



Spring 2018 Groundwater and Surface Water  
Monitoring

## **PACCAR Renton Site** **Renton, Washington**

Prepared for  
**PACCAR**

February 26, 2019  
1639-74



**HARTCROWSER**

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Data Validation Summary for Surface Water Samples

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## Spring 2018 Groundwater and Surface Water Monitoring

# PACCAR Renton Site

## Renton, Washington

This report provides the Spring 2018 groundwater and surface water monitoring results for the PACCAR Renton National Priorities List (NPL) Site. This monitoring report contains the elements described in the Confirmational Monitoring and Inspection Plan (CMIP; DOF 1997) and the Periodic Review (Ecology 2014) and presents the results of the groundwater, surface water, and structural fill cover monitoring conducted at the site in April 2018.

This report is divided into three sections:

- **Section 1.** Groundwater Monitoring
- **Section 2.** Surface Water Monitoring
- **Section 3.** PACCAR Structural Fill Cover Monitoring Field Inspection and Observation Form

The information in these sections is supplemented by tables and figures presented at the end of the respective sections. In addition, Appendices A and B presents the chemical data quality review for groundwater and surface water, respectively. Appendix C provides the laboratory report, and Appendix D presents groundwater quality summary charts.

# **SECTION 1**

## **Groundwater Monitoring**

# SECTION 1

## GROUNDWATER MONITORING

### Introduction

This section presents the results of the groundwater monitoring event conducted in April 2018. Specifically, it includes a tabulation of water level and groundwater quality data, groundwater flow maps, and an assessment of results relative to cleanup levels (CULs) for developing sampling and analysis recommendations consistent with the CMIP and Periodic Review (Ecology 2014).

### Groundwater Monitoring

Groundwater monitoring was completed on April 17, 2018, in accordance with the planned elements described by the Periodic Review (Ecology 2014). The groundwater elevation and chemical test results obtained from this event are compiled in this section.

The CMIP provides compound-specific CULs and hot spot action levels (HSALs) for comparison with the site data. The CULs represent the groundwater remediation goals at the site, while HSALs for groundwater are based on drinking water standards. Planned actions described in this report are based on an interpretation of the updated data relative to the decision-making processes outlined in the CMIP.

Data presented in this report are organized as follows:

- **Monitoring Summary.** An overview of the data collected from each monitoring well is given in Table 1-1. This table lists the wells sampled and identifies the chemicals analyzed in each well.
- **Groundwater Elevation.** Groundwater elevation measurements are compiled in Table 1-2 and contoured on Figures 1-1 and 1-2 for the Upper Sand and Lower Sand units, respectively.
- **Chemical Result Summary.** A summary of groundwater analytical results is provided in Table 1-3. All groundwater samples were analyzed for arsenic and/or vinyl chloride (Table 1-1). Field parameter measurements including turbidity, temperature, pH, dissolved oxygen, redox potential, and conductivity are also included in Table 1-3.
- **Purge Water Sampling.** Groundwater collected during well purging (before sampling) was analyzed for arsenic, chromium, lead, diesel- and heavy-oil-range hydrocarbons, and volatile organic compounds (VOCs). These data are necessary for future disposal documentation and are presented in Table A-2.
- **Chemical Data Compilation.** Appendix A includes a data validation summary for the groundwater quality results and a compilation of the April 2018 groundwater data (Table A-1) and purge water data (Table A-2). The laboratory report is provided in Appendix C.

- **Groundwater Quality Summary Charts.** Appendix D includes groundwater quality summary charts for each well sampled as part of the April 2018 sampling program. The charts summarize the historical sampling results for these wells.

### ***Future Monitoring***

The Periodic Review establishes the groundwater sampling program (Table 1-4) for the site, which consists of:

- Sample groundwater in Spring 2019 for arsenic in wells LW-6D, LW-9D, CW-1S, CW-1D, LW-9S, and MW-3I. Groundwater elevations and field parameters will also be measured in these wells.
- Sample groundwater in Spring 2019 for vinyl chloride in wells CW-1S and LW-9D.
- Sample groundwater in Spring 2019 in wells SC-1S and SC-2S for arsenic, lead, and chromium. Groundwater elevations and field parameters will also be measured.
- Groundwater elevations will be measured in the PACCAR monitoring well network in Spring 2019.

### ***Electronic Groundwater Quality Data***

An electronic copy of the complete groundwater quality database is submitted on CD-ROM with this report for reference and further evaluation, if warranted. The CD contains a Microsoft Access data file in addition to a program that can be used as a viewer to create monitoring summary reports for any well or analyte. Instructions for viewing the data and generating the monitoring summary reports follow.

Instructions for Printing “Monitoring Summary Report” from PACCAR Database.

1. Open ACCESS 2000

2. Select File

Open database

CD Drive:\PACCAR Apr-18.mdb

3. The message, “The database ‘PACCAR Apr-18’ is read-only” will appear. Click the OK button.

4. The Reports Menu will appear.

5. Double click on “Monitoring Summary”

6. The Enter Parameter Value box will appear with the prompt, “Enter Well”

Type in the well name (such as LW-09D).

7. Another Parameter Value box will appear with the prompt, “Enter CAS or Analyte Code”

Type in analyte name (such as Vinyl Chloride).

8. The report will be displayed on screen.

9. To print, select the print icon.

If an error message appears, you may have entered a well location or analyte name that doesn't exist in the database. Click OK, select “Well Water Level Analyte Summary” and re-enter the well name and analyte name as indicated above.

## References

Dalton, Olmstead & Fluglevand. 1997. Confirmational Monitoring and Inspections Plans, Former PACCAR Defense Systems Site, Renton, Washington. November 1997.

Washington State Department of Ecology. 2014. Periodic Review. PACCAR, Facility Site ID#: 2065, ISIS Cleanup Site ID# 788. July 2014.

**Table 1-1 – Groundwater Monitoring Program in April 2018**

<b>Well</b>	<b>VOC<sup>a</sup></b>	<b>Arsenic</b>
<b>Confirmation Lower Sand/Delta Deposits</b>		
CW-1D		X
LW-6D		X
LW-9D	X	X
<b>Confirmation Upper Sand/Aquitard Wells</b>		
CW-1S	X	X
LW-9S		X
MW-3I		X
<b>Quality Control Samples</b>		
	X	X
<b>Purge Water Samples</b>		
	X	X

<sup>a</sup> VOC is vinyl chloride.

Water elevations measured at approximately 33 wells.

All wells with samples submitted for laboratory analysis have the following parameters measured:

temperature, pH, conductivity, turbidity, dissolved oxygen, and redox potential.

Purge water samples analyzed for VOCs, arsenic, lead, total chromium, and TPH.

**Table 1-2 – Groundwater Elevation Data, April 2018**

<b>Well</b>	<b>Depth to Water in Feet</b>	<b>Reference Elevation in Feet</b>	<b>Water Elevation in Feet</b>
CW-1D	3.07	26.18	23.11
CW-1S	3.01	26.14	23.13
CW-3D	7.54	31.39	23.85
CW-3S	5.55	32.04	26.49
DM-2D	5.70	28.40	22.70
DM-5D	8.41	40.13	31.72
LW-14S	19.68	45.37	25.69
LW-1D	2.74	25.98	23.24
LW-1S	1.72	25.84	24.12
LW-2D	4.43	28.78	24.35
LW-2S	4.45	28.98	24.53
LW-4S	6.46	39.87	33.41
LW-6D	6.52	30.58	24.06
LW-6S	5.70	29.70	24.00
LW-7S	5.45	33.74	28.29
LW-9D	8.61	31.95	23.34
LW-9S	8.09	32.12	24.03
MW-1S(N)	3.81	26.56	22.75
MW-2D(R)	5.94	29.43	23.49
MW-2S(W)		28.85	Dry
MW-3I(N)	7.85	34.39	26.54
MW-3S(S)		34.39	Dry
OSP-10D	11.72	40.74	29.02
OSP-1D	11.31	41.51	30.20
OSP-1S	6.23	41.44	35.21
OW-4D	19.95	43.48	23.53
OW-4S	18.31	43.49	25.18
R-10D	9.83	35.15	25.32
R-10S	9.05	36.24	27.19
SC-1S	4.78	37.78	33.00
SC-2S	13.35	40.52	27.17
U-1D	7.99	30.29	22.30
U-1S	5.35	29.86	24.51

NL = Not located.

NM = Not measured.

**Table 1-3 - Summary of Groundwater Analytical Data**

Well	Date	Arsenic in µg/L	Lead in µg/L	Chromium in µg/L	Benzene in µg/L	Vinyl Chloride in µg/L	Total cPAHs <sup>a</sup> in µg/L	PCP * in µg/L	Diesel in mg/L	Heavy Oil in mg/L	Ferrous Iron <sup>b</sup> in mg/L	Temp. in °C	pH	Diss. Oxygen in mg/L	Cond. in µmhos /cm	Redox Potential in Eh	Turbidity in NTU	TSS in mg/L
CUL:		5	5	80	5	0.4	0.1		1	1	NE	NE	NE	NE	NE	NE	NE	NE
HSAL:		50	50	100	5	2	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Confirmation Lower Sand/Delta Deposits</b>																		
CW-01D	3/24/98	4.1	-	-	0.5 U	0.13 U	-	-	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/20/98	2 U	-	-	0.5 U	0.12 J	-	-	0.24 U	0.48 U	-	-	-	-	-	-	-	-
	3/4/99	3.2 +	-	-	0.5 U	0.039 U	-	-	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/19/99	6.3	1 U	10 U	0.5 U	0.2	-	-	0.24 U	0.71 U	-	14	6.8	-	580	-	-	-
	5/18/00	6	-	-	0.2 U	0.4	-	-	0.25 U	0.5 U	-	14	6.8	-	560	-	-	-
	3/19/01	5.8	-	-	0.2 U	0.2	-	-	0.25 U	0.5 U	-	-	-	-	-	-	-	-
	3/25/02	7.9	-	-	0.2 U	0.6	-	-	0.25 U	0.5 U	-	12	7.1	-	780	-	0.08	-
	10/16/02	-	-	-	-	-	-	-	-	-	-	15.8	6.7	-	760	-	0.18	-
	4/2/03	6.7	1 U	1 U	0.2 U	0.2	0.15 U	-	0.25 U	0.5 U	4	13.2	6.8	1.18	442	-	28	-
	3/31/04	8.2	-	-	0.2 U	0.3	-	-	-	-	55.5	13.4	6.2	0.01	496	-34	12	74.5
	4/13/05	6.1	-	-	-	-	-	-	-	-	46.4	14.4	6.5	0.1	283	18	0	31.5
	3/28/06	5.1	-	-	-	-	-	-	-	-	52.5	13.9	6.2	0.26	448	25	0	51.9
	3/27/07	6.2	-	-	-	-	-	-	-	-	45.2	13.3	5.2	0.11	417	62	0	31.6
	4/1/10	5.6	-	-	-	-	-	-	-	-	52	13.1	7.1	0.26	-	-100	293	54.4
	3/29/11	5.7	-	-	-	-	-	-	-	-	43.8	12.8	6.4	<0.01	270	-	10	48.2
	3/22/12	5.5	-	-	-	-	-	-	-	-	46.4	12.9	6.1	<0.01	727	-165	16.3	40
	11/15/12	-	-	-	-	0.14	-	-	-	-	48.4	13.9	6.3	1.15	332	-132	21	85.4
	3/12/13	5.4	0.3	1 U	0.02 U	0.1	0.2 U	0.25 U	0.1 U	0.2 U	55	13.1	9.9	<0.01	423	-13	24.9	80
	4/2/14	5.8	-	-	-	0.1	-	-	-	-	49.8	12.91	6.3	<0.01	410	-80	76.2	76.2
	4/15/15	5.4	-	-	-	-	-	-	-	-	-	13.99	6.2	<0.01	433	-88	13.9	-
	3/10/16	0.4	-	-	-	0.02 U	-	-	-	-	-	13.61	6.6	0.01	797	-8	1.4	-
	4/11/17	6.29	-	-	-	-	-	-	-	-	-	13.55	6.2	<0.01	797 <sup>c</sup>	-79	21	-
	4/17/18	5.16	-	-	-	-	-	-	-	-	-	13.6	5.99	0.09	477.1	0	220	-

**Table 1-3 - Summary of Groundwater Analytical Data**

Well	Date	Arsenic in µg/L	Lead in µg/L	Chromium in µg/L	Benzene in µg/L	Vinyl Chloride in µg/L	Total cPAHs <sup>a</sup> in µg/L	PCP * in µg/L	Diesel in mg/L	Heavy Oil in mg/L	Ferrous Iron <sup>b</sup> in mg/L	Temp. in °C	pH	Diss. Oxygen in mg/L	Cond. in µmhos /cm	Redox Potential in Eh	Turbidity in NTU	TSS in mg/L
CUL:		5	5	80	5	0.4	0.1		1	1	NE	NE	NE	NE	NE	NE	NE	NE
HSAL:		50	50	100	5	2	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
LW-06D	3/26/98	11	-	-	0.5 U	0.13 U	-	-	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/22/98	12	-	-	0.5 U	0.08 J	-	-	0.24 U	0.47 U	-	-	-	-	-	-	-	-
	3/5/99	3.1	-	-	0.5 U	0.039 U	-	-	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/19/99	10	1 U	10 U	0.5 U	0.099 J	-	-	0.24 U	0.71 U	-	14.1	6.4	-	530	-	-	-
	5/23/00	9	-	-	0.2 U	0.2 U	-	-	0.25 U	0.5 U	-	13	7.2	-	690	-	-	-
	3/16/01	10.8	-	-	0.2 U	0.2 U	-	-	0.25 U	0.5 U	-	14	7.1	-	900	-	0.14	-
	3/21/02	8.8	-	-	0.2 U	0.2 U	-	-	0.25 U	0.5 U	-	13	7.1	-	860	-	0.08	-
	4/3/03	3.3	1 U	1	0.2 U	0.2 U	0.15 U	-	0.25 U	0.5 U	4	11.4	6.9	1.25	454	-	18	-
	3/31/04	14.2	-	-	-	-	-	-	-	-	56.0	13.0	6.1	0.02	524	-2	27	93.0
	4/12/05	10.2	-	-	-	-	-	-	-	-	59.5	13.2	6.3	0.08	548	-15	0	38.9
	3/31/06	11.2	-	-	-	-	-	-	-	-	62.5	13.7	6.2	0.16	459	-10	0	20.3
	3/29/07	11.1	-	-	-	-	-	-	-	-	58.0	14.0	5.8	0.11	554	107	0	40.8
	3/26/08	9.8	-	-	-	-	-	-	-	-	49.6	11.1	6.7	0.52	436	-35	0	-
	3/26/09	10.4	-	-	-	-	-	-	-	-	63	13.36	5.6	2.64	764	-118	32	55
	4/2/10	10.4	-	-	-	-	-	-	-	-	62	12.5	7.1	<0.01	445	-83	160	58.4
	3/31/11	9.7	-	-	-	-	-	-	-	-	63	13	6.1	0.05	382	-61	10	70
	3/23/12	9.1	-	-	-	-	-	-	-	-	61.5	13.3	6.0	<0.01	724	-160	6.2	54.2
	3/13/13	9.1	0.1 U	1 U	0.025	0.14	0.2 U	-	0.1 U	0.2 U	65	13.18	8.6	<0.01	508	57	9.9	67.8
	4/2/14	7.8	-	-	-	-	-	-	-	-	56.5	14.01	6.3	0.01	527	-102	115.5	34.6
	4/15/15	7.8	-	-	-	-	-	-	-	-	-	14.05	6.2	<0.01	529	-189	25.4	-
	3/10/16	8.0	-	-	-	0.24	-	-	-	-	-	13.72	6.2	<0.01	533.9	-11	10.9	-
	4/11/17	10.0	-	-	-	-	-	-	-	-	-	13.71	6.1	<0.01	°	-101	4.0	-
	4/17/18	9.2	-	-	-	-	-	-	-	-	-	13.7	6.21	0.14	682	0	378	-

**Table 1-3 - Summary of Groundwater Analytical Data**

Well	Date	Arsenic in µg/L	Lead in µg/L	Chromium in µg/L	Benzene in µg/L	Vinyl Chloride in µg/L	Total cPAHs <sup>a</sup> in µg/L	PCP * in µg/L	Diesel in mg/L	Heavy Oil in mg/L	Ferrous Iron <sup>b</sup> in mg/L	Temp. in °C	pH	Diss. Oxygen in mg/L	Cond. in µmhos /cm	Redox Potential in Eh	Turbidity in NTU	TSS in mg/L
CUL:		5	5	80	5	0.4	0.1		1	1	NE	NE	NE	NE	NE	NE	NE	NE
HSAL:		50	50	100	5	2	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
LW-09D	3/26/98	9.5	-	-	0.5 U	0.97 J	-	0.82 U	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/21/98	7.6	-	-	0.5 U	0.7 J	-	0.8 U	0.24 U	0.47 U	-	-	-	-	-	-	-	-
	3/7/99	7.9	-	-	0.5 U	0.86	-	0.9 U	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/19/99	3.3	1 U	10 U	0.5 U	0.4 J	-	-	0.32	0.71 U	-	14.6	7.4	-	450	-	-	-
	5/24/00	9	-	-	0.2 U	0.3	-	-	0.25 U	0.5 U	-	14	6.7	-	740	-	-	-
	10/12/00	-	-	-	0.2 U	0.9	-	-	-	-	-	14	7.2	-	640	-	-	-
	3/15/01	9.4	-	-	0.2 U	0.9	-	-	0.25 U	0.5 U	-	14	6.8	-	590	-	0.14	-
	10/31/01	-	-	-	0.2 U	0.5	-	-	-	-	-	14	6.8	-	560	-	0.14	-
	3/20/02	11.4	-	-	0.2 U	1.6	-	-	0.25 U	0.5 U	-	13	8.0	-	910	-	0.11	-
	10/16/02	-	-	-	0.2 U	0.9	-	-	-	-	5.8	14.1	6.9	1.1	510	-	0.14	-
	4/4/03	0.9	1 U	1 U	0.2 U	0.2 U	0.15 U	0.25 U	0.25 U	0.5 U	3.4	12.6	7.3	0.71	389	-	12	-
	10/7/03	-	-	-	0.2 U	0.7	-	-	-	-	-	13	7.3	-	680	-	0.18	-
	3/31/04	12.2	-	-	0.2 U	1.1	-	-	-	-	54.5	12.2	6.2	0.22	523	-22	13	77.5
	10/20/04	-	-	-	0.2 U	1.0	-	-	-	-	52	12.6	6.2	0	528	-28	0	41.5
	4/12/05	8	-	-	0.2 U	1.3 J	-	-	-	-	54	12.5	6.4	0.05	540	-24	1	37.5
	11/3/05	-	-	-	0.2 U	0.8	-	-	-	-	52	12	6.7	0.32	517	-42	7	33.4
	3/31/06	7.7	-	-	0.2 U	0.8	-	-	-	-	53.5	12.6	6.3	0.12	433	-20	0	18.2
	3/27/07	8.5	-	-	0.2 U	0.9	-	-	-	-	-	12.2	6.0	0.19	541	54	0	-
	3/26/08	8.3	-	-	-	1.2	-	-	-	-	46.7	11.7	6.8	0.48	427	-15	0	-
	3/26/09	8.4	-	-	-	1.2	-	-	-	-	55.5	12.24	5.7	2.56	729	-129	48	36.4
	10/27/09	8	-	-	-	0.71	-	-	-	-	52.7	12.44	9.3	3.33	617	-146	20	51.1
	4/2/10	8.4	-	-	-	0.5	-	-	-	-	55	11.5	7.2	0	428	-90	242	41.2
	3/29/11	8.5	-	-	-	0.5	-	-	-	-	51.5	12	6.4	0.11	441	-	10	54.8
	3/23/12	7.5	-	-	-	0.32	-	-	-	-	51	11.9	6.0	0	666	-155	2.9	40
	3/15/13	8	0.1 U	0.7	0.02 U	0.41	0.2 U	0.25 U	0.1 U	0.2 U	54	12.31	7.2	0.02	491	235	59.8	62.2
	4/2/14	8.2	-	-	-	0.41	-	-	-	-	63	12.16	6.3	0.01	499.8	-65	27.6	27.7
	4/15/15	7.7	-	-	-	0.7	-	-	-	-	-	12.41	6.2	0.07	481	-192	164.8	-
	3/10/16	9.0	-	-	-	0.44	-	-	-	-	-	12.42	6.2	<0.01	478	-50	6	-
	4/11/17	8.5	-	-	-	0.35	-	-	-	-	-	12.45	6.2	<0.01	°	-73	17.4	-
	4/17/18	9.16	-	-	-	0.35	-	-	-	-	-	12.5	6.26	0.14	639	0	-	-

**Table 1-3 - Summary of Groundwater Analytical Data**

Well	Date	Arsenic in µg/L	Lead in µg/L	Chromium in µg/L	Benzene in µg/L	Vinyl Chloride in µg/L	Total cPAHs <sup>a</sup> in µg/L	PCP * in µg/L	Diesel in mg/L	Heavy Oil in mg/L	Ferrous Iron <sup>b</sup> in mg/L	Temp. in °C	pH	Diss. Oxygen in mg/L	Cond. in µmhos /cm	Redox Potential in Eh	Turbidity in NTU	TSS in mg/L
CUL:		5	5	80	5	0.4	0.1		1	1	NE	NE	NE	NE	NE	NE	NE	NE
HSAL:		50	50	100	5	2	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Confirmation Upper Sand/Aquitard Wells</b>																		
CW-01S	3/24/98	8.7	-	-	0.5 U	0.38 J	-	-	0.3	0.71 U	-	-	-	-	-	-	-	-
	10/20/98	6.6	-	-	0.62	0.86 J	-	-	0.24 U	0.47 U	-	-	-	-	-	-	-	-
	3/4/99	4.9	-	-	0.5 U	0.53	-	-	0.24 U	0.72 U	-	-	-	-	-	-	-	-
	10/19/99	7.1	1 U	10 U	0.53	0.63 J	-	-	0.24 U	0.71 U	-	14.9	6.6	-	550	-	-	-
	5/18/00	9	-	-	0.6	0.9	-	-	0.25 U	0.5 U	-	15	7.0	-	810	-	-	-
	3/19/01	8.7	-	-	0.7	1.3	-	-	0.25 U	0.5 U	-	-	-	-	-	-	-	-
	3/25/02	11.5	-	-	0.7	2.4	-	-	0.27	0.5 U	-	12	7.1	-	820	-	0.06	-
	10/16/02	-	-	-	-	-	-	-	-	-	-	16.1	6.6	-	580	-	0.14	-
	4/2/03	8.7	1 U	1	0.4	0.9	0.26 U	-	0.25 U	0.5 U	4	13.9	6.8	1.51	408	-	29	-
	10/7/03	-	-	-	0.2 U	0.6	-	-	-	-	-	14	6.9	-	770	-	0.09	-
	3/31/04	12.0	-	-	0.2	0.9	-	-	-	-	48.2	13.5	6.2	0.06	484	-7	30	72.5
	4/13/05	8.7	-	-	0.2 U	0.9	-	-	-	-	48.4	14.8	6.4	0.1	480	5	2	34.4
	3/28/06	8.1	-	-	0.2 U	0.9	-	-	-	-	46.6	14.2	6.5	0.2	524	9	0	33.5
	3/27/07	8.2	-	-	0.2 U	0.7	-	-	-	-	46.2	13.1	5.8	0.02	398	72	0	32.8
	3/27/08	8.1	-	-	-	0.63	-	-	-	-	37.6	12.3	6.6	0.67	379	-7	0	-
	3/24/09	8	-	-	-	0.54	-	-	-	-	0.999	12.83	5.8	2.2	665	-135	10	40.7
	4/1/10	8.1	-	-	0.2 U	0.4	-	-	-	-	49.7	13.1	7.0	<0.01	-	-94	333	69.6
	3/29/11	8.1	-	-	-	0.64	-	-	-	-	50.5	13.2	6.4	<0.01	440	-	10	48.7
	3/22/12	4.7	-	-	-	0.3	-	-	-	-	22.6	13.3	6.0	<0.01	441	-113	4.6	13.7
	3/12/13	7	0.2	1 U	0.023	0.62	0.2 U	-	0.16	0.2 U	52.5	13.01	9.9	0.01	464.3	3	1.2	48.3
	4/2/14	1.8	-	-	-	0.11	-	-	-	-	5.95	12.99	6.1	0.08	95.65	36	18	7
	4/15/15	3.6	-	-	-	0.46	-	-	-	-	-	14.4	5.9	0.08	237.5	-117	42.4	-
	3/10/16	0.4	-	-	-	0.02 U	-	-	-	-	-	13.13	6.6	6.4	163	71	18.1	-
	4/11/17	4.39	-	-	-	0.244	-	-	-	-	-	13.96	5.9	<0.01	374.9	7	3.6	-
	4/17/18	0.884	-	-	-	0.0243 J	-	-	-	-	-	13.8	5.69	1.83	37.3	321	10	-

**Table 1-3 - Summary of Groundwater Analytical Data**

Well	Date	Arsenic in µg/L	Lead in µg/L	Chromium in µg/L	Benzene in µg/L	Vinyl Chloride in µg/L	Total cPAHs <sup>a</sup> in µg/L	PCP * in µg/L	Diesel in mg/L	Heavy Oil in mg/L	Ferrous Iron <sup>b</sup> in mg/L	Temp. in °C	pH	Diss. Oxygen in mg/L	Cond. in µmhos /cm	Redox Potential in Eh	Turbidity in NTU	TSS in mg/L
CUL:		5	5	80	5	0.4	0.1		1	1	NE	NE	NE	NE	NE	NE	NE	NE
HSAL:		50	50	100	5	2	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
LW-09S	3/26/98	21	-	-	0.5 U	0.13 U	-	-	0.32	0.71 U	-	-	-	-	-	-	-	-
	10/21/98	17	-	-	0.5 U	0.31 J	-	-	0.36	0.47 U	-	-	-	-	-	-	-	-
	3/7/99	10 S	-	-	0.5 U	0.039 U	-	-	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/19/99	18	1 U	10 U	0.5 U	0.22 J	-	-	0.56	0.71 U	-	13.6	6.7	-	810	-	-	-
	5/24/00	14	-	-	0.2 U	0.2 U	-	-	0.25 U	0.5 U	-	13	7.2	-	860	-	-	-
	3/15/01	19.2	-	-	0.2 U	0.2 U	-	-	0.25	0.5 U	-	14	6.3	-	720	-	0.11	-
	3/20/02	19.9	-	-	0.2 U	0.2 U	-	-	0.38	0.5 U	-	13	7.4	-	660	-	0.08	-
	10/16/02	-	-	-	-	-	-	-	-	-	-	14.1	7.0	-	600	-	0.1	-
	4/4/03	13.4	1 U	2	0.2 U	0.2 U	0.15 U	-	0.4	0.5 U	3.8	11.5	7.5	1.12	268	-	16	-
	3/30/04	17.7	-	-	-	-	-	-	-	-	61.5	11.1	5.9	0.39	420	-12	49	89.0
	4/12/05	11.6	-	-	-	-	-	-	-	-	48.8	11.4	6.6	0.07	418	-37	10	48.4
	3/30/06	8.5	-	-	-	-	-	-	-	-	36.2	11.9	6.5	0.3	299	-15	0	43.6
	3/28/07	14.8	-	-	-	-	-	-	-	-	61	10.7	6.6	0.03	367	92	46	68.2
	3/25/08	12.8	-	-	-	-	-	-	-	-	39	10	6.4	1.08	343	-140	62	-
	3/26/09	13.3	-	-	-	-	-	-	-	-	57.5	11.86	6.0	2.4	612	-127	81	46.7
	4/2/10	18.3	-	-	-	-	-	-	-	-	65	10.4	7.6	<0.01	361	-124	77	56.4
	3/31/11	17.3	-	-	-	-	-	-	-	-	61	10.6	6.4	<0.01	322	-152	10	76 J
	3/23/12	14.1	-	-	-	-	-	-	-	-	54	10.5	6.2	<0.01	570	-190	9.2	68.1
	3/15/13	13.6	0.1 U	1.8	0.02 U	0.039	0.2 U	-	0.2	0.25	50	11.46	7.5	0.03	360.1	201	42	79.3
	4/2/14	14.6	-	-	-	-	-	-	-	-	61	11.03	6.7	0.07	417	-118	33.1	76.5
	4/15/15	19.2	-	-	-	-	-	-	-	-	-	11.72	6.5	0.01	410.5	-95	47.3	-
	3/10/16	14.8	-	-	-	0.027	-	-	-	-	-	11.59	6.4	<0.01	421.6	-74	27.6	-
	4/11/17	15.3	-	-	-	-	-	-	-	-	-	11.45	6.5	<0.01	--	-111	26.8	-
	4/17/18	7.31	-	-	-	-	-	-	-	-	-	11.3	6.49	0.16	523	0	57.2	-

**Table 1-3 - Summary of Groundwater Analytical Data**

Well	Date	Arsenic in µg/L	Lead in µg/L	Chromium in µg/L	Benzene in µg/L	Vinyl Chloride in µg/L	Total cPAHs <sup>a</sup> in µg/L	PCP * in µg/L	Diesel in mg/L	Heavy Oil in mg/L	Ferrous Iron <sup>b</sup> in mg/L	Temp. in °C	pH	Diss. Oxygen in mg/L	Cond. in µmhos /cm	Redox Potential in Eh	Turbidity in NTU	TSS in mg/L
CUL:		5	5	80	5	0.4	0.1		1	1	NE	NE	NE	NE	NE	NE	NE	NE
HSAL:		50	50	100	5	2	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
MW-03I	3/27/98	17	-	-	0.5 U	0.13 U	-	-	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/22/98	15	-	-	0.5 U	0.15 J	-	-	0.24 U	0.47 U	-	-	-	-	-	-	-	-
	3/5/99	10	-	-	0.5 U	0.039 U	-	-	0.24 U	0.71 U	-	-	-	-	-	-	-	-
	10/20/99	19	1 U	10 U	0.5 U	0.14 J	-	-	0.34	0.71 U	-	15.7	7.3	-	430	-	-	-
	5/23/00	14	-	-	0.2 U	0.2	-	-	0.25 U	0.5 U	-	13	7.1	-	620	-	-	-
	3/16/01	18	-	-	0.2 U	0.3	-	-	0.25 U	0.5 U	-	14	7.1	-	810	-	0.19	-
	3/25/02	19.4	-	-	0.2 U	0.5	-	-	0.28	0.5 U	-	13	7.4	-	940	-	0.13	-
	10/16/02	-	-	-	-	-	-	-	-	-	-	15.4	6.9	-	410	-	0.08	-
	4/1/03	37.4	1 U	1	0.2 U	0.2 U	0.15 U	-	0.29	0.5 U	5.5	13.2	6.9	0.86	268	-	35	-
	3/30/04	18.2	-	-	0.2 U	0.2 J	-	-	-	-	49.9	13	6.0	0.35	382	-33	19	79.5
	10/20/04	19.4	-	-	-	-	-	-	-	-	50.5	15.4	6.4	0.01	404	-26	1	43.5
	4/12/05	14.9	-	-	-	-	-	-	-	-	50.5	12.8	6.5	0.16	386	-41	0	35.2
	11/2/05	17.5	-	-	-	-	-	-	-	-	49.3	15	6.9	0.36	449	-40	7	30
	3/30/06	12.8	-	-	-	-	-	-	-	-	51.5	13.8	6.3	0.14	316	-11	0	51.4
	3/28/07	12.9	1 U	1 U	0.2 U	0.2 U	0.1 U	0.25 U	0.25 U	0.5 U	46	12.6	5.7	0.1	339	103	0	47.7
	3/25/08	18.6	-	-	-	-	-	-	-	-	37	11.1	6.9	0.8	320	-31	0	-
	3/26/09	13	-	-	-	-	-	-	-	-	48	11.94	5.8	2.11	504	-119	12	27.2
	4/2/10	13.8	-	-	-	-	-	-	-	-	50	11.5	7.4	0.15	320	-92	33	60.5
	3/31/11	14.9	-	-	-	-	-	-	-	-	51	12.2	6.2	0.08	265	-	10	98.8
	3/23/12	14.7	-	-	-	-	-	-	-	-	54.5	12	6.0	<0.01	547	-148	3	45.1
	11/15/12	-	-	-	-	0.029	-	-	-	-	46.2 J	12.9	6.3	2.29	284	-105	2.6	54
	3/14/13	10.9	0.1 U	0.5	0.02 U	0.066	0.2 U	-	0.1 U	0.2 U	52.0	12.35	8.4	<0.01	343	77	7.1	58
	4/2/14	13.2	-	-	-	-	-	-	-	-	56.0	12.53	6.5	0.02	407.5	-100	3.9	33.4
	4/15/15	13.5	-	-	-	-	-	-	-	-	-	12.6	6.4	0.1	388.6	-85	5.6	-
	3/10/16	16.9	-	-	-	0.077	-	-	-	-	-	11.72	6.4	<0.01	385.3	-36	9.2	-
	4/11/17	14.7	-	-	-	-	-	-	-	-	-	12.59	6.3	<0.01	°	-67	8.1	-
	4/17/18	13.9	-	-	-	-	-	-	-	-	-	12.2	6.38	0.14	501	0	30	-

**Table 1-3 - Summary of Groundwater Analytical Data**

Well	Date	Arsenic in µg/L	Lead in µg/L	Chromium in µg/L	Benzene in µg/L	Vinyl Chloride in µg/L	Total cPAHs <sup>a</sup> in µg/L	PCP * in µg/L	Diesel in mg/L	Heavy Oil in mg/L	Ferrous Iron <sup>b</sup> in mg/L	Temp. in °C	pH	Diss. Oxygen in mg/L	Cond. in µmhos /cm	Redox Potential in Eh	Turbidity in NTU	TSS in mg/L
CUL:		5	5	80	5	0.4	0.1		1	1	NE	NE	NE	NE	NE	NE	NE	NE
HSAL:		50	50	100	5	2	NE		NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Stabilized Cell Wells</b>																		
SC-01S	3/25/98	4.4	2.2	10 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/21/98	3.4	1.4	5 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/7/99	4.7	1 U	10 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/19/99	5.8	1 U	10 U	-	-	-	-	-	-	-	17.2	8.2	-	190	-	-	-
	5/24/00	5	1 U	0.5 U	-	-	-	-	-	-	-	13	7.0	-	740	-	-	-
	3/15/01	5.2	1 U	0.5 U	-	-	-	-	-	-	-	13	6.8	-	620	-	0.13	-
	3/20/02	5.8	1 U	0.5 U	-	-	-	-	-	-	-	12	7.2	-	860	-	0.15	-
	10/16/02	-	-	-	-	-	-	-	-	-	-	15.1	7.1	-	610	-	0.11	-
	4/4/03	4.9	1 U	0.5 U	-	-	-	-	-	-	0.6	13.8	8.1	2.6	107	-	26	-
	4/1/04	5.4	-	-	-	-	-	-	-	-	0.043	12.4	8.2	0.19	119	162	13	4.9
	4/12/05	5.1	-	-	-	-	-	-	-	-	0.04 U	12.7	8.0	0.15	123	-42	1	1.9
	3/29/06	4.7	-	-	-	-	-	-	-	-	0.04 U	12.8	7.7	0.32	97	-49	0	1.8
	3/29/07	4.6	-	-	-	-	-	-	-	-	0.04 U	12.9	7.1	0.2	118	93	0	2.9
3/13/13	4.6	0.1 U	1 U	-	-	-	-	-	-	0.046	11.72	8.7	0.09	105.7	70	9.3	3.3	
SC-02S	3/26/98	4.5	1 U	10 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/21/98	4	1 U	5 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/7/99	2.6	1 U	10 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10/19/99	4.7	1 U	10 U	-	-	-	-	-	-	-	16.5	-	-	-	-	-	-
	5/24/00	4	1 U	2 U	-	-	-	-	-	-	-	14	7.1	-	610	-	-	-
	3/15/01	4.1	1 U	2	-	-	-	-	-	-	-	13	6.3	-	810	-	0.17	-
	3/20/02	5.7	1 U	3.9	-	-	-	-	-	-	-	12	6.7	-	790	-	0.13	-
	10/16/02	-	-	-	-	-	-	-	-	-	-	13.4	6.5	-	560	-	0.09	-
	4/4/03	3.2	1 U	2	-	-	-	-	-	-	4.2	13	7.3	1.04	340	-	21	-
	4/1/04	4.9	-	-	-	-	-	-	-	-	36.5	12.7	6.2	0.03	386	66	18	23.2
3/13/13	3.3	0.1 U	2	-	-	-	-	-	-	34.8	12.85	8.6	0.05	361	115	22.5	1.4	

**Notes:**

<sup>a</sup> cPAHs are benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene (WAC 173-340-200). Total cPAH values presented are based on toxicity equivalency quotient (TEQ) calculation.

<sup>b</sup> Ferrous iron collected in October 2002 and April 2003 were field measurements using HACH kit. Other samples were analyzed in the laboratory using EPA Method SM 3500.

<sup>c</sup> Instrument error - no data

\* PCP = Pentachlorophenol

- = Sample not analyzed for specific analyte.

NE = Not established.

J = Estimated value.

U = Not selected at the detection limit noted.

See pages A-3 explanation of data qualifiers.

**Table 1-4 – Groundwater Monitoring Program for Spring 2019**

	Well	2019	
		VOC <sup>a</sup>	Arsenic
<b>Confirmation Lower Sand/Delta Deposits</b>			
	CW-1D		X
	LW-6D		X
	LW-9D	X	X
<b>Confirmation Upper Sand/Aquitard Wells</b>			
	CW-1S	X	X
	LW-9S		X
	MW-3I		X
<b>Stabilized Cell Wells</b>			
	SC-1S		X <sup>b</sup>
	SC-2S		X <sup>b</sup>
<b>Quality Control Samples</b>			
		X	X
<b>Purge Water Samples</b>			
		X	X

<sup>a</sup> VOC is vinyl chloride.

<sup>b</sup> Samples will also be analyzed for lead and total chromium

Water elevations will be measured at approximately 33 wells.

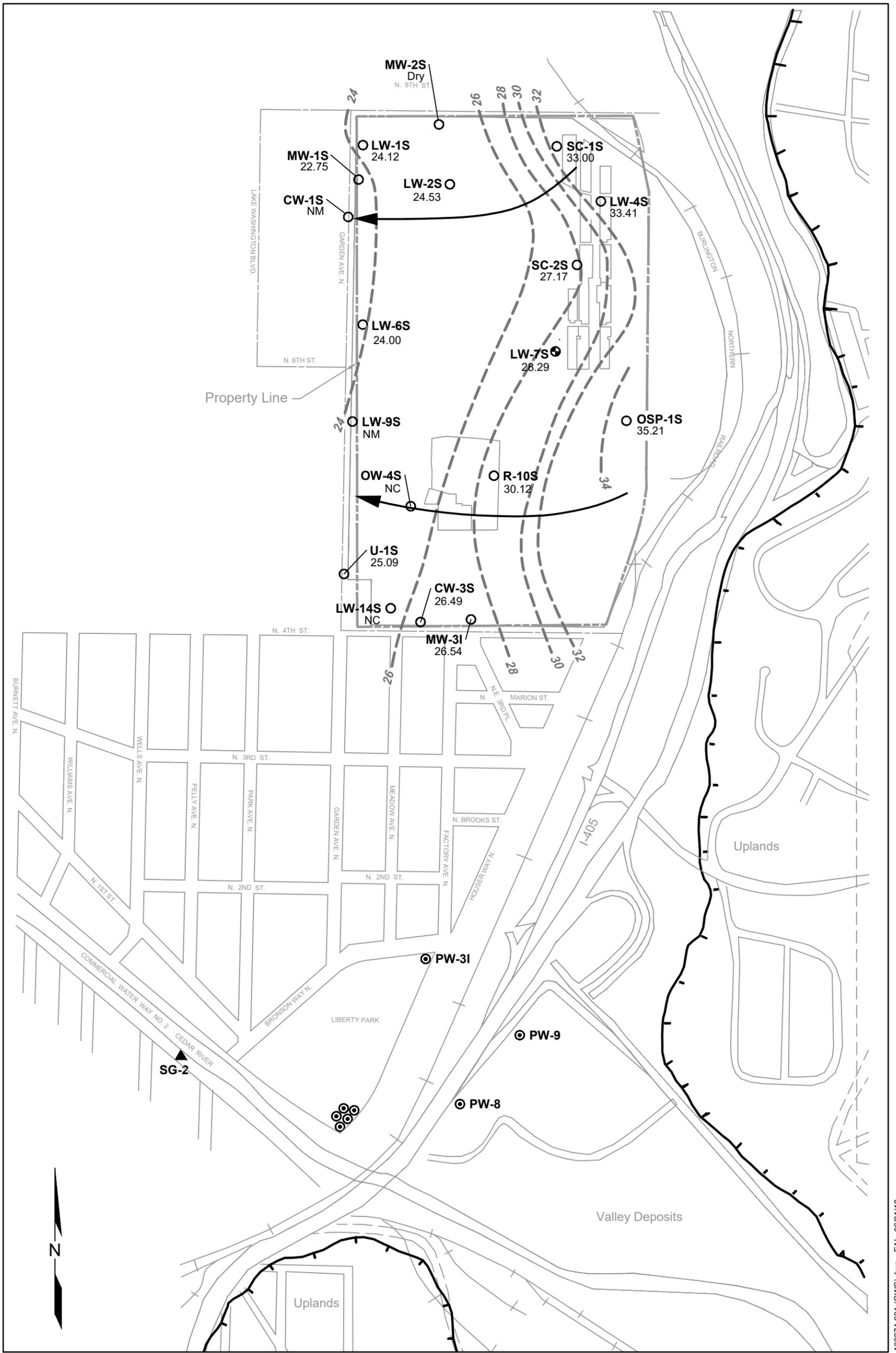
All wells with samples submitted for laboratory analysis will have the following parameters measured:

temperature, pH, conductivity, turbidity, dissolved oxygen, and redox potential.

Purge water samples will be analyzed for VOCs, arsenic, lead, total chromium, and TPH.

# Groundwater Elevation Contour Map

## Shallow Wells - April 2018



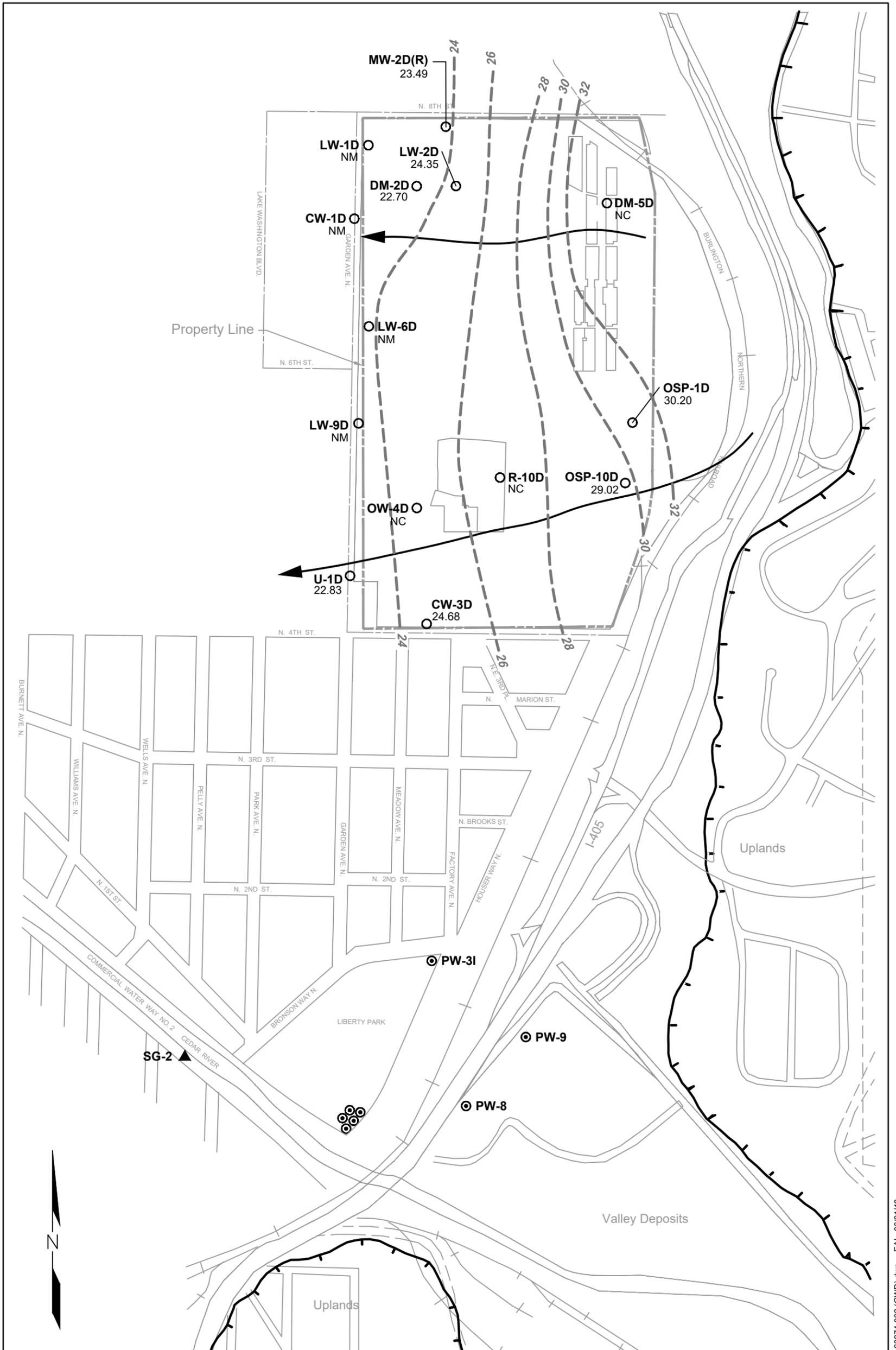
Note: Base map prepared from drawing provided by Dodds Engineering titled "Monitoring Wells PACCAR Renton Site", dated April 10, 1998.



Exploration Location and Number					
LW-7S	Monitoring Well	— 34	Groundwater Elevation Contour in Feet	←	Groundwater Flow Direction
OW-4S	Piezometer	35.83	Groundwater Elevation in Feet	— — —	Upland Boundary
PW-8	City of Renton Production Well	NM	Not Measured		
SG-2	River Staff Gage	NC	Not Calculated		

\*Groundwater elevation for MW-2S was not used in developing contours. See report for details

# Groundwater Elevation Contour Map Lower Sand Unit - April 2018



Note: Base map prepared from drawing provided by Dodds Engineering titled "Monitoring Wells PACCAR Renton Site," dated April 10, 1998.

- |              |                                |              |                                       |  |                            |
|--------------|--------------------------------|--------------|---------------------------------------|--|----------------------------|
| <b>MW-10</b> | Monitoring Well                | <b>24</b>    | Groundwater Elevation Contour in Feet |  | Groundwater Flow Direction |
| <b>OW-4D</b> | Piezometer                     | <b>24.23</b> | Groundwater Elevation in Feet         |  | Upland Boundary            |
| <b>PW-8</b>  | City of Renton Production Well | <b>NM</b>    | Not Measured                          |  |                            |
| <b>SG-2</b>  | River Staff Gage               | <b>NC</b>    | Not Calculated                        |  |                            |

## **SECTION 2**

### **Surface Water Monitoring**

## SECTION 2

# SURFACE WATER MONITORING

This section presents the results of the surface water monitoring event conducted in accordance with the CMIP and the Periodic Review. Samples were collected from five storm sewer manholes on April 18, 2018. Chemical test results are compiled in Table 2-1, and the sampling locations are shown with the generalized storm sewer configuration on Figure 2-1. The data quality review and laboratory report are provided in Appendices B and C, respectively.

The Periodic Review specifies annual surface water monitoring. Surface water monitoring was conducted in April 18, 2018 for metals (total copper, lead and zinc, and hexavalent chromium) at the five locations identified in the CMIP to assess whether any long-term changes are occurring.

The following notes apply to this monitoring event:

- **Off-Site Conditions.** Monitoring point SW-MH was used to evaluate the quality of stormwater generated off site and upstream of the PACCAR site. As summarized in Table 2-1, metal concentrations detected in the sample from SW-MH are higher or similar to those detected in the sample from SW-3, which is the PACCAR property discharge point located downstream of SW-MH (Figure 2-1).
- **Cleanup Level Compliance at SW-5.** The CMIP specifies that water quality from SW-5 will be compared with CULs for compliance purposes. The detected copper (0.00279 mg/L), lead (0.000265 mg/L) and zinc (0.00972 mg/L) concentrations in the sample from SW-5 did not exceed the CULs.

**Table 2-1 – Analytical Results for Surface Water Samples, April 2018**

Sample ID		SW-3	SW-5	SW-6	SW-DP	SW-MD	SW-MH
Sample Date	CUL <sup>a</sup>	4/18/18	4/18/18	4/18/18	4/18/18	4/18/18	4/18/18
<b>Total Metals in mg/L</b>							
Copper	0.007	0.00184	0.00279	0.00431	0.00171	0.00742	0.00314
Hexavalent chromium	0.011	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
Lead	0.001	0.000075 J	0.000265	0.000181	0.000085 J	0.000224	0.000295
Zinc	0.047	0.0123	0.00972	0.00217 J	0.0657	0.0134	0.0151

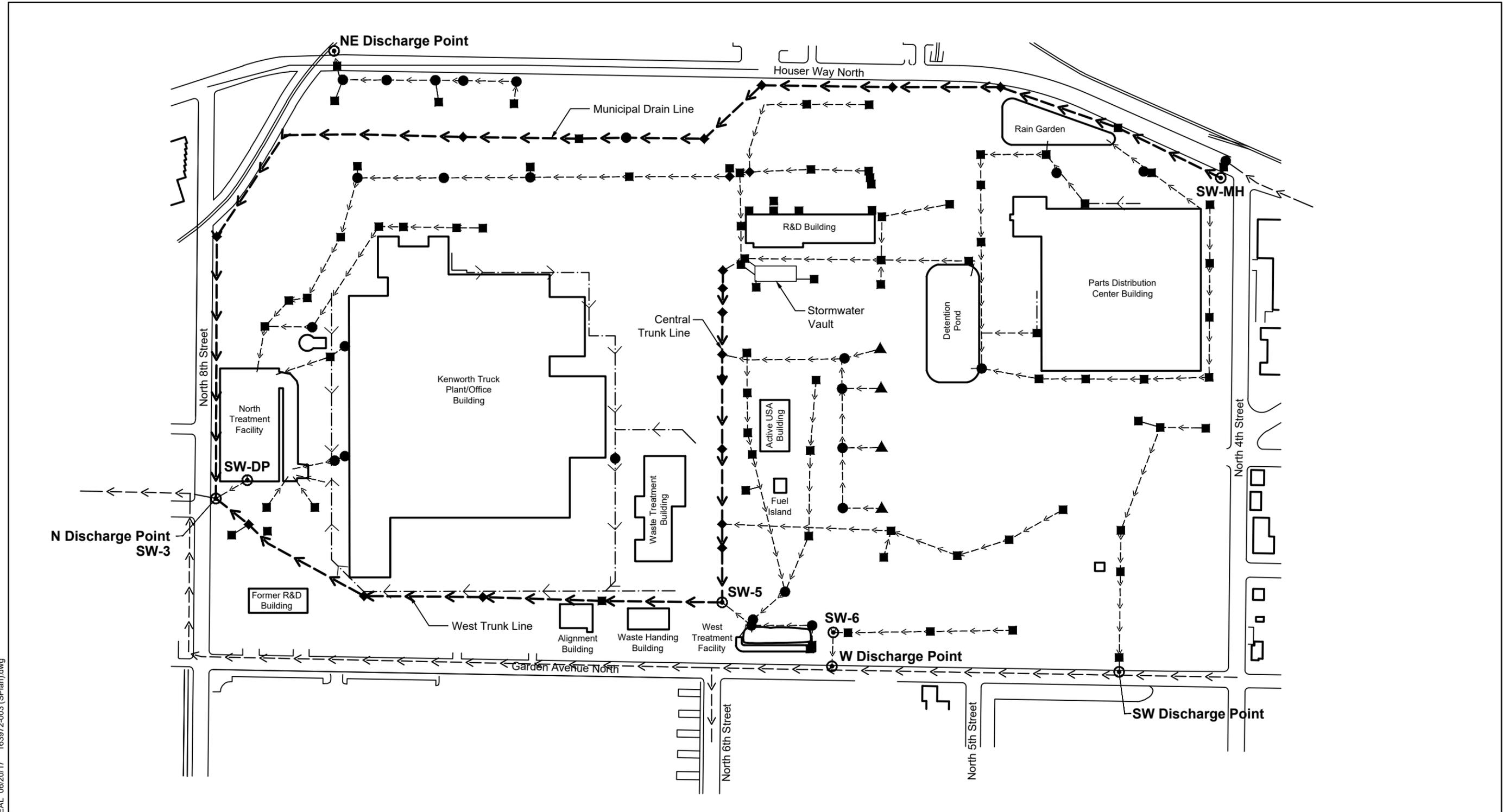
<sup>a</sup> Cleanup levels from CMIP (DOF 1997).

**Notes:**

See page B-3 for definition of data qualifiers.

SW-MD is a duplicate sample of SW-MH.

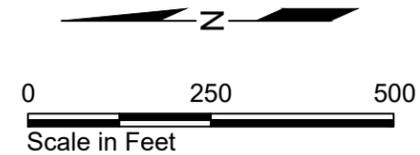
# Surface Water Sampling Location Plan



EAL\_06/20/17 163972-003 (SPlan).dwg

- |  |   |
|--|---|
| ■ Catch Basin                                    | —←— On-Site Storm Drain                           |
| ▲ Grated Drain                                   | - - - - - On-Site Storm Drain                     |
| ● Manhole and Cleanout                           | - - - - - Off-Site Storm Drain Flow and Direction |
| ◆ Square Cover                                   | - - - - - Perimeter Trench Drainage               |
| SW-MH ⊙ Surface Water Sample Location and Number |   |

**Note:**  
Surface drainage system was modified in 2016 due to construction of the Parts Distribution Center building.



**SECTION 3**  
**PACCAR Structural Fill Cover Monitoring**  
**Field Inspection and Observation Form**

## **SECTION 3**

# **PACCAR STRUCTURAL FILL COVER MONITORING FIELD INSPECTION AND OBSERVATION FORM**

The structural fill and pavement covers are monitored annually to document their condition and note areas where repair or maintenance is necessary. An engineer or technician conducted a site walk to observe and document the following:

- Conditions of paved area (settlement, ruts, cracks, other) and
- Disturbance in areas of planted cover (erosion, excavation, vegetation, other).

### **Field Inspection Observations**

Date of Field Inspection: April 18, 2018  
Weather Conditions: Cloudy, Temperature = 50 °F  
Inspection Personnel: Keylin Huddleston  
Staff Environmental Scientist

Construction was completed and a new building and soil stockpiles are present. Areas around the building appear to be in good condition, with no obvious signs of settlement or cracking in asphalt cover. The new stockpile area has a planted cover with good development of grass and show no signs of settlement or erosion.

### **Recommended Actions and Follow-Up**

#### ***Areas Needing Repair***

Review site conditions in the Spring 2019.

#### ***Documentation of Repair Completion***

None.

**APPENDIX A**  
**Data Validation Summary for**  
**Groundwater Samples**

# APPENDIX A

## DATA VALIDATION SUMMARY FOR GROUNDWATER SAMPLES

### Summary of Data Validation Effort

This appendix provides the quality assurance (QA) review of six groundwater samples, one purge water sample, and one field duplicate collected in accordance with the PACCAR CMIP (DOF 1997) and Periodic Review (Ecology 2014) for the Spring 2018 sampling event. The samples were submitted to Analytical Resources, Inc., (ARI) in Tukwila, Washington, for chemical analysis. The laboratory reported results as ARI Job No. 18D0266 (See Appendix C). The samples were analyzed for one or more of the following:

- Diesel and heavy oil by Ecology Method NWTPH-Dx;
- Total metals (arsenic, chromium, and lead) by EPA Method 200.8; and
- Vinyl chloride by EPA Method 8260C-SIM; and volatile organic compounds (VOCs) by EPA Method 8260C.

The laboratory performed ongoing quality assurance/quality control (QA/QC) reviews of laboratory procedures. Hart Crowser performed the data review, using laboratory quality control results summary sheets, to check that the data met data quality objectives for the project. The following criteria were evaluated in the standard data quality review process:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and relative percent differences (RPDs);
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries and RPDs;
- Laboratory and field duplicate RPDs;
- Calibration criteria (if reported); and
- Reporting limits (RL).

### Overall Data Quality

The overall data quality objectives (DQOs) as set forth in the quality assurance project plan (QAPP) were met, and the data for this site are acceptable for use as qualified. The completeness for the associated data is 100 percent. Detailed discussions are presented in the following pages.

### *Quality Assurance Objectives*

**Precision.** Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared with their average values. Precision is generally evaluated using LCS/LCSD, MS/MSD, lab duplicate results,

and field duplicate results. The LCS/LCSD, MS/MSD, and lab duplicate results provide information on laboratory (only) precision, while field duplicates provide information on field and laboratory precision combined.

Analytical precision is generally measured through LCS/LCSD and MS/MSD samples for organic analysis, and through laboratory duplicate samples for metals and other inorganic analysis. Analytical precision is quantitatively expressed as the RPD between the LCS/LCSD, MS/MSD, or laboratory duplicates. Analytical precision measurements were carried out on project groundwater samples at a minimum frequency of one in 20 samples. The analytical precision for all analytes was acceptable.

**Accuracy.** Accuracy measures the closeness of the measured value to the true value. The accuracy of chemical test results was assessed by analyzing standard reference materials or by "spiking" samples with known standards (surrogates, LCS, and/or MS) and measuring the percent recovery.

Accuracy measurements for all fractions were carried out in accordance with method requirements for organic and inorganic analyses and at a minimum frequency of one in 20 samples. The analytical accuracy for analytes was acceptable.

**Completeness.** Completeness is defined as the percentage of measurements made that are judged to be valid measurements. The completeness of the data is the ratio of acceptable data points to the total number of data points (expressed as a percent). The target completeness goal for this work was 100 percent. The completeness of the data for this project was 100 percent.

**Comparability.** Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Because standard techniques were used for both sample collection and laboratory analysis, the data collected from the same sampling locations and depths should be comparable to both internal data and other data generated.

## No Major Problems Encountered

No major problems were encountered.

## Minor Problems Encountered

No problems were encountered.

## Data Qualifier Definitions

The following data qualifiers are used in the text and tables according to a quality assurance review of the laboratory procedures and results:

- U** Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

- UJ** Indicates the compound or analyte was analyzed for and not detected. Because of quality control deficiencies identified during data validation, the value reported may not accurately reflect the sample quantitation limit.
  
- J** Indicates the compound or analyte was analyzed for and detected. The associated value is estimated, but the data are usable for decision making processes.

**Table A-1 – Compilation of Chemical Analytical Data for Groundwater Samples**

Sample ID Sampling Date	Cleanup Level	CW-1D 4/17/2018	CW-1S 4/17/2018	CW-100S 4/17/2018	LW-6D 4/17/2018	LW-9D 4/17/2018	LW-9S 4/17/2018	MW-3I 4/17/2018
<b>Metals in mg/L</b>								
Arsenic	0.005 <sup>a</sup>	0.00516	0.000884	0.000938	0.00918	0.00916	0.00731	0.0139
<b>Volatiles in µg/L</b>								
Vinyl chloride	0.4 <sup>b</sup>		0.0243 J	0.0251 J		0.346 J		

**Notes:**

<sup>a</sup> HSAL for arsenic is 0.05 mg/L.

<sup>b</sup> HSAL for vinyl chloride is 2 µg/L.

Blank indicates sample not analyzed for specific analyte.

See page A-3 for explanation of data qualifiers.

CW-100S is a duplicate sample from CW-1S.

**Table A-2 – Analytical Results for Purge Water**

Sample ID Sampling Date	KW Tank 4/17/2018
<b>Metals in µg/L</b>	
Arsenic	1.82
Chromium	0.5 U
Lead	0.343
<b>TPH in mg/L</b>	
Diesel Range Organics	0.1 U
Lube Oil	0.2 U
<b>Volatiles in µg/L</b>	
1,1,1,2-Tetrachloroethane	0.2 U
1,1,1-Trichloroethane	0.2 U
1,1,2,2-Tetrachloroethane	0.2 U
1,1,2-Trichloroethane	0.2 U
1,1-Dichloroethane	0.2 U
1,1-Dichloroethene	0.2 U
1,1-Dichloropropene	0.2 U
1,2,3-Trichlorobenzene	0.5 U
1,2,3-Trichloropropane	0.5 U
1,2,4-Trichlorobenzene	0.5 U
1,2,4-Trimethylbenzene	0.11 J
1,2-Dibromo-3-Chloropropane	0.5 U
1,2-Dichlorobenzene	0.2 U
1,2-Dichloroethane	0.2 U
1,2-Dichloropropane	0.2 U
1,3,5-Trimethylbenzene	0.2 U
1,3-Dichlorobenzene	0.2 U
1,3-Dichloropropane	0.2 U
1,4-Dichlorobenzene	0.2 U
2,2-Dichloropropane	0.2 U
2-Chloroethyl vinyl ether	1 U
2-Chlorotoluene	0.2 U
2-Hexanone	5 U
2-Pentanone	5 U
4-Chlorotoluene	0.2 U
4-Isopropyl Toluene	0.2 U
Acetone	27.3
Acrolein	5 U
Acrylonitrile	1 U
Benzene	0.2 U
Bromobenzene	0.2 U
Bromochloromethane	0.2 U
Bromoethane	0.2 U
Bromoform	0.2 U
Bromomethane	1 U
Carbon Disulfide	0.2 U
Carbon Tetrachloride	0.2 U
CFC-11	0.2 U
CFC-113	0.2 U
Chlorobenzene	0.2 U
Chlorodibromomethane	0.2 U

Sample ID Sampling Date	KW Tank 4/17/2018
<b>Volatiles in µg/L</b>	
Chloroethane	0.2 U
Chloroform	0.2 U
Chloromethane	0.5 U
Cis-1,2-Dichloroethene	0.2 U
Cis-1,3-Dichloropropene	0.2 U
Dibromomethane	0.2 U
Dichlorobromomethane	0.2 U
Dichlorodifluoromethane	0.2 U
Ethylbenzene	0.06 J
Ethylene Dibromide	0.2 U
Hexachlorobutadiene	0.5 U
Iodomethane	1 U
Isopropyl Benzene	0.2 U
m, p-Xylene	0.16 J
methyl ethyl ketone	5 U
Methyl isobutyl ketone	5 U
Methyl t-butyl ether	0.5 U
Methylene Chloride	1 U
Naphthalene	0.5 U
n-Butylbenzene	0.2 U
n-Propylbenzene	0.2 U
o-Xylene	0.2 U
Sec-Butylbenzene	0.2 U
Styrene	0.2 U
tert-butylbenzene	0.2 U
Tetrachloroethene	0.2 U
Toluene	0.2 U
Total Xylenes	0.16 J
Trans-1,2-Dichloroethene	0.2 U
Trans-1,3-Dichloropropene	0.2 U
Trans-1,4-Dichloro-2-butene	1 U
Trichloroethene	0.07 J
Vinyl Acetate	0.2 U
Vinyl Chloride	0.2 U

See page A-3 for explanation of data qualifiers.

Hart Crowser

**APPENDIX B**  
**Data Validation Summary for**  
**Surface Water Samples**

## **APPENDIX B**

# **DATA VALIDATION SUMMARY FOR SURFACE WATER SAMPLES**

### **Summary of Data Validation Effort**

This appendix provides the quality assurance (QA) review of five surface water samples and one field duplicate, collected in accordance with the PACCAR CMIP (DOF 1997) and Periodic Review (Ecology 2014) for the Spring 2018 sampling event. The samples were submitted to Analytical Resources, Inc., (ARI) in Tukwila, Washington, for chemical analysis. The laboratory reported results as ARI Job No. 18D0282 (See Appendix C). The samples were analyzed for the following:

- Total metals (copper, lead, and zinc) by EPA Method 200.8; and
- Hexavalent chromium by SM 3500-Cr B.

The laboratory performed ongoing quality assurance/quality control (QA/QC) reviews of laboratory procedures. Hart Crowser performed the data review using laboratory quality control results summary sheets to ensure the data met data quality objectives for the project. The following criteria were evaluated in the standard data quality review process:

- Holding times;
- Method blanks;
- Laboratory control sample (LCS) recoveries;
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries and relative percent differences (RPDs);
- Standard reference material (SRM) recoveries;
- Laboratory and field duplicate RPDs; and
- Reporting limits (RL).

### **Overall Data Quality**

The overall data quality objectives (DQOs) as set forth in the quality assurance project plan (QAPP) were met, and the data for this site are acceptable for use as qualified. The completeness for the associated data is 100 percent. Detailed discussions are presented in the following pages.

### ***Quality Assurance Objectives***

**Precision.** Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared with their average values. Precision is generally evaluated using LCS/LCSD, MS/MSD, lab duplicate, and field duplicate results. The LCS/LCSD, MS/MSD, and lab duplicate results provide information on laboratory (only) precision, while field duplicates provide information on field and laboratory precision combined.

Analytical precision is generally measured through LCS/LCSD and MS/MSD samples for organic analysis, and through lab duplicate samples for metals and other inorganic analysis. Analytical precision is quantitatively expressed as the RPD between the MS/MSD or duplicates. Analytical

precision measurements were carried out on project surface water samples at a minimum frequency of one in 20 samples. The analytical precision for all analytes was acceptable or not applicable when the sample and duplicate results were less than five times the RL.

**Accuracy.** Accuracy measures the closeness of the measured value to the true value. The accuracy of chemical test results was assessed by analyzing standard reference materials or by "spiking" samples with known standards (surrogates, LCS, SRM, and/or MS) and measuring the percent recovery.

Accuracy measurements for all fractions were carried out in accordance with method requirements for organic and inorganic analyses and at a minimum frequency of one in 20 samples. The analytical accuracy for all analytes was acceptable.

**Completeness.** Completeness is defined as the percentage of measurements made that are judged to be valid measurements. The completeness of the data is the ratio of acceptable data points to the total number of data points (expressed as a percent). The target completeness goal for this work was 100 percent. The completeness of the data for this project was 100 percent.

**Comparability.** Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Because standard techniques were used for both sample collection and laboratory analysis, the data collected from the same sampling locations and depths should be comparable to both internal and other data generated.

## **No Major Problems Encountered**

No major problems were encountered.

## **Minor Problems Encountered**

No minor problems were encountered.

## **Data Qualifier Definitions**

The following data qualifiers are used in the text and tables according to a quality assurance review of the laboratory procedures and results:

- U** Indicates the compound or analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for sample dilution by the laboratory.
- UJ** Indicates the compound or analyte was analyzed for and not detected. Because of quality control deficiencies identified during data validation, the value reported may not accurately reflect the sample quantitation limit.

**APPENDIX C**  
**LABORATORY REPORT**  
**Analytical Resources, Incorporated**



26 April 2018

Roy Jensen  
Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle, WA 98121

RE: Paccar

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
18D0266	N/A

-----

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



# Sample Custody Record

Samples Shipped to: \_\_\_\_\_

18D0266



Hart Crowser, Inc.  
3131 Elliott Avenue, Suite 600  
Seattle, Washington 98121  
Office: 206.324.9530 • Fax 206.328.5581

JOB <u>1639-74</u> LAB NUMBER _____ PROJECT NAME <u>PACAR 2018 Spring Sampling</u> HART CROWSER CONTACT <u>Roy Jensen</u> SAMPLED BY: <u>Keylin Huddleston</u>						REQUESTED ANALYSIS N W T P H - D X V O C s Total Metals <del>XXXX</del> V O C s <del>XX</del> Total Metal <del>XXXX</del>										NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS			
LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX															
	Purged water		4/17/2018	18:24	water	X	X	X												
	LW-9D			16:00						X	X									
	LW-6D			14:59							X									
	CW-15			13:15						X	X									
	MW-3I			17:07							X									
	CW-100S			13:00						X	X									
	LW-9S			17:37							X									
	CW-1D			12:05							X									
RELINQUISHED BY		DATE	RECEIVED BY		DATE	SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS: * As, Pb, Cr *** Vinyl chloride only *** As only										TOTAL NUMBER OF CONTAINERS				
SIGNATURE		TIME	SIGNATURE		TIME											SAMPLE RECEIPT INFORMATION				
PRINT NAME		TIME	PRINT NAME		TIME											CUSTODY SEALS:				
COMPANY		TIME	COMPANY		TIME											<input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A GOOD CONDITION <input type="checkbox"/> YES <input type="checkbox"/> NO TEMPERATURE _____ SHIPMENT METHOD: <input type="checkbox"/> HAND <input type="checkbox"/> COURIER <input type="checkbox"/> OVERNIGHT				
RELINQUISHED BY		DATE	RECEIVED BY		DATE	COOLER NO.:										STORAGE LOCATION:		TURNAROUND TIME:		
SIGNATURE		TIME	SIGNATURE		TIME	See Lab Work Order No. _____												<input type="checkbox"/> 24 HOURS <input type="checkbox"/> 1 WEEK <input type="checkbox"/> 48 HOURS <input type="checkbox"/> STANDARD <input type="checkbox"/> 72 HOURS    OTHER _____		
PRINT NAME		TIME	PRINT NAME		TIME	for Other Contract Requirements														
COMPANY		TIME	COMPANY		TIME															

White to Lab    Yellow to Project Manager    Pink to Sample Custodian



Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Purged Water	18D0266-01	Water	17-Apr-2018 18:24	17-Apr-2018 19:31
LW-9D	18D0266-02	Water	17-Apr-2018 16:00	17-Apr-2018 19:31
LW-6D	18D0266-03	Water	17-Apr-2018 14:59	17-Apr-2018 19:31
CW-1S	18D0266-04	Water	17-Apr-2018 13:15	17-Apr-2018 19:31
MW-3I	18D0266-05	Water	17-Apr-2018 17:07	17-Apr-2018 19:31
CW-100S	18D0266-06	Water	17-Apr-2018 13:00	17-Apr-2018 19:31
LW-9S	18D0266-07	Water	17-Apr-2018 17:37	17-Apr-2018 19:31
CW-1D	18D0266-08	Water	17-Apr-2018 12:05	17-Apr-2018 19:31



Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

## Case Narrative

### Volatiles - EPA Method SW8260C

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of all associated "Q" flagged analytes which are out of control low in the associated CCAL. All associated samples that contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.

The vials used did not contain air bubbles.

### Volatiles - EPA Method 8260C-SIM (Selected Ion Monitoring)

The sample(s) were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The vials used did not contain air bubbles.

### Total Metals - EPA Method 200.8

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.



Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

The LCS percent recoveries were within control limits.

**Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx**

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



WORK ORDER

18D0266

Client: Hart Crowser

Project Manager: Kelly Bottem

Project: Paccar

Project Number: [none]

**Report To:**

Hart Crowser  
Roy Jensen  
3131 Elliott Ave Suite 600  
Seattle, WA 98121  
Phone: (206) 324-9530  
Fax: -

**Invoice To:**

Hart Crowser  
Accounts Payable  
3131 Elliott Ave Suite 600  
Seattle, WA 98121  
Phone : (206) 324-9530  
Fax: -

Date Due: 02-May-2018 18:00 (10 day TAT)

Received By: Jacob Walter

Date Received: 17-Apr-2018 19:31

Logged In By: Jacob Walter

Date Logged In: 18-Apr-2018 09:29

Samples Received at: 2.2°C

Intact, properly signed and dated custody seals attached to outside of cooler(s).....No	Custody papers included with the cooler.....	Yes
Custody papers properly filled out (in, signed, analyses requested, etc).....Yes	Was a temperature blank included in the cooler.....	No
Was sufficient ice used (if appropriate).....Yes	All bottles sealed in individual plastic bags.....	No
All bottles arrived in good condition (unbroken).....Yes	All bottle labels complete and legible.....	Yes
Number of containers listed on COC match number received.....Yes	Bottle labels and tags agree with COC.....	Yes
Correct bottles used for the requested analyses.....Yes	All VOC vials free of air bubbles.....	No
Analyses/bottles require preservation (attach preservation sheet excluding VOC).....Yes	Sufficient amount of sample sent in each bottle.....	Yes
Sample split at ARI.....No		

**18D0266-01 Purged Water [Water] Sampled 17-Apr-2018 18:24**

8260C VOA	05/02/2018	10	5/1/2018
Met 200.8 - As UCT	05/02/2018	10	10/14/2018
Met 200.8 - Cr	05/02/2018	10	10/14/2018
Met 200.8 - Pb	05/02/2018	10	10/14/2018
TPH NW (Extractables) low level	05/02/2018	10	4/24/2018

**18D0266-02 LW-9D [Water] Sampled 17-Apr-2018 16:00**

8260C-SIM VOC	05/02/2018	10	5/1/2018
Met 200.8 - As UCT	05/02/2018	10	10/14/2018

**18D0266-03 LW-6D [Water] Sampled 17-Apr-2018 14:59**

Met 200.8 - As UCT	05/02/2018	10	10/14/2018
--------------------	------------	----	------------

**18D0266-04 CW-1S [Water] Sampled 17-Apr-2018 13:15**

8260C-SIM VOC	05/02/2018	10	5/1/2018
Met 200.8 - As UCT	05/02/2018	10	10/14/2018

**18D0266-05 MW-3I [Water] Sampled 17-Apr-2018 17:07**

Met 200.8 - As UCT	05/02/2018	10	10/14/2018
--------------------	------------	----	------------

**18D0266-06 CW-100S [Water] Sampled 17-Apr-2018 13:00**

8260C-SIM VOC	05/02/2018	10	5/1/2018
Met 200.8 - As UCT	05/02/2018	10	10/14/2018

**18D0266-07 LW-9S [Water] Sampled 17-Apr-2018 17:37**

Met 200.8 - As UCT	05/02/2018	10	10/14/2018
--------------------	------------	----	------------

**18D0266-08 CW-1D [Water] Sampled 17-Apr-2018 12:05**

Met 200.8 - As UCT	05/02/2018	10	10/14/2018
--------------------	------------	----	------------



WORK ORDER

18D0266

<b>Client:</b> Hart Crowser	<b>Project Manager:</b> Kelly Bottem
<b>Project:</b> Paccar	<b>Project Number:</b> [none]

Preservation Confirmation

Container ID	Container Type	pH	
18D0266-01 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18D0266-01 B	VOA Vial, Clear, 40 mL, HCL		
18D0266-01 C	VOA Vial, Clear, 40 mL, HCL		
18D0266-01 D	VOA Vial, Clear, 40 mL, HCL		
18D0266-01 E	Glass NM, Amber, 500 mL		
18D0266-01 F	Glass NM, Amber, 500 mL		
18D0266-02 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18D0266-02 B	VOA Vial, Clear, 40 mL, HCL	Bubble	
18D0266-02 C	VOA Vial, Clear, 40 mL, HCL	Bubble	
18D0266-02 D	VOA Vial, Clear, 40 mL, HCL	Bubble	
18D0266-03 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18D0266-04 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18D0266-04 B	VOA Vial, Clear, 40 mL, HCL		
18D0266-04 C	VOA Vial, Clear, 40 mL, HCL		
18D0266-04 D	VOA Vial, Clear, 40 mL, HCL		
18D0266-05 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18D0266-06 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18D0266-06 B	VOA Vial, Clear, 40 mL, HCL		
18D0266-06 C	VOA Vial, Clear, 40 mL, HCL		
18D0266-06 D	VOA Vial, Clear, 40 mL, HCL		
18D0266-07 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass
18D0266-08 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass

\_\_\_\_\_  
Preservation Confirmed By *JSB*

\_\_\_\_\_  
Date *04/18/18*



# Cooler Receipt Form

ARI Client: Hart Crouse

Project Name: \_\_\_\_\_

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: 18D0266

Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES  NO

Were custody papers included with the cooler? ..... YES  NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 2.38

Time: 0715

If cooler temperature is out of compliance fill out form 00070F

Cooler Accepted by: JBW Date: 04/17/18 Time: 1931 Temp Gun ID#: 1005206

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? ..... YES  NO

What kind of packing material was used? ... Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper  Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? ..... NA  YES  NO

Were all bottles sealed in individual plastic bags? ..... YES  NO

Did all bottles arrive in good condition (unbroken)? ..... YES  NO

Were all bottle labels complete and legible? ..... YES  NO

Did the number of containers listed on COC match with the number of containers received? ..... YES  NO

Did all bottle labels and tags agree with custody papers? ..... YES  NO

Were all bottles used correct for the requested analyses? ..... YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA  YES  NO

Were all VOC vials free of air bubbles? ..... NA  YES  NO

Was sufficient amount of sample sent in each bottle? ..... YES  NO

Date VOC Trip Blank was made at ARI..... NA

Was Sample Split by ARI :  YES  Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: JBW Date: 04/18/18 Time: 0745

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

LW-90, all vials have air bubbles, lab to determine size, will be marked as preservation sheet

By: JBW Date: 04/18/18

			Small → "sm" (< 2 mm) Peabubbles → "pb" (2 to < 4 mm) Large → "lg" (4 to < 6 mm) Headspace → "hs" (> 6 mm)
--	--	--	---



Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**Purged Water**  
**18D0266-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260C

Sampled: 04/17/2018 18:24

Instrument: NT2

Analyzed: 18-Apr-2018 15:21

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BGD0391 Sample Size: 10 mL  
Prepared: 18-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.09	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.06	0.20	ND	ug/L	U
Bromomethane	74-83-9	1	0.25	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.09	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.04	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.48	5.00	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.04	0.20	ND	ug/L	U
Acetone	67-64-1	1	2.06	5.00	27.3	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.05	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.04	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.23	1.00	ND	ug/L	U
Methylene Chloride	75-09-2	1	0.49	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	0.60	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.04	0.20	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.05	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.07	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.05	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	0.81	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.05	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.04	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.03	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.06	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.04	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.03	0.20	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.04	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.07	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.03	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.05	0.20	0.07	ug/L	J
1,2-Dichloropropane	78-87-5	1	0.04	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.05	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.15	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.25	1.00	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	0.97	5.00	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.06	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.04	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.08	0.20	ND	ug/L	U



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3131 Elliott Ave Suite 600  
Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**Purged Water**  
**18D0266-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260C

Sampled: 04/17/2018 18:24

Instrument: NT2

Analyzed: 18-Apr-2018 15:21

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	0.90	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.13	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.06	0.20	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.05	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.05	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.07	0.20	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.02	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.04	0.20	<b>0.06</b>	ug/L	J
1,1,1,2-Tetrachloroethane	630-20-6	1	0.04	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.05	0.40	<b>0.16</b>	ug/L	J
o-Xylene	95-47-6	1	0.03	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.09	0.60	<b>0.16</b>	ug/L	J
Styrene	100-42-5	1	0.05	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.06	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.06	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.13	0.50	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	0.32	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.02	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.06	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.02	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.02	0.20	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.02	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.03	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.02	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.02	0.20	<b>0.11</b>	ug/L	J
s-Butylbenzene	135-98-8	1	0.02	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.03	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.04	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.04	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.02	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.04	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.37	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.11	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.07	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.12	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.11	0.50	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.05	0.20	ND	ug/L	U
Methyl tert-butyl Ether	1634-04-4	1	0.07	0.50	ND	ug/L	U
2-Pentanone	107-87-9	1	5.00	5.00	ND	ug/L	U



Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**Purged Water**  
**18D0266-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260C

Sampled: 04/17/2018 18:24

Instrument: NT2

Analyzed: 18-Apr-2018 15:21

Analyte	CAS Number	Recovery		Units	Notes
		Limits	Recovery		
Surrogate: 1,2-Dichloroethane-d4		80-129 %	104	%	
Surrogate: Toluene-d8		80-120 %	96.6	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	97.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	103	%	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**Purged Water**  
**18D0266-01 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-Dx

Sampled: 04/17/2018 18:24

Instrument: FID4

Analyzed: 25-Apr-2018 04:04

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BGD0404 Sample Size: 500 mL  
Prepared: 19-Apr-2018 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)		1	0.100	ND	mg/L	U
Motor Oil Range Organics (C24-C38)		1	0.200	ND	mg/L	U
<i>Surrogate: o-Terphenyl</i>			50-150 %	70.5	%	



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Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**Purged Water**  
**18D0266-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8

Sampled: 04/17/2018 18:24

Instrument: ICPMS2

Analyzed: 19-Apr-2018 12:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	1	0.130	0.500	ND	ug/L	U
Lead	7439-92-1	1	0.0680	0.100	<b>0.343</b>	ug/L	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**Purged Water**  
**18D0266-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/17/2018 18:24

Instrument: ICPMS2

Analyzed: 19-Apr-2018 12:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>1.82</b>	ug/L	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**LW-9D**  
**18D0266-02 (Water)**

**Volatile Organic Compounds - SIM**

Method: EPA 8260C-SIM

Sampled: 04/17/2018 16:00

Instrument: NT16

Analyzed: 19-Apr-2018 17:34

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BGD0466 Sample Size: 10 mL  
Prepared: 19-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	<b>346</b>	ng/L	M
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	107	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	95.6	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	96.9	%	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**LW-9D**  
**18D0266-02 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/17/2018 16:00

Instrument: ICPMS2

Analyzed: 19-Apr-2018 14:58

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>9.16</b>	ug/L	



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Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**LW-6D**  
**18D0266-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/17/2018 14:59

Instrument: ICPMS2

Analyzed: 19-Apr-2018 15:02

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>9.18</b>	ug/L	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**CW-1S**  
**18D0266-04 (Water)**

**Volatile Organic Compounds - SIM**

Method: EPA 8260C-SIM

Sampled: 04/17/2018 13:15

Instrument: NT16

Analyzed: 19-Apr-2018 19:21

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BGD0466 Sample Size: 10 mL  
Prepared: 19-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	<b>24.3</b>	ng/L	M
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	96.7	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			75-125 %	96.2	%	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**CW-1S**  
**18D0266-04 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/17/2018 13:15

Instrument: ICPMS2

Analyzed: 19-Apr-2018 15:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>0.884</b>	ug/L	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**MW-3I**  
**18D0266-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/17/2018 17:07

Instrument: ICPMS2

Analyzed: 19-Apr-2018 15:12

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>13.9</b>	ug/L	



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Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**CW-100S**  
**18D0266-06 (Water)**

**Volatile Organic Compounds - SIM**

Method: EPA 8260C-SIM

Sampled: 04/17/2018 13:00

Instrument: NT16

Analyzed: 19-Apr-2018 19:41

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)  
Preparation Batch: BGD0466 Sample Size: 10 mL  
Prepared: 19-Apr-2018 Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	20.0	25.1	ng/L	M
Surrogate: 1,2-Dichloroethane-d4			80-129 %	106	%	
Surrogate: Toluene-d8			80-120 %	96.1	%	
Surrogate: 4-Bromofluorobenzene			75-125 %	97.2	%	



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Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**CW-100S**  
**18D0266-06 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/17/2018 13:00

Instrument: ICPMS2

Analyzed: 19-Apr-2018 15:16

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>0.938</b>	ug/L	



Hart Crowser 3131 Elliott Ave Suite 600 Seattle WA, 98121	Project: Paccar Project Number: [none] Project Manager: Roy Jensen	<b>Reported:</b> 26-Apr-2018 12:02
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**LW-9S**  
**18D0266-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 04/17/2018 17:37

Instrument: ICPMS2 Analyzed: 19-Apr-2018 15:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>7.31</b>	ug/L	



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

**Reported:**  
26-Apr-2018 12:02

**CW-1D**  
**18D0266-08 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/17/2018 12:05

Instrument: ICPMS2

Analyzed: 19-Apr-2018 15:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.0220	0.200	<b>5.16</b>	ug/L	



Hart Crowser  
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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**Volatile Organic Compounds - Quality Control**

**Batch BGD0391 - EPA 5030 (Purge and Trap)**

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0391-BLK2)</b>						Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 09:14					
Chloromethane	ND	0.09	0.50	ug/L							U
Vinyl Chloride	ND	0.06	0.20	ug/L							U
Bromomethane	ND	0.25	1.00	ug/L							U
Chloroethane	ND	0.09	0.20	ug/L							U
Trichlorofluoromethane	ND	0.04	0.20	ug/L							U
Acrolein	ND	2.48	5.00	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.04	0.20	ug/L							U
Acetone	ND	2.06	5.00	ug/L							U
1,1-Dichloroethene	ND	0.05	0.20	ug/L							U
Bromoethane	ND	0.04	0.20	ug/L							U
Iodomethane	ND	0.23	1.00	ug/L							U
Methylene Chloride	ND	0.49	1.00	ug/L							U
Acrylonitrile	ND	0.60	1.00	ug/L							U
Carbon Disulfide	ND	0.04	0.20	ug/L							U
trans-1,2-Dichloroethene	ND	0.05	0.20	ug/L							U
Vinyl Acetate	ND	0.07	0.20	ug/L							U
1,1-Dichloroethane	ND	0.05	0.20	ug/L							U
2-Butanone	ND	0.81	5.00	ug/L							U
2,2-Dichloropropane	ND	0.05	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.04	0.20	ug/L							U
Chloroform	ND	0.03	0.20	ug/L							U
Bromochloromethane	ND	0.06	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.04	0.20	ug/L							U
1,1-Dichloropropene	ND	0.03	0.20	ug/L							U
Carbon tetrachloride	ND	0.04	0.20	ug/L							U
1,2-Dichloroethane	ND	0.07	0.20	ug/L							U
Benzene	ND	0.03	0.20	ug/L							U
Trichloroethene	ND	0.05	0.20	ug/L							U
1,2-Dichloropropane	ND	0.04	0.20	ug/L							U
Bromodichloromethane	ND	0.05	0.20	ug/L							U
Dibromomethane	ND	0.15	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	0.25	1.00	ug/L							U
4-Methyl-2-Pentanone	ND	0.97	5.00	ug/L							U
cis-1,3-Dichloropropene	ND	0.06	0.20	ug/L							U
Toluene	ND	0.04	0.20	ug/L							U



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Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

### Volatile Organic Compounds - Quality Control

#### Batch BGD0391 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0391-BLK2)</b>						Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 09:14					
trans-1,3-Dichloropropene	ND	0.08	0.20	ug/L							U
2-Hexanone	ND	0.90	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.13	0.20	ug/L							U
1,3-Dichloropropane	ND	0.06	0.20	ug/L							U
Tetrachloroethene	ND	0.05	0.20	ug/L							U
Dibromochloromethane	ND	0.05	0.20	ug/L							U
1,2-Dibromoethane	ND	0.07	0.20	ug/L							U
Chlorobenzene	ND	0.02	0.20	ug/L							U
Ethylbenzene	ND	0.04	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.04	0.20	ug/L							U
m,p-Xylene	ND	0.05	0.40	ug/L							U
o-Xylene	ND	0.03	0.20	ug/L							U
Xylenes, total	ND	0.09	0.60	ug/L							U
Styrene	ND	0.05	0.20	ug/L							U
Bromoform	ND	0.06	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.06	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.13	0.50	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	0.32	1.00	ug/L							U
n-Propylbenzene	ND	0.02	0.20	ug/L							U
Bromobenzene	ND	0.06	0.20	ug/L							U
Isopropyl Benzene	ND	0.02	0.20	ug/L							U
2-Chlorotoluene	ND	0.02	0.20	ug/L							U
4-Chlorotoluene	ND	0.02	0.20	ug/L							U
t-Butylbenzene	ND	0.03	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.02	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.02	0.20	ug/L							U
s-Butylbenzene	ND	0.02	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.03	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.04	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.04	0.20	ug/L							U
n-Butylbenzene	0.03	0.02	0.20	ug/L							J
1,2-Dichlorobenzene	ND	0.04	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.37	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.11	0.50	ug/L							U
Hexachloro-1,3-Butadiene	0.08	0.07	0.50	ug/L							J



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### Volatile Organic Compounds - Quality Control

#### Batch BGD0391 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0391-BLK2)</b>											
						Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 09:14					
Naphthalene	ND	0.12	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.11	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.05	0.20	ug/L							U
Methyl tert-butyl Ether	ND	0.07	0.50	ug/L							U
2-Pentanone	ND	5.00	5.00	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.18			ug/L	5.00		104	81-118			
Surrogate: Toluene-d8	4.77			ug/L	5.00		95.4	89-112			
Surrogate: 4-Bromofluorobenzene	4.83			ug/L	5.00		96.5	85-114			
Surrogate: 1,2-Dichlorobenzene-d4	5.07			ug/L	5.00		101	80-120			

#### LCS (BGD0391-BS2)

Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 07:52

Chloromethane	7.35			ug/L	10.0		73.5	60-138			Q
Vinyl Chloride	8.91			ug/L	10.0		89.1	66-133			
Bromomethane	9.32			ug/L	10.0		93.2	72-131			
Chloroethane	12.0			ug/L	10.0		120	60-155			
Trichlorofluoromethane	9.47			ug/L	10.0		94.7	80-129			
Acrolein	46.0			ug/L	50.0		92.0	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.9			ug/L	10.0		109	76-129			
Acetone	43.0			ug/L	50.0		86.0	58-142			
1,1-Dichloroethene	9.90			ug/L	10.0		99.0	71-131			
Bromoethane	8.99			ug/L	10.0		89.9	78-128			
Iodomethane	10.4			ug/L	10.0		104	56-147			
Methylene Chloride	9.09			ug/L	10.0		90.9	65-135			
Acrylonitrile	8.79			ug/L	10.0		87.9	64-134			
Carbon Disulfide	9.33			ug/L	10.0		93.3	78-125			
trans-1,2-Dichloroethene	9.44			ug/L	10.0		94.4	78-128			
Vinyl Acetate	8.72			ug/L	10.0		87.2	55-138			
1,1-Dichloroethane	10.1			ug/L	10.0		101	76-124			
2-Butanone	44.5			ug/L	50.0		89.1	61-140			
2,2-Dichloropropane	9.15			ug/L	10.0		91.5	78-125			
cis-1,2-Dichloroethene	9.55			ug/L	10.0		95.5	80-121			
Chloroform	10.3			ug/L	10.0		103	80-122			
Bromochloromethane	10.3			ug/L	10.0		103	80-121			
1,1,1-Trichloroethane	10.2			ug/L	10.0		102	79-123			
1,1-Dichloropropene	10.5			ug/L	10.0		105	80-120			



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### Volatile Organic Compounds - Quality Control

#### Batch BGD0391 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BGD0391-BS2)</b>											
						Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 07:52					
Carbon tetrachloride	10.0			ug/L	10.0		100	53-137			
1,2-Dichloroethane	10.8			ug/L	10.0		108	75-123			
Benzene	9.99			ug/L	10.0		99.9	80-120			
Trichloroethene	10.5			ug/L	10.0		105	80-120			
1,2-Dichloropropane	9.73			ug/L	10.0		97.3	80-120			
Bromodichloromethane	10.2			ug/L	10.0		102	80-121			
Dibromomethane	10.1			ug/L	10.0		101	80-120			
2-Chloroethyl vinyl ether	9.32			ug/L	10.0		93.2	74-127			
4-Methyl-2-Pentanone	47.2			ug/L	50.0		94.5	67-133			
cis-1,3-Dichloropropene	9.78			ug/L	10.0		97.8	80-124			
Toluene	9.68			ug/L	10.0		96.8	80-120			
trans-1,3-Dichloropropene	10.1			ug/L	10.0		101	71-127			
2-Hexanone	44.5			ug/L	50.0		88.9	69-133			
1,1,2-Trichloroethane	10.0			ug/L	10.0		100	80-119			
1,3-Dichloropropane	9.93			ug/L	10.0		99.3	80-120			
Tetrachloroethene	10.3			ug/L	10.0		103	80-120			
Dibromochloromethane	10.1			ug/L	10.0		101	65-135			
1,2-Dibromoethane	10.1			ug/L	10.0		101	80-121			
Chlorobenzene	10.1			ug/L	10.0		101	80-120			
Ethylbenzene	10.0			ug/L	10.0		100	80-120			
1,1,1,2-Tetrachloroethane	9.83			ug/L	10.0		98.3	80-120			
m,p-Xylene	20.6			ug/L	20.0		103	80-121			
o-Xylene	10.0			ug/L	10.0		100	80-121			
Xylenes, total	30.6			ug/L	30.0		102	76-127			
Styrene	10.4			ug/L	10.0		104	80-124			
Bromoform	9.48			ug/L	10.0		94.8	51-134			
1,1,1,2,2-Tetrachloroethane	9.28			ug/L	10.0		92.8	77-123			
1,2,3-Trichloropropane	9.67			ug/L	10.0		96.7	76-125			
trans-1,4-Dichloro 2-Butene	8.38			ug/L	10.0		83.8	55-129			
n-Propylbenzene	10.3			ug/L	10.0		103	78-130			
Bromobenzene	10.1			ug/L	10.0		101	80-120			
Isopropyl Benzene	10.1			ug/L	10.0		101	80-128			
2-Chlorotoluene	9.93			ug/L	10.0		99.3	78-122			
4-Chlorotoluene	10.2			ug/L	10.0		102	80-121			
t-Butylbenzene	10.0			ug/L	10.0		100	78-125			



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**Volatile Organic Compounds - Quality Control**

**Batch BGD0391 - EPA 5030 (Purge and Trap)**

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BGD0391-BS2)</b>											
						Prepared: 18-Apr-2018	Analyzed: 18-Apr-2018 07:52				
1,3,5-Trimethylbenzene	10.2			ug/L	10.0		102	80-129			
1,2,4-Trimethylbenzene	10.2			ug/L	10.0		102	80-127			
s-Butylbenzene	10.3			ug/L	10.0		103	78-129			
4-Isopropyl Toluene	10.5			ug/L	10.0		105	79-130			
1,3-Dichlorobenzene	10.5			ug/L	10.0		105	80-120			
1,4-Dichlorobenzene	10.1			ug/L	10.0		101	80-120			
n-Butylbenzene	10.7			ug/L	10.0		107	74-129			
1,2-Dichlorobenzene	9.92			ug/L	10.0		99.2	80-120			
1,2-Dibromo-3-chloropropane	9.25			ug/L	10.0		92.5	62-123			
1,2,4-Trichlorobenzene	10.7			ug/L	10.0		107	64-124			
Hexachloro-1,3-Butadiene	10.5			ug/L	10.0		105	58-123			
Naphthalene	9.52			ug/L	10.0		95.2	50-134			
1,2,3-Trichlorobenzene	10.5			ug/L	10.0		105	49-133			
Dichlorodifluoromethane	9.05			ug/L	10.0		90.5	48-147			
Methyl tert-butyl Ether	9.27			ug/L	10.0		92.7	71-132			
2-Pentanone	45.4			ug/L	50.0		90.9	69-134			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.17			ug/L	5.00		103	81-118			
<i>Surrogate: Toluene-d8</i>	4.91			ug/L	5.00		98.2	89-112			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.19			ug/L	5.00		104	85-114			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.94			ug/L	5.00		98.8	80-120			

<b>LCS Dup (BGD0391-BSD2)</b>											
						Prepared: 18-Apr-2018	Analyzed: 18-Apr-2018 08:33				
Chloromethane	8.11			ug/L	10.0		81.1	60-138	9.84	30	Q
Vinyl Chloride	9.48			ug/L	10.0		94.8	66-133	6.21	20	
Bromomethane	9.66			ug/L	10.0		96.6	72-131	3.59	30	
Chloroethane	12.4			ug/L	10.0		124	60-155	2.99	30	
Trichlorofluoromethane	9.89			ug/L	10.0		98.9	80-129	4.32	30	
Acrolein	48.7			ug/L	50.0		97.3	52-144	5.58	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	11.4			ug/L	10.0		114	76-129	4.68	30	
Acetone	46.0			ug/L	50.0		92.0	58-142	6.73	30	
1,1-Dichloroethene	10.4			ug/L	10.0		104	71-131	4.51	20	
Bromoethane	9.88			ug/L	10.0		98.8	78-128	9.44	30	
Iodomethane	10.8			ug/L	10.0		108	56-147	4.06	30	
Methylene Chloride	9.48			ug/L	10.0		94.8	65-135	4.28	30	
Acrylonitrile	8.91			ug/L	10.0		89.1	64-134	1.35	30	



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Project: Paccar  
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Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**Volatile Organic Compounds - Quality Control**

**Batch BGD0391 - EPA 5030 (Purge and Trap)**

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BGD0391-BSD2)</b>					Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 08:33						
Carbon Disulfide	9.64			ug/L	10.0		96.4	78-125	3.24	30	
trans-1,2-Dichloroethene	9.76			ug/L	10.0		97.6	78-128	3.37	30	
Vinyl Acetate	9.47			ug/L	10.0		94.7	55-138	8.21	30	
1,1-Dichloroethane	10.7			ug/L	10.0		107	76-124	6.12	30	
2-Butanone	47.7			ug/L	50.0		95.3	61-140	6.79	30	
2,2-Dichloropropane	9.19			ug/L	10.0		91.9	78-125	0.40	30	
cis-1,2-Dichloroethene	9.95			ug/L	10.0		99.5	80-121	4.08	30	
Chloroform	10.8			ug/L	10.0		108	80-122	4.26	30	
Bromochloromethane	10.9			ug/L	10.0		109	80-121	6.08	30	
1,1,1-Trichloroethane	10.4			ug/L	10.0		104	79-123	1.66	30	
1,1-Dichloropropene	10.5			ug/L	10.0		105	80-120	0.21	30	
Carbon tetrachloride	9.91			ug/L	10.0		99.1	53-137	0.90	30	
1,2-Dichloroethane	10.8			ug/L	10.0		108	75-123	0.00		
Benzene	10.3			ug/L	10.0		103	80-120	3.00	20	
Trichloroethene	10.6			ug/L	10.0		106	80-120	0.94	30	
1,2-Dichloropropane	10.1			ug/L	10.0		101	80-120	4.04	20	
Bromodichloromethane	10.3			ug/L	10.0		103	80-121	0.36	30	
Dibromomethane	10.2			ug/L	10.0		102	80-120	1.48	30	
2-Chloroethyl vinyl ether	9.68			ug/L	10.0		96.8	74-127	3.82	30	
4-Methyl-2-Pentanone	49.7			ug/L	50.0		99.3	67-133	4.96	30	
cis-1,3-Dichloropropene	10.1			ug/L	10.0		101	80-124	3.39	30	
Toluene	9.94			ug/L	10.0		99.4	80-120	2.63	20	
trans-1,3-Dichloropropene	10.2			ug/L	10.0		102	71-127	0.99	30	
2-Hexanone	46.5			ug/L	50.0		92.9	69-133	4.42	30	
1,1,2-Trichloroethane	10.2			ug/L	10.0		102	80-119	1.99	20	
1,3-Dichloropropane	10.1			ug/L	10.0		101	80-120	1.69	30	
Tetrachloroethene	10.5			ug/L	10.0		105	80-120	1.48	30	
Dibromochloromethane	10.4			ug/L	10.0		104	65-135	2.77	30	
1,2-Dibromoethane	10.3			ug/L	10.0		103	80-121	1.90	20	
Chlorobenzene	10.2			ug/L	10.0		102	80-120	1.56	30	
Ethylbenzene	10.0			ug/L	10.0		100	80-120	0.12	20	
1,1,1,2-Tetrachloroethane	9.74			ug/L	10.0		97.4	80-120	0.92	30	
m,p-Xylene	20.6			ug/L	20.0		103	80-121	0.07	20	
o-Xylene	10.0			ug/L	10.0		100	80-121	0.05	20	
Xylenes, total	30.6			ug/L	30.0		102	76-127	0.07	30	



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Project Number: [none]  
Project Manager: Roy Jensen

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### Volatile Organic Compounds - Quality Control

#### Batch BGD0391 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BGD0391-BSD2)</b>					Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 08:33						
Styrene	10.4			ug/L	10.0		104	80-124	0.03	30	
Bromoform	9.89			ug/L	10.0		98.9	51-134	4.25	30	
1,1,2,2-Tetrachloroethane	9.72			ug/L	10.0		97.2	77-123	4.64	30	
1,2,3-Trichloropropane	10.0			ug/L	10.0		100	76-125	3.47	30	
trans-1,4-Dichloro 2-Butene	8.65			ug/L	10.0		86.5	55-129	3.19	30	
n-Propylbenzene	10.4			ug/L	10.0		104	78-130	0.26	30	
Bromobenzene	10.2			ug/L	10.0		102	80-120	1.00	30	
Isopropyl Benzene	10.1			ug/L	10.0		101	80-128	0.03	30	
2-Chlorotoluene	10.0			ug/L	10.0		100	78-122	1.01	30	
4-Chlorotoluene	10.3			ug/L	10.0		103	80-121	0.55	30	
t-Butylbenzene	10.1			ug/L	10.0		101	78-125	0.98	30	
1,3,5-Trimethylbenzene	10.3			ug/L	10.0		103	80-129	0.49	30	
1,2,4-Trimethylbenzene	10.4			ug/L	10.0		104	80-127	1.67	30	
s-Butylbenzene	10.3			ug/L	10.0		103	78-129	0.21	30	
4-Isopropyl Toluene	10.7			ug/L	10.0		107	79-130	1.05	30	
1,3-Dichlorobenzene	10.4			ug/L	10.0		104	80-120	0.53	30	
1,4-Dichlorobenzene	10.1			ug/L	10.0		101	80-120	0.02	30	
n-Butylbenzene	10.6			ug/L	10.0		106	74-129	1.29	30	
1,2-Dichlorobenzene	10.1			ug/L	10.0		101	80-120	1.92	30	
1,2-Dibromo-3-chloropropane	9.78			ug/L	10.0		97.8	62-123	5.59	30	
1,2,4-Trichlorobenzene	10.7			ug/L	10.0		107	64-124	0.47	30	
Hexachloro-1,3-Butadiene	10.5			ug/L	10.0		105	58-123	0.21	30	
Naphthalene	9.91			ug/L	10.0		99.1	50-134	4.02	30	
1,2,3-Trichlorobenzene	10.7			ug/L	10.0		107	49-133	1.83	30	
Dichlorodifluoromethane	9.09			ug/L	10.0		90.9	48-147	0.45	30	
Methyl tert-butyl Ether	9.59			ug/L	10.0		95.9	71-132	3.36	30	
2-Pentanone	49.3			ug/L	50.0		98.7	69-134	8.23	30	
Surrogate: 1,2-Dichloroethane-d4	5.24			ug/L	5.00		105	81-118			
Surrogate: Toluene-d8	4.94			ug/L	5.00		98.8	89-112			
Surrogate: 4-Bromofluorobenzene	5.03			ug/L	5.00		101	85-114			
Surrogate: 1,2-Dichlorobenzene-d4	5.03			ug/L	5.00		101	80-120			



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Seattle WA, 98121

Project: Paccar  
Project Number: [none]  
Project Manager: Roy Jensen

Reported:  
26-Apr-2018 12:02

**Volatile Organic Compounds - SIM - Quality Control**

**Batch BGD0466 - EPA 5030 (Purge and Trap)**

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0466-BLK1)</b>		Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 15:00								
Vinyl chloride	ND	20.0	ng/L							U
Surrogate: 1,2-Dichloroethane-d4	4910		ng/L	5000		98.2	80-129			
Surrogate: Toluene-d8	5020		ng/L	5000		100	80-120			
Surrogate: 4-Bromofluorobenzene	4870		ng/L	5000		97.3	75-125			
<b>LCS (BGD0466-BS1)</b>		Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 14:03								
Vinyl chloride	1850	20.0	ng/L	2000		92.7	76-120			
Surrogate: 1,2-Dichloroethane-d4	4860		ng/L	5000		97.2	80-129			
Surrogate: Toluene-d8	5060		ng/L	5000		101	80-120			
Surrogate: 4-Bromofluorobenzene	4980		ng/L	5000		99.5	75-125			
<b>LCS Dup (BGD0466-BSD1)</b>		Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 14:39								
Vinyl chloride	1800	20.0	ng/L	2000		89.8	76-120	3.19	30	
Surrogate: 1,2-Dichloroethane-d4	4840		ng/L	5000		96.9	80-129			
Surrogate: Toluene-d8	5060		ng/L	5000		101	80-120			
Surrogate: 4-Bromofluorobenzene	5010		ng/L	5000		100	75-125			



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Reported:  
26-Apr-2018 12:02

**Petroleum Hydrocarbons - Quality Control**

**Batch BGD0404 - EPA 3510C SepF**

Instrument: FID4 Analyst: JGR

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0404-BLK1)</b>		Prepared: 19-Apr-2018 Analyzed: 25-Apr-2018 00:56								
Diesel Range Organics (C12-C24)	ND	0.100	mg/L							U
Motor Oil Range Organics (C24-C38)	ND	0.200	mg/L							U
Surrogate: <i>o</i> -Terphenyl	0.433		mg/L	0.450		96.3	50-150			
<b>LCS (BGD0404-BS1)</b>		Prepared: 19-Apr-2018 Analyzed: 25-Apr-2018 01:16								
Diesel Range Organics (C12-C24)	2.66	0.100	mg/L	3.00		88.7	56-120			
Surrogate: <i>o</i> -Terphenyl	0.404		mg/L	0.450		89.8	50-150			



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Reported:  
26-Apr-2018 12:02

**Metals and Metallic Compounds - Quality Control**

**Batch BGD0434 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix**

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0434-BLK1)</b>						Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 11:57						
Chromium	52	ND	0.130	0.500	ug/L							U
Chromium	53	ND	0.0700	0.500	ug/L							U
Lead	208	ND	0.0680	0.100	ug/L							U
Arsenic	75a	ND	0.0220	0.200	ug/L							U
<b>LCS (BGD0434-BS1)</b>						Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 12:30						
Chromium	52	28.2	0.130	0.500	ug/L	25.0		113	80-120			
Chromium	53	27.7	0.0700	0.500	ug/L	25.0		111	80-120			
Lead	208	27.0	0.0680	0.100	ug/L	25.0		108	80-120			
Arsenic	75a	26.4	0.0220	0.200	ug/L	25.0		105	80-120			
<b>Duplicate (BGD0434-DUP1)</b>						Source: 18D0266-01 Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 12:16						
Chromium	52	ND	0.130	0.500	ug/L		ND					U
Lead	208	0.351	0.0680	0.100	ug/L		0.343			2.31	20	
Arsenic	75a	1.83	0.0220	0.200	ug/L		1.82			0.77	20	
<b>Matrix Spike (BGD0434-MS1)</b>						Source: 18D0266-01 Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 12:25						
Chromium	52	23.3	0.130	0.500	ug/L	25.0	ND	93.1	75-125			
Lead	208	26.7	0.0680	0.100	ug/L	25.0	0.343	105	75-125			
Arsenic	75a	28.0	0.0220	0.200	ug/L	25.0	1.82	105	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 200.8 in Water</b>	
Chromium-52	NELAP,WADOE,WA-DW,DoD-ELAP
Chromium-53	NELAP,WADOE,WA-DW,DoD-ELAP
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 200.8 UCT-KED in Water</b>	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 8260C in Water</b>	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

**EPA 8260C-SIM in Water**

Acrylonitrile	NELAP,CALAP,WADOE
Vinyl chloride	NELAP,CALAP,WADOE
1,1-Dichloroethene	NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	NELAP,CALAP,WADOE
Trichloroethene	NELAP,CALAP,WADOE
Tetrachloroethene	NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,CALAP,WADOE
1,2-Dichloroethane	NELAP,CALAP,WADOE
Benzene	NELAP,CALAP,WADOE

**NWTPH-Dx in Water**

Diesel Range Organics (C12-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C25)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C24)	DoD-ELAP,NELAP,WADOE
Diesel Range Organics (C10-C28)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C38)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C25-C36)	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-C40)	DoD-ELAP,NELAP,WADOE
Mineral Spirits Range Organics (Tol-C12)	DoD-ELAP,NELAP,WADOE
Mineral Oil Range Organics (C16-C28)	DoD-ELAP,NELAP,WADOE
Kerosene Range Organics (Tol-C18)	DoD-ELAP,NELAP,WADOE
JP8 Range Organics (C8-C18)	DoD-ELAP,NELAP,WADOE
JP5 Range Organics (C10-C16)	DoD-ELAP,NELAP,WADOE
JP4 Range Organics (Tol-C14)	DoD-ELAP,NELAP,WADOE
Jet-A Range Organics (C10-C18)	DoD-ELAP,NELAP,WADOE
Creosote Range Organics (C12-C22)	DoD-ELAP,NELAP,WADOE
Bunker C Range Organics (C10-C38)	DoD-ELAP,NELAP,WADOE
Stoddard Range Organics (C8-C12)	DoD-ELAP,NELAP,WADOE
Transformer Oil Range Organics (C12-C28)	DoD-ELAP,NELAP,WADOE



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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



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Project: Paccar  
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### Notes and Definitions

- \* Flagged value is not within established control limits.
- D The reported value is from a dilution
- E The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
- H Hold time violation - Hold time was exceeded.
- J Estimated concentration value detected below the reporting limit.
- M Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- U This analyte is not detected above the applicable reporting or detection limit.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

30 April 2018

Roy Jensen  
Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle, WA 98121

RE: Paccar

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
18D0282	N/A

----

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.



*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



# Sample Custody Record

Samples Shipped to: \_\_\_\_\_



Hart Crowser, Inc.  
 3131 Elliott Avenue, Suite 600  
 Seattle, Washington 98121  
 Office: 206.324.9530 • Fax 206.328.5581

JOB <u>1639-74</u> LAB NUMBER _____ PROJECT NAME <u>PACCAR</u> HART CROWSER CONTACT <u>Roy Jensen</u> SAMPLED BY: <u>Keylin Huddleston</u>						REQUESTED ANALYSIS Cr 6 Total Metals *										NO. OF CONTAINERS	OBSERVATIONS/COMMENTS/ COMPOSITING INSTRUCTIONS			
LAB NO.	SAMPLE ID	DESCRIPTION	DATE	TIME	MATRIX															
	SW-6		4/18/18	14:14	Water	x	x													2
	SW-MD			13:30		x	x													2
	SW-DP			11:14		x	x													2
	SW-5			08:10		x	x													2
	SW-MH			13:31		x	x													2
	SW-3			12:45		x	x													2
RELINQUISHED BY		DATE	RECEIVED BY		DATE	SPECIAL SHIPMENT HANDLING OR STORAGE REQUIREMENTS:										TOTAL NUMBER OF CONTAINERS				
SIGNATURE <u>Keylin Huddleston</u> PRINT NAME <u>Keylin Huddleston</u> COMPANY <u>Hart Crowser</u>		DATE <u>4/18/2018</u> TIME <u>15:20</u>	SIGNATURE <u>Brendon Fisk</u> PRINT NAME <u>ARL</u> COMPANY _____		DATE <u>4/19/18</u> TIME <u>1520</u>	* Cu, Pb, Zn										SAMPLE RECEIPT INFORMATION CUSTODY SEALS: <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A GOOD CONDITION <input type="checkbox"/> YES <input type="checkbox"/> NO TEMPERATURE _____ SHIPMENT METHOD: <input type="checkbox"/> HAND <input type="checkbox"/> COURIER <input type="checkbox"/> OVERNIGHT				
RELINQUISHED BY		DATE	RECEIVED BY		DATE	COOLER NO.:					STORAGE LOCATION:					TURNAROUND TIME:				
SIGNATURE		TIME	SIGNATURE		TIME	See Lab Work Order No. _____ for Other Contract Requirements										<input type="checkbox"/> 24 HOURS <input type="checkbox"/> 1 WEEK <input type="checkbox"/> 48 HOURS <input type="checkbox"/> STANDARD <input type="checkbox"/> 72 HOURS    OTHER _____				
PRINT NAME			PRINT NAME																	
COMPANY			COMPANY																	



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Seattle WA, 98121

Project: Paccar  
Project Number: 1639-74  
Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-6	18D0282-01	Water	18-Apr-2018 14:14	18-Apr-2018 15:20
SW-MD	18D0282-02	Water	18-Apr-2018 13:30	18-Apr-2018 15:20
SW-DP	18D0282-03	Water	18-Apr-2018 11:14	18-Apr-2018 15:20
SW-5	18D0282-04	Water	18-Apr-2018 08:10	18-Apr-2018 15:20
SW-MH	18D0282-05	Water	18-Apr-2018 13:31	18-Apr-2018 15:20
SW-3	18D0282-06	Water	18-Apr-2018 12:45	18-Apr-2018 15:20



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Reported:  
30-Apr-2018 15:38

## Case Narrative

### Total Metals - EPA Method 200.8

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

### Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



WORK ORDER

18D0282

Client: Hart Crowser	Project Manager: Kelly Bottem
Project: Paccar	Project Number: 1639-74

Preservation Confirmation

Container ID	Container Type	pH
18D0282-01 A	HDPE NM, 500 mL	
18D0282-01 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
18D0282-02 A	HDPE NM, 500 mL	
18D0282-02 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
18D0282-03 A	HDPE NM, 500 mL	
18D0282-03 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
18D0282-04 A	HDPE NM, 500 mL	
18D0282-04 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
18D0282-05 A	HDPE NM, 500 mL	
18D0282-05 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass
18D0282-06 A	HDPE NM, 500 mL	
18D0282-06 B	HDPE NM, 500 mL, 1:1 HNO3	L2 pass

SEF  
Preservation Confirmed By

4/18/18  
Date



# Cooler Receipt Form

ARI Client: Hart Crowser

Project Name: PACCAR

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: 10170282

Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)  
Time: 1520 5.1

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 7002565

Cooler Accepted by: BF Date: 4/18/18 Time: 1520

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: \_\_\_\_\_ NA

Was Sample Split by ARI : NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

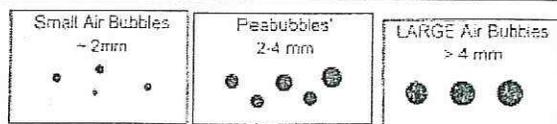
Samples Logged by: SEF Date: 4/18/18 Time: 1539

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
<u>SW-3</u>	<u>SW-5</u>		

**Additional Notes, Discrepancies, & Resolutions:**

SW-6 Metals bottle sample time 1415, SW-MD Hex bottle sample time 1336 Metals bottle sample time 1332, SW-DA Metals bottle sample time 1113, SW-5 Hex bottle sample time 812, By: SEF Date: 4/18/18 Metals bottle SW-5 (SW-3 on label) sample



Small → "sm" (< 2 mm)  
Peabubbles → "pb" (2 to < 4 mm)  
Large → "lg" (4 to < 6 mm)  
Headspace → "hs" (> 6 mm)

time 813, SW-MH Metals bottle sample time 1335,

3/2/10 SW-3 Metals bottle sample time 1246



Hart Crowser  
3131 Elliott Ave Suite 600  
Seattle WA, 98121

Project: Paccar  
Project Number: 1639-74  
Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-6**  
**18D0282-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8

Sampled: 04/18/2018 14:14

Instrument: ICPMS2

Analyzed: 19-Apr-2018 15:58

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0680	0.100	<b>0.181</b>	ug/L	



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Reported:  
30-Apr-2018 15:38

**SW-6**  
**18D0282-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/18/2018 14:14

Instrument: ICPMS2

Analyzed: 19-Apr-2018 15:58

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Copper	7440-50-8	1	0.340	0.500	<b>4.31</b>	ug/L	
Zinc	7440-66-6	1	0.820	4.00	<b>2.17</b>	ug/L	J



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Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-6**  
**18D0282-01 (Water)**

**Wet Chemistry**

Method: SM 3500-Cr B-09

Sampled: 04/18/2018 14:14

Instrument: UV1800-2

Analyzed: 18-Apr-2018 18:20

Sample Preparation: Preparation Method: No Prep Wet Chem  
Preparation Batch: BGD0432 Sample Size: 40 mL  
Prepared: 18-Apr-2018 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.013	0.013	ND	mg/L	U



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Project Manager: Roy Jensen

**Reported:**  
30-Apr-2018 15:38

**SW-MD**  
**18D0282-02 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8

Sampled: 04/18/2018 13:30

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:03

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	<b>0.224</b>	ug/L	



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Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-MD**  
**18D0282-02 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/18/2018 13:30

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:03

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Copper	7440-50-8	1	0.340	0.500	7.42	ug/L	
Zinc	7440-66-6	1	0.820	4.00	13.4	ug/L	



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Reported:  
30-Apr-2018 15:38

**SW-MD**  
**18D0282-02 (Water)**

**Wet Chemistry**

Method: SM 3500-Cr B-09

Sampled: 04/18/2018 13:30

Instrument: UV1800-2

Analyzed: 18-Apr-2018 18:21

Sample Preparation:

Preparation Method: No Prep Wet Chem  
Preparation Batch: BGD0432  
Prepared: 18-Apr-2018

Sample Size: 40 mL  
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.013	0.013	ND	mg/L	U



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Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-DP**  
**18D0282-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8

Sampled: 04/18/2018 11:14

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Lead	7439-92-1	1	0.0680	0.100	<b>0.0850</b>	ug/L	J



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Reported:  
30-Apr-2018 15:38

**SW-DP**  
**18D0282-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/18/2018 11:14

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Copper	7440-50-8	1	0.340	0.500	1.71	ug/L	
Zinc	7440-66-6	1	0.940	4.00	65.7	ug/L	



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**Reported:**  
30-Apr-2018 15:38

**SW-DP**  
**18D0282-03 (Water)**

**Wet Chemistry**

Method: SM 3500-Cr B-09

Sampled: 04/18/2018 11:14

Instrument: UV1800-2

Analyzed: 18-Apr-2018 18:21

Sample Preparation: Preparation Method: No Prep Wet Chem  
Preparation Batch: BGD0432 Sample Size: 40 mL  
Prepared: 18-Apr-2018 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.013	0.013	ND	mg/L	U



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Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-5**  
**18D0282-04 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8

Sampled: 04/18/2018 08:10

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:12

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0680	0.100	<b>0.265</b>	ug/L	



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Reported:  
30-Apr-2018 15:38

**SW-5**  
**18D0282-04 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/18/2018 08:10

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:12

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Copper	7440-50-8	1	0.340	0.500	2.79	ug/L	
Zinc	7440-66-6	1	0.820	4.00	9.72	ug/L	



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Reported:  
30-Apr-2018 15:38

**SW-5**  
**18D0282-04 (Water)**

**Wet Chemistry**

Method: SM 3500-Cr B-09

Sampled: 04/18/2018 08:10

Instrument: UV1800-2

Analyzed: 18-Apr-2018 18:21

Sample Preparation: Preparation Method: No Prep Wet Chem  
Preparation Batch: BGD0432 Sample Size: 40 mL  
Prepared: 18-Apr-2018 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.013	0.013	ND	mg/L	U



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Reported:  
30-Apr-2018 15:38

**SW-MH**  
**18D0282-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8

Sampled: 04/18/2018 13:31

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:17

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0680	0.100	<b>0.295</b>	ug/L	



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Reported:  
30-Apr-2018 15:38

**SW-MH**  
**18D0282-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/18/2018 13:31

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:17

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Copper	7440-50-8	1	0.340	0.500	<b>3.14</b>	ug/L	
Zinc	7440-66-6	1	0.820	4.00	<b>15.1</b>	ug/L	



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Reported:  
30-Apr-2018 15:38

**SW-MH**  
**18D0282-05 (Water)**

**Wet Chemistry**

Method: SM 3500-Cr B-09

Sampled: 04/18/2018 13:31

Instrument: UV1800-2

Analyzed: 18-Apr-2018 18:22

Sample Preparation: Preparation Method: No Prep Wet Chem  
Preparation Batch: BGD0432 Sample Size: 40 mL  
Prepared: 18-Apr-2018 Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.013	0.013	ND	mg/L	U



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Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-3**  
**18D0282-06 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8

Sampled: 04/18/2018 12:45

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Lead	7439-92-1	1	0.0680	0.100	<b>0.0750</b>	ug/L	J



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Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-3**  
**18D0282-06 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED

Sampled: 04/18/2018 12:45

Instrument: ICPMS2

Analyzed: 19-Apr-2018 16:21

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO<sub>3</sub> matrix  
Preparation Batch: BGD0434 Sample Size: 25 mL  
Prepared: 19-Apr-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
Copper	7440-50-8	1	0.340	0.500	<b>1.84</b>	ug/L	
Zinc	7440-66-6	1	0.820	4.00	<b>12.3</b>	ug/L	



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Project: Paccar  
Project Number: 1639-74  
Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**SW-3**  
**18D0282-06 (Water)**

**Wet Chemistry**

Method: SM 3500-Cr B-09

Sampled: 04/18/2018 12:45

Instrument: UV1800-2

Analyzed: 18-Apr-2018 18:23

Sample Preparation:

Preparation Method: No Prep Wet Chem  
Preparation Batch: BGD0432  
Prepared: 18-Apr-2018

Sample Size: 40 mL  
Final Volume: 50 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Hexavalent Chromium	1854-02-99	1.25	0.013	0.013	ND	mg/L	U



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Project Manager: Roy Jensen

Reported:  
30-Apr-2018 15:38

**Metals and Metallic Compounds - Quality Control**

**Batch BGD0434 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix**

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0434-BLK1)</b>						Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 11:57						
Lead	208	ND	0.0680	0.100	ug/L							U
Copper	63	ND	0.340	0.500	ug/L							U
Copper	65	ND	0.350	0.500	ug/L							U
Zinc	66	ND	0.820	4.00	ug/L							U
Zinc	67	ND	0.940	4.00	ug/L							U
<b>LCS (BGD0434-BS1)</b>						Prepared: 19-Apr-2018 Analyzed: 19-Apr-2018 12:30						
Lead	208	27.0	0.0680	0.100	ug/L	25.0		108	80-120			
Copper	63	26.7	0.340	0.500	ug/L	25.0		107	80-120			
Copper	65	26.4	0.350	0.500	ug/L	25.0		106	80-120			
Zinc	66	86.6	0.820	4.00	ug/L	80.0		108	80-120			
Zinc	67	80.2	0.940	4.00	ug/L	80.0		100	80-120			



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Reported:  
30-Apr-2018 15:38

Wet Chemistry - Quality Control

Batch BGD0432 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: KK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BGD0432-BLK1)</b>						Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 18:19					
Hexavalent Chromium	ND	0.013	0.013	mg/L							U
<b>LCS (BGD0432-BS1)</b>						Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 18:19					
Hexavalent Chromium	0.618	0.013	0.013	mg/L	0.625		98.8	85-115			D
<b>Duplicate (BGD0432-DUP1)</b>						Source: 18D0282-01 Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 18:20					
Hexavalent Chromium	ND	0.013	0.013	mg/L		ND					U
<b>Matrix Spike (BGD0432-MS1)</b>						Source: 18D0282-01 Prepared: 18-Apr-2018 Analyzed: 18-Apr-2018 18:20					
Hexavalent Chromium	0.056	0.013	0.013	mg/L	0.0625	ND	90.0	85-115			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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30-Apr-2018 15:38

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 200.8 in Water</b>	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 200.8 UCT-KED in Water</b>	
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
<b>SM 3500-Cr B-09 in Water</b>	
Hexavalent Chromium	WADOE,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	06/30/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018



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Project Manager: Roy Jensen

**Reported:**  
30-Apr-2018 15:38

### **Notes and Definitions**

- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the applicable reporting or detection limit.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

**APPENDIX D**  
**Groundwater Quality**  
**Summary Charts**

Analytical Constituents	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
	Spring	Fall																																								
Arsenic	+	+	+	\	\			\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\		
Lead				+							+																															
Chromium				+							+																															
Benzene	+	+	+	+	+		+		+		+		+																													
VC	+	+	+	+	+		+		\		+		+																													
Total cPAHs											+																															
Diesel	+	+	+	+	+		+		+		+																															
Heavy Oil	+	+	+	+	+		+		+		+																															

Notes:

- X = Analytical constituent concentration is above the HSAL.
  - \ = Analytical constituent concentration is above the CUL but below the HSAL.
  - + = Analytical constituent concentration is below the CUL.
  - = Not sampled
- VC = Vinyl chloride  
HSAL = Hot spot action level  
CUL = cleanup levels

CW-1S Analytical Constituents	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
	Spring	Fall																																								
Arsenic	\	\	+	\	\		\		\		\		\		\		\		\		\		\		+		\		+		\		+		\		+		\		+	
Lead				+							+																	+														
Chromium				+							+																															
Benzene	+	+	+	+	+		+		+		+	+	+		+		+		+		+		+		+		+		+		+		+		+		+		+		+	
VC	+	\	\	\	\		\		X		\	\	\		\		\		\		\		\		+		\		+		\		+		\		+		\		+	
Total cPAHs											+																															
Diesel	+	+	+	+	+		+		+		+																	+														
Heavy Oil	+	+	+	+	+		+		+		+																															

Notes:

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- VC = Vinyl chloride  
 HSAL = Hot spot action level  
 CUL = cleanup levels

<b>LW-6D</b>	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
Analytical Constituents	Spring	Fall																																								
Arsenic	\	\	+	\	\		\	\			+	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	
Lead				+							+																															
Chromium				+							+																															
Benzene	+	+	+	+	+		+		+		+																															
VC	+	+	+	+	+		+		+		+																															
Total cPAHs											+																															
Diesel	+	+	+	+	+		+		+		+																															
Heavy Oil	+	+	+	+	+		+		+		+																															

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 HSAL = Hot spot action level  
 CUL = cleanup levels

LW-9D	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
Analytical Constituents	Spring	Fall																																								
Arsenic	\	\	\	+	\		\		\		+		\		\		\		\		\		\		\		\		\		\		\		\		\		\		\	
Lead				+							+																															
Chromium				+							+																															
Benzene	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+																								
VC	\	\	\	+	+	\	\	\	\	\	+	\	\	\	\	\	\	\																							+	+
Total cPAHs											+																															
Diesel	+	+	+	+	+		+				+																															
Heavy Oil	+	+	+	+	+		+				+																															

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 HSAL = Hot spot action level  
 CUL = cleanup levels

<b>LW-9S</b>	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
Analytical Constituents	Spring	Fall																																								
Arsenic	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	
Lead																																										
Chromium				+								+																														
Benzene	+	+	+	+	+		+		+		+																															
VC	+	+	+	+	+		+		+		+																															
Total cPAHs												+																														
Diesel	+	+	+	+	+		+		+		+																															
Heavy Oil	+	+	+	+	+		+		+		+																															

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 CUL = cleanup levels

MW-31	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
Analytical Constituents	Spring	Fall																																								
Arsenic	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\	\		
Lead																																										
Chromium																																										
Benzene	+	+	+	+	+	+	+	+	+	+	+	+	+	+																												
VC	+	+	+	+	+	+	+	\	+	+	+	+																														
Total cPAHs																																										
Diesel	+	+	+	+	+	+	+	+	+	+	+	+																														
Heavy Oil	+	+	+	+	+	+	+	+	+	+	+	+																														

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 HSAL = Hot spot action level  
 CUL = cleanup levels

SC-1S	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
Analytical Constituents	Spring	Fall																																								
Arsenic	+	+	+	\	+		\		\		+		\		\		+		+																							
Lead	+	+	+	+	+		+		+		+																															
Chromium	+	+	+	+	+		+		+		+																															
Benzene																																										
VC																																										
Total cPAHs																																										
Diesel																																										
Heavy Oil																																										

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  - = Not sampled
- VC = Vinyl chloride  
 HSAL = Hot spot action level  
 CUL = cleanup levels

SC-2S	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
Analytical Constituents	Spring	Fall																																								
Arsenic	+	+	+	+	+		+		\		+		+																													
Lead	+	+	+	+	+		+		+		+																															
Chromium	+	+	+	+	+		+		+		+																															
Benzene																																										
VC																																										
Total cPAHs																																										
Diesel																																										
Heavy Oil																																										

Notes:

- X = Analytical constituent concentration is above the HSAL.
  - \ = Analytical constituent concentration is above the CUL but below the HSAL.
  - + = Analytical constituent concentration is below the CUL.
  - = Not sampled
- VC = Vinyl chloride  
 HSAL = Hot spot action level  
 CUL = cleanup levels