--
	5/20/2016	Soil Boring	N	15	28 U	28 U	--
	5/20/2016	Soil Boring	N	20	27 U	27 U	--
	5/20/2016	Soil Boring	N	25	27 U	27 U	--
	5/20/2016	Soil Boring	N	30	25 U	25 U	--
	5/20/2016	Soil Boring	FD	30	26 U	26 U	--
SB07	4/21/2014	Soil Boring	N	2.5 - 3	2.46 U	--	--
	4/21/2014	Soil Boring	N	3.5 - 4	2.4 U	--	--
SB-08	5/23/2016	Soil Boring	N	5	22 U	22 U	--
	5/23/2016	Soil Boring	N	10	25 U	25 U	--
	5/23/2016	Soil Boring	N	15	26 U	26 U	--
	5/23/2016	Soil Boring	N	20	27 U	27 U	--
	5/23/2016	Soil Boring	N	25	25 U	25 U	--
	5/23/2016	Soil Boring	N	30	26 U	26 U	--
SB08	4/22/2014	Soil Boring	N	4 - 4.5	3.96 U	--	--
	4/22/2014	Soil Boring	N	5 - 5.5	3.95 U	--	--
SB-09	5/23/2016	Soil Boring	N	5	23 U	23 U	--
	5/23/2016	Soil Boring	N	10	26 U	26 U	--
	5/23/2016	Soil Boring	N	15	26 U	26 U	--
	5/23/2016	Soil Boring	N	20	24 U	24 U	--
	5/23/2016	Soil Boring	N	25	27 U	27 U	--
	5/23/2016	Soil Boring	FD	25	27 U	27 U	--
	5/23/2016	Soil Boring	N	30	26 U	26 U	--
SB09	4/22/2014	Soil Boring	N	3.5 - 4	2 U	--	--
	4/22/2014	Soil Boring	N	15 - 15.5	**3.2 J**	**6.8 J**	7.1 U
	4/22/2014	Soil Boring	N	19.5 - 20	**3.8 J**	**7.6**	7.2 U
	4/22/2014	Soil Boring	N	25 - 25.5	**3.2 J**	**4.1 J**	6.9 U
SB-10	5/24/2016	Soil Boring	N	5	23 U	23 U	--
	5/24/2016	Soil Boring	N	10	27 U	27 U	--
	5/24/2016	Soil Boring	N	15	25 U	25 U	--
	5/24/2016	Soil Boring	N	20	26 U	26 U	--
	5/24/2016	Soil Boring	N	25	26 U	26 U	--
	5/24/2016	Soil Boring	N	30	28 U	28 U	--
SB10	4/22/2014	Soil Boring	N	15.5 - 16	**0.88 J**	7.3 U	7.3 U
	4/22/2014	Soil Boring	N	18.5 - 19	**6.5 J**	**3.5 J**	7.8 U
	4/22/2014	Soil Boring	N	20.5 - 21	**4.4 J**	**4.5 J**	8.5 U
SB-11	5/25/2016	Soil Boring	N	5	22 U	22 U	--
	5/25/2016	Soil Boring	N	10	27 U	27 U	--
	5/25/2016	Soil Boring	N	15	22 U	22 U	--
	5/25/2016	Soil Boring	N	20	24 U	24 U	--
	5/25/2016	Soil Boring	FD	20	25 U	25 U	--
	5/25/2016	Soil Boring	N	25	26 U	26 U	--
	5/25/2016	Soil Boring	N	30	25 U	25 U	--
SB11	4/23/2014	Soil Boring	N	16.5 - 17	3.43 U	--	--

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	4/23/2014	Soil Boring	N	17.5 - 18	4.18 U	--	--
	4/23/2014	Soil Boring	N	18.6 - 19.1	**1.4 J**	**1.4 J**	8 U
	4/23/2014	Soil Boring	N	20 - 20.5	**1.9 J**	**0.94 J**	7.7 U
	4/23/2014	Soil Boring	N	21.5 - 22	**1.7 J**	**0.88 J**	8.4 U
	4/23/2014	Soil Boring	N	28 - 28.5	**0.71 J**	**0.59 J**	8.4 U
SB-12	5/25/2016	Soil Boring	N	5	23 U	23 U	--
	5/25/2016	Soil Boring	N	10	26 U	26 U	--
	5/25/2016	Soil Boring	FD	10	25 U	25 U	--
	5/25/2016	Soil Boring	N	15	25 U	25 U	--
	5/25/2016	Soil Boring	N	20	23 U	23 U	--
	5/25/2016	Soil Boring	N	25	24 U	24 U	--
	5/25/2016	Soil Boring	N	30	25 U	25 U	--
SB12	4/24/2014	Soil Boring	N	20 - 20.5	**2.3 J**	**1.6 J**	8.9 U
	4/24/2014	Soil Boring	N	21.5 - 22	**1.9 J**	**1.4 J**	8.8 U
	4/24/2014	Soil Boring	N	28.5 - 29	**0.19 J**	7 U	7 U
SB-13	5/26/2016	Soil Boring	N	5	26 U	26 U	--
	5/26/2016	Soil Boring	N	10	23 U	23 U	--
	5/26/2016	Soil Boring	N	15	25 U	25 U	--
	5/26/2016	Soil Boring	N	20	25 U	25 U	--
	5/26/2016	Soil Boring	FD	20	25 U	25 U	--
	5/26/2016	Soil Boring	N	25	24 U	24 U	--
	5/26/2016	Soil Boring	N	30	27 U	27 U	--
SB13	4/24/2014	Soil Boring	N	14 - 14.5	**1.2 J**	7 U	7 U
	4/24/2014	Soil Boring	N	20 - 20.5	**4.1 J**	**2.2 J**	8.2 U
	4/24/2014	Soil Boring	N	21.2 - 21.7	**9.7**	**4.4 J**	7.9 U
	4/24/2014	Soil Boring	N	23 - 23.5	**7.1 J**	**3.7 J**	7.1 U
	4/24/2014	Soil Boring	N	27.5 - 28	**4.9 J**	**3 J**	7 U
SB-14	5/26/2016	Soil Boring	N	5	23 U	23 U	--
	5/26/2016	Soil Boring	N	10	24 U	24 U	--
	5/26/2016	Soil Boring	N	15	23 U	23 U	--
	5/26/2016	Soil Boring	FD	15	29 U	29 U	--
	5/26/2016	Soil Boring	N	20	22 U	22 U	--
	5/26/2016	Soil Boring	N	25	24 U	24 U	--
	5/26/2016	Soil Boring	N	30	30 U	30 U	--
SB14	4/24/2014	Soil Boring	N	18 - 18.5	**6.8 J**	**8.5**	7.8 U
	4/24/2014	Soil Boring	N	21.5 - 22	**9.3**	**11**	8.7 U
	4/24/2014	Soil Boring	N	23.5 - 24	**9.8 J**	**12**	11 U
	4/24/2014	Soil Boring	N	28 - 28.5	**0.27 J**	**0.5 J**	5.6 U
SB-15	6/30/2016	Soil Boring	N	5	22 U	22 U	--
	6/30/2016	Soil Boring	N	10	23 U	23 U	--
	6/30/2016	Soil Boring	N	15	21 U	21 U	--
	6/30/2016	Soil Boring	N	20	24 U	24 U	--
	6/30/2016	Soil Boring	N	25	27 U	27 U	--
	6/30/2016	Soil Boring	FD	25	27 U	27 U	--
	6/30/2016	Soil Boring	N	30	25 U	25 U	--
SB-16	6/27/2016	Soil Boring	N	5	22 U	22 U	--
	6/27/2016	Soil Boring	N	10	23 U	23 U	--
	6/27/2016	Soil Boring	N	15	23 U	23 U	--
	6/27/2016	Soil Boring	N	20	23 U	23 U	--
	6/27/2016	Soil Boring	N	25	25 U	25 U	--
	6/27/2016	Soil Boring	FD	25	24 U	24 U	--
	6/27/2016	Soil Boring	N	30	26 U	26 U	--
SB-17	6/28/2016	Soil Boring	N	5	22 U	22 U	--
	6/28/2016	Soil Boring	N	10	26 U	26 U	--
	6/28/2016	Soil Boring	N	15	23 U	23 U	--
	6/28/2016	Soil Boring	N	20	24 U	24 U	--
	6/28/2016	Soil Boring	N	25	23 U	23 U	--

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
					Analytical Data (µg/kg)		
	6/28/2016	Soil Boring	N	30	22 U	22 U	--
SB-18	6/30/2016	Soil Boring	N	5	24 U	24 U	--
	6/30/2016	Soil Boring	N	10	23 U	23 U	--
	6/30/2016	Soil Boring	N	15	25 U	25 U	--
	6/30/2016	Soil Boring	N	20	25 U	25 U	--
	6/30/2016	Soil Boring	N	25	24 U	24 U	--
	6/30/2016	Soil Boring	N	30	26 U	26 U	--
SB-19	6/30/2016	Soil Boring	N	5	24 U	24 U	--
	6/30/2016	Soil Boring	N	10	24 U	24 U	--
	6/30/2016	Soil Boring	N	15	24 U	24 U	--
	6/30/2016	Soil Boring	N	20	27 U	27 U	--
	6/30/2016	Soil Boring	N	25	28 U	28 U	--
	6/30/2016	Soil Boring	N	30	29 U	29 U	--
SB-20	7/6/2016	Soil Boring	N	5	1.8 U	1.8 U	--
	7/6/2016	Soil Boring	N	10	1.5 U	1.5 U	--
	7/6/2016	Soil Boring	N	15	1.5 U	1.5 U	--
	7/6/2016	Soil Boring	N	20	**5.4**	**6.3**	--
	7/6/2016	Soil Boring	N	25	**6.2**	**7.2**	--
	7/6/2016	Soil Boring	N	30	**10**	**8.8**	--
SB-21	7/7/2016	Soil Boring	N	5	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	10	0.26 U	0.26 U	--
	7/7/2016	Soil Boring	N	15	0.31 U	0.31 U	--
	7/7/2016	Soil Boring	N	20	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	25	0.25 U	0.25 U	--
	7/7/2016	Soil Boring	N	30	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	FD	30	0.28 U	0.28 U	--
SB-22	7/20/2016	Soil Boring	N	5	0.25 U	0.25 U	--
	7/20/2016	Soil Boring	N	20	**2.5**	**2.2**	--
	7/20/2016	Soil Boring	N	25	**7.2**	**6.1**	--
	7/20/2016	Soil Boring	N	30	**9.1**	**7.4**	--
SB-23	7/20/2016	Soil Boring	N	5	0.34 U	0.34 U	--
	7/20/2016	Soil Boring	N	10	0.27 U	0.27 U	--
	7/20/2016	Soil Boring	N	15	0.28 U	0.28 U	--
	7/20/2016	Soil Boring	N	20	0.26 U	0.26 U	--
	7/20/2016	Soil Boring	N	25	0.31 U	0.31 U	--
	7/20/2016	Soil Boring	N	30	0.31 U	0.31 U	--
SB-24	7/21/2016	Soil Boring	N	5	0.27 U	0.27 U	--
	7/21/2016	Soil Boring	N	10	0.3 U	0.3 U	--
	7/21/2016	Soil Boring	N	15	0.29 U	0.29 U	--
	7/21/2016	Soil Boring	N	20	0.29 U	0.29 U	--
	7/21/2016	Soil Boring	FD	20	0.28 U	0.28 U	--
	7/21/2016	Soil Boring	N	25	0.25 U	0.25 U	--
	7/21/2016	Soil Boring	N	30	0.26 U	0.26 U	--
SB-25	11/19/2016	Soil Boring	N	4	0.18 U	0.068 U	--
	11/19/2016	Soil Boring	N	8	0.15 U	0.057 U	--
	11/19/2016	Soil Boring	N	12	0.14 U	0.055 U	--
	11/19/2016	Soil Boring	N	16	0.24 U	0.092 U	--
	11/19/2016	Soil Boring	N	20	0.24 U	0.094 U	--
	11/19/2016	Soil Boring	N	22	0.24 U	0.092 U	--
SB-26	11/19/2016	Soil Boring	N	5	0.2 U	0.078 U	--
	11/19/2016	Soil Boring	N	10	0.24 U	0.092 U	--
	11/19/2016	Soil Boring	N	15	0.25 U	0.097 U	--
	11/19/2016	Soil Boring	N	20	0.26 U	0.099 U	--
	11/19/2016	Soil Boring	N	25	0.26 U	0.099 U	--
	11/19/2016	Soil Boring	N	30	0.25 U	0.097 U	--
SB-27	11/20/2016	Soil Boring	N	5	0.22 U	0.084 U	--
	11/20/2016	Soil Boring	N	10	0.21 U	0.079 U	--

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	11/20/2016	Soil Boring	N	15	0.22 U	0.084 U	--
	11/20/2016	Soil Boring	N	19	0.25 U	0.096 U	--
SB-28	11/20/2016	Soil Boring	N	5	0.2 U	0.076 U	--
	11/20/2016	Soil Boring	N	10	0.2 U	0.078 U	--
	11/20/2016	Soil Boring	N	15	0.25 U	0.095 U	--
	11/20/2016	Soil Boring	N	19	0.26 U	0.099 U	--
SB-29	11/20/2016	Soil Boring	N	5	0.2 U	0.078 U	--
	11/20/2016	Soil Boring	N	10	0.2 U	0.076 U	--
	11/20/2016	Soil Boring	N	13	0.26 U	0.099 U	--
SB-30	11/20/2016	Soil Boring	N	5	0.21 U	0.081 U	--
	11/20/2016	Soil Boring	N	10	0.21 U	0.08 U	--
	11/20/2016	Soil Boring	N	15	0.2 U	0.077 U	--
SB-31	11/20/2016	Soil Boring	N	5	0.21 U	0.079 U	--
	11/20/2016	Soil Boring	N	10	0.21 U	0.081 U	--
	11/20/2016	Soil Boring	N	15	0.2 U	0.078 U	--
SB-32	11/21/2016	Soil Boring	N	5	0.2 U	0.077 U	--
	11/21/2016	Soil Boring	N	10	0.26 UR	0.1 UR	--
	11/21/2016	Soil Boring	N	15	0.27 UR	0.11 UR	--
	11/21/2016	Soil Boring	N	20	0.24 UR	0.092 UR	--
	11/21/2016	Soil Boring	N	23	0.24 UR	0.094 UR	--
SB-33	11/21/2016	Soil Boring	N	5	0.21 UR	0.082 UR	--
	11/21/2016	Soil Boring	N	10	0.2 UR	0.076 UR	--
	11/21/2016	Soil Boring	N	15	0.25 UR	0.095 UR	--
	11/21/2016	Soil Boring	N	17	0.26 UR	0.1 UR	--
SB-34	1/9/2017	Soil Boring	N	5	18.2 U	28.1 U	--
	1/9/2017	Soil Boring	N	10	20.2 U	31.3 U	--
	1/9/2017	Soil Boring	N	15	24.7 U	38.2 U	--
	1/9/2017	Soil Boring	N	20	23 U	35.7 U	--
	1/9/2017	Soil Boring	N	25	21.1 U	32.7 U	--
	1/9/2017	Soil Boring	N	30	**30.2 J**	39.9 U	--
SB-35	1/12/2017	Soil Boring	N	10	19.8 U	30.7 U	--
	1/12/2017	Soil Boring	FD	10	17.7 U	27.4 U	--
	1/12/2017	Soil Boring	N	20	20.5 U	31.7 U	--
	1/12/2017	Soil Boring	N	25	19.8 U	30.7 U	--
	1/13/2017	Soil Boring	N	30	21.8 U	33.7 U	--
SB-36	1/11/2017	Soil Boring	N	5	18.7 U	29 U	--
	1/11/2017	Soil Boring	N	10	19.3 U	29.9 U	--
	1/11/2017	Soil Boring	N	15	21.7 U	33.6 U	--
	1/11/2017	Soil Boring	N	20	18.3 U	28.3 U	--
	1/11/2017	Soil Boring	N	25	17.6 U	27.3 U	--
	1/11/2017	Soil Boring	N	30	22.2 U	34.3 U	--
SB-37	1/11/2017	Soil Boring	N	5	18 U	27.8 U	--
	1/11/2017	Soil Boring	N	10	19.2 U	29.7 U	--
	1/11/2017	Soil Boring	N	15	18.3 U	28.3 U	--
	1/11/2017	Soil Boring	N	20	18.6 U	28.8 U	--
	1/11/2017	Soil Boring	N	25	19.1 U	29.6 U	--
	1/11/2017	Soil Boring	N	30	21.8 U	33.7 U	--
SB-40	2/13/2017	Soil Boring	N	5	18.9 U	29.2 U	--
	2/13/2017	Soil Boring	N	10	18.8 U	29.2 U	--
	2/13/2017	Soil Boring	N	15	24.7 U	38.2 U	--
	2/13/2017	Soil Boring	N	20	21.5 U	33.3 U	--
	2/13/2017	Soil Boring	N	25	25.7 U	39.8 U	--
	2/13/2017	Soil Boring	N	30	17.3 U	26.8 U	--
SB-41	2/14/2017	Soil Boring	N	5	17.9 U	27.8 U	--
	2/14/2017	Soil Boring	N	10	19.3 U	29.8 U	--
	2/14/2017	Soil Boring	N	15	20.3 U	31.4 U	--
	2/14/2017	Soil Boring	N	20	25.7 U	39.7 U	--

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	2/14/2017	Soil Boring	N	25	26.5 U	41 U	--
	2/14/2017	Soil Boring	N	30	22.4 U	34.6 U	--
	2/14/2017	Soil Boring	FD	30	22.6 U	35 U	--
SB-44	4/7/2017	Soil Boring	N	5	17.9 U	27.7 U	--
	4/7/2017	Soil Boring	N	10	19.5 U	30.2 U	--
	4/7/2017	Soil Boring	N	15	20 U	31 U	--
	4/7/2017	Soil Boring	N	20	22.7 U	35.2 U	--
	4/7/2017	Soil Boring	N	25	18.9 U	29.3 U	--
	4/7/2017	Soil Boring	N	30	21.1 U	32.7 U	--
SB101B	1/23/2018	Soil Boring	N	5	0.59 U	0.83 U	--
	1/23/2018	Soil Boring	N	15	0.52 U	**4.9**	--
	1/23/2018	Soil Boring	N	25	**4.2 J**	**5.5**	--
SB102B	1/24/2018	Soil Boring	N	5	**5.7**	**8.7**	--
	1/24/2018	Soil Boring	N	15	**8.7**	**10.6**	--
	1/24/2018	Soil Boring	N	25	**7.6**	**8.4**	--
	1/24/2018	Soil Boring	N	30	**10.7**	**10.2**	--
SB103B	1/25/2018	Soil Boring	N	5	**2.8 J**	**6.1**	--
	1/25/2018	Soil Boring	N	15	**4 J**	**4 J**	--
	1/25/2018	Soil Boring	N	22	**2.8 J**	**1.8 J**	--
	1/25/2018	Soil Boring	N	27	**7.2 J**	**3.8 J**	--
	1/25/2018	Soil Boring	FD	27	**10.6 J**	**5.5 J**	--
SB104B	1/25/2018	Soil Boring	N	5	0.57 U	0.8 U	--
	1/25/2018	Soil Boring	N	15	**13.7**	**5.1 J**	--
	1/25/2018	Soil Boring	N	22	**4.5 J**	**4.1 J**	--
	1/25/2018	Soil Boring	N	27	**7.2**	**3.6 J**	--
SB-201	12/13/2018	Soil Boring	N	5	30 U	31 U	--
	12/13/2018	Soil Boring	N	15	35 U	36 U	--
SB-202	12/13/2018	Soil Boring	N	5	28 U	30 U	--
	12/13/2018	Soil Boring	N	15	37 U	39 U	--
SB-203	12/13/2018	Soil Boring	N	5	30 U	31 U	--
	12/13/2018	Soil Boring	N	15	39 U	41 U	--
SB-204	12/13/2018	Soil Boring	N	5	31 U	32 U	--
	12/13/2018	Soil Boring	N	15	41 U	43 U	--
	12/13/2018	Soil Boring	FD	15	41 U	42 U	--
SB-205	12/13/2018	Soil Boring	N	5	29 U	31 U	--
	12/13/2018	Soil Boring	N	15	36 U	38 U	--
SB-206	6/19/2019	Soil Boring	N	5	28 U	29 U	--
	6/19/2019	Soil Boring	N	10	28 U	29 U	--
	6/19/2019	Soil Boring	N	15	37 U	39 U	--
	6/19/2019	Soil Boring	N	20	38 U	39 U	--
	6/19/2019	Soil Boring	N	25	34 U	35 U	--
	6/19/2019	Soil Boring	N	30	34 U	36 U	--
SB-207	6/21/2019	Soil Boring	N	5	30 U	31 U	--
	6/21/2019	Soil Boring	N	10	28 U	30 U	--
	6/21/2019	Soil Boring	N	15	30 U	31 U	--
	6/21/2019	Soil Boring	N	20	28 U	30 U	--
	6/21/2019	Soil Boring	N	25	29 U	30 U	--
	6/21/2019	Soil Boring	N	30	29 U	30 U	--
SB-208	6/20/2019	Soil Boring	N	5	30 U	31 U	--
	6/20/2019	Soil Boring	N	10	33 U	34 U	--
	6/20/2019	Soil Boring	N	15	32 U	**39 J**	--
	6/20/2019	Soil Boring	N	20	30 U	**35 J**	--
	6/20/2019	Soil Boring	N	25	29 U	30 U	--
	6/20/2019	Soil Boring	N	30	32 U	34 U	--
SV-105	3/7/2018	Sub-slab Soil	N	0	0.7 U	0.99 U	--
	3/7/2018	Sub-slab Soil	N	3	0.59 U	0.83 U	--
SV-106	3/7/2018	Sub-slab Soil	N	0	**8.3**	**5.7**	--

Table 4-4. Summary of Analytical Vadose Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Vadose at 13 C			42	74	5,000
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	3/7/2018	Sub-slab Soil	N	3	0.66 U	0.94 U	--
SV-107	3/7/2018	Sub-slab Soil	N	0	**1.4 J**	**0.97 J**	--
	3/7/2018	Sub-slab Soil	N	2	**1.7 J**	**1.1 J**	--
SV-108	3/30/2018	Sub-slab Soil	N	0	0.7 U	0.99 U	--
	3/30/2018	Sub-slab Soil	N	3	0.8 U	1.1 U	--
SV-109	3/30/2018	Sub-slab Soil	N	0	0.59 U	0.84 U	--
	3/30/2018	Sub-slab Soil	N	3	0.81 U	1.1 U	--
SV-110	3/8/2018	Sub-slab Soil	N	0	0.56 U	0.79 U	--
	3/8/2018	Sub-slab Soil	N	3	0.59 U	0.83 U	--
SV-112	3/30/2018	Sub-slab Soil	N	0	0.6 U	0.85 U	--
	3/30/2018	Sub-slab Soil	N	3	**1.1 J**	0.83 U	--
SV-113	3/30/2018	Sub-slab Soil	N	0	0.64 U	0.9 U	--
	3/30/2018	Sub-slab Soil	FD	0	0.55 U	0.78 U	--
	3/30/2018	Sub-slab Soil	N	1.5	0.56 U	0.8 U	--
	3/30/2018	Sub-slab Soil	FD	1.5	0.6 U	0.85 U	--
SV-114	3/30/2018	Sub-slab Soil	N	3	0.53 U	0.75 U	--

Notes:
Detections in **bold**
-- = not analyzed
µg/kg = microgram(s) per kilogram
C = degrees centigrade
FD = field duplicate
ft = feet
J = estimated result
MTCA = Model Toxics Control Act
N = normal sample
U = not detected at or above the indicated reporting limit
UJ = not detected; indicated reporting limit is estimated
UR = not detected; result was rejected and is not usable

Table 4-5. Summary of Analytical Saturated Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Saturated			2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
MW-1D	7/6/2016	Soil Boring	N	35	1.7 U	1.7 U	--
	7/6/2016	Soil Boring	N	40	2.1 U	2.1 U	--
	7/6/2016	Soil Boring	N	45	2.1 U	2.1 U	--
MW-2D	7/1/2016	Soil Boring	N	35	26 U	26 U	--
	7/1/2016	Soil Boring	N	40	25 U	25 U	--
	7/1/2016	Soil Boring	N	45	27 U	27 U	--
	7/1/2016	Soil Boring	FD	45	26 U	26 U	--
	7/1/2016	Soil Boring	N	50	26 U	26 U	--
	7/1/2016	Soil Boring	N	55	24 U	24 U	--
	7/1/2016	Soil Boring	N	60	23 U	23 U	--
	7/1/2016	Soil Boring	N	65	26 U	26 U	--
	7/1/2016	Soil Boring	N	70	27 U	27 U	--
	7/1/2016	Soil Boring	N	75	29 U	29 U	--
	7/1/2016	Soil Boring	N	80	25 U	25 U	--
	7/1/2016	Soil Boring	N	85	24 U	24 U	--
MW-3D	5/10/2016	Soil Boring	N	35	26 U	26 U	--
	5/10/2016	Soil Boring	N	40	26 U	26 U	--
	5/10/2016	Soil Boring	N	45	26 U	26 U	--
	5/10/2016	Soil Boring	N	50	29 U	29 U	--
	5/10/2016	Soil Boring	N	55	24 U	24 U	--
MW-5D	5/20/2016	Soil Boring	N	35	25 U	25 U	--
	5/20/2016	Soil Boring	N	40	25 U	25 U	--
	5/20/2016	Soil Boring	N	45	27 U	27 U	--
	5/20/2016	Soil Boring	N	50	23 U	23 U	--
	5/20/2016	Soil Boring	N	55	23 U	23 U	--
MW-6D	6/27/2016	Soil Boring	N	35	25 U	25 U	--
	6/27/2016	Soil Boring	N	40	27 U	27 U	--
	6/27/2016	Soil Boring	N	45	26 U	26 U	--
	6/27/2016	Soil Boring	FD	45	27 U	27 U	--
	6/27/2016	Soil Boring	N	50	26 U	26 U	--
MW-8S (SB-05)	5/17/2016	Soil Boring	N	35	26 U	26 U	--
	5/17/2016	Soil Boring	N	40	**27**	24 U	--
	5/17/2016	Soil Boring	N	45	**35**	26 U	--
	5/17/2016	Soil Boring	N	50	22 U	22 U	--
MW-9S (SB-04)	5/16/2016	Soil Boring	N	35	**160**	26 U	--
	5/16/2016	Soil Boring	N	40	**100**	26 U	--
	5/16/2016	Soil Boring	FD	40	**98**	26 U	--
SB-01	5/11/2016	Soil Boring	N	35	25 U	25 U	--
	5/11/2016	Soil Boring	N	40	24 U	24 U	--
	5/11/2016	Soil Boring	N	45	26 U	26 U	--
	5/11/2016	Soil Boring	N	47	25 U	25 U	--
	5/11/2016	Soil Boring	FD	47	26 U	26 U	--
SB-02	5/12/2016	Soil Boring	N	35	27 U	27 U	--
	5/12/2016	Soil Boring	N	40	24 U	24 U	--
	5/12/2016	Soil Boring	N	45	25 U	25 U	--
	5/12/2016	Soil Boring	FD	45	25 U	25 U	--
	5/12/2016	Soil Boring	N	50	26 U	26 U	--
	5/12/2016	Soil Boring	N	55	27 U	27 U	--
	5/12/2016	Soil Boring	N	60	27 U	27 U	--
	5/12/2016	Soil Boring	N	65	29 U	29 U	--
	5/12/2016	Soil Boring	N	70	28 U	28 U	--
	5/12/2016	Soil Boring	N	75	26 U	26 U	--
SB-03	5/13/2016	Soil Boring	N	35	26 U	26 U	--
	5/13/2016	Soil Boring	N	40	23 U	23 U	--
SB-06	5/18/2016	Soil Boring	N	35	26 U	26 U	--
	5/18/2016	Soil Boring	FD	35	25 U	25 U	--
	5/18/2016	Soil Boring	N	40	26 U	26 U	--
	5/18/2016	Soil Boring	N	45	26 U	26 U	--

Table 4-5. Summary of Analytical Saturated Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Saturated			2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	5/18/2016	Soil Boring	N	50	22 U	22 U	--
	5/18/2016	Soil Boring	N	56	25 U	25 U	--
	5/19/2016	Soil Boring	N	61	24 U	24 U	--
	5/19/2016	Soil Boring	N	65	23 U	23 U	--
	5/19/2016	Soil Boring	N	70	27 U	27 U	--
	5/19/2016	Soil Boring	N	75	26 U	26 U	--
SB-07	5/20/2016	Soil Boring	N	35	26 U	26 U	--
	5/20/2016	Soil Boring	N	40	25 U	25 U	--
	5/20/2016	Soil Boring	N	45	32 U	32 U	--
	5/20/2016	Soil Boring	N	50	26 U	26 U	--
	5/20/2016	Soil Boring	N	55	27 U	27 U	--
	5/20/2016	Soil Boring	N	60	33 U	33 U	--
	5/20/2016	Soil Boring	N	65	26 U	26 U	--
	5/20/2016	Soil Boring	N	70	24 U	24 U	--
	5/20/2016	Soil Boring	N	75	24 U	24 U	--
SB-08	5/23/2016	Soil Boring	N	35	27 U	27 U	--
	5/23/2016	Soil Boring	N	40	25 U	25 U	--
	5/23/2016	Soil Boring	FD	40	**36**	26 U	--
	5/23/2016	Soil Boring	N	45	**28**	26 U	--
	5/23/2016	Soil Boring	N	50	24 U	24 U	--
SB-09	5/23/2016	Soil Boring	N	35	27 U	27 U	--
	5/23/2016	Soil Boring	N	39	23 U	23 U	--
SB-10	5/24/2016	Soil Boring	N	35	26 U	26 U	--
	5/24/2016	Soil Boring	FD	35	27 U	27 U	--
	5/24/2016	Soil Boring	N	40	25 U	25 U	--
	5/24/2016	Soil Boring	N	45	23 U	23 U	--
SB-11	5/25/2016	Soil Boring	N	35	24 U	24 U	--
	5/25/2016	Soil Boring	N	40	25 U	25 U	--
	5/25/2016	Soil Boring	N	45	25 U	25 U	--
	5/25/2016	Soil Boring	N	50	25 U	25 U	--
	5/25/2016	Soil Boring	N	55	25 U	25 U	--
	5/25/2016	Soil Boring	N	60	24 U	24 U	--
	5/25/2016	Soil Boring	N	65	23 U	23 U	--
SB11	4/23/2014	Soil Boring	N	32 - 32.5	7.5 U	7.5 U	7.5 U
SB-12	5/25/2016	Soil Boring	N	35	25 U	25 U	--
	5/25/2016	Soil Boring	N	40	24 U	24 U	--
	5/25/2016	Soil Boring	N	45	25 U	25 U	--
	5/25/2016	Soil Boring	N	50	25 U	25 U	--
	5/25/2016	Soil Boring	N	55	24 U	24 U	--
SB-13	5/26/2016	Soil Boring	N	35	27 U	27 U	--
	5/26/2016	Soil Boring	N	40	31 U	31 U	--
	5/26/2016	Soil Boring	N	45	28 U	28 U	--
	5/26/2016	Soil Boring	N	50	27 U	27 U	--
	5/26/2016	Soil Boring	N	55	26 U	26 U	--
	5/26/2016	Soil Boring	N	60	25 U	25 U	--
	5/26/2016	Soil Boring	N	63	24 U	24 U	--
SB13	4/24/2014	Soil Boring	N	30 - 30.5	**15**	**6.6 J**	7.3 U
SB-14	5/26/2016	Soil Boring	N	35	25 U	25 U	--
	5/26/2016	Soil Boring	N	40	27 U	27 U	--
	5/26/2016	Soil Boring	N	45	31 U	31 U	--
	5/26/2016	Soil Boring	N	50	31 U	31 U	--
	5/26/2016	Soil Boring	N	54	24 U	24 U	--
SB-15	6/30/2016	Soil Boring	N	35	25 U	25 U	--
	6/30/2016	Soil Boring	N	40	25 U	25 U	--
	6/30/2016	Soil Boring	N	45	26 U	26 U	--
	6/30/2016	Soil Boring	N	50	24 U	24 U	--
	6/30/2016	Soil Boring	N	55	24 U	24 U	--
	6/30/2016	Soil Boring	N	60	23 U	23 U	--

Table 4-5. Summary of Analytical Saturated Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Saturated			2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	6/30/2016	Soil Boring	N	65	26 U	26 U	--
	6/30/2016	Soil Boring	FD	65	25 U	25 U	--
	6/30/2016	Soil Boring	N	70	27 U	27 U	--
	6/30/2016	Soil Boring	N	75	23 U	23 U	--
	6/30/2016	Soil Boring	N	80	25 U	25 U	--
	6/30/2016	Soil Boring	N	85	26 U	26 U	--
	6/30/2016	Soil Boring	N	90	22 U	22 U	--
	6/30/2016	Soil Boring	N	95	24 U	24 U	--
SB-17	6/28/2016	Soil Boring	N	35	26 U	26 U	--
	6/28/2016	Soil Boring	FD	35	25 U	25 U	--
	6/28/2016	Soil Boring	N	40	20 U	20 U	--
	6/28/2016	Soil Boring	N	45	21 U	21 U	--
	6/28/2016	Soil Boring	N	50	26 U	26 U	--
	6/28/2016	Soil Boring	N	55	25 U	25 U	--
	6/28/2016	Soil Boring	N	60	28 U	28 U	--
	6/28/2016	Soil Boring	N	65	29 U	29 U	--
	6/28/2016	Soil Boring	N	70	26 U	26 U	--
	6/28/2016	Soil Boring	N	75	26 U	26 U	--
	6/28/2016	Soil Boring	N	80	25 U	25 U	--
SB-18	6/30/2016	Soil Boring	N	35	**43**	28 U	--
	6/30/2016	Soil Boring	N	40	**35**	26 U	--
	6/30/2016	Soil Boring	N	45	27 U	27 U	--
	6/30/2016	Soil Boring	N	50	26 U	26 U	--
SB-19	6/30/2016	Soil Boring	N	35	26 U	26 U	--
	6/30/2016	Soil Boring	FD	35	25 U	25 U	--
	6/30/2016	Soil Boring	N	40	26 U	26 U	--
SB-20	7/6/2016	Soil Boring	N	35	**14**	**9.1**	--
	7/6/2016	Soil Boring	FD	35	0.21 U	**0.53 J**	--
	7/6/2016	Soil Boring	N	39	**17**	**10**	--
SB-21	7/7/2016	Soil Boring	N	35	0.31 U	0.31 U	--
	7/7/2016	Soil Boring	N	40	0.26 U	0.26 U	--
	7/7/2016	Soil Boring	N	45	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	50	0.32 U	0.32 U	--
	7/7/2016	Soil Boring	N	55	0.29 U	0.29 U	--
	7/7/2016	Soil Boring	N	60	0.33 U	0.33 U	--
	7/7/2016	Soil Boring	N	65	0.3 U	0.3 U	--
SB-22	7/20/2016	Soil Boring	N	35	**20**	**8.3**	--
SB-23	7/20/2016	Soil Boring	N	35	0.36 U	0.36 U	--
	7/20/2016	Soil Boring	N	40	0.32 U	0.32 U	--
	7/20/2016	Soil Boring	N	45	0.37 U	0.37 U	--
	7/20/2016	Soil Boring	N	50	0.32 U	0.32 U	--
	7/20/2016	Soil Boring	N	55	0.38 U	0.38 U	--
	7/20/2016	Soil Boring	N	60	0.26 U	0.26 U	--
SB-24	7/21/2016	Soil Boring	N	35	0.25 U	0.25 U	--
	7/21/2016	Soil Boring	N	40	0.27 U	0.27 U	--
	7/21/2016	Soil Boring	FD	40	0.29 U	0.29 U	--
	7/21/2016	Soil Boring	N	45	0.28 U	0.28 U	--
	7/21/2016	Soil Boring	N	50	0.25 U	0.25 U	--
	7/21/2016	Soil Boring	N	55	0.32 U	0.32 U	--
SB-26	11/19/2016	Soil Boring	N	31	0.26 U	0.099 U	--
SB-34	1/9/2017	Soil Boring	N	35	**58.2 J**	32.4 U	--
	1/9/2017	Soil Boring	N	40	24.2 U	37.5 U	--
	1/9/2017	Soil Boring	N	45	21.1 U	32.7 U	--
	1/9/2017	Soil Boring	N	50	24.6 U	38.1 U	--
	1/9/2017	Soil Boring	N	55	23.2 U	35.9 U	--
	1/9/2017	Soil Boring	N	60	23 U	35.6 U	--
	1/10/2017	Soil Boring	N	65	18.8 U	29.2 U	--
	1/10/2017	Soil Boring	FD	65	17.3 U	26.8 U	--

Table 4-5. Summary of Analytical Saturated Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Saturated			2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
SB-35	1/13/2017	Soil Boring	N	35	22.5 U	34.7 U	--
	1/13/2017	Soil Boring	N	40	20.8 U	32.2 U	--
	1/13/2017	Soil Boring	N	45	20.1 U	31.2 U	--
	1/13/2017	Soil Boring	N	50	20.5 U	31.7 U	--
	1/13/2017	Soil Boring	N	55	19.1 U	29.6 U	--
	1/13/2017	Soil Boring	N	60	23.7 U	36.7 U	--
	1/13/2017	Soil Boring	N	65	23.7 U	36.6 U	--
	1/13/2017	Soil Boring	N	70	24.4 U	37.8 U	--
	1/13/2017	Soil Boring	N	75	25.5 U	39.5 U	--
	1/13/2017	Soil Boring	N	80	21.8 U	33.7 U	--
SB-36	1/11/2017	Soil Boring	N	35	21.5 U	33.3 U	--
	1/11/2017	Soil Boring	FD	35	20.4 U	31.5 U	--
	1/11/2017	Soil Boring	N	40	20.6 U	31.9 U	--
	1/11/2017	Soil Boring	N	45	23.4 U	36.3 U	--
	1/11/2017	Soil Boring	N	50	21 U	32.6 U	--
SB-37	1/11/2017	Soil Boring	N	35	19.2 U	29.7 U	--
	1/11/2017	Soil Boring	FD	35	21.6 U	33.4 U	--
	1/12/2017	Soil Boring	N	40	23.6 U	36.6 U	--
	1/12/2017	Soil Boring	N	45	23.9 U	37 U	--
	1/12/2017	Soil Boring	N	50	25.4 U	39.4 U	--
	1/12/2017	Soil Boring	N	55	26.4 U	40.8 U	--
	1/12/2017	Soil Boring	N	60	23.8 U	36.8 U	--
	1/12/2017	Soil Boring	N	65	22.4 U	34.7 U	--
	1/12/2017	Soil Boring	N	70	24.6 U	38 U	--
	1/12/2017	Soil Boring	N	75	20.5 U	31.7 U	--
	1/12/2017	Soil Boring	N	80	19.6 U	30.3 U	--
SB-40	2/13/2017	Soil Boring	N	35	17.3 U	26.8 U	--
	2/13/2017	Soil Boring	N	40	19.3 U	29.9 U	--
	2/13/2017	Soil Boring	N	45	23 U	35.6 U	--
	2/13/2017	Soil Boring	N	50	22.8 U	35.3 U	--
	2/13/2017	Soil Boring	N	55	23.1 U	35.8 U	--
	2/13/2017	Soil Boring	N	60	22.6 U	35 U	--
	2/13/2017	Soil Boring	FD	60	20.8 U	32.3 U	--
	2/13/2017	Soil Boring	N	65	22.9 U	35.5 U	--
	2/13/2017	Soil Boring	N	70	21.9 U	33.9 U	--
	2/13/2017	Soil Boring	N	75	19.7 U	30.5 U	--
	2/13/2017	Soil Boring	N	80	19.5 U	30.2 U	--
	2/13/2017	Soil Boring	FD	80	18.1 U	27.9 U	--
	2/13/2017	Soil Boring	N	85	15.4 U	23.8 U	--
	2/13/2017	Soil Boring	N	90	15.2 U	23.5 U	--
	2/13/2017	Soil Boring	N	95	19.4 U	30 U	--
SB-41	2/14/2017	Soil Boring	N	35	23.5 U	36.4 U	--
	2/14/2017	Soil Boring	N	40	16.2 U	25.1 U	--
	2/14/2017	Soil Boring	N	45	17.3 U	26.8 U	--
SB-44	4/7/2017	Soil Boring	N	35	20.5 U	31.8 U	--
	4/7/2017	Soil Boring	N	40	19.7 U	30.4 U	--
	4/7/2017	Soil Boring	N	45	20.4 U	31.5 U	--
	4/7/2017	Soil Boring	FD	45	35.3 U	54.7 U	--
	4/7/2017	Soil Boring	N	50	22.9 U	35.5 U	--
	4/7/2017	Soil Boring	N	55	21.9 U	33.8 U	--
	4/7/2017	Soil Boring	N	60	21.5 U	33.3 U	--
	4/7/2017	Soil Boring	N	65	22.9 U	35.4 U	--
	4/7/2017	Soil Boring	N	70	24.6 U	38.1 U	--
	4/7/2017	Soil Boring	N	72.5	54.6 U	84.4 U	--
SB101B	1/23/2018	Soil Boring	N	36	**20.6**	**9.4**	--
SB-206	6/19/2019	Soil Boring	N	35	34 U	36 U	--
	6/19/2019	Soil Boring	N	40	33 U	35 U	--
	6/19/2019	Soil Boring	N	45	36 U	38 U	--

Table 4-5. Summary of Analytical Saturated Zone Soil Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
		MTCA Protection of Groundwater, Saturated			2.2	4.8	270
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/kg)		
	6/19/2019	Soil Boring	N	50	37 U	39 U	--
	6/19/2019	Soil Boring	N	55	33 U	35 U	--
	6/19/2019	Soil Boring	N	60	34 U	35 U	--
	6/19/2019	Soil Boring	N	65	32 U	34 U	--
	6/19/2019	Soil Boring	N	70	33 U	34 U	--
	6/19/2019	Soil Boring	FD	70	35 U	37 U	--
	6/19/2019	Soil Boring	N	77	33 U	34 U	--
	6/19/2019	Soil Boring	FD	77	29 U	30 U	--
SB-207	6/21/2019	Soil Boring	N	35	29 U	31 U	--
	6/21/2019	Soil Boring	N	40	30 U	32 U	--
	6/21/2019	Soil Boring	N	45	36 U	38 U	--
	6/21/2019	Soil Boring	N	50	34 U	35 U	--
	6/21/2019	Soil Boring	N	55	38 U	40 U	--
	6/21/2019	Soil Boring	N	60	46 U	48 U	--
	6/21/2019	Soil Boring	N	65	36 U	38 U	--
	6/21/2019	Soil Boring	FD	65	36 U	38 U	--
	6/21/2019	Soil Boring	N	70	37 U	39 U	--
	6/21/2019	Soil Boring	N	75	35 U	36 U	--
SB-208	6/20/2019	Soil Boring	N	35	37 U	39 U	--
	6/20/2019	Soil Boring	N	40	38 U	39 U	--
	6/20/2019	Soil Boring	N	45	36 U	38 U	--
	6/20/2019	Soil Boring	N	50	32 U	33 U	--
	6/20/2019	Soil Boring	FD	50	42 U	44 U	--
	6/20/2019	Soil Boring	N	55	39 U	40 U	--
	6/20/2019	Soil Boring	N	60	39 U	**43 J**	--
	6/20/2019	Soil Boring	N	65	38 U	40 U	--
	6/20/2019	Soil Boring	N	70	36 U	37 U	--
	6/20/2019	Soil Boring	N	75	35 U	37 U	--
	6/20/2019	Soil Boring	N	80	36 U	37 U	--
	6/20/2019	Soil Boring	N	85	34 U	36 U	--
	6/20/2019	Soil Boring	N	90	35 U	37 U	--

Notes:
Detections in **bold**
-- = not analyzed
µg/kg = microgram(s) per kilogram
C = degrees centigrade
FD = field duplicate
ft = feet
J = estimated result
MTCA = Model Toxics Control Act
N = normal sample
U = not detected at or above the indicated reporting limit
UJ = not detected; indicated reporting limit is estimated
UR = not detected; result was rejected and is not usable

Table 4-6. Summary of Passive Soil Vapor Data – Carbon Tetrachloride

Location	Group	Type	Depth (feet bgs)	Sample Date	Carbon tetrachloride Analytical Data (µg/m^3)
SV02	Passive Soil Vapor	N	5	10/12/2017	6.6 U
SV03	Passive Soil Vapor	N	5	10/12/2017	6.6 U
SV04	Passive Soil Vapor	N	5	10/12/2017	6.6 U
SV05	Passive Soil Vapor	N	5	10/12/2017	6.6 U
SV06	Passive Soil Vapor	N	5	10/12/2017	6.6 U
SV07	Passive Soil Vapor	N	5	10/12/2017	6.6 U
SV08	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV10	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV11	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV12	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV13	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV14	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV15	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV16	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV17	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV18	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV19	Passive Soil Vapor	N	5	10/16/2017	**160**
SV20	Passive Soil Vapor	N	5	10/16/2017	5.8 U
SV23	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV24	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV25	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV26	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV27	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV28	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV29	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV30	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV31	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV32	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV33	Passive Soil Vapor	N	3	10/17/2017	5.8 U
SV34	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV35	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV36	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV37	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV38	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV39	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV40	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV41	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV42	Passive Soil Vapor	N	5	10/17/2017	5.8 U
SV43	Passive Soil Vapor	N	5	10/17/2017	5.9 U
SV44	Passive Soil Vapor	N	5	10/17/2017	5.9 U
SV45	Passive Soil Vapor	N	5	10/17/2017	5.9 U
SV46	Passive Soil Vapor	N	5	10/17/2017	**16**
SV47	Passive Soil Vapor	N	5	10/17/2017	5.9 U
SV49	Passive Soil Vapor	N	5	10/17/2017	**390**
SV50	Passive Soil Vapor	N	5	10/17/2017	**92**
SV51	Passive Soil Vapor	N	5	10/17/2017	**44**
SV52	Passive Soil Vapor	N	5	10/17/2017	**140**
SV53	Passive Soil Vapor	N	5	10/17/2017	**480**
SV54	Passive Soil Vapor	N	5	10/17/2017	**15**
SV55	Passive Soil Vapor	N	5	10/17/2017	**40**
SV56	Passive Soil Vapor	N	5	10/17/2017	**210**
SV57	Passive Soil Vapor	N	5	10/17/2017	6 U
SV58	Passive Soil Vapor	N	5	10/17/2017	**150**

Table 4-6. Summary of Passive Soil Vapor Data – Carbon Tetrachloride

Location	Group	Type	Depth (feet bgs)	Sample Date	Carbon tetrachloride Analytical Data (µg/m^3)
SV59	Passive Soil Vapor	N	5	10/17/2017	**88**
SV60	Passive Soil Vapor	N	5	10/17/2017	**25**
SV61	Passive Soil Vapor	N	5	10/17/2017	6 U
SV62	Passive Soil Vapor	N	5	10/17/2017	6 U
SV63	Passive Soil Vapor	N	5	10/17/2017	6 U
SV64	Passive Soil Vapor	N	5	10/17/2017	6 U
SV65	Passive Soil Vapor	N	5	10/17/2017	6 U
SV66	Passive Soil Vapor	N	5	10/17/2017	6 U
SV67	Passive Soil Vapor	N	5	10/17/2017	6 U
SV68	Passive Soil Vapor	N	5	10/17/2017	6 U
SV69	Passive Soil Vapor	N	5	10/17/2017	6 U
SV70	Passive Soil Vapor	N	5	10/17/2017	6 U
SV72	Passive Soil Vapor	N	5	10/17/2017	6 U
SV73	Passive Soil Vapor	N	5	10/17/2017	**6.9**
SV74	Passive Soil Vapor	N	5	10/17/2017	**9.1**
SV75	Passive Soil Vapor	N	5	10/17/2017	**90**
SV76	Passive Soil Vapor	N	5	10/17/2017	**39**
SV77	Passive Soil Vapor	N	5	10/17/2017	**210**
SV78	Passive Soil Vapor	N	5	10/17/2017	6 U
SV80	Passive Soil Vapor	N	5	10/17/2017	**14**
SV81	Passive Soil Vapor	N	5	10/17/2017	**48**
SV82	Passive Soil Vapor	N	5	10/17/2017	**37**
SV83	Passive Soil Vapor	N	5	10/17/2017	6 U
SV84	Passive Soil Vapor	N	5	10/17/2017	6 U
SV85	Passive Soil Vapor	N	5	10/17/2017	6 U
SV86	Passive Soil Vapor	N	5	10/17/2017	6 U
SV87	Passive Soil Vapor	N	5	10/17/2017	6 U
SV88	Passive Soil Vapor	N	5	10/17/2017	6 U
SV89	Passive Soil Vapor	N	5	10/17/2017	6 U
SV90	Passive Soil Vapor	N	5	10/17/2017	6 U
SV92	Passive Soil Vapor	N	4	10/17/2017	**26**

Notes:
Detections in **bold**

µg/m^3 = microgram(s) per cubic meter
bgs = below ground surface
N = normal sample
U = not detected at or above the indicated reporting limit

Table 4-7. Summary of Analytical Soil Vapor Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/m^3)		
			MTCA Method B Cancer[a]		42	11	NE
Location	Group	Type	Depth	Sample Date	Analytical Data (µg/m^3)		
SB101A	Soil Vapor	N	5	2/7/2018	**8.7**	**3.4 J**	**46.5**
SB101A	Soil Vapor	N	25	2/7/2018	**25,700**	**4,170 J**	**199 J**
SB101A	Soil Vapor	FD	25	2/7/2018	**28,000**	**2,220 J**	**102 J**
SB102A	Soil Vapor	N	5	2/7/2018	**903**	**509**	**41.4**
SB102A	Soil Vapor	N	15	2/7/2018	**3,500**	**1,500**	**32.9**
SB103A	Soil Vapor	N	5	2/7/2018	**2,160**	**2,000**	**17.6**
SB104A	Soil Vapor	N	5	2/7/2018	**281**	**141**	**17.6**
SB104A	Soil Vapor	N	15	2/7/2018	**1,850**	**996**	**46.7**
SB104A	Soil Vapor	N	22	2/7/2018	**12,100**	**840**	**42.5**
SB104A	Soil Vapor	N	27	2/7/2018	**19,700**	**1,320**	**46.4**

Notes:

[a] = 2015 Deep Soil Gas Screening Level

Detections in **bold**

µg/m^3 = microgram(s) per cubic meter

bgs = below ground surface

FD = field duplicate

J = estimated result

N = normal sample

Table 4-8. Summary of Analytical Sub-slab Soil Vapor Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Group	Type	Sample Date	Carbon tetrachloride	Chloroform	Carbon disulfide
				Screening Levels (µg/m³)		
		MTCA Method B Cancer[a]		14	3.6	NE
				Analytical Data (µg/m³)		
Elementary School Gym Supply Closet	Sub-slab Soil Vapor	N	12/19/2017	**0.23**	**0.12**	NA
High School Basement Utility Room	Sub-slab Soil Vapor	N	12/19/2017	**0.29**	**0.12**	NA
Middle School Basement Storage Closet	Sub-slab Soil Vapor	N	12/19/2017	**1.8**	**1.8**	NA
SV-105	Sub-slab Soil Vapor	N	3/1/2018	**160**	**8.8**	**3.2**
SV-107	Sub-slab Soil Vapor	N	3/1/2018	**225**	**9.3**	**2.5**
SV-111	Sub-slab Soil Vapor	N	3/1/2018	**396**	**56.4**	**17**
SV-112	Sub-slab Soil Vapor	N	4/3/2018	**1.4**	**0.19 J**	NA
SV-113	Sub-slab Soil Vapor	N	4/3/2018	**503**	**34.2**	NA
SV-114	Sub-slab Soil Vapor	N	3/8/2018	**6.6**	**0.69**	NA

Notes:
[a] = 2015 Sub-Slab Soil Gas Screening Level
Detections in **bold**
µg/m³ = microgram(s) per cubic meter
J = estimated result
MTCA = Model Toxics Control Act
N = normal sample
NA = not analyzed
NE = not established

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
		MTCA Method B Cancer			0.63	1.4	NE
		MTCA Method B Non-cancer			NU	NU	800
					Analytical Data (µg/L)		
Asher Well	11/30/2016	Domestic Well	N	90	0.079 U	0.21 U	0.2 U
	02/24/2017	Domestic Well	N	90	0.079 U	0.21 U	0.2 U
	06/05/2017	Domestic Well	N	90	0.079 U	0.21 U	0.2 U
	09/12/2017	Domestic Well	N	90	0.2 U	0.46 U	0.37 U
	01/05/2018	Domestic Well	N	90	0.2 U	0.46 U	0.37 UJ
	01/05/2018	Domestic Well	FD	90	0.2 U	0.46 U	0.37 U
	03/20/2018	Domestic Well	N	90	0.2 U	0.46 U	0.37 U
	03/20/2018	Domestic Well	FD	90	0.2 U	0.46 U	0.37 U
	06/27/2018	Domestic Well	N	90	0.19 U	0.45 U	0.078 U
	09/28/2018	Domestic Well	N	90	0.19 U	0.45 U	0.078 UJ
	01/07/2019	Domestic Well	N	90	0.19 U	0.45 U	0.078 UJ
	03/21/2019	Domestic Well	N	90	0.19 U	0.45 U	0.078 U
	06/13/2019	Domestic Well	N	90	0.19 U	0.45 U	0.078 U
	10/03/2019	Domestic Well	N	90	0.19 U	0.45 U	0.19 U
	12/05/2019	Domestic Well	N	90	0.19 U	0.45 U	0.19 U
Atwood House	01/04/2018	Domestic Well	N	NA	0.2 U	0.46 U	0.37 UJ
	03/19/2018	Domestic Well	N	NA	0.2 U	0.46 U	0.37 U
	03/19/2018	Domestic Well	FD	NA	0.2 U	0.46 U	0.37 U
	07/31/2018	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	09/28/2018	Domestic Well	N	NA	0.19 U	0.45 U	0.078 UJ
	01/04/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	03/21/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	06/17/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	12/06/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.19 U
Atwood Shop	01/04/2018	Domestic Well	N	NA	0.2 U	0.46 U	0.37 UJ
	03/19/2018	Domestic Well	N	NA	0.2 U	0.46 U	0.37 U
	07/31/2018	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	09/28/2018	Domestic Well	N	NA	0.19 U	0.45 U	0.078 UJ
	01/04/2019	Domestic Well	N	NA	0.19 UJ	0.45 UJ	0.078 UJ
	03/21/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	06/17/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
Davey Well (W46)	07/27/2016	Domestic Well	N	NA	**18.3**	**5.3**	0.2 U
	09/08/2016	Domestic Well	N	NA	**22.3**	**5.8**	0.042 U
	02/24/2017	Domestic Well	N	NA	**17**	**4.6**	0.2 U
Freeman Store Well	01/21/2013	Domestic Well	N	NA	1 U	1 U	1 U
	07/27/2016	Domestic Well	N	NA	0.079 U	0.21 U	0.2 U
	08/19/2016	Domestic Well	N	NA	0.12 U	0.098 U	0.2 U
GSNE	11/02/2017	Grab	N	NA	0.2 U	0.46 U	0.37 U
Lang Well	09/08/2016	Domestic Well	N	225	**0.16**	**220**	**1.3**
	10/18/2016	Domestic Well	N	225	0.079 U	**1.9**	0.2 U
	12/01/2016	Domestic Well	N	225	0.079 U	0.21 U	0.2 U
	02/24/2017	Domestic Well	N	225	0.079 U	0.21 U	0.2 U
	06/06/2017	Domestic Well	N	225	0.079 U	0.21 U	0.2 U
	09/12/2017	Domestic Well	N	225	0.2 U	0.46 U	0.37 U
	01/05/2018	Domestic Well	N	225	0.2 U	0.46 U	0.37 UJ
	01/05/2018	Domestic Well	FD	225	0.2 U	0.46 U	0.37 U
	04/03/2018	Domestic Well	N	225	0.2 U	0.46 U	0.37 U
	06/27/2018	Domestic Well	N	225	0.19 U	0.45 U	0.078 U
	06/27/2018	Domestic Well	FD	225	0.19 U	0.45 U	0.078 U
	09/28/2018	Domestic Well	N	225	0.19 U	0.45 U	0.078 UJ
	01/15/2019	Domestic Well	N	225	0.19 U	0.45 U	0.078 U
	03/21/2019	Domestic Well	N	225	0.19 U	0.45 U	0.078 U
	06/17/2019	Domestic Well	N	225	0.19 U	0.45 U	0.078 U
	09/18/2019	Domestic Well	N	225	0.19 U	0.45 U	0.078 U
	12/05/2019	Domestic Well	N	225	0.19 U	0.45 U	0.19 U
Lashaw Well (Agricultural)	09/08/2016	Domestic Well	N	NA	**9.1**	**1.7**	0.042 U
	06/06/2017	Domestic Well	N	NA	**3.3**	**0.22 J**	0.2 U
	09/12/2017	Domestic Well	N	NA	**1.5**	**0.66**	0.37 U
	06/27/2018	Domestic Well	N	NA	**2**	0.45 U	0.13 UJ
	10/02/2018	Domestic Well	N	NA	**4.1**	**2**	**0.11**
	06/17/2019	Domestic Well	N	NA	**2.8**	**2.7**	0.078 U
	10/03/2019	Domestic Well	N	NA	**4.3**	0.45 U	0.19 U
Lashaw Well (Domestic)	11/30/2016	Domestic Well	N	150	**0.89**	0.21 U	0.2 U
	12/15/2016	Domestic Well	N	150	**0.7 J**	0.21 U	0.2 U
	02/24/2017	Domestic Well	N	150	**0.68**	0.21 U	0.2 U

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
Location	Sample Date	Group	Type	Depth (ft)	Analytical Data (µg/L)		
	06/06/2017	Domestic Well	N	150	**0.77**	0.21 U	0.2 U
	09/12/2017	Domestic Well	N	150	**0.59**	0.46 U	0.37 U
	01/09/2018	Domestic Well	N	150	**0.89**	0.46 U	0.37 U
	03/19/2018	Domestic Well	N	150	**0.82**	0.46 U	0.37 U
	03/19/2018	Domestic Well	FD	150	**1.2**	0.46 U	0.37 U
	06/27/2018	Domestic Well	N	150	**0.27 J**	0.45 U	0.078 U
	10/02/2018	Domestic Well	N	150	**0.48**	0.45 U	0.078 U
	03/21/2019	Domestic Well	N	150	**0.77**	0.45 U	0.078 U
	06/17/2019	Domestic Well	N	150	**0.51**	0.45 U	0.078 U
	10/03/2019	Domestic Well	N	150	**0.29 J**	0.45 U	0.19 U
	10/03/2019	Domestic Well	FD	150	**0.51**	0.45 U	0.19 U
	12/05/2019	Domestic Well	N	150	**0.54**	0.45 U	0.19 U
Marlow Well	07/27/2016	Domestic Well	N	82	**120**	**8.4**	0.2 U
	08/19/2016	Domestic Well	N	82	**123**	**9**	0.2 U
	11/30/2016	Domestic Well	N	82	**143**	**8.8**	**0.23**
	11/30/2016	Domestic Well	FD	82	**142**	**8.7**	**0.26**
	02/28/2017	Domestic Well	N	82	**85.3**	**6.9**	**0.24 J**
	05/31/2017	Domestic Well	N	82	**124**	**9.3**	**1.6**
	09/19/2017	Domestic Well	N	82	**126**	**9.5**	**0.49 J**
	09/19/2017	Domestic Well	FD	82	**142**	**8.7**	0.37 U
	12/12/2017	Domestic Well	N	82	**134**	**9.4**	**0.66 J**
	12/12/2017	Domestic Well	FD	82	**139**	**8.3**	**0.71 J**
	04/10/2018	Domestic Well	N	82	**112**	**7.7**	0.37 U
	06/27/2018	Domestic Well	N	82	**116**	**8.5**	**0.16 J**
	09/28/2018	Domestic Well	N	82	**167 J**	**9.7 J**	0.078 UJ
	01/07/2019	Domestic Well	N	82	**123**	**8.4**	**0.52 J**
	03/21/2019	Domestic Well	N	82	**104**	**7.6**	0.078 U
	06/17/2019	Domestic Well	N	82	**109**	**7.7**	**0.57 J**
	09/18/2019	Domestic Well	N	82	0.19 U	0.45 U	0.078 U
	10/10/2019	Domestic Well	N	82	**120**	**8.2**	0.19 U
	12/11/2019	Domestic Well	N	82	**94.9**	**11.4**	**0.45 J**
	12/11/2019	Domestic Well	FD	82	**97.3**	**10.4**	**0.43 J**
MW-1D	08/04/2016	Monitoring Well Water	N	93	0.12 U	0.098 U	0.2 U
	12/09/2016	Monitoring Well Water	N	93	0.079 U	0.21 U	0.2 U
	02/28/2017	Monitoring Well Water	N	93	0.079 U	0.21 U	**1.4**
	06/08/2017	Monitoring Well Water	N	93	0.079 U	0.21 U	**0.61 J**
	10/10/2017	Monitoring Well Water	N	93	0.2 U	0.46 U	0.37 U
	12/21/2017	Monitoring Well Water	N	93	0.2 U	0.46 U	0.37 U
	03/15/2018	Monitoring Well Water	N	93	0.2 U	0.46 U	0.37 U
	06/29/2018	Monitoring Well Water	N	93	0.19 U	0.45 U	0.078 U
	09/27/2018	Monitoring Well Water	N	93	0.19 U	0.45 U	0.078 U
	12/21/2018	Monitoring Well Water	N	93	0.19 U	0.45 U	0.078 UJ
	03/18/2019	Monitoring Well Water	N	93	0.19 U	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	N	93	0.19 U	0.45 U	0.078 U
	09/18/2019	Monitoring Well Water	N	93	0.19 U	0.45 U	0.078 U
	12/13/2019	Monitoring Well Water	N	93	0.19 U	0.45 U	0.19 U
MW-1S	08/04/2016	Monitoring Well Water	N	20	0.12 U	0.098 U	0.2 U
	06/02/2017	Monitoring Well Water	N	20	0.079 U	0.21 U	0.2 U
	10/12/2017	Monitoring Well Water	N	20	0.2 U	0.46 U	0.37 U
	01/15/2018	Monitoring Well Water	N	20	0.2 U	0.46 U	0.37 U
	03/16/2018	Monitoring Well Water	N	20	0.2 U	0.46 U	0.37 U
	06/26/2018	Monitoring Well Water	N	20	0.19 U	0.45 U	0.078 U
	09/25/2018	Monitoring Well Water	N	20	0.19 U	0.45 U	0.078 UJ
	12/20/2018	Monitoring Well Water	N	20	0.19 U	0.45 U	0.078 UJ
	03/13/2019	Monitoring Well Water	N	20	0.19 U	0.45 U	0.078 U
	06/27/2019	Monitoring Well Water	N	20	0.19 U	0.45 U	0.078 U
	09/14/2019	Monitoring Well Water	N	20	0.19 U	0.45 U	0.078 U
	12/19/2019	Monitoring Well Water	N	20	0.19 U	0.45 U	0.19 U
MW-2D	08/03/2016	Monitoring Well Water	N	140	0.12 U	0.098 U	0.2 U
	08/03/2016	Monitoring Well Water	FD	140	0.12 U	0.098 U	0.2 U
	12/09/2016	Monitoring Well Water	N	140	0.079 U	0.21 U	0.2 U
	02/28/2017	Monitoring Well Water	N	140	0.079 U	0.21 U	0.2 U
	06/08/2017	Monitoring Well Water	N	140	0.079 U	0.21 U	0.2 U
	09/14/2017	Monitoring Well Water	N	140	0.2 U	0.46 U	0.37 U
	01/15/2018	Monitoring Well Water	N	140	0.2 U	0.46 U	**0.78 J**

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
					Analytical Data (µg/L)		
	03/15/2018	Monitoring Well Water	N	140	**1.2**	0.46 U	0.37 U
	06/29/2018	Monitoring Well Water	N	140	0.19 U	0.45 U	0.078 U
	09/27/2018	Monitoring Well Water	N	140	0.19 U	0.45 U	0.078 U
	12/21/2018	Monitoring Well Water	N	140	0.19 U	0.45 U	0.078 UJ
	12/21/2018	Monitoring Well Water	FD	140	0.19 U	0.45 U	0.078 UJ
	03/18/2019	Monitoring Well Water	N	140	0.19 U	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	N	140	0.19 U	0.45 U	0.078 U
	09/18/2019	Monitoring Well Water	N	140	0.19 U	0.45 U	0.078 U
	12/13/2019	Monitoring Well Water	N	140	0.19 U	0.45 U	0.19 U
MW-3D	06/13/2016	Monitoring Well Water	N	173	0.12 U	0.098 U	0.2 U
	06/13/2016	Monitoring Well Water	FD	173	0.12 U	0.098 U	0.2 U
	12/10/2016	Monitoring Well Water	N	173	0.079 U	0.21 U	0.2 U
	03/03/2017	Monitoring Well Water	N	173	0.079 U	0.21 U	0.2 U
	06/09/2017	Monitoring Well Water	N	173	0.079 U	0.21 U	0.2 U
	09/14/2017	Monitoring Well Water	N	173	0.2 U	0.46 U	0.37 U
	01/15/2018	Monitoring Well Water	N	173	0.2 U	0.46 U	0.37 U
	03/14/2018	Monitoring Well Water	N	173	0.2 U	0.46 U	0.37 U
	06/29/2018	Monitoring Well Water	N	173	0.19 U	0.45 U	0.078 U
	09/27/2018	Monitoring Well Water	N	173	0.19 U	0.45 U	0.078 U
	12/18/2018	Monitoring Well Water	N	173	0.19 U	0.45 U	0.078 U
	12/18/2018	Monitoring Well Water	FD	173	0.19 U	0.45 U	0.078 U
	03/15/2019	Monitoring Well Water	N	173	0.19 U	0.45 U	0.078 U
	03/15/2019	Monitoring Well Water	FD	173	0.19 U	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	N	173	0.19 U	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	FD	173	0.19 U	0.45 U	0.078 U
	09/20/2019	Monitoring Well Water	N	173	0.19 U	0.45 U	0.078 U
	12/10/2019	Monitoring Well Water	N	173	0.19 U	0.45 U	0.19 U
MW-4D	08/04/2016	Monitoring Well Water	N	185	**4.8**	**0.6**	0.2 U
	08/04/2016	Monitoring Well Water	FD	185	**4.4**	**0.58**	0.2 U
	12/08/2016	Monitoring Well Water	N	185	**6.7**	**0.85**	0.2 U
	03/03/2017	Monitoring Well Water	N	185	**4.7**	**0.97**	0.2 U
	06/09/2017	Monitoring Well Water	N	185	**5.1**	**0.89 J**	0.2 U
	10/05/2017	Monitoring Well Water	N	185	**4.4**	**1**	0.37 U
	12/15/2017	Monitoring Well Water	N	185	**6.4**	0.46 U	0.37 U
	03/12/2018	Monitoring Well Water	N	185	**3.3**	**0.55**	0.37 U
	06/27/2018	Monitoring Well Water	N	185	**1.8**	**1.2**	0.078 U
	09/26/2018	Monitoring Well Water	N	185	**7.3 J**	0.45 UJ	0.078 UJ
	01/15/2019	Monitoring Well Water	N	185	**6.5**	**1**	0.078 U
	03/19/2019	Monitoring Well Water	N	185	**0.37 J**	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	N	185	**3.2**	**0.84 J**	0.078 U
	09/17/2019	Monitoring Well Water	N	185	**2.8**	**1**	0.078 U
	12/18/2019	Monitoring Well Water	N	185	**7.9**	**1.3 J**	0.19 U
MW-5D	08/03/2016	Monitoring Well Water	N	145	0.12 U	0.098 U	0.2 U
	12/08/2016	Monitoring Well Water	N	145	0.079 U	0.21 U	0.2 U
	03/01/2017	Monitoring Well Water	N	145	0.079 U	0.21 U	0.2 U
	06/09/2017	Monitoring Well Water	N	145	0.079 U	0.21 U	0.2 U
	10/10/2017	Monitoring Well Water	N	145	0.2 U	0.46 U	0.37 U
	12/19/2017	Monitoring Well Water	N	145	0.2 U	0.46 U	0.37 U
	03/13/2018	Monitoring Well Water	N	145	0.2 U	0.46 U	0.37 U
	06/28/2018	Monitoring Well Water	N	145	0.19 U	0.45 U	**0.082 J**
	09/26/2018	Monitoring Well Water	N	145	0.19 U	0.45 U	0.078 U
	12/18/2018	Monitoring Well Water	N	145	0.19 UJ	0.45 UJ	0.078 UJ
	03/18/2019	Monitoring Well Water	N	145	0.19 U	0.45 U	0.078 U
	06/25/2019	Monitoring Well Water	N	145	0.19 U	0.45 U	0.078 U
	09/17/2019	Monitoring Well Water	N	145	0.19 U	0.45 U	0.078 U
	12/16/2019	Monitoring Well Water	N	145	0.19 U	0.45 U	0.19 U
MW-6D	08/19/2016	Monitoring Well Water	N	222	**2**	0.098 U	0.2 U
	12/08/2016	Monitoring Well Water	N	222	**1.4**	0.21 U	0.2 U
	12/08/2016	Monitoring Well Water	FD	222	**1.2**	0.21 U	0.2 U
	03/01/2017	Monitoring Well Water	N	222	**2.5**	**0.35**	0.2 U
	03/01/2017	Monitoring Well Water	FD	222	**2.5**	**0.33**	0.2 U
	06/15/2017	Monitoring Well Water	N	222	**3.6**	**0.3 J**	0.2 U
	10/05/2017	Monitoring Well Water	N	222	**2.7**	0.46 U	0.37 U
	12/20/2017	Monitoring Well Water	N	222	**2.2**	0.46 U	0.37 U
	03/12/2018	Monitoring Well Water	N	222	**2.4**	0.46 U	0.37 U

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
					Analytical Data (µg/L)		
	06/27/2018	Monitoring Well Water	N	222	**0.34 J**	0.45 U	0.078 U
	06/27/2018	Monitoring Well Water	FD	222	**0.33 J**	0.45 U	0.078 U
	09/25/2018	Monitoring Well Water	N	222	**1**	0.45 U	0.078 U
	03/14/2019	Monitoring Well Water	N	222	**3.4**	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	N	222	0.19 U	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	FD	222	0.19 U	0.45 U	0.078 U
	09/19/2019	Monitoring Well Water	N	222	0.19 U	0.45 U	0.078 U
	12/12/2019	Monitoring Well Water	N	222	**0.48 J**	0.45 U	0.19 U
MW-6S	08/04/2016	Monitoring Well Water	N	40	0.12 U	0.098 U	0.2 U
	12/05/2016	Monitoring Well Water	N	40	0.079 U	0.21 U	**0.4 J**
	03/02/2017	Monitoring Well Water	N	40	0.079 U	0.21 U	0.2 U
	06/02/2017	Monitoring Well Water	N	40	0.079 U	0.21 U	0.2 U
	10/12/2017	Monitoring Well Water	N	40	0.2 U	0.46 U	0.37 U
	12/14/2017	Monitoring Well Water	N	40	0.2 U	0.46 U	0.37 U
	03/16/2018	Monitoring Well Water	N	40	0.2 U	0.46 U	0.37 U
	06/26/2018	Monitoring Well Water	N	40	0.19 U	0.45 U	0.078 U
	09/25/2018	Monitoring Well Water	N	40	0.19 U	0.45 U	0.078 UJ
	09/25/2018	Monitoring Well Water	FD	40	0.19 U	0.45 U	0.078 UJ
	12/20/2018	Monitoring Well Water	N	40	0.19 U	0.45 U	0.078 UJ
	03/13/2019	Monitoring Well Water	N	40	0.19 U	0.45 U	0.078 U
	06/27/2019	Monitoring Well Water	N	40	0.19 U	0.45 U	0.078 U
	09/14/2019	Monitoring Well Water	N	40	0.19 U	0.45 U	0.078 U
	12/19/2019	Monitoring Well Water	N	40	0.19 U	0.45 U	0.19 U
	12/19/2019	Monitoring Well Water	FD	40	0.19 U	0.45 U	0.19 U
MW-6U	08/25/2017	Monitoring Well Water	N	55	**15.3**	**2.2**	0.37 U
	10/12/2017	Monitoring Well Water	N	55	**40.3**	**1.6**	0.37 U
	01/15/2018	Monitoring Well Water	N	55	**62.3**	**2.6**	0.37 U
	03/12/2018	Monitoring Well Water	N	55	**55.7**	**2.2**	0.37 U
	06/27/2018	Monitoring Well Water	N	55	**51.1**	**2.1**	0.23 UJ
	09/25/2018	Monitoring Well Water	N	55	**50.2 J**	**2.3 J**	**0.5 J**
	03/14/2019	Monitoring Well Water	N	55	**26.6**	**1.2**	0.078 U
	06/26/2019	Monitoring Well Water	N	55	**46.1**	**2.2**	**0.65 J**
	09/19/2019	Monitoring Well Water	N	55	**82.3**	**2.7**	0.078 U
	12/12/2019	Monitoring Well Water	N	55	**80.9**	**4.6**	**0.21 J**
MW-7S	06/13/2016	Monitoring Well Water	N	43.5	**1.1**	**0.26 J**	0.2 U
	12/07/2016	Monitoring Well Water	N	43.5	**1.4**	0.21 U	0.2 U
	03/01/2017	Monitoring Well Water	N	43.5	**1.5**	0.21 U	0.2 U
	05/31/2017	Monitoring Well Water	N	43.5	**1.3**	0.21 U	0.2 U
	10/10/2017	Monitoring Well Water	N	43.5	**1.3**	0.46 U	0.37 U
	12/14/2017	Monitoring Well Water	N	43.5	**1.5**	0.46 U	0.37 U
	03/16/2018	Monitoring Well Water	N	43.5	0.2 U	0.46 U	0.37 U
	06/26/2018	Monitoring Well Water	N	43.5	**0.38 J**	0.45 U	0.078 U
	09/25/2018	Monitoring Well Water	N	43.5	**2**	0.45 U	0.078 UJ
	12/20/2018	Monitoring Well Water	N	43.5	**1.3**	0.45 U	0.078 UJ
	03/13/2019	Monitoring Well Water	N	43.5	**1**	0.45 U	0.078 U
	06/27/2019	Monitoring Well Water	N	43.5	**1.5**	0.45 U	0.078 U
	09/14/2019	Monitoring Well Water	N	43.5	**2.1**	0.45 U	0.078 U
	12/19/2019	Monitoring Well Water	N	43.5	**1.1**	0.45 U	0.19 U
MW-8S	06/13/2016	Monitoring Well Water	N	49.5	**181**	**60**	0.2 U
	12/05/2016	Monitoring Well Water	N	49.5	**274**	**61.5**	**0.26 J**
	03/03/2017	Monitoring Well Water	N	49.5	**231**	**57.2**	**1.1**
	06/02/2017	Monitoring Well Water	N	49.5	**190**	**49.5**	**1.2 J**
	10/12/2017	Monitoring Well Water	N	49.5	**208**	**51.7**	**1**
	12/14/2017	Monitoring Well Water	N	49.5	**222**	**46**	**1**
	03/16/2018	Monitoring Well Water	N	49.5	**147**	**49.2**	0.37 U
	06/26/2018	Monitoring Well Water	N	49.5	**121**	**43.1**	**0.27 J**
	09/25/2018	Monitoring Well Water	N	49.5	**157**	**46.2**	0.078 UJ
	12/20/2018	Monitoring Well Water	N	49.5	**147**	**43.5**	0.078 UJ
	03/13/2019	Monitoring Well Water	N	49.5	**214**	**51.4**	0.078 U
	06/27/2019	Monitoring Well Water	N	49.5	**133**	**42.6**	0.078 U
	09/14/2019	Monitoring Well Water	N	49.5	**193**	**43.4**	0.078 U
	12/19/2019	Monitoring Well Water	N	49.5	**167**	**38.9**	0.19 U
MW-9D	02/27/2017	Monitoring Well Water	N	90	**132**	**5.6**	**0.36**
	06/26/2017	Monitoring Well Water	N	90	**104**	**4.2**	**0.28 J**
	10/05/2017	Monitoring Well Water	N	90	**78.4**	**3.6**	0.37 U

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
						Screening Levels (µg/L)	
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
Location	Sample Date	Group	Type	Depth (ft)		Analytical Data (µg/L)	
	12/20/2017	Monitoring Well Water	N	90	**95.7**	**3.3**	**0.58 J**
	03/13/2018	Monitoring Well Water	N	90	**101**	**3.8**	0.37 U
	06/28/2018	Monitoring Well Water	N	90	**93.2**	**4.1**	**0.082 J**
	06/28/2018	Monitoring Well Water	FD	90	**94.8**	**4.1**	**0.28 J**
	09/27/2018	Monitoring Well Water	N	90	**96.6 J**	**4.1**	0.078 U
	09/27/2018	Monitoring Well Water	FD	90	**101 J**	**4.2 J**	0.078 UJ
	12/18/2018	Monitoring Well Water	N	90	**86.8**	**4.1**	0.078 U
	12/18/2018	Monitoring Well Water	FD	90	**85.9**	**3.8**	0.078 U
	03/15/2019	Monitoring Well Water	N	90	**124**	**4.5**	0.078 U
	03/15/2019	Monitoring Well Water	FD	90	**135**	**4.6**	0.078 U
	06/24/2019	Monitoring Well Water	N	90	**119**	**4.4**	0.078 U
	09/20/2019	Monitoring Well Water	N	90	**74.4**	**4**	0.078 U
	12/13/2019	Monitoring Well Water	N	90	**114**	**5.5**	0.19 U
MW-9S	06/13/2016	Monitoring Well Water	N	38.5	**506**	**95.1**	0.2 U
	12/05/2016	Monitoring Well Water	N	38.5	**1,000**	**102**	**0.6 J**
	03/01/2017	Monitoring Well Water	N	38.5	**540**	**74.4**	**1.4**
	06/02/2017	Monitoring Well Water	N	38.5	**512**	**72.4**	**2.7 J**
	10/12/2017	Monitoring Well Water	N	38.5	**557**	**72.5**	**2.4**
	12/14/2017	Monitoring Well Water	N	38.5	**541**	**65.8**	**6.4**
	03/16/2018	Monitoring Well Water	N	38.5	**289**	**53.4**	0.74 U
	06/26/2018	Monitoring Well Water	N	38.5	**309**	**57**	**0.13 J**
	09/25/2018	Monitoring Well Water	N	38.5	**408**	**54.8**	0.16 UJ
	09/25/2018	Monitoring Well Water	FD	38.5	**409**	**58.3**	**0.27 J**
	12/21/2018	Monitoring Well Water	N	38.5	**226**	**34.1**	0.078 UJ
	12/21/2018	Monitoring Well Water	FD	38.5	**227**	**37.7**	0.078 UJ
	03/13/2019	Monitoring Well Water	N	38.5	**326**	**51.4**	0.078 U
	06/27/2019	Monitoring Well Water	N	38.5	**286**	**48.4**	0.078 U
	09/14/2019	Monitoring Well Water	N	38.5	**347**	**54.5**	**0.97 J**
	09/14/2019	Monitoring Well Water	FD	38.5	**331**	**55.1**	**0.88 J**
	12/19/2019	Monitoring Well Water	N	38.5	**442**	**73.6**	0.19 U
	12/19/2019	Monitoring Well Water	FD	38.5	**368**	**64.2**	0.19 U
MW-9U	08/25/2017	Monitoring Well Water	N	66	**820**	**50.8**	**4.3**
	10/12/2017	Monitoring Well Water	N	66	**639**	**17.3**	**2**
	01/15/2018	Monitoring Well Water	N	66	**298**	**8.7**	**0.76 J**
	03/14/2018	Monitoring Well Water	N	66	**772**	**17**	**0.79**
	06/28/2018	Monitoring Well Water	N	66	**584 J**	**16.7**	**0.54 J**
	06/28/2018	Monitoring Well Water	FD	66	**606**	**16.5**	**0.66 J**
	09/27/2018	Monitoring Well Water	N	66	**618**	**14.8**	0.16 U
	09/27/2018	Monitoring Well Water	FD	66	**623**	**16**	**0.42 J**
	12/18/2018	Monitoring Well Water	N	66	**15.9**	0.45 U	0.078 U
	12/18/2018	Monitoring Well Water	FD	66	**15.1**	0.45 U	**0.17 J**
	03/15/2019	Monitoring Well Water	N	66	**810**	**21.8**	0.078 U
	03/15/2019	Monitoring Well Water	FD	66	**754**	**21.2**	**0.42 J**
	06/24/2019	Monitoring Well Water	N	66	**378**	**10.1**	0.078 U
	06/24/2019	Monitoring Well Water	FD	66	**386**	**11**	0.078 U
	09/20/2019	Monitoring Well Water	N	66	**514**	**14.4**	**1.6**
	09/20/2019	Monitoring Well Water	FD	66	**528**	**14.9**	**1.4**
	12/13/2019	Monitoring Well Water	N	66	**153**	**3.6 J**	0.19 U
MW-10S	08/04/2016	Monitoring Well Water	N	71	**3.8**	**1.5**	0.2 U
	12/07/2016	Monitoring Well Water	N	71	**25.8**	**1.1**	0.2 U
	03/03/2017	Monitoring Well Water	N	71	**31.6**	**1.5**	**0.21**
	05/31/2017	Monitoring Well Water	N	71	**34**	**2.3**	**0.66 J**
	10/12/2017	Monitoring Well Water	N	71	**1.9**	0.46 U	0.37 U
	12/14/2017	Monitoring Well Water	N	71	**0.86**	0.46 U	0.37 U
	03/16/2018	Monitoring Well Water	N	71	**7.3**	0.46 U	0.37 U
	06/26/2018	Monitoring Well Water	N	71	**0.46 J**	0.45 U	0.078 U
	09/25/2018	Monitoring Well Water	N	71	**0.84**	0.45 U	0.078 UJ
	12/20/2018	Monitoring Well Water	N	71	**0.42 J**	0.45 U	0.078 UJ
	03/13/2019	Monitoring Well Water	N	71	0.19 U	0.45 U	0.078 U
	06/27/2019	Monitoring Well Water	N	71	0.19 U	0.45 U	0.078 U
	09/14/2019	Monitoring Well Water	N	71	**0.31 J**	0.45 U	0.078 U
	12/19/2019	Monitoring Well Water	N	71	0.19 U	0.45 U	0.19 U
MW-11S	08/04/2016	Monitoring Well Water	N	72.5	0.12 U	**0.54**	0.2 U
	08/04/2016	Monitoring Well Water	FD	72.5	0.12 U	**0.38 J**	0.2 U
	12/07/2016	Monitoring Well Water	N	72.5	0.079 U	**0.33**	0.2 U

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
					Analytical Data (µg/L)		
	03/02/2017	Monitoring Well Water	N	72.5	0.079 U	0.21 U	0.2 U
	05/31/2017	Monitoring Well Water	N	72.5	0.079 U	0.21 U	0.2 U
	10/12/2017	Monitoring Well Water	N	72.5	0.2 U	0.46 U	0.37 U
	12/14/2017	Monitoring Well Water	N	72.5	0.2 U	0.46 U	0.37 U
	03/16/2018	Monitoring Well Water	N	72.5	0.2 U	0.46 U	0.37 U
	06/26/2018	Monitoring Well Water	N	72.5	0.19 U	0.45 U	0.078 U
	09/25/2018	Monitoring Well Water	N	72.5	0.19 U	0.45 U	0.078 UJ
	12/20/2018	Monitoring Well Water	N	72.5	0.19 U	0.45 U	0.078 UJ
	03/13/2019	Monitoring Well Water	N	72.5	0.19 U	0.45 U	0.078 U
	06/27/2019	Monitoring Well Water	N	72.5	0.19 U	0.45 U	0.078 U
	09/14/2019	Monitoring Well Water	N	72.5	0.19 U	0.45 U	0.078 U
	12/19/2019	Monitoring Well Water	N	72.5	0.19 U	0.45 U	0.19 U
MW-12S	08/04/2016	Monitoring Well Water	N	51	0.12 U	0.098 U	0.2 U
	12/05/2016	Monitoring Well Water	N	51	0.079 U	0.21 U	**0.27 J**
	03/02/2017	Monitoring Well Water	N	51	0.079 U	0.21 U	**0.2**
	05/31/2017	Monitoring Well Water	N	51	0.079 U	0.21 U	0.2 U
	10/12/2017	Monitoring Well Water	N	51	0.2 U	0.46 U	0.37 U
	12/14/2017	Monitoring Well Water	N	51	0.2 U	0.46 U	0.37 U
	03/16/2018	Monitoring Well Water	N	51	0.2 U	0.46 U	0.37 U
	06/26/2018	Monitoring Well Water	N	51	0.19 U	0.45 U	0.078 U
	09/25/2018	Monitoring Well Water	N	51	**0.97**	0.45 U	0.078 UJ
	12/20/2018	Monitoring Well Water	N	51	0.19 U	0.45 U	0.078 UJ
	03/13/2019	Monitoring Well Water	N	51	0.19 U	0.45 U	0.078 U
	06/27/2019	Monitoring Well Water	N	51	0.19 U	0.45 U	0.078 U
	09/14/2019	Monitoring Well Water	N	51	0.19 U	0.45 U	0.078 U
	12/19/2019	Monitoring Well Water	N	51	0.19 U	0.45 U	0.19 U
MW-13S	02/28/2017	Monitoring Well Water	N	26	0.079 U	0.21 U	0.2 U
	05/31/2017	Monitoring Well Water	N	26	0.079 U	0.21 U	0.2 U
	10/12/2017	Monitoring Well Water	N	26	0.2 U	0.46 U	0.37 U
	12/11/2017	Monitoring Well Water	N	26	0.2 U	0.46 U	0.37 U
	03/14/2018	Monitoring Well Water	N	26	0.2 U	0.46 U	0.37 U
	06/25/2018	Monitoring Well Water	N	26	0.19 U	0.45 U	0.078 U
	09/24/2018	Monitoring Well Water	N	26	0.19 U	0.45 U	0.078 U
	01/10/2019	Monitoring Well Water	N	26	0.19 U	0.45 U	0.078 U
	03/19/2019	Monitoring Well Water	N	26	0.19 U	0.45 U	0.078 U
	06/28/2019	Monitoring Well Water	N	26	**0.56 J**	0.45 UJ	0.078 UJ
	06/28/2019	Monitoring Well Water	FD	26	**0.35 J**	0.45 UJ	0.078 UJ
	09/16/2019	Monitoring Well Water	N	26	0.19 U	0.45 U	0.078 U
	12/18/2019	Monitoring Well Water	N	26	0.19 U	0.45 U	0.19 U
MW-14D	01/25/2017	Soil Boring Grab Sample	N	30	**20.3**	**12.3**	0.2 U
	02/27/2017	Monitoring Well Water	N	127	0.079 U	0.21 U	0.2 U
	06/09/2017	Monitoring Well Water	N	127	0.079 U	0.21 U	0.2 U
	09/14/2017	Monitoring Well Water	N	127	0.2 U	0.46 U	0.37 U
	12/15/2017	Monitoring Well Water	N	127	0.2 U	0.46 U	0.37 U
	03/13/2018	Monitoring Well Water	N	127	0.2 U	0.46 U	0.37 U
	06/28/2018	Monitoring Well Water	N	127	0.19 U	0.45 U	**0.15 J**
	09/26/2018	Monitoring Well Water	N	127	0.19 U	0.45 U	0.078 U
	01/14/2019	Monitoring Well Water	N	127	0.19 U	0.45 U	0.078 U
	03/18/2019	Monitoring Well Water	N	127	0.19 U	0.45 U	0.078 U
	06/26/2019	Monitoring Well Water	N	127	0.19 U	0.45 U	0.078 U
	09/19/2019	Monitoring Well Water	N	127	0.19 U	0.45 U	0.078 U
	12/10/2019	Monitoring Well Water	N	127	0.19 U	0.45 U	0.19 U
MW-15D	06/26/2017	Soil Boring Grab Sample	N	20	**2.1**	**0.26 J**	0.2 U
	07/07/2017	Monitoring Well Water	N	126	**8.9**	**0.48 J**	0.2 U
	10/02/2017	Monitoring Well Water	N	126	**9.7**	**0.56**	0.37 U
	12/20/2017	Monitoring Well Water	N	126	**9.7**	0.46 U	0.37 U
	03/12/2018	Monitoring Well Water	N	126	**9.5**	**0.48**	0.37 U
	06/28/2018	Monitoring Well Water	N	126	**8.7**	0.45 U	**0.12 J**
	09/26/2018	Monitoring Well Water	N	126	**10.1**	0.45 U	0.078 U
	03/14/2019	Monitoring Well Water	N	126	**10.7**	**0.55 J**	0.078 U
	06/25/2019	Monitoring Well Water	N	126	**7.9**	0.45 U	0.078 U
	09/17/2019	Monitoring Well Water	N	126	**7.5**	0.45 U	0.078 U
	12/09/2019	Monitoring Well Water	N	126	**7.9**	0.45 U	0.19 U
MW-16D	03/02/2017	Monitoring Well Water	N	97.5	0.079 U	0.21 U	0.2 U
	03/02/2017	Monitoring Well Water	FD	97.5	0.079 U	0.21 U	0.2 U

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
					Analytical Data (µg/L)		
	06/07/2017	Monitoring Well Water	N	97.5	0.079 U	0.21 U	0.2 U
	06/07/2017	Monitoring Well Water	FD	97.5	0.079 U	0.21 U	0.2 U
	10/02/2017	Monitoring Well Water	N	97.5	0.2 U	0.46 U	0.37 U
	12/20/2017	Monitoring Well Water	N	97.5	0.2 U	0.46 U	0.37 U
	03/12/2018	Monitoring Well Water	N	97.5	0.2 U	0.46 U	0.37 U
	06/29/2018	Monitoring Well Water	N	97.5	0.19 U	0.45 U	0.078 U
	06/29/2018	Monitoring Well Water	FD	97.5	0.19 U	0.45 U	0.078 U
	09/26/2018	Monitoring Well Water	N	97.5	0.19 U	0.45 U	0.078 U
	03/19/2019	Monitoring Well Water	N	97.5	0.19 U	0.45 U	0.078 U
	06/25/2019	Monitoring Well Water	N	97.5	0.19 U	0.45 U	0.078 U
	09/17/2019	Monitoring Well Water	N	97.5	0.19 U	0.45 U	0.078 U
	12/12/2019	Monitoring Well Water	N	97.5	0.19 U	0.45 U	0.19 U
MW-17D	04/03/2017	Soil Boring Grab Sample	N	55	0.079 U	0.21 U	0.2 U
	04/04/2017	Soil Boring Grab Sample	N	75	**1.8**	**0.22 J**	0.2 U
	04/04/2017	Soil Boring Grab Sample	N	104	**45.7**	**1.7**	0.2 U
	04/13/2017	Monitoring Well Water	N	204	0.079 U	0.21 U	0.2 U
	06/14/2017	Monitoring Well Water	N	214	0.079 U	0.21 U	**7.7**
	10/10/2017	Monitoring Well Water	N	214	0.2 U	0.46 U	**3**
	12/21/2017	Monitoring Well Water	N	214	0.2 U	0.46 U	**2.2**
	03/13/2018	Monitoring Well Water	N	214	0.2 U	0.46 U	**1.3**
	06/28/2018	Monitoring Well Water	N	214	0.19 U	0.45 U	**1**
	09/26/2018	Monitoring Well Water	N	214	0.19 U	0.45 U	**0.95 J**
	12/18/2018	Monitoring Well Water	N	214	0.19 U	0.45 U	**0.41 J**
	03/20/2019	Monitoring Well Water	N	214	0.19 U	0.45 U	**0.46 J**
	03/20/2019	Monitoring Well Water	FD	214	0.19 U	0.45 U	**0.54 J**
	06/25/2019	Monitoring Well Water	N	214	0.19 U	0.45 U	0.078 U
	09/19/2019	Monitoring Well Water	N	214	0.19 U	0.45 U	0.078 U
	12/12/2019	Monitoring Well Water	N	214	0.19 U	0.45 U	0.19 U
MW-18D	01/04/2017	Soil Boring Grab Sample	N	17.5	0.079 U	0.21 U	0.2 U
	01/06/2017	Soil Boring Grab Sample	N	80	0.079 U	0.21 U	0.2 U
	01/06/2017	Soil Boring Grab Sample	FD	80	0.079 U	0.21 U	0.2 U
	03/02/2017	Monitoring Well Water	N	154	0.079 U	0.21 U	0.2 U
	06/07/2017	Monitoring Well Water	N	154	0.079 U	0.21 U	0.2 U
	10/02/2017	Monitoring Well Water	N	154	0.2 U	0.46 U	0.37 U
	12/15/2017	Monitoring Well Water	N	154	0.2 U	0.46 U	0.37 U
	03/12/2018	Monitoring Well Water	N	154	0.2 U	0.46 U	0.37 U
	06/29/2018	Monitoring Well Water	N	165	0.19 U	0.45 U	0.078 U
	09/26/2018	Monitoring Well Water	N	165	0.19 UJ	0.45 UJ	0.078 UJ
	03/19/2019	Monitoring Well Water	N	165	0.19 U	0.45 U	0.078 U
	06/25/2019	Monitoring Well Water	N	165	0.19 U	0.45 U	0.078 U
	09/17/2019	Monitoring Well Water	N	154	0.19 U	0.45 U	0.078 U
	12/12/2019	Monitoring Well Water	N	154	0.19 U	0.45 U	0.19 U
MW-19D	05/10/2017	Monitoring Well Water	N	167	**334**	**27.3**	**0.25**
	06/15/2017	Monitoring Well Water	N	167	**412**	**25**	**1.1 J**
	10/05/2017	Monitoring Well Water	N	165	**329**	**18.9**	**0.97**
	10/05/2017	Monitoring Well Water	FD	165	**345**	**21.7**	**0.89**
	12/21/2017	Monitoring Well Water	N	165	**402**	**19.4**	**2.6**
	03/13/2018	Monitoring Well Water	N	165	**423**	**18.9**	**0.42**
	06/28/2018	Monitoring Well Water	N	165	**443**	**20.9**	**0.44 J**
	09/26/2018	Monitoring Well Water	N	165	**448**	**17**	0.16 U
	01/14/2019	Monitoring Well Water	N	165	**509**	**21.4**	**1.1**
	03/20/2019	Monitoring Well Water	N	165	**386**	**21**	**0.23 J**
	03/20/2019	Monitoring Well Water	FD	165	**400**	**21.5**	**0.26 J**
	06/27/2019	Monitoring Well Water	N	165	**401**	**26.2**	0.078 U
	06/27/2019	Monitoring Well Water	FD	165	**408**	**26.4**	0.078 U
	09/17/2019	Monitoring Well Water	N	167	**455**	**24.2**	**1.4**
	12/10/2019	Monitoring Well Water	N	167	**433**	**34.9**	**0.77 J**
MW-20D	06/15/2017	Soil Boring Grab Sample	N	94.5	**29.4**	**1**	0.2 U
	07/07/2017	Monitoring Well Water	N	140	**32.1**	**1.3**	**0.29 J**
	10/05/2017	Monitoring Well Water	N	140	**29.3**	**1.5**	0.37 U
	12/14/2017	Monitoring Well Water	N	140	**38.2**	**0.93 J**	0.37 U
	03/15/2018	Monitoring Well Water	N	140	**29.5**	**1.3**	0.37 U
	06/28/2018	Monitoring Well Water	N	140	**27.7**	**1.1**	**0.091 J**
	09/26/2018	Monitoring Well Water	N	140	**30.7**	0.45 U	0.078 U
	09/26/2018	Monitoring Well Water	FD	140	**28.8**	0.45 U	0.078 U

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
		MTCA Method B Cancer			0.63	1.4	NE
		MTCA Method B Non-cancer			NU	NU	800
					Analytical Data (µg/L)		
	01/15/2019	Monitoring Well Water	N	140	**27.6**	**1.1**	0.078 U
	03/15/2019	Monitoring Well Water	N	140	**35.6**	**1.3 J**	0.078 U
	06/25/2019	Monitoring Well Water	N	140	**23.9**	**0.92 J**	**0.5 J**
	09/18/2019	Monitoring Well Water	N	140	**25.5**	0.45 U	0.078 U
	09/18/2019	Monitoring Well Water	FD	140	**27.7**	0.45 U	0.078 U
	12/09/2019	Monitoring Well Water	N	140	**23.7**	**0.97 J**	0.19 U
MW-21D	07/05/2017	Soil Boring Grab Sample	N	20	0.079 U	0.21 U	0.2 U
	07/11/2017	Monitoring Well Water	N	120	0.079 U	0.21 U	0.2 U
	10/02/2017	Monitoring Well Water	N	120	0.2 U	0.46 U	0.37 U
	12/14/2017	Monitoring Well Water	N	120	0.2 U	0.46 U	0.37 U
	04/03/2018	Monitoring Well Water	N	120	0.2 U	0.46 U	0.37 U
	06/29/2018	Monitoring Well Water	N	120	0.19 U	0.45 U	**0.11 J**
	09/26/2018	Monitoring Well Water	N	120	0.19 UJ	0.45 UJ	0.078 UJ
	03/14/2019	Monitoring Well Water	N	120	0.19 U	0.45 U	0.078 U
	06/25/2019	Monitoring Well Water	N	120	0.19 U	0.45 U	0.078 U
	09/17/2019	Monitoring Well Water	N	120	0.19 U	0.45 U	0.078 U
	12/09/2019	Monitoring Well Water	N	120	0.19 U	0.45 U	0.19 U
MW-22S	12/12/2017	Monitoring Well Water	N	10.5	**2.2**	0.46 U	0.37 U
MW-24S	12/21/2018	Monitoring Well Water	N	NA	**6.9**	**6.5**	0.078 UJ
	03/13/2019	Monitoring Well Water	N	NA	**66.5**	**41.7**	0.078 U
	06/27/2019	Monitoring Well Water	N	NA	**63.4**	**37.1**	0.078 U
	10/04/2019	Monitoring Well Water	N	NA	**107**	**54.1**	**1.4**
	12/19/2019	Monitoring Well Water	N	NA	**58.6**	**24.2**	0.19 U
MW-25S	12/21/2018	Monitoring Well Water	N	NA	**52.9**	**24.9**	0.078 UJ
	03/13/2019	Monitoring Well Water	N	NA	**34**	**8.9**	0.078 U
	06/27/2019	Monitoring Well Water	N	NA	**119**	**44.7**	0.078 U
	10/04/2019	Monitoring Well Water	N	NA	**127**	**47.2**	0.19 U
	12/19/2019	Monitoring Well Water	N	NA	**225**	**61.2**	0.19 U
MW-26	05/23/2019	Monitoring Well Water	N	225	0.19 U	0.45 U	0.078 U
	05/23/2019	Monitoring Well Water	FD	225	0.19 U	0.45 U	0.078 U
MW-27	07/25/2019	Monitoring Well Water	N	233	**15.6**	**5.7**	0.078 U
	08/30/2019	Monitoring Well Water	N	238	**11.7**	**5.6**	0.078 U
	12/10/2019	Monitoring Well Water	N	238	**3.3**	**2.6 J**	0.19 U
	12/16/2019	Monitoring Well Water	N	238	**3.9**	**2.9 J**	0.19 U
MW-28	07/18/2019	Monitoring Well Water	N	180	**314**	**15.1**	0.078 U
	12/10/2019	Monitoring Well Water	N	180	**429**	**27.9**	**0.69 J**
MW-29	07/19/2019	Monitoring Well Water	N	120	**399 J**	**22.1**	0.078 U
	12/16/2019	Monitoring Well Water	N	120	**412**	**87.2**	0.19 U
MW-30	12/16/2019	Monitoring Well Water	N	80	0.19 U	0.45 U	0.19 U
MW-31	08/07/2019	Monitoring Well Water	N	380	0.19 U	0.45 U	0.078 U
	12/16/2019	Monitoring Well Water	N	380	0.19 U	0.45 U	0.19 U
MW-32	07/25/2019	Monitoring Well Water	N	284	0.19 U	0.45 U	0.078 U
	12/16/2019	Monitoring Well Water	N	284	0.19 U	0.45 U	0.19 U
MW-33	07/24/2019	Monitoring Well Water	N	80	**11.2**	**1**	0.078 U
	08/30/2019	Monitoring Well Water	N	264	**1.1**	0.45 U	0.078 U
	12/17/2019	Monitoring Well Water	N	80	0.19 U	0.45 U	0.19 U
MW-34	12/17/2019	Monitoring Well Water	N	165	0.19 U	0.45 U	0.19 U
MW-35	08/22/2019	Monitoring Well Water	N	162	**40**	**2.6**	0.078 U
	12/18/2019	Monitoring Well Water	N	162	**65.9**	**4.4**	0.19 U
MW-36	08/16/2019	Monitoring Well Water	N	65	**116 J**	**8.5 J**	**0.078 R**
	12/18/2019	Monitoring Well Water	N	65	**180**	**9.3**	0.19 U
Out-of-Use Freeman School District Well (W26)	01/21/2013	Domestic Well	N	92	1 U	1 U	1 U
	04/22/2014	Domestic Well	N	92	**23**	**1.9**	0.5 U
	08/04/2016	Domestic Well	N	92	**19.8**	**2.1**	0.2 U
	12/09/2016	Domestic Well	N	92	**22.5**	**1.5**	0.2 U
	03/09/2017	Domestic Well	N	92	**28**	**2.2**	0.2 U
	06/15/2017	Domestic Well	N	92	**34.6**	**2.5**	**0.26 J**
	10/16/2017	Domestic Well	N	92	**27**	**1.5**	0.37 U
	01/16/2018	Domestic Well	N	92	**24.2**	**1.7**	0.37 U
	03/14/2018	Domestic Well	N	92	**29.7**	**2.4**	0.37 U
	06/25/2018	Domestic Well	N	92	**34.7**	**2.8**	0.097 UJ
	09/24/2018	Domestic Well	N	92	**27.1**	**1.6**	0.078 U
	01/10/2019	Domestic Well	N	92	**25.2**	**2**	0.078 U
	03/20/2019	Domestic Well	N	92	**34.9**	**2.7 J**	0.078 U
	06/28/2019	Domestic Well	N	92	**31.8 J**	**2.5 J**	0.078 UJ

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
					Analytical Data (µg/L)		
	09/16/2019	Domestic Well	N	92	**24.3**	**2**	0.078 U
	12/17/2019	Domestic Well	N	92	**30.4**	**2.5 J**	0.19 U
Out-of-Use Marlow Well (No. 2)	10/07/2016	Domestic Well	N	80	**120**	**6.7**	**0.37**
	03/09/2017	Domestic Well	N	80	**0.25**	**0.27**	0.2 U
	06/26/2017	Domestic Well	N	80	**1.1**	**1.1**	0.2 U
	10/16/2017	Domestic Well	N	80	**13**	0.46 U	0.37 U
	01/16/2018	Domestic Well	N	80	**8.6**	**3.9**	0.37 U
	03/16/2018	Domestic Well	N	80	**66**	**5.9**	0.37 U
	06/25/2018	Domestic Well	N	80	**49.6**	**3.6**	0.22 UJ
	09/24/2018	Domestic Well	N	80	**30.6**	**1.1**	0.078 U
	01/10/2019	Domestic Well	N	80	**69.1**	**3.8**	0.078 U
	03/20/2019	Domestic Well	N	80	**49.5**	**4.7**	0.078 U
	06/27/2019	Domestic Well	N	80	**5.9**	**21.3**	**0.2 J**
	07/16/2019	Domestic Well	N	80	**27.4**	**2.7**	0.078 U
	08/01/2019	Domestic Well	N	80	**14.4**	**2**	0.078 U
	08/13/2019	Domestic Well	N	80	**19.8**	**2.6 J**	0.078 U
	08/29/2019	Domestic Well	N	80	**8.5**	**1.6**	0.078 U
	09/11/2019	Domestic Well	N	80	**24.5**	**2**	0.078 U
	09/26/2019	Domestic Well	N	80	**15.6**	**2.9**	0.078 U
	10/10/2019	Domestic Well	N	80	**9.6**	**1.4**	0.19 U
	11/05/2019	Domestic Well	N	80	**4.7**	**3.4**	0.19 U
	11/21/2019	Domestic Well	N	80	**4.7**	**0.95 J**	0.19 U
	12/03/2019	Domestic Well	N	80	**5.9**	0.45 U	0.19 U
	12/11/2019	Domestic Well	N	80	**9.7**	0.45 U	0.19 U
	12/11/2019	Domestic Well	FD	80	**10.4**	0.45 U	0.19 U
	12/20/2019	Domestic Well	N	80	**9.9**	**1.2 J**	0.19 U
Out-of-Use Marlow Well (W20)	01/21/2013	Domestic Well	N	82	**21.2**	**2.04**	1 U
	08/04/2016	Domestic Well	N	82	0.12 U	0.098 U	0.2 U
	12/10/2016	Domestic Well	N	82	0.079 U	0.21 U	0.2 U
	03/03/2017	Domestic Well	N	82	0.079 U	0.21 U	0.2 U
	06/14/2017	Domestic Well	N	82	0.079 UJ	0.21 UJ	0.2 UJ
	10/16/2017	Domestic Well	N	82	0.2 U	0.46 U	0.37 U
	12/11/2017	Domestic Well	N	82	0.2 U	0.46 U	0.37 U
	03/15/2018	Domestic Well	N	82	0.2 U	0.46 U	0.37 U
	06/25/2018	Domestic Well	N	82	0.19 U	0.45 U	0.078 U
	09/24/2018	Domestic Well	N	82	0.19 U	0.45 U	0.078 U
	01/10/2019	Domestic Well	N	82	0.19 U	0.45 U	0.078 U
	03/19/2019	Domestic Well	N	82	0.19 U	0.45 U	0.078 U
	06/28/2019	Domestic Well	N	82	0.19 UJ	0.45 UJ	0.078 UJ
	09/16/2019	Domestic Well	N	82	0.19 U	0.45 U	0.078 U
	12/18/2019	Domestic Well	N	82	0.19 U	0.45 U	0.19 U
Primary Freeman School District Well (WS5)	05/27/1992	Domestic Well	N	189	0.5 U	0.5 U	--
	11/13/1992	Domestic Well	N	189	0.5 U	0.5 U	--
	01/30/2001	Domestic Well	N	189	**0.7**	0.5 U	--
	03/22/2001	Domestic Well	N	189	**0.7**	**0.7**	--
	07/11/2001	Domestic Well	N	189	0.5 U	0.5 U	--
	06/20/2002	Domestic Well	N	189	**1.4**	0.5 U	--
	08/12/2003	Domestic Well	N	189	0.5 U	0.5 U	--
	11/16/2004	Domestic Well	N	189	**1.64**	0.5 U	--
	05/31/2006	Domestic Well	N	189	0.5 U	0.5 U	--
	04/30/2007	Domestic Well	N	189	**2.31**	0.5 U	--
	04/03/2008	Domestic Well	N	189	**7.78**	0.5 U	--
	05/20/2008	Domestic Well	N	189	**2.34**	0.5 U	--
	09/12/2008	Domestic Well	N	189	**2.14**	0.5 U	--
	11/13/2008	Domestic Well	N	189	**3.72**	0.5 U	--
	02/26/2009	Domestic Well	N	189	**1.66**	--	--
	06/25/2009	Domestic Well	N	189	**1.8**	0.5 U	--
	11/04/2009	Domestic Well	N	189	**3.28**	--	--
	04/28/2010	Domestic Well	N	189	**4.29**	--	--
	08/18/2010	Domestic Well	N	189	**2.22**	0.5 U	--
	10/27/2010	Domestic Well	N	189	**3.13**	0.5 U	--
	03/31/2011	Domestic Well	N	189	**3.9**	--	--
	06/22/2011	Domestic Well	N	189	0.5 U	--	--
	09/21/2011	Domestic Well	N	189	0.5 U	--	--
	12/07/2011	Domestic Well	N	189	0.5 U	0.5 U	--

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
					Analytical Data (µg/L)		
	03/21/2012	Domestic Well	N	189	**5.9**	0.5 U	--
	04/19/2012	Domestic Well	N	189	**7.2**	0.5 U	--
	06/14/2012	Domestic Well	N	189	**2.1**	0.5 U	--
	09/05/2012	Domestic Well	N	189	**3.1**	0.5 U	--
	12/12/2012	Domestic Well	N	189	**8**	**0.51**	--
	01/24/2013	Domestic Well	N	189	**7.6**	**0.36**	--
	01/25/2013	Domestic Well	N	189	**22**	**1.28**	1 U
	04/10/2013	Domestic Well	N	189	**9.3**	**0.62**	--
	07/02/2013	Domestic Well	N	189	**3.3**	0.29 U	--
	09/18/2013	Domestic Well	N	189	**3.8**	0.29 U	--
	11/06/2013	Domestic Well	N	189	**5.5**	**0.38**	--
	04/22/2014	Domestic Well	N	189	**8.8**	**0.52**	0.5 U
	05/07/2014	Domestic Well	N	189	**6.7**	**0.46**	--
	09/17/2014	Domestic Well	N	189	**3.2**	0.5 U	--
	03/04/2015	Domestic Well	N	189	**11**	**0.69**	--
	03/04/2015	Domestic Well	FD	189	**0.42**	0.5 U	--
	06/03/2015	Domestic Well	N	189	**4.2**	**0.33**	--
	09/30/2015	Domestic Well	N	189	**4**	**0.52**	--
	10/21/2015	Domestic Well	N	189	**5**	**0.29**	--
	01/27/2016	Domestic Well	N	189	**11**	**0.72**	--
	04/12/2016	Domestic Well	N	189	**13**	**0.74**	--
	07/16/2016	Domestic Well	N	189	**3.3**	**0.3**	--
	07/27/2016	Domestic Well	N	189	**4**	**0.29 J**	0.2 U
	09/30/2016	Domestic Well	N	189	**4**	**0.52**	--
	10/05/2016	Domestic Well	N	189	0.5 U	**0.38**	--
	12/07/2016	Domestic Well	N	189	**11.6**	**0.55**	0.2 U
	04/05/2017	Domestic Well	N	NA	**0.0081**	**0.0005**	--
	06/14/2017	Domestic Well	N	189	**4.5**	**0.33 J**	0.2 U
	07/19/2017	Domestic Well	N	NA	**3.7**	**0.39**	--
	09/06/2017	Domestic Well	N	NA	**0.19**	0.5 U	--
	10/04/2017	Domestic Well	N	NA	**6.7**	**0.43**	--
	10/11/2017	Domestic Well	N	189	**8.1**	0.46 U	0.37 U
	01/10/2018	Domestic Well	N	NA	**16.4**	**0.9**	--
	01/19/2018	Domestic Well	N	189	**61.8**	**2.3**	0.37 U
	03/15/2018	Domestic Well	N	189	**33.6**	**1.7**	0.37 U
	04/25/2018	Domestic Well	N	NA	**17.1**	**1.35**	--
	06/06/2018	Domestic Well	N	NA	0.5 U	0.5 U	--
	07/17/2018	Domestic Well	N	189	**5.5**	0.45 U	0.078 U
	10/01/2018	Domestic Well	N	189	**6.8**	0.45 U	0.078 UJ
	10/10/2018	Domestic Well	N	189	**8.6**	**0.49 J**	0.078 U
	12/19/2018	Domestic Well	N	189	**23**	**1.1**	0.078 U
	01/09/2019	Domestic Well	N	NA	**25.9**	**1.43**	--
	02/06/2019	Domestic Well	N	NA	**1.07**	0.5 U	--
	03/07/2019	Domestic Well	N	NA	**0.61**	0.5 U	--
	04/10/2019	Domestic Well	N	NA	**11.9**	**0.7**	--
	05/07/2019	Domestic Well	N	189	**7.1**	**0.47 J**	0.078 U
	06/17/2019	Domestic Well	N	189	**5**	0.45 U	0.078 U
	07/31/2019	Domestic Well	N	NA	**7.4**	**0.53**	--
	08/06/2019	Domestic Well	N	NA	0.5 U	0.5 U	--
	09/19/2019	Domestic Well	N	189	**4.7**	0.45 U	0.078 U
	12/06/2019	Domestic Well	N	189	**7.4**	0.45 U	0.19 U
Randall Well	07/27/2016	Domestic Well	N	73	**324**	**12**	1 U
	08/19/2016	Domestic Well	N	73	**287**	**15.2**	0.39 U
	11/29/2016	Domestic Well	N	73	**364**	**13.8**	**0.32 J**
	02/28/2017	Domestic Well	N	73	**324**	**12.7**	**0.7 J**
	05/31/2017	Domestic Well	N	73	**268**	**13.4**	**1.6**
	05/31/2017	Domestic Well	FD	73	**272**	**13.4**	**2.4**
	09/19/2017	Domestic Well	N	73	**260**	**11.5**	0.37 U
	09/19/2017	Domestic Well	FD	73	**256**	**10.5**	**0.54**
	12/12/2017	Domestic Well	N	73	**289**	**10.2**	**1.5 J**
	12/12/2017	Domestic Well	FD	73	**292**	**9.9**	**2.5**
	04/10/2018	Domestic Well	N	73	**251**	**10.3**	0.37 U
	06/27/2018	Domestic Well	N	73	**202**	**8.8**	**0.12 J**
	09/28/2018	Domestic Well	N	73	**207 J**	**8.9**	0.078 UJ
	01/07/2019	Domestic Well	N	73	**250**	**9.8**	**0.76 J**

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Group	Type	Depth (ft)	Carbon tetrachloride	Chloroform	Carbon disulfide
					Screening Levels (µg/L)		
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
					Analytical Data (µg/L)		
	03/21/2019	Domestic Well	N	73	**182**	**8**	0.078 U
	06/17/2019	Domestic Well	N	73	**191**	**7.9**	**0.71 J**
	10/10/2019	Domestic Well	N	73	**218**	**8**	**2.9**
	12/06/2019	Domestic Well	N	73	**166**	**6.9**	0.19 U
Reed Well (W30)	01/25/2013	Domestic Well	N	119.5	1 U	1 U	1 U
	07/27/2016	Domestic Well	N	119.5	0.079 U	0.21 U	0.2 U
	07/27/2016	Domestic Well	FD	119.5	0.079 U	0.21 U	0.2 U
	12/01/2016	Domestic Well	N	119.5	0.079 U	0.21 U	0.2 U
	02/24/2017	Domestic Well	N	119.5	0.079 U	0.21 U	0.2 U
	06/20/2017	Domestic Well	N	119.5	0.079 U	0.21 U	0.2 U
	09/13/2017	Domestic Well	N	119.5	0.2 U	0.46 U	0.37 U
	01/09/2018	Domestic Well	N	119.5	0.2 U	0.46 U	0.37 U
	09/28/2018	Domestic Well	N	119.5	0.19 U	0.45 U	0.078 UJ
	01/07/2019	Domestic Well	N	119.5	0.19 U	0.45 U	0.078 UJ
	03/21/2019	Domestic Well	N	119.5	0.19 U	0.45 U	0.078 U
	06/13/2019	Domestic Well	N	119.5	0.19 U	0.45 U	0.078 U
	10/03/2019	Domestic Well	N	119.5	0.19 U	0.45 U	0.19 U
	12/13/2019	Domestic Well	N	119.5	0.19 U	0.45 U	0.19 U
	12/13/2019	Domestic Well	FD	119.5	0.19 U	0.45 U	0.19 U
SB-34	01/10/2017	Soil Boring Grab Sample	N	63	**9.5 J**	**1.9 J**	1 UJ
SB-35	01/13/2017	Soil Boring Grab Sample	N	69	0.079 U	0.21 U	0.2 U
SB-37	01/12/2017	Soil Boring Grab Sample	N	81	0.079 U	0.21 U	0.2 U
SB-41	02/14/2017	Soil Boring Grab Sample	N	37	0.4 U	1 U	1 U
SB-43	01/12/2017	Soil Boring Grab Sample	N	25	0.079 U	0.21 U	**0.26 J**
	01/12/2017	Soil Boring Grab Sample	N	40	**1.5**	0.21 U	0.2 U
SB-206	06/19/2019	Soil Boring Grab Sample	N	NA	**0.5 J**	**0.87 J**	0.078 U
SB-208	06/20/2019	Soil Boring Grab Sample	N	NA	0.38 U	0.9 U	0.16 U
Silva Well	09/08/2016	Domestic Well	N	NA	0.076 U	0.1 U	0.042 U
	11/30/2016	Domestic Well	N	NA	0.079 U	0.21 U	0.2 U
	02/24/2017	Domestic Well	N	NA	0.079 U	0.21 U	0.2 U
	02/24/2017	Domestic Well	FD	NA	0.079 U	0.21 U	0.2 U
	06/01/2017	Domestic Well	N	NA	0.079 U	0.21 U	0.2 U
	09/12/2017	Domestic Well	N	NA	**0.98**	0.46 U	0.37 U
	09/25/2017	Domestic Well	N	NA	0.2 U	0.46 U	0.37 U
	09/29/2017	Domestic Well	N	NA	0.2 U	0.46 U	0.37 U
	01/05/2018	Domestic Well	N	NA	0.2 U	0.46 U	0.37 UJ
	01/05/2018	Domestic Well	FD	NA	0.2 U	0.46 U	0.37 U
	03/20/2018	Domestic Well	N	NA	0.2 U	0.46 U	0.37 U
	06/27/2018	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	09/28/2018	Domestic Well	N	NA	**1.3**	0.45 U	0.078 UJ
	01/04/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	05/07/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	06/13/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.078 U
	10/03/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.19 U
	12/10/2019	Domestic Well	N	NA	0.19 U	0.45 U	0.19 U
Stark Well (W15)	03/03/2017	Domestic Well	N	104	0.079 U	0.21 U	0.2 U
	06/01/2017	Domestic Well	N	104	0.079 U	0.21 U	0.2 U
	06/01/2017	Domestic Well	FD	104	0.079 U	0.21 U	0.2 U
	09/12/2017	Domestic Well	N	104	0.2 U	0.46 U	0.37 U
	01/04/2018	Domestic Well	N	104	0.2 U	0.46 U	0.37 UJ
	03/19/2018	Domestic Well	N	104	0.2 U	0.46 U	0.37 U
	03/19/2018	Domestic Well	FD	104	0.2 U	0.46 U	0.37 U
	06/27/2018	Domestic Well	N	104	0.19 U	0.45 U	0.078 U
	09/28/2018	Domestic Well	N	104	0.19 U	0.45 U	0.078 UJ
	01/04/2019	Domestic Well	N	104	0.19 U	0.45 U	0.078 U
	03/21/2019	Domestic Well	N	104	0.19 U	0.45 U	0.078 U
	06/13/2019	Domestic Well	N	104	0.19 U	0.45 U	0.078 U
	09/18/2019	Domestic Well	N	104	0.19 U	0.45 U	0.078 U
	12/05/2019	Domestic Well	N	104	0.19 U	0.45 U	0.19 U
	12/05/2019	Domestic Well	FD	104	0.19 U	0.45 U	0.19 U
Thorson Well	03/02/2017	Domestic Well	N	160	0.079 U	0.21 U	0.2 U
	06/26/2017	Domestic Well	N	160	0.079 U	0.21 U	0.2 U
	09/12/2017	Domestic Well	N	160	0.2 U	0.46 U	0.37 U
	01/05/2018	Domestic Well	N	160	0.2 U	0.46 U	0.37 UJ
	03/19/2018	Domestic Well	N	160	0.2 U	0.46 U	0.37 U

Table 4-9. Summary of Analytical Groundwater Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

					Carbon tetrachloride	Chloroform	Carbon disulfide
						Screening Levels (µg/L)	
				MTCA Method B Cancer	0.63	1.4	NE
				MTCA Method B Non-cancer	NU	NU	800
Location	Sample Date	Group	Type	Depth (ft)		Analytical Data (µg/L)	
	06/27/2018	Domestic Well	N	160	0.19 U	0.45 U	0.11 UJ
	09/28/2018	Domestic Well	N	160	0.19 U	0.45 U	0.078 UJ
	01/07/2019	Domestic Well	N	160	0.19 U	0.45 U	0.078 U
	03/21/2019	Domestic Well	N	160	0.19 U	0.45 U	0.078 U
	06/17/2019	Domestic Well	N	160	0.19 U	0.45 U	0.078 U
	09/18/2019	Domestic Well	N	160	0.19 U	0.45 U	0.078 U
	12/06/2019	Domestic Well	N	160	0.19 U	0.45 U	0.19 U

Notes:
Detections in **bold**
-- = not analyzed
µg/L = microgram(s) per liter
FD = field duplicate
ft = feet
MTCA = Model Toxics Control Act
J = estimated result
NA = sample collected at undocumented depth
NE = not established
NU = not used
R = result was rejected and is not usable
U = not detected at or above the indicated reporting limit
UJ = not detected; indicated reporting limit is estimated

Table 4-10. Summary of Analytical Surface Water Data – Carbon Tetrachloride, Chloroform, and Carbon Disulfide

				Carbon disulfide	Carbon tetrachloride	Chloroform
				Screening Levels (µg/L)		
			MTCA Method B Cancer	NE	4.9	56
Location	Group	Type	Sample Date	Analytical Data (µg/L)		
Stream Gauge 1	Little Cottonwood Creek Surface Water	N	12/12/2017	0.37 U	0.2 U	0.46 U
	Little Cottonwood Creek Surface Water	N	3/20/2018	0.37 U	0.2 U	0.46 U
Stream Gauge 2	Little Cottonwood Creek Surface Water	N	12/12/2017	0.37 U	0.2 U	0.46 U
	Little Cottonwood Creek Surface Water	N	3/20/2018	0.37 U	0.2 U	0.46 U

Notes:
Detections in **bold**
µg/L = microgram(s) per liter
MTCA = Model Toxics Control Act
N = normal sample
NE = not established
U = not detected at or above the indicated reporting limit

Table 4-11. Groundwater Monitoring Program Overview

Location	Frequency	Analyses
MW-1D	Quarterly	VOCs and water quality parameters[a]
MW-1S	Quarterly	VOCs and water quality parameters[a]
MW-2D	Quarterly	VOCs and water quality parameters[a]
MW-3D	Quarterly	VOCs and water quality parameters[a]
MW-4D	Quarterly	VOCs and water quality parameters[a]
MW-5D	Quarterly	VOCs and water quality parameters[a]
MW-6D	Quarterly	VOCs and water quality parameters[a]
MW-6S	Quarterly	VOCs and water quality parameters[a]
MW-6U	Quarterly	VOCs and water quality parameters[a]
MW-7S	Quarterly	VOCs and water quality parameters[a]
MW-8S	Quarterly	VOCs and water quality parameters[a]
MW-9D	Quarterly	VOCs and water quality parameters[a]
MW-9S	Quarterly	VOCs and water quality parameters[a]
MW-9U	Quarterly	VOCs and water quality parameters[a]
MW-10S	Quarterly	VOCs and water quality parameters[a]
MW-11S	Quarterly	VOCs and water quality parameters[a]
MW-12S	Quarterly	VOCs and water quality parameters[a]
MW-13S	Quarterly	VOCs and water quality parameters[a]
MW-14D	Quarterly	VOCs and water quality parameters[a]
MW-15D	Quarterly	VOCs and water quality parameters[a]
MW-16D	Quarterly	VOCs and water quality parameters[a]
MW-17D	Quarterly	VOCs and water quality parameters[a]
MW-18D	Quarterly	VOCs and water quality parameters[a]
MW-19D	Quarterly	VOCs and water quality parameters[a]
MW-20D	Quarterly	VOCs and water quality parameters[a]
MW-21D	Quarterly	VOCs and water quality parameters[a]
MW-22S [b]	NA	NA
MW-23S [b]	NA	NA
MW-24S	Quarterly	VOCs and water quality parameters[a]
MW-25S	Quarterly	VOCs and water quality parameters[a]
MW-26	Quarterly	VOCs and water quality parameters[a]
MW-27	Quarterly	VOCs and water quality parameters[a]
MW-28	Quarterly	VOCs and water quality parameters[a]
MW-29	Quarterly	VOCs and water quality parameters[a]
MW-30	Quarterly	VOCs and water quality parameters[a]
MW-31	Quarterly	VOCs and water quality parameters[a]
MW-32	Quarterly	VOCs and water quality parameters[a]
MW-33	Quarterly	VOCs and water quality parameters[a]
MW-34	Quarterly	VOCs and water quality parameters[a]
MW-35	Quarterly	VOCs and water quality parameters[a]
MW-36	Quarterly	VOCs and water quality parameters[a]
Asher Well	Quarterly	VOCs and water quality parameters[a]
Davey Well (W46) [b]	NA	NA
Freeman Store Well [b]	NA	NA
Lang Well	Quarterly	VOCs and water quality parameters[a]
Lashaw Agricultural	Quarterly	VOCs and water quality parameters[a]

Table 4-11. Groundwater Monitoring Program Overview

Location	Frequency	Analyses
Lashaw Well	Quarterly	VOCs and water quality parameters[a]
Marlow Well	Quarterly	VOCs and water quality parameters[a]
Out-of-Use Marlow Well (No. 2)	Quarterly	VOCs and water quality parameters[a]
Randall Well	Quarterly	VOCs and water quality parameters[a]
Silva Well	Quarterly	VOCs and water quality parameters[a]
Atwood Home Well	Quarterly	VOCs and water quality parameters[a]
Atwood Shop Well	Quarterly	VOCs and water quality parameters[a]
Thorson Well	Quarterly	VOCs and water quality parameters[a]
Brandt well (W10) [b]	NA	NA
Stark Well (W15)	Quarterly	VOCs and water quality parameters[a]
Marlow well (W20) (not in use)	Quarterly	VOCs and water quality parameters[a]
Out of use Freeman School Well (W26) (former Marlow well)	Quarterly	VOCs and water quality parameters[a]
Reed Well (W30)	Quarterly	VOCs and water quality parameters[a]
Primary Freeman School District Well (WS5)	Quarterly	VOCs and water quality parameters[a]
Stream Gauge 1	Quarterly	VOCs[a]
Stream Gauge 2	Quarterly	VOCs[a]

[a] Analytical Methods:
Low Level VOCs (EPA 8260)
TAL Dissolved Metals (EPA 6010/7470)
Alkalinity (SM 2320)
Chloride/Sulfate/Nitrate (EPA 300.0)
Total Dissolved Solids (SM 2540)
Total Organic Carbon (SM 5310)
Sulfide (SM 4500)
Methane/Ethane/Ethene (RSK 175),
Chemical Oxygen Demand (EPA 410.4)
Nitrate+Nitrite (EPA 353.2)
[b] Not included in the groundwater monitoring network

Notes:
EPA = U.S. Environmental Protection Agency
NA = not applicable
TAL = Target Analyte List
VOC = volatile organic compound

Table 4-12. Nonparametric Trend Analysis for Carbon Tetrachloride

Well	Total Samples	Detect Count	Detect Freq. (%)	Min Non-Detect (µg/L)	Min Detect (µg/L)	Max Non-Detect (µg/L)	Max Detect (µg/L)	Mean (µg/L)	Std Dev. (µg/L)	CV	Last Result (µg/L)	Last Sample Date	MK Test Value (S)	MK p-value	Sen's Slope Estimator (µg/L/yr)	Mann-Kendall Result	Trend Analysis Result	Stability Based On CV
Asher Well	13	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.524	---	47.6% (+)	No Trend	>50% ND
Atwood House	8	0	0	0.190	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.548	---	45.2% (+)	No Trend	>50% ND
Atwood Shop	7	0	0	0.190	---	0.200	---	---	---	---	0.19 U	Jun-19	0	0.563	---	43.7% (+)	No Trend	>50% ND
Davey Well (W46)	3	3	100	---	17.0	---	22.3	19.2	2.76	0.144	17.0	Feb-17	IS	IS	IS	IS	IS	IS
Lang Well	15	1	7	0.079	0.160	0.200	0.160	---	---	---	0.19 U	Dec-19	-14	0.264	---	73.6% (-)	No Trend	>50% ND
Lashaw Well (Agricultural)	7	7	100	---	1.50	---	9.10	3.87	2.52	0.652	4.30	Oct-19	1	0.500	---	50% (+)	No Trend	Stable
Lashaw Well (Domestic)	13	13	100	---	0.270	---	1.20	0.677	0.236	0.349	0.540	Dec-19	-23	0.092	---	90.8% (-)	No Trend	Stable
Marlow Carbon Influent	147	145	99	0.200	75.3	0.200	200	121	26.5	0.220	123	Dec-19	-1317	0.014	-4.83	98.6% (sig -)	Decreasing	---
Marlow Well	16	15	94	0.190	85.3	0.190	167	114	35.0	0.307	97.3	Dec-19	-36	0.058	---	94.2% (-)	No Trend	Stable
MW-1D	14	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.522	---	47.8% (+)	No Trend	>50% ND
MW-1S	12	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.527	---	47.3% (+)	No Trend	>50% ND
MW-2D	14	1	7	0.079	1.20	0.200	1.20	---	---	---	0.19 U	Dec-19	-1	0.500	---	50% (-)	No Trend	>50% ND
MW-3D	14	0	0	0.079	---	0.500	---	---	---	---	0.19 U	Dec-19	0	0.522	---	47.8% (+)	No Trend	>50% ND
MW-4D	14	14	100	---	0.370	---	7.90	4.66	2.19	0.470	7.90	Dec-19	-13	0.259	---	74.1% (-)	No Trend	Stable
MW-5D	14	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.522	---	47.8% (+)	No Trend	>50% ND
MW-6D	13	11	85	0.190	0.340	0.190	3.60	1.72	1.16	0.672	0.48 J	Dec-19	-27	0.057	---	94.3% (-)	No Trend	Stable
MW-6S	14	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.522	---	47.8% (+)	No Trend	>50% ND
MW-6U	10	10	100	---	15.3	---	82.3	51.1	21.2	0.414	80.9	Dec-19	13	0.146	---	85.4% (+)	No Trend	Stable
MW-7S	14	13	93	0.200	0.380	0.200	2.10	1.26	0.498	0.394	1.10	Dec-19	8	0.354	---	64.6% (+)	No Trend	Stable
MW-8S	14	14	100	---	121	---	274	185	42.7	0.231	167	Dec-19	-28	0.071	---	92.9% (-)	No Trend	Stable
MW-9D	12	12	100	---	74.4	---	135	103	19.2	0.186	114	Dec-19	-3	0.447	---	55.4% (-)	No Trend	Stable
MW-9S	14	14	100	---	227	---	1,000	449	194	0.431	442	Dec-19	-35	0.031	-92.7	96.9% (sig -)	Decreasing	---
MW-9U	11	11	100	---	15.9	---	820	514	269	0.524	153	Dec-19	-21	0.060	---	94% (-)	No Trend	Stable
MW-10S	14	11	79	0.190	0.310	0.190	34.0	7.70	12.1	1.58	0.19 U	Dec-19	-64	0.000	-1.43	100% (sig -)	Decreasing	---
MW-11S	14	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.522	---	47.8% (+)	No Trend	>50% ND
MW-12S	14	1	7	0.079	0.970	0.200	0.970	---	---	---	0.19 U	Dec-19	3	0.457	---	54.3% (+)	No Trend	>50% ND
MW-13S	12	1	8	0.079	0.560	0.200	0.560	---	---	---	0.19 U	Dec-19	7	0.344	---	65.6% (+)	No Trend	>50% ND
MW-14D	13	1	8	0.079	20.3	0.200	20.3	---	---	---	0.19 U	Dec-19	-12	0.255	---	74.5% (-)	No Trend	>50% ND
MW-15D	11	11	100	---	2.10	---	10.7	8.43	2.33	0.276	7.90	Dec-19	-3	0.440	---	56% (-)	No Trend	Stable
MW-16D	11	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.531	---	46.9% (+)	No Trend	>50% ND
MW-17D	14	1	7	0.079	45.7	0.200	45.7	---	---	---	0.19 U	Dec-19	-11	0.295	---	70.5% (-)	No Trend	>50% ND
MW-18D	13	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.524	---	47.6% (+)	No Trend	>50% ND
MW-19D	12	12	100	---	334	---	509	418	47.2	0.113	433	Dec-19	30	0.022	32.6	97.8% (sig +)	Increasing	---
MW-20D	12	12	100	---	23.7	---	38.2	29.6	4.22	0.143	23.7	Dec-19	-27	0.037	-2.23	96.3% (sig -)	Decreasing	---
MW-21D	11	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.531	---	46.9% (+)	No Trend	>50% ND
MW-22S	1	1	100	---	2.20	---	2.20	2.20	---	---	2.20	Dec-17	IS	IS	IS	IS	IS	IS
MW-24S	5	5	100	---	6.90	---	107	60.5	35.6	0.589	58.6	Dec-19	2	0.408	---	59.2% (+)	No Trend	Stable
MW-25S	5	5	100	---	34.0	---	225	112	75.2	0.674	225	Dec-19	8	0.042	169	95.8% (sig +)	Increasing	---
MW-26	1	0	0	0.190	---	0.190	---	---	---	---	0.19 U	May-19	IS	IS	IS	IS	IS	IS
MW-27	4	4	100	---	3.30	---	15.6	8.63	6.02	0.698	3.90	Dec-19	-4	0.167	---	83.3% (-)	No Trend	Stable

Table 4-12. Nonparametric Trend Analysis for Carbon Tetrachloride

Well	Total Samples	Detect Count	Detect Freq. (%)	Min Non-Detect (µg/L)	Min Detect (µg/L)	Max Non-Detect (µg/L)	Max Detect (µg/L)	Mean (µg/L)	Std Dev. (µg/L)	CV	Last Result (µg/L)	Last Sample Date	MK Test Value (S)	MK p-value	Sen's Slope Estimator (µg/L/yr)	Mann-Kendall Result	Trend Analysis Result	Stability Based On CV
MW-28	2	2	100	---	314	---	429	372	81.3	0.219	429	Dec-19	IS	IS	IS	IS	IS	IS
MW-29	2	2	100	---	399	---	412	406	9.19	0.023	412	Dec-19	IS	IS	IS	IS	IS	IS
MW-30	1	0	0	0.190	---	0.190	---	---	---	---	0.19 U	Dec-19	IS	IS	IS	IS	IS	IS
MW-31	2	0	0	0.190	---	0.190	---	---	---	---	0.19 U	Dec-19	IS	IS	IS	IS	IS	IS
MW-32	2	0	0	0.190	---	0.190	---	---	---	---	0.19 U	Dec-19	IS	IS	IS	IS	IS	IS
MW-33	3	2	67	0.190	1.10	0.190	11.2	4.16	4.99	1.20	0.19 U	Dec-19	IS	IS	IS	IS	IS	IS
MW-34	1	0	0	0.190	---	0.190	---	---	---	---	0.19 U	Dec-19	IS	IS	IS	IS	IS	IS
MW-35	2	2	100	---	40.0	---	65.9	53.0	18.3	0.346	65.9	Dec-19	IS	IS	IS	IS	IS	IS
MW-36	2	2	100	---	116	---	180	148	45.3	0.306	180	Dec-19	IS	IS	IS	IS	IS	IS
Out-of-Use Freeman School District Well (W26)	16	15	94	0.080	19.8	0.080	34.9	26.1	8.06	0.309	30.4	Dec-19	52	0.010	2.32	99% (sig +)	**Increasing**	---
Out-of-Use Marlow Well (No. 2)	23	23	100	---	0.250	---	120	24.7	28.8	1.16	9.90	Dec-19	-59	0.063	---	93.7% (-)	No Trend	**Not Stable**
Out-of-Use Marlow Well (W20)	15	1	7	0.079	21.2	0.200	21.2	---	---	---	0.19 U	Dec-19	-14	0.264	---	73.6% (-)	No Trend	>50% ND
Primary Freeman School District Well (WS5)	16	15	94	0.080	19.8	0.080	34.9	26.1	8.06	0.309	30.4	Dec-19	52	0.010	2.32	99% (sig +)	**Increasing**	---
Randall Carbon Influent	146	146	100	---	127	---	402	269	51.1	0.190	243	Dec-19	-5929	0.000	-40.5	100% (sig -)	**Decreasing**	---
Randall Well	15	15	100	---	166	---	364	253	58.5	0.231	166	Dec-19	-76	0.000	-42.9	100% (sig -)	**Decreasing**	---
Reed Well (W30)	13	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.524	---	47.6% (+)	No Trend	>50% ND
Silva Well	16	2	13	0.076	0.980	0.200	1.30	---	---	---	0.19 U	Dec-19	-1	0.500	---	50% (-)	No Trend	>50% ND
Stark Well (W15)	12	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.527	---	47.3% (+)	No Trend	>50% ND
Thorson Well	12	0	0	0.079	---	0.200	---	---	---	---	0.19 U	Dec-19	0	0.527	---	47.3% (+)	No Trend	>50% ND

Notes:

"---" = not applicable

% = percent

> 50% ND = greater than 50 percent non-detect

µg/L = micrograms per liter

µg/L/yr = micrograms per liter per year

CV = coefficient of variation

Freq. = frequency

IS = insufficient number of samples

Max = maximum

Min = minimum

MK = Mann-Kendall

p-value = probability value

S = Mann-Kendall statistic (number of positive differences minus number of negative differences)

sig = (Statistically) significant.

Std Dev. = standard deviation

Trend analysis performed using Mann-Kendall single-tailed test at 0.05 significance level with nondetects assigned a common value less than the smallest measured value in the data set.

Summary statistics calculated using the Kaplan-Meier product limit estimator for non-detects.

Table 4-12. Nonparametric Trend Analysis for Carbon Tetrachloride

Well	Total Samples	Detect Count	Detect Freq. (%)	Min Non-Detect (µg/L)	Min Detect (µg/L)	Max Non-Detect (µg/L)	Max Detect (µg/L)	Mean (µg/L)	Std Dev. (µg/L)	CV	Last Result (µg/L)	Last Sample Date	MK Test Value (S)	MK p-value	Sen's Slope Estimator (µg/L/yr)	Mann-Kendall Result	Trend Analysis Result	Stability Based On CV

For monitoring points exhibiting no trend at the 95 percent confidence level, concentrations are deemed stable if the coefficient of variation (CV) is equal to or less than one.

Table 4-13. Summary of Analytical Air Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

			Carbon disulfide	Carbon tetrachloride	Chloroform
	MTCA Method B - Air		320[b]	0.42[c]	0.11[c]
	Established Background Levels		NE	0.68	0.08
Location	Sample Date	Type	Analytical Data (µg/m3)		
Davey Residence - Indoor Air	9/10/2016	N	0.16 U	**4.7**	**1.4**
	9/20/2019	N	--	**0.6**	**0.1**
	9/20/2019	N	--	**0.63**	**0.11**
	9/20/2019	N	--	**0.59**	**0.11**
	9/20/2019	N	--	**0.74**	**0.18**
	9/27/2019	N	--	**0.61**	**0.13**
	9/27/2019	N	--	**0.49**	**0.11**
	9/27/2019	N	--	**0.54**	**0.11**
	9/27/2019	N	--	**0.67**	**0.14**
Davey Residence - Outdoor Air	9/10/2016	N	0.16 U	**0.56 J**	0.31 U
	9/20/2019	N	--	**0.67**	**0.15**
	9/20/2019	N	--	**0.47**	**0.14**
	9/27/2019	N	--	**0.73**	**0.13**
	9/27/2019	FD	--	**0.52**	**0.15**
	9/27/2019	N	--	**0.58**	**0.12**
Elementary School Office	8/27/2016	N	0.18 U	**0.77 J**	**0.99 J**
	8/28/2016	N	0.18 U	0.35 U	0.35 U
	8/29/2016	N	0.18 U	**0.76 J**	0.35 U
	10/19/2016	N	--	**0.54**	0.0011 U
	10/20/2016	N	--	**0.6**	0.0011 U
	10/21/2016	N	--	**0.41**	0.0011 U
	10/21/2016	FD	--	**0.42**	0.0011 U
High School Office	8/27/2016	N	0.18 U	**0.68 J**	**1.7 J**
	8/28/2016	N	0.2 U	0.39 U	**1.2**
	8/29/2016	N	0.18 U	0.35 U	**0.75 J**
	10/19/2016	N	--	**0.44**	**0.2**
	10/20/2016	N	--	**0.5**	**0.11**
	10/21/2016	N	--	**0.47**	**0.25**
Marlow Crawl Space	9/27/2017	N	--	**0.8**	**0.088**
	9/27/2017	FD	--	**0.66**	**0.097**
Marlow Residence - Indoor Air	8/31/2016	N	0.17 U	**0.68 J**	0.32 U
	9/8/2016	N	**1 J**	0.28 U	0.18 U
	9/9/2016	N	0.16 U	0.31 U	0.31 U
	9/10/2016	N	0.18 U	0.34 U	0.33 U
	10/19/2016	N	--	**0.49**	0.0011 U

Table 4-13. Summary of Analytical Air Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Type	Carbon disulfide	Carbon tetrachloride	Chloroform
	MTCA Method B - Air		320[b]	0.42[c]	0.11[c]
	Established Background Levels		NE	0.68	0.08
			Analytical Data (µg/m3)		
	10/20/2016	N	--	**0.41**	**0.23**
	10/21/2016	N	--	**0.34**	**0.27**
Marlow Residence - Outdoor Air	8/31/2016	N	0.18 U	**0.82 J**	0.33 U
	9/8/2016	N	0.1 U	0.28 U	0.18 U
	9/9/2016	N	0.16 U	0.31 U	0.31 U
	9/10/2016	N	0.17 U	**0.55 J**	0.32 U
	10/19/2016	N	--	**0.8**	**0.53**
	10/20/2016	N	--	**0.36**	0.0011 U
	10/21/2016	N	--	**0.41**	0.0011 U
Middle School North Modular	10/19/2016	N	--	**0.85**	**0.32**
	10/20/2016	N	--	**0.46**	0.0011 U
	10/21/2016	N	--	**0.42**	0.0011 U
Middle School Office	8/27/2016	N	**0.69 J**	**0.83 J**	0.35 U
	8/28/2016	N	0.18 U	0.34 U	0.33 U
	8/29/2016	N	0.18 U	0.35 U	0.35 U
	10/19/2016	N	--	**0.54**	0.0012 U
	10/20/2016	N	--	**0.56**	0.0011 U
	10/21/2016	N	--	**0.41**	**0.42**
Middle School Outdoor Air	8/27/2016	N	**0.81 J**	**0.8 J**	0.35 U
	8/28/2016	N	0.18 U	**0.61 J**	0.33 U
	8/29/2016	N	0.18 U	0.35 U	0.35 U
	10/19/2016	N	--	**0.51**	0.0011 U
	10/20/2016	N	--	**0.51**	0.0011 U
	10/21/2016	N	--	0.036 U	0.0044 U
Middle School South Modular	10/19/2016	N	--	**0.63**	0.0011 U
	10/20/2016	N	--	**0.53**	0.0011 U
	10/21/2016	N	--	**0.4**	0.0019 U
Northeast Background Location	10/19/2016	N	--	**0.63**	**0.048 J**
	10/20/2016	N	--	**0.66**	**0.053 J**
	10/21/2016	N	--	**0.5**	0.0017 U
Northwest Background Location	10/19/2016	N	--	**0.56**	**0.054 J**
	10/20/2016	N	--	**0.62**	**0.057 J**
	10/21/2016	N	--	**0.38**	**0.031 J**
Preschool	10/19/2016	N	--	**0.48**	0.0011 U
	10/20/2016	N	--	**0.45**	**0.1**

Table 4-13. Summary of Analytical Air Data - Carbon Tetrachloride, Chloroform, and Carbon Disulfide

Location	Sample Date	Type	Carbon disulfide	Carbon tetrachloride	Chloroform
	MTCA Method B - Air		320[b]	0.42[c]	0.11[c]
	Established Background Levels		NE	0.68	0.08
			Analytical Data (µg/m3)		
	10/21/2016	N	--	**0.39**	**0.13**
	10/21/2016	FD	--	**0.44**	**0.14**
Randall Crawl Space	9/27/2017	N	--	**0.9**	**0.11**
Randall Residence - Indoor Air	8/31/2016	N	**0.68 J**	**2.5**	**0.49 J**
	9/8/2016	N	0.1 U	**1.5**	0.18 U
	9/9/2016	N	0.16 U	**0.56 J**	0.29 U
	9/10/2016	N	0.17 U	**0.64 J**	0.32 U
	10/19/2016	N	--	**1**	**0.53**
	10/20/2016	N	--	**0.7**	**6.4 a**
	10/20/2016	FD	--	**0.69**	**6 a**
	10/21/2016	N	--	**0.39**	**6.6 a**
Randall Residence - Outdoor Air	8/31/2016	N	**0.9 J**	**0.84 J**	0.33 U
Southeast Background Location	10/19/2016	N	--	**0.62**	**0.045 J**
	10/20/2016	N	--	**0.66**	**0.11**
	10/21/2016	N	--	**0.56**	**0.042 J**
Southwest Background Location	10/19/2016	N	--	**0.71**	**0.07 J**
	10/20/2016	N	--	**0.66**	**0.058 J**
	10/20/2016	FD	--	**1**	**0.25**
	10/21/2016	N	--	**0.63**	**0.045 J**
	10/21/2016	FD	--	**0.6**	**0.058 J**

a = Chlorine-containing cleaning product use observed during sampling.

[b] = non cancer

[c] = cancer

Detections in **bold**

-- = not analyzed

µg/m3 = micrograms per cubic meter

FD = field duplicate

J = estimated result

N = normal sample

NE = not established

U = not detected at or above the indicated reporting limit

Table 6-1. Preliminary Cleanup Levels

Analyte	Drinking Water Groundwater Cleanup Levels MTCA Method B (µg/L)	Saturated Soil Cleanup Levels MTCA, Protection of Groundwater-Saturated (µg/kg)
Carbon Tetrachloride	0.63[a]	2.2
Chloroform	1.4[a]	4.8
Carbon Disulfide	800[b]	270

[a] Cancer; Per WAC 173-340-720(4)(c)(i), MTCA Method B Cancer groundwater screening levels include an inhalation correction factor that takes into account volatilization from indoor tap water

[b] = Non cancer

Notes:

µg/kg= microgram(s) per kilogram

µg/L = microgram(s) per liter

MTCA = Model Toxics Control Act

WAC = Washington Administrative Code

Table 6-2. Chemical-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
Federal Chemical Specific Requirements				
"Designation of Uses," National Recommended Water Quality Criteria	40 CFR 131	Applicable	Establishes numeric water quality criteria for the protection of human health and aquatic organisms. Toxic criteria for the protection of aquatic life is provided in the water quality criteria regulations 40 CFR 131.36(b)(1), "EPA's Section 304(a), Criteria for Priority Toxic Pollutants," supersede criteria adopted by the state, except where the state criteria are more stringent than the federal criteria.	Groundwater at the GHFF contains contaminants that may require remediation and discharge into surface waterbody.
Clean Air Act	42 U.S.C 7401 et seq.	Applicable	Requires minimization of the harmful effects to air quality from excavation, construction, and other removal activities.	Potentially applicable if remedial alternatives involve construction OR if air stripping; potential to emit emission subject to these standards.
National Primary Drinking Water Regulations	40 CFR 141.11-141.16	Relevant and Appropriate	National Primary Drinking Water Regulations (primary standards or MCLs) are legally enforceable standards for public water systems that provide water for at least 15 connections or at least 25 people. Primary standards protect public health by limiting the levels of contaminants in drinking water.	Generally relevant and appropriate for aquifers that are existing or potential public or private sources of drinking water.
Maximum Contaminant Levels	40 CFR 141.60-141.63			
National Primary Drinking Water Regulations	40 CFR 141.50-141.52	Relevant and Appropriate	Non-enforceable health goals for public water systems set at levels that would result in no known or anticipated adverse health risks. The NCP at 40 CFR Sections 300.430(e)(2)(i)(B)-(D) states that MCLGs, established under the Safe Drinking Water Act, that are set at levels above zero should be attained by remedial actions for surface water or groundwater that are current or potential sources of drinking water. For COCs that do not have MCLGs, or if the MCLGs have been set at zero, the remedial actions should achieve MCLs.	Considered potentially relevant and appropriate where set above zero. May be relevant and appropriate in assessing potential risk to or setting cleanup levels for groundwater and surface water identified as a potential source of drinking water.
Maximum Contaminant Level Goals				
Clean Water Act	33 U.S.C 1314	Relevant and Appropriate	Establishes criteria based on designated or potential use of the water. Non-enforceable guidance used to set water quality standards; may potentially be relevant and appropriate per CERCLA Section 121(d)(2)(B)(1).	May be relevant and appropriate in assessing potential risk to surface water for remedial alternatives that include discharge to Rock Creek.
Water Quality Criteria	Quality Criteria for Water			
Clean Water Act NPDES Construction Storm Water Permit Program	40 CFR 122.26	Applicable	Establishes discharge requirements of storm water to waters of the United States from construction sites 1 acre in size or larger.	Implemented through General NPDES Permit issued by Ecology. Applicable if remedial construction activities disturb 1 acre or more of land.
National Emission Standards for Hazardous Air Pollutants for Source Categories	40 CFR 63	Applicable	Regulates the generation of fugitive dust emissions during any onsite activity.	Applicable if soil may be disturbed and dust control is required.
Resource Conservation and Recovery Act Treatment Standards	40 CFR Part 268.40-49	Applicable	Specifies treatment standards and technologies for specific hazardous wastes.	Standards are potentially applicable to hazardous wastes generated during remedial activities.
Resource Conservation and Recovery Act	40 CFR Part 261	Applicable	Defines solid wastes that are subject to regulation as hazardous waste.	Portions of RCRA related to hazardous waste determination and analytical testing; onsite storage, treatment, and disposal are applicable.
Identification and Listing of Hazardous Waste				
Washington Chemical-specific Requirements				
"Model Toxics Control Act Statute and Regulation" (Chapter 70.105D RCW, as amended); "MTCA Cleanup Regulation"	Chapter 173-340 WAC	Applicable	Groundwater cleanup levels are based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions.	Groundwater at the GHFF contains contaminants that may require remediation. Although onsite groundwater is not currently used for drinking water, it is a potential drinking water source.

Table 6-2. Chemical-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
“Ground Water Cleanup Standards”	WAC 173-340-720		Method B equations (720-2) are used to calculate groundwater cleanup levels for carcinogens. Groundwater cleanup levels are established at concentrations that do not directly or indirectly cause violations of surface water, sediments, soil, or air cleanup standards.	
Method B Cleanup Levels for Potable Ground Water”	WAC 73-340-720(4)(b)(i-iii)(B)			
Adjustments to Cleanup Levels”	WAC 173-340-720(7)			
“Model Toxics Control Act Statute and Regulation”; “MTCA Cleanup	Chapter 70.105D RCW, as amended Chapter 173-340 WAC	Applicable	Surface water cleanup levels are based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions.	Groundwater at the GHFF contains contaminants that may require remediation. Although onsite groundwater is not currently used for drinking water, it is a potential drinking water source.
“Surface Water Cleanup Standards”	WAC 173-340-730			
"Water Pollution Control" (Chapter 90.48 RCW, as amended); “Water Quality Standards for Groundwaters of the State	Chapter 173-200 WAC	Applicable	Establishes groundwater quality standards which, together with the State of Washington technology-based treatment requirements, provide for the protection of the environment and human health and protection of existing and future beneficial uses of groundwaters.	Groundwater at the GHFF contains contaminants that may require remediation.
“Water Pollution Control” (Chapter 90.48 RCW, as amended); “Water Quality Standards for Surface Waters of the State of Washington”	Chapter 173-201A WAC	Applicable	Establishes water quality standards for surface waters of the State of Washington consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife.	Groundwater at the GHFF contains contaminants that may require remediation; applicable if remediation activities impact surface water.
“Toxic Substances”	WAC 173-201A-240(3)			
Control for New Sources of Toxic Air Pollutants	WAC 173-460	Applicable	Establishes control of new or modified sources emitting Toxic Air Pollutants (TAPs) in order to prevent air pollution, reduce emissions to the extent reasonably possible, and to maintain such levels of air quality as will protect human health and safety.	Groundwater at GHFF contains contaminants that may be emitted into the air and become TAPs with the use of certain remedial technologies such as air stripping.

Notes:

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

CFR = *Code of Federal Regulations*

COC = constituent of concern

Ecology = Washington State Department of Ecology

EPA = U.S. Environmental Protection Agency

GHFF = Grain Handling Facility at Freeman

MCL = maximum contaminant level

MCLG = maximum contaminant level goal

MTCA = Model Toxics Control Act

NCP = National Contingency Plan

NPDES = National Pollutant Discharge Elimination System

RCRA = Resource Conservation and Recovery Act

RCW = Revised Code of Washington

TAP = Toxic Air Pollutant

U.S.C = *United States Code*

WAC = Washington Administrative Code

Table 6-3. Location-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
Federal Location-specific Requirements				
ESA	Endangered Species Act of 1973 – 16 U.S.C Sections 1531-1544; 50 CFR Part 402	Potentially Applicable	The ESA makes it unlawful to remove or "take" threatened and endangered plants and animals, and protects their habitats. Applicable to work performed in locations that may contain threatened or endangered species or their habitat.	Remedial activities will be conducted in a manner that does not result in a "take" of threatened or endangered species or adversely impact their habitats, to the extent that such species are present.
Clean Water Act Dredge and Fill Requirements	Clean Water Act Section 404 – 33 U.S.C Section 1344 33 U.S.C 1251-1376; 40 CFR 230	Potentially Applicable	Discharge of dredged or fill material to waters of the United States or wetlands is prohibited without obtaining coverage under a nationwide or site-specific permit. EPA guidelines for discharge of dredged or fill materials in 40 CFR 230 specify consideration of alternatives that have fewer adverse impacts and prohibit discharges that would result in exceedance of surface water quality standards, exceedance of toxic effluent standards, or jeopardy of threatened or endangered species.	Potentially applicable if remedial alternatives that include discharge to Rock Creek involve construction of an outfall structure.
Native American Graves Protection and Repatriation Regulations Act	25 U.S.C Section 3001, et seq. 43 CFR 10.1, et seq.	Potentially Applicable	NAGPRA establishes requirements regulating the removal and trafficking of human remains and cultural items, including funerary and sacred objects.	Although Native American graves are not known to exist in areas to be disturbed by remedial activities, if such areas were discovered during construction, NAGPRA requirements would be met.
American Indian Religious Freedom Act	42 U.S.C. 1996 et seq.	Applicable	Establishes a federal responsibility to protect and preserve the inherent right of American Indians to believe, express, and exercise the traditional religious of American Indians.	Applicable for activities potentially affecting religious sites or related materials, if encountered.
Clean Water Act of 1977 Wetlands Protection	33 CFR 320-330	Applicable	Indicates prohibitions on dredge and fill of waters of the United States, including wetlands.	Applicable if wetlands are disturbed on-site by remedial activities.
Floodplain Management "Compliance with Floodplain and Wetland Environmental Review Requirements"	10 CFR 1022	Applicable	Take action to avoid adverse effects, minimize potential harm, and restore and preserve natural and beneficial values of the floodplain.	Applicable if remedial activities occur within a floodplain.
Migratory Bird Treaty Act	Migratory Bird Treaty Act – 16 U.S.C 703-712	Applicable	This act makes it unlawful to "take, capture, kill," or otherwise impact a migratory bird or any nest or egg of a migratory bird.	Remedial activities will be conducted in a manner that does not adversely impact migratory birds, their nests, or eggs to the extent that they are present at or near the site.
National Historic Preservation Act of 1966 "Protection of Historic Properties"	36 CFR 800	Applicable	Legislation intended to preserve historical and archaeological sites in the United States of America. Requires federal agencies to consider the impacts of their undertaking on cultural properties through identification, evaluation, mitigation processes, and consultation with interested parties.	Applicable to activities potentially affecting historic or cultural sites, if encountered.
"Procedures for Implementing the National Environmental Policy Act and Assessing the Environmental Effects Abroad of EPA Actions," "Applicant Requirements"	40 CFR 6.301(b)			
Rules Implementing the Fish and Wildlife Conservation Act of 1980	50 CFR 83	Applicable	Preserve and promote conservation of non game fish and wildlife and their habitats.	Remedial activities will be conducted in a manner that does not adversely impact non-game fish, and wildlife and/or their habitats to the extent that they are present at or near the site.

Table 6-3. Location-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
Washington Location-specific Requirements				
Spokane County Code Critical Aquifer Recharge Areas	Chapter 11.20.075	Applicable	Regulates uses or activities in the critical aquifer recharge area and establishes wastewater/stormwater disposal performance standards and monitoring requirements.	Applicable if remedial activities occur within the critical aquifer recharge area.
Spokane County Code Fish and Wildlife Habitat Conservation Areas	Chapter 11.20.060	Applicable	Regulates uses and activities in priority habitats.	Site is located within the priority habitat for elk.
Spokane County Code Wetlands	Chapter 11.20.050	Applicable	Establishes regulations that limit use or activity in a wetland and establishes wetland buffers and mitigation requirements.	Applicable if remedial activities occur within a wetland or wetland buffer.

Notes:

CFR = *Code of Federal Regulations*

EPA = U.S. Environmental Protection Agency

ESA = Endangered Species Act

NAGPRA = Native American Graves Protection and Repatriation Act

U.S.C = United States Code

Table 6-4. Action-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
Federal Action-specific Requirements				
Clean Water Act Pre-Treatment Requirements	40 CFR 403.5	Applicable	Users may not introduce into a POTW any pollutant that causes pass through or interference. Discharge of specific pollutants is prohibited, including but not limited to those that create a fire or explosion hazard, cause damage to the POTW, will cause flow obstructions, or result in the presence of toxic gasses, vapors, or fumes.	Applicable to groundwater treatment alternatives that include discharge of treated effluent to POTWs. The groundwater treatment system will be operated in a manner that does not produce such discharges.
Clean Water Act NPDES Construction Storm Water Permit Program	40 CFR 122.26	Potentially Applicable	Permit requirements for discharges of storm water to waters of the United States from construction sites 1 acre in size or larger.	Implemented through General Permit issued by the state or local stormwater permitting authority. Applicable if remedial construction activities disturb 1 acre or more of soil.
Clean Water Act NPDES Permit Program	40 CFR 122.21	Applicable	Permit requirements for point source discharges of wastewater to waters of the United States	Applicable to remedial alternatives that include discharge to Rock Creek.
Underground Injection Control Program	40 CFR Part 144 Subpart G	Applicable	Establishes requirements for Class V injection wells including the prohibition on allowing movement of fluid into underground sources of drinking water that might cause endangerment, and proper closure of wells. Class V wells must be registered with EPA's underground injection well inventory.	Applicable to all wells used for injection of remedial fluids, water, or air. Permit coverage will be obtained by registering the wells with EPA's underground injection well inventory.
Federal Occupational Safety and Health Act (OSHA) Standards	OSHA, Part 1910,	Applicable	The federal OSHA standards are intended to ensure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.	Applicable during remedial investigation and construction activities.
Washington Action-specific Requirements				
"Hazardous Waste Management Act of 1976"	Chapter 70.105 RCW, as amended	Applicable	Establishes criteria for solid and recycled solid wastes.	Solid wastes and/or recycled solid wastes may be generated during remedial actions.
"Dangerous Waste Regulations"	Chapter 173-303 WAC			
"Identifying Solid Waste"	WAC 173-303-016			
"Recycling Processes Involving Solid Waste"	WAC 173-303-017			
"Recycled, Reclaimed, and Recovered Wastes"	WAC 173-303-120	Applicable	Defines the requirements for the recycling of materials that are solid and dangerous waste. Specifically, WAC 173-303-120(3) provides for the management of certain recyclable materials, including spent refrigerants, antifreeze, and lead acid batteries. WAC 173-303-120(5) provides for the recycling of used oil.	Recycled, reclaimed, and recovered wastes may be generated during remedial actions.
"Recycled, Reclaimed, and Recovered Wastes"	WAC 173-303-120(3)			
"Recycled, Reclaimed, and Recovered Wastes"	WAC 173-303-120(5)			
"Requirements for Generators of Dangerous Waste"	WAC 173-303-170	Applicable	Establishes the requirements for dangerous waste generators.	Applicable if dangerous wastes is generated from the remedial activities.
"Solid Waste Management—Reduction and Recycling" (Chapter 70.95 RCW, as amended); "Solid Waste Handling Standards"	Chapter 173-350 WAC	Applicable	Establishes minimum functional performance standards for the proper handling and disposal of solid waste. Requirements for the proper handling of solid waste materials originating from residences, commercial, agricultural, and industrial operations and other sources and identifies those functions necessary to ensure effective solid waste handling programs at both the state and local level.	Solid, nondangerous waste will be generated during the remedial activities.
"Owner Responsibilities for Solid Waste	WAC 173-350-025			
"Performance Standards"	WAC 173-350-040			

Table 6-4. Action-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
"On Site Storage, Collection and Transportation Standards"	WAC 173-350-300			
"Remedial Action"	WAC 173-350-900			
"Washington Clean Air Act" (Chapter 70.94 RCW, as amended); "Controls for New Sources of Toxic Air Pollutants"	Chapter 173-460 WAC	Applicable	Establishes control of new sources emitting toxic air pollutants to prevent air pollution, reduce emissions to the extent reasonably possible, and maintain such levels of air quality as will protect human health and safety. Toxic air pollutants include carcinogens and noncarcinogens listed in WAC 173 460 150. Three major requirements of this regulation include (1) implementation of best available control technology for toxics, (2) quantification of toxic air pollutant emissions, and (3) health and safety protection demonstration.	Remediation activities such as treatment systems with the potential to emit hazardous air emissions and that would be considered a new source.
"Purpose"	WAC 173-460-010			
"Applicability"	WAC 173-460-030			
"Control Technology Requirements"	WAC 173-460-060			
"Ambient Impact Requirement"	WAC 173-460-070			
"First Tier Review"	WAC 173-460-080			
"Table of ASIL, SQER and de Minimis Emission Values"	WAC 173-460-150			
"Water Pollution Control"	Chapter 90.48 RCW, as amended	Applicable	Establishes criteria and standards for an underground injection control program	Groundwater at the GHFF contains contaminants that may require remediation; treated groundwater may be discharged through underground injection wells.
"Underground Injection Control Program"	Chapter 173-218 WAC			
"UIC Well Classification Including Allowed and Prohibited Wells"	WAC 173-218-040			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies well planning and construction requirements.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"How Shall Each Water Well Be Planned and Constructed?"	WAC 173-160-161			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the equipment cleaning standards.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Are the Equipment Cleaning Standards?"	WAC 173-160-440			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the general construction requirements for resource protection wells.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Are the General Construction Requirements for Resource Protection Wells?"	WAC 173-160-420			

Table 6-4. Action-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the minimum casing standards.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Are the Minimum Casing Standards?"	WAC 173-160-430			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the minimum standards for resource protection wells and geotechnical soil borings.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Are the Minimum Standards for Resource Protection Wells and Geotechnical Soil Borings?"	WAC 173-160-400			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the requirements for preserving natural barriers to groundwater movement between aquifers.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Are the Requirements for Preserving the Natural Barriers to Ground Water Movement Between Aquifers?	WAC 173-160-181			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the requirements for locating a well.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Are the Requirements for the Location of the Well Site and Access to the Well?"	WAC 173-160-171			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the well sealing requirements.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Are the Well Sealing Requirements?"	WAC 173-160-450			
"Water Well Construction Act of 1971"	Chapter 18.104 RCW, as amended	Applicable	Identifies the decommissioning process for resource protection wells.	Groundwater monitoring and treatment wells occur at the GHFF.
"Minimum Standards for Construction and Maintenance of Wells"	Chapter 173-160 WAC			
"What Is the Decommissioning Process for Resource Protection Wells?"	WAC 173-160-460			
Accumulating Dangerous Waste On Site	WAC 173-303-200	Applicable	Establishes the requirements for accumulating wastes onsite.	Applicable if dangerous wastes is generated from the remedial activities.

Table 6-4. Action-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
Ambient Air Quality Standards	WAC 173-470-100)	Applicable	Sets maximum acceptable levels for particulate matter in the ambient air at 150 µg/m^3 over a 24-hour period, or 60 µg/m^3 annual geometric mean. It also sets the 24-hour ambient air concentration standards for particles less than 10 µm in diameter (PM_{10}) at 105 µg/m^3 and 50 µg/m^3 geometric mean.	Particulate matter can be generated during the remedial actions. Ambient air quality standards for particulate matter will be considered if the remedial actions raise emissions above the standard.
Conditional Exclusion of Special Wastes	WAC 173-303-073	Applicable	Establishes the conditional exclusion and the management requirements of special wastes, as defined in WAC 173-303-040, “Definitions.”	Special wastes may be generated during remedial actions.
Designation of Dangerous Waste	WAC 173-303-070	Applicable	Establishes the method for determining if a solid waste is a dangerous waste (or an extremely hazardous waste).	Dangerous/hazardous waste may be generated during remedial actions.
Emission Standards for Sources Emitting Hazardous Air Pollutants	WAC 173-400-075	Applicable	Establishes national emission standards for hazardous air pollutants. Adopts, by reference, 40 CFR 61, “National Emission Standards for Hazardous Air Pollutants,” and appendixes.	Remedial actions performed at the GHFF, including decontamination, demolition, and excavation activities implemented during a remedial action could have the potential to emit emission (visible, particulate, fugitive, and hazardous air emissions and odors) subject to these standards because groundwater hazardous contaminants detected at the GHFF include covered hazardous air pollutants.
General Regulations for Air Pollution Sources	WAC 173-400	Applicable	Defines methods of control to be employed to minimize the release of air contaminants associated with fugitive emissions resulting from materials handling, construction, demolition, or other operations. Emissions must be minimized through application of best available control technology.	Remedial actions performed at the GHFF, including decontamination, demolition, and excavation activities implemented during a remedial action could have the potential to emit emission (visible, particulate, fugitive, and hazardous air emissions and odors) subject to these standards because groundwater hazardous contaminants detected at the GHFF include covered hazardous air pollutants.
General Standards for Maximum Emissions	WAC 173-400-040	Applicable	All sources and emissions units are required to meet the general emission standards unless a specific source standard is available. General standards apply to visible emissions, particulate fallout, fugitive emissions, odors, emission detrimental to health and property, sulfur dioxide, and fugitive dust.	Applicable to remedial actions that have the potential to release hazardous air emissions.
Land Disposal Restrictions	WAC 173-303-140	Applicable	Establishes treatment requirements and disposal prohibitions for land disposal of dangerous waste.	Applicable to the disposal of dangerous waste if dangerous waste is generated during remedial activities.
Maximum Environmental Noise Levels	WAC 173-60-040	Applicable	Establishes permissible, maximum noise levels.	Applicable to remedial activities.
Methods for defining background concentrations	WAC 173-340-709	Applicable	Establishes background air levels for site-related hazardous substances.	Applicable to remedial actions that have the potential to release hazardous air emissions.
Particle Fallout Standards	WAC 173-470-110	Applicable	Establishes the standard for particle fallout not to exceed 10 g/m^2 per month in an industrial area or 5 g/m^2 per month in residential or commercial areas. Alternative levels for areas where natural dust levels exceed 3.5 g/m^2 per month are set at 6.5 g/m^2 per month, plus background levels for industrial areas and 1.5 g/m^2 per month, plus background in residential and commercial areas.	Particulates and dust can be generated during the remedial actions.
Protection of Upper Aquifer Zones	WAC 173-154	Applicable	Establishes requirements to prevent depletion, excessive level decline, and/or reduction in water quality of the aquifer.	Applicable to remedial alternatives involving withdrawal of groundwater from the aquifer.

Table 6-4. Action-Specific Requirements

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
Requirements for Universal Waste	WAC 173-303-077	Applicable	Identifies those wastes exempted from regulation under WAC 173-303-140, "Land Disposal Restrictions," and WAC 173-303-170 through 173-303-9907 (excluding WAC 173-303-960, "Special Powers and Authorities of the Department"). These wastes are subject to regulation under WAC 173-303-573, "Standards for Universal Waste Management."	Universal wastes may be generated during remedial actions.
Accreditation of Environmental Laboratories	WAC 173-50	Applicable	Department of ecology, department of health, and other entities require persons and organizations submitting analytical data under the purview of their programs to use environmental laboratories which are accredited. The accreditation program is designed to satisfy the intent of RCW 43.21A.230 and 43.21A.445.	Applicable where environmental sampling data are collected for remedial investigation and remedial action activities under the Department of Ecology.
Safety Standards for Construction Work	WAC 296-155	Applicable	Establishes safety and health construction safety standards into one chapter of the Washington Administrative Code, with the intent that the safety standards of the Washington state department of labor and industries will be at least as effective as those adopted by the U.S. Department of Labor and administered by the Occupational Safety and Health Administration as published in the Code of Federal Regulations.	Applicable for any remedial construction activities.
Local Action-specific Requirements				
Spokane County Code Grading	SCC Title 3, Section 3.10.020	Applicable	Establishes rules and regulations to control excavation, grading and earthwork construction.	Applicable if remedial activities involve excavation, grading or earthwork construction, including fills and embankments.

Notes:

$\mu g/m^3$ = microgram(s) per cubic meter

μm = micrometer(s)

CFR = *Code of Federal Regulations*

EPA = U.S. Environmental Protection Agency

g/m^2 = gram(s) per square meter

GHFF = Grain Handling Facility at Freeman

NPDES = National Pollutant Discharge Elimination System

NTR = National Toxics Rule

POTW = publicly owned treatment works

RCW =

SCC = Spokane County Code

U.S.C = United States Code

WAC = Washington Administrative Code

Table 6-5. "To Be Considered" Advisories and Guidance

Requirement	Citation	Applicable/Relevant and Appropriate	Description	Comments
State of Washington, Department of Ecology, Cleanup Levels and Risk Calculation	https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC	To be considered	Online tool to help identify MTCA cleanup criteria.	
State of Washington, Department of Ecology, Guidance for Remediation of Petroleum Contaminated Sites	Ecology, 2016.	To be considered	This document provides guidance on the remediation of petroleum contaminated sites under MTCA Chapter 70.105D, and its implementing regulations, Chapter 173-340 WAC. It is primarily intended to provide guidance to persons with technical backgrounds and experience in contaminated site cleanup, including Ecology Cleanup Project Managers (site managers), consultants and contractors.	The subject site is not a petroleum contaminated site, but the guidance provides many standards of practice that may generally apply during cleanup under MTCA.
State of Washington, Department of Ecology, Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action	Ecology, 2018	To be considered	This draft document provides guidance on how to evaluate and respond to the vapor intrusion exposure pathway pursuant to MTCA Cleanup Regulation, chapter 173-340 WAC.	Will be considered when assessing human health risk posed by contaminants at the site.
EPA Risk Assessment Guidance for Superfund	EPA, 1989	To be considered	Guidance and framework to assess human health risk.	Will be considered when assessing human health risk posed by contaminants at the site.
State of Washington Department of Ecology, Human Health Risk Assessment Procedure	WAC 173-340-708	To be considered	State-specific guidance and framework to assess human health risk.	
EPA, Ecological Risk Assessment Guidance for Superfund	EPA, 1997	To be considered	Guidance on designing and conducting ecological risk assessments.	Will be considered when assessing ecological risk posed by contaminants at the site.
State of Washington Department of Ecology, Terrestrial Ecological Evaluation Procedure	WAC 173-340-7490	To be considered	State-specific guidance on designing and conducting ecological risk assessments.	
EPA, OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air, 2015	EPA, 2015	To be considered	Provides guidance on how to evaluate and respond to the vapor intrusion exposure pathway	Will be considered when assessing human health risk posed by contaminants at the site.

Notes: EPA = U.S. Environmental Protection Agency; WAC = Washington Administrative Code

Table 7-1. Screening of Remedial Technologies

Remedial Technology			Technology Description	Screening Comments
Monitored Natural Attenuation	Monitoring and Reporting	Groundwater monitoring	The process requires installation of a specific groundwater monitoring well network and conducting periodic groundwater monitoring and assessment to track changes in groundwater flow and plume fate and transport under a regulatory program. For MNA, monitoring provides data to demonstrate degradation/decline of COC concentrations in groundwater.	MNA is not retained for consideration because there is not strong evidence of natural processes in MNA occurring at the Site.
		Soil vapor monitoring	Monitoring to provide data to demonstrate decline of COC concentrations in soil vapor.	Not retained. Based on available data, Ecology has determined that there is no indication of vadose zone VOC source or VOC vapor plume of concern. Vapor intrusion has been identified as an incomplete exposure pathway.
Engineering Controls/ Containment	Horizontal Barriers	Capping	Capping involves paving or placement of a low-permeability layer at the ground surface. Capping can limit contaminant mobility and mitigate potential migration via air, surface water, and groundwater by attenuating vapor migration and controlling stormwater run-on and runoff and precipitation-enhanced percolation that may carry contaminants into groundwater. Caps/covers can range from a one-layer system of vegetated soil or concrete/asphalt to a complex multi-layer system of soils and geosynthetics. Materials used in the construction of multi-layer caps include low-permeability and high-permeability soils and low-permeability geosynthetic products. Low-permeability materials divert water and reduce its passage into waste (barrier layer) while high permeability materials (drainage layer) carry water away that percolates into the cap. Other materials may be used to increase slope stability.	Not retained. Because there is no indication of vadose zone sources or direct contact risk, capping will have no effect on saturated zone impacts.
		Vapor barriers	An impermeable horizontal barrier is emplaced, typically beneath buildings, to reduce migration of COC vapor. Low-permeability soils limit migration. No vapor intrusion issues are expected for this site.	Not retained. Vapor intrusion has not been identified as a complete exposure pathway
	Vertical Barriers	Vapor barrier	An impermeable vertical barrier is emplaced, typically between source areas and buildings, to reduce vertical migration of COC vapor up into buildings. Low-permeability soils limit migration. No vapor intrusion issues are expected for this site.	Not retained. Vapor intrusion has not been identified as a complete exposure pathway
		Permeable adsorptive barrier	A permeable vertical barrier is emplaced to absorb mobile NAPL and/or dissolved-phase compounds preventing further migration. These barriers have somewhat limited effectiveness on higher solubility compounds.	Retained for further assessment. A PAB can potentially be used either locally or plume wide to remove dissolved VOCs from aqueous phase when they move through adsorptive media such as PlumeStopTM or BOS-100TM, which have become commercially available in recent years. However, due to the highly heterogenous geological conditions of the basalt aquifer, and the dynamic hydraulic regime controlled or seriously disturbed by various extraction wells operating on demand, careful treatability study and field pilot-scale testing will be required to evaluate and, if applicable, design full-scale application of this technology for the site.
		Slurry wall	Slurry walls are vertically installed barriers that reduce lateral migration of dissolved and free phase COCs from the site. They are ideally used at sites where the slurry wall can key into a naturally occurring low permeability horizontal layer (for example, clay or competent bedrock) to completely isolate the impacted zone.	Not retained. Deep impacts and lack of a low permeability layer to key the wall into greatly limits the effectiveness of this remedial technology.
		Groundwater Extraction	Extraction of groundwater from a line of vertical extraction wells create a hydraulic barrier that prevents lateral contaminant migration beyond the barrier (the line of extraction wells). Extracted groundwater is treated aboveground using a variety of treatment processes, including liquid-phase GAC, air stripping, fluidized bed reactors, filtration, and chemical oxidation. Because carbon tetrachloride is the primary COC for the site, air stripping with vapor-phase activated carbon and liquid-phase activated carbon are the two retained aboveground treatment technologies to be evaluated for extracted groundwater as discussed below under "Treatment."	Retained. Groundwater extraction to hydraulically reduce downgradient migration of dissolved-phase contaminants can potentially either be implemented as a standalone remedial alternative from the beginning or become a part of remedial action in conjunction with other technologies. It may also be a possible fallback configuration to attempt aggressive plume restoration by pumping and treating. However, due to the highly heterogenous geological conditions of the basalt aquifer, and the dynamic hydraulic regime controlled or seriously disturbed by various extraction wells operating on demand, careful study and additional aquifer testing will be required to evaluate and if applicable design full-scale application of this technology for the site
		Groundwater injection/infiltration	Freshwater can be injected into a line of injection/infiltration wells to form a vertical hydraulic barrier to reduce lateral plume migration. An injection/infiltration permit will be required.	Not retained. Hydraulic barrier via injection requires supply of high quality water which is not available at the site. Re-injection as part of groundwater recirculation is retained, and discussed as part of removal actions below.
Removal	Soil Removal	Excavation	Impacted soil is excavated using standard excavation equipment or pattern large diameter auger drilling. Excavation and backfill with high permeability soils can also enhance other remedial technologies such as soil vapor extraction.	Not retained. Source area in soil not identified.
	Groundwater Collection	Groundwater extraction	Groundwater extraction wells are installed throughout of plume area and the groundwater is pumped to physically remove contaminants from the saturated zone. Extracted groundwater is treated aboveground using a variety of treatment processes, including liquid-phase GAC, air stripping, fluidized bed reactors, filtration, and chemical oxidation. Treated water would either be discharged to a creek under a NPDES permit or injected into the formation outside of the body of plume.	Retained. Extraction of impacted groundwater for above ground treatment can hydraulically reduce further plume migration and remove contaminants dissolved in groundwater within the capture zone of extraction wells. However, due to the highly heterogenous geological conditions of the basalt aquifer, and the dynamic hydraulic regime controlled or seriously disturbed by various extraction wells operating on demand, careful study and additional aquifer testing will be required to evaluate and if applicable design full-scale application of this technology for the site
		Groundwater recirculation	Same as above under groundwater extraction, except that the extracted water would be injected into the body of plume after above ground treatment to remove COCs. The injection/infiltration wells would be strategically located so that the injected water would move through the plume domain to flush COCs from the formation to nearby extraction wells.	Retained. Recirculation can potentially enhance mass removal from the formation by an accelerated flushing effect. However due to significant aquifer heterogeneities and presence of domestic water supply wells, injected water may not necessarily reach nearby extraction wells if other preferential pathways exist. Careful evaluation and field verification will likely be necessary.
	Vapor Removal	Soil vapor extraction	A moderate vacuum would be applied to wells (can be vertical or horizontal) screened primarily in the vadose zone to recover volatile impacts and also provide oxygen, which would aid in stimulating aerobic biodegradation of certain COCs. This technology would be used in conjunction with another active remedy such as air sparging to remediate saturated zone impacts.	Not retained. Insignificant vadose zone impacts. Unless air sparging is selected for treatment of dissolved plume in groundwater, vapor extraction is not expected to provide much value for remediation of the dissolved-phase plume. Air sparging is not considered an effective groundwater remedy for the Site (see below).
		Air sparging	Air is injected into the groundwater via injection/infiltration wells or well points (can be vertical or horizontal) or within a sparge trench. Volatile chemicals are stripped from the water and soil. COCs vapors are recovered by an SVE system in the vadose zone.	Not retained. Depth of impacted zone and the overlying low-permeability zone with heterogeneous basalt bedrock precludes treatment in this manner.

Table 7-1. Screening of Remedial Technologies

Remedial Technology			Technology Description	Screening Comments
		In-well stripping or groundwater circulation well	Air-lift pumping in a well with two screened intervals results in recirculation of groundwater through the aquifer and well. In addition, air-bubble stripping within the well removes VOCs from the groundwater. A low vacuum head is used to extract vapors to the surface for treatment. Vapor-phase VOCs in extracted air may require treatment.	Not retained. The technology is "in situ" as it does not extract any groundwater for above ground treatment and does not require disposal of treated groundwater. However, the effective radius of influence is relatively limited based on aquifer pumping test data and number of wells needed will be more than pump and treat technology. Most importantly, the technology assumes a relatively uniform formation so that groundwater extracted from deeper intervals can recharge back to formation from upper intervals and recirculate back to the lower interval in a spherical circulation pattern. Highly heterogenous basalt bedrock formation and dynamic hydraulics (on-demand extraction from domestic water supply wells) create serious challenges for the effectiveness of this technology.
	Groundwater and Vapor Collection	Multi-phase extraction	Liquids and vapors are simultaneously recovered from a group of extraction wells to provide simultaneous remediation of the saturated and vadose zones. Unsaturated zone impacts are primarily remediated by volatilization whereas saturated zone impacts are primarily remediated through advection. Options for liquid recovery include applied vacuum and liquid recovery pumps. Vapors and liquids are treated separately above ground. Liquids are treated in the manner described below for the pump and treat technology. Dewatering provided by the liquid recovery system allows SVE to remediate impacted saturated zones. This technology is optimally applied at moderate permeability sites where significant contaminant mass is present near the water table or capillary fringe and dewatering can occur without excessive liquid recovery.	Not retained. Multi-phase extraction is not an applicable technology for the plume based on Site CSM (basalt bedrock and very diluted groundwater plume).
Treatment	Physical	Liquid-phase activated carbon	Activated carbon can be used to remove COCs from groundwater in two ways: 1) filtering and adsorption of COCs when COC-bearing groundwater is pumped through liquid-phase activated carbon in an aboveground water treatment system; and 2) Injection of carbonaceous materials (for example, activated carbon) into the subsurface to retard migration of various COCs. PAB is one form of such application where injection occurs into a line of wells/borings perpendicular to groundwater flow direction.	Retained. Carbon can be an effective technology for treatment of VOCs within extracted groundwater. In-situ application would be in the form of injection within the plume to form a PAB. However, careful treatability study and pilot-scale testing would be necessary to assess PAB effectiveness in the heterogenous basalt formation and the potential adverse effect on geochemistry which could impact domestic water supply wells.
		Air stripping	Air stripping involves blowing air through extracted groundwater to strip out volatile COCs dissolved in groundwater. Depending on concentrations and regulatory requirements, COC vapors stripped from extracted groundwater can either be released to the atmosphere or further treated by vapor-phase activated carbon or a thermal oxidizer.	Retained. Air stripping and vapor-phase activated carbon combination is a common application for aboveground treatment of groundwater containing VOCs.
		Vapor-phase activated carbon	Vapor-phase activated carbon can be used to treat VOC vapors from a SVE system or treat VOC vapors from an air stripping system.	Retained. Vapor-phase activated carbon is a common application for aboveground treatment of vapor emissions from treating groundwater containing VOCs.
		In situ thermal treatment	Thermal heating of the subsurface enhances desorption and volatilization of VOCs from soil and groundwater and is used to enhance another remedial technology such as multiphase extraction or SVE. Heating can be accomplished through thermal heating wells or soil resistance heating, which involves passing electric current directly through the ground. Heating of the ground increases the volatility of VOCs, which allows their rapid removal by SVE. Cracking of clays and silts due to desiccation leads to secondary permeability, which allows treatment of low permeability soils by this process.	Not retained. Not applicable for treating relatively large, low concentration dissolved-phase plume.
		Permeability enhancements (such as pneumatic fracturing)	Low permeability soil and bedrock are frequently difficult to remediate because it is difficult to generate sufficient fluid flow through the material. Various means have been used to increase the overall permeability, including hydraulic and pneumatic fracturing and also deep mixing of coarse media (for example, gravels) with large diameter augers. While not a standalone remedy, permeability enhancements could be used to mitigate vapor migration and/ radius of influence issues for the AS/SVE, biosparge, and multi-phase extraction.	Not retained. Due to the presence of many domestic water supply wells, fracturing process could potentially create preferential flow paths for plume to migrate into some domestic water supply wells and make the situation worse than it is now.
	Chemical	In situ chemical oxidation	ISCO involves injecting chemical oxidants into the vadose zone and/or groundwater to oxidize organic contaminants. Common oxidants are hydrogen peroxide-based Fenton's reagent, $KMnO_4$, sodium permanganate, and sodium persulfate. Ozone can also oxidize organic chemicals in situ, but it has been used less frequently. Complete mineralization to carbon dioxide and water is the desired endpoint of an in situ chemical oxidation process.	Not retained. Not applicable for relatively large, low concentration dissolved-phase plume. Also, oxidation of carbon tetrachloride can produce recalcitrant intermediate compounds that are poorly understood and could be more toxic. In addition, because of the presence of many domestic water supply wells in the plume area, ISCO induced redox condition changes could mobilize some metals such as hexavalent chromium which can be a significant risk and should be avoided.
		Chemical oxidation	Chemical oxidation can be used to treat extracted groundwater through a system that destroys carbon tetrachloride and other associated VOCs by chemical oxidation.	Not retained. Treatment of extracted groundwater containing primarily carbon tetrachloride is more complicated than air-stripping/vapor-phase activated carbon or liquid-phase activated carbon.
		In-well oxidation	Combined with the in-well aeration/stripping process, the vapor stream is treated within the well using an advanced oxidation process.	Not retained. Not applicable for relatively large, low concentration dissolved-phase plume. Also, the effectiveness and potential concern from oxidation discussed above concerning ISCO are additional concerns for in-well oxidation.
		Permeable reactive barrier	Flow-through in situ PRB. Also known as passive treatment wall. A "funnel and gate" configuration utilizing impermeable vertical barriers to channel groundwater through a permeable zone ("gate") that contains zero-valent iron filings or other reactants (for example, metal oxides and sulfides, aluminosilicates, sorbents, and organics) is common in porous media. Can be applied as a source-zone or plume containment system.	Not retained, except as possible supplement to a PAB discussed above. The depth of the impacts and the highly heterogenous basalt bedrock formation as well as hydraulic disturbances from on-demand pumping of domestic water supply wells would make PRB installation and maintenance very challenging. Also, there is no known reactive media that can completely degrade carbon tetrachloride to non-toxic end products without generation of recalcitrant intermediate compounds that are either hard to treat or poorly understood. If iron filings or similar chemicals are used, the anaerobic condition induced by the PRB can potentially mobilize certain metals such as arsenic, manganese and iron and cause other water quality issues for the domestic water supply wells. Such potential impacts can be evaluated during pilot-scale testing.
	Thermal	Thermal oxidizer	Thermal oxidizer can be used to treat VOCs stripped out of groundwater. A thermal oxidizer can completely destroy VOCs contained in vapors extracted from an SVE system or stripped out of extracted groundwater from an air stripper. A thermal oxidizer is used when the COCs cannot be effectively treated by vapor-phase activated carbon.	Not retained. Using thermal oxidizer to treat VOC vapors from air stripping at the Site is not a cost-effective option compared with vapor-phase activated carbon.

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Table 7-1. Screening of Remedial Technologies

Remedial Technology			Technology Description	Screening Comments
	Biological	Phytoremediation	Plants are used to clean up VOCs in soil and groundwater through the plants' natural abilities to take up, accumulate, and/or degrade the contaminants; deep-rooted trees can be used to take up impacted groundwater from the aquifer and hydraulically contain groundwater plumes in shallow groundwater.	Not retained. Plant uptake for phytoremediation systems is typically limited to shallow water table conditions and plume depths of less than 30 feet bgs.
		Biosparging	Air is injected into the groundwater via a series of injection points to increase the biological activity of the indigenous aerobic microorganisms and biodegrade the petroleum hydrocarbons and fuel oxygenates in the groundwater. The hydrocarbon acts as the electron donor, and the oxygen acts as an electron acceptor. Biosparging can be implemented with a grid-injection pattern, a single line of air injection points (or sparge curtain), or a series of air sparge curtains. For a biosparging application, air can be delivered continuously or through pulsed injection, which is more common. Ideally VOC vapors migrate into the vadose zone at a rate at which they are remediated by aerobic biodegradation eliminating migration to the atmosphere.	Not retained. Carbon tetrachloride is at highest oxidation state and degradation of carbon tetrachloride does not occur under aerobic conditions. Injection of air into aquifer can strip VOCs including carbon tetrachloride out of groundwater but delivery of air to targeted depths in this highly heterogeneous basalt bedrock formation with multiple domestic water supply wells and the uncertainty on the degradation products from carbon tetrachloride discussed earlier under air sparging and oxidation limit the applicability of this technology.
Treatment	Biological	Enhanced bioremediation (aerobic and anaerobic)	Either oxygen (an electron acceptor) under aerobic conditions, or an electron donor and/or anaerobic electron acceptor under anaerobic conditions, is added with nutrients through recirculation or injection to enhance the naturally occurring microbial activity from bacteria targeting specific compounds. Bioremediation systems such as bioreactors can also be used to treat VOCs from extracted groundwater.	Not retained. In addition to difficulties in effectively delivering and maintaining amendments for enhanced biodegradation, complete biodegradation of carbon tetrachloride can only occur under anaerobic conditions; anaerobic degradation typically stalls when it is degraded to methylene chloride. In addition, biodegradation of carbon tetrachloride can produce recalcitrant intermediate compounds that are still poorly understood. The induced anaerobic condition could also mobilize metals such as arsenic, manganese and iron which can be a significant problem for domestic water supply wells.
		In situ bioaugmentation	Microbial cultures that have been specially bred for degradation of specific contaminants or contaminant groups are added to the subsurface through recirculation or injection. Under aerobic conditions, electron acceptors and/or nutrients are typically added with the microbes to enhance biodegradation. Likewise, under anaerobic conditions, an electron donor and/or nutrients are added.	Not retained. Bioaugmentation is a complimentary step for enhanced bioremediation. As indicated above under enhanced bioremediation, enhanced bioremediation is not retained for further consideration for this project.

Notes:
Remedial technology types and screening comments shown in bold are retained for incorporation into remedial alternatives.
AS = air sparging
bgs = Below ground surface
COC = constituent of concern
CSM = conceptual site model
GAC = granular activated carbon
ISCO = in situ chemical oxidation
$KMnO_4$ = potassium permanganate
MNA = monitored or monitoring natural attenuation
NAPL = nonaqueous phase liquid
NPDES = National Pollutant Discharge Elimination System
PAB = permeable adsorptive barrier
PRB = permeable reactive barrier
SVE = soil vapor extraction
VOC = volatile organic compound

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Table 8-1. Summary of Remedial Action Alternatives

Remedial Action Alternative	Components	Description
1	Permeable Adsorptive Barrier	A PAB would involve the injection of activated carbon into the aquifer to retard further migration of Site COCs via adsorption. The PAB would be installed as a linear transect along the downgradient Site boundary, using a series of closely spaced injection borings or wells. The spacing of injections would be determined as part of field pilot-scale testing, and would be based on the achievable site-specific injection radius. Bench-scale and field pilot-scale testing would also be used to optimize dosing requirements and to evaluate the benefit of potential co-injectants, such as micro-scale ZVI.
	Institutional Controls	Institutional controls will reduce unacceptable exposures until the proposed RAOs are achieved. Institutional controls will include limitations on excavation activities, construction limitations for the GHFF, guidelines for drilling at the site, and limitations on groundwater extraction.
	Groundwater Monitoring and Reporting	Perform groundwater monitoring to provide data to demonstrate decline of COC concentrations in groundwater.
	Point-of-Entry Domestic Water Treatment	A domestic water supply component will be provided to property owners, including the Freeman School District, overlying portions of the groundwater aquifer impacted by carbon tetrachloride and its degradation products at concentrations exceeding the cleanup criteria. Domestic water supply components developed for the Site include: city connection, offsite wellfield, point-of-entry treatment, and deep extraction wells. Continued use of point-of-entry domestic water treatment systems was selected as the representative domestic water supply component used for comparative evaluations.
2	Groundwater Extraction and Treatment and Infiltration	A groundwater extraction and treatment system would provide hydraulic capture of the highest concentrations of COCs in groundwater, with active ex situ treatment of COCs. Reinjection/infiltration will enhance reduction of COC concentrations by promoting flushing of the impacted zone. In situ treatment of areas outside the hydraulic capture zone would be conducted via natural attenuation processes. A hydraulic barrier is established that reduces contaminant migration. Impacted groundwater is treated using air stripping or liquid-phase GAC.
	Institutional Controls	Institutional controls will reduce unacceptable exposures until the proposed RAOs are achieved. Institutional controls will include limitations on excavation activities, construction limitations for the GHFF, guidelines for drilling at the site, and limitations on groundwater extraction.
	Groundwater Monitoring and Reporting	Perform groundwater monitoring to provide data to demonstrate decline of COC concentrations in groundwater.
	Point-of-Entry Domestic Water Treatment	A domestic water supply component will be provided to property owners, including the Freeman School District, overlying portions of the groundwater aquifer impacted by carbon tetrachloride and its degradation products at concentrations exceeding the cleanup criteria. Domestic water supply components developed for the Site include: city connection, offsite wellfield, point-of-entry treatment, and deep extraction wells. Continued use of point-of-entry domestic water treatment systems was selected as the representative domestic water supply component used for comparative evaluations.

Notes:

COC = constituent of concern

GAC = granular activated carbon

GHFF = Grain Handling Facility at Freeman

PAB = permeable adsorptive barrier

RAO = remedial action objective

ZVI = zero-valent iron

Table 8-2. Summary of Costs for Remedial Alternatives

	Alternative 1. Permeable Adsorptive Barrier, including Groundwater Monitoring and Reporting	**Alternative 2. Groundwater Recirculation, including Groundwater Monitoring and Reporting**
Total Capital Cost	$3,660,000	$4,630,000
Annual Cost	$109,000	$301,000
Duration (Years)	32 Years	17 Years
Total Annual Cost	$3,490,000	$5,120,000
Total	**$7,150,000**	**$9,750,000**

Notes:
All costs rounded to three significant figures.
Costs exclude point-of-entry domestic water treatment (Table 8-3).
A 15-year duration was used for cost estimating.

Table 8-3. Summary of Costs for Domestic Water Supply Components

	1. City Connection	2. Offsite Wellfield	3. Point-of-entry Treatment	4. Deep Extraction Wells
Total Capital Cost	$12,370,000	$3,070,000	$0	$2,600,000
Annual Cost	$0	$50,000	$168,000	$0
Duration (Years)[a]	Estimated > 15 Years	Estimated > 15 Years	Estimated > 15 Years	Estimated > 15 Years
Total Annual Cost	$0[b]	$750,000	$2,520,000	$0
Total	**$12,400,000**	**$3,820,000**	**$2,520,000**	**$2,600,000**

[a] A duration of 15 years was used for estimating total annual costs for comparison purposes.

[b] City water fees would be paid by the property owners.

Note:

All costs rounded to three significant figures.

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Table 9-1. Detailed Analysis of Remedial Alternatives

Alternative	Threshold Criteria: 1. Overall Protectiveness of Human Health and Environment	Threshold Criteria: 2. Compliance with ARARs	Balancing Criteria: 3. Long-term Effectiveness and Permanence	Balancing Criteria: 4. Reduction of Toxicity, Mobility, or Volume through Treatment	Balancing Criteria: 5. Short-term Effectiveness	Balancing Criteria: 6. Implementability	Balancing Criteria: 7. Relative Cost
Alternative 1: Permeable Adsorptive Barrier, Institutional Controls, Groundwater Monitoring and Reporting, and Point-of-Entry Domestic Water Treatment	Likely protective with provision of point-of-entry domestic water treatment. Will not completely reduce the migration of COCs as there remain some uncertainties regarding the extent to which natural biodegradation is occurring within the aquifer where COCs are present, and the extent to which isolation of COCs at the Site source will be effective.	Can meet most ARARs over short to moderate time periods, and all ARARs over very long time periods.	Point-of-entry domestic water treatment provides long-term source of clean domestic water. Institutional controls provide long-term administrative protections against exposure. Natural attenuation mechanisms operate to achieve cleanup criteria over long time periods; abiotic and biological degradation irreversibly degrade organic contaminants. Long-term effectiveness is enhanced by isolation of higher dissolved-phase COC concentrations within the source area via adsorption to injected liquid-phase activated carbon. Additional pilot study is recommended to evaluate (1) injectability and distribution of treatment reagents, and (2) effectiveness of adsorptive barrier to reduce further migration of Site COCs.	Some uncertainty as to whether this alternative will significantly reduce toxicity or volume in a reasonable timeframe, as it is anticipated to require many decades to achieve the very low cleanup standards. COC mobility is reduced by institutional controls eliminating groundwater extraction from shallow and CRBG aquifers. Source isolation with a PAB can further reduce intra-plume mobility.	Alternative 1 presents greater short-term risks to construction workers and the public than Alternative 2, because of added construction and injection for the PAB, which requires a large number of drilled wells. This alternative provides limited improvement in short-term effectiveness, as the PAB limits migration of high-concentration COCs from the source area (reducing intra-plume mobility). Institutional controls and alternate water supply provide immediate protections for human health exposures over the short term (and continuing to the long term).	There are potential limitations to implementing the PAB, and pilot-scale field testing and treatability studies are required to determine adsorption characteristics, dosing requirements, and injectability within the fractured basalt aquifer. There are remaining uncertainties regarding the extent to which natural biodegradation is occurring within the aquifer where COCs are present.	High
Alternative 2: Groundwater Recirculation (extraction, treatment, and infiltration), Institutional Controls, Groundwater Monitoring and Reporting, and Point-of-Entry Domestic Water Treatment	Likely protective with provision of point-of-entry domestic water treatment. Will likely reduce overall migration of COCs although there remain some uncertainties regarding the extent to which COCs can be removed from the plume.	Can meet most ARARs over short to moderate time periods, and all ARARs over very long time periods.	Point-of-entry domestic water treatment provides long-term source of clean domestic water. Institutional controls provide long-term administrative protections against exposure. Natural attenuation mechanisms operate to achieve cleanup criteria over long time periods; abiotic and biological degradation irreversibly degrade organic contaminants. Long-term effectiveness is enhanced by active hydraulic capture of impacted groundwater within shallow and CRBG aquifers. Additional pilot study and aquifer testing are recommended to determine (1) whether an adequate hydraulic capture zone to intercept dissolved-phase COCs can be achieved, and (2) whether aquifer parameter assumptions, design specifications, and capture zone estimates are accurate.	Some uncertainty as to whether this alternative will significantly reduce toxicity or volume in a reasonable timeframe, as it is anticipated to require many decades to achieve the very low cleanup standards for portions of aquifers beyond the capture zone of proposed extraction wells. COC mobility is greatly limited by active hydraulic capture using groundwater extraction and treatment.	Alternative 2 presents incrementally lesser short-term risks to construction workers and the public than Alternative 1, because of added construction of the groundwater extraction, treatment, and infiltration system. This alternative provides short-term effectiveness, as active hydraulic capture using groundwater extraction and treatment limit overall migration of dissolved-phase COCs. Institutional controls and alternate water supply provide immediate protections for human health exposures over the short term (and continuing to the long term).	Implementing this alternative requires additional groundwater modeling and aquifer testing to support final well and treatment capacity design. The treatment process may require permits and aquifer infiltration must be acceptable to Ecology and regional stakeholders.	High

Notes:

Criteria 8 (State Acceptance) and 9 (Community Acceptance) will be judged during the proposed plan preparation.

ARAR = applicable or relevant and appropriate requirement
COC = constituent of concern
CRBG = Columbia River Basalt Group
Ecology = Washington State Department of Ecology
PAB = permeable adsorptive barrier

Table 9-2. Disproportionate Cost Analysis and Comparison to Model Toxics Control Act Criteria

			Alternative 1 **Permeable Adsorptive Barrier, Institutional Controls, Groundwater Monitoring and Reporting, and Point-of-Entry Domestic Water Treatment**	**Alternative 2** **Groundwater Recirculation (extraction, treatment, and infiltration), Institutional Controls, Groundwater Monitoring and Reporting, and Point-of-Entry Domestic Water Treatment**
1 Meets Remedial Action Objectives			Yes	Yes
2 Compliance with MTCA Threshold Criteria				
• Protect human health and the environment • Comply with cleanup standards • Comply with applicable state/federal laws • Provide for compliance monitoring			• Yes • Yes • Yes • Yes	• Yes • Yes • Yes • Yes
3 Restoration Timeframe			32 years	17 years
• Potential risk to human health and environment • Practicability of achieving shorter restoration time • Current use of site, surrounding area, and resources • Future use of site, surrounding area, and resources • Availability of alternative water supplies • Likely effectiveness/reliability of institutional controls • Ability to monitor migration of hazardous substances • Toxicity of hazardous substances at the site • Natural processes that reduce concentrations			• Low • Low • Commercial and Residential • Commercial and Residential • Components available and evaluated • Medium • High • Medium • No	• Low • Medium • Commercial and Residential • Commercial and Residential • Components available and evaluated • Medium • High • Medium • No
4 Relative Benefits Ranking (Score 1-10)				
Weighting	*Criteria*			
17%	*Overall Protectiveness*		3	9
17%	*Permanence*		6	8
17%	*Long Term Effectiveness*		6	8
17%	*Management of Short Term Risk*		7	8
17%	*Implementability*		4	5
17%	*Consideration of Public Concerns*		6	9
MTCA Overall Benefit Score (1-10)		Row A	5.0	8.1
5 Disproportionate Cost Analysis				
Capital Cost			$3,660,000	$4,630,000

Table 9-2. Disproportionate Cost Analysis and Comparison to Model Toxics Control Act Criteria

		Alternative 1 Permeable Adsorptive Barrier, Institutional Controls, Groundwater Monitoring and Reporting, and Point-of-Entry Domestic Water Treatment	Alternative 2 Groundwater Recirculation (extraction, treatment, and infiltration), Institutional Controls, Groundwater Monitoring and Reporting, and Point-of-Entry Domestic Water Treatment
Annual Cost		$277,000	$469,000
Duration (Years)		32	17
Estimated Remedy Cost	Row B	$12,500,000	$12,600,000
Magnitude of Cost Compared to Lowest Cost Alternate		--	101%
Magnitude of Relative Benefit to Most Permanent Alternative Benefit Ratio/Relative Cost (divided by 1,000,000)	Row C = Row A / (Row B / 1,000,000)	0.43	0.62
6 Remedy Permanent to the Maximum Extent Practicable		No	Yes