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Subject:

Second Quarter 2023 Groundwater Monitoring Report
Former Chevron Station No. 98944
1323 Lee Boulevard
Richland, Washington
Facility Site ID: 27223439
Cleanup Site ID: 5798

ENVIRONMENT

Date:
July 12, 2023

Dear Ms. Caron:

On behalf of Chevron Environmental Management Company (CEMC), Arcadis U.S., Inc. (Arcadis) has prepared this *Second Quarter 2023 Groundwater Monitoring Report* (Report) to document the second quarter groundwater monitoring activities at Former Chevron Station No. 98944 (the site; Figures 1 and 2) located at 1323 Lee Boulevard in Richland, Washington. The three remaining onsite monitoring wells (MW-9, MW-10, and MW-11) were gauged and sampled during the groundwater monitoring event on May 16, 2023.

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SITE BACKGROUND

The site was operated as a Standard Oil/Chevron gasoline service station from 1960 until approximately 1976. All station features were subsequently demolished, and the site was redeveloped in 2003 with a commercial structure and associated parking areas. Currently, the site is occupied by a Subway restaurant. Previous site investigations and site history were summarized in the *First Quarter 2020 Groundwater Monitoring Report* (Arcadis 2020).

Our ref:
30064311

SITE GEOLOGY/HYDROGEOLOGY

The topography of the general site area slopes gently to the east and southeast (Figure 1). The confluence of the Yakima and Columbia Rivers is located south-southeast of the site. The topography to the west contains an alluvial terrace running north-south.

The site is located in Pasco Basin. Local geology consists of alluvial sediments deposited over basalt bedrock of the Columbia River Basalt Group (Reidel and Fecht, 1994). Glacial outburst flood deposits (cobbles, gravels, and sands) were deposited on top of this and reworked by local streams and rivers, chiefly the

Columbia River in this region (Reidel and Fecht, 1994).

Previous subsurface explorations at the site have generally encountered silt and sandy gravels to depths of approximately 20 feet below ground surface (bgs) (CRA 2007). The soil types observed in monitoring well borings (MW-9 through MW-11) were consistent with historical findings; silt was encountered at 5 to 5.5 feet bgs, silt and well graded gravel was encountered at 10 and 15 feet bgs, and poorly- and well-graded gravel was encountered at 17 to 20 feet bgs.

Depth to groundwater beneath the site ranges from approximately 6 to 15 feet bgs. The general groundwater flow direction appears to follow the local topography to the south-southeast.

GROUNDWATER MONITORING AND SAMPLING

Groundwater monitoring and sampling was completed at the site on May 16, 2023, by Blaine Tech Services, Inc. (Blaine Tech). The completed tasks included measuring depth to groundwater, collection of groundwater samples, and recording of groundwater quality parameters (recorded on field forms; Attachment 1) from monitoring wells MW-9, MW-10, and MW-11.

Groundwater Elevation

Blaine Tech gauged groundwater monitoring wells MW-9, MW-10 and MW-11 using a static water level indicator prior to groundwater sample collection on May 16, 2023. The measured depth to groundwater ranged from 13.16 (MW-10) to 13.54 (MW-9) feet below top of casing and groundwater elevations ranged from 345.67 to 345.81 feet above the North American Vertical Datum of 1988 (NAVD88). Groundwater elevations in these three wells are generally consistent when compared to historical groundwater elevations. Note that based on the current data, the approximately 7-foot difference in elevation between wells MW-9 and MW-10 noted during the previous event is considered anomalous or a field error. Groundwater depths and elevations are summarized in Table 1.

Groundwater Sampling

Monitoring wells MW-9, MW-10, and MW-11 were purged and sampled using a peristaltic pump and dedicated tubing via low-flow methods. During the purging process, the following parameters were monitored and recorded on the sampling field forms, included as Attachment 1.

- pH
- electrical conductivity
- turbidity
- dissolved oxygen
- oxidation reduction potential
- temperature

Purging continued until these parameters stabilized in accordance with United States Environmental Protection Agency procedures (USEPA 2017). Samples were then collected in laboratory-supplied containers, labeled, packaged in ice-cooled chests, and shipped under proper chain-of-custody protocols to Pace Analytical (National Center for Testing & Innovation) in Mount Juliet, Tennessee. Groundwater samples were analyzed for the following constituents:

- Total petroleum hydrocarbons – gasoline range organics (TPH-GRO) by Northwest method NWTPH-Gx;
- Total petroleum hydrocarbons – diesel and heavy oil range organics (TPH-DRO/HRO) by Northwest method NWTPH-Dx with and without silica-gel cleanup (SGC) sample preparation
- Benzene, toluene, ethylbenzene and xylenes (BTEX) by USEPA method 8260D.

The laboratory analytical report and chain-of-custody documentation are included in Attachment 2.

QUALITY ASSURANCE/QUALITY CONTROL

Trip blanks assess potential sample contamination resulting from the transportation and storage of samples. The trip blank was analyzed for BTEX, and all results were either non-detect or were detected at estimated concentrations less than the reporting limit.

Field duplicate samples help assess the reproducibility of the analyses. A field duplicate sample was collected from monitoring well MW-10 during the event and submitted to Pace Analytical for chemical analysis. The parent and duplicate sample results are considered comparable.

DATA INTERPRETATION AND CONCLUSIONS

Current and historical groundwater elevations and analytical results for site constituents of potential concern (COPCs) are summarized in Table 1; historical geochemical analytical results are summarized in Table 2; and groundwater field parameters are summarized in Table 3. Based on local topography and previous sampling events, the groundwater flow direction has historically been inferred to be to the east-southeast with some variation noted. The groundwater flow direction during the current event was observed to be to the south-southeast. A groundwater analytical map for the samples collected on May 16, 2023, is shown on Figure 2.

TPH-GRO was detected above the applicable Model Toxics Control Act (MTCA) Method A cleanup level (CUL) in well MW-9 at a concentration of 2,280 µg/L, and in well MW-10 at a concentration of 811 µg/L. TPH-DRO (analyzed without SGC) was detected above the MTCA Method A CUL in well MW-9 at a concentration of 891 µg/L; however, following SGC TPH-DRO was reported below the CUL (496 µg/L) indicating the presence of natural organic material being reported in the diesel range. Other COPCs were either not detected in the wells or were detected at concentrations below MTCA Method A CULs.

Groundwater monitoring will continue on a quarterly basis. The next groundwater monitoring event is currently scheduled for third quarter of 2023. Potential biodegradation of dissolved site related COPCs in groundwater will continue to be evaluated during sampling events in the first and third quarter of each year.

In accordance with the Ecology-approved March 29, 2022 *Monitoring Well Installation Work Plan* (work plan), the installation of additional monitoring wells at the site to further evaluate the extent of petroleum hydrocarbons in groundwater and the occurrence of natural attenuation is planned during summer 2023, pending approval of a right-of-way permit from the City of Richland.

Please contact Ada Hamilton at ada.hamilton@arcadis.com if you should have any questions.

Rachel Caron
Washington State Department of Ecology
July 12, 2023

Sincerely,

Arcadis U.S., Inc.



Ada Hamilton
Project Manager



Rebecca Andresen, L.G.
Licensed Geologist 2588

Copies:

James Kiernan, CEMC

REFERENCES

- Arcadis, 2020. First Quarter 2020 Groundwater Monitoring Report, Chevron Ste No. 9-8944, 1323 Lee Boulevard, Richland, WA, March 17.
- Conestoga, Rovers, and Associates, 2007. Soil and Groundwater Assessment Report, Former Chevron Service Station No. 9-8944, 1323 Lee Boulevard, Richland, WA, December 11.
- Ecology. 2005. Version 1.0; Guidance on Remediation of Petroleum-Contaminated Ground Water By Natural Attenuation. July.
- USEPA, 2017, Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, United States Environmental Protection Agency, EQASOP-GW4. <https://www.epa.gov/sites/production/files/2017-10/documents/eqasop-gw4.pdf>
- Reidel, S.P., and Fecht, K.R. 1994. Geologic Map of the Richland 1:100,000 Quadrangle. Washington Division of Geology and Earth Resources Open File Report 94-8. June.

Enclosures:

Tables

- 1 Table 1. Groundwater Gauging Data and Analytical Results
- 2 Table 2. Geochemical Analytical Results
- 3 Table 3. Groundwater Field Parameter Measurements

Figures

- 1 Figure 1. Site Location Map
- 2 Figure 2. Groundwater Analytical Map – May 16, 2023

Attachments

- 1 Attachment A. Field Data and Chain of Custody
- 2 Attachment B. Laboratory Analytical Report

TABLES



Well ID	Date	TOC	DTW	GWE	HYDROCARBONS					PRIMARY VOCs				LEAD		OXYGENATES		PAHs								Comments	
					TPH-GRO	TPH-DRO	TPH-DRO w/SGC	TPH-HRO	TPH-HRO w/SGC	Benzene	Toluene	Ethylbenzene	Xylene	Dissolved Lead	Total Lead	MTBE by SW8020	MTBE by SW8260B	Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene		
					800/1000	500	500	500	500	5	1,000	700	1,000	NA	15	NA	20	160	NA	NA	NA	NA	NA	NA	NA		NA
MTCA Method A Cleanup Levels					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L		
MW-1	8/11/1994	93.98	7.03	86.95	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	8/25/1994	93.98	7.00	86.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	9/23/1994	93.98	7.00	86.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	8/12/1996	93.98	7.29	86.69	14,400	--	--	--	--	94.4	15.5	325	978	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	2/27/2000	93.98	8.58	85.40	16,200	--	--	--	--	11.7	<8.00	439	504	--	--	--	<25.0	--	--	--	--	--	--	--	--	--	--
MW-1	2/21/2001	93.98	8.66	85.32	6,320	--	--	--	--	38.3	9.30	194	64.1	--	--	--	15.4	<4.00	--	--	--	--	--	--	--	--	--
MW-1	05/22/2001 ¹	93.98	9.95	84.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	8/11/2001	93.98	9.14	84.84	8,450	--	--	--	--	48.4	11.8	410	356	--	--	--	<50.0	<50.0	--	--	--	--	--	--	--	--	--
MW-1	11/10/2001	93.98	9.85	84.13	6,650	--	--	--	--	49.2	11.0	340	97.9	--	--	--	16.8	<5.00	--	--	--	--	--	--	--	--	--
MW-1	2/4/2002	93.98	10.71	83.27	1,480	--	--	--	--	1.81	<1.00	71.6	3.81	--	--	--	--	<5.00	--	--	--	--	--	--	--	--	--
MW-1	08/24/2002 ²	93.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	2/20/2003	93.98	10.55	83.43	91	--	--	--	--	<0.50	<0.50	<1.0	<3.0	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-1	8/21/2003	93.98	11.26	82.72	78	--	--	--	--	<0.5	<0.5	<0.5	<1.5	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-1	02/19/2004 ¹	93.98	11.79	82.19	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	08/10/2004 ¹	93.98	10.97	83.01	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	12/03/2004 ¹	93.98	11.39	82.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	02/21/2006 ³	93.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	10/23/2007 ⁴	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	8/11/1994	93.21	6.10	87.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Well Decommissioned
MW-2	8/25/1994	93.21	6.11	87.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	9/23/1994	93.21	6.11	87.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	8/12/1996	93.21	6.40	86.81	17,400	--	--	--	--	152	39.2	306	1,120	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	2/27/2000	93.21	7.77	85.44	7,500	--	--	--	--	99.8	13.0	175	453	--	--	--	<10.0	--	--	--	--	--	--	--	--	--	--
MW-2	2/21/2001	93.21	7.84	85.37	1,510	--	--	--	--	20.1	5.43	31.9	67.2	--	--	--	<5.00	<2.00	--	--	--	--	--	--	--	--	--
MW-2	5/22/2001	93.21	8.14	85.07	4,310	--	--	--	--	34.9	7.91	109	211	--	--	--	11.6	<5.00	--	--	--	--	--	--	--	--	--
MW-2	8/11/2001	93.21	8.35	84.86	1,870	--	--	--	--	14.6	2.90	16.6	20.5	--	--	--	<25.0	<5.00	--	--	--	--	--	--	--	--	--
MW-2	11/10/2001	93.21	9.10	84.11	4,320	--	--	--	--	51.0	6.44	53.0	91.5	--	--	--	25.1	<5.00	--	--	--	--	--	--	--	--	--
MW-2	2/4/2002	93.21	9.96	83.25	4,500	--	--	--	--	33.3	2.80	74.5	97.6	--	--	--	--	<5.00	--	--	--	--	--	--	--	--	--
MW-2	8/24/2002	93.21	9.18	84.03	3,400	--	--	--	--	17	2.10	25	56	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-2	2/20/2003	93.21	9.78	83.43	2,600	--	--	--	--	7.3	1.80	47	32	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-2	8/21/2003	93.21	10.52	82.69	840	--	--	--	--	2.1	<2.0	2.9	<3.0	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-2	2/19/2004	93.21	11.06	82.15	950	--	--	--	--	<5.0	<0.5	3.0	<5.0	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-2	8/10/2004	93.21	10.16	83.05	<50	--	--	--	--	<0.5	<0.5	<0.5	<1.5	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-2	12/3/2004	93.21	10.68	82.53	<48	--	--	--	--	<0.5	<0.5	<0.5	<1.5	--	--	--	<2.5	--	--	--	--	--	--	--	--	--	--
MW-2	02/21/2006 ¹	93.21	11.52	81.69	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-2	10/23/2007 ⁴	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Well Decommissioned
MW-3	8/11/1994	94.57	7.63	86.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	8/25/1994	94.57	7.59	86.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	9/23/1994	94.57	7.59	86.98	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	8/12/1996	94.57	7.89	86.68	37,700	--	--	--	--	84.6	77.1	1,190	3,800	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	2/27/2000	94.57	9.18	85.39	30,700	--	--	--	--	42.4	60.1	1,160	3,250	--	--	--	<25.0	--	--	--	--	--	--	--	--	--	--
MW-3	2/21/2001	94.57	9.23	85.34	6,090	--	--	--	--	29.9	6.07	182	293	--	--	--	8.75	<4.00	--	--	--	--	--	--	--	--	--
MW-3	05/22/2001 ¹	94.57	9.52	85.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	08/11/2001 ⁵	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	11/10/2001 ²	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	02/04/2002 ²	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	08/24/2002 ³	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	02/20/2003 ²	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	08/21/2003 ³	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	02/19/2004 ³	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	08/10/2004 ³	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	12/03/2004 ⁴	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	02/21/2006 ³	94.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	10/23/2007 ²	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Well Decommissioned

Table 1
Groundwater Gauging Data and Analytical Results
Chevron Site No. 98944
1323 Lee Boulevard
Richland, Washington

Well ID	Date	TOC	DTW	GWE	HYDROCARBONS					PRIMARY VOCs				LEAD		OXYGENATES		PAHs								Comments
					TPH-GRO	TPH-DRO	TPH-DRO w/SGC	TPH-HRO	TPH-HRO w/SGC	Benzene	Toluene	Ethylbenzene	Xylene	Dissolved Lead	Total Lead	MTBE by SW8020	MTBE by SW8260B	Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(e)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	
					800/1000	500	500	500	500	5	1,000	700	1,000	NA	15	NA	20	160	NA	NA	NA	NA	NA	NA	NA	
MTCA Method A Cleanup Levels				μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L			
MW-10	10/9/2018	--	13.47	--	9,500 [9,400]	740 [680]	430 [430]	<110 [<100]	<69 [<68]	<1.0 [<1.0]	<1.0 [<1.0]	91 [86]	<5.0 [<5.0]	8.3 [8.6]	7.6 [8.2]	--	--	--	--	--	--	--	--	--		
MW-10	12/12/2018	--	13.72	--	8,000 [7,900]	540 [540]	350 [400]	<100 [<100]	<66 [<66]	<0.20 [<0.20]	0.40 [0.50]	81 [85]	4.0 [4.0]	2.0 [1.8]	2.2 [2.1]	--	--	--	--	--	--	--	--	--		
MW-10	9/19/2019	--	12.88	--	--	--	190 J [250 J]	--	--	--	--	--	--	--	<1.4 J [1.3 J]	--	--	--	--	--	--	--	--	--		
MW-10	2/19/2020	--	13.98	--	4,600 [4,500]	1,300 [1,200]	--	150 J [150 J]	--	<0.53 [<0.53]	<0.39 [<0.39]	31 [33]	1.8 J [2.0 J]	--	1.1 J	--	--	--	--	--	--	--	--	--		
MW-10	5/20/2020	--	14.31	--	4,900 [4,700]	2,100 [2,400]	1,500 [1,900]	270 J * [280 J *]	<89 * [98 J *]	<0.24 [<0.24]	0.45 J [0.46 J]	47 [49]	2.5 J [2.4 J]	--	2.0 J [1.9 J]	--	--	--	--	--	--	--	--	--		
MW-10	8/27/2020	--	13.32	--	1,100 [1,000]	810 [1000]	--	670 B [910 B]	--	<0.24 [<0.24]	<0.39 [0.42 J]	5.4 [6.0]	<0.39 [<0.39]	--	2.0 J [1.7 J]	--	--	--	--	--	--	--	--	--		
MW-10	11/5/2020	--	13.46	--	3,300 [2,900]	1,100 [1,200]	760 [800]	500 [540]	<89 [90 J]	<0.24 [<0.24]	0.88 J [0.88 J]	21 [21]	1.2 J [1.2 J]	--	<1.0 [<1.0]	--	--	--	--	--	--	--	--	--		
MW-10	2/24/2021	--	13.37	--	3,300 [3,400]	1,000 [1,200]	--	220 J [240 J]	--	0.24 [0.24]	0.65 J [0.63 J]	27 [28]	1.7 J [1.6 J]	--	--	--	--	--	--	--	--	--	--	--		
MW-10	5/18/2021	--	13.78	--	3,200 [3,780]	771 [812]	215 [343]	<250	<250	<0.941 [<0.0941]	<0.278 [<0.278]	15.1 [21.1]	0.875 J [1.40 J]	--	--	--	--	--	--	--	--	--	--	--		
MW-10	8/18/2021	358.96	12.44	346.52	1,440 [996]	704 [599]	233 [96.5 J]	428 [523]	<250 [<250]	<1.00 [<1.00]	0.394 J [0.327 J]	4.93 [3.51]	0.352 J [0.307 J]	--	<6.00 [<6.00]	--	--	--	--	--	--	--	--	--		
MW-10	11/10/2021	358.96	13.00	345.96	263 B [233 B]	175 J [193 J]	-- [-]	<250 [<250]	<250 [<250]	<1.00 [<1.00]	<1.00 [<1.00]	0.174 J [<1.00]	<3.00 [<3.00]	--	--	--	--	--	--	--	--	--	--	--		
MW-10	1/18/2022	358.96	12.88	346.08	65.5 J [101]	135 J [165 J]	<200 [<200]	302 [296]	<250 [<250]	<1.00 [<1.00]	<1.00 [<1.00]	0.366 J [0.234 J]	<3.00 [<3.00]	--	<6.00 [<6.00]	--	--	--	--	--	--	--	--	--		
MW-10	4/5/2022	358.96	13.35	345.61	604 [867]	277 [278]	78.1 J [82.4 J]	<250 [<250]	<250 [<250]	<1.00 [<1.00]	<1.00 [<1.00]	1.83 [2.20]	0.186 J [0.174 J]	--	--	--	--	--	--	--	--	--	--	--		
MW-10	7/19/2022	358.96	12.60	346.36	46.0 J [64.2 J]	278 [189 J]	<200 [<200]	364 [351]	<250 [<250]	<1.00 [<1.00]	<1.00 [<1.00]	<1.00 [<1.00]	<3.00 [<3.00]	--	<2.00 [<2.00]	--	--	--	--	--	--	--	--	--		
MW-10	10/25/2022	358.96	12.53	346.43	121B [105 B]	<200 [<200]	<200 [<200]	<250 [<250]	<250 [<250]	<1.00 [<1.00]	<1.00 [<1.00]	<1.00 [<1.00]	<3.00 [<3.00]	--	--	--	--	--	--	--	--	--	--	--		
MW-10	2/16/2023	358.96	12.89	346.07	105 B [290]	118 J [114 J]	<200 [<200]	501 [420]	<250 [<250]	<1.00 [<1.00]	<1.00 [<1.00]	0.278 J [0.342 J]	<3.00 [<3.00]	-- [-]	<2.00 [<2.00]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	
MW-10	5/16/2023	358.96	13.16	345.80	811 [1,070]	175 J [203]	175 J [<200]	<250 [<250]	<250 [<250]	<1.00 [<1.00]	<1.00 [<1.00]	2.26 [3.62]	0.404 J [0.454 J]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	-- [-]	
MW-11	10/9/2018	--	13.63	--	7,800	740	450	200	<69	<0.20	<0.20	2.0	<1.0	3.2	3.4	--	--	--	--	--	--	--	--	--		
MW-11	12/12/2018	--	13.81	--	4,100	270	300	<100	<66	<0.20	<0.20	0.70	<1.0	<1.1	<1.1	--	--	--	--	--	--	--	--	--		
MW-11	9/19/2019	--	12.95	--	470	310	--	120 J	--	--	--	--	--	--	<4.0	--	--	--	--	--	--	--	--	--		
MW-11	2/19/2020	--	14.09	--	2,100	--	--	<110	--	<0.53	<0.39	<0.50	<0.39	--	1.4 J	--	--	--	--	--	--	--	--	--		
MW-11	5/20/2020	--	14.33	--	2,100	1,600	1,400	130 J *	130 J *	<0.24	0.77 J	<0.50	<0.39	--	<1.0	--	--	--	--	--	--	--	--	--		
MW-11	8/27/2020	--	13.59	--	1,600	1,100	--	400 B	--	<0.24	0.88 J	<0.50	<0.39	--	<1.0	--	--	--	--	--	--	--	--	--		
MW-11	11/5/2020	--	13.34	--	1,800	740	370	140 J	--	<0.24	0.71 J	<0.50	<0.39	--	<1.0	--	--	--	--	--	--	--	--	--		
MW-11	2/24/2021	--	13.45	--	1,000	430	--	120 J	--	0.24	0.39	0.50	0.39	--	--	--	--	--	--	--	--	--	--	--		
MW-11	5/18/2021	--	13.91	--	1,540	490	425	<250	<250	<0.0941	<0.278	0.154 J	0.330 J	--	--	--	--	--	--	--	--	--	--	--		
MW-11	8/18/2021	359.06	13.43	345.63	1,190	445	187 J	161 J	<250	<1.00	<1.00	<1.00	<3.00	--	<6.00	--	--	--	--	--	--	--	--	--		
MW-11	11/10/2021	359.06	13.10	345.96	573 B	338	92.4 J	<250	<250	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--	--	--		
MW-11	1/18/2022	359.06	13.05	346.01	515	210	114 J	168 J	<250	<1.00	<1.00	<1.00	<3.00	--	<6.00	--	--	--	--	--	--	--	--	--		
MW-11	4/5/2022	359.06	13.45	345.61	773	272	113 J	<250	<250	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--	--	--		
MW-11	7/19/2022	359.06	12.66	346.40	518	268	97.8 J	<250	<250	<1.00	<1.00	<1.00	<3.00	--	<2.00	--	--	--	--	--	--	--	--	--		
MW-11	10/25/2022	359.06	12.62	346.44	430 B	<200	<200	<250	<250	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--	--	--		
MW-11	2/16/2023	359.06	7.94	351.12	621	197 J	86.3 J	351	<250	<1.00	<1.00	<1.00	<3.00	--	<2.00	--	--	--	--	--	--	--	--	--		
MW-11	5/16/2023	359.06	13.25	345.81	272	71.9 J	71.9 J	<250	<250	<1.00	<1.00	<1.00	0.177 J	--	--	--	--	--	--	--	--	--	--	--		
Trip Blank	2/27/2000	--	--	--	<50.0	--	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	<5.00	--	--	--	--	--	--	--	--	--	
Trip Blank	2/21/2001	--	--	--	<50.0	--	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	<5.00	--	--	--	--	--	--	--	--	--	
Trip Blank	5/22/2001	--	--	--	<50.0	--	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	<5.00	--	--	--	--	--	--	--	--	--	
Trip Blank	8/11/2001	--	--	--	<50.0	--	--	--	--	<0.500	<0.500	<0.500	<1.50	--	--	<5.00	--	--	--	--	--	--	--	--	--	
Trip Blank	11/10/2001	--	--	--	<100	--	--	--	--	<0.500	<2.00	<1.00	<1.50	--	--	<5.00	--	--	--	--	--	--	--	--	--	
Trip Blank	2/4/2002	--	--	--	<50.0	--	--	--	--	<0.500	<0.500	<0.500	<1.00	--	--	<5.00	--	--	--	--	--	--	--	--	--	
Trip Blank	8/24/2002	--	--	--	<50	--	--	--	--	<0.50	<0.50	<0.50	<1.5	--	--	<2.5	--	--	--	--	--	--	--	--	--	
Trip Blank	2/20/2003	--	--	--	<50	--	--	--	--	<0.50	<0.50	<0.50	<1.5	--	--	<2.5	--	--	--	--	--	--	--	--	--	
Trip Blank	8/21/2003	--	--	--	<50	--	--	--	--	<0.5	<0.5	<0.5	<1.5	--	--	<2.5	--	--	--	--	--	--	--	--	--	
Trip Blank	2/19/2004	--	--	--	<50	--	--	--	--	<0.5	<0.5	<0.5	<1.5	--	--	<2.5	--	--	--	--	--	--	--	--	--	
Trip Blank	8/10/2004	--	--	--	<50	--	--	--	--	<0.5	<0.5	<0.5	<1.5	--	--	<2.5	--	--	--	--	--	--	--	--	--	
Trip Blank	12/3/2004	--	--	--	<48	--	--	--	--	<0.5	<0.5	<0.5	<1.5	--	--	<2.5	--	--	--	--	--	--	--	--	--	
Trip Blank	10/23/2007	--	--	--	<50	--	--	--	--	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	
Trip Blank	3/24/2008	--	--	--	<50	--	--	--	--	<1.0	<1.0	<1.0	<2.0	--	--	--	--	--	--	--	--	--	--	--	--	
Trip Blank	5/12/2008	--	--	--	<50	--	--	--	--	<0.5																

Well ID	Date	TOC	DTW	GWE	HYDROCARBONS					PRIMARY VOCs				LEAD		OXYGENATES		PAHs								Comments
					TPH-GRO	TPH-DRO	TPH-DRO w/SGC	TPH-HRO	TPH-HRO w/SGC	Benzene	Toluene	Ethylbenzene	Xylene	Dissolved Lead	Total Lead	MTBE by SW8020	MTBE by SW8260B	Naphthalene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(e)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	
MTCA Method A Cleanup Levels					800/1000	500	500	500	500	5	1,000	700	1,000	NA	15	NA	20	160	NA	NA	NA	NA	NA	NA	NA	NA
	Units	ft	ft	ft-elev.	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
Trip Blank	4/5/2022	--	--	--	--	--	--	--	--	<1.00	<1.00	<1.00	0.242 J	--	--	--	--	--	--	--	--	--	--	--	--	
Trip Blank	7/19/2022	--	--	--	--	--	--	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--	--	--	--	
Trip Blank	10/25/2022	--	--	--	--	--	--	--	--	<1.00	<1.00	<1.00	<3.00	--	--	--	--	--	--	--	--	--	--	--	--	
Trip Blank	5/16/2023	--	--	--	--	--	--	--	--	<1.00	0.546 J	0.158 J	0.853 J	--	--	--	--	--	--	--	--	--	--	--	--	
Equipment Blank	9/9/2011	--	--	--	<50	<29			<68	<0.5	<0.5	<0.5	<0.5	--	<0.080	--	--	<1	--	--	--	--	--	--	--	
Equipment Blank	8/27/2012	--	--	--	<50	<29			<68	<0.5	<0.5	<0.5	<0.5	--	--	--	--	<1	--	--	--	--	--	--	--	

LEGEND:
BOLD = Detected concentrations above the MTCA Method A Cleanup Levels
 ID = Identification
 MTCA = Model Toxics Control Act Cleanup Regulations [WAC 173-340-720(2)(a)(1), as amended February 2001]
 NA = No applicable MTCA Method A cleanup level
 TOC = Top of Casing
 DTW = Depth to Water
 GWE = Groundwater elevation
 (ft-elev) = Feet Above Elevation
 ft = Feet
 µg/L = Micrograms per Liter
 TPH-DRO = Total Petroleum Hydrocarbons - Diesel Range Organics
 TPH-GRO = Total Petroleum Hydrocarbons - Gasoline Range Organics
 TPH-HRO = Total Petroleum Hydrocarbons - Oil Range Organics
 BTEX = Benzene, toluene, ethylbenzene, xylenes
 VOCs = Volatile organic compounds
 MTBE = Methyl tertiary butyl ether
 PAHs = Polycyclic aromatic hydrocarbons
 -- = Not available / not applicable
 < = Not detected above laboratory method detection limit (till 5/18/2021). Not detected above REPORTED detection limit (from 8/18/2021)
 J = The identification of the analyte is acceptable; the reported value is an estimate.
 B = Compound was found in the blank and sample
 H = Sample was prepped or analyzed beyond the specified holding time
 w/SGC = with Silica Gel Cleanup
 [] = Duplicate sample results
¹ = Not sampled due to insufficient water
² = Inaccessible
³ = Dry
⁴ = Destroyed
⁵ = Inaccessible - Paved over
 + = LCS and/or LCSD is outside acceptance limits, high biased.

NOTES:
 800/1,000 = GRO MTCA Method A CUL with benzene present is 800 µg/L and without is 1,000 µg/L
 Monitoring wells MW-9, MW-10 and MW-11 have not been surveyed.
 Concentrations in bold exceed MTCA Method A Cleanup Levels.

Well ID	Date	TOC	DTW	GWE	Methane	Nitrate	Sulfate	Total Manganese	Dissolved Manganese	Total Iron	Dissolved Iron
	Units	ft	ft	ft-elev.	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-9	5/20/2020	--	14.64	--	51	570	79,000	1,600	--	--	--
MW-9	8/27/2020	--	13.78	--	--	<20	19,000	560	580	1,300	1000
MW-9	11/5/2020	--	13.75	--	1,200	<20	1,000 J	1,600	1,700	2,200	2,000
MW-9	2/24/2021	--	13.68	--	3,200	560	830 J	1,200	1,300	1,400 J	1,600 J
MW-9	5/18/2021	--	14.19	--	--	--	--	--	--	--	--
MW-9	8/18/2021	359.21	13.79	345.42	38.7	54.4 J	11,400	829	873	1,020	--
MW-9	11/10/2021	359.21	13.30	345.91	--	--	--	--	--	--	--
MW-9	1/18/2022	359.21	13.33	345.88	1,980	<100	<5,000	2,100	2,080	2,260	--
MW-9	4/5/2022	359.21	13.69	345.52	--	--	--	--	--	--	--
MW-9	7/19/2022	359.21	12.92	346.29	58.7	158 P1	28,500	328	379	759	--
MW-9	10/25/2022	359.21	12.84	346.37	--	--	--	--	--	--	--
MW-9	2/16/2023	359.21	5.68	353.53	4,220	<100	621 J	1,420	1,540	1,670	--
MW-9	5/16/2023	359.21	13.54	345.67	--	--	--	--	--	--	--
MW-10	5/20/2020	--	14.31	--	980 [1,200]	600 [640 H]	410,000 [380,000]	3,500 [3,400]	--	--	--
MW-10	8/27/2020	--	13.32	--	--	4,800 [4,600]	170,000 [160,000]	520 [780]	950 [890]	560 J [810 J]	760 J [670 J]
MW-10	11/5/2020	--	13.46	--	280 [280]	2,100 [2,200]	79,000 [80,000]	760 [740]	790 [760]	1,200 [1,200]	1,300 [1,200]
MW-10	2/24/2021	--	13.37	--	520 [470]	1,100 [1,100]	56,000 [56,000]	920 [970]	1,000 [1,100]	2,500 [2,600]	2,800 [2,700]
MW-10	5/18/2021	--	13.78	--	--	--	--	--	--	--	--
MW-10	8/18/2021	358.96	12.44	346.52	289 [182]	3,940 [3,840]	107,000 [105,000]	413 [428]	517 [500]	1,040 [961]	--
MW-10	11/10/2021	358.96	13.00	345.96	--	--	--	--	--	--	--
MW-10	1/18/2022	358.96	12.88	346.08	11 [10.9]	2,170 [2,150]	59,500 [61,100]	108 [103]	73.6 [77]	104 [96.7 J]	--
MW-10	4/5/2022	358.96	13.35	345.61	--	--	--	--	--	--	--
MW-10	7/19/2022	358.96	12.60	346.36	<10.0 [<10.0]	5,720 [5,870]	83,400 [84,300]	112 [120]	17.7 [17.1]	209 [211]	--
MW-10	10/25/2022	358.96	12.53	346.43	--	--	--	--	--	--	--
MW-10	2/16/2023	358.96	12.89	346.07	12.4 [22.1]	2,790 [2,790]	52,400 [52,000]	93.9 [99.2]	29.8 [31.4]	80.6 J [92.3 J]	-- [-]
MW-10	5/16/2023	358.96	13.16	345.80	--	--	--	--	--	--	--
MW-11	5/20/2020	--	14.33	--	1400	740	97,000	2,900	--	--	--
MW-11	8/27/2020	--	13.59	--	--	1,100	52,000	1,900	2,000	4,500	3,900
MW-11	11/5/2020	--	13.34	--	460	<20	23,000	2,000	1,900	3,200	2,900
MW-11	2/24/2021	--	13.45	--	390	790	18,000	1,500	1,500	2,200 J	2,000 J
MW-11	5/18/2021	--	13.91	--	--	--	--	--	--	--	--
MW-11	8/18/2021	359.06	13.43	345.63	532	90.5 J	37,000	992	1,050	2,190	--
MW-11	11/10/2021	359.06	13.10	345.96	--	--	--	--	--	--	--
MW-11	1/18/2022	359.06	13.05	346.01	66	55.5 J	21,700	986	948	1,960	--
MW-11	4/5/2022	359.06	13.45	345.61	--	--	--	--	--	--	--
MW-11	7/19/2022	359.06	12.66	346.40	330	237	22,600	736	721	1,760	--
MW-11	10/25/2022	359.06	12.62	346.44	--	--	--	--	--	--	--
MW-11	2/16/2023	359.06	7.94	351.12	221	129	7,430	934	850	2,920	--
MW-11	5/16/2023	359.06	13.25	345.81	--	--	--	--	--	--	--

Well ID	Date	TOC	DTW	GWE	Methane	Nitrate	Sulfate	Total Manganese	Dissolved Manganese	Total Iron	Dissolved Iron
	Units	ft	ft	ft-elev.	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L

LEGEND:

- ID = Identification
- TOC = Top of Casing
- DTW = Depth to Water
- GWE = Groundwater elevation
- (ft-elev) = Feet Above Elevation
- ft = Feet
- µg/L = Micrograms per Liter
- = Not available / not applicable
- < = Not detected above laboratory method detection limit (till 5/18/2021). Not detected above REPORTED detection limit (8/18/2021)
- J = The identification of the analyte is acceptable; the reported value is an estimate.
- P1 = RPD value not applicable for sample concentrations less than 5 times the reporting limit.
- H = Sample was prepped or analyzed beyond the specified holding time
- [] = Duplicate sample results

Table 3
Groundwater Field Parameter Measurements
Chevron Site No. 98944
1323 Lee Boulevard
Richland, Washington



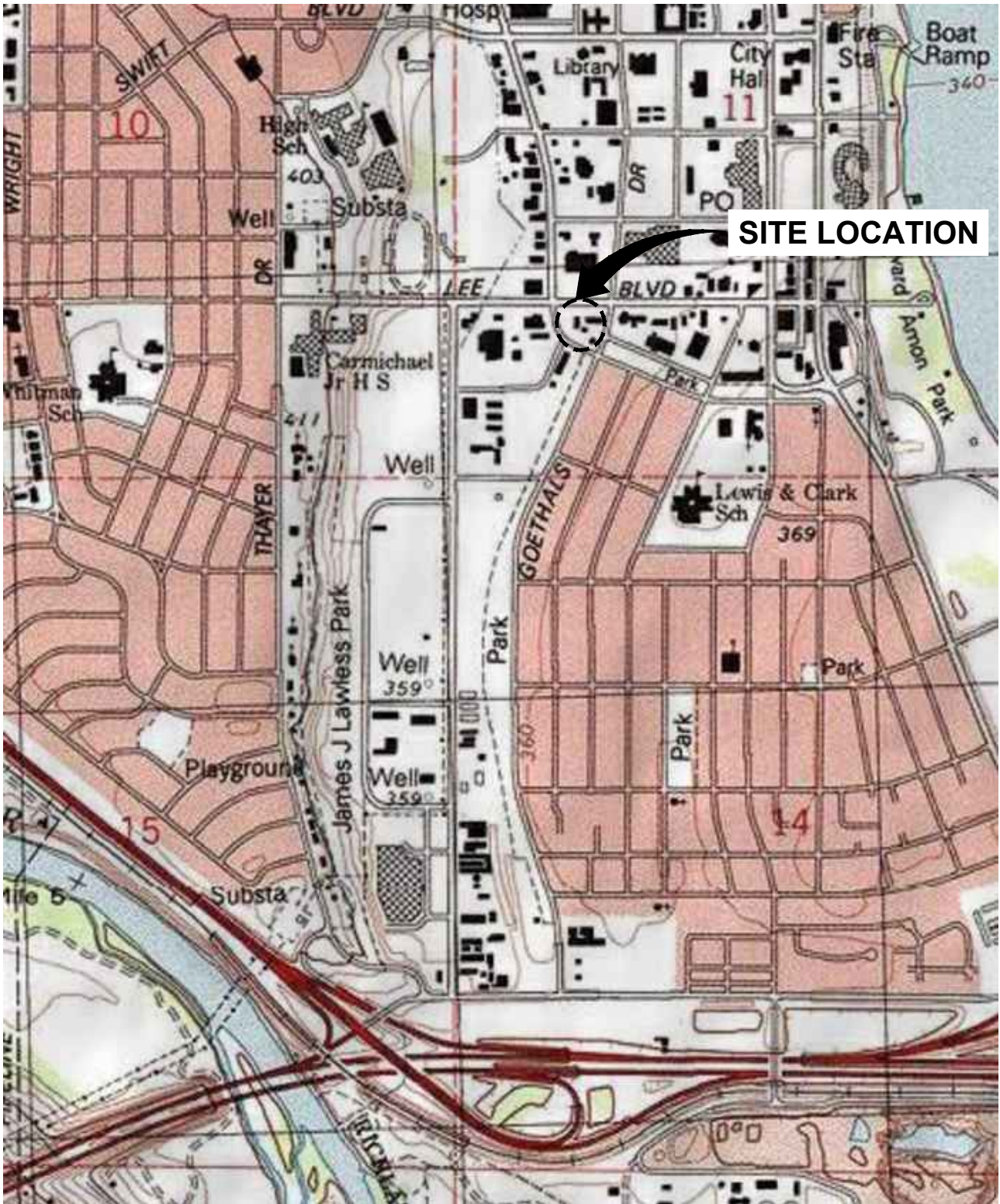
Well ID	Date	pH	Conductivity	Dissolved Oxygen	ORP	Turbidity	Ferrous Iron
		--	mS/cm	mg/L	mV	NTU	mg/L
MW-9	2/19/2020	6.76	0.665	3.16	83.9	9	--
MW-9	5/20/2020	7.04	0.939	0.58	-74.9	7	0.0
MW-9	8/27/2020	7.17	0.579	1.02	7.5	16	0.0
MW-9	11/5/2020	7.23	0.929	0.51	-80.9	16	--
MW-9	2/24/2021	7.30	0.56	0.63	-105.7	14	0.8
MW-9	5/18/2021	7.12	0.702	0.35	-120.7	16	--
MW-9	8/18/2021	7.91	0.694	0.50	148.9	9.0	--
MW-9	11/10/2021	7.37	0.643	1.63	0.2	11.0	--
MW-9	1/18/2022	6.40	0.969	1.49	56.2	6.0	--
MW-9	4/5/2022	6.34	1.77	0.38	140	18.0	--
MW-9	7/19/2022	6.80	0.742	0.88	130.7	10.0	--
MW-9	10/25/2022	6.80	0.745	0.09	187.7	3.0	--
MW-9	2/16/2023	6.53	0.241	0.64	-259.4	5.0	--
MW-9	5/16/2023	7.26	1.72	0.41	154.9	20.0	--
MW-10	2/19/2020	4.30	0.824	2.56	158.3	11	--
MW-10	5/20/2020	6.85	1.925	0.3	-90.1	17	0.0
MW-10	8/27/2020	7.16	1.62	0.27	12.5	8	0.0
MW-10	11/5/2020	7.11	1.91	0.44	-103.4	10	--
MW-10	2/24/2021	7.05	0.814	0.9	-67.6	48	2.4
MW-10	5/18/2021	7.04	1.39	0.36	-112.9	32	--
MW-10	8/18/2021	7.17	1.64	1.83	140.7	14	--
MW-10	11/10/2021	7.35	1.33	1.62	-17.2	6.0	--
MW-10	1/18/2022	6.35	0.917	0.52	99.1	12.0	--
MW-10	4/5/2022	6.29	1.68	0.49	76.1	13.0	--
MW-10	7/19/2022	6.52	1.26	2.01	233.1	10.0	--
MW-10	10/25/2022	6.94	1.24	0.09	131	9.0	--
MW-10	2/16/2023	7.04	0.308	1.96	-294.2	6.0	--
MW-10	5/16/2023	8.00	1.81	0.86	159	16.0	--
MW-11	2/19/2020	4.60	0.946	2.63	168.1	31	--
MW-11	5/20/2020	6.94	1.48	0.31	-90.9	61	0.0
MW-11	8/27/2020	7.09	1.45	0.22	-83.2	10	0.0
MW-11	11/5/2020	7.19	1.40	0.49	-56.7	11	--
MW-11	2/24/2021	7.07	0.743	0.69	-90	14	0.6
MW-11	5/18/2021	6.80	1.08	0.37	-117	60	--
MW-11	8/18/2021	7.00	1.179	1.68	101.5	60	--
MW-11	11/10/2021	7.44	1.25	0.41	-0.8	46.0	--
MW-11	1/18/2022	6.27	0.944	0.88	104.2	12.0	--
MW-11	4/5/2022	6.19	1.29	0.15	49.1	30.0	--
MW-11	7/19/2022	6.82	0.830	1.25	129.6	100	--
MW-11	10/25/2022	6.94	1.06	0.09	110.4	10.0	--
MW-11	2/16/2023	7.05	0.269	0.96	-327.3	25.0	--
MW-11	5/16/2023	7.18	1.79	0.28	141.2	40.0	--

Notes:

- ID = Identification
- mg/L = Milligrams per liter
- mS/cm = milliSiemens per centimeter
- mV = millivolts
- NTU = Nephelometric Turbidity Unit
- pH = potential of hydrogen
- ORP = oxygen reduction potential
- = not analyzed/not available

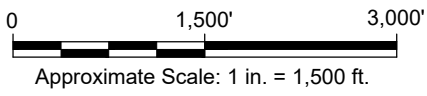
FIGURES





SITE LOCATION

REFERENCE: BASE MAP CREATED WITH TOPO! - RICHLAND, US TOPO.



CHEVRON SERVICE SITE 9-8944 1323 LEE BOULEVARD RICHLAND, WASHINGTON	
SITE LOCATION MAP	
	FIGURE 1

LEE BOULEVARD

LEGEND:

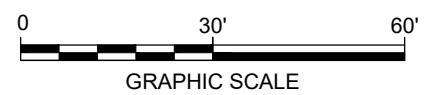
- MW-10 GROUNDWATER MONITORING WELL LOCATION
- MW-3 ABANDONED WELL LOCATIONS
- MW-2 DESTROYED MONITORING WELL LOCATION
- (345.81)** GROUNDWATER ELEVATION IN FEET
- 345.80 GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- BOLD** BOLD VALUES ARE GREATER THAN THEIR RESPECTIVE MTCA METHOD A CLEANUP LEVEL
- <1.00 NOT DETECTED AT OR ABOVE THE REPORTED DETECTION LIMIT
- J THE IDENTIFICATION OF THE ANALYTE IS ACCEPTABLE; THE REPORTED VALUE IS AN ESTIMATE
- * ECOLOGY MODEL TOXICS CONTROL ACT (MTCA) METHOD A CLEANUP LEVELS (CULs) FOR GROUNDWATER, WAC CHAPTER 173-340-900, TABLE 720-1
- 800/1,000 GRO MTCA METHOD A CUL WITH B PRESENT IS 800 (µg/L) AND WITHOUT IS 1,000 (µg/L)
- TPH TOTAL PETROLEUM HYDROCARBONS
- [] DUPLICATE SAMPLE

MW-11	
Date	5/16/2023
TPH-GRO	272
TPH-DRO	71.9 J
TPH-DRO w/SGC	71.9 J
TPH-HRO	<250
TPH-HRO w/SGC	<250
B	<1.00
T	<1.00
E	<1.00
X	0.177 J

MW-10	
Date	5/16/2023
TPH-GRO	811 [1,070]
TPH-DRO	175 J [203]
TPH-DRO w/SGC	175 J [<200]
TPH-HRO	<250 [<250]
TPH-HRO w/SGC	<250 [<250]
B	<1.00 [<1.00]
T	<1.00 [<1.00]
E	2.26 [3.62]
X	0.404 J [0.454 J]

MW-9	
Date	5/16/2023
TPH-GRO	2,280
TPH-DRO	891
TPH-DRO w/SGC	496
TPH-HRO	<250
TPH-HRO w/SGC	<250
B	<5.00
T	<5.00
E	14.3
X	5.73 J

Well ID		
Constituent	MTCA CULs*	
TPH-GRO	TPH as gasoline	800/1,000
TPH-DRO	TPH as diesel	500
TPH-DRO w/SGC	TPH as diesel with silica gel	500
TPH-HRO	TPH as motor oil	500
TPH-HRO w/SGC	TPH as motor oil with silica gel	500
B	Benzene	5
T	Toluene	1,000
E	Ethylbenzene	700
X	Xylenes (total)	1,000



NOTES:

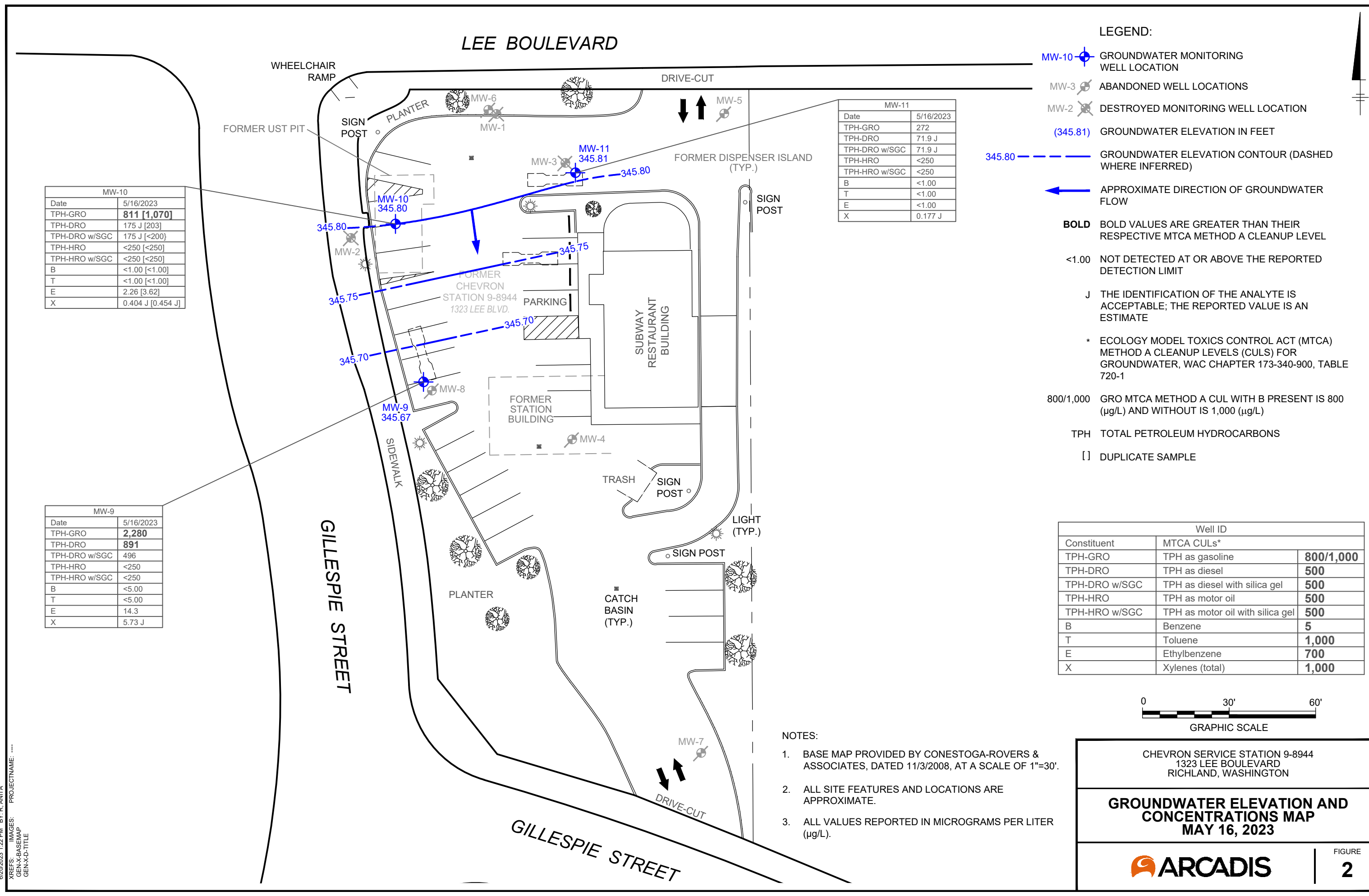
- BASE MAP PROVIDED BY CONESTOGA-ROVERS & ASSOCIATES, DATED 11/3/2008, AT A SCALE OF 1"=30'.
- ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.
- ALL VALUES REPORTED IN MICROGRAMS PER LITER (µg/L).

CHEVRON SERVICE STATION 9-8944
1323 LEE BOULEVARD
RICHLAND, WASHINGTON

**GROUNDWATER ELEVATION AND CONCENTRATIONS MAP
MAY 16, 2023**

ARCADIS

FIGURE 2



ATTACHMENT A

Field Data Sheets and General Procedures



Groundwater Gauging Log

Project Number	30064311							
Client:	Chevron							
Site ID:	98944							
Site Location:	Kennewick, Washington							
Measuring Point:	Top of Casing							
Date(s):	02/16/2023							
Sampler(s):	Lee Bures							
Gauging Equipment:	Interface Probe							
Well ID	Date	Gauging Time	Static Water Level (ft bmp)	Depth to Product (ft bmp)	Total Depth (ft bmp)	PID Reading (ppm)	LNAPL Removed (gal)	Comments
MW-9	02/16/2023	10:55	5.68	ND	18.40	--	--	--
MW-10	02/16/2023	10:57	12.89	ND	18.15	--	--	--
MW-11	02/16/2023	10:59	7.94	ND	18.00	--	--	--

ft-bmp = feet below measuring point

ND = Not Detected

PID = Photoionization Detector Reading

ppm = parts per million

-- = Not Recorded

Project Number	30064311	Well ID	MW-9	Date	2/16/2023	
Site Location	Kennewick, Washington	Site ID	98944	Weather (°F)	Clear	Sampled by Lee Bures
Measuring Point Description	Top of Casing	Screen Depth Interval (ft-bmp)	8 to 18	Casing Diameter (in.)	2	Well Casing Material
Static Water Level (ft-bmp)	5.68	Total Depth (ft-bmp)	18.4	Water Column (ft)	12.72	Gallons in Well 2.07
Water Quality Meter Make/Model	Hach 2100Q, YSI 556 MP5	Purge Method	Low-Flow	Sample Method	Grab	
Sample Time	11:27	Well Volumes Purged	0.38	Sample ID	MW-9-23026	Purge Equipment Peristaltic
Purge Start	11:11	Gallons Purged	0.79	Duplicate ID	--	Sample Equipment Peristaltic
Purge End	11:26	Total Purge Time (h:m)	0:15			

Time	Rate (ml/min)	Depth to Water (ft)	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
									Color	Odor
11:14	200	5.69	6.88	0.241	14.0	0.83	7.76	-274.4	Clear	--
11:17	200	5.69	6.49	0.240	6.0	0.68	7.68	-258	Clear	--
11:20	200	5.7	6.50	0.241	5.0	0.67	7.65	-259.5	Clear	--
11:23	200	5.7	6.51	0.241	5.0	0.66	7.67	-259.3	Clear	--
11:26	200	5.7	6.53	0.241	5.0	0.64	7.66	-259.4	Clear	--

Comments: None

Well Casing Volume Conversion

Well diameter (in.) = 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Sample Information

Sample ID: MW-9-23026 Sample Time: 11:27 Sample Depth (ft-bmp): 11
Analytes and Methods: See Chain-of-Custody.

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
PVC = Polyvinyl Chloride

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
-- = Not Recorded

Project Number	30064311	Well ID	MW-11	Date	2/16/2023	
Site Location	Kennewick, Washington	Site ID	98944	Weather (°F)	Clear	Sampled by Lee Bures
Measuring Point Description	Top of Casing	Screen Depth Interval (ft-bmp)	8 to 18	Casing Diameter (in.)	2	Well Casing Material
Static Water Level (ft-bmp)	7.94	Total Depth (ft-bmp)	18	Water Column (ft)	10.06	Gallons in Well 1.63
Water Quality Meter Make/Model	Hach 2100Q,YSI 556 MP5	Purge Method	Low-Flow	Sample Method	Grab	
Sample Time	12:50	Well Volumes Purged	0.49	Sample ID	MW-11-230216	Purge Equipment Peristaltic
Purge Start	12:33	Gallons Purged	0.79	Duplicate ID	--	Sample Equipment Peristaltic
Purge End	12:48	Total Purge Time (h:m)	0:15			

Time	Rate (ml/min)	Depth to Water (ft)	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
									Color	Odor
12:36	200	7.97	7.05	0.277	47.0	2.00	8.97	-308	Clear	--
12:39	200	7.97	7.05	0.274	28.0	1.09	8.71	-322.1	Clear	--
12:42	200	7.99	7.05	0.272	27.0	1.00	8.48	-326.9	Clear	--
12:45	200	7.99	7.05	0.271	25.0	0.98	8.51	-327.1	Clear	--
12:48	200	7.99	7.05	0.269	25.0	0.96	8.50	-327.3	Clear	--

Comments: None

Well Casing Volume Conversion

Well diameter (in.) = 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Sample Information

Sample ID: MW-11-230216 Sample Time: 12:50 Sample Depth (ft-bmp): 13
Analytes and Methods: See Chain-of-Custody.

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
PVC = Polyvinyl Chloride

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
-- = Not Recorded

Project Number	30064311	Well ID	MW-10	Date	2/16/2023	
Site Location	Kennewick, Washington	Site ID	98944	Weather (°F)	Clear	Sampled by Lee Bures
Measuring Point Description	Top of Casing	Screen Depth Interval (ft-bmp)	8 to 18	Casing Diameter (in.)	2	Well Casing Material
Static Water Level (ft-bmp)	12.89	Total Depth (ft-bmp)	18.15	Water Column (ft)	5.26	Gallons in Well 0.85
Water Quality Meter Make/Model	Hach 2100Q,YSI 556 MP5	Purge Method	Low-Flow	Sample Method	Grab	
Sample Time	12:04	Well Volumes Purged	0.93	Sample ID	MW-10-230216	Purge Equipment Peristaltic
Purge Start	11:47	Gallons Purged	0.79	Duplicate ID	Duplicate-1-181210	Sample Equipment Peristaltic
Purge End	12:02	Total Purge Time (h:m)	0:15			

Time	Rate (ml/min)	Depth to Water (ft)	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)	Appearance	
									Color	Odor
11:50	200	12.9	7.07	0.307	6.0	2.20	9.58	-301.1	Clear	--
11:53	200	12.9	7.07	0.309	6.0	2.17	9.52	-299.3	Clear	--
11:56	200	12.91	7.06	0.308	6.0	2.00	9.50	-294.7	Clear	--
11:59	200	12.91	7.06	0.308	6.0	1.98	9.48	-294.4	Clear	--
12:02	200	12.91	7.04	0.308	6.0	1.96	9.47	-294.2	Clear	--

Comments: None

Well Casing Volume Conversion

Well diameter (in.) = 1 = 0.04 1.5 = 0.09 2.5 = 0.26 3.5 = 0.50 6 = 1.47
gallons per foot 1.25 = 0.06 2 = 0.16 3 = 0.37 4 = 0.65

Sample Information

Sample ID: MW-10-230216 Sample Time: 12:04 Sample Depth (ft-bmp): 15

Analytes and Methods: See Chain-of-Custody.

ft-bmp = feet below measuring point
in. = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
PVC = Polyvinyl Chloride

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius
-- = Not Recorded

Arcadis - Chevron - WA

1100 Olive Way
Suite 800
Seattle, WA 98101

Report to:
Ada Hamilton

Project Description:
98944

Phone: 206-325-5254

Collected by (print):
Fonda DeSantos

Collected by (signature):
Fonda DeSantos

Immediately
Packed on Ice N Y

Sample ID

MW-9-230216

MW-10-230216

MW-11-230216

Duplicate-1-181210

TRIP BLANK-1-180626

Client Project #
30064311

Site/Facility ID #
1323 LEE BLVD. RICHLAND WA

Rush? (Lab MUST Be Notified)
 Same Day Five Day
 Next Day 5 Day (Rad Only)
 Two Day 10 Day (Rad Only)
 Three Day

Comp/Grab

Matrix *

Depth

Date

Time

No. of Cntrs

Billing Information:
Attn: Accounts Payable
630 Plaza Dr., Ste. 600
Highlands Ranch, CO 80129

Email To:

ada.hamilton@arcadis.com; Sean.Parry@arcadis.com

Please Circle:

PT MT CT ET

Lab Project #
CHEVARCWA-98944

Quote #

Date Results Needed

FF Dis5 Mn 6020 250m HDPE HNO3

BTEX 8260 40m/AmB-HCl

* Nitrate, Sulfate 125m HDPE-NOPres

Methane RSK175 40m/AmB HCl

NWTPHDX w/ silica 40m/AmB-HCl-BT

NWTPHDX no silica 40m/AmB-HCl-BT

NWTPHGX 40m/AmB HCl

Total Fe, Mn, Pb 6020 250m HDPE-HNO3

Pros

Chk

Chain of Custody Page 1 of 1



MT JULIET, TN

12955 Location 84 Mount Juliet, TN 37122
Submitting a sample via this chain of custody
constitutes acknowledgement and acceptance of the
terms and conditions found at:
http://www.paceenvironmentalsciences.com/chainofcustody

SDG #

Table #

Account: CHEVARCWA

Template: T224053

Prelog: P979061

PM: 110 - Brian Ford

PB

Shipped Via:

Remarks (Lab Only)

Sample Receipt Checklist

COC Seal Present/Intact:	Y	N
COC Signed/Accurate:	Y	N
Bottles arrive intact:	Y	N
Correct bottles used:	Y	N
Sufficient volume sent:	Y	N
If Applicable		
VOA Zero Headspace:	Y	N
Preservation Correct/Checked:	Y	N
RAP Screen <0.5 mL/hr:	Y	N

If preservation required by Login, Date/Time

Condition:
NCF / OK

Remarks: *Nitrate has a 48 hour holding time.

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - Waste Water
DW - Drinking Water
OT - Other

Relinquished by: (Signature)
Fonda DeSantos

Relinquished by: (Signature)

Relinquished by: (Signature)

Samples returned via:
 UPS FedEx Courier

Date: 02/16/23

Date: 02/16/23

Date:

Time: 1400

Time:

Time:

Tracking #

Received by: (Signature)

SHIPPED VIA FEDEX

Received by: (Signature)

Received for lab by: (Signature)

Trip Blank Received: Yes / No

HCL / Meoth TBR

Temp: °C

Bottles received:

Date:

Hold:

Condition:
NCF / OK

WELLHEAD INSPECTION FORM

Client: ARCADIS Site: RICHLAND-1323 LEE ST. Date: 02/16/23

Job #: 230216-FD1 Technician: FD Page 1 of 1

Well ID	Well Inspected - No Corrective Action Required	Check indicates deficiency										Well Not Inspected (explain in notes)	Notes <small>(list if cap or lick replaced, if there are access issues associated with repairs, if traffic control is required, if stand pipe damaged, or any specific details not covered by checklist)</small>	
		Cap non-functional	Lock non-functional	Lock missing	Bolts missing (list qty)	Tabs stripped (list qty)	Tabs broken (list qty)	Annular seal incomplete	Apron damaged	Rim / Lid broken	Trip Hazard			Below Grade
MW-9	X													
MW-10	X													
MW-11	X													

NOTES: _____

Permit To Work

for Chevron EMC Sites

Client: ARCADIS Date 02/16/23

Site Address: 1323 LEE BLVD

Job Number: 230216-FD1 Technician(s): FD

Pre-Job Safety Review

1. JMP reviewed, site restrictions and parking/access issues addressed.	Reviewed: <input checked="" type="checkbox"/>
2. Special Permit Required Task Review	
Are there any conditions or tasks that would require:	Yes No
Confined space entry	<input type="checkbox"/> <input checked="" type="checkbox"/>
Working at height	<input type="checkbox"/> <input checked="" type="checkbox"/>
Lock-out/Tag-out	<input type="checkbox"/> <input checked="" type="checkbox"/>
Excavations greater than 4 feet deep	<input type="checkbox"/> <input checked="" type="checkbox"/>
Excavations within 3 feet of a buried active electrical line or product piping or within 10 feet of a high pressure gas line.	<input type="checkbox"/> <input checked="" type="checkbox"/>
Use of overhead equipment within 15 feet of an overhead electrical power line or pole supporting one	<input type="checkbox"/> <input checked="" type="checkbox"/>
Hot work	<input type="checkbox"/> <input checked="" type="checkbox"/>
If "Yes" was the answer to any of the Special Permit Required Tasks above, the Project Manager will contact the client and arrange to modify the Scope of Work so that the Special Permit Required Tasks are not required to be performed by Blaine Tech Services employees.	
3. Is a Traffic Control Permit required for today's work?	Yes No <input type="checkbox"/> <input checked="" type="checkbox"/>
If so is it in the folder?	<input type="checkbox"/> <input type="checkbox"/>
Is it current?	<input type="checkbox"/> <input type="checkbox"/>
Do you understand the Traffic Control Plan and what equipment you will need?	<input type="checkbox"/> <input type="checkbox"/>

On site Pre-Job Safety Review

1. Reviewed and signed the site specific HASP.	<input checked="" type="checkbox"/>
2. Route to hospital understood.	<input checked="" type="checkbox"/>
3. Reviewed "Groundwater Monitoring Well Sampling General Job Safety Analysis included in the HASP.	<input checked="" type="checkbox"/>
4. Exceptional circumstances today that are not covered by the HASP, JSA or JMP have been addressed and mitigated.	<input checked="" type="checkbox"/>
5. Understands procedure to follow, if site circumstances change, to address new site hazards.	<input checked="" type="checkbox"/>
6. There are no unexpected conditions which would make your task a Special Permit Required Task. If there is, contact your Project Manager.	<input checked="" type="checkbox"/>
7. All site hazards have been communicated to all necessary onsite personnel during tailgate safety meeting.	<input checked="" type="checkbox"/>
8. After lunch tailgate safety meeting refresher conducted.	<input checked="" type="checkbox"/>
If Checklist Task cannot be completed, explain:	

Permit To Work Authority:

Name	Title	Date	Time

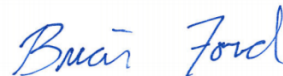
ATTACHMENT B

**Laboratory Report and Chain-of-Custody
Documentation**

Arcadis - Chevron - WA

Sample Delivery Group: L1617167
Samples Received: 05/17/2023
Project Number: 30064311
Description: 98944
Site: 1323 LEE BLVD. RICHLAND WA
Report To: Ada Hamilton
1100 Olive Way
Suite 800
Seattle, WA 98101

Entire Report Reviewed By:



Brian Ford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

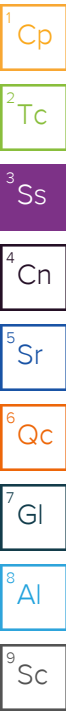
Cp: Cover Page	1	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
MW-9-230516 L1617167-01	5	
MW-10-230516 L1617167-02	6	⁴ Cn
MW-11-230516 L1617167-03	7	⁵ Sr
1-181210 L1617167-04	8	
TRIP BLANK-1-180626 L1617167-05	9	⁶ Qc
Qc: Quality Control Summary	10	
Volatile Organic Compounds (GC) by Method NWTPHGX	10	⁷ Gl
Volatile Organic Compounds (GC/MS) by Method 8260D	11	
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	12	⁸ Al
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	13	
Gl: Glossary of Terms	14	⁹ Sc
Al: Accreditations & Locations	15	
Sc: Sample Chain of Custody	16	

SAMPLE SUMMARY

MW-9-230516 L1617167-01 GW

Collected by: Diana Ojeda
 Collected date/time: 05/16/23 13:15
 Received date/time: 05/17/23 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method NWTPHGX	WG2064863	5	05/23/23 17:14	05/23/23 17:14	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG2065033	5	05/23/23 18:49	05/23/23 18:49	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG2065495	1	05/25/23 16:38	05/25/23 22:28	MWS	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG2065496	1	05/25/23 16:39	05/26/23 07:23	MWS	Mt. Juliet, TN



MW-10-230516 L1617167-02 GW

Collected by: Diana Ojeda
 Collected date/time: 05/16/23 12:35
 Received date/time: 05/17/23 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method NWTPHGX	WG2064863	1	05/23/23 13:16	05/23/23 13:16	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG2065033	1	05/23/23 13:50	05/23/23 13:50	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG2065495	1	05/25/23 16:38	05/25/23 22:48	MWS	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG2065496	1	05/25/23 16:39	05/25/23 22:48	MWS	Mt. Juliet, TN

MW-11-230516 L1617167-03 GW

Collected by: Diana Ojeda
 Collected date/time: 05/16/23 13:43
 Received date/time: 05/17/23 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method NWTPHGX	WG2064863	1	05/23/23 13:34	05/23/23 13:34	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG2065033	1	05/23/23 14:11	05/23/23 14:11	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG2065495	1	05/25/23 16:38	05/25/23 23:08	MWS	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG2065496	1	05/25/23 16:39	05/25/23 23:08	MWS	Mt. Juliet, TN

1-181210 L1617167-04 GW

Collected by: Diana Ojeda
 Collected date/time: 05/16/23 12:00
 Received date/time: 05/17/23 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC) by Method NWTPHGX	WG2064863	1	05/23/23 13:52	05/23/23 13:52	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG2065033	1	05/23/23 14:32	05/23/23 14:32	DWR	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT	WG2065495	1	05/25/23 16:38	05/25/23 23:28	MWS	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG2065496	1	05/25/23 16:39	05/26/23 07:03	MWS	Mt. Juliet, TN


TRIP BLANK-1-180626 L1617167-05 GW

Collected by: Diana Ojeda
 Collected date/time: 05/16/23 09:00
 Received date/time: 05/17/23 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG2065033	1	05/23/23 12:44	05/23/23 12:44	DWR	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Project Manager

Sample Delivery Group (SDG) Narrative

pH outside of method requirement.

Lab Sample ID

[L1617167-03](#)

Project Sample ID

[MW-11-230516](#)

Method

NWTPHDX-NO SGT

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	2280		158	500	5	05/23/2023 17:14	WG2064863
(S) a,a,a-Trifluorotoluene(FID)	98.6			78.0-120		05/23/2023 17:14	WG2064863



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Benzene	U		0.471	5.00	5	05/23/2023 18:49	WG2065033
Toluene	U		1.39	5.00	5	05/23/2023 18:49	WG2065033
Ethylbenzene	14.3		0.685	5.00	5	05/23/2023 18:49	WG2065033
Total Xylenes	5.73	J	0.870	15.0	5	05/23/2023 18:49	WG2065033
(S) Toluene-d8	110			80.0-120		05/23/2023 18:49	WG2065033
(S) 4-Bromofluorobenzene	94.6			77.0-126		05/23/2023 18:49	WG2065033
(S) 1,2-Dichloroethane-d4	98.9			70.0-130		05/23/2023 18:49	WG2065033

Sample Narrative:

L1617167-01 WG2065033: Non-target compounds too high to run at a lower dilution.

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	891		66.7	200	1	05/25/2023 22:28	WG2065495
Residual Range Organics (RRO)	U		83.3	250	1	05/25/2023 22:28	WG2065495
(S) o-Terphenyl	114			52.0-156		05/25/2023 22:28	WG2065495

Sample Narrative:

L1617167-01 WG2065495: Sample resembles laboratory standard for Kerosene.

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	496		66.7	200	1	05/26/2023 07:23	WG2065496
Residual Range Organics (RRO)	U		83.3	250	1	05/26/2023 07:23	WG2065496
(S) o-Terphenyl	92.6			52.0-156		05/26/2023 07:23	WG2065496

Sample Narrative:

L1617167-01 WG2065496: Sample resembles laboratory standard for Kerosene.

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	811		31.6	100	1	05/23/2023 13:16	WG2064863
(S) a,a,a-Trifluorotoluene(FID)	100			78.0-120		05/23/2023 13:16	WG2064863

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0941	1.00	1	05/23/2023 13:50	WG2065033
Toluene	U		0.278	1.00	1	05/23/2023 13:50	WG2065033
Ethylbenzene	2.26		0.137	1.00	1	05/23/2023 13:50	WG2065033
Total Xylenes	0.404	J	0.174	3.00	1	05/23/2023 13:50	WG2065033
(S) Toluene-d8	116			80.0-120		05/23/2023 13:50	WG2065033
(S) 4-Bromofluorobenzene	101			77.0-126		05/23/2023 13:50	WG2065033
(S) 1,2-Dichloroethane-d4	122			70.0-130		05/23/2023 13:50	WG2065033

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	175	J	66.7	200	1	05/25/2023 22:48	WG2065495
Residual Range Organics (RRO)	U		83.3	250	1	05/25/2023 22:48	WG2065495
(S) o-Terphenyl	108			52.0-156		05/25/2023 22:48	WG2065495

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	175	J	66.7	200	1	05/25/2023 22:48	WG2065496
Residual Range Organics (RRO)	U		83.3	250	1	05/25/2023 22:48	WG2065496
(S) o-Terphenyl	108			52.0-156		05/25/2023 22:48	WG2065496

Sample Narrative:

L1617167-02 WG2065496: Reporting from non-silica gel data due to non-detect to the RDL.

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	272		31.6	100	1	05/23/2023 13:34	WG2064863
(S) a,a,a-Trifluorotoluene(FID)	95.5			78.0-120		05/23/2023 13:34	WG2064863

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0941	1.00	1	05/23/2023 14:11	WG2065033
Toluene	U		0.278	1.00	1	05/23/2023 14:11	WG2065033
Ethylbenzene	U		0.137	1.00	1	05/23/2023 14:11	WG2065033
Total Xylenes	0.177	J	0.174	3.00	1	05/23/2023 14:11	WG2065033
(S) Toluene-d8	108			80.0-120		05/23/2023 14:11	WG2065033
(S) 4-Bromofluorobenzene	94.9			77.0-126		05/23/2023 14:11	WG2065033
(S) 1,2-Dichloroethane-d4	103			70.0-130		05/23/2023 14:11	WG2065033

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	71.9	J	66.7	200	1	05/25/2023 23:08	WG2065495
Residual Range Organics (RRO)	U		83.3	250	1	05/25/2023 23:08	WG2065495
(S) o-Terphenyl	108			52.0-156		05/25/2023 23:08	WG2065495

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	71.9	J	66.7	200	1	05/25/2023 23:08	WG2065496
Residual Range Organics (RRO)	U		83.3	250	1	05/25/2023 23:08	WG2065496
(S) o-Terphenyl	108			52.0-156		05/25/2023 23:08	WG2065496

Sample Narrative:

L1617167-03 WG2065496: Reporting from non-silica gel data due to non-detect to the RDL.

Volatile Organic Compounds (GC) by Method NWTPHGX

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Gasoline Range Organics-NWTPH	1070		31.6	100	1	05/23/2023 13:52	WG2064863
(S) <i>a,a,a</i> -Trifluorotoluene(FID)	100			78.0-120		05/23/2023 13:52	WG2064863

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Benzene	U		0.0941	1.00	1	05/23/2023 14:32	WG2065033
Toluene	U		0.278	1.00	1	05/23/2023 14:32	WG2065033
Ethylbenzene	3.62		0.137	1.00	1	05/23/2023 14:32	WG2065033
Total Xylenes	0.454	J	0.174	3.00	1	05/23/2023 14:32	WG2065033
(S) Toluene-d8	107			80.0-120		05/23/2023 14:32	WG2065033
(S) 4-Bromofluorobenzene	94.8			77.0-126		05/23/2023 14:32	WG2065033
(S) 1,2-Dichloroethane-d4	103			70.0-130		05/23/2023 14:32	WG2065033

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-NO SGT

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	203		66.7	200	1	05/25/2023 23:28	WG2065495
Residual Range Organics (RRO)	U		83.3	250	1	05/25/2023 23:28	WG2065495
(S) <i>o</i> -Terphenyl	104			52.0-156		05/25/2023 23:28	WG2065495

Sample Narrative:

L1617167-04 WG2065495: Sample resembles laboratory standard for Gasoline.

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Diesel Range Organics (DRO)	U		66.7	200	1	05/26/2023 07:03	WG2065496
Residual Range Organics (RRO)	U		83.3	250	1	05/26/2023 07:03	WG2065496
(S) <i>o</i> -Terphenyl	86.3			52.0-156		05/26/2023 07:03	WG2065496

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Benzene	U		0.0941	1.00	1	05/23/2023 12:44	WG2065033
Toluene	0.546	J	0.278	1.00	1	05/23/2023 12:44	WG2065033
Ethylbenzene	0.158	J	0.137	1.00	1	05/23/2023 12:44	WG2065033
Total Xylenes	0.853	J	0.174	3.00	1	05/23/2023 12:44	WG2065033
(S) Toluene-d8	112			80.0-120		05/23/2023 12:44	WG2065033
(S) 4-Bromofluorobenzene	103			77.0-126		05/23/2023 12:44	WG2065033
(S) 1,2-Dichloroethane-d4	99.5			70.0-130		05/23/2023 12:44	WG2065033

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Method Blank (MB)

(MB) R3928945-2 05/23/23 11:11

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Gasoline Range Organics-NWTPH	U		31.6	100
(S) a,a,a-Trifluorotoluene(FID)	97.9			78.0-120

Laboratory Control Sample (LCS)

(LCS) R3928945-1 05/23/23 10:34

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Gasoline Range Organics-NWTPH	5500	4790	87.1	70.0-124	
(S) a,a,a-Trifluorotoluene(FID)			103	78.0-120	

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Method Blank (MB)

(MB) R3928580-2 05/23/23 11:13

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Benzene	U		0.0941	1.00
Toluene	U		0.278	1.00
Ethylbenzene	U		0.137	1.00
Total Xylenes	U		0.174	3.00
<i>(S) Toluene-d8</i>	110			80.0-120
<i>(S) 4-Bromofluorobenzene</i>	104			77.0-126
<i>(S) 1,2-Dichloroethane-d4</i>	100			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3928580-1 05/23/23 10:09

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Benzene	5.00	4.13	82.6	70.0-123	
Toluene	5.00	4.49	89.8	79.0-120	
Ethylbenzene	5.00	4.85	97.0	79.0-123	
Total Xylenes	15.0	14.0	93.3	79.0-123	
<i>(S) Toluene-d8</i>			109	80.0-120	
<i>(S) 4-Bromofluorobenzene</i>			100	77.0-126	
<i>(S) 1,2-Dichloroethane-d4</i>			102	70.0-130	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Method Blank (MB)

(MB) R3929659-1 05/25/23 20:27

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		66.7	200
Residual Range Organics (RRO)	U		83.3	250
<i>(S) o-Terphenyl</i>	101			52.0-156

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3929659-2 05/25/23 20:47 • (LCSD) R3929659-3 05/25/23 21:07

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	1500	1350	1520	90.0	101	50.0-150			11.8	20
<i>(S) o-Terphenyl</i>				114	115	52.0-156				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3929660-1 05/25/23 21:27

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Diesel Range Organics (DRO)	U		66.7	200
Residual Range Organics (RRO)	U		83.3	250
<i>(S) o-Terphenyl</i>	88.5			52.0-156

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3929660-2 05/25/23 21:47 • (LCSD) R3929660-3 05/25/23 22:08

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Diesel Range Organics (DRO)	1500	1170	1180	78.0	78.7	50.0-150			0.851	20
<i>(S) o-Terphenyl</i>				97.5	94.0	52.0-156				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

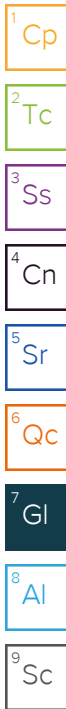
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
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ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Company Name/Address: **Arcadis - Chevron - WA**
 1100 Olive Way
 Suite 800
 Seattle, WA 98101

Billing Information:
 Attn: Accounts Payable
 630 Plaza Dr., Ste. 600
 Highlands Ranch, CO 80129

Report to: **Ada Hamilton**
 Email To: **ada.hamilton@arcadis.com; Sean.Parry@arcadis**

Project Description: **98944**
 City/State Collected: **Richland, WA**
 Please Circle: PT MT CT ET

Client Project #: **30064311**
 Lab Project #: **CHEVARCWA-98944**

Site/Facility ID #: **1323 LEE BLVD. RICHLAND WA**
 P.O. #

Collected by (print): **Diana Ojeda**
 Collected by (signature): *Diana Ojeda*
 Rush? (Lab MUST Be Notified)
 Same Day Five Day
 Next Day 5 Day (Rad Only)
 Two Day 10 Day (Rad Only)
 Three Day
 Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Analysis / Container / Preservative
MW-9-230516	Gr	GW	-	5/16/23	1315	9	8260 BTEX 40mIAmb-HCl NWTPHDX no silica 40mIAmb-HCl-BT NWTPHDX w/ silica 40mIAmb-HCl-BT NWTPHGX 40mIAmb HCl
MW-10-230516	↓	↓	-	↓	1235	9	
MW-11-230516	↓	↓	-	↓	1343	9	
1-181210	↓	↓	-	↓	1200	9	
Trip Blank-1-180626	↓	↓	-	↓	0900	1	

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Analysis / Container / Preservative
MW-9-230516	Gr	GW	-	5/16/23	1315	9	X X X X
MW-10-230516	↓	↓	-	↓	1235	9	X X X X
MW-11-230516	↓	↓	-	↓	1343	9	X X X X
1-181210	↓	↓	-	↓	1200	9	X X X X
Trip Blank-1-180626	↓	↓	-	↓	0900	1	X

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE

MT JULIET, TN

12065 Lebanon Rd Mount Juliet, TN 37122
 Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: <https://info.pacelabs.com/hubs/pas-standard-terms.pdf>

SDG # **1167167**
D050

Acctnum: **CHEVARCWA**
 Template: **T229241**
 Prelogin: **P995932**
 PM: **110 - Brian Ford**
 PB:

Shipped Via:

* Matrix: SS - Soil AIR - Air F - Filter
 GW - Groundwater B - Bioassay
 WW - WasteWater
 DW - Drinking Water
 OT - Other

Remarks:

Samples returned via: UPS FedEx Courier

Tracking #

pH _____ Temp _____
 Flow _____ Other _____

Sample Receipt Checklist

COC Seal Present/Intact: Y N
 COC Signed/Accurate: Y N
 Bottles arrive intact: Y N
 Correct bottles used: Y N
 Sufficient volume sent: Y N

If Applicable

VOA Zero Headspace: Y N
 Preservation Correct/Checked: Y N
 RAD Screen <0.5 mR/hr: Y N

Relinquished by: (Signature) *Diana Ojeda* Date: **5/16/23** Time: **1403**
 Received by: (Signature) *Shipped via FedEx* Trip Blank Received: Yes No
 (HCL) MeOH TBR

Relinquished by: (Signature) Date: Time: Received by: (Signature) TMSA7 °C Bottles Received: **5.0+0=5.0 36**
 If preservation required by Login: Date/Time

Relinquished by: (Signature) Date: Time: Received for lab by: (Signature) *Haylee J* Date: **5/17/23** Time: **930**
 Hold: Condition: **NCF / OK**