City of Bothell™

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LETTER OF TRANSMITTAL

Date: February 3, 2016

Company: Department of Ecology
Attn: Sunny Becker NWRO Toxics
Address: Cleanup Program 3190 - 160th SE
Bellevue, WA 98008

From: Nduta Mbuthia, Project Engineer, Capital Projects Division

Attached please find: Electronic copy of:-

1) Letter Report (1/25/2016) - YR2, QTR 4 Groundwater Monitoring Report for Riverside Site

- ☐ For your information/files
- ☐ For your action
- ☒ At your request
- ☐ Approved as noted
- ☐ Returned for correction
- ☐ Please return all copies
- ☐ Other:

Comments: Note - YR2, QTR 3 previously provided via email 11/25/15; tabulated data only

HWA GEOSCIENCES INC.

Geotechnical Engineering • Hydrogeology • Geoenvironmental Services • Inspection and Testing

January 25, 2016
HWA Project No. 2007 098- 2012

Ms. Sunny Becker
Washington Department of Ecology
Toxics Cleanup Program, Northwest Regional Office
3190 - 160th SE Bellevue, WA 98008

Subject: **GROUND WATER MONITORING RESULTS**
YEAR 2, QUARTER 4 - DECEMBER 2015
Riverside Site
Bothell, Washington

Dear Ms. Becker:

This report describes ground water monitoring results for the Riverside site, hereafter referred to as "the Site", located in downtown Bothell, Washington.

Ground water remediation is being performed as an interim action, in response to tetrachloroethene (PCE) and its degradation products in shallow ground water at concentrations exceeding Model Toxics Control Act (MTCA) Method A cleanup levels. The interim action is being performed in accordance with the Interim Action Work Plan (IAWP) dated January 7, 2013 and per the scope of work set forth in Amendment 2 to Agreed Order DE 6295, dated April 19, 2013, between the City of Bothell (City) and the Washington State Department of Ecology (Ecology). Remediation is being performed via pump-and-treat methods, which includes ground water extraction and discharge to the sanitary sewer via King County Industrial Waste Discharge permit 4268-01. The remediation system includes four extraction wells (EW-1 through EW-4) and eight monitoring wells (RMW-4 through RMW-10 and BC-3).

Figure 1 shows a site plan with well locations. Ground water monitoring and remediation activities are described below.

GROUND WATER REMEDIATION ACTIVITIES

The ground water extraction and treatment system began operation in December 2013 and is still operating. Ground water extraction from the remediation system is measured via a totalizing flow meter placed in the effluent pipe that discharges to the King County sanitary sewer.

Quarterly discharge reports are submitted to King County Industrial Waste Division using standard forms provided by King County; four quarterly reports for Year 2015 are

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attached for reference. Effluent samples were collected from extraction wells EW-1 through EW-4 and from the combined discharge effluent from the remediation system. Sampling dates for extraction wells are shown in Table 1.

COMPLIANCE GROUND WATER MONITORING

This section describes performance monitoring of ground water performed during the interim action.

- First year (2014) ground water monitoring events were performed in April, June, September and December 2014.
- Second year (2015) ground water monitoring events were performed in March, June, September, and December 2015.

All monitoring events have included sampling some wells on a quarterly basis and some wells on a semi-annual basis in accordance with the IAWP (see Table 1).

Performance monitoring is performed to confirm that the interim action has attained cleanup standards. Performance monitoring includes collection of ground water samples from the extraction wells and selected monitoring wells, as described in Table 1 (excerpted from the IAWP).

Performance monitoring samples are analyzed for halogenated volatile organic compounds (HVOCs) and field parameters (temperature, dissolved oxygen, oxygen reduction potential, specific conductivity, and pH).

GROUND WATER ANALYTICAL RESULTS

Analytical results for ground water samples are summarized in Table 2. Figures 2, 3, and 4 show graphs of HVOCs over time as follows:

- Figure 2 - Monitoring wells, PCE vs time
- Figure 3 - Extraction wells, PCE vs time
- Figure 4 - MW-7 HVOCs vs. time

Review of analytical results for monitoring well samples provides the following observations and trends:

- Sampling events in September 2009 and May 2013 provide ground water chemistry data from when the wells were installed, and base-line ground water chemistry data prior to initial operation of the ground water treatment system, respectively.

- Quarterly and semi-annual sampling results from April 2013 to December 2015 provide data regarding decreased HVOC concentrations, changing HVOC

concentrations in response to ground water extraction, and HVOC concentrations in ground water effluent discharged from the treatment system.

- HVOC concentrations exceeding MTCA Method A cleanup levels were detected in monitoring wells RMW-6, RMW-7 and BC-3.

- Vinyl chloride concentrations exceeding MTCA Method A cleanup levels were detected in well RMW-6 in September 2009 and May 2013. However, these and other HVOC concentrations have been non-detect or below the cleanup levels since then.

- HVOC concentrations have been historically highest in RMW-7, and have been generally decreasing over time, albeit with an apparent seasonal trend (high concentrations in the dry season).

- HVOC concentrations at BC-3 generally show decreasing PCE and TCE concentrations, and the presence of degradation products indicating that groundwater remediation is progressing.

Review of analytical results for extraction well samples provides the following observations and trends:

- PCE concentrations were detected in all samples collected from each extraction well from April 2014 to September 2015. Almost of all these results exceeded the MTCA Method A cleanup level. PCE concentrations above the cleanup level were detected in all sampled extraction wells during the December 2015 sampling event except for EW-4 where PCE was not detected.

- PCE concentrations at the extraction wells appear relatively steady (with some variability) at wells EW-1, EW-2 and EW-3, and appear to be decreasing (with some variability) at well EW-4. The variability of the PCE concentrations also appears to be a result of seasonal trend (higher concentrations in the dry season).

GROUND WATER TREATMENT SYSTEM PERFORMANCE DATA

Treatment system performance data is collected on at least a monthly basis. Total discharge to-date is 3,420,032 gallons based on totalizer readings at the discharge outlet to the sanitary sewer. Average flows have been around 5,000 gallons per day, with flows up to 10,000 gallons per day during periods of higher ground water and when all wells are functioning properly.

CONCLUSIONS

Analytical results indicate all extraction wells have been and continue to recover HVOC-impacted ground water. Analytical results from monitoring wells indicate decreasing

trends in HVOC concentrations at RMW-7 and BC-3, where HVOC concentrations have historically been highest, with some seasonal variabilities. HVOC concentrations have decreased or not been detected at monitoring wells where HVOCs are historically low or have not been detected.

In summary, the analytical results from the ground water monitoring and extraction wells show that the treatment system is effectively collecting HVOC-impacted ground water, and that HVOC concentrations in ground water are generally decreasing. We recommend continued operation of the treatment system, and no augmentation or modifications appear warranted other than what is needed as part of normal operation and maintenance.

In previous conversations with the City, Ecology has commented on the possibility of additional extraction wells near the river to enhance capture of HVOC-impacted ground water. HWA recommends no augmentation of the existing remediation system at this time based on the positive trends shown in the analytical data. Additional wells may result in drawing HVOC-impacted groundwater closer to the river, pumping clean river water into the treatment system, at increased cost, or cause other hydrogeologic disturbances that could alter the progress of remediation activities.

Please feel free to contact me if you have any questions or need additional information.

Sincerely,
HWA GEOSCIENCES INC.

Arnie Sugar, LG, LHG
Principal Hydrogeologist

Attachments:
Table 1, Performance Monitoring per the IAWP
Table 2, Ground water analytical results
Figure 1, Site plan, HVOCs in ground water
Figure 2, Monitoring wells, PCE vs time
Figure 3, Extraction wells, PCE vs time
Figure 4, MW-7 HVOCs vs. time
Year 2015 Quarterly King County Industrial Waste Reports

Table 1
Performance Monitoring
Bothell Riverside Site

Sample Type	Sampling Location	Sampling Frequency / Rationale
Preliminary Point of Compliance	Extraction well 1 Extraction well 2 Extraction well 3 Extraction well 4 RMW-7	Quarterly for one year, then modify based on results and consultation with Ecology (e.g. move to semi-annual if concentrations stabilize)
Combined discharge	Combined discharge at sewer manhole or manifold	As required by KCIWD permit
Nearby wells	BC-3 RMW-4 RMW-5 RMW-6 RMW-8 RMW-9 RMW-10	Semi-annual for one year, then modify based on results and consultation with Ecology to check for water quality impacts due to pumping

Table 2
Bothell Riverside Site
Ground Water Analytical Results

			FIELD PARAMETERS							HVOCs							NOTES
Monitoring Well Identification	Screened Interval (ft bgs)	Date Sampled	Depth to Water (ft below MP)	pH (units)	Conductivity (µS)	Temp (^{o}C)	Dissolved Oxygen (mg/L)	Oxygen Reduction Potential (ORP)	Settable Solids (mg/L)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	1,1-Dichloro-ethene (µg/L)	(cis) 1,2-Dichloro-ethene (µg/L)	(trans) 1,2-Dichloro-ethene (µg/L)	Vinyl chloride (µg/L)	Chloroform (ug/L)	
MTCA Method A (Table 720-1, WAC 173-340-900) or Method B Cleanup Level										**5**	**5**	**400 (B)**	**16 (B)**	**160 (B)**	**0.2**		
KCIWD Limits									**7.00**	**240**	**500**	**1700**	**Total <2000**		**12**		
RMW-4	**15-25**	6/24/14															Wellhead buried under new landscaping
		12/19/14	12.2	6.59	1183	14.6	1.70			**0.79**	**0.33**	<0.20	<0.20	<0.20	<0.20		
		6/23/15	13.09	5.76	987	17.67	0.00	-125.70		**0.52**	**0.72**	<0.20	<0.20	<0.20	<0.20		
		12/8/15	11.95	5.99	510	14.9	0.00	-69.90		**2.2**	**0.56**	<0.20	<0.20	<0.20	<0.2		
RMW-5	**12-22**	5/24/13	11.51	6.70	932	13.9	1.00			**1.7**	<0.2		<0.2		<0.20		
		6/24/14	14.51	6.48	740	14.5	0.15			**1.4**	**0.40**	<0.20	<0.20	<0.20	<0.20		
		12/19/14	13.61	6.28	1226	13.3	0.55			**1.3**	**0.32**	<0.20	**0.22**	<0.20	<0.20		
		6/23/15	14.26	6.28	953	16.1	0.00	-127.10		**0.66**	**0.36**	<0.20	<0.20	<0.20	<0.20		
		12/8/15	13.29	5.83	318	14.54	18.61	-90.40		**1.6**	<0.20	<0.20	<0.20	<0.20	<0.2		
RMW-6	**15-25**	9/14/09								<0.2	**0.27**		**3.6**		**5.3**		
		5/24/13	10.42	6.68	467	14.3	1.40			<0.2	<0.2		**2.7**		**3.4**		
		6/24/14	14.79	6.47	407	14.2	0.13			**0.34**	**0.60**	<0.20	**0.42**	<0.20	<0.20		
		12/19/14	13.31	6.09	294	14.3	0.82			**0.47**	<0.20	<0.20	<0.20	<0.20	<0.20		
		6/23/15	13.65	6.12	283	15.2	0.00	8.00		<0.20	**1.4**	<0.20	**0.88**	<0.20	<0.20		
		12/8/15	12.46	6.00	232	14.99	0.00	-40.10		<0.2	**2.7**	<0.20	**1.0**	<0.20	<0.20		
RMW-7	**15-25**	9/14/09								**50**	**120**		**190**		**22**		
		5/24/13	16.31	6.80	447	16.2	0.30			**9**	**33**		**65**		**9.3**		
		4/4/14	16.65	6.50	1969	12.9	0.55			**0.75**	**3.8**		**35**	**0.54**	**8.3**		
		6/25/14	16.55	6.48	865	15.2	0.03			**5.2**	**24**	<0.20	**80**	**1.1**	**9.9**		
		9/22/14	17.54	6.96	386	18.2	5.25			<1.0	**3.2**	<1.0	**170**	**1.6**	**47**		
		12/19/14	17.49	6.06	683	15.4	0.73			**2.9**	**8.9**	<1.0	**150**	**1.4**	**34**		
		3/18/15	16.66	6.35	1127	14.9	1.87			<0.40	**1.5**	<0.40	**57**	**0.64**	**20**	<0.40	
		6/23/15	17.41	5.97	508	17.96	0	-70.3		<0.40	**3.1**	<0.40	**95**	**1.2**	**9.6**		
		9/11/15	18.50	6.22	464	21.54	3.23			**4.2**	**23**	<1.0	**110**	**1.4**	**14**		
		12/8/15	15.97	5.96	274	15.92	0.00	-12.3		**3.5**	**8.7**	<0.20	**85**	**0.87**	**9.0**		
RMW-8	**20-30**	9/15/09								**0.46**	**2.6**		**1.3**		<0.2		
		5/24/13	18.81	6.42	494	16.4	0.10			**0.5**	**0.85**		**0.44**		<0.2		
		6/25/14	19.62	6.27	650	15.7	0.20			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
		12/19/14	20.63	6.18	431	14.5	0.84			**0.7**	<0.20	<0.20	<0.20	<0.20	<0.20		
		6/23/15	20.87	5.74	333	26.9	0.27	-61.20		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
		12/8/15	19.42	5.83	344	15.15	1.51	44.30		<0.2	**0.39**	<0.20	**0.47**	<0.20	<0.2		
RMW-9	**20-30**	9/15/09								<0.20	<0.20		<0.20		<0.20		
		5/24/13	13.65	6.38	247	15.7	4.00			<0.20	<0.20		<0.20		<0.20		
		6/24/14										<0.20		<0.20			Well abandoned during SR 522 construction
RMW-9R		12/19/14	15.31	6.16	182	15.7	2.92			**0.79**	<0.20	<0.20	<0.20	<0.20	<0.20		
		6/23/15	4.00	5.93	139	18.7	4.20	70.40		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
		12/8/15	15.92	5.75	163	15.61	3.29	94.30		<0.2	<0.2	<0.20	<0.2	<0.20	<0.2		

RMW-10	**32-42**	5/24/13	11.85	6.52	247	13.3	6.60			<0.20	<0.20		<0.20		<0.20		
		6/24/14	15.00	6.19	361	15.4	1.08			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
		12/19/14	14.80	6.08	284	15.0	2.03			**0.69**	<0.20	<0.20	<0.20	<0.20	<0.20		
		6/23/15	20.40	6.43	233	17.3	7.28	37.00		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
		12/8/15	19.69	5.94	134	14.69	5.41	50.00		<0.2	<0.2	<0.20	<0.2	<0.20	<0.2		
BC-3	**15-25**	9/5/08								**110**	**120**		**46**		<1		
		5/24/13	12.95	6.55	342	15.1	4.00			**25**	**11**		**4**		<0.20		
		6/24/14	14.41	6.06	426	14.8	2.40			**11**	**4.0**	<0.20	**0.75**	<0.20	<0.20		
		12/19/14	15.61	6.07	298	14.8	1.82			**7.7**	**2.1**	<0.20	**0.44**	<0.20	<0.20		
		6/23/15	18.30	5.68	161	21.2	364.00	123.40		**3.8**	**0.9**	<0.20	<0.20	<0.20	<0.20		
		12/8/15	15.3	5.59	248	15.17	6.05	120.80		**5.3**	**1.3**	<0.20	**0.29**	<0.20	<0.20		
EW-1	**12.5-32.5**	4/4/14	27.90							**17**	**3**		**1.2**		<0.20		
		6/25/14	14.78	6.61	0.10	18.3	5.68			**27**	**8.1**	<0.20	**6.5**	<0.20	<0.20		
		9/22/14															Pump not working
		12/19/14		6.42	107	17.3	4.99			**21**	**2.6**	<0.20	**0.82**	<0.20	<0.20		
		3/18/15		7.01	167	15.9	3.65			**2.8**	**0.27**	<0.20	<0.20	<0.20	<0.20	<0.20	
		6/23/15								**22**	**2**	<0.20	**0.95**	<0.20	<0.20	**2.20**	
		9/11/15	15.86	6.01	160	19.54	2.99	-49.88		**41**	**2.2**	<0.20	**0.79**	<0.20	<0.20	**1.30**	
		12/8/15															Pump not working
EW-2	**15-35**	4/4/14	23.70							**13**	**2.8**		**1.5**		<0.20		
		6/25/14	17.10	6.58	143	16.5	2.21			**28**	**3.8**	<0.20	**1.5**	<0.20	<0.20		
		9/22/14								**66**	**16**	<0.40	**12**	<0.40	<0.40		
		12/19/14		7.01	204	15.8	2.31			**44**	**12**	<0.40	**12**	<0.40	<0.40		
		3/18/15		6.87	251	15.0	2.16			**22**	**6.5**	<0.20	**4.3**	<0.20	<0.20	<0.20	
		6/23/15								**8.6**	**2.4**	<0.20	**1.8**	<0.20	<0.20	**1.40**	
		9/11/15	19.89	6.11	235	19.9	2.84	-56.8		**6.5**	**0.62**	<0.20	<0.20	<0.20	<0.20	**0.25**	
		12/8/15		5.92	201	15.12	2.43	595.1		**16**	**2.6**	<0.20	**2.4**	<0.20	<0.20		
EW-3	**14-34**	4/4/14	23.80							**49**	**14**		**7.2**		**0.61**		
		6/25/14	19.00	6.58	182	16.4	6.34			**41**	**14**	<0.40	**12**	<0.40	<0.40		
		9/22/14								**190**	**59**	<1.0	**33**	<1.0	**1.10**		
		12/19/14		6.82	275	15.9	6.02			**21**	**6.4**	<0.20	**6**	<0.20	<0.20		
		3/18/15		6.78	322	15.4	5.47			**140**	**46**	<1.0	**29**	<1.0	<1.0	<1.0	
		6/23/15								**87**	**24**		**9**			**15.00**	
		9/11/15	20.86	6.56	354	19.89	2.53	-65.78		**81**	**28**	<0.40	**14**	<0.40	<0.40	**0.44**	
		12/8/15		5.82	247	16.59	2.36	160		**33**	**11**	<0.20	**7.8**	<0.20	**0.38**		
EW-4	**11-31**	4/4/14	12.50														Pump not working
		6/25/14	17.30	6.46	0.22	16.0	1.73			**1.7**	**1.8**	<0.20	**1.1**	<0.20	**0.38**		
		9/22/14								**45**	**10**	<0.20	**7.4**	<0.20	**0.87**		
		12/19/14		6.68	105	16.6	1.99			**1.2**	**1.6**	<0.20	**1.1**	<0.20	**0.27**		
		3/18/15								**15**	**4.8**	<0.20	**3.2**	<0.20	<0.20	**0.21**	
		6/23/15								**0.85**	**2.8**	<0.20	**1.7**	<0.20	**0.37**	**2.10**	
		9/11/15	18.84	6.23	125	19.22	2.55	-65.32		**1.8**	**2.1**	<0.20	**0.92**	<0.20	**0.28**	<0.20	
		12/8/15		5.84	424	22.04	0	214		<0.20	**1.6**	<0.20	**2.9**	<0.20	**0.85**		
DISCH	**NA**	4/4/14	NA	6.48	443	15.3				**25**	**6.3**		**3**	<0.20	<0.20		
		6/25/14	NA	6.40	200	16.4	1.43		0.0	**30**	**8.4**	<0.20	**5.9**	<0.20	**0.38**		
		9/22/14	NA						0.2	**79**	**18**	<0.40	**13**	<0.40	<0.40		
		12/18/14	NA							**11**	**2.7**	<0.20	**2.5**	<0.20	<0.20		
		3/18/15	NA	6.54	230	15.1	1.89		0.1	**25**	**7.4**	<0.20	**4.7**	<0.20	<0.20	<0.20	
		6/23/15	NA							**11**	**2.3**	<0.20	**1.5**	<0.20	<0.20	**1.60**	
		9/11/15	NA	6.23	245	20.55	2.68	-65.3	0	**7.9**	**1.5**	<0.20	**0.77**	<0.20	<0.20	**0.39**	
		12/8/15	NA	6.15	267	17.2	3.9	18		**68**	**21**	<0.20	**15**	**0.23**	**0.91**		

QC Samples			FIELD PARAMETERS							HVOCs							NOTES
DUP 6/25/14		6/25/14								**28**	**8.4**	<0.20	**6.4**	<0.20	**0.37**		Duplicate of DISCH 6/25/14
DUP 12/19/14		12/19/14								**0.92**	<0.20	<0.20	<0.20	<0.20	<0.20		Duplicate of RMW-8 12/19/2014
Trip Blank		6/25/14								<0.20	<0.20	<0.20	<0.20	<0.20	<0.20		
DUP 9/22/14		9/22/14								**66**	**16**	<0.40	<0.40	<0.40	<0.40		Duplicate of EX2 9/22/2014
Trip Blank		3/18/15								<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
DUP		3/18/15								<0.40	**1.0**	<0.40	**54**	**0.65**	**19**	<0.40	Duplicate of RMW-7 3/18/2015
Trip Blank		9/11/15								<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
DUP		9/11/15								**23**	1.7	<0.20	**0.62**	<0.20	<0.20	**0.91**	
Trip Blank		12/8/15								<0.2	<0.2	<0.20	<0.2	<0.20	<0.2		
DUP		12/8/15								**2.8**	**0.6**	<0.2	<0.2	<0.2	<0.2		Duplicate of RMW-4 12/8/15

Bold indicates analyte detected at a concentration greater than the laboratory reporing limit

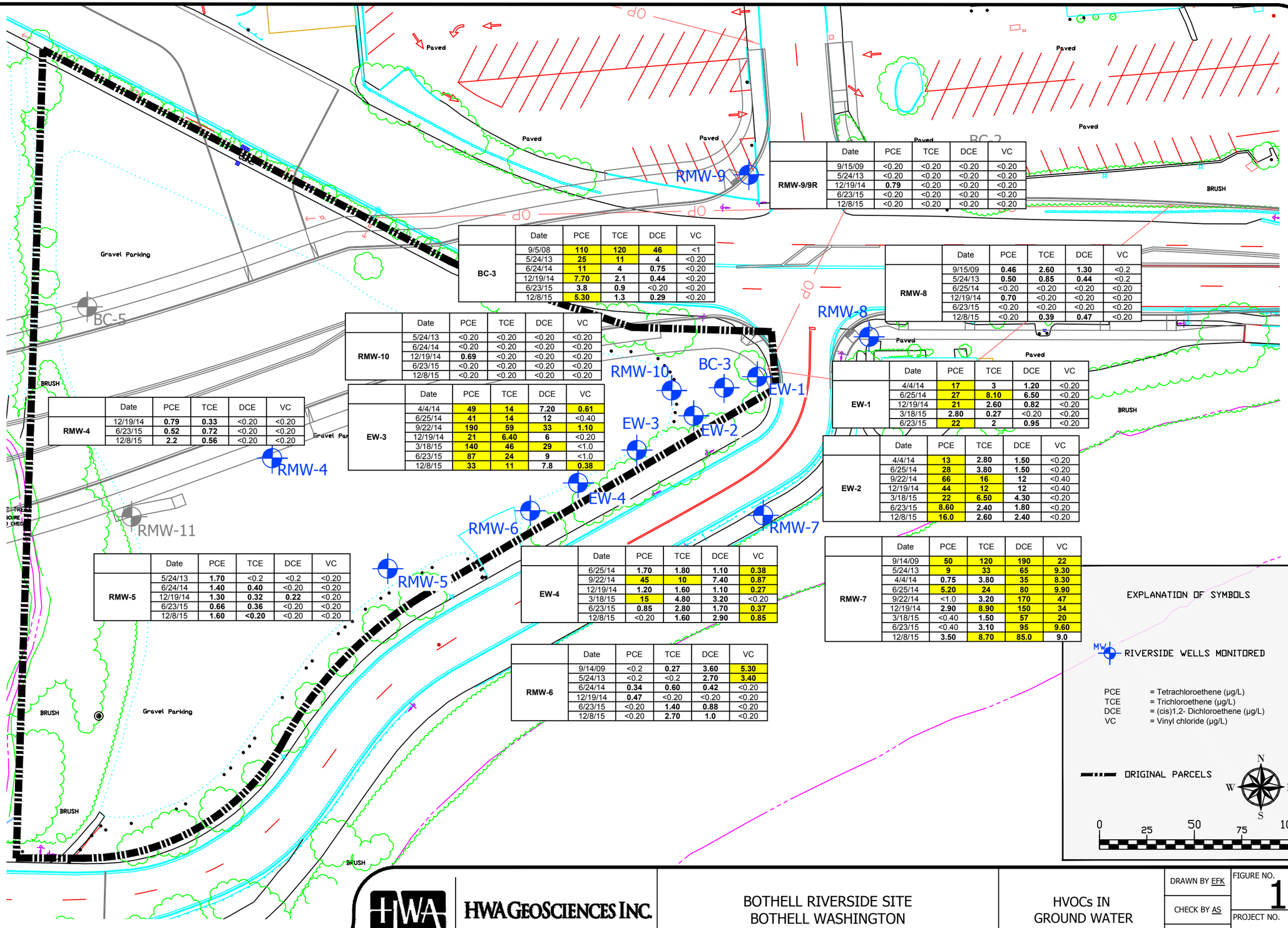
Yellow highlight indicates analyte exceeds MTCA cleanup level

MTCA = Model Toxic Control Act

KCIWD = King County Industrial Waste Discharge limit

Blank – Not analyzed

NA – Not applicable



	Date	PCE	TCE	DCE	VC
RMW-9/9R	9/15/09	<0.20	<0.20	<0.20	<0.20
	5/24/13	<0.20	<0.20	<0.20	<0.20
	12/19/14	**0.79**	<0.20	<0.20	<0.20
	6/23/15	<0.20	<0.20	<0.20	<0.20
	12/8/15	<0.20	<0.20	<0.20	<0.20

	Date	PCE	TCE	DCE	VC
BC-3	9/5/08	**110**	**120**	**46**	<1
	5/24/13	**25**	**11**	**4**	<0.20
	6/24/14	**11**	**4**	**0.75**	<0.20
	12/19/14	**7.70**	**2.1**	**0.44**	<0.20
	6/23/15	**3.8**	**0.9**	<0.20	<0.20
	12/8/15	**5.30**	**1.3**	**0.29**	<0.20

	Date	PCE	TCE	DCE	VC
RMW-8	9/15/09	**0.46**	**2.60**	**1.30**	<0.2
	5/24/13	**0.50**	**0.85**	**0.44**	<0.2
	6/25/14	<0.20	<0.20	<0.20	<0.20
	12/19/14	**0.70**	<0.20	<0.20	<0.20
	6/23/15	<0.20	<0.20	<0.20	<0.20
	12/8/15	<0.20	**0.39**	**0.47**	<0.20

	Date	PCE	TCE	DCE	VC
RMW-10	5/24/13	<0.20	<0.20	<0.20	<0.20
	6/24/14	<0.20	<0.20	<0.20	<0.20
	12/19/14	**0.69**	<0.20	<0.20	<0.20
	6/23/15	<0.20	<0.20	<0.20	<0.20
	12/8/15	<0.20	<0.20	<0.20	<0.20

	Date	PCE	TCE	DCE	VC
EW-1	4/4/14	**17**	**3**	**1.20**	<0.20
	6/25/14	**27**	**8.10**	**6.50**	<0.20
	12/19/14	**21**	**2.60**	**0.82**	<0.20
	3/18/15	**2.80**	**0.27**	<0.20	<0.20
	6/23/15	**22**	**2**	**0.95**	<0.20

	Date	PCE	TCE	DCE	VC
RMW-4	12/19/14	**0.79**	**0.33**	<0.20	<0.20
	6/23/15	**0.52**	**0.72**	<0.20	<0.20
	12/8/15	**2.2**	**0.56**	<0.20	<0.20

	Date	PCE	TCE	DCE	VC
EW-3	4/4/14	**49**	**14**	**7.20**	**0.61**
	6/25/14	**41**	**14**	**12**	<0.40
	9/22/14	**190**	**59**	**33**	**1.10**
	12/19/14	**21**	**6.40**	**6**	<0.20
	3/18/15	**140**	**46**	**29**	<1.0
	6/23/15	**87**	**24**	**9**	<1.0
	12/8/15	**33**	**11**	**7.8**	**0.38**

	Date	PCE	TCE	DCE	VC
EW-2	4/4/14	**13**	**2.80**	**1.50**	<0.20
	6/25/14	**28**	**3.80**	**1.50**	<0.20
	9/22/14	**66**	**16**	**12**	<0.40
	12/19/14	**44**	**12**	**12**	<0.40
	3/18/15	**22**	**6.50**	**4.30**	<0.20
	6/23/15	**8.60**	**2.40**	**1.80**	<0.20
	12/8/15	**16.0**	**2.60**	**2.40**	<0.20

	Date	PCE	TCE	DCE	VC
RMW-5	5/24/13	**1.70**	<0.2	<0.2	<0.20
	6/24/14	**1.40**	**0.40**	<0.20	<0.20
	12/19/14	**1.30**	**0.32**	**0.22**	<0.20
	6/23/15	**0.66**	**0.36**	<0.20	<0.20
	12/8/15	**1.60**	**<0.20**	<0.20	<0.20

	Date	PCE	TCE	DCE	VC
EW-4	6/25/14	**1.70**	**1.80**	**1.10**	**0.38**
	9/22/14	**45**	**10**	**7.40**	**0.87**
	12/19/14	**1.20**	**1.60**	**1.10**	**0.27**
	3/18/15	**15**	**4.80**	**3.20**	<0.20
	6/23/15	**0.85**	**2.80**	**1.70**	**0.37**
	12/8/15	<0.20	**1.60**	**2.90**	**0.85**

	Date	PCE	TCE	DCE	VC
RMW-7	9/14/09	**50**	**120**	**190**	**22**
	5/24/13	**9**	**33**	**65**	**9.30**
	4/4/14	**0.75**	**3.80**	**35**	**8.30**
	6/25/14	**5.20**	**24**	**80**	**9.90**
	9/22/14	<1.0	**3.20**	**170**	**47**
	12/19/14	**2.90**	**8.90**	**150**	**34**
	3/18/15	<0.40	**1.50**	**57**	**20**
	6/23/15	<0.40	**3.10**	**95**	**9.60**
	12/8/15	**3.50**	**8.70**	**85.0**	**9.0**

	Date	PCE	TCE	DCE	VC
RMW-6	9/14/09	<0.2	**0.27**	**3.60**	**5.30**
	5/24/13	<0.2	<0.2	**2.70**	**3.40**
	6/24/14	**0.34**	**0.60**	**0.42**	<0.20
	12/19/14	**0.47**	<0.20	<0.20	<0.20
	6/23/15	<0.20	**1.40**	**0.88**	<0.20
	12/8/15	<0.20	**2.70**	**1.0**	<0.20

HWA GeoSciences Inc.

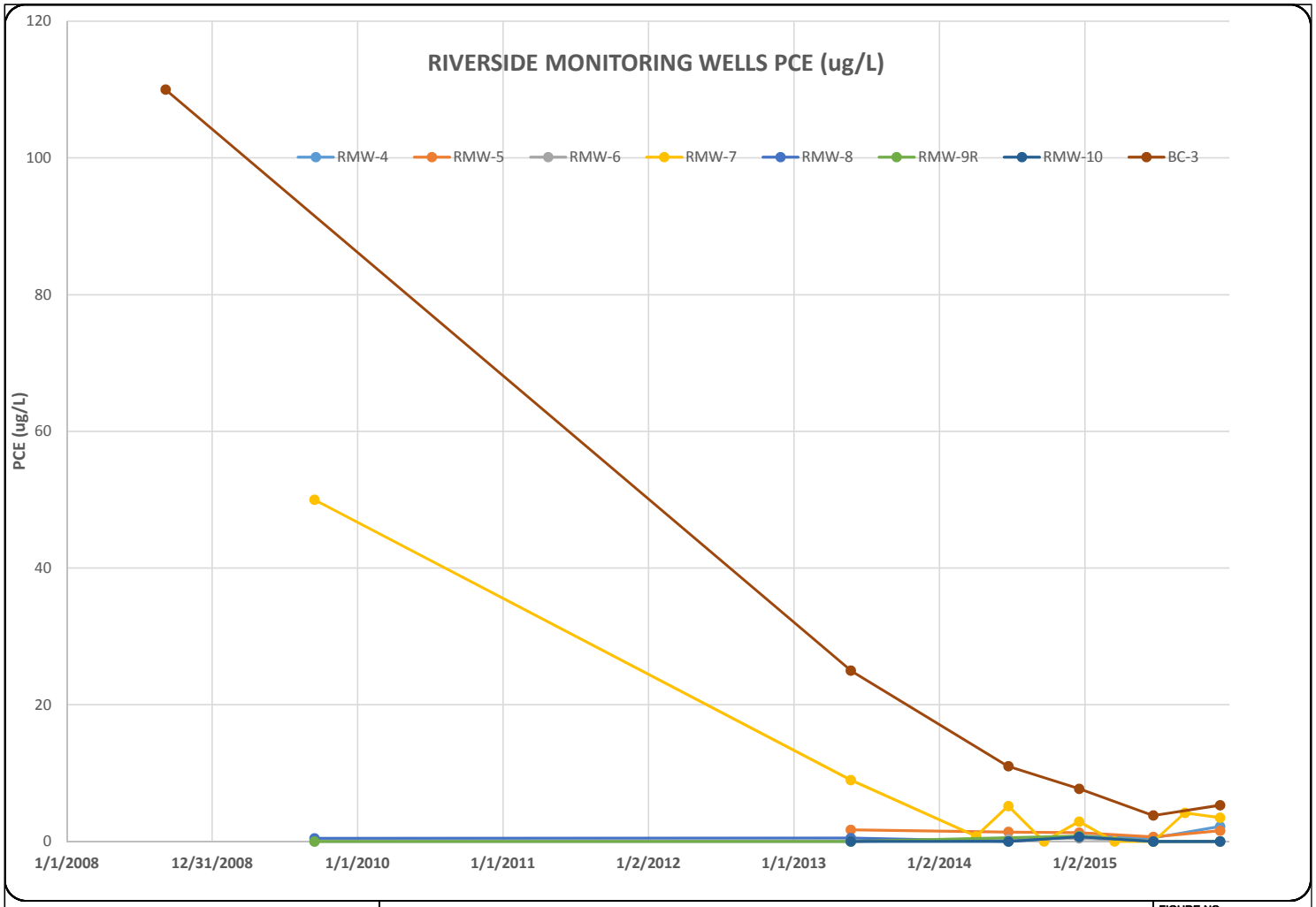
BOTHELL RIVERSIDE SITE
BOTHELL WASHINGTON

HVOCs IN
GROUND WATER

DRAWN BY EFK
CHECK BY AS
DATE 09.03.15

FIGURE NO. 1
PROJECT NO. 2007-098 T2012

S:\2007 PROJECTS\2007-098-22 BOTHELL CROSSROADS\CAD 2007-098\HWA 2007-098-21 T2012.DWG <11x17 T2012 Fig 1> Plotted: 1/25/2016 8:28 AM



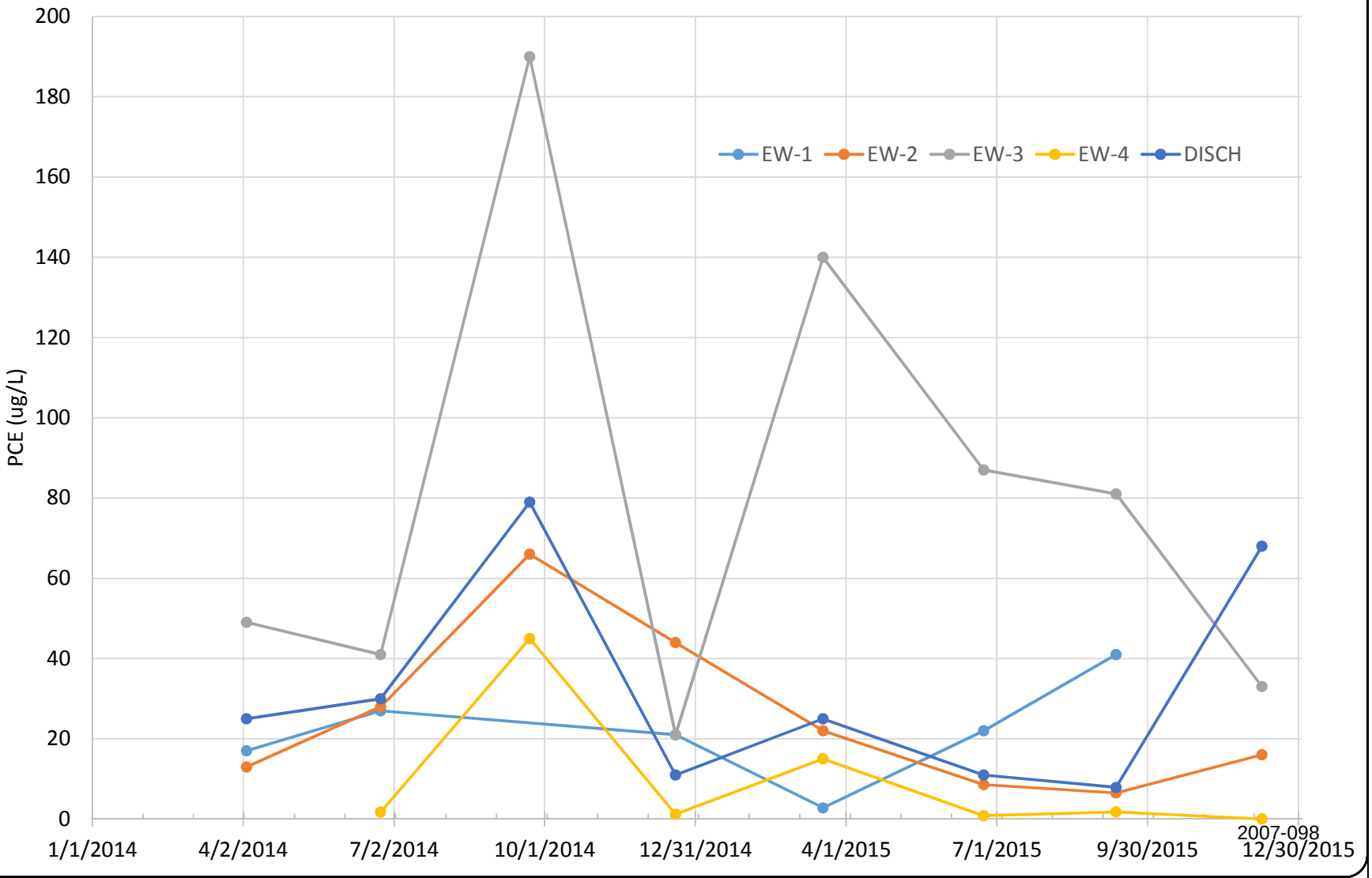
HWA GeoSciences Inc.

MONITORING WELL PCE CONCENTRATIONS OVER TIME

RIVERSIDE SITE
BOTHELL, WASHINGTON

FIGURE NO. 2

PROJECT NO. 2007-098-2012



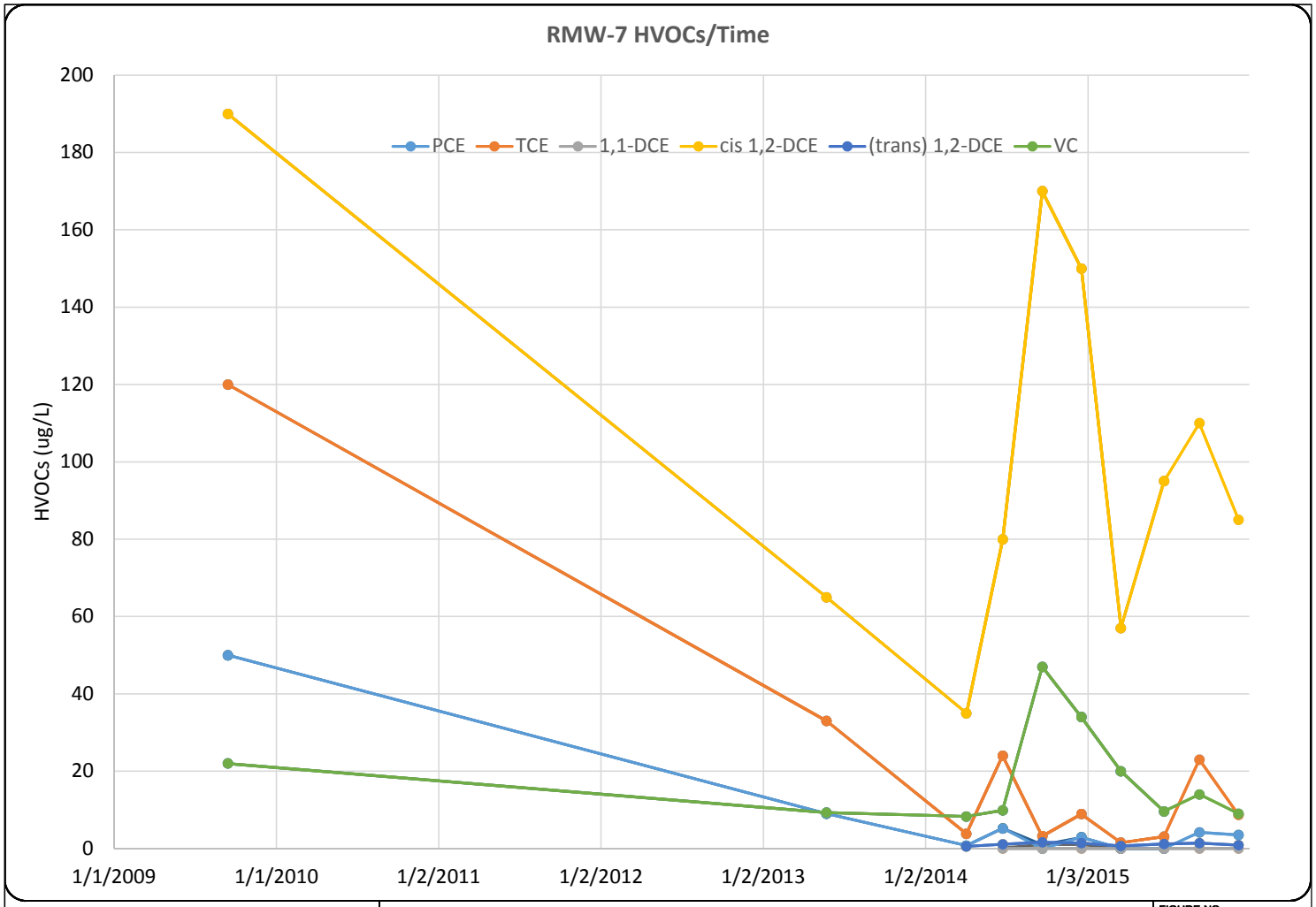
HWA GeoSciences Inc.

EXTRACTION WELL HVOC CONCENTRATIONS OVER TIME

RIVERSIDE SITE
BOTHELL, WASHINGTON

FIGURE NO. 3

PROJECT NO. 2007-098-2012



HWA GeoSciences Inc.

RMW-7 HVOC CONCENTRATIONS OVER TIME

RIVERSIDE SITE
BOTHELL, WASHINGTON

FIGURE NO. 4

PROJECT NO. 2007-098-2012

King County

Industrial Waste Quarterly Self-Monitoring Report

Send to: King County Industrial Waste
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001
Email: info.KCIW@kingcounty.gov

Company Name: Bothell, City of - Riverside Groundwater Remediation Site

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2015** **QUARTER 1** **Sample Site No.:** IW1175A **Permit/DA No.:** 4268-01

Month	Sample Date	Sample Type C (Composite) G (Grab) BC (Batch)	1,2-Dichloro-ethylene (**Total** *cis & trans*) (µg/l)	Tetrachloro-ethylene **(PCE)** (µg/l)	Trichloro-ethylene **(TCE)** (µg/l)	Vinyl Chloride (µg/l)	1,1-Dichloro-ethane (µg/l)	Settleable Solids (ml/L)	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
January										
								Total volume discharged for January		158.320
February										
								Total volume discharged for February		146,970
March										
		G	4.7	25	7.4	<0.20	<0.20	0	5051	
								Total volume discharged for March		177,730

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that all data requiring a laboratory analysis were analyzed by a Washington State Department of Ecology accredited laboratory for each parameter tested

4-6-15

Arnie Sugar, Designated rep. for City of Bothell per Delegation of signature form dated 8/22/13

Signature of Principal Executive or Authorized Agent — Date

Due date: First quarter report is due by April 15 each year.

King County

Industrial Waste Quarterly Self-Monitoring Report

Send to: King County Industrial Waste
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001
Email: info.KCIW@kingcounty.gov

Company Name: Bothell, City of - Riverside Groundwater Remediation Site

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2015** **QUARTER 2** **Sample Site No.:** IW1175A **Permit/DA No.:** 4268-01

Month	Sample Date	Sample Type C (Composite) G (Grab) BC (Batch)	1,2-Dichloro-ethylene (Total *cis & trans*) (µg/l)	Tetrachloro-ethylene (PCE) (µg/l)	Trichloro-ethylene (TCE) (µg/l)	Vinyl Chloride (µg/l)	1,1-Dichloro-ethane (µg/l)	Settleable Solids (ml/L)	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
April										
									Total volume discharged for April	143,739
May										
									Total volume discharged for May	154,289
June										
	6/23	G	1.5	11	2.3	<0.20	<0.20	0	8,757	
									Total volume discharged for June	164,804

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that all data requiring a laboratory analysis were analyzed by a Washington State Department of Ecology accredited laboratory for each parameter tested.

7/10/15

Jeff Thompson, Designated rep. for City of Bothell per Delegation of signature form dated 8/22/13

Signature of Principal Executive or Authorized Agent Date

Due date: Second quarter report is due by July 15 each year.

King County

Industrial Waste Quarterly Self-Monitoring Report

Send to: King County Industrial Waste
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001
Email: info.KCIW@kingcounty.gov

Company Name: Bothell, City of - Riverside Groundwater Remediation Site

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2015** **QUARTER 3** **Sample Site No.:** IW1175A **Permit/DA No.:** 4268-01

Month	Sample Date	Sample Type C (Composite) G (Grab) BC (Batch)	1,2-Dichloro-ethylene (Total *cis & trans*) (µg/l)	Tetrachloro-ethylene (PCE) (µg/l)	Trichloro-ethylene (TCE) (µg/l)	Vinyl Chloride (µg/l)	1,1-Dichloro-ethane (µg/l)	Settleable Solids (ml/L)	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
July										
									Total volume discharged for July	171,887
August										
									Total volume discharged for August	164,750
September										
	9/13/15	G	0.77	7.9	1.5	<0.20	<0.20	0	6,686	
									Total volume discharged for September	175,036

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that all data requiring a laboratory analysis were analyzed by a Washington State Department of Ecology accredited laboratory for each parameter tested

10/7/15

Jeff Thompson, Designated rep. for City of Bothell per Delegation of signature form dated 8/22/13

Signature of Principal Executive or Authorized Agent — Date

Due date: Third quarter report is due by October 15 each year.

King County

Industrial Waste Quarterly Self-Monitoring Report

Send to: King County Industrial Waste
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
Phone 206-263-3000 / FAX 206-263-3001
Email: info.KCIW@kingcounty.gov

Company Name: **Bothell, City of - Riverside Groundwater Remediation Site**

This form is available at www.kingcounty.gov/industrialwaste.

Please specify year: **2015** **QUARTER 4** **Sample Site No.:** **IW1175A** **Permit/DA No.:** **4268-01**

Month	Sample Date	Sample Type C (Composite) G (Grab) BC (Batch)	1,2-Dichloro-ethylene (**Total** *cis & trans*) (µg/l)	Tetrachloro-ethylene **(PCE)** (µg/l)	Trichloro-ethylene **(TCE)** (µg/l)	Vinyl Chloride (µg/l)	1,1-Dichloro-ethane (µg/l)	Settleable Solids (ml/L)	Discharge Volume on sample day (gallons)	Total Monthly Flow (gallons)
October										
	Total volume discharged for October									189,065
November										
	Total volume discharged for November									194,009
December										
	12/9/15	G	15	68	21	0.91	<0.20	0	3,247	
	Total volume discharged for December									195,550

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that all data requiring a laboratory analysis were analyzed by a Washington State Department of Ecology accredited laboratory for each parameter tested

Arnie Sugar , Designated rep. for City of Bothell per Delegation of signature form dated 8/22/13

Signature of Principal Executive or Authorized Agent

Date 1 4 16

Due date: Fourth quarter report is due by January 15 each year.