Groundwater Sampling Summary
Event 6, Second Quarter 2019

Final Supplemental Groundwater Sampling and Data Evaluation
Northwest Pipe Company, Portland, Oregon ECSI #138

Prepared for

Northwest Pipe Company

June 26, 2019

JACOBS
2020 SW Fourth Avenue Suite 300
Portland, Oregon 97201

Contents

Table 1
Groundwater Elevation Measurements
Supplemental Groundwater Investigation
Northwest Pipe Company Portland Plant

Well ID	Measurement Point Elevation (NGVD 29, ft)	Ground Surface Elevation (NGVD 29, ft)	Measurement Date	Depth to Water (ft bgs)	Elevation (NGVD 29, ft)
MW-01	30.64	30.99	10/25/2016	12.96	17.68
			1/10/2017	11.60	19.04
			1/30/2017	11.23	19.41
			4/25/2017	9.64	21.00
			7/24/2017	11.05	19.59
			12/4/2018	13.89	16.75
			5/7/2019	12.76	17.88
MW-02	27.66	27.97	10/25/2016	10.04	17.62
			1/10/2017	8.70	18.96
			1/30/2017	8.22	19.44
			4/25/2017	6.66	21.00
			7/24/2017	8.16	19.50
			12/4/2018	10.98	16.68
			5/7/2019	9.84	17.82
MW-03	29.15	29.38	10/25/2016	11.63	17.52
			1/10/2017	10.20	18.95
			1/30/2017	9.69	19.46
			4/25/2017	8.09	21.06
			7/24/2017	9.82	19.33
			12/4/2018	12.66	16.49
			5/7/2019	11.42	17.73
MW-04	30.12	30.77	10/25/2016	12.50	17.62
			1/10/2017	11.07	19.05
			1/30/2017	10.62	19.50
			4/25/2017	9.00	21.12
			7/24/2017	10.64	19.48
			12/4/2018	13.49	16.63
			5/7/2019	12.29	17.83
MW-05	30.38	30.74	10/25/2016	12.70	17.68
			1/10/2017	11.38	19.00
			1/30/2017	10.98	19.40
			4/25/2017	9.44	20.94
			7/24/2017	10.82	19.56
			12/4/2018	13.60	16.78
			5/7/2019	12.51	17.87
MW-06	29.82	30.06	10/25/2016	12.16	17.66
			1/10/2017	10.80	19.02
			1/30/2017	10.38	19.44
			4/25/2017	8.79	21.03
			7/24/2017	10.27	19.55
			12/4/2018	13.11	16.71
			5/7/2019	11.96	17.86

Table 1
Groundwater Elevation Measurements
Supplemental Groundwater Investigation
Northwest Pipe Company Portland Plant

Well ID	Measurement Point Elevation (NGVD 29, ft)	Ground Surface Elevation (NGVD 29, ft)	Measurement Date	Depth to Water (ft bgs)	Elevation (NGVD 29, ft)
T4S1MW-02S	35.27	35.59	10/25/2016	18.35	16.92
			1/10/2017	16.52	18.75
			1/30/2017	16.10	19.17
			4/25/2017	14.15	21.12
			7/24/2017	16.39	18.88
			12/4/2018	19.39	15.88
			5/7/2019	17.89	17.38
T4S1MW-03S	32.91	33.36	10/25/2016	19.04	13.87
			1/10/2017	18.04	14.87
			1/30/2017	17.61	15.30
			4/25/2017	15.65	17.26
			7/24/2017	18.09	14.82
			12/4/2018	19.85	13.06
			5/7/2019	18.75	14.16
T4S1MW-09	33.47	33.75	10/25/2016	19.33	14.14
			1/10/2017	18.47	15.00
			1/30/2017	18.10	15.37
			4/25/2017	16.46	17.01
			7/24/2017	18.51	14.96
			12/4/2018	19.99	13.48
			5/7/2019	19.01	14.46
T4S1MW-10	22.22	22.53	10/25/2016	8.16	14.06
			1/10/2017	7.44	14.78
			1/30/2017	7.20	15.02
			4/25/2017	5.65	16.57
			7/24/2017	7.57	14.65
			12/4/2018	8.75	13.47
			5/7/2019	8.02	14.20
T4S1MW-17	31.06	31.34	10/25/2016	14.89	16.17
			1/10/2017	13.43	17.63
			1/30/2017	12.87	18.19
			4/25/2017	11.31	19.75
			7/24/2017	13.75	17.31
			12/4/2018	16.68	14.38
			5/7/2019	14.81	16.25
T4S1MW-22	32.95	33.30	10/25/2016	15.46	17.49
			1/10/2017	13.95	19.00
			1/30/2017	13.44	19.51
			4/25/2017	11.78	21.17
			7/24/2017	13.63	19.32
			12/4/2018	16.50	16.45
			5/7/2019	15.34	17.61

Table 1
Groundwater Elevation Measurements
Supplemental Groundwater Investigation
Northwest Pipe Company Portland Plant

Well ID	Measurement Point Elevation (NGVD 29, ft)	Ground Surface Elevation (NGVD 29, ft)	Measurement Date	Depth to Water (ft bgs)	Elevation (NGVD 29, ft)
T4S1MW-23	31.21	31.45	10/25/2016	13.72	17.49
			1/10/2017	12.44	18.77
			1/30/2017	11.82	19.39
			4/25/2017	10.45	20.76
			7/24/2017	12.34	18.87
			12/4/2018	14.98	16.23
			5/7/2019	13.72	17.49
T4S1MW-25	30.95	31.38	10/25/2016	15.11	15.84
			1/10/2017	13.46	17.49
			1/30/2017	12.95	18.00
			4/25/2017	11.16	19.79
			7/24/2017	13.54	17.41
			12/4/2018	16.03	14.92
			5/7/2019	14.57	16.38
Willamette River			10/25/2016		5.03
			1/10/2017		6.82
			1/30/2017		6.07
			4/25/2017		14.88
			7/24/2017		4.00
			12/4/2018		2.20
			5/7/2019		6.02

Notes:
ft bgs = feet below ground surface
NGVD 29 = National Geodetic Vertical Datum of 1929

Table 2
Groundwater Quality Field Parameters
Supplemental Groundwater Investigation
Northwest Pipe Company Portland Plant

Well	Date Sampled	Temperature (°C)	pH	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
Northwest Pipe Company Wells							
MW-01	10/26/2016	15.9	6.42	352	0.26	6	6.8
	2/2/2017	16.0	6.64	385	0.01	-36	3.1
	5/1/2017	15.5	6.56	423	0.12	36	3.0
	7/26/2017	17.2	6.46	513	0.08	66	1.0
	12/6/2018	15.0	6.61	460	0.47	-32	1.0
	5/9/2019	16.4	6.48	889	0.92	93	1.7
MW-02	10/26/2016	16.8	6.90	197	0.24	-138	0.7
	2/1/2017	15.4	6.97	202	0.09	-136	8.2
	4/27/2017	15.0	7.11	240	0.20	-142	8.1
	7/25/2017	20.1	6.74	244	0.07	-141	1.0
	12/5/2018	15.8	7.10	265	0.36	-167	1.6
	5/8/2019	17.1	7.03	501	0.52	-136	4.6
MW-03	10/26/2016	16.4	6.61	281	0.32	-88	2.6
	2/2/2017	15.9	6.76	321	0.26	-68	3.2
	5/1/2017	15.5	6.56	334	0.07	-43	3.5
	7/27/2017	17.0	6.55	360	0.08	-69	2.6
	12/7/2018	14.6	6.74	372	1.02	-43	5.8
	5/9/2019	15.8	6.67	691	0.44	-37	6.3
MW-04	10/26/2016	14.8	6.34	323	0.28	-59	4.1
	2/1/2017	14.3	6.39	440	0.32	-45	1.3
	4/27/2017	13.0	6.60	337	0.22	-59	5.0
	7/26/2017	15.1	6.42	374	0.13	-66	8.1
	12/6/2018	14.3	6.53	403	0.53	-48	1.3
	5/8/2019	14.5	6.47	777	0.92	-30	1.4
MW-05	10/26/2016	15.5	6.50	375	0.17	-52	1.2
	2/2/2017	15.7	6.59	426	0.33	77	1.8
	5/1/2017	15.4	6.60	360	0.11	-40	0.5
	7/27/2017	18.0	6.46	390	0.11	19	2.2
	12/7/2018	13.5	6.71	386	0.62	-7	1.0
	5/9/2019	16.7	6.39	748	0.79	97	1.2
MW-06	10/26/2016	15.9	6.47	266	0.15	-76	2.7
	2/2/2017	15.5	6.54	299	0.20	-47	2.8
	5/1/2017	15.7	6.35	310	0.13	20	4.4
	7/27/2017	16.6	6.27	322	0.07	-9	10.7
	12/7/2018	14.3	6.61	395	0.66	-49	13.4
	5/9/2019	17.8	6.42	712	0.70	31	36.1
Port of Portland Wells							
T4S1MW-03S	10/25/2016	14.2	6.42	245	0.86	72	0.5
	2/1/2017	14.3	6.65	111	5.19	145	0.8
	4/26/2017	13.2	6.62	87	8.96	167	1.6
	7/25/2017	16.0	6.46	164	4.46	115	0.3
	12/5/2018	13.4	6.53	203	0.63	161	0.2
	5/8/2019	14.5	6.55	338	2.34	145	0.3
T4S1MW-09	10/25/2016	14.9	6.51	278	3.27	-53	1.6
	2/1/2017	14.9	6.67	234	2.87	-41	0.9
	4/26/2017	14.3	6.51	200	0.98	-20	4.2
	7/25/2017	16.0	6.45	216	1.77	96	1.8
	12/5/2018	14.8	6.76	176	1.49	187	0.5
	5/8/2019	14.4	6.26	393	5.52	194	1.2
T4S1MW-22	10/25/2016	15.7	6.35	217	0.33	97	4.0
	2/1/2017	14.4	6.40	255	0.30	132	1.2
	4/27/2017	15.0	6.36	232	1.20	169	1.4

Table 2
Groundwater Quality Field Parameters
Supplemental Groundwater Investigation
Northwest Pipe Company Portland Plant

Well	Date Sampled	Temperature (°C)	pH	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
	7/26/2017	16.0	6.25	242	0.88	117	0.7
	12/6/2018	15.0	6.47	281	0.63	149	0.3
	5/8/2019	15.8	6.22	651	1.13	123	1.2
T4S1MW-23	10/25/2016	15.1	6.49	165	0.90	39	1.2
	2/1/2017	14.2	6.54	177	1.31	51	1.4
	4/27/2017	14.9	6.53	161	1.12	92	1.9
	7/26/2017	18.0	6.57	165	1.47	61	0.6
	12/6/2018	13.8	6.67	182	1.14	80	1.0
	5/9/2019	14.6	6.37	438	1.34	101	1.5

Notes:
°C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts
uS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Units

Table 3

Groundwater Quality Analytical Data for Natural Attenuation Parameters

Supplemental Groundwater Investigation

Northwest Pipe Company Portland Plant

		Natural Attenuation Parameters (mg/L)							
Sample ID	*Sample Date*	**Chloride**	**Nitrate-N**	**Sulfate**	**TOC**	**Iron, dissolved**	**Ferrous Iron[1]**	**Carbon Dioxide[1]**	**Methane**
Northwest Pipe Company Wells									
MW-01	10/26/2016	2.46	0.37 J	10.1	1	1.59	--	81	1.25
	2/1/2017	3.69	0.061	4.71	0.84	3.01	--	68.2	1.74
	5/1/2017	4	0.029	3.57	1.34	1.53	--	82.6	3.12
	7/26/2017	5.29	4.22	29.3	1.28	0.01	--	10.3	0.177
	12/6/2018	2.5	0.2	8.5	1.2	--	4.72	50	0.62
	5/9/2019	2.7	0.5 U	12	1.2	--	0.08	95	0.31
MW-02	10/26/2016	1.98	0.023 J	4.15	1.48	5.45	--	29.6	3.68
	2/1/2017	2.5	0.39	8.09	1.23	5.39	--	17.6	3.3
	4/27/2017	2.47	0.31	5.37	1.6	1.34	--	15.6	3.42
	7/25/2017	3.14	0.27	5.88	1.52	5.91	--	19.3	5.33
	12/5/2018	2.9	0.02 U	2.5	1.6	--	4.94	34	7.3
	5/8/2019	2.9 U	0.044 J	0.92 J	1.3	--	3.64	40	7.2
MW-03	10/26/2016	3.61	0.018 J	10.2	1.27	6.14	--	53.6	1.48
	2/1/2017	3.92	0.018	10.4	0.93	4.46	--	44.1	0.734
	5/1/2017	5.47	0.0028 U	12.1	1.27	3.32	--	53.9	0.748
	7/27/2017	5.19	0.011	9.48	1.33	6.31	--	57.6	2.67
	12/7/2018	3.8	0.02 U	10	1.5	--	2.96	45	2.2
	5/9/2019	4.3	0.2 U	9.4	1.3	--	2.72	60	2.3
MW-04	10/26/2016	3	0.043 J	5.7	1.21	12.9	--	104	1.46
	2/1/2017	4.9	0.0028 U	4.42	1.09	9.75	--	98.4	1.86
	4/27/2017	4.52	0.011	2.35	1.40	9.83	--	82	1.21
	7/26/2017	4.1	0.023	2.55	0.72	10.0	--	82.9	1.78
	12/6/2018	3.3	0.046 J	4.1	1.7	--	2.96	80	2.9
	5/8/2019	3.4 U	0.058 J	3.7	1.3	--	10.08	85	1.4
MW-05	10/26/2016	5.36	0.34 J	20.5	1.67	4.46	--	75.1	1.16
	2/1/2017	7.03	0.57	29.7	1.5	0.0137 U	--	74.9	0.887
	5/1/2017	4.87	0.0028 U	11.9	1.33	4.17	--	50.5	2.31
	7/27/2017	6.53	1.05	20.9	1.28	2.14	--	63.8	1.19
	12/7/2018	3.5	0.02 U	7.1	1.6	--	1.85	40	1.7
	5/9/2019	4.8	1	17	1.5	--	0.05	60	0.17
MW-06	10/26/2016	5.07	0.016 J	5.17	1.25	7.29	--	57.1	2.28
	2/1/2017	6.12	0.0028 U	9.27	1.15	6.10	--	60.5	0.623
	5/1/2017	6.2	0.0028 U	13.9	1.27	3.53	--	81.8	0.206
	7/27/2017	5.18	0.0084 J	13.7	1.05	3.24	--	78.6	0.214 J
	12/7/2018	5.2	0.02 U	8.7	1.5	--	1.87	55	3.5
	5/9/2019	5.8	0.13 U	17	1.5	--	1.41	90	0.37
MW-06	10/26/2016	5.05	0.017 J	5.36	1.15	7.4	--	59.5	2.04
Duplicate	2/1/2017	5.95	0.003 J	9.09	1.12	6.09	--	62.3	0.666
	5/1/2017	6.21	0.0028 U	14	1.4	3.6	--	82.3	0.265
	7/27/2017	5.21	0.01	13.6	1.16	3.22	--	80	0.382 J
	12/7/2018	5.2	0.02 U	8.8	1.5	--	1.87	55	4.1
	5/9/2019	5.7	0.14 U	17	1.6	--	--	--	0.35
Port of Portland Wells									
T4S1MW-03S	10/25/2016	5.1 J	5.19 J	24.7 J	0.85 J	0.0304 J	--	26.2 J	0.0291 J
	2/1/2017	0.86	1.23	4.54	0.39 J	0.01 U	--	13.9	0.0101 J
	4/26/2017	0.71	0.44	2.56	0.5	0.01 U	--	9.6	0.00515 U
	7/25/2017	1.9	3.79	12.4	0.56	0.01 U	--	18.1	0.00495 U
	12/5/2018	1.6	1.2	13	0.82 J	--	0	37.5	0.1 U
	5/8/2019	1.5 U	1.4	6.9	0.63	--	0.05	24	0.00025 U

Table 3

Groundwater Quality Analytical Data for Natural Attenuation Parameters

Supplemental Groundwater Investigation

Northwest Pipe Company Portland Plant

		Natural Attenuation Parameters (mg/L)							
Sample ID	*Sample Date*	**Chloride**	**Nitrate-N**	**Sulfate**	**TOC**	**Iron, dissolved**	**Ferrous Iron[1]**	**Carbon Dioxide[1]**	**Methane**
T4S1MW-09	10/25/2016	2.76 J	1.23 J	5.97 J	1.09 J	7.62	--	49.1 J	2.64 J
	2/1/2017	1.7	2.94	5.66	0.61	4.41	--	29	1.22
	4/26/2017	1.65	1.87	5.95	0.7	2.00	--	27.3	0.0225 J
	7/25/2017	2.34	1.94	7.16	0.69	0.0321 J	--	30.8	0.0225 J
	12/5/2018	1.8	1.2	5.6	0.66 J	--	0	27.5	0.00025 U
	5/8/2019	1.6 U	1.8	7	0.53	--	0.08	26	0.0024
T4S1MW-22	10/25/2016	2.8 J	0.095 J	5.49 J	1.19 J	0.01 U	--	48.4 J	0.0159 J
	2/1/2017	4.56	0.039	8.9	1.09	0.01 U	--	84.5	0.0334
	4/27/2017	3.38	0.92	10	1.18	0.01 U	--	49.1	0.00605 U
	7/26/2017	4.78	0.36	7.9	1.15	0.01 U	--	60	0.0154 J
	12/6/2018	6.1	0.02 U	15	1.3	--	0	50	0.16
	5/8/2019	7.9	0.11 J	11	1.2	--	0.05	85	0.041
T4S1MW-23	10/25/2016	3.92 J	0.27 J	7.67 J	0.65 J	0.221	--	52.9 J	0.00507 J
	2/1/2017	4.24	0.58	8.74	0.68	0.185	--	26.9	0.0379
	4/27/2017	3.36	0.42	7.76	0.78	0.0545 J	--	20.4	0.00712 J
	7/26/2017	4.07	0.36	4.83	1.18	0.11	--	27.5	0.0196 J
	12/6/2018	3.6	0.42	10	0.79 J	--	0.02	26	0.068
	5/9/2019	13	0.48 U	8.3	0.67	--	0.08	36	0.016

Notes:

mg/L = milligrams per Liter

TOC = Total Organic Carbon

[1] Parameter was measured in the field in 2018.

Qualifiers

U - the analyte was analyzed for but was not detected above the detection limit.

J - the analyte was detected, but the associated numerical value is considered an estimated quantity.

Table 4

Groundwater Quality Analytical Data for Volatile Organic Compounds

Supplemental Groundwater Investigation

Northwest Pipe Company Portland Plant

		Volatile Organic Compounds (µg/L)			
		PCE	TCE	cis-1,2-DCE	VC
Portland Harbor ROD Concentrations (µg/L) [1]		*0.24*	*0.6*	*9.9*	*0.022*
Northwest Pipe Company Wells					
MW-01	10/26/2016	**158**	**22.8**	**113**	**16.7**
(1,280 feet to river)	2/1/2017	**71.1**	**14.9**	**107**	**29.9**
	5/1/2017	**61.7**	**13**	**220**	**51.6**
	7/26/2017	**197**	**26.7**	**174**	**8.51**
	12/6/2018	**98**	**13**	**160**	**19**
	5/9/2019	**220**	**28**	**100**	**4**
MW-02	10/26/2016	**0.0598**	0.15 U	0.15 U	**0.0652**
(1,140 feet to river)	2/1/2017	**0.169**	0.15 U	**0.20 J**	**0.0370**
	4/27/2017	**0.224**	0.15 U	**0.21 J**	**0.0115 J**
	7/25/2017	**0.451**	0.15 U	**0.41 J**	**0.0190 J**
	12/5/2018	0.1 U	0.1 U	**1.4**	**2.6**
	5/8/2019	0.1 U	0.1 U	**0.36**	**1.2**
MW-03	10/26/2016	**630**	**221**	**428**	**22.8**
(975 feet to river)	2/1/2017	**483**	**178**	**502**	**20.8**
	5/1/2017	**657**	**283**	**847**	**26.1**
	7/27/2017	**550**	**209**	**670**	**29.9**
	12/7/2018	**490**	**160**	**850**	**46**
	5/9/2019	**370**	**100**	**860**	**46**
MW-04	10/26/2016	**28.2**	**38.4**	**111**	**4.45**
(1,130 feet to river)	2/1/2017	**12.4**	**20.3**	**119**	**9.73**
	4/27/2017	**14.4**	**29.7**	**116**	**16.6**
	7/26/2017	**18.5**	**35.4**	**137**	**9.43**
	12/6/2018	**16**	**19**	**190**	**4.6**
	5/8/2019	**5.4**	**8.4**	**150**	**6.1**
MW-05	10/26/2016	**3,510**	**195**	**1,160**	**40.4**
(1,370 feet to river)	2/1/2017	**4,150**	**208**	**1,240**	**39.5**
	5/1/2017	**949**	**92**	**634**	**70.7**
	7/27/2017	**3,640**	**170**	**1,730**	**7.58 J**
	12/7/2018	**1,200**	**85**	**1,600**	**77**
	5/9/2019	**4,400**	**240**	**1,700**	**14**
MW-06	10/26/2016	**287**	**60.4**	**1,160**	**170**
(1,200 feet to river)	2/1/2017	**805**	**147**	**1,590**	**51**
	5/1/2017	**1,280**	**225**	**1,530**	**21.9**
	7/27/2017	**810**	**128**	**1,080**	**18.3**
	12/7/2018	**430**	**110**	**1,300**	**130**
	5/9/2019	**980**	**210**	**1,900**	**40**
MW-06	10/26/2016	**299**	**70.9**	**1,130**	**177**
Duplicate	2/1/2017	**760**	**145**	**1,600**	**53.9**
(1,200 feet to river)	5/1/2017	**1,280**	**228**	**1,550**	**20.7**
	7/27/2017	**728**	**123**	**1,080**	**22.5**
	12/7/2018	**400**	**110**	**1,400**	**130**
	5/9/2019	**1,000**	**220**	**1,900**	**44**

Table 4

Groundwater Quality Analytical Data for Volatile Organic Compounds

Supplemental Groundwater Investigation

Northwest Pipe Company Portland Plant

		Volatile Organic Compounds (µg/L)			
		PCE	TCE	cis-1,2-DCE	VC
Portland Harbor ROD Concentrations (µg/L) [1]		*0.24*	*0.6*	*9.9*	*0.022*
Port of Portland Wells (Upgradient to Downgradient)					
T4S1MW-22	10/25/2016	**1.46 J**	**4.6 J**	**2.77 J**	**0.0499 J**
(1,010 feet to river)	2/1/2017	**1.28**	**4.29**	**5.36**	**0.106**
	4/27/2017	**1.43**	**3.56**	**2.11**	**0.022**
	7/26/2017	**1.71**	**3.00**	**3.78**	**0.0638**
	12/6/2018	**1.40**	**4.60**	**5.8**	**0.076 J**
	5/8/2019	**1.80**	**4.40**	**7.5**	**0.33**
T4S1MW-23	10/25/2016	**1.59 J**	0.15 UJ	**0.70 J**	0.008 UJ
(710 feet to river)	2/1/2017	**0.937**	**0.41 J**	**0.65**	**0.0188 J**
	4/27/2017	**1.07**	**0.39 J**	**0.42 J**	0.008 U
	7/26/2017	**1.21**	**0.29 J**	0.15 U	0.008 U
	12/6/2018	**1.80**	**0.61**	**1.4**	**0.023 J**
	5/9/2019	**1.90**	**0.5**	**0.34**	0.02 U
T4S1MW-03S	10/25/2016	**0.112 J**	0.15 UJ	0.15 UJ	0.008 UJ
(160 feet to river)	2/1/2017	**0.23**	0.15 U	0.15 U	0.008 U
	4/26/2017	**0.117**	0.15 U	0.15 U	0.008 U
	7/25/2017	**0.0508**	0.15 U	0.15 U	0.008 U
	12/5/2018	0.1 U	0.1 U	0.1 U	0.02 U
	5/8/2019	0.1 U	0.1 U	0.1 U	0.02 U
T4S1MW-09	10/25/2016	**0.0191 J**	0.15 UJ	0.15 UJ	**0.0197 J**
(145 feet to river)	2/1/2017	**0.0177 J**	0.15 U	0.15 U	**0.0113 J**
	4/26/2017	0.005 U	0.15 U	0.15 U	0.008 U
	7/25/2017	**0.0139 J**	0.15 U	0.15 U	0.008 U
	12/5/2018	0.1 U	0.1 U	0.1 U	0.02 U
	5/8/2019	0.1 U	0.1 U	0.1 U	0.02 U

Notes:

µg/L = micrograms per Liter

Results shown in **bold** denote detected concentrations.

Shaded values exceed identified ROD concentrations.

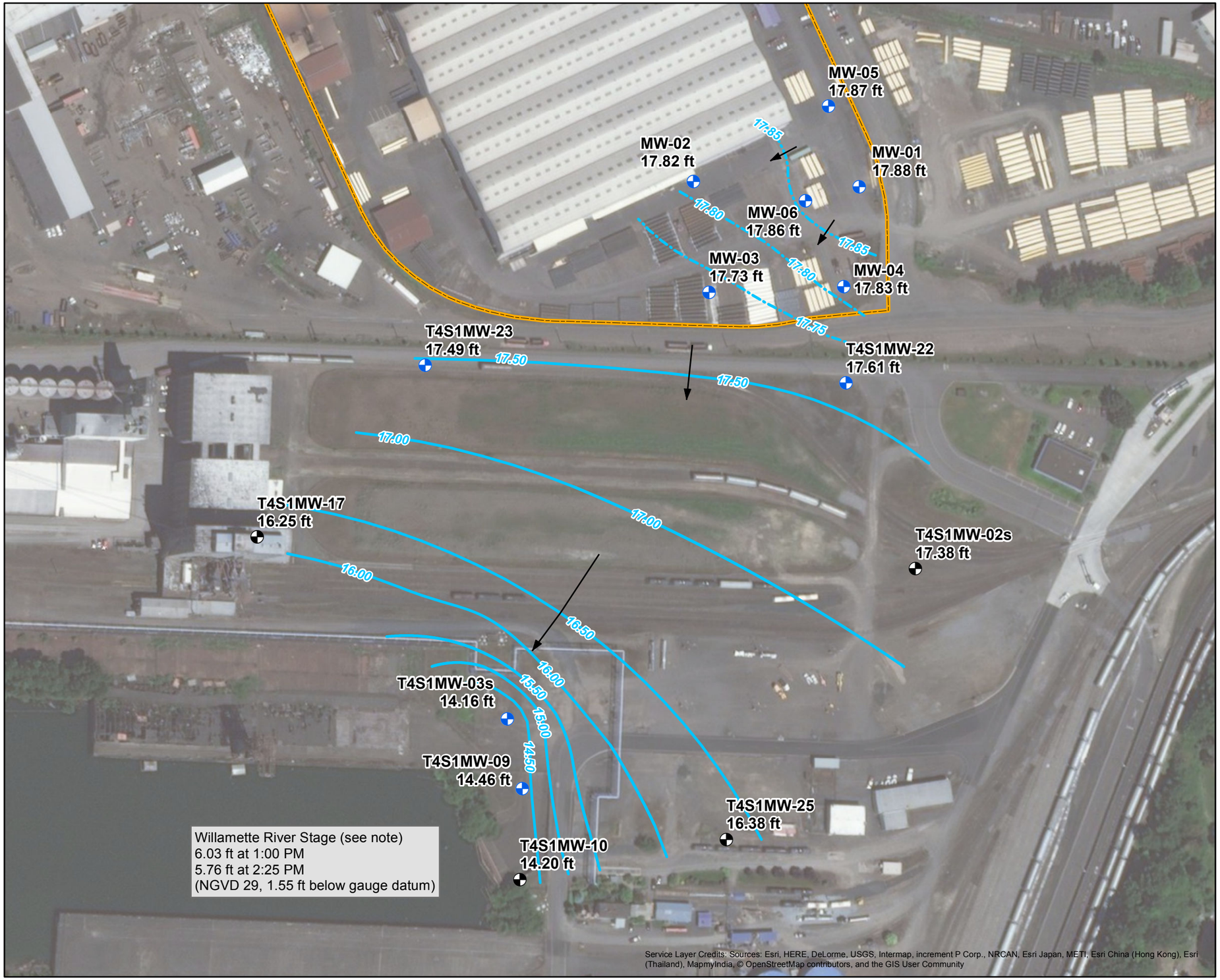
[1]ROD concentrations are selected from Table 17 of the Portland Harbor Record of Decision (U.S. Environmental Protection Agency Region 10, 2017). Values were selected from remedial action objectives (RAOs) 4 and 8 associated with migration of contaminated groundwater.

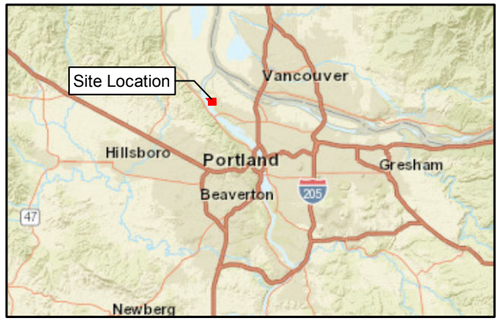
Qualifiers

U - the analyte was analyzed for but was not detected above the detection limit.

J - the analyte was detected, but the associated numerical value is considered an estimated quantity.

UJ - the analyte was not detected above the detection limit. However, the detection limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.





LEGEND

- Groundwater Elevation Contour (0.5 ft contour interval, ft NGVD29)
- Groundwater Elevation Contour (0.05 ft contour interval, to show detail in the NW Pipe Southeast Area, ft NGVD29)
- Groundwater Flow Direction

Investigation Wells

- Groundwater Quality Monitoring
- Water Level Only
- Northwest Pipe Facility Boundary

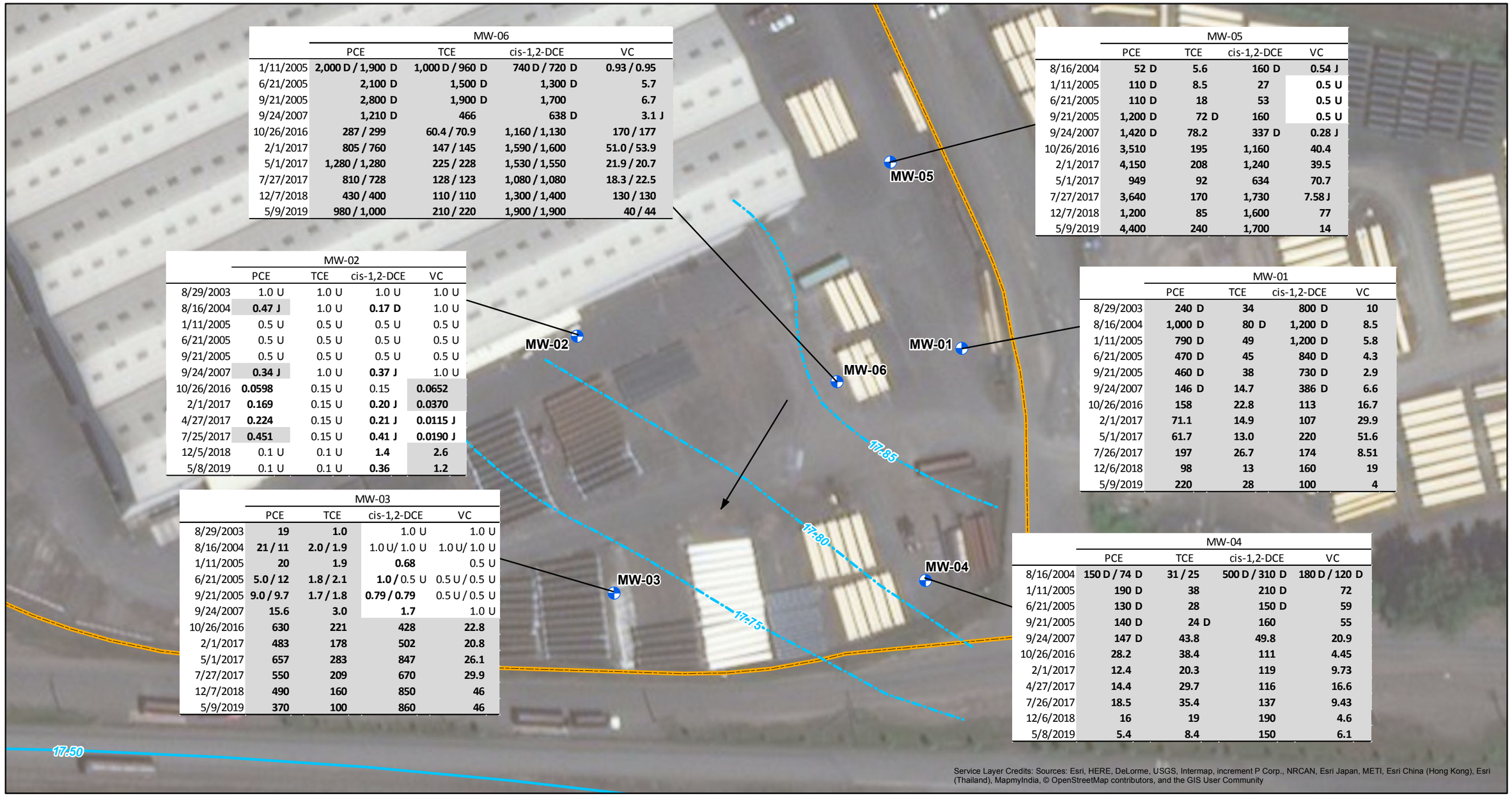
Note: Groundwater levels measured between 1:00 PM and 2:30 PM on May 7, 2019. During this period, the Willamette River stage decreased by 0.27 feet, as measured at the Broadway Bridge river gauge (USGS 14211720).

N

0 100 200 400
Feet

FIGURE 1
Groundwater Elevation Contour Map
May 7, 2019
Supplemental Groundwater Sampling and Data Evaluation
Northwest Pipe Company, Portland, Oregon

ch2m.



MW-06

	PCE	TCE	cis-1,2-DCE	VC
1/11/2005	**2,000 D / 1,900 D**	**1,000 D / 960 D**	**740 D / 720 D**	**0.93 / 0.95**
6/21/2005	**2,100 D**	**1,500 D**	**1,300 D**	**5.7**
9/21/2005	**2,800 D**	**1,900 D**	**1,700**	**6.7**
9/24/2007	**1,210 D**	**466**	**638 D**	**3.1 J**
10/26/2016	**287 / 299**	**60.4 / 70.9**	**1,160 / 1,130**	**170 / 177**
2/1/2017	**805 / 760**	**147 / 145**	**1,590 / 1,600**	**51.0 / 53.9**
5/1/2017	**1,280 / 1,280**	**225 / 228**	**1,530 / 1,550**	**21.9 / 20.7**
7/27/2017	**810 / 728**	**128 / 123**	**1,080 / 1,080**	**18.3 / 22.5**
12/7/2018	**430 / 400**	**110 / 110**	**1,300 / 1,400**	**130 / 130**
5/9/2019	**980 / 1,000**	**210 / 220**	**1,900 / 1,900**	**40 / 44**

MW-05

	PCE	TCE	cis-1,2-DCE	VC
8/16/2004	**52 D**	**5.6**	**160 D**	**0.54 J**
1/11/2005	**110 D**	**8.5**	**27**	**0.5 U**
6/21/2005	**110 D**	**18**	**53**	**0.5 U**
9/21/2005	**1,200 D**	**72 D**	**160**	**0.5 U**
9/24/2007	**1,420 D**	**78.2**	**337 D**	**0.28 J**
10/26/2016	**3,510**	**195**	**1,160**	**40.4**
2/1/2017	**4,150**	**208**	**1,240**	**39.5**
5/1/2017	**949**	**92**	**634**	**70.7**
7/27/2017	**3,640**	**170**	**1,730**	**7.58 J**
12/7/2018	**1,200**	**85**	**1,600**	**77**
5/9/2019	**4,400**	**240**	**1,700**	**14**

MW-02

	PCE	TCE	cis-1,2-DCE	VC
8/29/2003	1.0 U	1.0 U	1.0 U	1.0 U
8/16/2004	**0.47 J**	1.0 U	**0.17 D**	1.0 U
1/11/2005	0.5 U	0.5 U	0.5 U	0.5 U
6/21/2005	0.5 U	0.5 U	0.5 U	0.5 U
9/21/2005	0.5 U	0.5 U	0.5 U	0.5 U
9/24/2007	**0.34 J**	1.0 U	**0.37 J**	1.0 U
10/26/2016	**0.0598**	0.15 U	0.15	**0.0652**
2/1/2017	**0.169**	0.15 U	**0.20 J**	**0.0370**
4/27/2017	**0.224**	0.15 U	**0.21 J**	**0.0115 J**
7/25/2017	**0.451**	0.15 U	**0.41 J**	**0.0190 J**
12/5/2018	0.1 U	0.1 U	**1.4**	**2.6**
5/8/2019	0.1 U	0.1 U	**0.36**	**1.2**

MW-01

	PCE	TCE	cis-1,2-DCE	VC
8/29/2003	**240 D**	**34**	**800 D**	**10**
8/16/2004	**1,000 D**	**80 D**	**1,200 D**	**8.5**
1/11/2005	**790 D**	**49**	**1,200 D**	**5.8**
6/21/2005	**470 D**	**45**	**840 D**	**4.3**
9/21/2005	**460 D**	**38**	**730 D**	**2.9**
9/24/2007	**146 D**	**14.7**	**386 D**	**6.6**
10/26/2016	**158**	**22.8**	**113**	**16.7**
2/1/2017	**71.1**	**14.9**	**107**	**29.9**
5/1/2017	**61.7**	**13.0**	**220**	**51.6**
7/26/2017	**197**	**26.7**	**174**	**8.51**
12/6/2018	**98**	**13**	**160**	**19**
5/9/2019	**220**	**28**	**100**	**4**

MW-03

	PCE	TCE	cis-1,2-DCE	VC
8/29/2003	**19**	**1.0**	1.0 U	1.0 U
8/16/2004	**21 / 11**	**2.0 / 1.9**	1.0 U/ 1.0 U	1.0 U/ 1.0 U
1/11/2005	**20**	**1.9**	**0.68**	0.5 U
6/21/2005	**5.0 / 12**	**1.8 / 2.1**	**1.0** / 0.5 U	0.5 U / 0.5 U
9/21/2005	**9.0 / 9.7**	**1.7 / 1.8**	**0.79 / 0.79**	0.5 U / 0.5 U
9/24/2007	**15.6**	**3.0**	**1.7**	1.0 U
10/26/2016	**630**	**221**	**428**	**22.8**
2/1/2017	**483**	**178**	**502**	**20.8**
5/1/2017	**657**	**283**	**847**	**26.1**
7/27/2017	**550**	**209**	**670**	**29.9**
12/7/2018	**490**	**160**	**850**	**46**
5/9/2019	**370**	**100**	**860**	**46**

MW-04

	PCE	TCE	cis-1,2-DCE	VC
8/16/2004	**150 D / 74 D**	**31 / 25**	**500 D / 310 D**	**180 D / 120 D**
1/11/2005	**190 D**	**38**	**210 D**	**72**
6/21/2005	**130 D**	**28**	**150 D**	**59**
9/21/2005	**140 D**	**24 D**	**160**	**55**
9/24/2007	**147 D**	**43.8**	**49.8**	**20.9**
10/26/2016	**28.2**	**38.4**	**111**	**4.45**
2/1/2017	**12.4**	**20.3**	**119**	**9.73**
4/27/2017	**14.4**	**29.7**	**116**	**16.6**
7/26/2017	**18.5**	**35.4**	**137**	**9.43**
12/6/2018	**16**	**19**	**190**	**4.6**
5/8/2019	**5.4**	**8.4**	**150**	**6.1**

LEGEND

- Groundwater Quality Monitoring Well (CVOC concentrations in µg/L)
- Well Used for Water Level Measurements Only
- Groundwater Elevation Contour (May 7, 2019) (0.5 ft contour interval, ft NGVD29)
- Groundwater Elevation Contour (May 7, 2019) (0.05 ft contour interval, to show detail in the NW Pipe Southeast Area, ft NGVD29)
- Groundwater Flow Direction
- Northwest Pipe Facility Boundary

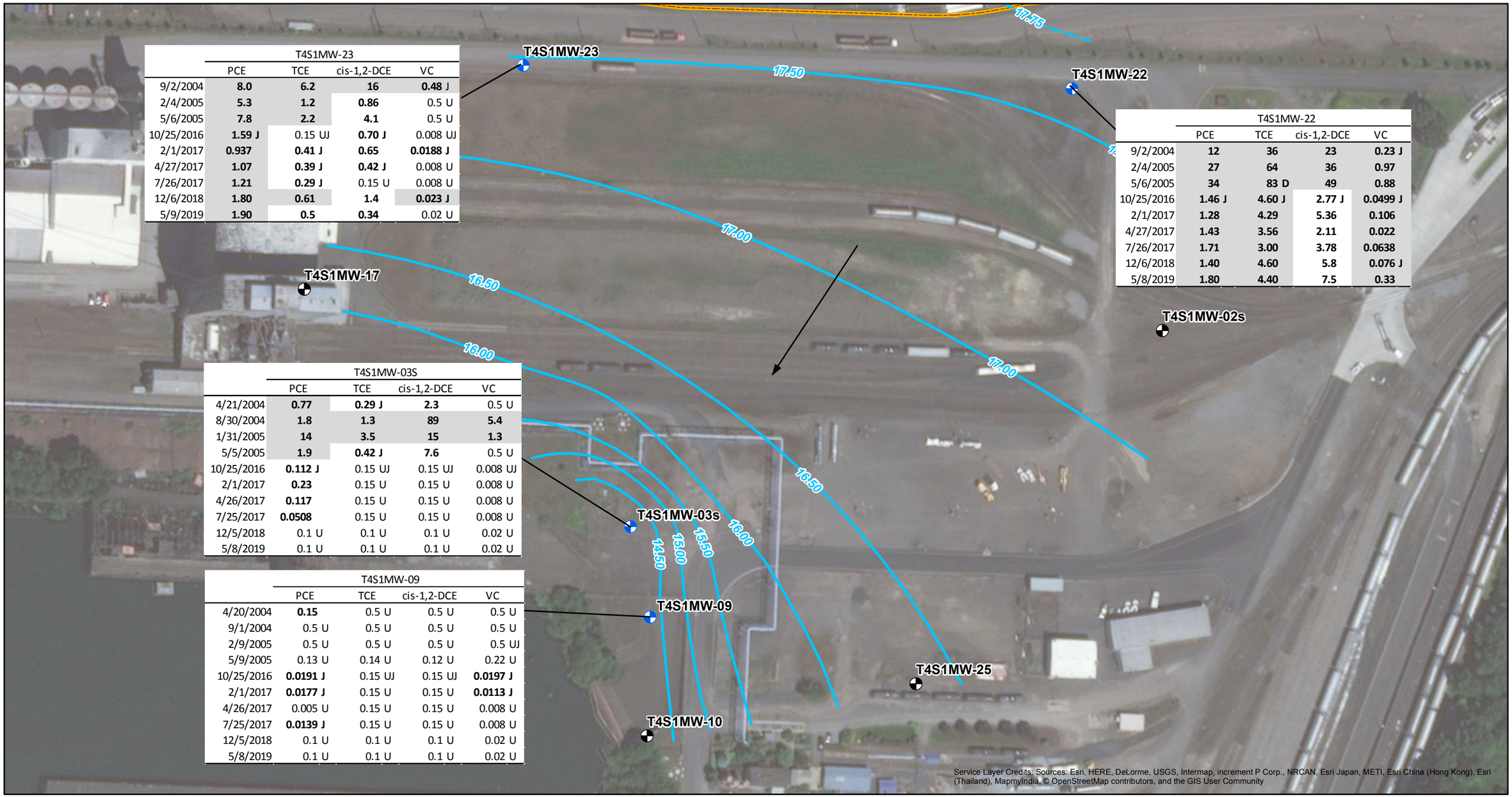
Notes:
All chlorinated volatile organic compound (CVOC) concentrations are reported in micrograms per liter (µg/L).
PCE = Tetrachloroethene; TCE = Trichloroethene; cis-1,2-DCE = cis-1,2-Dichloroethene; VC = Vinyl Chloride
D - the sample was diluted for analysis.
U - the analyte was analyzed for but was not detected above the detection limit.
J - the analyte was detected, but the associated numerical value is considered an estimated quantity.
UJ - the analyte was not detected above the detection limit. However, the detection limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
Results shown in bold denote detected concentrations.
Shaded values exceed ROD concentrations selected from Table 17 of the Portland Harbor Record of Decision (U.S. Environmental Protection Agency Region 10, 2017). Values were selected from remedial action objectives (RAOs) 4 and 8 associated with migration of contaminated groundwater. The following values are used:
PCE = 0.24, TCE = 0.6, cis-1,2-DCE = 9.9, and VC = 0.022. All values in µg/L.

N

0 25 50 100
Feet

Figure 2a. Southeast Area CVOC Concentrations
August 2003 through May 2019
Northwest Pipe Company
Portland, Oregon

JACOBS



T4S1MW-23	PCE	TCE	cis-1,2-DCE	VC
9/2/2004	**8.0**	**6.2**	**16**	**0.48** J
2/4/2005	**5.3**	**1.2**	**0.86**	0.5 U
5/6/2005	**7.8**	**2.2**	**4.1**	0.5 U
10/25/2016	**1.59** J	0.15 UJ	**0.70** J	0.008 UJ
2/1/2017	**0.937**	**0.41** J	**0.65**	**0.0188** J
4/27/2017	**1.07**	**0.39** J	**0.42** J	0.008 U
7/26/2017	**1.21**	**0.29** J	0.15 U	0.008 U
12/6/2018	**1.80**	**0.61**	**1.4**	**0.023** J
5/9/2019	**1.90**	**0.5**	**0.34**	0.02 U

T4S1MW-22	PCE	TCE	cis-1,2-DCE	VC
9/2/2004	**12**	**36**	**23**	**0.23** J
2/4/2005	**27**	**64**	**36**	**0.97**
5/6/2005	**34**	**83** D	**49**	**0.88**
10/25/2016	**1.46** J	**4.60** J	**2.77** J	**0.0499** J
2/1/2017	**1.28**	**4.29**	**5.36**	**0.106**
4/27/2017	**1.43**	**3.56**	**2.11**	**0.022**
7/26/2017	**1.71**	**3.00**	**3.78**	**0.0638**
12/6/2018	**1.40**	**4.60**	**5.8**	**0.076** J
5/8/2019	**1.80**	**4.40**	**7.5**	**0.33**

T4S1MW-03S	PCE	TCE	cis-1,2-DCE	VC
4/21/2004	**0.77**	**0.29** J	**2.3**	0.5 U
8/30/2004	**1.8**	**1.3**	**89**	**5.4**
1/31/2005	**14**	**3.5**	**15**	**1.3**
5/5/2005	**1.9**	**0.42** J	**7.6**	0.5 U
10/25/2016	**0.112** J	0.15 UJ	0.15 UJ	0.008 UJ
2/1/2017	**0.23**	0.15 U	0.15 U	0.008 U
4/26/2017	**0.117**	0.15 U	0.15 U	0.008 U
7/25/2017	**0.0508**	0.15 U	0.15 U	0.008 U
12/5/2018	0.1 U	0.1 U	0.1 U	0.02 U
5/8/2019	0.1 U	0.1 U	0.1 U	0.02 U

T4S1MW-09	PCE	TCE	cis-1,2-DCE	VC
4/20/2004	**0.15**	0.5 U	0.5 U	0.5 U
9/1/2004	0.5 U	0.5 U	0.5 U	0.5 U
2/9/2005	0.5 U	0.5 U	0.5 U	0.5 UJ
5/9/2005	0.13 U	0.14 U	0.12 U	0.22 U
10/25/2016	**0.0191** J	0.15 UJ	0.15 UJ	**0.0197** J
2/1/2017	**0.0177** J	0.15 U	0.15 U	**0.0113** J
4/26/2017	0.005 U	0.15 U	0.15 U	0.008 U
7/25/2017	**0.0139** J	0.15 U	0.15 U	0.008 U
12/5/2018	0.1 U	0.1 U	0.1 U	0.02 U
5/8/2019	0.1 U	0.1 U	0.1 U	0.02 U

LEGEND

- Groundwater Quality Monitoring Well (CVOC concentrations in µg/L)
- Well Used for Water Level Measurements Only
- Groundwater Elevation Contour (May 7, 2019) (0.5 ft contour interval, ft NGVD29)
- Groundwater Elevation Contour (May 7, 2019) (0.05 ft contour interval, to show detail in the NW Pipe Southeast Area, ft NGVD29)
- Groundwater Flow Direction
- Northwest Pipe Facility Boundary

Notes:
All chlorinated volatile organic compound (CVOC) concentrations are reported in micrograms per liter (µg/L).
PCE = Tetrachloroethene; TCE = Trichloroethene; cis-1,2-DCE = cis-1,2-Dichloroethene; VC = Vinyl Chloride
D - the sample was diluted for analysis.
U - the analyte was analyzed for but was not detected above the detection limit.
J - the analyte was detected, but the associated numerical value is considered an estimated quantity.
UJ - the analyte was not detected above the detection limit. However, the detection limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
Results shown in bold denote detected concentrations.
Shaded values exceed ROD concentrations selected from Table 17 of the Portland Harbor Record of Decision (U.S. Environmental Protection Agency Region 10, 2017). Values were selected from remedial action objectives (RAOs) 4 and 8 associated with migration of contaminated groundwater. The following values are used:
PCE = 0.24, TCE = 0.6, cis-1,2-DCE = 9.9, and VC = 0.022. All values in µg/L.

N

0 45 90 180
Feet

Figure 2b. Southeast Area CVOC Concentrations
August 2003 through May 2019
Northwest Pipe Company
Portland, Oregon

JACOBS

\\PDXFPP01\PROJ\NORTHWESTPIPECOMPANY\485880PORTHARBSUP\GIS\MAPFILES\2019\FIGURE6-13B_CVOC_CONCENTRATIONS_2003-2019.MXD GGEE 6/13/2019 8:43:58 AM

Attachment A
Field Sampling Sheets and Notes

CH2M WELL SAMPLING FIELD LOG

Date: 5/8/19

Project #: 682722CH.GW.05

Well I.D.: T451MW-09

Field Team: S. BARTON + L. TOCHIKO

Total Depth (ft) 31.50 (-) DTW (ft) 19.12 (X 0.17 gal\ft) = Well Casing Volume (gal.) = 2.1 gal

Field Conditions: CLOUDY, 52°F, CALM

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or X dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~22 FT

Purge water disposal: IDW DRUM

Comments/Exceptions to SAP: New tubing - old dedicated tubing had a kink

~3 FT tubing from top of well to pump

ON 0807

DTW 19.19

	Purge Volume (gallons)	Specific Conduct. ~~(µS/cm)~~ mS/cm +/- 3%	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
08:07	PUMP ON								19.19	
08:21	2.25	0.396	14.4	6.7	239.2	5.44	1.74		19.18	clear colorless
08:26	3.25	0.393	14.25	6.53	224.1	5.44	1.41	0.2	19.16	CC
08:31	3.75	0.393	14.27	6.57	216.2	5.56	1.24	0.1	19.16	CC
08:36	4.0	0.393	14.3	6.57	209.1	5.66	1.40	0.05	19.16	CC
08:41	4.5	0.394	14.32	6.61	203.7	5.65	1.33	0.1	19.16	CC
08:46	4.8	0.394	14.29	6.61	198.6	5.62	1.55	0.06	19.12	CC
08:51	5.5	0.393	14.35	6.60	193.8	5.52	1.22	0.16	19.15	CC
:		turned pump down prior to sampling								
:										
08:55	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **CI** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/8/19 Time: 8:55 Well ID: T45/MW-09

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	Fe = 0.08 mg/L Field measurement Only							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	CO_2 = 26 mg/L Field measurement Only							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							
Comments: CUT NEW TUBING								

CH2M WELL SAMPLING FIELD LOG

Date: 5/8/19

Project #: 682722CH.GW.05 **Well I.D.:** T451MW-035

Field Team: S. BARTON / L. TOCHKO

Total Depth (ft) 30 (-) DTW (ft) 18.77 (X 0.17 gal\ft) = Well Casing Volume (gal.) = 1.9

Field Conditions: CLOUDY, 55°F, SLIGHT BREEZE

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or X | dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~25 FT BTDC Purge water disposal: IDW DRUM

Comments/Exceptions to SAP: ~4 FT Tubing from top of well to pump

	Purge Volume (gallons)	Specific Conduct. ~~(µS/cm)~~ mS/cm	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
9:47	PUMP	ON							18.77	
10:31	2	0.340	14.82	6.63	147.2	2.32	0.67	-	18.81	CC
10:36	2.2	0.339	14.56	6.54	149.5	2.24	0.56	0.04		CC
10:41	2.3	0.338	14.47	6.55	145.1	2.34	0.33			
:										
:										
:										
:										
:										
:										
10:45	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **Cl** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/8/19 Time: 10 : 45 Well ID: T451MW-035

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	Field measurement Only 0.05 mg/L							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	Field measurement Only 24 mg/L							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							
Comments:								

CH2M WELL SAMPLING FIELD LOG

Date: 5/8/19

Project #: 682722CH.GW.05 **Well I.D.:** MW-02

Field Team: S. BARTON + L. TOCHICO

Total Depth (ft) 21.06 (-) DTW (ft) 9.85 (X gal\ft) = Well Casing Volume (gal.) = 1.9

Field Conditions: PARTLY CLOUDY, CALM, 60°-

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or | X dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): 3 FT TUBING OUT Purge water disposal: IDW DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. (mS/cm)	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
11:30	PUMP	ON							9.85	
11:45	2.1	0.475	15.31	6.55	-100.7	0.58	3.23		10.38	
11:50	2.75	0.486	16.26	6.93	-123.4	0.49	3.77	0.13	10.14	~~very slightly~~ clear yellow/colorless
11:55	3.0	0.499	16.60	7.01	-132.6	0.52	1.66	0.05	10.11	clear colorless
12:00	3.25	0.499	17.12	7.07	-137.7	0.43	2.38	0.05	10.02	CC
12:05	3.5	0.501	17.08	7.03	-135.6	0.52	4.58	0.05	10.01	
:										
:										
:										
:										
1:10	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **Cl** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/8/19 Time: 12 : 10 Well ID: MW-02

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	3.64 mg/L Field measurement Only							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	Field measurement Only 40 mg/L							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							
Comments:								

CH2M WELL SAMPLING FIELD LOG

Date: 5/8/19

Project #: 682722CH.GW.05 Well I.D.: MW-04

Field Team: S. BARROW & L. TOCHKO

Total Depth (ft) 27.39 (-) DTW (ft) 12.28 (X 0.17 gal/ft) = Well Casing Volume (gal.) = 2.6

Field Conditions: SUNNY, SLIGHT BREEZE 60°F

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or | dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~ 45FT TUBING FROM TOP OF WELL TO PUMP Purge water disposal: IDW DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. (mS/cm)	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
12:46	Pump	ON								
13:04	2.75	0.737	14.89	6.25	-4.2	0.91	2.66		12.35	CC
13:09	3.5	0.758	14.89	6.36	-12.1	0.79	1.34	0.15	12.35	CC
13:14	4.25	0.766	14.48	6.49	-31.1	0.99	1.03	0.15	12.31	CC
13:19	4.65	0.775	14.54	6.43	-31.4	0.95	1.31	0.08	12.31	CC
13:24	5.25	0.777	14.54	6.47	-30.3	0.92	1.41	0.08	12.31	CC
:										
:										
:										
:										
13:30	Start Sampling									
:	End Sampling									

0.4

* VC = Very cloudy CI = Cloudy SC = Slightly Cloudy VSC = Very Slightly Cloudy AC = Almost Clear C = Clear CC = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/8/19 Time: 13:30 Well ID: MW-04

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	10.08 mg/L Field measurement Only							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	Field measurement Only 85mg/L							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							

Comments:

CH2M WELL SAMPLING FIELD LOG

Date: 5/8/19

Project #: 682722CH.GW.05 Well I.D.: T451 MW-22

Field Team: S BARTON & L. TOCHKO

Total Depth (ft) 23 (-) DTW (ft) 15.22 (X 0.17 gal\ft) = Well Casing Volume (gal.) = 1.3

Field Conditions: CLEAR, SLIGHT BREEZE, 66°F

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or |X| dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated-submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~1 FT TUBING OUT OF WELL Purge water disposal: IDW DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. (µS/cm)	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
14:37	PUMP	ON							15.22	
14:45	1.3	0.661	15.09	5.99	142.2	0.98	1.41		15.25	CC, COLORLESS ODORLESS
14:50	2.0	0.665	15.23	6.21	129.8	1.10	0.72		15.25	" "
14:55	2.5	~~0.66~~ @ 0.654	15.42	6.23	123.3	1.22	0.75		15.24	" "
15:00	2.9	0.651	15.33	6.22	122.7	1.13	1.16	0.08	15.22	" "
:										
:										
:										
:										
:										
15:05	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **CI** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/8/19 Time: 15 : 05 Well ID: THSI MW-22

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	Field measurement Only 0.05 mg/L							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	Field measurement Only 85 mg/L							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							

Comments:

CH2M WELL SAMPLING FIELD LOG

Date: 5/9/19

Project #: 682722CH.GW.05

Well I.D.: T4S1 MW-23

Field Team: S. BARTOW + L. TOCHKO

Total Depth (ft) 25 (-) DTW (ft) 13.74 (X 0.17 gal\ft) = Well Casing Volume (gal.) = 1.9

Field Conditions: SUNNY, CALM, 54°F

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or X | dedicated polyethylene (teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~3.5 FT TUBING OUT OF WELL Purge water disposal: 10W DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. ~~mS/cm~~ (µS/cm)	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
08:00	PUMP ON									
08:24	2.1	0.537	14.58	7.99	139.1	4.00	1.87	—	13.75	CC
08:29	2.25	0.486	14.93	6.74	123.1	2.10	1.81	0.03	13.75	CC
08:34	2.5	0.472	14.86	6.53	114.7	1.69	1.74	0.05	13.75	CC
08:39	2.8	0.460	14.68	6.45	110.5	1.50	1.46	0.06	13.75	CC
08:44	3.0	0.451	14.65	6.40	107.1	1.43	1.47	0.04	13.75	CC
08:49	3.25	0.443	14.63	6.39	102.6	1.40	1.45	0.05	13.75	CC
08:54	3.5	0.438	14.63	6.37	100.7	1.34	1.46	0.05	13.75	CC
:										
:										
09:00	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **CI** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/9/19 Time: 09 : 00 Well ID: T451 MW-23

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	0.09 mg/L Field measurement Only							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	36 mg/L Field measurement Only							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							
Comments:								

CH2M WELL SAMPLING FIELD LOG

Date: 5/9/19

Project #: 682722CH.GW.05 Well I.D.: MW-01

Field Team: S. BRADTOW & L. TOCHKO

Total Depth (ft) 24.57 (-) DTW (ft) 12.77 (X 0.17 gal\ft) = Well Casing Volume (gal.) = 2

Field Conditions: SUNNY, CLEAR, CALM 64°F

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or X | dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~4 FT TUBING OUT OF WELL Purge water disposal: IDW DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. mS/cm or ~~uS/cm~~	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
9:37	PUMP	ON							12.77	
9:53	2.0	0.906	15.54	6.45	124.1	0.61	0.97		12.77	CC COLORLESS ODORLESS
9:58	2.5	0.895	15.82	6.43	107.6	0.64	1.26		12.76	" "
10:03	2.75	0.889	16.05	6.45	98.1	0.74	1.08	0.05	12.76	" "
10:08	3.0	0.888	16.20	6.46	94.3	0.68	1.39	0.05	12.75	" "
10:13	3.5	0.889	16.36	6.48	93.4	0.92	1.67	0.05	12.75	" "
:										
:										
:										
:										
10:20	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **Cl** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/9/19 Time: 10 : 20 Well ID: MW-01

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	0.08mg/L Field measurement Only							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	95mg/L Field measurement Only							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							
Comments:								

CH2M WELL SAMPLING FIELD LOG

Date: 5/9/19

Project #: 682722CH.GW.05 Well I.D.: MW-03

Field Team: S. BARTON + L. TOCHKO

Total Depth (ft) 25.10 (-) DTW (ft) 11.42 (X 0.17 gal\ft) = Well Casing Volume (gal.) = 2.3

Field Conditions: CLEAR, CALM, 64°F

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or X | dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~4' OF TUBING OUT OF WELL Purge water disposal: IDW DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. (mS/cm)	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
10:53	PUMP	ON							11.42	
11:23	2.3	0.689	15.43	6.59	-20.2	0.40	8.73		11.62	CC ODORLESS COLORLESS
11:28	2.6	0.691	15.55	6.62	-29.9	0.37	6.30	0.06	11.52	" "
11:33	2.9	0.692	15.83	6.67	-34.7	0.46	7.03	0.06	11.52	" "
11:38	3.25	0.691	15.77	6.67	-37.0	0.44	6.32	0.07	11.52	" "
:										
:										
:										
:										
:										
11:45	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **CI** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/9/19 Time: 11 : 45 Well ID: MW-03

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	2.72 mg/L Field measurement Only							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	Field measurement Only 60 mg/L							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							
Comments:								

CH2M WELL SAMPLING FIELD LOG

Date: 5/9/19

Project #: 682722CH.GW.05

Well I.D.: MW-06

Field Team: S. BARTON & L. TOCHKO

Total Depth (ft) 29.03 (-) DTW (ft) 11.95 (X 0.17gal\ft) = Well Casing Volume (gal.) = 2.9

Field Conditions: CALM, CLEAR, 80°F

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or X | dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): ~25' OF TUBING OUT OF WELL Purge water disposal: IDW DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. (mS/cm)	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
12:18	PUMP	ON							11.95	
12:53	3.0	0.716	16.47	6.24	43.0	0.87	38.9		11.97	orange particles clear
12:58	3.25	0.713	17.31	6.40	34.0	0.91	38.6	0.05	11.95	"
13:03	3.5	0.709	17.75	6.42	29.3	0.84	41.1	0.05	11.95	"
13:08	3.75	0.712	17.77	6.42	31.1	0.7	36.1	0.05	11.95	"
:										
:										
:										
:										
:										
13:10	Start Sampling									
:	End Sampling									

* VC = Very cloudy CI = Cloudy SC = Slightly Cloudy VSC = Very Slightly Cloudy AC = Almost Clear C = Clear CC = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling

Groundwater Sampling

Project #: 682722CH.GW.05

DATE: 5/9/19 Time: 13 : 10 Well ID: MW-06

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	(3)	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	Field measurement Only 1.41 mg/L							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	(1)	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	(1)	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	Field measurement Only 90 mg/L							HACH CO2 Test Kit
Methane	3	(3)	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID MW100-050919	Time: 12:00							
Comments:								

CH2M WELL SAMPLING FIELD LOG

Date: 5/9/19

Project #: 682722CH.GW.05 Well I.D.: MW-05

Field Team: S. BARTOW & L. TOCHKO

Total Depth (ft) 27.84 (-) DTW (ft) 12.49 (X 0.17 gal\ft) = Well Casing Volume (gal.) = 2.6

Field Conditions: CLEAR, SLIGHT BREEZE, 80°F

Decontamination: Alconox wash, DI wash

PURGE INFORMATION

X	Purge Method:	Transient peristaltic pump with | | new or X | dedicated polyethylene/teflon-lined tubing
	Purge Method :	Dedicated submersible pump with | | new or | | dedicated polyethylene tubing
	Purge Method:	Dedicated Hydrostar pump with | | new or | | dedicated polyethylene tubing

Pump Suction Depth (ft): 2 FT OF TUBING OUT OF WELL Purge water disposal: IDW DRUM

Comments/Exceptions to SAP:

	Purge Volume (gallons)	Specific Conduct. (µS/cm)	Temp. (°C)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Purge Rate (gpm)	DTW (ft)	* Clarity/ Color/Remarks
Target Stabilization Criteria	-	+/- 3%	-	+/- 0.1	+/- 10	+/- 0.3	+/- 10 if > 10 NTU	0.03 - 0.08	-	
Time										
13:45	PUMP	ON							12.49	
14:06	2.7	0.748	15.91	6.20	105.9	0.63	1.22		12.49	CC COLORLESS ODORLESS
14:11	3.0	0.743	17.07	6.32	99.5	0.59	0.42	0.06	12.49	CC ODORLESS
14:16	3.3	0.748	16.74	6.39	96.5	0.79	1.15	0.06	12.49	CC
:										
:										
:										
:										
:										
:										
14:20	Start Sampling									
:	End Sampling									

* **VC** = Very cloudy **CI** = Cloudy **SC** = Slightly Cloudy **VSC** = Very Slightly Cloudy **AC** = Almost Clear **C** = Clear **CC** = Crystal Clear

Laboratory Analytical Program - Quarterly Sampling
Groundwater Sampling
Project #: 682722CH.GW.05

DATE: 5/9/19 Time: 14 : 20 Well ID: MW-05

Sample I.D.	Number of Sample Containers (Circled) Equip-ment	Dupli-cate	Parent Sample	Volume	Type	Pres.	Shipping Date	Analytical Method
Organic Constituents								
TCE, cis 1,2-DCE, PCE, VC	3	3	(3)	40 mL	Glass	HCl		EPA 8260C, no headspace
Metals								
Dissolved Ferrous Iron	0.05mg/L Field measurement Only							HACH DR890- Ferrous Iron
Natural Attenuation Monitoring Constituents								
Nitrate, Sulfate, Chloride	1	1	(1)	250 mL	Poly	None		Nitrate (300), Sulfate & Chloride (300.0_28D)
TOC	1	1	(1)	250 mL	Glass	H2S04		SM5310
Carbon Dioxide	Field measurement Only 60mg/L							HACH CO2 Test Kit
Methane	3	3	(3)	40 mL	Glass	HCl		RSK 175, no headspace
Duplicate ID	Time:							
Comments:								

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: LAURA TOCHKO	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-33446-10901.3
Client Contact: Bernice Kidd	Phone: 425-891-2855	E-Mail: kristine.allen@testamericainc.com		Page: Page ~~3 of 3~~ 1 OF 1
Company: CH2M Hill, Inc.				Job #:
Address: 2020 SW 4th Ave Suite 300	Due Date Requested:			
City: Portland	TAT Requested (days): STANDARD			
State, Zip: OR, 97201				
Phone: 530-229-3203(Tel)	PO #: PO 682722.RI.02			
Email: bernice.kidd@jacobs.com	WO #:			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EMAX 8260C_LL - TCE, cis 1,2-DCE, PCE, Vinyl Chloride	RSK_175 - Methane	300.0_28D, 300_48HR: Cl, SO4, Nitrates	5310C - TOC	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	A	N	S		
T45IMW#09-050819-0	5/8/19	0855	G	W			X	X	X	X	8	VOCs to be sent to EMAX
T45IMW035-050819-0	5/8/19	1045	G	W			X	X	X	X	8	
MW02-050819-0	5/8/19	1210	G	W			X	X	X	X	8	
MW04-050819-0	5/8/19	1336	G	W			X	X	X	X	8	
TRIPBLANK-050819	5/8/19	0800	-	W			X				2	
T45IMW22-050819	5/8/19	1505	G	W			X	X	X	X	8	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
LAURA TOCHKO	5/8/19 16:15	JACOBS			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: LAURA TOCHKO	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-33446-10901.3
Client Contact: Bernice Kidd	Phone: 425-891-2855	E-Mail: kristine.allen@testamericainc.com		Page: Page ~~3 of 3~~ 1 of 1
Company: CH2M Hill, Inc.				Job #:
Address: 2020 SW 4th Ave Suite 300	Due Date Requested:			
City: Portland	TAT Requested (days): STANDARD			
State, Zip: OR, 97201				
Phone: 530-229-3203(Tel)	PO #: PO 682722.RI.02			
Email: bernice.kidd@jacobs.com	WO #:			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EMAX 8260C_LL - TCE, cis 1,2-DCE, PCE, Vinyl Chloride	RSK_175 - Methane	300.0_28D, 300_48HR: Cl, SO4, Nitrates	5310C - TOC	8260 TCE, cis 1,2-DCE, PCE, VC									Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	A	N	S											
T451MW23-050919-0	5/9/19	09:00	G	W			X	X	X	X										3	VOCs to be sent to EMAX
MW01-050919-0	5/9/19	10:20	G	W			X	X	X	X										3	
TRIPBLANK-050919	5/9/19	08:00	—	W			X													1	
MW03-050919-0	5/9/19	11:45	G	W			X	X	X	X										3	
MW06-050919-0	5/9/19	13:10	G	W			X	X	X	X										3	
MW100-050919-0	5/9/19	12:00	G	W			X	X	X	X										3	
MW05-050919-0	5/9/19	14:20	G	W			X	X	X	X										3	
IDW DRUM 2-050919	5/9/19	15:00	G	W							X									3	VOCs Test America

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
LAURA TOCHKO	5/9/19 16:00	JACOBS			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Attachment B
Laboratory Analytical Data

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-86047-1
Client Project/Site: Northwest Pipe Company GW Monitoring

For:
CH2M Hill, Inc.
2020 SW 4th Ave
Suite 300
Portland, Oregon 97201

Attn: Bernice Kidd

Kristine D. Allen

Authorized for release by:
5/30/2019 1:52:56 PM

Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Table of Contents

Case Narrative

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Job ID: 580-86047-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-86047-1

Comments
No additional comments.

Receipt
The samples were received on 5/9/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.2º C.

Subcontract Work
Method TCE, cis 1,2-DCE, PCE, Vinyl Chloride - low level: This method was subcontracted to EMAX Laboratories Inc. The subcontract laboratory certification is different from that of the facility issuing the final report.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
Method(s): Chloride was detected in the method blank greater than the method detection limit but less than the reporting limit.

No additional nalytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: CH2M Hill, Inc. Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Qualifiers

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: T4SIMW09-050819-0
Lab Sample ID: 580-86047-1
Date Collected: 05/08/19 08:55
Matrix: Water
Date Received: 05/09/19 09:30

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	2.4		0.99	0.25	ug/L			05/14/19 13:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.6	B	0.90	0.14	mg/L			05/09/19 16:39	1
NO3 as N	1.8		0.20	0.020	mg/L			05/09/19 16:39	1
Sulfate	7.0		1.2	0.26	mg/L			05/09/19 16:39	1
Total Organic Carbon	0.53		0.10	0.050	mg/L			05/15/19 06:29	1

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: T4SIMW03s-050819-0
Lab Sample ID: 580-86047-2
Date Collected: 05/08/19 10:45
Matrix: Water
Date Received: 05/09/19 09:30

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	ND		0.99	0.25	ug/L			05/14/19 13:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.5	B	0.90	0.14	mg/L			05/09/19 17:14	1
NO3 as N	1.4		0.20	0.020	mg/L			05/09/19 17:14	1
Sulfate	6.9		1.2	0.26	mg/L			05/09/19 17:14	1
Total Organic Carbon	0.63		0.10	0.050	mg/L			05/15/19 06:41	1

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: MW02-050819-0
Lab Sample ID: 580-86047-3
Date Collected: 05/08/19 12:10
Matrix: Water
Date Received: 05/09/19 09:30

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (TCD)	7200		1000	500	ug/L			05/14/19 14:03	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.9	B	0.90	0.14	mg/L			05/09/19 17:26	1
NO3 as N	0.044	J	0.20	0.020	mg/L			05/09/19 17:26	1
Sulfate	0.92	J	1.2	0.26	mg/L			05/09/19 17:26	1
Total Organic Carbon	1.3		0.10	0.050	mg/L			05/15/19 06:54	1

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: MW04-050819-0
Lab Sample ID: 580-86047-4
Date Collected: 05/08/19 13:30
Matrix: Water
Date Received: 05/09/19 09:30

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (TCD)	1400		1000	500	ug/L			05/14/19 14:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	3.4	B	0.90	0.14	mg/L			05/09/19 17:37	1
NO3 as N	0.058	J	0.20	0.020	mg/L			05/09/19 17:37	1
Sulfate	3.7		1.2	0.26	mg/L			05/09/19 17:37	1
Total Organic Carbon	1.3		0.10	0.050	mg/L			05/15/19 08:15	1

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: T4SIMW22-050819
Lab Sample ID: 580-86047-6

Date Collected: 05/08/19 15:05
Matrix: Water
Date Received: 05/09/19 09:30

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	41		0.99	0.25	ug/L			05/14/19 14:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	7.9	B	0.90	0.14	mg/L			05/09/19 17:49	1
NO3 as N	0.11	J	0.20	0.020	mg/L			05/09/19 17:49	1
Sulfate	11		1.2	0.26	mg/L			05/09/19 17:49	1
Total Organic Carbon	1.2		0.10	0.050	mg/L			05/15/19 08:28	1

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 440-546352/8
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	ND		0.99	0.25	ug/L			05/14/19 13:17	1
Methane (TCD)	ND		1000	500	ug/L			05/14/19 13:17	1

Lab Sample ID: LCS 440-546352/4
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (TCD)	4190	4460		ug/L		106	80 - 120

Lab Sample ID: LCS 440-546352/6
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (FID)	83.9	80.4		ug/L		96	80 - 120

Lab Sample ID: LCSD 440-546352/5
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (TCD)	4190	4570		ug/L		109	80 - 120	2	20

Lab Sample ID: LCSD 440-546352/7
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (FID)	83.9	78.5		ug/L		94	80 - 120	2	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 580-300401/3
Matrix: Water
Analysis Batch: 300401

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NO3 as N	ND		0.20	0.020	mg/L			05/09/19 16:04	1

Lab Sample ID: LCS 580-300401/4
Matrix: Water
Analysis Batch: 300401

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
NO3 as N	5.00	5.21		mg/L		104	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 580-300401/5
Matrix: Water
Analysis Batch: 300401

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
NO3 as N			5.00	5.22		mg/L		104	90 - 110	0	15

Lab Sample ID: 580-86047-1 MS
Matrix: Water
Analysis Batch: 300401

Client Sample ID: T4SIMW09-050819-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
NO3 as N	1.8		5.00	7.00		mg/L		105	90 - 110

Lab Sample ID: 580-86047-1 MSD
Matrix: Water
Analysis Batch: 300401

Client Sample ID: T4SIMW09-050819-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
NO3 as N	1.8		5.00	6.99		mg/L		105	90 - 110	0	15

Lab Sample ID: MB 580-300404/3
Matrix: Water
Analysis Batch: 300404

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.683	J	0.90	0.14	mg/L			05/09/19 16:04	1
Sulfate	ND		1.2	0.26	mg/L			05/09/19 16:04	1

Lab Sample ID: LCS 580-300404/4
Matrix: Water
Analysis Batch: 300404

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride			50.0	52.1		mg/L		104	90 - 110
Sulfate			50.0	51.7		mg/L		103	90 - 110

Lab Sample ID: LCSD 580-300404/5
Matrix: Water
Analysis Batch: 300404

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			50.0	52.1		mg/L		104	90 - 110	0	15
Sulfate			50.0	51.7		mg/L		103	90 - 110	0	15

Lab Sample ID: 580-86047-1 MS
Matrix: Water
Analysis Batch: 300404

Client Sample ID: T4SIMW09-050819-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1.6	B	50.0	54.2		mg/L		105	90 - 110
Sulfate	7.0		50.0	59.5		mg/L		105	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 580-86047-1 MSD
Matrix: Water
Analysis Batch: 300404

Client Sample ID: T4SIMW09-050819-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1.6	B	50.0	54.2		mg/L		105	90 - 110	0	15
Sulfate	7.0		50.0	59.6		mg/L		105	90 - 110	0	15

Method: SM 5310C - TOC

Lab Sample ID: MB 440-546810/6
Matrix: Water
Analysis Batch: 546810

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		0.10	0.050	mg/L			05/15/19 06:18	1

Lab Sample ID: LCS 440-546810/5
Matrix: Water
Analysis Batch: 546810

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	9.97		mg/L		100	85 - 115

Lab Sample ID: MRL 440-546810/4
Matrix: Water
Analysis Batch: 546810

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	0.100	0.0749	J	mg/L		75	50 - 150

Lab Sample ID: 580-86047-1 MS
Matrix: Water
Analysis Batch: 546810

Client Sample ID: T4SIMW09-050819-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	0.53		10.0	10.4		mg/L		98	85 - 115

Lab Sample ID: 580-86047-1 MSD
Matrix: Water
Analysis Batch: 546810

Client Sample ID: T4SIMW09-050819-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Organic Carbon	0.53		10.0	10.4		mg/L		98	85 - 115	0	20

Lab Chronicle

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: T4SIMW09-050819-0
Lab Sample ID: 580-86047-1
Date Collected: 05/08/19 08:55
Matrix: Water
Date Received: 05/09/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 13:33	EI	TAL IRV
Total/NA	Analysis	300.0		1	300401	05/09/19 16:39	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300404	05/09/19 16:39	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 06:29	YZ	TAL IRV

Client Sample ID: T4SIMW03s-050819-0
Lab Sample ID: 580-86047-2
Date Collected: 05/08/19 10:45
Matrix: Water
Date Received: 05/09/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 13:50	EI	TAL IRV
Total/NA	Analysis	300.0		1	300401	05/09/19 17:14	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300404	05/09/19 17:14	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 06:41	YZ	TAL IRV

Client Sample ID: MW02-050819-0
Lab Sample ID: 580-86047-3
Date Collected: 05/08/19 12:10
Matrix: Water
Date Received: 05/09/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 14:03	EI	TAL IRV
Total/NA	Analysis	300.0		1	300401	05/09/19 17:26	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300404	05/09/19 17:26	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 06:54	YZ	TAL IRV

Client Sample ID: MW04-050819-0
Lab Sample ID: 580-86047-4
Date Collected: 05/08/19 13:30
Matrix: Water
Date Received: 05/09/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 14:16	EI	TAL IRV
Total/NA	Analysis	300.0		1	300401	05/09/19 17:37	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300404	05/09/19 17:37	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 08:15	YZ	TAL IRV

Client Sample ID: T4SIMW22-050819
Lab Sample ID: 580-86047-6
Date Collected: 05/08/19 15:05
Matrix: Water
Date Received: 05/09/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 14:29	EI	TAL IRV
Total/NA	Analysis	300.0		1	300401	05/09/19 17:49	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300404	05/09/19 17:49	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 08:28	YZ	TAL IRV

Lab Chronicle

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Laboratory References:

EMAX Lab. = EMAX Laboratories Inc, 1835 W. 205th Street, Torrance, CA 90501

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Laboratory: Eurofins TestAmerica, Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-20
ANAB	DoD		L2236	01-19-22
ANAB	ISO/IEC 17025		L2236	01-19-22
California	State Program	9	2901	11-05-19
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-20

Laboratory: Eurofins TestAmerica, Irvine

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	CA01531	06-30-19
Arizona	State Program	9	AZ0671	10-14-19
California	LA Cty Sanitation Districts	9	10256	06-30-19
California	State Program	9	CA ELAP 2706	06-30-19
Guam	State Program	9	Cert. No. 19-005R	01-23-20
Hawaii	State Program	9	N/A	01-29-20
Kansas	NELAP	7	E-10420	07-31-19
Nevada	State Program	9	CA015312018-1	07-31-19
New Mexico	State Program	6	N/A	01-29-20
Oregon	NELAP	10	4028	01-29-20
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-18-00214	07-09-21
Washington	State Program	10	C900	09-03-19

Sample Summary

Client: CH2M Hill, Inc.
Job ID: 580-86047-1
Project/Site: Northwest Pipe Company GW Monitoring

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-86047-1	T4SIMW09-050819-0	Water	05/08/19 08:55	05/09/19 09:30	
580-86047-2	T4SIMW03s-050819-0	Water	05/08/19 10:45	05/09/19 09:30	
580-86047-3	MW02-050819-0	Water	05/08/19 12:10	05/09/19 09:30	
580-86047-4	MW04-050819-0	Water	05/08/19 13:30	05/09/19 09:30	
580-86047-5	Trip Blank-050819	Water	05/08/19 08:00	05/09/19 09:30	
580-86047-6	T4SIMW22-050819	Water	05/08/19 15:05	05/09/19 09:30	

EMAX LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889

Date: 05-29-2019
EMAX Batch No.: 19E088

Attn: Kris Allen

TestAmerica, Inc.
5755 8th Street East
Tacoma WA 98424

Subject: Laboratory Report
Project: NW PIPE COMPANY GW MONITORING

Enclosed is the Laboratory report for samples received on 05/10/19.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
T4SIMW09-050819-0 (580-86047-1)	E088-01	05/08/19	WATER	VOC SIM
T4SIMW03S-050819-0 (580-86047-2)	E088-02	05/08/19	WATER	VOC SIM
MW02-050819-0 (580-86047-3)	E088-03	05/08/19	WATER	VOC SIM
MW04-050819-0 (580-86047-4)	E088-04	05/08/19	WATER	VOC SIM
TRIP BLANK-050819 (580-86047-5)	E088-05	05/08/19	WATER	VOC SIM
T4SIMW22-050819 (580-86047-6)	E088-06	05/08/19	WATER	VOC SIM

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning
these results.

Sincerely yours,

Caspar J. Pang
Laboratory Director

EMAX certifies that results included in this report meets all TNI & DOD requirements unless noted in the Case Narrative.

NELAP Accredited Certificate Number CA002912018-14
ANAB Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing
California ELAP Accredited Certificate Number 2672

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-65933.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kristine.allen@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: EMAX Laboratories Inc		Accreditations Required (See note):		Job #: 580-86047-1
Address: 1835 W. 205th Street, ,	Due Date Requested: 5/21/2019			
City: Torrance	TAT Requested (days):			
State, Zip: CA, 90501				
Phone:	PO #:			
Email:	WO #:			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

	Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (TCE, cis 1,2-DCE, PCE, Vinyl Chloride - low level)/ TCE, cis 1,2-DCE, PCE, Vinyl Chloride -	Total Number of containers	Special Instructions/Note:
				Preservation Code:						
1	T4SIMW09-050819-0 (580-86047-1)	5/8/19	08:55 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
2	T4SIMW03s-050819-0 (580-86047-2)	5/8/19	10:45 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
3	MW02-050819-0 (580-86047-3)	5/8/19	12:10 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
4	MW04-050819-0 (580-86047-4)	5/8/19	13:30 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
5	Trip Blank-050819 (580-86047-5)	5/8/19	08:00 Pacific		Water			X	2	Please provide CH2 Lab Spec EDD if possible.
6	T4SIMW22-050819 (580-86047-6)	5/8/19	15:05 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	5-9-19	TASea	Maria Martinez	5-10-19 9:45	EMax
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0.4°C

REPORT ID: 19E088

SAMPLE RECEIPT FORM 1

Type of Delivery	Airbill / Tracking Number	ECN 19E088
☑ Fedex ☐ UPS ☐ GSO ☐ Others	4912 4943 5133	Recipient Mona Martinez
☐ EMAX Courier ☐ Client Delivery		Date 5-10-19 Time 9:45

COC INSPECTION

☑ Client Name	☑ Client PM/FC	☐ Sampler Name	☑ Sampling Date/Time	☑ Sample ID	☑ Matrix
☑ Address	☐ Tel # / Fax #	☐ Courier Signature	☑ Analysis Required	☐ Preservative (if any)	☐ TAT
Safety Issues (if any)	☐ High concentrations expected	☐ From Superfund Site	☐ Rad screening required		

Note: _____

PACKAGING INSPECTION

Container	☑ Cooler	☐ Box	☐ Other		
Condition	☐ Custody Seal	☐ Intact	☐ Damaged		
Packaging	☐ Bubble Pack	☐ Styrofoam	☐ Popcorn	☐ Sufficient	☐ _____
Temperatures (Cool, ≤6 °C but not frozen)	☑ Cooler 1 0.4 °C	☐ Cooler 2_____ °C	☐ Cooler 3_____ °C	☐ Cooler 4_____ °C	☐ Cooler 5_____ °C
	☐ Cooler 6_____ °C	☐ Cooler 7_____ °C	☐ Cooler 8_____ °C	☐ Cooler 9_____ °C	☐ Cooler 10_____ °C
Thermometer:	*A - S/N 170324872*	*B - S/N 150555522*	*C - S/N 170324888*	*D - S/N* _____	

Comments: ☐ **Temperature is out of range. PM was informed IMMEDIATELY.**

Note: _____

DISCREPANCIES

LabSampleID	LabSampleContainerID	Code	ClientSample Label ID / Information	Corrective Action
2	5	D3	Label Reads: T45IMW03S-	R1
1-6	1-17	D2	Label Reads: VOCs, SW8260 Sim CH4 (RSK 175) VOC	R1

5/10/19

☐ pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.

NOTES/OBSERVATIONS:

☐ Continue to next page.

LEGEND:

Code	Description- Sample Management
D1	Analysis is not indicated in _____
D2	Analysis mismatch COC vs label
D3	Sample ID mismatch COC vs label
D4	Sample ID is not indicated in _____
D5	Container -[improper] [leaking] [broken]
D6	Date/Time is not indicated in _____
D7	Date/Time mismatch COC vs label
D8	Sample listed in COC is not received
D9	Sample received is not listed in COC
D10	No initial/date on corrections in COC/label
D11	Container count mismatch COC vs received
D12	Container size mismatch COC vs received

Code	Description-Sample Management
D13	Out of Holding Time
D14	Bubble is >6mm
D15	No trip blank in cooler
D16	Preservation not indicated in _____
D17	Preservation mismatch COC vs label
D18	Insufficient chemical preservative
D19	Insufficient Sample
D20	No filtration info for dissolved analysis
D21	No sample for moisture determination
D22	_____
D23	_____
D24	_____

Code	Description-Sample Management
R1	Proceed as indicated in ☑ COC ☐ Label
R2	Refer to attached instruction
R3	Cancel the analysis
R4	Use vial with smallest bubble first
R5	Log-in with latest sampling date and time+1 min
R6	Adjust pH as necessary
R7	Filter and preserved as necessary
R8	_____
R9	_____
R10	_____
R11	_____
R12	_____

REVIEWS:

Sample Labeling Mona Martinez Date 5-10-19 — 5/10/19

SRF Date 5/10/19

PM Date 5/10/19


TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
ORIGIN ID:TCMA (253) 922-2310
SAMPLE RECEIVING
TA-SEATTLE
5755 8TH ST E
FIFE, WA 98424
UNITED STATES US
SHIP DATE: 09MAY19
ACTWGT: 1.00 LB
CAD: 989746/CAFE3211
BILL SENDER
TO SHIPPING/RECEIVING
EMAX LABORATORIES INC
1835 W. 205TH STREET
TORRANCE CA 90501
(253) 922-2310
REF: S580-33723
PO: NO
FedEx
Express
TRK# 0201 4912 4943 5133
FRI - 10 MAY 10:30A
PRIORITY OVERNIGHT
92 HHRA
90501
CA-US LAX
Temp: 0.4

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than LOQ/RL but greater than LOD/MDL/DL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range or estimated value.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
DL	Detection Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

TESTAMERICA, INC.

NW PIPE COMPANY GW MONITORING

METHOD 5030B/8260B SIM
EDB BY GC/MS SIM

SDG#: 19E088

CASE NARRATIVE

Client : TESTAMERICA, INC.

Project: NW PIPE COMPANY GW MONITORING

SDG : 19E088

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

A total of six (6) water samples were received on 05/10/19 to be analyzed for EDB by GC/MS SIM in accordance with Method SW5030B/8260B SIM and project specific requirements.

Holding Time
Samples were analyzed within the prescribed holding time.

Instrument Performance and Calibration
Instrument tune check was performed prior to calibration. Result was within acceptance criteria. Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using secondary source (ICV). Continuing calibration (CCV) was carried out at a frequency required by the project. All project calibration requirements were satisfied. Refer to calibration summary forms of ICAL, ICV and CCV for details.

Method Blank
Method blank was prepared and analyzed at the frequency required by the project. For this SDG, two (2) method blanks were analyzed. VOF5E09B and VOF5E12B were compliant to project requirement. Refer to sample result summary forms for details.

Lab Control Sample
Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, two (2) sets of LCS/LCD were analyzed. VOF5E09L/VOF5E09C and VOF5E12L/VOF5E12C were within LCS limits. Refer to LCS summary forms for details.

Matrix QC Sample
No matrix QC sample was provided on this SDG.

Surrogate
Surrogates were added on QC and field samples. All surrogate recoveries were within QC limits. Refer to sample result summary forms for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.
Sample E088-04 was reported at dilution due to high concentration.

LAB CHRONICLE
EDB BY GC/MS SIM

Client : TESTAMERICA, INC. SDG NO. : 19E088
Project : NW PIPE COMPANY GW MONITORING Instrument ID : F5

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	VOF5E09B	1	NA	05/16/1912:57	05/16/1912:57	REY120	RDY169	VOF5E09	Method Blank
LCS1W	VOF5E09L	1	NA	05/16/1911:40	05/16/1911:40	REY117	RDY169	VOF5E09	Lab Control Sample (LCS)
LCD1W	VOF5E09C	1	NA	05/16/1912:06	05/16/1912:06	REY118	RDY169	VOF5E09	LCS Duplicate
TRIP BLANK-050819 (580-86047-5)	E088-05	1	NA	05/16/1913:22	05/16/1913:22	REY121	RDY169	VOF5E09	Field Sample
T4SIMW09-050819-0 (580-86047-1)	E088-01	1	NA	05/16/1916:18	05/16/1916:18	REY128	RDY169	VOF5E09	Field Sample
T4SIMW03S-050819-0 (580-86047-2)	E088-02	1	NA	05/16/1916:44	05/16/1916:44	REY129	RDY169	VOF5E09	Field Sample
MW02-050819-0 (580-86047-3)	E088-03	1	NA	05/16/1917:09	05/16/1917:09	REY130	RDY169	VOF5E09	Field Sample
T4SIMW22-050819 (580-86047-6)	E088-06	1	NA	05/16/1918:00	05/16/1918:00	REY132	RDY169	VOF5E09	Field Sample
MBLK2W	VOF5E12B	1	NA	05/21/1911:43	05/21/1911:43	REY211	RDY169	VOF5E12	Method Blank
LCS2W	VOF5E12L	1	NA	05/21/1910:52	05/21/1910:52	REY209	RDY169	VOF5E12	Lab Control Sample (LCS)
LCD2W	VOF5E12C	1	NA	05/21/1911:17	05/21/1911:17	REY210	RDY169	VOF5E12	LCS Duplicate
MW04-050819-0 (580-86047-4)	E088-04I	25	NA	05/21/1912:08	05/21/1912:08	REY212	RDY169	VOF5E12	Diluted Sample
MW04-050819-0 (580-86047-4)DL	E088-04J	50	NA	05/21/1912:34	05/21/1912:34	REY213	RDY169	VOF5E12	Diluted Sample
T4SIMW22-050819 (580-86047-6)DL	E088-06I	10	NA	05/21/1912:59	05/21/1912:59	REY214	RDY169	VOF5E12	Diluted Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/16/19 16:18
Sample ID: T4SIMW09-050819-0 (580-86047-1)	Date Analyzed: 05/16/19 16:18
Lab Samp ID: E088-01	Dilution Factor: 1
Lab File ID: REY128	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.548	0.5000	110	70-130
4-BROMOFLUOROBENZENE	0.449	0.5000	89.8	70-130
TOLUENE-D8	0.439	0.5000	87.7	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/16/19 16:44
Sample ID: T4SIMW03S-050819-0 (580-86047-2)	Date Analyzed: 05/16/19 16:44
Lab Samp ID: E088-02	Dilution Factor: 1
Lab File ID: REY129	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.575	0.5000	115	70-130
4-BROMOFLUOROBENZENE	0.454	0.5000	90.8	70-130
TOLUENE-D8	0.440	0.5000	88.0	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/16/19 17:09
Sample ID: MW02-050819-0 (580-86047-3)	Date Analyzed: 05/16/19 17:09
Lab Samp ID: E088-03	Dilution Factor: 1
Lab File ID: REY130	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	0.36	0.20	0.10
VINYL CHLORIDE	1.2	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.568	0.5000	114	70-130
4-BROMOFLUOROBENZENE	0.455	0.5000	90.9	70-130
TOLUENE-D8	0.437	0.5000	87.4	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/21/19 12:08 # 05/21/19 12:34
Sample ID: MW04-050819-0 (580-86047-4)	Date Analyzed: 05/21/19 12:08 # 05/21/19 12:34
Lab Samp ID: E088-04I #E088-04J	Dilution Factor: 25 # 50
Lab File ID: REY212 #REY213	Matrix : WATER
Ext Btch ID: VOF5E12 #VOF5E12	% Moisture : NA
Calib. Ref.: RDY169 #RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
# CIS-1,2-DICHLOROETHYLENE	150	10	5.0
VINYL CHLORIDE	6.1	2.5	0.50
TETRACHLOROETHENE	5.4	5.0	2.5
TCE	8.4	5.0	2.5

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	13.1	12.50	105	70-130
4-BROMOFLUOROBENZENE	11.5	12.50	92.0	70-130
TOLUENE-D8	11.1	12.50	88.9	70-130
# 1,2-DICHLOROETHANE-D4	26.3	25.00	105	70-130
# 4-BROMOFLUOROBENZENE	23.3	25.00	93.4	70-130
# TOLUENE-D8	22.7	25.00	90.6	70-130

Members of the Associated File

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/21/19 12:08
Sample ID: MW04-050819-0 (580-86047-4)	Date Analyzed: 05/21/19 12:08
Lab Samp ID: E088-04I	Dilution Factor: 25
Lab File ID: REY212	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	140E	5.0	2.5
VINYL CHLORIDE	6.1	2.5	0.50
TETRACHLOROETHENE	5.4	5.0	2.5
TCE	8.4	5.0	2.5

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	13.1	12.50	105	70-130
4-BROMOFLUOROBENZENE	11.5	12.50	92.0	70-130
TOLUENE-D8	11.1	12.50	88.9	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/21/19 12:34
Sample ID: MW04-050819-0 (580-86047-4)DL	Date Analyzed: 05/21/19 12:34
Lab Samp ID: E088-04J	Dilution Factor: 50
Lab File ID: REY213	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	150	10	5.0
VINYL CHLORIDE	6.3	5.0	1.0
TETRACHLOROETHENE	5.6J	10	5.0
TCE	8.7J	10	5.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	26.3	25.00	105	70-130
4-BROMOFLUOROBENZENE	23.3	25.00	93.4	70-130
TOLUENE-D8	22.7	25.00	90.6	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/16/19 13:22
Sample ID: TRIP BLANK-050819 (580-86047-5)	Date Analyzed: 05/16/19 13:22
Lab Samp ID: E088-05	Dilution Factor: 1
Lab File ID: REY121	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.532	0.5000	106	70-130
4-BROMOFLUOROBENZENE	0.459	0.5000	91.7	70-130
TOLUENE-D8	0.448	0.5000	89.5	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/16/19 18:00 # 05/21/19 12:59
Sample ID: T4SIMW22-050819 (580-86047-6)	Date Analyzed: 05/16/19 18:00 # 05/21/19 12:59
Lab Samp ID: E088-06 #E088-06I	Dilution Factor: 1 # 10
Lab File ID: REY132 #REY214	Matrix : WATER
Ext Btch ID: VOF5E09 #VOF5E12	% Moisture : NA
Calib. Ref.: RDY169 #RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
# CIS-1,2-DICHLOROETHYLENE	7.5	2.0	1.0
VINYL CHLORIDE	0.33	0.10	0.020
TETRACHLOROETHENE	1.8	0.20	0.10
# TCE	4.4	2.0	1.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.570	0.5000	114	70-130
4-BROMOFLUOROBENZENE	0.457	0.5000	91.4	70-130
TOLUENE-D8	0.444	0.5000	88.8	70-130
# 1,2-DICHLOROETHANE-D4	5.00	5.000	100	70-130
# 4-BROMOFLUOROBENZENE	4.25	5.000	84.9	70-130
# TOLUENE-D8	4.11	5.000	82.2	70-130

Members of the Associated File

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/16/19 18:00
Sample ID: T4SIMW22-050819 (580-86047-6)	Date Analyzed: 05/16/19 18:00
Lab Samp ID: E088-06	Dilution Factor: 1
Lab File ID: REY132	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	8.2E	0.20	0.10
VINYL CHLORIDE	0.33	0.10	0.020
TETRACHLOROETHENE	1.8	0.20	0.10
TCE	5.1E	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.570	0.5000	114	70-130
4-BROMOFLUOROBENZENE	0.457	0.5000	91.4	70-130
TOLUENE-D8	0.444	0.5000	88.8	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/08/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/10/19
Batch No. : 19E088	Date Extracted: 05/21/19 12:59
Sample ID: T4SIMW22-050819 (580-86047-6)DL	Date Analyzed: 05/21/19 12:59
Lab Samp ID: E088-06I	Dilution Factor: 10
Lab File ID: REY214	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	7.5	2.0	1.0
VINYL CHLORIDE	0.36J	1.0	0.20
TETRACHLOROETHENE	1.6J	2.0	1.0
TCE	4.4	2.0	1.0

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	5.00	5.000	100	70-130
4-BROMOFLUOROBENZENE	4.25	5.000	84.9	70-130
TOLUENE-D8	4.11	5.000	82.2	70-130

QC SUMMARIES

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: NA
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/16/19
Batch No. : 19E088	Date Extracted: 05/16/19 12:57
Sample ID: MBLK1W	Date Analyzed: 05/16/19 12:57
Lab Samp ID: VOF5E09B	Dilution Factor: 1
Lab File ID: REY120	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.548	0.5000	110	70-130
4-BROMOFLUOROBENZENE	0.460	0.5000	91.9	70-130
TOLUENE-D8	0.447	0.5000	89.4	70-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TESTAMERICA, INC.
PROJECT: NW PIPE COMPANY GW MONITORING
BATCH NO.: 19E088
METHOD: SW5030B/8260B SIM

MATRIX:	WATER			% MOISTURE:	NA
DILUTION FACTOR:	1	1	1		
SAMPLE ID:	MBLK1W				
LAB SAMP ID:	VOF5E09B	VOF5E09L	VOF5E09C		
LAB FILE ID:	REY120	REY117	REY118		
DATE EXTRACTED:	05/16/1912:57	05/16/1911:40	05/16/1912:06	DATE COLLECTED:	NA
DATE ANALYZED:	05/16/1912:57	05/16/1911:40	05/16/1912:06	DATE RECEIVED:	05/16/19
PREP. BATCH:	VOF5E09	VOF5E09	VOF5E09		
CALIB. REF:	RDY169	RDY169	RDY169		

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
cis-1,2-Dichloroethylene	ND	0.500	0.503	101	0.500	0.487	97	3	70-130	20
Vinyl Chloride	ND	0.500	0.395	79	0.500	0.388	78	2	60-140	20
Tetrachloroethene	ND	0.500	0.483	97	0.500	0.471	94	3	70-130	20
TCE	ND	0.500	0.527	105	0.500	0.506	101	4	70-130	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	0.500	0.541	108	0.500	0.491	98	70-130
4-Bromofluorobenzene	0.500	0.482	96	0.500	0.432	86	70-130
Toluene-d8	0.500	0.456	91	0.500	0.416	83	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: NA
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/21/19
Batch No. : 19E088	Date Extracted: 05/21/19 11:43
Sample ID: MBLK2W	Date Analyzed: 05/21/19 11:43
Lab Samp ID: VOF5E12B	Dilution Factor: 1
Lab File ID: REY211	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.515	0.5000	103	70-130
4-BROMOFLUOROBENZENE	0.463	0.5000	92.6	70-130
TOLUENE-D8	0.446	0.5000	89.3	70-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TESTAMERICA, INC.
PROJECT: NW PIPE COMPANY GW MONITORING
BATCH NO.: 19E088
METHOD: SW5030B/8260B SIM

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: VOF5E12B VOF5E12L VOF5E12C
LAB FILE ID: REY211 REY209 REY210
DATE EXTRACTED: 05/21/1911:43 05/21/1910:52 05/21/1911:17 DATE COLLECTED: NA
DATE ANALYZED: 05/21/1911:43 05/21/1910:52 05/21/1911:17 DATE RECEIVED: 05/21/19
PREP. BATCH: VOF5E12 VOF5E12 VOF5E12
CALIB. REF: RDY169 RDY169 RDY169

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
cis-1,2-Dichloroethylene	ND	0.500	0.518	104	0.500	0.514	103	1	70-130	20
Vinyl Chloride	ND	0.500	0.426	85	0.500	0.417	83	2	60-140	20
Tetrachloroethene	ND	0.500	0.474	95	0.500	0.477	95	1	70-130	20
TCE	ND	0.500	0.501	100	0.500	0.501	100	0	70-130	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	0.500	0.537	107	0.500	0.536	107	70-130
4-Bromofluorobenzene	0.500	0.497	99	0.500	0.455	91	70-130
Toluene-d8	0.500	0.457	91	0.500	0.455	91	70-130

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: LAURA TOCHKO	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-33446-10901.3
Client Contact: Bernice Kidd	Phone: 425-891-2855	E-Mail: kristine.allen@testamericainc.com		Page: Page ~~3 of 3~~ 1 OF 1
Company: CH2M Hill, Inc.				Job #:
Address: 2020 SW 4th Ave Suite 300	Due Date Requested:			
City: Portland	TAT Requested (days): STANDARD			
State, Zip: OR, 97201				
Phone: 530-229-3203(Tel)	PO #: PO 682722.RI.02			
Email: bernice.kidd@jacobs.com	WO #:			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Loc: 580
86047

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EMAX 8260C_LL - TCE, cis 1,2-DCE, PCE, Vinyl Chloride	RSK_175 - Methane	300.0_28D, 300_48HR: Cl, SO4, Nitrates	5310C - TOC	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	A	N	S		
T4SIMW09-050819-0	5/8/19	0855	G	W			X	X	X	X	3	VOCs to be sent to EMAX
T4SIMW03S-050819-0	5/8/19	1045	G	W			X	X	X	X	3	
MW02-050819-0	5/8/19	1210	G	W			X	X	X	X	3	
MW04-050819-0	5/8/19	1330	G	W			X	X	X	X	3	
TRIPBLANK-050819	5/8/19	0800	-	W			X				2	
T4SIMW22-050819	5/8/19	1505	G	W			X	X	X	X	3	

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Therm. ID: 5 Cor: 1.2 ° Unc: 1.3 °
Cooler Dsc: Lg. Blue
Packing: Bub
Cust. Seal: Yes ___ No ___
Blue Ice, Wet, Dry, None
FedEx: P.O.
UPS: ___
Lab Courr: ___
Other: ___

580-86047 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ___ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
LAURA TOCHKO	5/8/19 16:15	JACOBS	Diana	5-9-19 DW 9:30	TASCA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Allen, Kristine D	Carrier Tracking No(s): 4912 4943 5122	COC No: 580-65930.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kristine.allen@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note):		Job #: 580-86047-1
Address: 17461 Derian Ave, Suite 100,	Due Date Requested: 5/21/2019			
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #:			
Email:	WO #:			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175/ Methane	5310C/ TOC	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
T4SIMW09-050819-0 (580-86047-1)	5/8/19	08:55 Pacific		Water			X	X	4	
T4SIMW03s-050819-0 (580-86047-2)	5/8/19	10:45 Pacific		Water			X	X	4	
MW02-050819-0 (580-86047-3)	5/8/19	12:10 Pacific		Water			X	X	4	
MW04-050819-0 (580-86047-4)	5/8/19	13:30 Pacific		Water			X	X	4	
T4SIMW22-050819 (580-86047-6)	5/8/19	15:05 Pacific		Water			X	X	4	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc attention immediately If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by	Date:	Time:	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	5.9.19	TAsea			
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
			Olga Cisneros	5/10/19 1000	TAINW
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ☒ Yes ☐ No	Custody Seal No :	Cooler Temperature(s) °C and Other Remarks: 2.6/2.9 TR-93

Ver: 01/16/2019

5/30/2019

Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 580-86047-1

Login Number: 86047
List Number: 1
Creator: Hobbs, Kenneth F

List Source: Eurofins TestAmerica, Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 580-86047-1

Login Number: 86047
List Number: 2
Creator: Ornelas, Olga

List Source: Eurofins TestAmerica, Irvine
List Creation: 05/10/19 02:45 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-86076-1
Client Project/Site: Northwest Pipe Company GW Monitoring

For:
CH2M Hill, Inc.
2020 SW 4th Ave
Suite 300
Portland, Oregon 97201

Attn: Bernice Kidd

Kristine D. Allen

Authorized for release by:
5/30/2019 2:28:02 PM

Kristine Allen, Manager of Project Management
(253)248-4970
kristine.allen@testamericainc.com

Table of Contents

Job ID: 580-86076-1

Laboratory: Eurofins TestAmerica, Seattle

Narrative

Job Narrative
580-86076-1

Comments
No additional comments.

Receipt
The samples were received on 5/10/2019 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was -1.6º C.

Subcontract Work
Method TCE, cis 1,2-DCE, PCE, Vinyl Chloride - low level: This method was subcontracted to EMAX Laboratories Inc. The subcontract laboratory certification is different from that of the facility issuing the final report.

GC/MS VOA
Method(s) 8260C: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 580-300469 recovered outside control limits for the following analytes: cis-1,2-Dichloroethene, Tetrachloroethene, Trichloroethene. The individual recoveries of the LCS and LCSD met the acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: CH2M Hill, Inc. Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	RPD of the LCS and LCSD exceeds the control limits

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: T4SIMW23-050919-0
Lab Sample ID: 580-86076-1
Date Collected: 05/09/19 09:00
Matrix: Water
Date Received: 05/10/19 09:35

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	16		0.99	0.25	ug/L			05/14/19 16:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13		0.90	0.14	mg/L			05/15/19 02:41	1
NO3 as N	0.48	F1 B	0.20	0.020	mg/L			05/11/19 01:42	1
Sulfate	8.3	B	1.2	0.26	mg/L			05/15/19 02:41	1
Total Organic Carbon	0.67		0.10	0.050	mg/L			05/15/19 10:17	1

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: MW01-050919-0
Lab Sample ID: 580-86076-2
Date Collected: 05/09/19 10:20
Matrix: Water
Date Received: 05/10/19 09:35

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	310		0.99	0.25	ug/L			05/14/19 16:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.7		0.90	0.14	mg/L			05/15/19 03:40	1
NO3 as N	0.50	B	0.20	0.020	mg/L			05/11/19 02:18	1
Sulfate	12	B	1.2	0.26	mg/L			05/15/19 03:40	1
Total Organic Carbon	1.2		0.10	0.050	mg/L			05/15/19 11:20	1

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: MW03-050919-0
Lab Sample ID: 580-86076-4
Date Collected: 05/09/19 11:45
Matrix: Water
Date Received: 05/10/19 09:35

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (TCD)	2300		1000	500	ug/L			05/14/19 17:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.3		0.90	0.14	mg/L			05/15/19 03:51	1
NO3 as N	0.20	B	0.20	0.020	mg/L			05/11/19 02:29	1
Sulfate	9.4	B	1.2	0.26	mg/L			05/15/19 03:51	1
Total Organic Carbon	1.3		0.10	0.050	mg/L			05/15/19 10:29	1

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: MW06-050919-0
Lab Sample ID: 580-86076-5
Date Collected: 05/09/19 13:10
Matrix: Water
Date Received: 05/10/19 09:35

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	370		0.99	0.25	ug/L			05/14/19 17:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.8		0.90	0.14	mg/L			05/15/19 04:03	1
NO3 as N	0.13	J B	0.20	0.020	mg/L			05/11/19 02:41	1
Sulfate	17	B	1.2	0.26	mg/L			05/15/19 04:03	1
Total Organic Carbon	1.5		0.10	0.050	mg/L			05/15/19 11:32	1

Client Sample Results

Client: CH2M Hill, Inc.
Project/Site: Northwest Pipe Company GW Monitoring

Job ID: 580-86076-1

Client Sample ID: MW100-050919-0
Date Collected: 05/09/19 12:00
Date Received: 05/10/19 09:35

Lab Sample ID: 580-86076-6
Matrix: Water

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	350		0.99	0.25	ug/L			05/14/19 17:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.7		0.90	0.14	mg/L			05/15/19 04:15	1
NO3 as N	0.14	J B	0.20	0.020	mg/L			05/11/19 02:53	1
Sulfate	17	B	1.2	0.26	mg/L			05/15/19 04:15	1
Total Organic Carbon	1.6		0.10	0.050	mg/L			05/15/19 11:45	1

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: MW05-050919-0
Lab Sample ID: 580-86076-7

Date Collected: 05/09/19 14:20
Matrix: Water
Date Received: 05/10/19 09:35

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	170		0.99	0.25	ug/L			05/14/19 17:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.8		0.90	0.14	mg/L			05/15/19 04:27	1
NO3 as N	1.0	B	0.20	0.020	mg/L			05/11/19 03:04	1
Sulfate	17	B	1.2	0.26	mg/L			05/15/19 04:27	1
Total Organic Carbon	1.5		0.10	0.050	mg/L			05/15/19 11:57	1

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: IDW DRUM 2-050919
Lab Sample ID: 580-86076-8

Date Collected: 05/09/19 15:00
Matrix: Water
Date Received: 05/10/19 09:35

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	1.6		1.0	0.22	ug/L			05/10/19 19:55	1
cis-1,2-Dichloroethene	49	*	3.0	0.69	ug/L			05/10/19 19:55	1
TCE	4.8	*	3.0	0.85	ug/L			05/10/19 19:55	1
PCE	21	*	3.0	0.41	ug/L			05/10/19 19:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*97*		*80 - 122*		*05/10/19 19:55*	*1*
Trifluorotoluene (Surr)	*103*		*80 - 120*		*05/10/19 19:55*	*1*
Dibromofluoromethane (Surr)	*98*		*77 - 120*		*05/10/19 19:55*	*1*
4-Bromofluorobenzene (Surr)	*97*		*80 - 125*		*05/10/19 19:55*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 126*		*05/10/19 19:55*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-300469/7
Matrix: Water
Analysis Batch: 300469

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		1.0	0.22	ug/L			05/10/19 17:54	1
cis-1,2-Dichloroethene	ND		3.0	0.69	ug/L			05/10/19 17:54	1
TCE	ND		3.0	0.85	ug/L			05/10/19 17:54	1
PCE	ND		3.0	0.41	ug/L			05/10/19 17:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*100*		*80 - 122*		*05/10/19 17:54*	*1*
Trifluorotoluene (Surr)	*102*		*80 - 120*		*05/10/19 17:54*	*1*
Dibromofluoromethane (Surr)	*103*		*77 - 120*		*05/10/19 17:54*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 125*		*05/10/19 17:54*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 126*		*05/10/19 17:54*	*1*

Lab Sample ID: LCS 580-300469/4
Matrix: Water
Analysis Batch: 300469

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	10.0	9.07		ug/L		91	65 - 130
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	76 - 129
TCE	10.0	10.4		ug/L		104	70 - 131
PCE	10.0	11.6		ug/L		116	76 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*99*		*80 - 122*
Trifluorotoluene (Surr)	*102*		*80 - 120*
Dibromofluoromethane (Surr)	*95*		*77 - 120*
4-Bromofluorobenzene (Surr)	*100*		*80 - 125*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 126*

Lab Sample ID: LCSD 580-300469/5
Matrix: Water
Analysis Batch: 300469

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride	10.0	6.78		ug/L		68	65 - 130	29	35
cis-1,2-Dichloroethene	10.0	7.65	*	ug/L		77	76 - 129	27	15
TCE	10.0	8.11	*	ug/L		81	70 - 131	25	15
PCE	10.0	9.38	*	ug/L		94	76 - 120	21	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*97*		*80 - 122*
Trifluorotoluene (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*96*		*77 - 120*
4-Bromofluorobenzene (Surr)	*99*		*80 - 125*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 126*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 440-546352/8
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane (FID)	ND		0.99	0.25	ug/L			05/14/19 13:17	1
Methane (TCD)	ND		1000	500	ug/L			05/14/19 13:17	1

Lab Sample ID: LCS 440-546352/4
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (TCD)	4190	4460		ug/L		106	80 - 120

Lab Sample ID: LCS 440-546352/6
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methane (FID)	83.9	80.4		ug/L		96	80 - 120

Lab Sample ID: LCSD 440-546352/5
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (TCD)	4190	4570		ug/L		109	80 - 120	2	20

Lab Sample ID: LCSD 440-546352/7
Matrix: Water
Analysis Batch: 546352

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane (FID)	83.9	78.5		ug/L		94	80 - 120	2	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 580-300517/3
Matrix: Water
Analysis Batch: 300517

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NO3 as N	0.122	J	0.20	0.020	mg/L			05/10/19 16:21	1

Lab Sample ID: LCS 580-300517/4
Matrix: Water
Analysis Batch: 300517

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
NO3 as N	5.00	5.24		mg/L		105	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 580-300517/5
Matrix: Water
Analysis Batch: 300517

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
NO3 as N			5.00	5.25		mg/L		105	90 - 110	0	15

Lab Sample ID: 580-86076-1 MS
Matrix: Water
Analysis Batch: 300517

Client Sample ID: T4SIMW23-050919-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
NO3 as N	0.48	F1 B	5.00	6.05	F1	mg/L		111	90 - 110

Lab Sample ID: 580-86076-1 MSD
Matrix: Water
Analysis Batch: 300517

Client Sample ID: T4SIMW23-050919-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
NO3 as N	0.48	F1 B	5.00	6.04	F1	mg/L		111	90 - 110	0	15

Lab Sample ID: MB 580-300714/3
Matrix: Water
Analysis Batch: 300714

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.90	0.14	mg/L			05/14/19 20:27	1
Sulfate	0.344	J	1.2	0.26	mg/L			05/14/19 20:27	1

Lab Sample ID: LCS 580-300714/4
Matrix: Water
Analysis Batch: 300714

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride			50.0	51.3		mg/L		103	90 - 110
Sulfate			50.0	51.1		mg/L		102	90 - 110

Lab Sample ID: LCSD 580-300714/5
Matrix: Water
Analysis Batch: 300714

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			50.0	51.3		mg/L		103	90 - 110	0	15
Sulfate			50.0	51.1		mg/L		102	90 - 110	0	15

Lab Sample ID: 580-86076-1 MS
Matrix: Water
Analysis Batch: 300714

Client Sample ID: T4SIMW23-050919-0
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	13		50.0	65.0		mg/L		105	90 - 110
Sulfate	8.3	B	50.0	60.5		mg/L		104	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 580-86076-1 MSD
Client Sample ID: T4SIMW23-050919-0
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 300714

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	13		50.0	65.0		mg/L		105	90 - 110	0	15
Sulfate	8.3	B	50.0	60.5		mg/L		104	90 - 110	0	15

Method: SM 5310C - TOC

Lab Sample ID: MB 440-546810/6
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 546810

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		0.10	0.050	mg/L			05/15/19 06:18	1

Lab Sample ID: LCS 440-546810/5
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 546810

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	9.97		mg/L		100	85 - 115

Lab Sample ID: MRL 440-546810/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 546810

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	0.100	0.0749	J	mg/L		75	50 - 150

Lab Chronicle

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: T4SIMW23-050919-0
Lab Sample ID: 580-86076-1
Date Collected: 05/09/19 09:00
Matrix: Water
Date Received: 05/10/19 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 16:26	EI	TAL IRV
Total/NA	Analysis	300.0		1	300517	05/11/19 01:42	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300714	05/15/19 02:41	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 10:17	YZ	TAL IRV

Client Sample ID: MW01-050919-0
Lab Sample ID: 580-86076-2
Date Collected: 05/09/19 10:20
Matrix: Water
Date Received: 05/10/19 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 16:48	EI	TAL IRV
Total/NA	Analysis	300.0		1	300517	05/11/19 02:18	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300714	05/15/19 03:40	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 11:20	YZ	TAL IRV

Client Sample ID: MW03-050919-0
Lab Sample ID: 580-86076-4
Date Collected: 05/09/19 11:45
Matrix: Water
Date Received: 05/10/19 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 17:01	EI	TAL IRV
Total/NA	Analysis	300.0		1	300517	05/11/19 02:29	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300714	05/15/19 03:51	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 10:29	YZ	TAL IRV

Client Sample ID: MW06-050919-0
Lab Sample ID: 580-86076-5
Date Collected: 05/09/19 13:10
Matrix: Water
Date Received: 05/10/19 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 17:14	EI	TAL IRV
Total/NA	Analysis	300.0		1	300517	05/11/19 02:41	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300714	05/15/19 04:03	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 11:32	YZ	TAL IRV

Client Sample ID: MW100-050919-0
Lab Sample ID: 580-86076-6
Date Collected: 05/09/19 12:00
Matrix: Water
Date Received: 05/10/19 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 17:27	EI	TAL IRV
Total/NA	Analysis	300.0		1	300517	05/11/19 02:53	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300714	05/15/19 04:15	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 11:45	YZ	TAL IRV

Lab Chronicle

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Client Sample ID: MW05-050919-0
Lab Sample ID: 580-86076-7
Date Collected: 05/09/19 14:20
Matrix: Water
Date Received: 05/10/19 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	RSK-175		1	546352	05/14/19 17:40	EI	TAL IRV
Total/NA	Analysis	300.0		1	300517	05/11/19 03:04	EMM	TAL SEA
Total/NA	Analysis	300.0		1	300714	05/15/19 04:27	EMM	TAL SEA
Total/NA	Analysis	SM 5310C		1	546810	05/15/19 11:57	YZ	TAL IRV

Client Sample ID: IDW DRUM 2-050919
Lab Sample ID: 580-86076-8
Date Collected: 05/09/19 15:00
Matrix: Water
Date Received: 05/10/19 09:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	300469	05/10/19 19:55	W1T	TAL SEA

Laboratory References:

EMAX Lab. = EMAX Laboratories Inc, 1835 W. 205th Street, Torrance, CA 90501

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

TAL SEA = Eurofins TestAmerica, Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Laboratory: Eurofins TestAmerica, Seattle

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-20
ANAB	DoD		L2236	01-19-22
ANAB	ISO/IEC 17025		L2236	01-19-22
California	State Program	9	2901	11-05-19
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-20

Laboratory: Eurofins TestAmerica, Irvine

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	CA01531	06-30-19
Arizona	State Program	9	AZ0671	10-14-19
California	LA Cty Sanitation Districts	9	10256	06-30-19
California	State Program	9	CA ELAP 2706	06-30-19
Guam	State Program	9	Cert. No. 19-005R	01-23-20
Hawaii	State Program	9	N/A	01-29-20
Kansas	NELAP	7	E-10420	07-31-19
Nevada	State Program	9	CA015312018-1	07-31-19
New Mexico	State Program	6	N/A	01-29-20
Oregon	NELAP	10	4028	01-29-20
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-18-00214	07-09-21
Washington	State Program	10	C900	09-03-19

Sample Summary

Client: CH2M Hill, Inc.
Job ID: 580-86076-1
Project/Site: Northwest Pipe Company GW Monitoring

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
580-86076-1	T4SIMW23-050919-0	Water	05/09/19 09:00	05/10/19 09:35	
580-86076-2	MW01-050919-0	Water	05/09/19 10:20	05/10/19 09:35	
580-86076-3	TRIPBLANK-050919	Water	05/09/19 08:00	05/10/19 09:35	
580-86076-4	MW03-050919-0	Water	05/09/19 11:45	05/10/19 09:35	
580-86076-5	MW06-050919-0	Water	05/09/19 13:10	05/10/19 09:35	
580-86076-6	MW100-050919-0	Water	05/09/19 12:00	05/10/19 09:35	
580-86076-7	MW05-050919-0	Water	05/09/19 14:20	05/10/19 09:35	
580-86076-8	IDW DRUM 2-050919	Water	05/09/19 15:00	05/10/19 09:35	

EMAX LABORATORIES, INC.
1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889

Date: 05-29-2019
EMAX Batch No.: 19E100

Attn: Kris Allen

TestAmerica, Inc.
5755 8th Street East
Tacoma WA 98424

Subject: Laboratory Report
Project: NW PIPE COMPANY GW MONITORING

Enclosed is the Laboratory report for samples received on 05/14/19.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
T4SIMW23-050919-0 (580-86076-1)	E100-01	05/09/19	WATER	VOC SIM
MW01-050919-0 (580-86076-2)	E100-02	05/09/19	WATER	VOC SIM
TRIPBLANK-050919 (580-86076-3)	E100-03	05/09/19	WATER	VOC SIM
MW03-050919-0 (580-86076-4)	E100-04	05/09/19	WATER	VOC SIM
MW06-050919-0 (580-86076-5)	E100-05	05/09/19	WATER	VOC SIM
MW100-050919-0 (580-86076-6)	E100-06	05/09/19	WATER	VOC SIM
MW05-050919-0 (580-86076-7)	E100-07	05/09/19	WATER	VOC SIM

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning
these results.

Sincerely yours,

Caspar J. Pang
Laboratory Director

EMAX certifies that results included in this report meets all TNI & DOD requirements unless noted in the Case Narrative.

NELAP Accredited Certificate Number CA002912018-14
ANAB Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing
California ELAP Accredited Certificate Number 2672

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

19E100

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-65998.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kristine.allen@testamericainc.com	State of Origin: Oregon	Page: Page 1 of 1
Company: EMAX Laboratories Inc		Accreditations Required (See note):		Job #: 580-86076-1
Address: 1835 W. 205th Street, ,	Due Date Requested: 5/22/2019			
City: Torrance	TAT Requested (days):			
State, Zip: CA, 90501				
Phone:	PO #:			
Email:	WO #:			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

	Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (TCE, cis 1,2-DCE, PCE, Vinyl Chloride - low level)/ TCE, cis 1,2-DCE, PCE, Vinyl Chloride -	Total Number of containers	Special Instructions/Note:
				Preservation Code:		X	X			
1	T4SIMW23-050919-0 (580-86076-1)	5/9/19	09:00 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
2	MW01-050919-0 (580-86076-2)	5/9/19	10:20 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
3	TRIPBLANK-050919 (580-86076-3)	5/9/19	08:00 Pacific		Water			X	2	Please provide CH2 Lab Spec EDD if possible.
4	MW03-050919-0 (580-86076-4)	5/9/19	11:45 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
5	MW06-050919-0 (580-86076-5)	5/9/19	13:10 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
6	MW100-050919-0 (580-86076-6)	5/9/19	12:00 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.
7	MW05-050919-0 (580-86076-7)	5/9/19	14:20 Pacific		Water			X	3	Please provide CH2 Lab Spec EDD if possible.

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Tom Blankenship	5/13/19	TA-Sea	Valerie Duran	5/14/19 0935	EMAX
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.7

SAMPLE RECEIPT FORM 1

Type of Delivery	Airbill / Tracking Number	
☑ Fedex ☐ UPS ☐ GSO ☐ Others	4912 4943 5420	ECN 19E100
☐ EMAX Courier ☐ Client Delivery		Recipient ValerieDuran
		Date 5/14/19 Time 935

COC INSPECTION

☑ Client Name	☑ Client PM/FC	☐ Sampler Name	☑ Sampling Date/Time	☑ Sample ID	☑ Matrix
☑ Address	☑ Tel # / Fax #	☐ Courier Signature	☑ Analysis Required	☑ Preservative (if any)	☑ TAT
Safety Issues (if any)	☐ High concentrations expected	☐ From Superfund Site	☐ Rad screening required		

Note:

PACKAGING INSPECTION

Container	☑ Cooler	☐ Box	☐ Other		
Condition	☐ Custody Seal	☐ Intact	☐ Damaged		
Packaging	☑ Bubble Pack	☐ Styrofoam	☐ Popcorn	☐ Sufficient	☐ _____
Temperatures (Cool, ≤6 °C but not frozen)	☑ Cooler 1 1.7 °C	☐ Cooler 2_____ °C	☐ Cooler 3_____ °C	☐ Cooler 4_____ °C	☐ Cooler 5_____ °C
	☐ Cooler 6_____ °C	☐ Cooler 7_____ °C	☐ Cooler 8_____ °C	☐ Cooler 9_____ °C	☐ Cooler 10_____ °C
Thermometer:	*A - S/N 170324872*	*B - S/N 150555522*	*C - S/N 170324888*	*D - S/N* _____	

Comments: ☐ **Temperature is out of range. PM was informed IMMEDIATELY.**

Note:

DISCREPANCIES

LabSampleID	LabSampleContainerID	Code	ClientSample Label ID / Information	Corrective Action
1-7	1-20	D2	label analysis reads: VOCs, SW8260 SIM	R1

☐ pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.

NOTES/OBSERVATIONS:

LEGEND:

Code	Description- Sample Management
D1	Analysis is not indicated in _____
D2	Analysis mismatch COC vs label
D3	Sample ID mismatch COC vs label
D4	Sample ID is not indicated in _____
D5	Container -[improper] [leaking] [broken]
D6	Date/Time is not indicated in _____
D7	Date/Time mismatch COC vs label
D8	Sample listed in COC is not received
D9	Sample received is not listed in COC
D10	No initial/date on corrections in COC/label
D11	Container count mismatch COC vs received
D12	Container size mismatch COC vs received

Code	Description-Sample Management
D13	Out of Holding Time
D14	Bubble is >6mm
D15	No trip blank in cooler
D16	Preservation not indicated in _____
D17	Preservation mismatch COC vs label
D18	Insufficient chemical preservative
D19	Insufficient Sample
D20	No filtration info for dissolved analysis
D21	No sample for moisture determination
D22	
D23	
D24	

☐ **Continue to next page.**

Code	Description-Sample Management
R1	Proceed as indicated in ☑ COC ☐ Label
R2	Refer to attached instruction
R3	Cancel the analysis
R4	Use vial with smallest bubble first
R5	Log-in with latest sampling date and time+1 min
R6	Adjust pH as necessary
R7	Filter and preserved as necessary
R8	
R9	
R10	
R11	
R12	

REVIEWS:

Sample Labeling ValerieDuran / Cynthia
Date 5/14/19 5/14/19

SRF Cynthia
Date 5/14/19

PM
Date 5/15/19

ORIGIN ID:TCMA (253) 922-2310
SAMPLE RECEIVING
TA-SEATTLE
5755 8TH ST E

FIFE, WA 98424
UNITED STATES US

SHIP DATE: 13MAY19
ACTWGT: 17.30 LB
CAD: 989746/CAFE3211

BILL SENDER

TO SHIPPING/RECEIVING
EMAX LABORATORIES INC
1835 W. 205TH STREET

TORRANCE CA 90501
(253) 922-2310 REF: S580-33754
PO: NO

Fed E

TRK# 0201 4912 4943 5420

TUE - 14 MAY 10:3
PRIORITY OVERNIGI

92 HHRA 1.7

9050
CA-US LA

Part # 156471-438 RITZ EXP 12/19

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range or estimated value.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

TESTAMERICA, INC.

NW PIPE COMPANY GW MONITORING

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

SDG#: 19E100

CASE NARRATIVE

Client : TESTAMERICA, INC.

Project: NW PIPE COMPANY GW MONITORING

SDG : 19E100

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

A total of seven (7) water samples were received on 05/14/19 to be analyzed for EDB by GC/MS SIM in accordance with Method SW5030B/8260B SIM and project specific requirements.

Holding Time
Samples were analyzed within the prescribed holding time.

Instrument Performance and Calibration
Instrument tune check was performed prior to calibration. Result was within acceptance criteria. Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using secondary source (ICV). Continuing calibration (CCV) was carried out at a frequency required by the project. All project calibration requirements were satisfied. Refer to calibration summary forms of ICAL, ICV and CCV for details.

Method Blank
Method blank was prepared and analyzed at the frequency required by the project. For this SDG, two (2) method blanks were analyzed. VOF5E09B and VOF5E12B were compliant to project requirement. Refer to sample result summary forms for details.

Lab Control Sample
Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, two (2) sets of LCS/LCD were analyzed. VOF5E09L/VOF5E09C and VOF5E12L/VOF5E12C were within LCS limits. Refer to LCS summary forms for details.

Matrix QC Sample
No matrix QC sample was provided on this SDG.

Surrogate
Surrogates were added on QC and field samples. All surrogate recoveries were within QC limits. Refer to sample result summary forms for details.

Sample Analysis
Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.
Samples E100-04, -05, 06 and -07 was reported at dilution due to high concentration.

LAB CHRONICLE
EDB BY GC/MS SIM

Client : TESTAMERICA, INC. SDG NO. : 19E100
Project : NW PIPE COMPANY GW MONITORING Instrument ID : F5

WATER

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	VOF5E09B	1	NA	05/16/1912:57	05/16/1912:57	REY120	RDY169	VOF5E09	Method Blank
LCS1W	VOF5E09L	1	NA	05/16/1911:40	05/16/1911:40	REY117	RDY169	VOF5E09	Lab Control Sample (LCS)
LCD1W	VOF5E09C	1	NA	05/16/1912:06	05/16/1912:06	REY118	RDY169	VOF5E09	LCS Duplicate
TRIPBLANK-050919 (580-86076-3)	E100-03	1	NA	05/16/1913:47	05/16/1913:47	REY122	RDY169	VOF5E09	Field Sample
T4SIMW23-050919-0 (580-86076-1)	E100-01	1	NA	05/16/1918:25	05/16/1918:25	REY133	RDY169	VOF5E09	Field Sample
MW01-050919-0 (580-86076-2)	E100-02	1	NA	05/16/1918:51	05/16/1918:51	REY134	RDY169	VOF5E09	Field Sample
MBLK2W	VOF5E12B	1	NA	05/21/1911:43	05/21/1911:43	REY211	RDY169	VOF5E12	Method Blank
LCS2W	VOF5E12L	1	NA	05/21/1910:52	05/21/1910:52	REY209	RDY169	VOF5E12	Lab Control Sample (LCS)
LCD2W	VOF5E12C	1	NA	05/21/1911:17	05/21/1911:17	REY210	RDY169	VOF5E12	LCS Duplicate
MW01-050919-0 (580-86076-2)DL	E100-02I	100	NA	05/21/1913:24	05/21/1913:24	REY215	RDY169	VOF5E12	Diluted Sample
MW03-050919-0 (580-86076-4)	E100-04I	250	NA	05/21/1913:50	05/21/1913:50	REY216	RDY169	VOF5E12	Diluted Sample
MW06-050919-0 (580-86076-5)	E100-05I	250	NA	05/21/1914:15	05/21/1914:15	REY217	RDY169	VOF5E12	Diluted Sample
MW05-050919-0 (580-86076-7)	E100-07I	100	NA	05/21/1914:40	05/21/1914:40	REY218	RDY169	VOF5E12	Diluted Sample
MW100-050919-0 (580-86076-6)	E100-06I	250	NA	05/21/1915:06	05/21/1915:06	REY219	RDY169	VOF5E12	Diluted Sample
MW05-050919-0 (580-86076-7)DL	E100-07J	1000	NA	05/21/1915:35	05/21/1915:35	REY220	RDY169	VOF5E12	Diluted Sample
MW06-050919-0 (580-86076-5)DL	E100-05J	500	NA	05/21/1916:01	05/21/1916:01	REY221	RDY169	VOF5E12	Diluted Sample
MW100-050919-0 (580-86076-6)DL	E100-06J	1000	NA	05/21/1916:25	05/21/1916:25	REY222	RDY169	VOF5E12	Diluted Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/16/19 18:25
Sample ID: T4SIMW23-050919-0 (580-86076-1)	Date Analyzed: 05/16/19 18:25
Lab Samp ID: E100-01	Dilution Factor: 1
Lab File ID: REY133	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	0.34	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	1.9	0.20	0.10
TCE	0.50	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.571	0.5000	114	70-130
4-BROMOFLUOROBENZENE	0.453	0.5000	90.6	70-130
TOLUENE-D8	0.439	0.5000	87.8	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/16/19 18:51 # 05/21/19 13:24
Sample ID: MW01-050919-0 (580-86076-2)	Date Analyzed: 05/16/19 18:51 # 05/21/19 13:24
Lab Samp ID: E100-02 #E100-02I	Dilution Factor: 1 # 100
Lab File ID: REY134 #REY215	Matrix : WATER
Ext Btch ID: VOF5E09 #VOF5E12	% Moisture : NA
Calib. Ref.: RDY169 #RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
# CIS-1,2-DICHLOROETHYLENE	100	20	10
VINYL CHLORIDE	3.8	0.10	0.020
# TETRACHLOROETHENE	220	20	10
# TCE	28	20	10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.578	0.5000	116	70-130
4-BROMOFLUOROBENZENE	0.468	0.5000	93.6	70-130
TOLUENE-D8	0.438	0.5000	87.6	70-130
# 1,2-DICHLOROETHANE-D4	54.5	50.00	109	70-130
# 4-BROMOFLUOROBENZENE	47.0	50.00	94.1	70-130
# TOLUENE-D8	46.0	50.00	92.0	70-130

Members of the Associated File

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/16/19 18:51
Sample ID: MW01-050919-0 (580-86076-2)	Date Analyzed: 05/16/19 18:51
Lab Samp ID: E100-02	Dilution Factor: 1
Lab File ID: REY134	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	100E	0.20	0.10
VINYL CHLORIDE	3.8	0.10	0.020
TETRACHLOROETHENE	200E	0.20	0.10
TCE	30E	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.578	0.5000	116	70-130
4-BROMOFLUOROBENZENE	0.468	0.5000	93.6	70-130
TOLUENE-D8	0.438	0.5000	87.6	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 13:24
Sample ID: MW01-050919-0 (580-86076-2)DL	Date Analyzed: 05/21/19 13:24
Lab Samp ID: E100-02I	Dilution Factor: 100
Lab File ID: REY215	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	100	20	10
VINYL CHLORIDE	5.7J	10	2.0
TETRACHLOROETHENE	220	20	10
TCE	28	20	10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	54.5	50.00	109	70-130
4-BROMOFLUOROBENZENE	47.0	50.00	94.1	70-130
TOLUENE-D8	46.0	50.00	92.0	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/16/19 13:47
Sample ID: TRIPBLANK-050919 (580-86076-3)	Date Analyzed: 05/16/19 13:47
Lab Samp ID: E100-03	Dilution Factor: 1
Lab File ID: REY122	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.536	0.5000	107	70-130
4-BROMOFLUOROBENZENE	0.462	0.5000	92.5	70-130
TOLUENE-D8	0.448	0.5000	89.6	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 13:50
Sample ID: MW03-050919-0 (580-86076-4)	Date Analyzed: 05/21/19 13:50
Lab Samp ID: E100-04I	Dilution Factor: 250
Lab File ID: REY216	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	860	50	25
VINYL CHLORIDE	46	25	5.0
TETRACHLOROETHENE	370	50	25
TCE	100	50	25

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	134	125.0	107	70-130
4-BROMOFLUOROBENZENE	113	125.0	90.1	70-130
TOLUENE-D8	112	125.0	89.5	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 14:15 # 05/21/19 16:01
Sample ID: MW06-050919-0 (580-86076-5)	Date Analyzed: 05/21/19 14:15 # 05/21/19 16:01
Lab Samp ID: E100-05I #E100-05J	Dilution Factor: 250 # 500
Lab File ID: REY217 #REY221	Matrix : WATER
Ext Btch ID: VOF5E12 #VOF5E12	% Moisture : NA
Calib. Ref.: RDY169 #RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
# CIS-1,2-DICHLOROETHYLENE	1900	100	50
VINYL CHLORIDE	40	25	5.0
TETRACHLOROETHENE	980	50	25
TCE	210	50	25

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	134	125.0	107	70-130
4-BROMOFLUOROBENZENE	115	125.0	92.1	70-130
TOLUENE-D8	112	125.0	89.9	70-130
# 1,2-DICHLOROETHANE-D4	279	250.0	112	70-130
# 4-BROMOFLUOROBENZENE	220	250.0	88.2	70-130
# TOLUENE-D8	215	250.0	85.9	70-130

Members of the Associated File

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 14:15
Sample ID: MW06-050919-0 (580-86076-5)	Date Analyzed: 05/21/19 14:15
Lab Samp ID: E100-05I	Dilution Factor: 250
Lab File ID: REY217	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	1900E	50	25
VINYL CHLORIDE	40	25	5.0
TETRACHLOROETHENE	980	50	25
TCE	210	50	25

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	134	125.0	107	70-130
4-BROMOFLUOROBENZENE	115	125.0	92.1	70-130
TOLUENE-D8	112	125.0	89.9	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 16:01
Sample ID: MW06-050919-0 (580-86076-5)DL	Date Analyzed: 05/21/19 16:01
Lab Samp ID: E100-05J	Dilution Factor: 500
Lab File ID: REY221	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	1900	100	50
VINYL CHLORIDE	40J	50	10
TETRACHLOROETHENE	970	100	50
TCE	210	100	50

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	279	250.0	112	70-130
4-BROMOFLUOROBENZENE	220	250.0	88.2	70-130
TOLUENE-D8	215	250.0	85.9	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 15:06 # 05/21/19 16:25
Sample ID: MW100-050919-0 (580-86076-6)	Date Analyzed: 05/21/19 15:06 # 05/21/19 16:25
Lab Samp ID: E100-06I #E100-06J	Dilution Factor: 250 # 1000
Lab File ID: REY219 #REY222	Matrix : WATER
Ext Btch ID: VOF5E12 #VOF5E12	% Moisture : NA
Calib. Ref.: RDY169 #RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
# CIS-1,2-DICHLOROETHYLENE	1900	200	100
VINYL CHLORIDE	44	25	5.0
TETRACHLOROETHENE	1000	50	25
TCE	220	50	25

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	134	125.0	107	70-130
4-BROMOFLUOROBENZENE	107	125.0	85.6	70-130
TOLUENE-D8	101	125.0	81.1	70-130
# 1,2-DICHLOROETHANE-D4	579	500.0	116	70-130
# 4-BROMOFLUOROBENZENE	453	500.0	90.6	70-130
# TOLUENE-D8	446	500.0	89.2	70-130

Members of the Associated File

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 15:06
Sample ID: MW100-050919-0 (580-86076-6)	Date Analyzed: 05/21/19 15:06
Lab Samp ID: E100-06I	Dilution Factor: 250
Lab File ID: REY219	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	2000E	50	25
VINYL CHLORIDE	44	25	5.0
TETRACHLOROETHENE	1000	50	25
TCE	220	50	25

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	134	125.0	107	70-130
4-BROMOFLUOROBENZENE	107	125.0	85.6	70-130
TOLUENE-D8	101	125.0	81.1	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 16:25
Sample ID: MW100-050919-0 (580-86076-6)DL	Date Analyzed: 05/21/19 16:25
Lab Samp ID: E100-06J	Dilution Factor: 1000
Lab File ID: REY222	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	1900	200	100
VINYL CHLORIDE	43J	100	20
TETRACHLOROETHENE	980	200	100
TCE	210	200	100

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	579	500.0	116	70-130
4-BROMOFLUOROBENZENE	453	500.0	90.6	70-130
TOLUENE-D8	446	500.0	89.2	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 14:40 # 05/21/19 15:35
Sample ID: MW05-050919-0 (580-86076-7)	Date Analyzed: 05/21/19 14:40 # 05/21/19 15:35
Lab Samp ID: E100-07I #E100-07J	Dilution Factor: 100 # 1000
Lab File ID: REY218 #REY220	Matrix : WATER
Ext Btch ID: VOF5E12 #VOF5E12	% Moisture : NA
Calib. Ref.: RDY169 #RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
# CIS-1,2-DICHLOROETHYLENE	1700	200	100
VINYL CHLORIDE	14	10	2.0
# TETRACHLOROETHENE	4400	200	100
TCE	240	20	10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	53.1	50.00	106	70-130
4-BROMOFLUOROBENZENE	46.0	50.00	91.9	70-130
TOLUENE-D8	43.8	50.00	87.6	70-130
# 1,2-DICHLOROETHANE-D4	580	500.0	116	70-130
# 4-BROMOFLUOROBENZENE	489	500.0	97.9	70-130
# TOLUENE-D8	469	500.0	93.7	70-130

Members of the Associated File

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 14:40
Sample ID: MW05-050919-0 (580-86076-7)	Date Analyzed: 05/21/19 14:40
Lab Samp ID: E100-07I	Dilution Factor: 100
Lab File ID: REY218	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	1700E	20	10
VINYL CHLORIDE	14	10	2.0
TETRACHLOROETHENE	4300E	20	10
TCE	240	20	10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	53.1	50.00	106	70-130
4-BROMOFLUOROBENZENE	46.0	50.00	91.9	70-130
TOLUENE-D8	43.8	50.00	87.6	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: 05/09/19
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/14/19
Batch No. : 19E100	Date Extracted: 05/21/19 15:35
Sample ID: MW05-050919-0 (580-86076-7)DL	Date Analyzed: 05/21/19 15:35
Lab Samp ID: E100-07J	Dilution Factor: 1000
Lab File ID: REY220	Matrix : WATER
Ext Btch ID: VOF5E12	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	1700	200	100
VINYL CHLORIDE	ND	100	20
TETRACHLOROETHENE	4400	200	100
TCE	240	200	100

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	580	500.0	116	70-130
4-BROMOFLUOROBENZENE	489	500.0	97.9	70-130
TOLUENE-D8	469	500.0	93.7	70-130

QC SUMMARIES

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client : TESTAMERICA, INC.	Date Collected: NA
Project : NW PIPE COMPANY GW MONITORING	Date Received: 05/16/19
Batch No. : 19E100	Date Extracted: 05/16/19 12:57
Sample ID: MBLK1W	Date Analyzed: 05/16/19 12:57
Lab Samp ID: VOF5E09B	Dilution Factor: 1
Lab File ID: REY120	Matrix : WATER
Ext Btch ID: VOF5E09	% Moisture : NA
Calib. Ref.: RDY169	Instrument ID : TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.548	0.5000	110	70-130
4-BROMOFLUOROBENZENE	0.460	0.5000	91.9	70-130
TOLUENE-D8	0.447	0.5000	89.4	70-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TESTAMERICA, INC.
PROJECT: NW PIPE COMPANY GW MONITORING
BATCH NO.: 19E100
METHOD: SW5030B/8260B SIM

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: VOF5E09B VOF5E09L VOF5E09C
LAB FILE ID: REY120 REY117 REY118
DATE EXTRACTED: 05/16/1912:57 05/16/1911:40 05/16/1912:06 DATE COLLECTED: NA
DATE ANALYZED: 05/16/1912:57 05/16/1911:40 05/16/1912:06 DATE RECEIVED: 05/16/19
PREP. BATCH: VOF5E09 VOF5E09 VOF5E09
CALIB. REF: RDY169 RDY169 RDY169

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
cis-1,2-Dichloroethylene	ND	0.500	0.503	101	0.500	0.487	97	3	70-130	20
Vinyl Chloride	ND	0.500	0.395	79	0.500	0.388	78	2	60-140	20
Tetrachloroethene	ND	0.500	0.483	97	0.500	0.471	94	3	70-130	20
TCE	ND	0.500	0.527	105	0.500	0.506	101	4	70-130	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	0.500	0.541	108	0.500	0.491	98	70-130
4-Bromofluorobenzene	0.500	0.482	96	0.500	0.432	86	70-130
Toluene-d8	0.500	0.456	91	0.500	0.416	83	70-130

METHOD SW5030B/8260B SIM
EDB BY GC/MS SIM

Client	: TESTAMERICA, INC.	Date Collected:	NA
Project	: NW PIPE COMPANY GW MONITORING	Date Received:	05/21/19
Batch No.	: 19E100	Date Extracted:	05/21/19 11:43
Sample ID:	MBLK2W	Date Analyzed:	05/21/19 11:43
Lab Samp ID:	VOF5E12B	Dilution Factor:	1
Lab File ID:	REY211	Matrix :	WATER
Ext Btch ID:	VOF5E12	% Moisture :	NA
Calib. Ref.:	RDY169	Instrument ID :	TOF5

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
CIS-1,2-DICHLOROETHYLENE	ND	0.20	0.10
VINYL CHLORIDE	ND	0.10	0.020
TETRACHLOROETHENE	ND	0.20	0.10
TCE	ND	0.20	0.10

SURROGATE PARAMETERS	RESULTS	SPK_AMT	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	0.515	0.5000	103	70-130
4-BROMOFLUOROBENZENE	0.463	0.5000	92.6	70-130
TOLUENE-D8	0.446	0.5000	89.3	70-130

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: TESTAMERICA, INC.
PROJECT: NW PIPE COMPANY GW MONITORING
BATCH NO.: 19E100
METHOD: SW5030B/8260B SIM

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: VOF5E12B VOF5E12L VOF5E12C
LAB FILE ID: REY211 REY209 REY210
DATE EXTRACTED: 05/21/1911:43 05/21/1910:52 05/21/1911:17 DATE COLLECTED: NA
DATE ANALYZED: 05/21/1911:43 05/21/1910:52 05/21/1911:17 DATE RECEIVED: 05/21/19
PREP. BATCH: VOF5E12 VOF5E12 VOF5E12
CALIB. REF: RDY169 RDY169 RDY169

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
cis-1,2-Dichloroethylene	ND	0.500	0.518	104	0.500	0.514	103	1	70-130	20
Vinyl Chloride	ND	0.500	0.426	85	0.500	0.417	83	2	60-140	20
Tetrachloroethene	ND	0.500	0.474	95	0.500	0.477	95	1	70-130	20
TCE	ND	0.500	0.501	100	0.500	0.501	100	0	70-130	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	0.500	0.537	107	0.500	0.536	107	70-130
4-Bromofluorobenzene	0.500	0.497	99	0.500	0.455	91	70-130
Toluene-d8	0.500	0.457	91	0.500	0.455	91	70-130

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: LAURA TOCHKO	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-33446-10901.3
Client Contact: Bernice Kidd	Phone: 425-891-2855	E-Mail: kristine.allen@testamericainc.com		Page: Page ~~3 of 3~~ 1 of 1
Company: CH2M Hill, Inc.				Job #: 86076
Address: 2020 SW 4th Ave Suite 300	Due Date Requested:			
City: Portland	TAT Requested (days): STANDARD			
State, Zip: OR, 97201				
Phone: 530-229-3203(Tel)	PO #: PO 682722.RI.02			
Email: bernice.kidd@jacobs.com	WO #:			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EMAX 8260C_LL - TCE, cis 1,2-DCE, PCE, Vinyl Chloride	RSK_175 - Methane	300.0_28D, 300_48HR: Cl, SO4, Nitrates	5310C - TOC	8260 TCE, cis 1,2-DCE, PCE, VC												Containers
			Preservation Code:				A	A	N	S													
-1 T451MW23-050919-0	5/9/19	09:00	G	W			X	X	X	X													3
MW01-050919-0	5/9/19	10:20	G	W			X	X	X	X													3
-3 TRIPBLANK-050919	5/9/19	08:00	-	W			X																2
MW03-050919-0	5/9/19	11:45	G	W			X	X	X	X													3
-5 MW06-050919-0	5/9/19	13:10	G	W			X	X	X	X													3
MW100-050919-0	5/9/19	12:00	G	W			X	X	X	X													3
-7 MW05-050919-0	5/9/19	14:20	G	W			X	X	X	X													3
IDW DRUM2-050919	5/9/19	15:00	G	W							X												3

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

580-86076 Chain of Custody

VOCs to be sent to EMAX

VOCs Test America

Therm. ID: IR4 Cor: -1.6 ° Unc: -1.8 °
Cooler Dsc: Lg Blue
Packing: Bub
Cust. Seal: Yes X No
Blue Ice: Wet, Dry, None
FedEx: PO
UPS:
Lab Courr:
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: LAURA TOCHKO	Date/Time: 5/9/19 16:00	Company: JACOBS	Received by: Tom Blan	Date/Time: 5/10/19 0935	Company: TA Seat
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
Δ Yes Δ No		

Ver: 01/16/2019

Eurofins TestAmerica, Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Allen, Kristine D	Carrier Tracking No(s):	COC No: 580-65976.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kristine.allen@testamericainc com	State of Origin: Oregon	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note)		Job #: 580-86076-1
Address: 17461 Derian Ave, Suite 100,	Due Date Requested: 5/22/2019			
City: Irvine	TAT Requested (days):			
State, Zip: CA, 92614-5817				
Phone: 949-261-1022(Tel) 949-260-3297(Fax)	PO #			
Email	WO #			
Project Name: Northwest Pipe Company GW Monitoring	Project #: 58013218			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	RSK_175/ Methane	5310C/ TOC	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
T4SIMW23-050919-0 (580-86076-1)	5/9/19	09.00 Pacific		Water			X	X	4	
MW01-050919-0 (580-86076-2)	5/9/19	10:20 Pacific		Water			X	X	4	
MW03-050919-0 (580-86076-4)	5/9/19	11:45 Pacific		Water			X	X	4	
MW06-050919-0 (580-86076-5)	5/9/19	13:10 Pacific		Water			X	X	4	
MW100-050919-0 (580-86076-6)	5/9/19	12:00 Pacific		Water			X	X	4	
MW05-050919-0 (580-86076-7)	5/9/19	14:20 Pacific		Water			X	X	4	

Note. Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Tom Blanton	5/10/19	TA-Sea		5/11/19 1020	TAL RY
2	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.: 4912 4943 5372
Cooler Temperature(s) °C and Other Remarks: 1.4/2.0 IR88

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 580-86076-1

Login Number: 86076
List Number: 1
Creator: Blankinship, Tom X

List Source: Eurofins TestAmerica, Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 580-86076-1

Login Number: 86076
List Number: 2
Creator: Ornelas, Olga

List Source: Eurofins TestAmerica, Irvine
List Creation: 05/11/19 12:06 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Attachment C
Data Quality Assessment

Groundwater Data Quality Evaluation for Northwest Pipe Company, Portland, Oregon

PREPARED FOR:	Stephanie Heldt-Sheller/Northwest Pipe Company Dave Bennett/Northwest Pipe Company
PREPARED BY:	Shannon Fitzsimmons/Jacobs
REVIEWED BY:	Bernice Kidd/Jacobs
REFERENCE:	Northwest Pipe Company GWM 2Q Event – May 8 and May 9, 2019
DATE:	June 10, 2019

Introduction

The objective of this data quality evaluation (DQE) is to assess the representativeness and usability of data quality for groundwater quality samples collected to monitor the groundwater at the Northwest Pipe Company. The rationale for monitoring, the data quality objectives (DQOs), and the method for performing this DQE is provided in the *Final Supplemental Groundwater Sampling and Data Evaluation*, Northwest Pipe Company, Oregon, August 2016 (hereafter referred to as the *NWP SAP*).

This DQE report is intended as a general data quality assessment designed to summarize data issues and written in accordance with *National Functional Guidelines (NFGs) for Superfund Organic Methods Data Review* (EPA, 2016) and *NFGs for Inorganic Superfund Methods Data Review* (EPA, 2016).

Findings

The overall summaries of the data validation findings are contained in Tables 1 through 7 and summarized in the method sections that follow:

- **Table 1**: Sample Summary by Chain of Custody – Data Summary. Presents the sample identifiers, sampling dates, and SDG sorted by chain-of-custody (COC) number.
- **Table 2**: Sample Chronology – Data Summary. Presents the sample identifiers, methods, sampling dates, received dates, extraction dates, and analysis dates sorted by SDG number.
- **Table 3**: Overall Flagging Summary. Presents the number of occurrences for each data validation reason by method.
- **Table 4:** Blank Contamination - Qualified Data. Presents the results that are qualified because of blank contamination.

- **Table 5**: Laboratory Control Sample – Qualified Data. Presents the results that are qualified because of matrix spike/matrix spike duplicate recovery exceedances.
- **Table 6**: Matrix Spike Precision/Accuracy - Qualified Data. Presents the results that are qualified because of matrix spike/matrix spike duplicate recovery exceedances.
- **Table 7**: Site Completeness by Analyte – Qualified Data. Presents the percent completeness by method, analyte, and matrix.

This DQE report includes 10 normal groundwater samples, one IDW sample, two trip blanks, and one field duplicate (FD) collected May 8 and May 9, 2019. These samples were reported under two sample delivery groups: 580-86047-1 and 580-86076-1. A list of samples included in this DQE are presented in Table 1. Five methods were used to analyze the groundwater samples and are provided in Table 2. The majority of analyses were performed by TestAmerica Laboratory, Seattle, Washington (STL-SEA) and TestAmerica Laboratory, Irvine, California (TAMI). One low-level method was subcontracted to EMAX Laboratories Inc, Torrance, California (EMXT) to achieve lower reporting limits. Samples were collected and delivered by overnight carrier to STL-SEA, STL-SEA was responsible for shipment of samples to TAMI and EMXT.

The data were assessed according to the requirements of the *NWP SAP* and included a review of:

1. chain of custody documentation;
2. holding-time compliance;
3. required quality control (QC) samples at the specified frequencies;
4. flagging for method blanks;
5. laboratory control sample/laboratory control sample duplicates (LCS/LCSD);
6. matrix spike/matrix spike duplicate (MS/MSD) recoveries;

and other method-specific criteria as defined by the *NWP SAP*.

Field samples were also reviewed to ascertain field compliance and data quality issues. This included the review of a FD.

Data flags were assigned using the *NFGs* as guidance. These flags, as well as the reason for each flag, are entered into the electronic database and can be found in Table 3. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will be only one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts.

The data flags are those listed in the NWP *SAP* and are defined below:

- J = the analyte was detected, but the associated numerical value is considered an estimated quantity.
- R = the sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified. No associated value is reported.
- U = the analyte was analyzed for but was not detected above the detection limit.
- UJ = the analyte was not detected above the detection limit. However, the detection limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately

and precisely measure the analyte in the sample.

Overall Flagging Summary

The overall summaries of the data validation findings are summarized in the following sections. Table 3 provides a flagging summary of overall occurrences for each data validation reason by method.

Temperature

Temperature requirements were met.

Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination that affected the sample results, with the following exceptions listed in Table 4:

Chloride and Nitrate as Nitrogen analyzed by E300.0A were detected in the method blank. The associated sample results less than five times the concentrations in the blank were flagged "U" and should be considered as non-detects.

Field Duplicates

In accordance with the *NWP SAP*, one field duplicate (FD) was collected from well MW06, and all precision criteria were met.

Laboratory Control Samples

LCS and LCSDs were analyzed at the required frequency and the accuracy and precision criteria were met, with the following exceptions listed in Table 5:

The LCS and LCSD relative percent difference (RPD) exceeded the acceptance criteria for trichloroethene, tetrachloroethene and cis-1,2-dichloroethene by SW8260C. The associated sample results were flagged "J" for the precision exceedance.

Matrix Spikes

Matrix spikes and matrix spike duplicates were analyzed at the required batch frequency and all accuracy and precision criteria were met, with the following exception listed in Table 6:

The recoveries for the MS and SD performed on sample T4SIMW23-050919-0 were greater than the upper control limit for Nitrate as Nitrogen. The associated detected sample result was qualified as estimated and flagged "J".

Results

Analysis for tetrachloroethene, trichloroethylene, *cis*-1,2-dichloroethene, and vinyl chloride were analyzed by SW8260B-SIM in the groundwater samples due to the low-level reporting limit required.

Holding Times

All holding-time criteria were met.

Chain of Custody

There were no discrepancies.

Overall Assessment

The final activity in the DQE is an assessment of whether the data meets the data quality objectives. The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected and the resulting analytical data can be used to support the decision-making process. The

precision, accuracy, representativeness, completeness and comparability are addressed in the *NWP SAP*.

The following summary highlights the data evaluation findings for the above defined events:

1. No data were rejected and completeness was 100 percent for all method/matrix/analyte combinations as shown in Table 7.

2. There was blank contamination for two anions by E300.0, nine results were qualified as non-detects.

3. Precision was exceeded for three VOC analytes analyzed by SW8260C, three results were qualified as estimated.

4. MS/SD recoveries were greater than the upper control limit for Method E300.0; one result was qualified as estimated.

5. The precision and accuracy of the data, as measured by field and laboratory QC indicators, suggests that the NWP SAP goals for project use were met.

6. The field crew followed the *NWP SAP* and project documents.

Works Cited

CH2M Hill, Inc. 2016. *Final Supplemental Groundwater Sampling and Data Evaluation (referenced herein as the NWP SAP)*, Northwest Pipe Company, Oregon. August.

EPA, 2016. *National Functional Guidelines for Superfund Organic Methods Data Review*. September.

EPA, 2016. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. September

TABLE 1

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
580-86047-1	08-May-19	WATER	N	MW02-050819-0	580-86047-1	EMXT
			N	MW02-050819-0	580-86047-1	STL-SEA
			N	MW02-050819-0	580-86047-1	TAMI
			N	MW04-050819-0	580-86047-1	STL-SEA
			N	MW04-050819-0	580-86047-1	TAMI
			N	MW04-050819-0	580-86047-1	EMXT
			N	T4SIMW03s-050819-0	580-86047-1	STL-SEA
			N	T4SIMW03s-050819-0	580-86047-1	TAMI
			N	T4SIMW03S-050819-0	580-86047-1	EMXT
			N	T4SIMW09-050819-0	580-86047-1	STL-SEA
			N	T4SIMW09-050819-0	580-86047-1	EMXT
			N	T4SIMW09-050819-0	580-86047-1	TAMI
			MS	T4SIMW09-050819-0MS	580-86047-1	STL-SEA
			MS	T4SIMW09-050819-0MS	580-86047-1	TAMI
			SD	T4SIMW09-050819-0SD	580-86047-1	STL-SEA
			SD	T4SIMW09-050819-0SD	580-86047-1	TAMI
			N	T4SIMW22-050819	580-86047-1	EMXT
			N	T4SIMW22-050819	580-86047-1	STL-SEA
			N	T4SIMW22-050819	580-86047-1	TAMI
			TB	TRIP BLANK-050819	580-86047-1	EMXT
580-86076-1	09-May-19	WATER	N	IDW DRUM 2-050919	580-86076-1	STL-SEA
			N	MW01-050919-0	580-86076-1	STL-SEA
			N	MW01-050919-0	580-86076-1	TAMI
			N	MW01-050919-0	580-86076-1	EMXT
			N	MW03-050919-0	580-86076-1	EMXT
			N	MW03-050919-0	580-86076-1	STL-SEA
			N	MW03-050919-0	580-86076-1	TAMI
			N	MW05-050919-0	580-86076-1	EMXT
			N	MW05-050919-0	580-86076-1	STL-SEA
			N	MW05-050919-0	580-86076-1	TAMI
			N	MW06-050919-0	580-86076-1	EMXT

TABLE 1

Sample Summary by COC - Data Summary

CoC Number	Sample Date	Matrix	QAQC Type	Sample Identification	SDG	Laboratory
580-86076-1	09-May-19	WATER	N	MW06-050919-0	580-86076-1	STL-SEA
			N	MW06-050919-0	580-86076-1	TAMI
			FD	MW100-050919-0	580-86076-1	STL-SEA
			FD	MW100-050919-0	580-86076-1	TAMI
			FD	MW100-050919-0	580-86076-1	EMXT
			N	T4SIMW23-050919-0	580-86076-1	EMXT
			N	T4SIMW23-050919-0	580-86076-1	STL-SEA
			N	T4SIMW23-050919-0	580-86076-1	TAMI
			MS	T4SIMW23-050919-0MS	580-86076-1	STL-SEA
			SD	T4SIMW23-050919-0SD	580-86076-1	STL-SEA
			TB	TRIPBLANK-050919	580-86076-1	EMXT

SDG = Sample delivery group
EMXT = EMAX Laboratories Inc.
STL-SEA = TestAmerica Seattle
TAMI = TestAmerica Irvine

QAQC Type
FD = Field Duplicate
MS = Matrix Spike
N = Normal
SD = Matrix Spike Duplicate
TB = Trip Blank

TABLE 2

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
STL-SEA	580-86047-1	MW02-050819-0	E300.0A	5/8/2019	5/9/2019		5/9/2019
TAMI		MW02-050819-0	RSK-175	5/8/2019	5/9/2019		5/14/2019
		MW02-050819-0	SM5310B	5/8/2019	5/9/2019		5/15/2019
EMXT		MW02-050819-0	SW8260C-SIM	5/8/2019	5/10/2019	5/16/2019	5/16/2019
STL-SEA		MW04-050819-0	E300.0A	5/8/2019	5/9/2019		5/9/2019
TAMI		MW04-050819-0	RSK-175	5/8/2019	5/9/2019		5/14/2019
		MW04-050819-0	SM5310B	5/8/2019	5/9/2019		5/15/2019
EMXT		MW04-050819-0	SW8260C-SIM	5/8/2019	5/10/2019	5/21/2019	5/21/2019
STL-SEA		T4SIMW03s-050819-0	E300.0A	5/8/2019	5/9/2019		5/9/2019
TAMI		T4SIMW03s-050819-0	RSK-175	5/8/2019	5/9/2019		5/14/2019
		T4SIMW03s-050819-0	SM5310B	5/8/2019	5/9/2019		5/15/2019
EMXT		T4SIMW03S-050819-0	SW8260C-SIM	5/8/2019	5/10/2019	5/16/2019	5/16/2019
STL-SEA		T4SIMW09-050819-0	E300.0A	5/8/2019	5/9/2019		5/9/2019
TAMI		T4SIMW09-050819-0	RSK-175	5/8/2019	5/9/2019		5/14/2019
		T4SIMW09-050819-0	SM5310B	5/8/2019	5/9/2019		5/15/2019
EMXT		T4SIMW09-050819-0	SW8260C-SIM	5/8/2019	5/10/2019	5/16/2019	5/16/2019
STL-SEA		T4SIMW09-050819-0MS	E300.0A	5/8/2019	5/9/2019		5/9/2019
TAMI		T4SIMW09-050819-0MS	SM5310B	5/8/2019	5/9/2019		5/15/2019
STL-SEA		T4SIMW09-050819-0SD	E300.0A	5/8/2019	5/9/2019		5/9/2019
TAMI		T4SIMW09-050819-0SD	SM5310B	5/8/2019	5/9/2019		5/15/2019
STL-SEA		T4SIMW22-050819	E300.0A	5/8/2019	5/9/2019		5/9/2019
TAMI		T4SIMW22-050819	RSK-175	5/8/2019	5/9/2019		5/14/2019
		T4SIMW22-050819	SM5310B	5/8/2019	5/9/2019		5/15/2019
EMXT		T4SIMW22-050819	SW8260C-SIM	5/8/2019	5/10/2019	5/16/2019	5/16/2019
		T4SIMW22-050819	SW8260C-SIM	5/8/2019	5/10/2019	5/21/2019	5/21/2019
		TRIP BLANK-050819	SW8260C-SIM	5/8/2019	5/10/2019	5/16/2019	5/16/2019
STL-SEA	580-86076-1	IDW DRUM 2-050919	SW8260C	5/9/2019	5/10/2019	5/10/2019	5/10/2019
		MW01-050919-0	E300.0A	5/9/2019	5/10/2019		5/11/2019
		MW01-050919-0	E300.0A	5/9/2019	5/10/2019		5/15/2019
TAMI		MW01-050919-0	RSK-175	5/9/2019	5/10/2019		5/14/2019
		MW01-050919-0	SM5310B	5/9/2019	5/10/2019		5/15/2019
EMXT		MW01-050919-0	SW8260C-SIM	5/9/2019	5/14/2019	5/16/2019	5/16/2019
		MW01-050919-0	SW8260C-SIM	5/9/2019	5/14/2019	5/21/2019	5/21/2019
STL-SEA		MW03-050919-0	E300.0A	5/9/2019	5/10/2019		5/11/2019
		MW03-050919-0	E300.0A	5/9/2019	5/10/2019		5/15/2019
TAMI		MW03-050919-0	RSK-175	5/9/2019	5/10/2019		5/14/2019

TABLE 2

Sample Chronology - Data Summary

Laboratory	SDG	Sample Identification	Method	Sample Date	Receive Date	Extract Date	Analysis Date
TAMI	580-86076-1	MW03-050919-0	SM5310B	5/9/2019	5/10/2019		5/15/2019
EMXT		MW03-050919-0	SW8260C-SIM	5/9/2019	5/14/2019	5/21/2019	5/21/2019
STL-SEA		MW05-050919-0	E300.0A	5/9/2019	5/10/2019		5/11/2019
		MW05-050919-0	E300.0A	5/9/2019	5/10/2019		5/15/2019
TAMI		MW05-050919-0	RSK-175	5/9/2019	5/10/2019		5/14/2019
		MW05-050919-0	SM5310B	5/9/2019	5/10/2019		5/15/2019
EMXT		MW05-050919-0	SW8260C-SIM	5/9/2019	5/14/2019	5/21/2019	5/21/2019
STL-SEA		MW06-050919-0	E300.0A	5/9/2019	5/10/2019		5/11/2019
		MW06-050919-0	E300.0A	5/9/2019	5/10/2019		5/15/2019
TAMI		MW06-050919-0	RSK-175	5/9/2019	5/10/2019		5/14/2019
		MW06-050919-0	SM5310B	5/9/2019	5/10/2019		5/15/2019
EMXT		MW06-050919-0	SW8260C-SIM	5/9/2019	5/14/2019	5/21/2019	5/21/2019
STL-SEA		MW100-050919-0	E300.0A	5/9/2019	5/10/2019		5/11/2019
		MW100-050919-0	E300.0A	5/9/2019	5/10/2019		5/15/2019
TAMI		MW100-050919-0	RSK-175	5/9/2019	5/10/2019		5/14/2019
		MW100-050919-0	SM5310B	5/9/2019	5/10/2019		5/15/2019
EMXT		MW100-050919-0	SW8260C-SIM	5/9/2019	5/14/2019	5/21/2019	5/21/2019
STL-SEA		T4SIMW23-050919-0	E300.0A	5/9/2019	5/10/2019		5/15/2019
		T4SIMW23-050919-0	E300.0A	5/9/2019	5/10/2019		5/11/2019
TAMI		T4SIMW23-050919-0	RSK-175	5/9/2019	5/10/2019		5/14/2019
		T4SIMW23-050919-0	SM5310B	5/9/2019	5/10/2019		5/15/2019
EMXT		T4SIMW23-050919-0	SW8260C-SIM	5/9/2019	5/14/2019	5/16/2019	5/16/2019
STL-SEA		T4SIMW23-050919-0MS	E300.0A	5/9/2019	5/10/2019		5/11/2019
		T4SIMW23-050919-0MS	E300.0A	5/9/2019	5/10/2019		5/15/2019
		T4SIMW23-050919-0SD	E300.0A	5/9/2019	5/10/2019		5/11/2019
		T4SIMW23-050919-0SD	E300.0A	5/9/2019	5/10/2019		5/15/2019
EMXT		TRIPBLANK-050919	SW8260C-SIM	5/9/2019	5/14/2019	5/16/2019	5/16/2019

SDG = sample delivery group

EMXT = EMAX Laboratories Inc

STL-SEA = TestAmerica Seattle

TAMI = TestAmerica Irvine

TABLE 3

Overall Flagging Summary

Method	Matrix	Validation Reason	Qualifier*	Qualifier Type	Number of Affected Analytes
E300.0A	WATER				
Category = Blank		Laboratory blank contamination less than the reporting limit	U	Protocol	9
Category = Matrix		Matrix spike duplicate recovery criteria greater than the upper control limit	J	Other	1
Category = Matrix		Matrix spike recovery greater than the upper control limit	J	Other	1
SW8260C	WATER	LCS RPD criteria exceeded			
Category = LaboratoryControlSample			J	Protocol	3

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

= = Analyte was detected greater than the quantitation limit.

J = The analyte was detected, but the associated numerical value is considered an estimated quantity.

U = The analyte was analyzed for but was not detected above the detection limit.

Qualifier Type:

Protocol = Flagging due to contractor/laboratory protocol violations.
Other = Flagging due to sample, matrix, or field issues not related to Quality Assurance Project Plan (QAPP) or Sampling and Analysis Plan (SAP) protocol.

TABLE 4

Blank Contamination - Qualified Data

Analyte	Sample Identification	Result	Blank Contamination Qualifier*	Criteria	Comments
Method (Matrix): E300.0A (WATER)					
Chloride					
	MW02-050819-0	2.9 mg/L	U	LB<RL	blank target = 0.683mg/L
	MW04-050819-0	3.4 mg/L	U	LB<RL	blank target = 0.683mg/L
	T4SIMW03s-050819-0	1.5 mg/L	U	LB<RL	blank target = 0.683mg/L
	T4SIMW09-050819-0	1.6 mg/L	U	LB<RL	blank target = 0.683mg/L
Nitrate-N					
	MW01-050919-0	0.5 mg/L	U	LB<RL	blank target = 0.122mg/L
	MW03-050919-0	0.2 mg/L	U	LB<RL	blank target = 0.122mg/L
	MW06-050919-0	0.13 mg/L	U	LB<RL	blank target = 0.122mg/L
	MW100-050919-0	0.14 mg/L	U	LB<RL	blank target = 0.122mg/L
	T4SIMW23-050919-0	0.48 mg/L	U	LB<RL	blank target = 0.122mg/L

mg/L = milligrams per liter

Blank target = concentration of field or laboratory blank.

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

U = The analyte was analyzed for but was not detected above the detection limit.

Criteria:

LB<RL = Laboratory blank contamination less than the reporting limit

TABLE 5

Laboratory Control Sample - Qualified Data

Analyte	Sample Identification / QAQC Type	Result	LCS Qualifier*	LCS Recovery	Criteria
Method (Matrix): SW8260C (WATER)					
trichloroethene	IDW DRUM 2-050919 / N	4.8 ug/L	J	RPD = 24.74 Limit =20	LCSRPD
tetrachloroethene	IDW DRUM 2-050919 / N	21 ug/L	J	RPD = 21.16 Limit =20	LCSRPD
cis-1,2-Dichloroethene	IDW DRUM 2-050919 / N	49 ug/L	J	RPD = 26.63 Limit =20	LCSRPD

%R = percent recovery

ug/L = micrograms per liter

QAQC Type

N = Normal Environmental Sample
FD = Field Duplicate

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was detected, but the associated numerical value is considered an estimated quantity.

Criteria:

LCSRPD = LCS RPD criteria exceeded

TABLE 6

Matrix Spike Precision/Accuracy - Qualified Data

Analyte	Sample Identification	Result	MS/MSD Qualifier*	MS Recovery	Criteria
Method (Matrix): E300.0A (WATER)					
Nitrate-N	T4SIMW23-050919-0	0.48 mg/L	J	%R = 111 LCL=90 UCL=110	MS>UCL
	T4SIMW23-050919-0	0.48 mg/L	J	%R = 111 LCL=90 UCL=110	SD>UCL

%R = percent recovery
LCL = lower control limit
UCL = upper control limit

mg/L = milligrams per liter

* The most severe flag for each analyte becomes the final validation flag.

Qualifier Description:

J = The analyte was detected, but the associated numerical value is considered an estimated quantity.

Criteria:

MS>UCL = Matrix spike recovery greater than the upper control limit
SD>UCL = Matrix spike duplicate recovery criteria greater than the upper control limit

TABLE 7

Site Completeness by Analyte - Qualified Data

Method	Analyte	Units	Number of Occurrences							Completeness (%)	
			Analyses	Detects	Non-detects	Blank Flags	J-Flags	Contractor R-Flags	Total R-Flags	Contractor	Overall
E300.0A	Chloride	MG/L	11	7	4					100	100
	Nitrate-N	MG/L	11	6	5		3			100	100
	Sulfate	MG/L	11	11			1			100	100
RSK-175	Methane	UG/L	11	10	1					100	100
SM5310B	Total Organic Carbon	MG/L	11	11						100	100
SW8260C	cis-1,2-Dichloroethene	UG/L	1	1			1			100	100
	Tetrachloroethene (PCE)	UG/L	1	1			1			100	100
	Trichloroethene (TCE)	UG/L	1	1			1			100	100
	Vinyl Chloride	UG/L	1	1						100	100
SW8260C-SIM	cis-1,2-Dichloroethene	UG/L	11	9	2					100	100
	Tetrachloroethene (PCE)	UG/L	11	8	3					100	100
	Trichloroethene (TCE)	UG/L	11	8	3					100	100
	Vinyl Chloride	UG/L	11	8	3					100	100

% = Percent
J-Flags = Estimated results
R-Flags = Rejected results
mg/L = milligrams per liter
ug/L = micrograms per liter