

September 6, 2024

Mr. Mark T. Pugh, R.G.  
DEQ Northwest Region  
700 NE Multnomah St, Ste 600  
Portland, OR 97232

**RE: Merit USA/FPI/ORRICO Site: Post-Closure Water Monitoring Report #3, for the Third Annual Monitoring Event on May 29, 2024 (DEQ Order No. LQSR-NWR-12-09).**

Dear Mr. Pugh:

### **Introduction**

Remediation activities are complete at the Merit USA/FPI/ORRICO site (Site) and a Certificate of Completion/Consent Order was issued on October 13, 2022 (Attachment A). The *Post-Closure Monitoring Plan* (Attachment B) for the Site requires: (1) light, non-aqueous-phase liquid (LNAPL) monitoring and LNAPL removal at groundwater monitoring wells FP-3 and FP-7, and (2) water quality monitoring at specific groundwater monitoring and surface water locations. This report documents the third annual post-closure monitoring activities as completed per the *Post-Closure Monitoring Plan* on May 29, 2024.

### **Summary of LNAPL Monitoring and Removal at Wells FP-3 and FP-7**

The presence of sheen or LNAPL was monitored monthly in groundwater monitoring wells FP-3 and FP-7. These wells are located north of the Record of Decision (ROD) Operable Units (OUs) OU3 and OU4 and within ORRICO's plant operations area (Figure 1). Monitoring data collected between July 2023 and May 2024 (i.e., since the previous report) are discussed herein.

The monitoring procedures were completed as described in the *Post-Closure Monitoring Plan* (Attachment B). As of May 2022, the LNAPL monitoring method was changed from a Coliwasa sampler to an oil-water interface probe that allows measurements to 0.01 foot of the product/water face depth and thickness of the LNAPL (if present). Field observations from these monthly monitoring events, including the amount of removed LNAPL, are summarized in Table 1 along with data from previous monitoring events. The variable LNAPL measurements are likely due to the use of a more accurate free product interface probe rather than using field observations and/or a Coliwasa sampler.

LNAPL was observed in both wells between July 2023 and May 2024. LNAPL was measured in thickness ranging from 0.0008 feet to 0.08 feet in FP-3 with the highest measurement observed in July 2023. Measured LNAPL thickness at FP-7 ranged from 0.0008 feet to 0.08 feet and the highest measurement was in July 2023. The free product observed was typically described as black or brown, with oil only observed on the vac truck stinger or free product measurement probe.

Approximately 5 gallons of LNAPL were removed from well FP-3 and approximately 4 gallons were removed from well FP-7 during this period. LNAPL and any water extracted from the monitoring wells was recycled at the ORRCCO facility.

### **Annual Monitoring of Wells FP-3, FP-5, FP-7 and FP-9 & Surface Water**

At the request of the Oregon Department of Environmental Quality (DEQ), annual groundwater monitoring will take place during April or May for five years starting in 2022 to monitor groundwater and surface water elevations and water quality in the interim period between the wet and dry seasons at the Site. This provides an estimate of groundwater and surface water conditions for the entire year without excessive contaminant dilution (wet season) or during a period when no surface water is present in the wetlands (dry season). The surface water and four groundwater monitoring wells were selected for annual monitoring to represent conditions within the plant operations area (FP-3 and FP-7), within OU3 (FP-5), and within the wetlands (FP-9). Sample locations are highlighted on Figure 1.

Coles + Betts Environmental Consulting (C+BEC) collected a surface water elevation at well FP-9, and groundwater elevations and samples at all four selected monitoring locations on May 29, 2024. The monitoring activities were completed in accordance with the *Post-Closure Monitoring Plan* and the groundwater elevations, field measurements of water quality, and analytical laboratory data are summarized below.

In well FP-3, oil was observed on the interface probe tape and was not read by the probe when measuring free product and water levels in the well. Approximately 1.29 feet of free product was observed in well FP-7. Free product was not observed in wells FP-5 and FP-9. The surface water did not have a petroleum sheen.

### ***Groundwater and Surface Water Elevations***

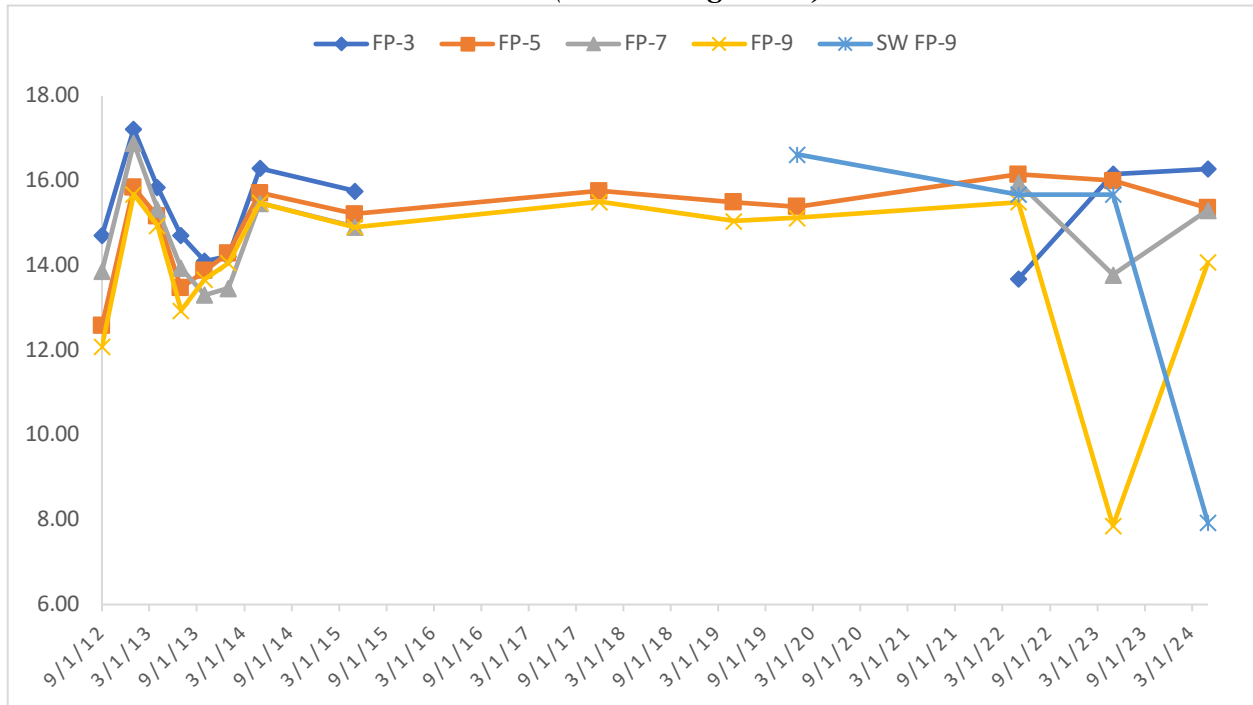
Prior to collecting groundwater elevations, the groundwater monitoring wells were opened and allowed an hour to equilibrate with the atmosphere. The depth to water in each well was measured from a marked point on the well casing.

The groundwater elevation in well FP-7, the only well with LNAPL that was field measured, was measured at 14.21 feet msl (top of casing elevation is 24.88 feet msl and depth to water was 10.67 feet below top of casing). The free product elevation was 15.5 feet msl and the measured depth to product at well FP-7 was 9.38 feet below top of casing. The groundwater elevation in well FP-7 was corrected to 15.30 feet msl by multiplying the LNAPL thickness (1.29 feet) by LNAPL specific gravity (average of 0.91 for diesel), with the result (1.092) added to the elevation of the groundwater/LNAPL interface (14.21 feet msl). With this calculation, the groundwater elevation in FP-7 was the third lowest elevation measured at the Site (15.30) and is 0.06 feet lower than the groundwater elevation measured at nearby well FP-5 (15.36 feet msl).

Surface water was measured adjacent to FP-9 by measuring the top of the well to the top of the surface water adjacent to the well.

Groundwater and surface water elevations are summarized in Table 2 and graphed in Chart 1 below.

**Chart 1. Groundwater Elevations in Feet (2012 through 2024).**



Groundwater contours in the vicinity of these key monitoring locations are provided in Figure 2. The water elevations are provided in bold font and the estimated groundwater contour intervals defined in un-bolded blue font. Groundwater contours are in 0.5-foot intervals. As indicated previously, the groundwater elevation measured in the field at FP-7 was 14.21 feet, and 15.30 feet when adjusted for LNAPL (the adjustment is noted in Figure 2).

Previous groundwater elevation data, from the broader range of monitoring wells at the site, indicates a general groundwater flow from the northeastern portion of the site toward the southwest. All groundwater elevations were higher in 2024 than during the previous monitoring event except for well FP-5 and the surface water elevations, which were lower than the previous monitoring event. Well FP-3 continues to have the highest groundwater elevation. Groundwater flow diagrams for May 2022 at well FP-7 appeared to show mounding at FP-7, possibly due to significant rainfalls and subsequent recharge from the bioswale (these groundwater elevations were corrected for NAPL). The groundwater elevation in May 2023 and in May 2024 at well FP-7 flowed toward well FP-7 from the north and south. The flow gradient from the south is lower than the flow gradient from the north as based on the 0.06 foot elevation difference between FP-5 and FP-7. These groundwater mounding and low groundwater area at FP-7 are likely due to the presence of LNAPL which causes difficulty with getting accurate free product and water table depth measurements. As indicated previously, groundwater at the site generally flows northeast to southwest.

**Selected Field Parameters at Wells**

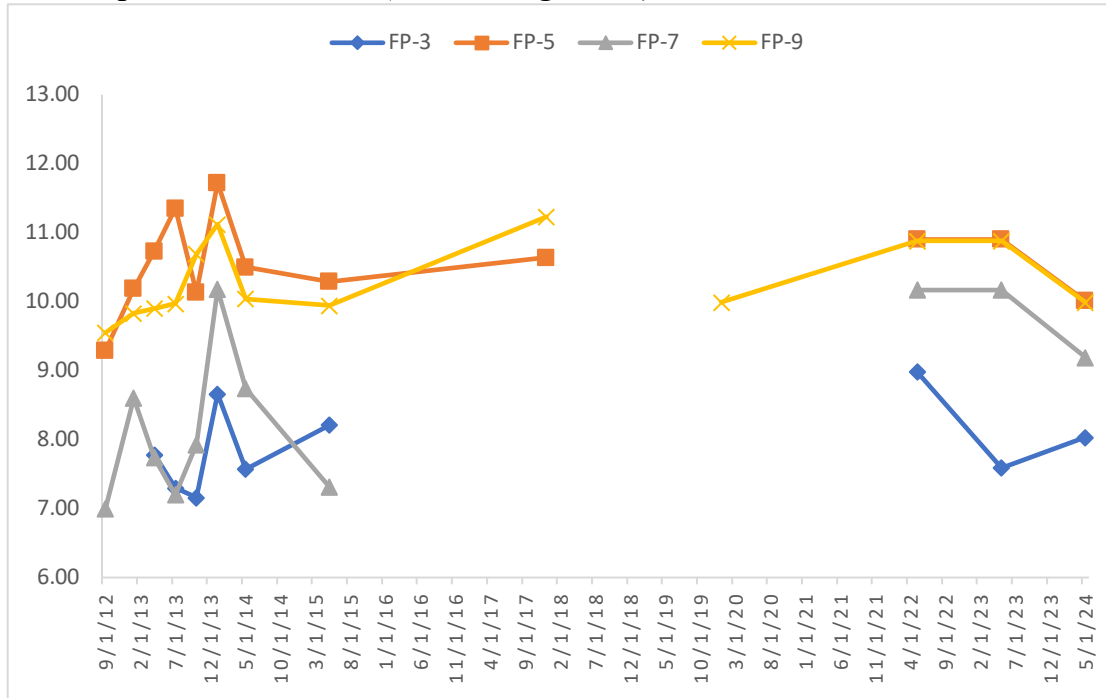
Groundwater samples were collected using a peristaltic pump to purge the wells with a flow rate as low as practical. Field parameters of pH, temperature, conductivity, dissolved oxygen, ORP and turbidity were measured during sampling using a calibrated multi-meter and flow-through

cell during the purge process. Field parameters are provided in Table 2. Selected findings are presented below.

pH Values

Historical pH values for the wells are summarized in Chart 2 below.

**Chart 2. pH Values in Wells (2012 through 2024).**

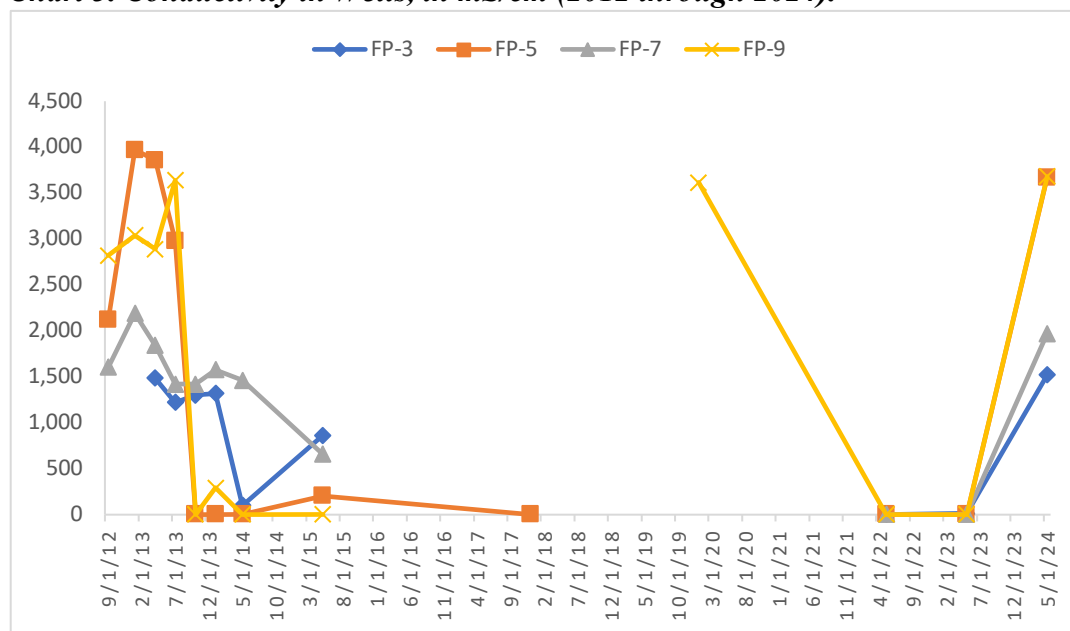


The wells have historically higher pH values than several of the other monitoring wells on Site due to their locations within or adjacent to the aluminum dross-filled panhandle. The wells had shown variable pH but all locations showed a decrease in May 2024 except well FP-3.

## Conductivity

Historical conductivity measurements for the wells are summarized in Chart 3 below.

**Chart 3. Conductivity in Wells, in mS/cm (2012 through 2024).**



Historical field conductivity readings at the site have varied greatly between 2012 and 2024. Conductivity readings in May 2024 at all locations were higher than the previous monitoring event.

### ***Analytical Laboratory Results at Wells***

Once field parameters stabilized at or after removing three well volumes from each well, the groundwater samples were placed into 1-liter amber bottles preserved with hydrochloric acid and 250 ml poly containers for laboratory analysis. The collected samples were labelled and placed in a chilled cooler for delivery to Apex Laboratories, LLC of Tigard, Oregon and analyzed as follows:

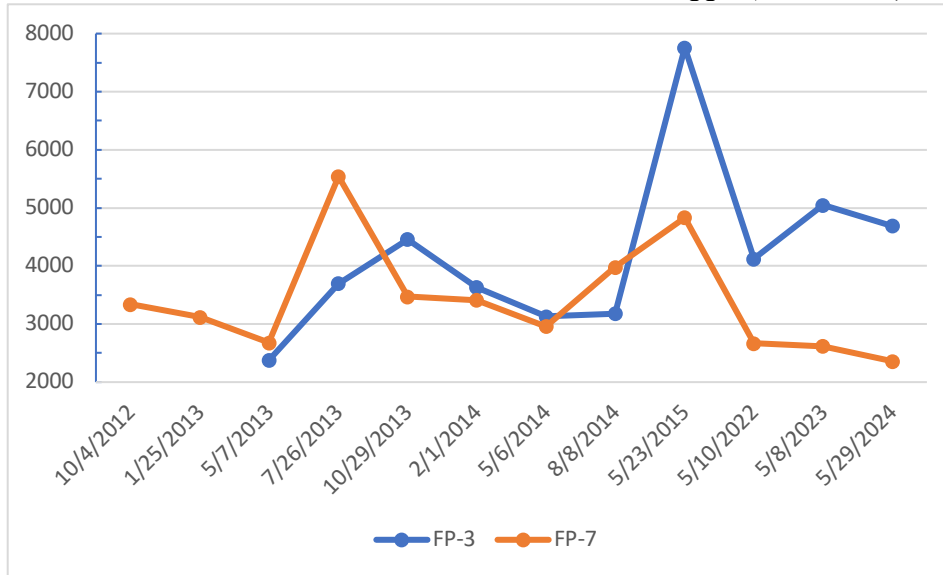
- Samples collected from FP-3 and FP-7 in the plant operations area were analyzed for diesel and oil-range petroleum hydrocarbons using WADOE Method NWTPH-Dx.
- Samples collected from FP-5 and FP-9 in the OU3 and OU4 areas were analyzed for dissolved metals (lead, zinc, and chromium) using EPA Method 6020A and fluoride using EPA Method 300.0/9056A.

Data were compared to DEQ ROD Screening Criteria. Laboratory analytical results for groundwater monitoring are summarized in Table 3. The analytical laboratory data report is included as Attachment C.

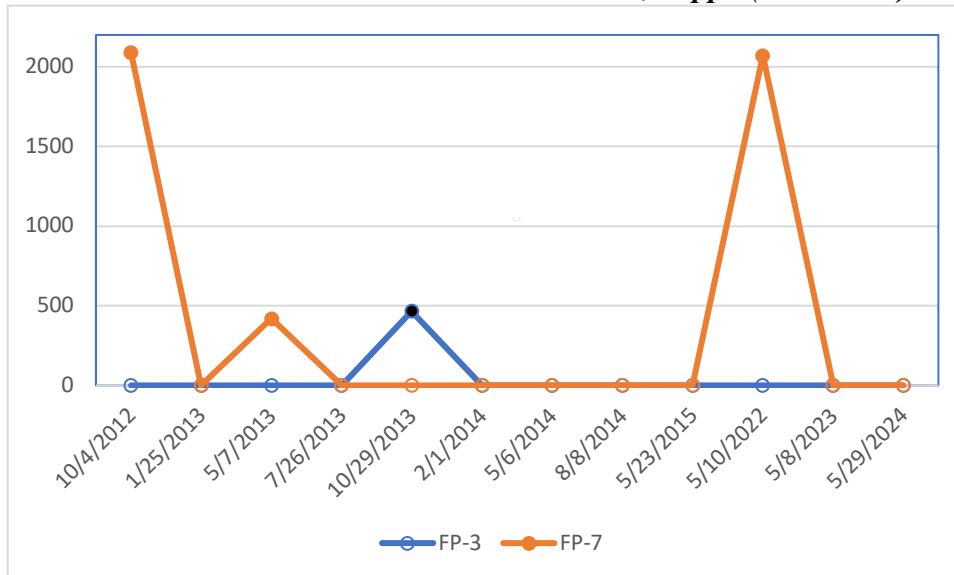
FP-3 and FP-7 Diesel- and Oil-Range Organic Concentrations

Wells FP-3 and FP-7 were selected for post-closure monitoring since they have traditionally had the highest concentrations of diesel-range organics (DRO) and oil-range organics (ORO) at the Site. Historical concentrations of DRO and ORO in groundwater at wells FP-3 and FP-7 are presented below in Charts 4 and 5, respectively.

**Chart 4. DRO Concentrations in FP-3 and FP-7, in ppb (2012-2024).**



**Chart 5. ORO Concentrations in FP-3 and FP-7, in ppb (2013-2024).**



Note: Non-detect values are shown as open symbols.

DRO concentrations in both wells fluctuated in the past, and the concentration of DRO at wells FP-3 and FP-7 in 2024 decreased from the last monitoring event in 2023. Except for a minor detection of ORO above the reporting limit in 2013, concentrations in well FP-3 continue to be

non-detect. ORO has been intermittently detected well FP-7 including in 2022, but ORO was not detected in the well in 2023 and 2024.

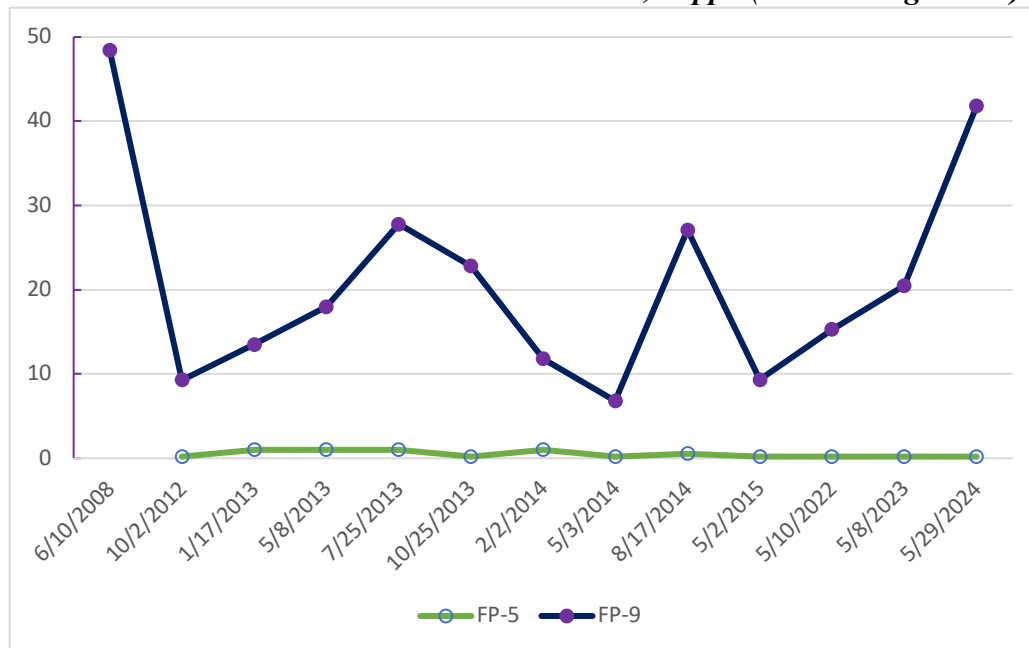
### FP-5 and FP-9 Metals and Fluoride Results

The May 2024 lead, zinc, chromium, and fluoride analytical laboratory results were compared to historical metals data from the Site and ROD Screening Levels. The findings are summarized below.

### Lead

Historical lead concentrations are presented in Chart 6 below.

**Chart 6. Lead Concentrations in FP-5 and FP-9, in ppb (2008 through 2024).**



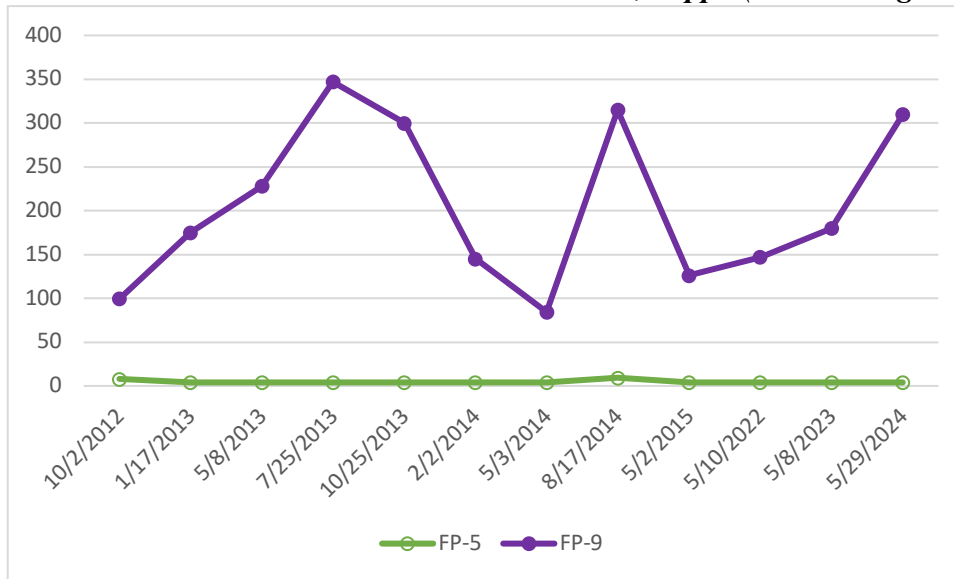
Note: Non-detect values are shown as open symbols.

Lead concentrations in well FP-5 in OU3 remained non-detect in May 2024. The lead concentrations in well FP-9 (41.8 ppb), located in the wetland area of OU4, increased over last period and exceeds the ROD Screening Criterion of 2.5 ppb. The lead value in well FP-9 was elevated due to laboratory dilution to prepare the sample and may not be representative of actual lead in groundwater at FP-9.

## Zinc

Historical zinc concentrations are presented in Chart 7 below.

**Chart 7. Zinc Concentrations in FP-5 and FP-9, in ppb (2012 through 2024).**



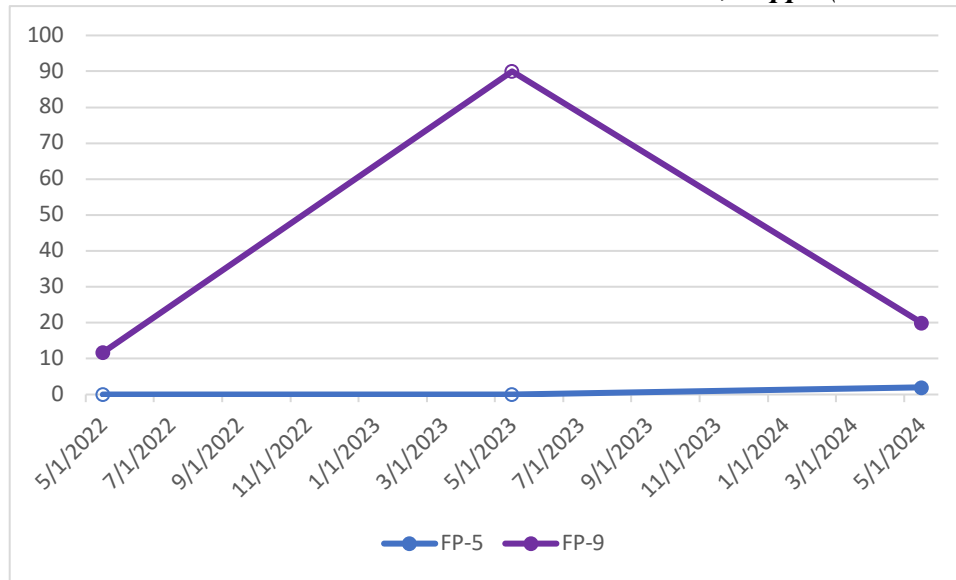
Note: Non-detect values are shown as open symbols.

Zinc concentrations in well FP-5 in OU3 remained non-detect in May 2024. Concentrations in FP-9, located in the wetland area of OU4, increased from 180 ppb in May 2023 to 310 ppb in May 2024. The May 2024 concentration exceeded the ROD Screening Criterion for zinc of 120 ppb; and, the value for May 2023 (180 ppb) was non-detect and the method reporting limit was elevated due to dilution required for analysis. The May 2024 zinc level (310 ppb) is consistent with previous post-remediation results of 347 ppb, 300 ppb, and 315 ppb in July and October 2013, and August 2014, respectively.

## Chromium

Historical chromium concentrations are presented in Chart 8 below.

**Chart 8. Chromium Concentrations in FP-5 and FP-9, in ppb (2022 through 2024).**



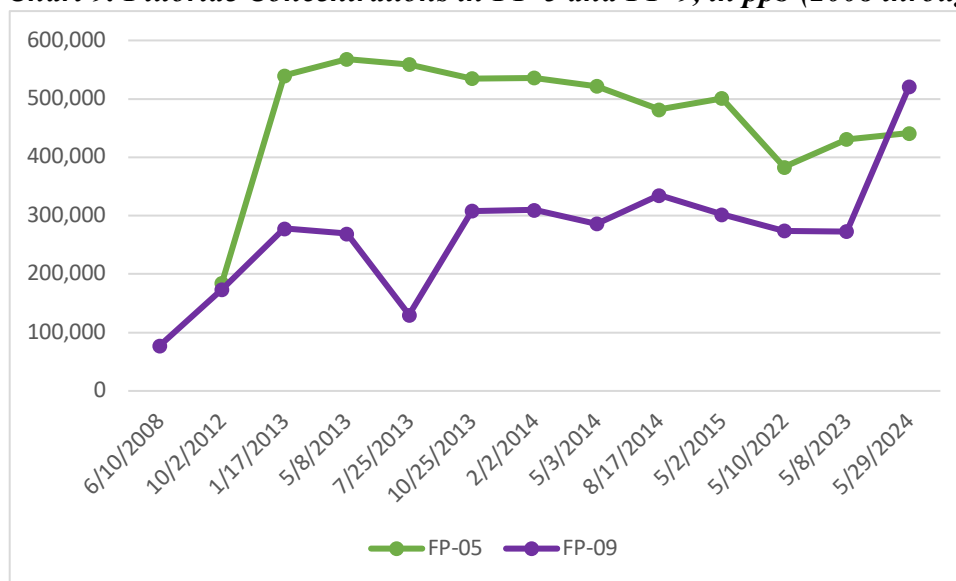
Note: Non-detect values are shown as open symbols.

Chromium concentrations were first measured at monitoring wells FP-5 and FP-9 in May 2022. Well FP-5 had undetectable concentrations of chromium in May 2022 and 2023 above the MRL of 2 ppb, and in May 2024 had detectable chromium of 2 ppb. The May 2024 chromium value in well FP-9 was elevated due to laboratory dilution to prepare the sample and may not be representative of actual chromium in groundwater at FP-9. The chromium in well FP-9 in May 2024 decreased over the previous period (May 2023) from 90 ppb. The May 2023 value of 90 ppb is non-detect and the method reporting limit; and was elevated due to dilution require for analysis. The May 2024 chromium is 20 ppb and is higher than the ROD Screening Criterion for the Site (11 ppb).

## Fluoride

Historical fluoride concentrations are presented in Chart 9 below.

**Chart 9. Fluoride Concentrations in FP-5 and FP-9, in ppb (2008 through 2024).**



Fluoride concentrations in wells FP-5 and FP-9 have historically been higher than other wells at the Site due to their locations within (FP-5) or directly down-gradient from the aluminum dross fill (FP-9). Monitoring of these wells for fluoride during the transition between wet and dry season (*i.e.*, May) was agreed upon between ORRCO and DEQ because May is when concentrations are likely to be the highest for fluoride (*i.e.*, “worst case”).

Fluoride concentrations at well FP-5 increased slightly from 431,000 ppb to 441,000 ppb over the previous period but concentrations continue to show an overall decreasing trend. Fluoride at well FP-9 increased from the previous period from 273,000 ppb to 521,000 ppb. The measured fluoride in wells FP-5 and FP-9 are above the ROD Screening Criterion for the Site (1,940 ppb).

Fluoride had a decreasing trend prior to this increase, particularly in well FP-9. Fluoride will continue to be monitored.

## Conclusions

Based on findings from the third annual post-closure monitoring event, we offer the following conclusions:

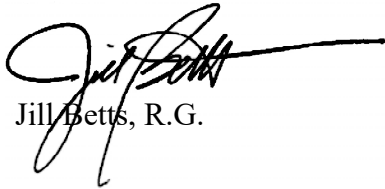
- LNAPL was monitored monthly at wells FP-3 and FP-7 between July 2023 and May 2024. LNAPL was observed in both wells during each monitoring event. The variable LNAPL measurements is due to the use of a more accurate free product interface probe rather than using field observations and/or a Coliwasa sampler. Approximately 5 gallons of LNAPL were removed from well FP-3 and approximately 4 gallons were removed from well FP-7 during this period.
- Surface water elevation was measured in the wetland adjacent to well FP-9 at 7.93 feet.

- Measured groundwater elevations ranged from 14.07 feet at well FP-9 to 16.28 feet at well FP-3. The groundwater elevation at well FP-7 was adjusted due to the LNAPL present. Groundwater was previously observed as mounding at well FP-7 in 2022, and in 2023 and 2024 now appears to be the low point in the panhandle area of the Site, with groundwater flowing towards well FP-7 from the north and south.
- The concentration of diesel-range organics (DRO) in groundwater at wells FP-3 and FP-7 decreased since the previous monitoring event. Oil-range organics were not detected in either well FP-3 or FP-7.
- As with the previous monitoring event, lead, zinc, chromium, and fluoride at well FP-9 and fluoride at well FP-5 were above their respective ROD screening criteria; however, the lead, zinc and chromium values in well FP-9 were elevated due to laboratory dilution to prepare the sample.

This report is the third annual post-closure monitoring report. Additional reports will be submitted annually for 2 years (i.e., through 2026) until approval is granted to discontinue monitoring.

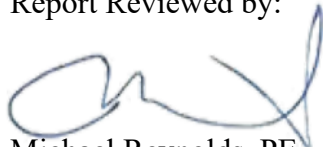
Should you have any questions concerning this report, please contact the undersigned.

Regards,



Jill Betts, R.G.

Report Reviewed by:



Michael Reynolds, PE  
Reynolds Engineering, LLC



cc: Mr. Scott Briggs, ORRCO  
Mr. Bill Briggs, ORRCO  
Mr. Kevin T. Sasse, Dunn Carney  
Mr. Chris Harris, Esq., ORRCO's General Counsel

Attachments:

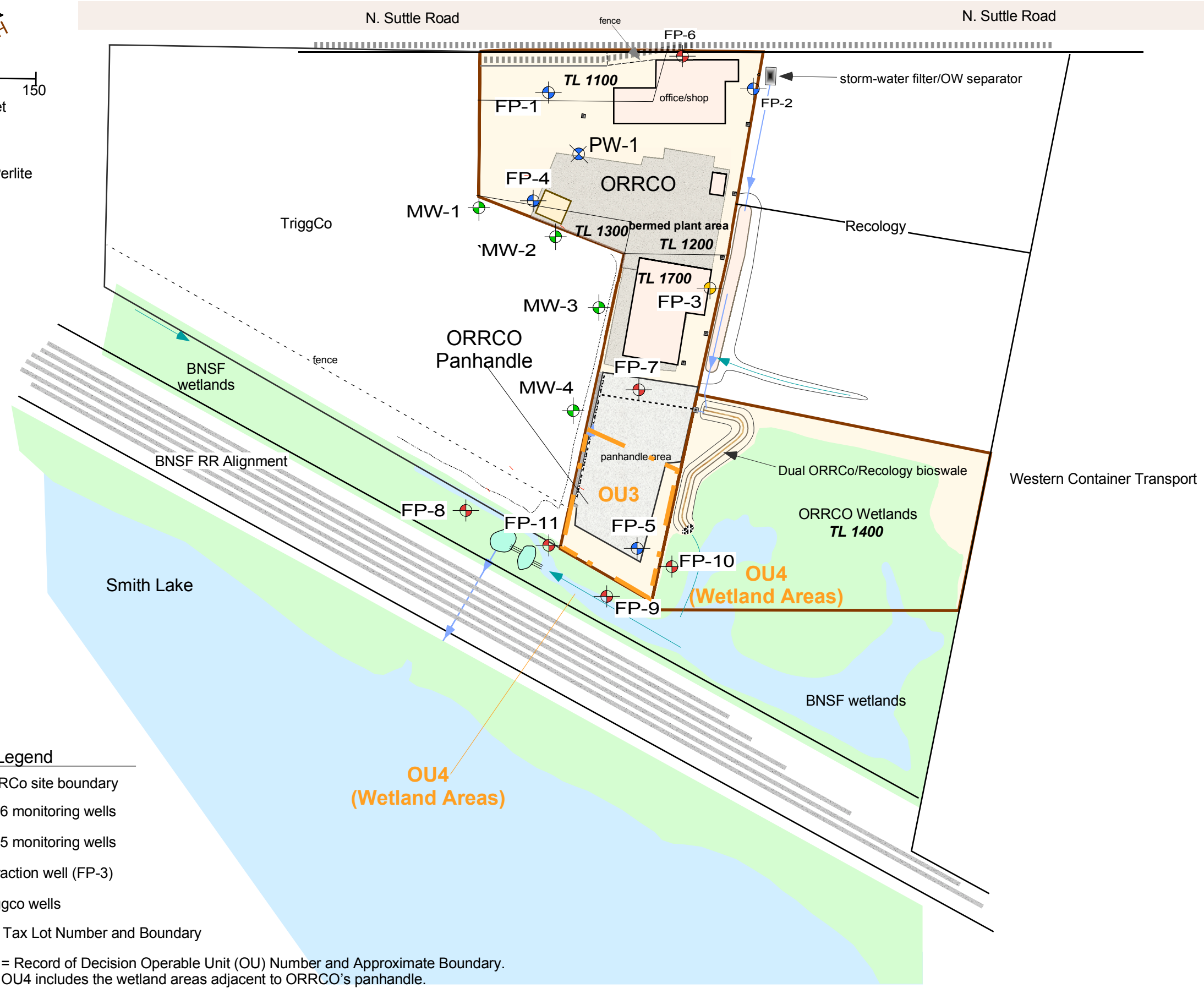
- Figure 1. ORRCO Site Map
- Figure 2. ORRCO Site May 2024 Post-Closure Monitoring Event Groundwater Elevation Data
- Table 1. Summary of Monthly LNAPL Monitoring and Removal
- Table 2. Field Monitoring Data for September 2012 through May 2024: Groundwater and Surface Water
- Table 3. Laboratory Analytical Results for Groundwater Monitoring (2013-2024)

- Attachment A – DEQ Order on Consent, Certificate of Completion
- Attachment B – *Merit USA/FPI/ORRCO Five-Year Post-Closure Monitoring Plan for Operable Units 3 and 4, 4150 N. Suttle Road, Portland, Oregon (DEQ Order No. LQSR-NWR-04-02)*, by Coles + Betts Environmental Consulting, dated July 22, 2021
- Attachment C – Apex Labs Final Report and Chain of Custody, dated June 24, 2024



0 150  
Feet

Supreme Perlite



**Legend**

- = ORRCo site boundary
- = 1996 monitoring wells
- = 2005 monitoring wells
- = extraction well (FP-3)
- = Triggco wells

**TL 1700** = Tax Lot Number and Boundary

**OU3** = Record of Decision Operable Unit (OU) Number and Approximate Boundary. OU4 includes the wetland areas adjacent to ORRCO's panhandle.

Note: Diagram based on Benthin Engineering Inc.'s 2006 survey



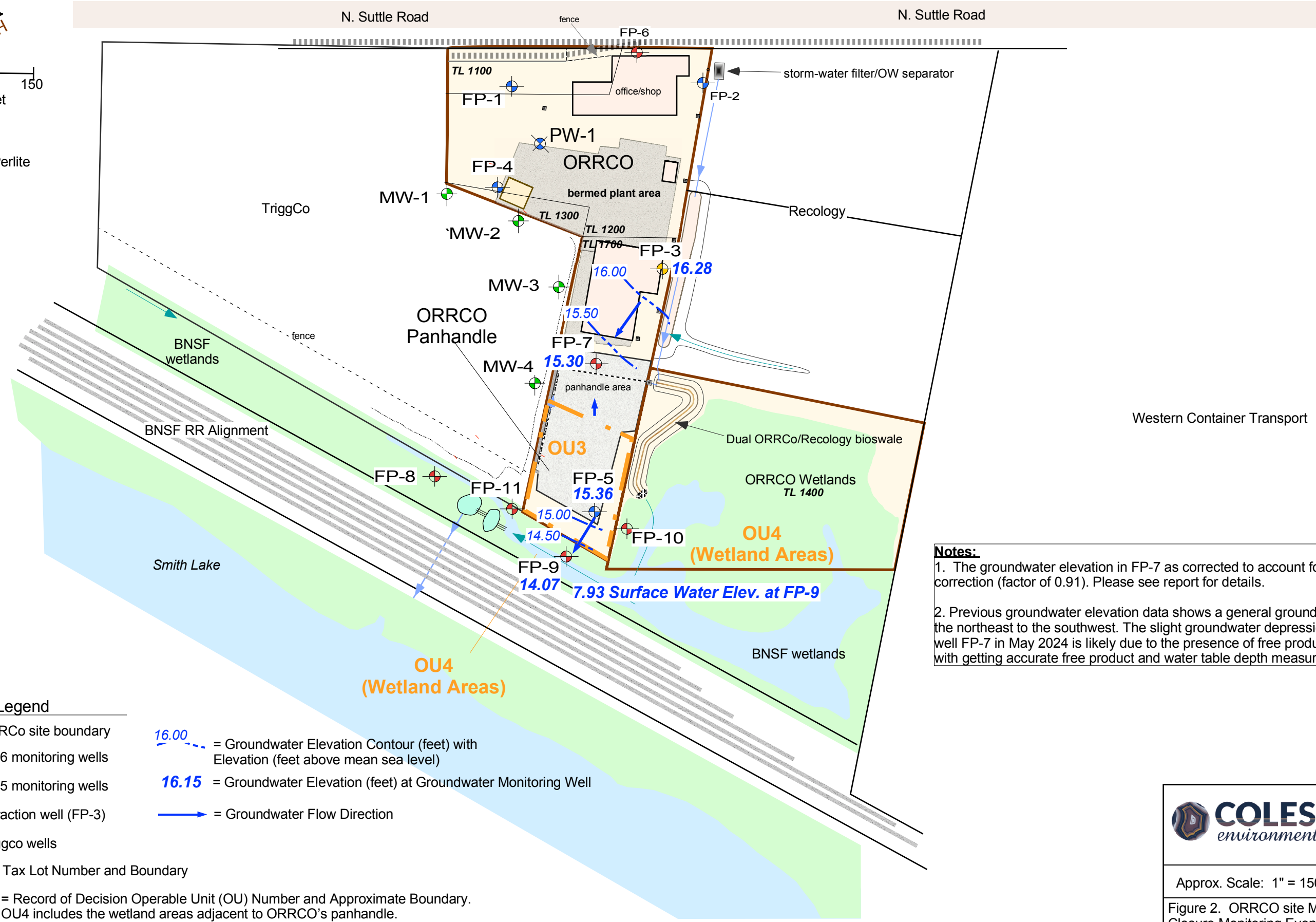
Approx. Scale: 1" = 150'	Approved By	Date/Revision
		12/2/2020 Rev. 0

Figure 1. ORRCO Site Map



0 150  
Feet

Supreme Perlite



**Notes:**  
 1. The groundwater elevation in FP-7 as corrected to account for the diesel NAPL correction (factor of 0.91). Please see report for details.  
 2. Previous groundwater elevation data shows a general groundwater flow from the northeast to the southwest. The slight groundwater depression observed at well FP-7 in May 2024 is likely due to the presence of free product and difficulty with getting accurate free product and water table depth measurements.

- Legend**
- = ORRCo site boundary
  - = 1996 monitoring wells
  - = 2005 monitoring wells
  - = extraction well (FP-3)
  - = Triggco wells

- = Groundwater Elevation Contour (feet) with Elevation (feet above mean sea level)
- = Groundwater Elevation (feet) at Groundwater Monitoring Well
- = Groundwater Flow Direction

**TL 1700** = Tax Lot Number and Boundary

**OU3** = Record of Decision Operable Unit (OU) Number and Approximate Boundary. OU4 includes the wetland areas adjacent to ORRCo's panhandle.

Note: Diagram based on Benthin Engineering Inc.'s 2006 survey



Approx. Scale: 1" = 150'	Approved By	Date/Revision
		9/5/2024 Rev. 0

Figure 2. ORRCo site May 2024 Post-Closure Monitoring Event Groundwater Elevation Data

**Table 1. Summary of Monthly LNAPL Monitoring and Removal  
ORRCO, 4150 N Suttle Rd, Portland, OR**

Well Number	Groundwater Monitoring Wells				Notes
	FP-3		FP-7		
Date	LNAPL thickness (feet)	LNAPL removed (gallons)	LNAPL thickness (feet)	LNAPL removed (gallons)	
1/11/2021	-	205	-	135	Sheen in both
2/4/2021	-	205	-	155	Sheen in both
3/15/2021	-	215	-	165	Sheen in both
4/5/2021	-	260	-	155	Sheen in both
5/8/2021	-	190	-	110	Sheen in both
6/1/2021	-	100	-	150	Sheen in both
7/15/2021	-	80	-	100	Sheen in both
8/3/2021	-	50	-	50	Sheen in both
9/25/2021	-	75	-	80	Sheen in both
10/16/2021	-	20	-	20	Sheen in both
11/23/2021	-	105	-	105	Sheen in both
12/27/2021	-	200	-	150	Sheen in both
1/17/2022	-	50	-	100	No sheen
2/2/2022	-	150	-	100	No sheen
3/5/2022	-	30	-	30	No sheen
4/9/2022	-	40	-	50	No sheen
5/16/2022	-	40	0.8	30	FP-3 oil on stinger only. FP-7 brown, viscous/sticky, no odor.
6/22/2022	0.02	20	0.61	62	FP-3 emulsified oil on the stinger, brown, no odor. FP-7 emulsified oil, brown, sticky, no odor.
7/29/2022	Not measurable	~1	Not measurable	~1	Emulsified, trace amount on stinger in both wells.
8/12/2022	Sheen only	-	Sheen only	-	Sheen only in both wells.
9/13/2022	0.02	<1	0.02	<1	Brown, no odor, sticky on stinger in both wells.
10/6/2022	Not measurable	-	0.08	<1	FP-3 No oil on stinger. FP-7 brown on stinger only.
11/16/2022	0.04	<1	Not measurable	-	FP-3 had very light sheen on stinger. FP-7 did not have sheen on stinger, only had oil droplets.
12/30/2022	0.01	<1	0.05	<1	FP-3 has oil on stringer. FP-7 did not have free oil, only wet oil on stringer.
1/11/2023	0.05	-	0.05	-	No free oil; oil only on stringers. No odors
2/27/2023	Not measurable	-	Not measurable	-	No free oil; oil only on stringers. No odors.
3/9/2023	1.5	-	0.5	-	Oil on stringers only.
4/12/2023	Not measurable	<1	Not measurable	<1	Oil on stringers only.
5/9/2023	0.63	~1-2	2.1	~2-3	Oil emulsified in water; brown and tacky on stringers.
6/23/2023	Not measurable	<1	Not measurable	<1	Oil on stringers only. No odor.
7/3/2023	0.08	1	0.08	1	Black, no odor.
8/17/2023	0.004	<1	0.004	<1	Oil on stinger only.
9/15/2023	0.008	<1	0.004	<1	Oil on stinger only.
10/10/2023	0.004	<1	0.004	<1	Oil on stinger only.
11/1/2023	0.004	<1	0.004	<1	Oil on stinger only.
12/8/2023	0.0008	<1	0.0008	<1	Brown, oil on stinger only.
1/6/2024	0.004	<1	0.017	<1	Oil on stinger only.
2/21/2024	0.004	1	0.004	<1	FP-3 black oil on stinger only. FP-7 brown oil on stinger only.
3/2/2024	0.004	1	0.004	1	Black oil on stinger and probe only.
4/13/2024	0.004	<1	0.004	<1	Brown on stinger only.
5/1/2024	0.004	1	0.004	1	Brown on stinger only.

**Table 2. Field Monitoring Data for September 2012 through May 2024: Groundwater and Surface Water  
ORRCO, 4150 N Suttle Rd, Portland, OR**

		Groundwater Monitoring Wells														Surface Water				
		Merit USA/FPI On-Site Monitoring Wells										Triggco Off-Site Monitoring Wells				Surface Water Sampling Points Next to Wells				
		FP-1	FP-2	FP-3 *	FP-4	FP-5	FP-6	FP-7 *	FP-8	FP-9	FP-10	FP-11	MW-1	MW-2	MW-3	MW-4	SW-FP-09	SW-FP-10	SW-FP-11	SW-SG-01
Top of Casing Elevation: Pre-Remediation (ft)		23.85	24.04	24.96	24.36	25.81	27.22	24.88	20.26	17.18	16.3	18.68	24.18	21.84	19.94	18.55	-	-	-	-
Top of Casing Elevation: Post-Remediation (ft)		23.85	24.04	24.96	24.36	34.73	27.22	24.88	20.26	17.18	16.3	18.68	24.18	21.84	19.94	18.55	17.18	16.3	18.68	-
Top of Casing Elevation: Post-Paving (ft)		-	24.78	24.57	-	31.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monitoring Date	Parameter																			
<b>Before the Remedial Action</b>																				
9/26/12	Water Level Depth (ft)	7.68	7.37	10.25	10.12	13.23	10.52	11.02	8.08	5.09	3.29	6.51	-	-	-	-	-	-	-	-
	Water Level Elevation (ft)	16.17	16.67	14.71	14.24	12.58	16.70	13.86	12.18	12.09	13.01	12.17	-	-	-	-	-	-	-	-
	pH	6.76	7.15	-	6.73	9.29	6.84	7.00	6.92	9.55	9.34	8.02	-	-	-	-	-	-	-	-
	Temperature (°C)	20.20	19.90	-	14.60	19.90	16.90	16.00	17.40	14.30	17.80	15.30	-	-	-	-	-	-	-	-
	Conductivity (uS/cm)	502.00	679.00	-	725.00	2,120.00	208.00	1,606.00	1,269.00	2,820.00	3,450.00	1,875.00	-	-	-	-	-	-	-	-
	DO (mg/L)	2.36	1.14	-	2.14	0.72	5.17	1.45	2.31	1.71	0.24	2.26	-	-	-	-	-	-	-	-
	Eh (mV)	-102.00	-108.00	-	-90.00	-143.00	121.00	-134.00	-116.00	-155.00	-156.00	-189.00	-	-	-	-	-	-	-	-
<b>During the Remedial Action</b>																				
1/16/13	Water Level Depth (ft)	5.76	4.79	7.74	7.37	18.89	8.03	7.99	4.93	1.50	0.46	3.10	6.79	4.79	2.92	1.71	-	-	-	-
	Water Level Elevation (ft)	18.09	19.25	17.22	16.99	15.84	19.19	16.89	15.33	15.68	15.84	15.58	17.39	17.05	17.02	16.84	-	-	-	-
	pH	6.93	6.66	-	6.62	10.19	6.85	8.60	7.18	9.83	9.18	8.01	-	5.78	6.78	6.90	7.52	7.48	7.58	7.33
	Temperature (°C)	12.70	17.30	-	12.50	12.10	13.90	14.10	7.50	21.70	8.70	8.00	-	10.20	13.60	10.30	4.20	4.60	6.20	4.60
	Conductivity (uS/cm)	480.00	269.00	-	594.00	3,970.00	144.00	2,190.00	376.00	3,040.00	3,570.00	1,245.00	-	143.00	1,046.00	1,480.00	359.00	404.00	369.00	374.00
	DO (mg/L)	1.30	2.46	-	0.20	3.95	5.02	1.23	5.40	1.54	3.50	6.67	-	3.75	4.00	4.16	7.04	6.94	6.07	6.67
	Eh (mV)	-98.00	-33.00	-	-47.00	-188.00	78.00	49.00	-100.00	-14.00	-19.00	-195.00	-	131.00	25.00	-129.00	100.00	92.00	91.00	95.00
4/25/13	Water Level Depth (ft)	6.89	6.48	9.11	8.53	19.57	9.65	9.55	5.45	2.24	1.22	3.87	8.25	5.93	4.85	2.82	-	-	-	-
	Water Level Elevation (ft)	16.96	17.56	15.85	15.83	15.16	17.57	15.33	14.81	14.94	15.08	14.81	15.93	15.91	15.09	15.73	-	-	-	-
	pH	6.56	(pH meter problems)	7.78	6.49	10.73	6.46	7.74	7.97	9.90	9.29	8.61	-	6.55	8.42	6.82	8.74	8.58	8.95	8.36
	Temperature (°C)	16.80	13.80	13.90	14.20	17.50	13.40	15.50	13.80	14.10	13.10	14.00	-	13.40	14.70	11.30	22.80	19.00	24.70	18.50
	Conductivity (uS/cm)	454.00	440.00	1,488.00	635.00	3,860.00	167.00	1,840.00	613.00	2,890.00	3,330.00	1,823.00	-	579.00	1,167.00	1,077.00	669.00	705.00	651.00	654.00
	DO (mg/L)	0.78	1.36	0.44	0.70	1.12	3.12	0.40	0.49	0.74	0.41	0.52	-	1.73	1.01	1.62	3.26	2.38	3.55	2.14
	Eh (mV)	-86.00	-40.00	-144.00	-87.00	-71.00	100.00	-184.00	-155.00	-48.00	-64.00	-209.00	-	-67.00	-10.00	-138.00	36.00	-8.00	-5.00	46.00
7/24/13	Water Level Depth (ft)	7.75	7.56	10.25	9.85	21.26	10.68	10.94	7.51	4.25	2.94	5.78	9.66	7.30	5.34	4.12	-	-	-	-
	Water Level Elevation (ft)	16.10	16.48	14.71	14.51	13.47	16.54	13.94	12.75	12.93	13.36	12.90	14.52	14.54	14.60	14.43	-	-	-	-
	pH	6.71	7.04	7.30	6.64	11.35	6.55	7.20	6.89	9.97	9.75	8.43	-	6.64	6.56	6.95	-	-	-	-
	Temperature (°C)	17.00	13.90	15.70	14.00	15.80	15.20	14.90	17.50	19.10	17.90	18.10	-	14.10	16.10	14.90	-	-	-	-
	Conductivity (uS/cm)	539.00	563.00	1,222.00	627.00	2,980.00	179.90	1,420.00	943.00	3,640.00	3,530.00	1,091.00	-	815.00	1,362.00	1,006.00	-	-	-	-
	DO (mg/L)	0.19	0.39	0.63	0.27	0.41	0.51	0.55	0.49	0.32	0.43	0.60	-	0.44	0.50	0.32	-	-	-	-
	Eh (mV)	-111.00	-55.00	-101.00	-51.00	-261.00	72.00	-155.00	-105.00	-161.00	-199.00	-232.00	-	-101.00	-33.00	-124.00	-	-	-	-
<b>After the Remedial Action</b>																				
10/22/13	Water Level Depth (ft)	8.23	8.79	10.47	10.60	17.49	11.20	11.58	6.99	3.51	2.53	5.14	10.42	8.04	6.03	4.71	-	-	-	-
	Water Level Elevation (ft)	15.62	15.99	14.10	13.76	13.88	16.02	13.30	13.27	13.67	13.77	13.54	13.76	13.80	13.91	13.84	-	-	-	-
	pH	6.70	6.83	7.16	6.57	10.13	6.59	7.93	7.39	10.69	9.56	8.76	-	6.74	6.79	6.98	7.94	8.02	11.40	12.62
	Temperature (°C)	15.40	15.70	15.80	14.10	14.80	12.40	16.20	15.80	14.90	15.50	15.70	-	15.20	16.30	14.70	13.90	13.10	16.20	17.80
	Conductivity (uS/cm)	553.00	498.00	1,303.00	6.78	3.81	201.00	1,420.00	416.00	3.08	3.31	1,192.00	-	789.00	1,390.00	1,437.00	445.00	749.00	496.00	445.00
	DO (mg/L)	0.22	0.18	0.16	0.23	0.34	0.30	0.34	0.35	0.41	0.41	0.22	-	0.18	0.36	0.18	0.56	32.00	1.67	1.05
	Eh (mV)	-17.00	4.00	-84.00	-30.00	-195.00	59.00	-229.00	-71.00	-100.00	15.00	-215.00	-	-106.00	111.00	-78.00	40.00	0.74	-55.00	11.00
1/30/14	Water Level Depth (ft)	8.37	9.24	10.35	10.45	17.08	10.64	11.42	7.09	3.12	2.23	4.76	10.29	7.89	5.88	4.54	-	-	-	-
	Water Level Elevation (ft)	15.48	15.54	14.22	13.91	14.29	16.58	13.46	13.17	14.06	14.07	13.92	13.89	13.95	14.06	14.01	-	-	-	-
	pH	6.80	8.15	8.66	6.47	11.72	9.26	10.18	7.32	11.12	9.84	8.47	-	8.22	9.23	8.91	12.76	8.63	8.76	8.30
	Temperature (°C)	14.30	13.10	12.90	11.50	14.70	12.10	15.60	5.80	8.20	9.70	7.60	-	13.80	13.80	12.20	6.10	9.20	8.20	7.20
	Conductivity (uS/cm)	460.00	451.00	1,318.00	602.00	3.63	216.00	1,578.00	241.00	291.00	3.01	225.00	-	703.00	1,154.00	1,593.00	313.00	357.00	319.00	332.00
	DO (mg/L)	0.10	0.14	0.19	0.27	0.14	0.28	0.09	0.41	0.36	0.23	0.27	-	0.23	0.23	0.16	0.86	0.65	0.77	0.84
	Eh (mV)	-83.00	-62.00	-53.00	-16.00	-362.00	16.00	-224.00	44.00	-142.00	-53.00	-5.00	-	-89.00	-72.00	-122.00	47.00	8.00	30.00	3.00

**Table 2. Field Monitoring Data for September 2012 through May 2024: Groundwater and Surface Water  
ORRCO, 4150 N Suttle Rd, Portland, OR**

		Groundwater Monitoring Wells														Surface Water				
		Merit USA/FPI On-Site Monitoring Wells										Triggco Off-Site Monitoring Wells				Surface Water Sampling Points Next to Wells				
		FP-1	FP-2	FP-3 *	FP-4	FP-5	FP-6	FP-7 *	FP-8	FP-9	FP-10	FP-11	MW-1	MW-2	MW-3	MW-4	SW-FP-09	SW-FP-10	SW-FP-11	SW-SG-01
Top of Casing Elevation: Pre-Remediation (ft)		23.85	24.04	24.96	24.36	25.81	27.22	24.88	20.26	17.18	16.3	18.68	24.18	21.84	19.94	18.55	-	-	-	-
Top of Casing Elevation: Post-Remediation (ft)		23.85	24.04	24.96	24.36	34.73	27.22	24.88	20.26	17.18	16.3	18.68	24.18	21.84	19.94	18.55	17.18	16.3	18.68	-
Top of Casing Elevation: Post-Paving (ft)		-	24.78	24.57	-	31.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monitoring Date	Parameter																			
5/1/14	Water Level Depth (ft)	6.81	6.66	8.28	8.48	15.66	9.06	9.41	5.22	1.70	0.76	3.21	8.20	5.80	3.93	2.70	-	-	-	-
	Water Level Elevation (ft)	17.04	18.12	16.29	15.88	15.71	18.16	15.47	15.04	15.48	15.54	15.47	15.98	16.04	16.01	15.85	-	-	-	-
	pH	6.64	6.53	7.57	6.63	10.50	6.63	8.74	7.23	10.04	9.20	8.33	-	6.57	6.47	7.08	7.75	7.60	7.67	7.47
	Temperature (°C)	14.90	14.50	13.80	13.40	14.10	11.50	14.70	12.70	13.20	12.90	12.90	-	13.00	13.70	12.60	17.50	17.50	19.30	18.90
	Conductivity (uS/cm)	324.00	317.00	99.70	605.00	3.03	148.00	1,462.00	256.00	2.62	2.97	477.00	-	286.00	754.00	1,003.00	321.00	342.00	260.00	269.00
	DO (mg/L)	0.17	0.14	0.18	0.21	0.26	0.24	0.12	0.20	0.21	0.24	0.23	-	0.15	0.21	0.19	0.20	1.30	0.53	0.55
	Eh (mV)	-114.00	-25.00	-235.00	-127.00	-100.00	67.00	-299.00	-120.00	-253.00	-214.00	-223.00	-	-75.00	-23.00	-133.00	-70.00	-45.00	1.00	39.00
5/2/15	Water Level Depth (ft)	6.84	6.85	8.81	8.69	16.16	9.33	9.97	5.53	2.28	1.28	3.91	8.43	6.14	4.20	2.93	-	-	-	-
	Water Level Elevation (ft)	17.01	17.93	15.76	15.67	15.21	17.89	14.91	14.73	14.90	15.02	14.77	15.75	15.70	15.74	15.62	-	-	-	-
	pH	-	-	8.21	6.72	10.29	-	7.31	7.03	9.94	9.15	7.84	-	6.40	6.63	7.14	8.22	7.63	7.78	8.08
	Temperature (°C)	-	-	14.70	14.20	15.30	-	15.50	18.60	14.40	13.60	15.20	-	13.90	14.20	13.60	22.00	16.60	15.30	14.90
	Conductivity (uS/cm)	-	-	864.00	298.00	205.00	-	659.00	236.00	2.23	1,768.00	393.00	-	236.00	664.00	827.00	186.00	275.00	259.00	267.00
	DO (mg/L)	-	-	0.17	0.17	0.11	-	0.14	0.17	0.19	0.18	0.20	-	0.37	0.29	0.28	3.23	2.03	1.45	1.76
	Eh (mV)	-	-	-152.00	-104.00	-2,566.00	-	-179.00	-119.00	-129.00	-192.00	-177.00	-	-33.00	-45.00	-153.00	-32.00	63.00	31.00	48.00
December 2017	Water Level Depth (ft)	-	-	-	-	15.61	-	-	-	1.68	0.88	3.30	-	-	-	-	-	-	-	-
	Water Level Elevation (ft)	-	-	-	-	15.76	-	-	-	15.50	15.42	15.38	-	-	-	-	-	-	-	-
	pH	-	-	-	-	10.64	-	-	-	11.23	10.33	8.64	-	-	-	-	9.37	4.33	9.33	8.83
	Temperature (°C)	-	-	-	-	15.50	-	-	-	10.60	10.80	11.40	-	-	-	-	4.90	6.10	4.50	5.80
	Conductivity (uS/cm)	-	-	-	-	3.12	-	-	-	-	-	-	-	-	-	-	-	-	-	170.00
	DO (mg/L)	-	-	-	-	0.19	-	-	-	0.19	0.12	0.16	-	-	-	-	1.26	1.43	1.32	1.18
	Eh (mV)	-	-	-	-	122.00	-	-	-	-	-	-	-	-	-	-	-	-	-	
May 2019	Water Level Depth (ft)	-	-	-	-	15.88	-	-	-	2.13	1.20	3.79	-	-	-	-	-	-	-	Broken
	Water Level Elevation (ft)	-	-	-	-	15.49	-	-	-	15.05	15.10	14.89	-	-	-	-	-	-	-	-
	pH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Temperature (°C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Conductivity (uS/cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	DO (mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Eh (mV)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
January 2020	Water Level Depth (ft)	-	-	-	-	15.98	-	-	-	2.06	1.35	3.66	-	-	-	-	1.83	1.25	Dry	Broken
	Water Level Elevation (ft)	-	-	-	-	15.39	-	-	-	15.12	14.95	15.02	-	-	-	-	16.62	15.20	-	-
	pH	-	-	-	-	-	-	-	-	9.99	-	-	-	-	-	-	7.10	7.16	-	-
	Temperature (°C)	-	-	-	-	-	-	-	-	9.39	-	-	-	-	-	-	7.14	7.03	-	-
	Conductivity (uS/cm)	-	-	-	-	-	-	-	-	3,614.00	-	-	-	-	-	-	101.00	175.00	-	-
	DO (mg/L)	-	-	-	-	-	-	-	-	0.88	-	-	-	-	-	-	6.66	5.52	-	-
	Eh (mV)	-	-	-	-	-	-	-	2.20	-	-	-	-	-	-	32.00	25.70	-	-	
10-May 2022	Water Level Depth (ft)	-	-	10.89	-	15.22	-	8.93	-	1.69	-	-	-	-	-	-	1.51	-	-	-
	Water Level Elevation (ft)	-	-	13.68	-	16.15	-	15.95	-	15.49	-	-	-	-	-	-	15.67	-	-	-
	pH	-	-	8.98	-	10.90	-	10.17	-	10.88	-	-	-	-	-	-	-	-	-	-
	Temperature (°C)	-	-	15.25	-	15.09	-	15.91	-	13.61	-	-	-	-	-	-	-	-	-	-
	Conductivity (uS/cm)	-	-	1.36	-	3.49	-	2.43	-	3.45	-	-	-	-	-	-	-	-	-	-
	DO (mg/L)	-	-	0.00	-	0.00	-	0.00	-	0.00	-	-	-	-	-	-	-	-	-	-
	ORP (mV)	-	-	-225.00	-	-206.00	-	-28.00	-	-264.00	-	-	-	-	-	-	-	-	-	-
8-May 2023	Water Level Depth (ft)	-	-	8.41	-	15.37	-	11.10	-	1.69	-	-	-	-	-	-	1.51	-	-	-
	Water Level Elevation (ft)	-	-	16.16	-	16.00	-	13.78	-	7.86	-	-	-	-	-	-	15.67	-	-	-
	pH	-	-	7.59	-	10.90	-	10.17	-	10.88	-	-	-	-	-	-	-	-	-	-
	Temperature (°C)	-	-	13.80	-	15.09	-	15.91	-	13.61	-	-	-	-	-	-	-	-	-	-

**Table 2. Field Monitoring Data for September 2012 through May 2024: Groundwater and Surface Water  
ORRCO, 4150 N Suttle Rd, Portland, OR**

		Groundwater Monitoring Wells														Surface Water				
		Merit USA/FPI On-Site Monitoring Wells										Triggco Off-Site Monitoring Wells				Surface Water Sampling Points Next to Wells				
		FP-1	FP-2	FP-3 *	FP-4	FP-5	FP-6	FP-7 *	FP-8	FP-9	FP-10	FP-11	MW-1	MW-2	MW-3	MW-4	SW-FP-09	SW-FP-10	SW-FP-11	SW-SG-01
Top of Casing Elevation: Pre-Remediation (ft)		23.85	24.04	24.96	24.36	25.81	27.22	24.88	20.26	17.18	16.3	18.68	24.18	21.84	19.94	18.55	-	-	-	-
Top of Casing Elevation: Post-Remediation (ft)		23.85	24.04	24.96	24.36	34.73	27.22	24.88	20.26	17.18	16.3	18.68	24.18	21.84	19.94	18.55	17.18	16.3	18.68	-
Top of Casing Elevation: Post-Paving (ft)		-	24.78	24.57	-	31.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monitoring Date	Parameter																			
	Conductivity (uS/cm)	-	-	13.35	-	3.49	-	2.43	-	3.45	-	-	-	-	-	-	-	-	-	-
	DO (mg/L)	-	-	0.50	-	0.00	-	0.00	-	0.00	-	-	-	-	-	-	-	-	-	-
	ORP (mV)	-	-	-82.00	-	-206.00	-	-28.00	-	-264.00	-	-	-	-	-	-	-	-	-	-
29-May 2024	Water Level Depth (ft)	-	-	8.29	-	16.01	-	10.67	-	3.11	-	-	-	-	-	-	9.25	-	-	-
	Water Level Elevation (ft)	-	-	16.28	-	15.36	-	15.30	-	14.07	-	-	-	-	-	-	7.93	-	-	-
	pH	-	-	8.03	-	10.01	-	9.19	-	9.99	-	-	-	-	-	-	-	-	-	-
	Temperature (°C)	-	-	14.23	-	16.31	-	15.47	-	14.76	-	-	-	-	-	-	-	-	-	-
	Conductivity (uS/cm)	-	-	1,520	-	3,670.00	-	1,970.00	-	3,680.00	-	-	-	-	-	-	-	-	-	-
	DO (mg/L)	-	-	4.86	-	0.00	-	0.00	-	0.00	-	-	-	-	-	-	-	-	-	-
	ORP (mV)	-	-	-164	-	-170.00	-	-159.00	-	-237.00	-	-	-	-	-	-	-	-	-	-

**Notes:**

FP-3 is an extraction well, but is being used as a groundwater monitoring well

\* Water depth measurements are uncertain due to the presence of free product (oil).

"-" not measured

FP-5: Top of Casing (TOC) was raised subsequent to panhandle fill/remediation activities.

DEQ did not require groundwater monitoring field parameters or sampling for the May 2019 monitoring event.

**Table 3**  
**Laboratory Analytical Results for Groundwater Monitoring (2013-2024)**  
**ORRCO, 4150 N Suttle Rd, Portland, OR**

			NWTPH-Dx		EPA 6020A (Diss)					EPA 300.0	300.0 (Diss)			
			Oil Range Organics	Diesel Range Organics	Chromium (field filtered)	Lead (field filtered)	Zinc (field filtered)	Fluoride	Fluoride (filtered)					
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L				
DEQ ROD Screening Criteria			-	-	11	2.5	120	1940	1940					
Field ID	Date Sampled	Lab Report Number												
FP-03	5/7/2013	A3E0205	404	U	<b>2,380</b>	F-11, H-02	-	1	U	4	U	491	-	-
	7/26/2013	A3G0625	388	U	<b>3,700</b>	F-11	-	1	U	4	U	335	-	-
	10/29/2013	A3K0111	<b>465</b>	F-01	<b>4,460</b>	F-11, F-20, F-01	-	0.2	U	4	U	532	-	-
	2/1/2014	A4B0012	400	U	<b>3,630</b>	F-20	-	1	U	4	U	861	-	-
	5/6/2014	A4E0293	392	U	<b>3,130</b>	F-11, F-20	-	0.2	U	4	U	<b>1,440</b>	-	-
	8/8/2014	A4H0219	404	U	<b>3,180</b>	F-11	-	0.2	U	4	U	<b>1,150</b>	-	-
	5/23/2015	A5E0699	412	U	<b>7,760</b>	F-11, F-20, F-01	-	0.2	U	4	U	-	-	-
	5/10/2022	A2E0410	151	U	<b>4,120</b>	B-02	-	-	-	-	-	-	-	-
	5/29/2024	A4E1739	755	U	<b>4,690</b>	-	-	-	-	-	-	-	-	-
FP-05	9/28/2012	A12I538	388	U	<b>479</b>	F-11	-	0.2	U	8	U	<b>185,000</b>	-	-
	1/22/2013	A13A498	388	U	<b>945</b>	F-13	-	1	U	4	U	<b>540,000</b>	-	-
	5/7/2013	A3E0205	377	U	<b>702</b>	F-20	-	1	U	4	U	<b>568,000</b>	-	-
	7/26/2013	A3G0625	388	U	<b>545</b>	F-18	-	1	U	4	U	<b>559,000</b>	-	-
	10/23/2013	A3J0641	388	U	<b>1,080</b>	F-18	-	0.2	U	4	U	<b>535,000</b>	A-01	-
	2/1/2014	A4B0012	400	U	<b>767</b>	F-18	-	1	U	4	U	<b>536,000</b>	-	-
	5/9/2014	A4E0293	400	U	<b>617</b>	F-11, F-20	-	0.2	U	4	U	<b>522,000</b>	-	-
	8/24/2014	A4H0574	392	U	<b>729</b>	F-20	-	<b>0.567</b>	-	<b>9.36</b>	-	<b>482,000</b>	-	-
	5/23/2015	A5E0699	-	-	-	-	-	0.2	U	4	U	<b>501,000</b>	<b>502,000</b>	-
	5/10/2022	A2E0410	-	-	-	2	U	0.2	U	4	U	<b>383,000</b>	-	-
	5/29/2024	A4E1739	-	-	-	2	FILT1,H-12	0.2	FILT1,H-12	4	FILT1,H-12	<b>441,000</b>	-	-
FP-07	10/4/2012	A12J169	<b>2090</b>	F-16	<b>3,340</b>	F-11	-	1	-	4	U	-	-	-
	1/25/2013	A13A498	381	U	<b>3,120</b>	F-01, F-11	-	1	-	4	U	-	-	-
	5/7/2013	A3E0205	<b>420</b>	-	<b>2,680</b>	F-11, F-20	-	<b>1.16</b>	-	4	U	-	-	-
	7/26/2013	A3G0625	388	U	<b>5,540</b>	F-11	-	<b>1.29</b>	-	4	U	-	-	-
	10/29/2013	A3K0111	388	U	<b>3,470</b>	F-11	-	<b>0.656</b>	-	4	U	-	-	-
	2/1/2014	A4B0012	404	U	<b>3,410</b>	F-20	-	1	U	4	U	-	-	-
	5/6/2014	A4E0293	404	U	<b>2,960</b>	F-11	-	0.2	U	4	U	<b>43,900</b>	-	-
	8/8/2014	A4H0219	392	U	<b>3,980</b>	F-11	-	<b>0.4</b>	-	4	U	<b>13,200</b>	-	-
	5/23/2015	A5E0699	396	U	<b>4,830</b>	F-01	-	<b>0.322</b>	-	4	U	-	-	-
	5/10/2022	A2E0410	<b>2,070</b>	-	<b>2,670</b>	-	-	-	-	-	-	-	-	-
5/29/2024	A4E1739	755	U	<b>2,360</b>	F-13	-	-	-	-	-	-	-	-	
FP-09	6/10/2008	A806098	-	-	-	-	-	<b>48.4</b>	-	-	-	<b>77,200</b>	-	-
	10/2/2012	A12J169	<b>1200</b>	F-16	<b>1,530</b>	F-11	-	<b>9.28</b>	-	<b>99.4</b>	-	<b>174,000</b>	-	-
	1/17/2013	A13A375	392	U	<b>740</b>	F-11	-	<b>13.5</b>	-	<b>175</b>	-	<b>278,000</b>	-	-
	5/8/2013	A3E0300	860	U	<b>838</b>	F-11, F-20	-	<b>18</b>	-	<b>228</b>	-	<b>269,000</b>	-	-
	7/25/2013	A3G0625	430	U	<b>910</b>	F-18	-	<b>27.8</b>	-	<b>347</b>	-	<b>130,000</b>	-	-
	10/25/2013	A3J0735	412	U	<b>939</b>	A-01, F-01	-	<b>22.8</b>	-	<b>300</b>	-	<b>308,000</b>	-	-
	2/2/2014	A4B0012	400	U	<b>267</b>	F-18	-	<b>11.8</b>	-	<b>145</b>	-	<b>310,000</b>	-	-
	5/3/2014	A4E0121	381	U	<b>767</b>	F-13, F-20, F-01	-	<b>6.81</b>	-	<b>84.3</b>	-	<b>286,000</b>	-	-
	8/17/2014	A4H0403	460	U	<b>1,850</b>	F-11	-	<b>27.1</b>	-	<b>315</b>	-	<b>335,000</b>	-	-
	5/2/2015	A5E0053	-	-	-	-	-	<b>9.33</b>	-	<b>126</b>	-	<b>302,000</b>	<b>301,000</b>	-
	5/10/2022	A2E0410	-	-	-	11.7	-	<b>15.3</b>	-	<b>147</b>	-	<b>274,000</b>	-	-
	5/29/2024	A4E1739	-	-	-	<b>20</b>	DISSX,FILT1,H-12	<b>41.8</b>	DISSX,FILT1,H-12	<b>310</b>	DISSX,FILT1,H-12	<b>521,000</b>	-	-

**Notes:**

1. µg/L = Micrograms per liter.
2. **Bold** values indicate the analyte was detected above method detection limits.
3. **Red** values indicate that the sample exceeds RBC and/or ROD Criteria.
4. ROD = Record of Decision
5. "-" = not analyzed or no DEQ, ROD Screening Criteria.

**Lab Qualifiers**

- U = Analyte was not detected above the reported method detection limit.
- A-01 - Detected hydrocarbon pattern resembles a mixture of weathered diesel and weathered gasoline.
- B-2 - Analyte detected in an associated blank at a level between one-half the MRF and the MRL.
- H-02 - This sample was extracted outside of the recommended holding time.
- F-01 - This sample appears to contain volatile range organics.
- F-11 - The hydrocarbon pattern indicates possible weathered diesel, or a contribution from a related component.
- F-13 - The chromatographic pattern does not resemble the fuel standard used for quantitation.
- F-16 - Results for oil are biased high due to overlap from the reported diesel result.
- F-18 - Result for Diesel (DRO C12-C24) is due to overlap from Gasoline or a Gasoline Range product.
- F-20 - Result for Diesel is Estimated due to overlap from the Gasoline Range.

**ATTACHMENT A**

**DEQ Order on Consent, Certificate of Completion**

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY

In the Matter of:

Oil Re-Refining Company, Fuel Processors,  
Inc. and Merit USA, Inc.

Order on Consent

DEQ No. LQSR-NWR-12-09

CERTIFICATION OF COMPLETION

1. Findings

A. On September 18, 2012, the Oregon Department of Environmental Quality (DEQ) entered into an Order on Consent (Consent Order) DEQ No. LQSR-NWR-12-09 with Oil Re-Refining Company, Fuel Processor's Inc., and Merit USA, Inc., (collectively, Respondents) concerning the Property at 4150 N. Suttle Road in Portland, Oregon (the Site). The Site is referred to as Merit Oil, and assigned Environmental Cleanup Site Information #673 in DEQ Northwest Region Cleanup Program files.

B. Under the terms of the Consent Order, Respondents agreed to remove soil and sediment containing hotspot levels of lead, chromium, and/or zinc, implement engineering and institutional controls for remaining hazardous substances at concentrations above acceptable risk levels, and perform post-cleanup monitoring, in accordance with DEQ's Record of Decision dated June 2011. Work completed by Respondents includes:

- Removal of sediment hotspots from wetland areas of the facility, capping remaining sediment with contaminants above risk-based concentrations with clean soil, and restoring the wetland area with native plants;

- Excavation of hotspot fill from the panhandle upland area of the site;
- Off-site disposal of soil and sediment that exceeds hotspot levels;
- Consolidation of non-hotspot sediment within the upland panhandle area;
- Benching the bank of the panhandle area that borders the wetlands and capping the bank with clean fill;
- Capping the panhandle area with asphalt to minimize infiltration of rainfall through contaminated fill;
- Re-engineering the bank between the facility and the adjacent Triggco property to mitigate potential erosion and overland transport of contaminated fill to the wetland through Triggco's stormwater collection system;
- Periodic removal of light, non-aqueous phase liquid from monitoring wells FP-3 and FP-7;
- Surface water and groundwater monitoring and reporting; and
- Installation of a stormwater management system.

C. Site grading, removal and capping and excavation work began in November 2013, and was completed in September 2014. Approximately 1,830 tons of sediment and soil were removed and disposed of off-site at a permitted solid waste landfill. Approximately 39,000 square feet of wetland were remediated. The panhandle and upland area was capped with approximately 33,000 square feet of asphalt to prevent leaching of panhandle material, and to prevent direct contact with site workers. A lined stormwater swale with a filter at its discharge point was constructed along the western site boundary. The remediation work is summarized in an *Interim Project Completion Report* dated February 2, 2013, and a *Project Completion Report* dated March 3, 2014.

D. Seven surface water and/or groundwater monitoring events were completed between October 2013 and January 2020. The monitoring results are summarized in a report entitled *Request for Certification of Completion with Groundwater Monitoring* and dated September 21, 2020.

E. On February 1, 2021, DEQ provided public notice and opportunity to comment on a proposed Certification of Completion determination for the facility in accordance with ORS 465.320 and 465.325(10)(b). Copies of the work plans and reports completed for the project were available to review at DEQ's Northwest Region office in Portland and on DEQ's website. The public notice was published on February 1, 2021, in the *Oregon Secretary of State's Bulletin*, and in the Oregonian newspaper. The comment period was closed on March 2, 2021. No comments were received.

F. Based on the reports and other information submitted by Respondents, and DEQ's inspection and oversight of activities, DEQ finds that ORRSCO, Fuel Processors, Inc, and Merit USA, Inc. have satisfactorily completed the Consent Order scope of work.

## **2. Conclusions**

A. Based on the reports and other information submitted by Respondents, and DEQ's inspection and oversight of activities, DEQ finds that Respondents ORRSCO, Fuel Processors, Inc, and Merit USA, Inc. have satisfactorily completed the Consent Order scope of work.

B. No further remedial actions are required at the site to protect the public health, safety, and welfare or the environment, except as provided under Subsection 3.B. of this Certification.

## **3. Conditions**

A. This Certification of Completion applies only to the satisfactory completion of the work conducted by Respondents pursuant to the Consent Order.

B. Institutional and Engineering controls are memorialized in an Easement and Equitable Servitudes (E&ES) that was recorded with Multnomah County on October 7, 2022. Controls include maintenance of the asphalt cap and bank and wetland soil caps, implementation of the DEQ-approved contaminated media management plan (CMMP) dated July 22, 2021, and continued groundwater monitoring and reporting consistent with the Five-Year Post-Closure Monitoring Plan dated July 22, 2021.

C. DEQ's determination that no further remedial action is necessary at the Site may be withdrawn upon discovery of new information showing that public health, safety, and welfare or the environment are not being protected.

D. DEQ does not, by this certification, assume liability for any claim arising from acts or omissions of Respondents or its officers, employees, agents, successors, subsidiaries, or assigns relating to actions pursuant to the Consent Order.

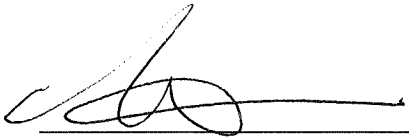
**4. Notice**

This order constitutes certification of completion under ORS 465.325(10), and may be appealed by any aggrieved person in accordance with ORS 465.325(10)(c).

**ISSUED BY:**

State of Oregon

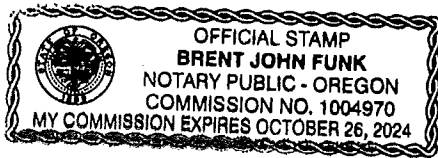
Department of Environmental Quality


By: 

Kevin Parrett, Manager  
DEQ Northwest Region Cleanup Program

10/12/2022  
Date

The foregoing instrument is acknowledged before me this 12th day of October, 2022, by Kevin Parrett, Northwest Region Cleanup Manager of the Oregon Department of Environmental Quality, on its behalf.



  
NOTARY PUBLIC FOR OREGON  
My commission expires: 10/26/2024

**CERTIFICATE OF SERVICE**

I certify that I served a true copy of the above Certification of Completion by depositing it in the United States mail, postage prepaid, and addressed to the following persons:

Kate L. Moore  
Dunn Carney LLP  
851 SW 6th Ave #1500  
Portland, OR 97204

\_\_\_\_\_  
(Name)

\_\_\_\_\_  
(Date)

**ATTACHMENT B**

***Merit USA/FPI/ORRCO Five-Year Post-Closure Monitoring Plan for Operable Units 3 and 4, 4150 N. Suttle Road, Portland, Oregon (DEQ Order No. LQSR-NWR-04-02), by Coles + Betts Environmental Consulting, dated July 22, 2021***

July 22, 2021

Mr. Mark T. Pugh, R.G.  
Project Manager  
DEQ Northwest Region  
2020 SW Fourth Avenue, Suite 400  
Portland, OR 97201-5884

Regarding: **Merit USA/FPI/ORRCO Five-Year Post-Closure Monitoring Plan for Operable Units 3 and 4, 4150 N. Suttle Road, Portland, Oregon (DEQ Order No. LQSR-NWR-04-02)**

Dear Mr. Pugh:

This Monitoring Plan describes the post-closure monitoring requirements at the Merit USA/FPI/ORRCO site at 4150 N. Suttle Road, Portland, Oregon, as memorialized by the Oregon Department of Environmental Quality (DEQ) in an Easement and Equitable Servitudes (E&ES). The monitoring will occur within Operable Units (OUs) 3 and 4, located at the southern portion of the site at the panhandle and wetlands, and in the adjacent plant yard (OUR2B). The site layout, location of the work area and the OUs are indicated in Figure 1. The required monitoring activities described herein include annual groundwater monitoring and reporting, and monthly inspections and free-phase petroleum monitoring and vacuum extraction as warranted with reporting.

### **Monthly Inspections and Free-Phase Petroleum Monitoring and Reporting at Groundwater Monitoring Wells FP-3 and FP-7**

DEQ requires the monthly inspections for free-phase petroleum at groundwater monitoring wells FP-3 and FP-7. These wells are located north of OUs 3 and 4 within ORRCO's plant operations area (Figure 1). The monitoring procedure for each well is as follows:

1. Obtain field notes and forms, and monitoring forms. Indicate date and list name(s) of staff completing field product monitoring in the field notes.
2. Open the monitoring well.
3. Lower a Coliwasa sampler\* into the well and extend the sampler to 1 foot below the top of the water table.
4. Retract the Coliwasa sampler, with care taken not to touch the sampler along the well's sidewalls.
5. Inspect the sampler for free-phase petroleum.
  - a. If free-phase petroleum is observed in the sampler, the features of the free product will be recorded in field notes (i.e., sheen, blebs, thickness, color, odor, and any other observations).
  - b. If free-phase petroleum is not observed, the observation of "no free product" will be recorded in field notes.

6. If free-phase petroleum is present, ORRCO will remove it with a vacuum truck, and record the removed free product volume and groundwater volume brought up with the free product in the field notes.
7. Submit all field notes to the Plant Manager for subsequent reporting to DEQ.

Notes: \*A new Coliwasa sampler will be used every time when free product is measured.

A letter report documenting the free product monitoring activities will be submitted to DEQ on a quarterly basis for the first year of monitoring, and on an annual basis thereafter for years two through five. If a year of monthly monitoring indicates there is no free product in one or both wells, monitoring and reporting will be reduced or eliminated as agreed upon by DEQ and ORRCO.

#### **Annual Groundwater and Surface-Water Monitoring and Reporting for Wells FP-3, FP-5, FP-7, FP-9, and Surface Water Adjacent to FP-9**

At the request of DEQ, annual groundwater monitoring will occur during April or May at four groundwater monitoring wells as follows:

- FP-3 (located in the plant operations area),
- FP-5 (located in OU3),
- FP-7 (located in the plant operations area), and
- FP-9 (located within the wetlands).

The groundwater elevations will be collected at all four monitoring wells before collecting groundwater samples. The surface water elevation also will be measured adjacent to FP-9.

Surface water will be collected adjacent to FP-9. The April/May event was selected to reflect the groundwater and surface-water conditions between the wet season and the dry season. This will provide an estimate of groundwater and surface-water conditions for the entire year without excessive contaminant dilution (wet season) or no surface water available (dry season).

The wells will be purged prior to sampling until field parameters stabilize. The field parameters conductivity, temperature, pH, redox, and dissolved oxygen will be measured at each groundwater well location using a calibrated multi-meter and flow-through cell.

The wells will be sampled using flow rates that are as low as practical. Groundwater samples will be collected and analyzed per the U.S. Environmental Protection Agency (EPA) methods, or per the other methods noted in the table below. Samples analyzed for dissolved metals will be field filtered using a 0.45-micron filter.

Groundwater Monitoring Well	Contaminant of Concern <sup>1</sup>	Laboratory Analyses
<i>Plant Operations Area</i>		
FP-3	Diesel- and oil-range petroleum hydrocarbons.	NWTPH-Dx
FP-7	Diesel- and oil-range petroleum hydrocarbons.	NWTPH-Dx
<i>OUs 3 and 4</i>		
FP-5	Dissolved metals lead, zinc and chromium. Fluoride.	EPA Method 6020A EPA Method 300.0/9056A
FP-9	Dissolved metals lead, zinc and chromium. Fluoride.	EPA Method 6020A EPA Method 300.0/9056A

The sample containers will be labeled and placed in a chilled container and shipped to Apex Laboratories, LLC of Tigard, Oregon for analyses.

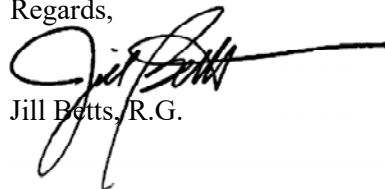
The groundwater data will be compared to DEQ ROD Screening Criteria for Ecological Risk Screening (Table 12 of the ROD), to DEQ Risk-Based Criteria (RBCs), or to the fluoride screening criteria agreed upon by DEQ as follows:

- Diesel- and oil-range petroleum hydrocarbons will be compared to previous results to evaluate concentration trends.
- Dissolved lead will be compared to the DEQ ROD Screening Criteria of 2.5 µg/L.
- Dissolved zinc will be compared to the DEQ ROD Screening Criteria of 120 µg/L.
- Dissolved chromium will be compared to the DEQ ROD Screening Criteria of 11 µg/L.
- Fluoride data will be compared to the DEQ Screening Criteria of 1,940 µg/L.

A report will be submitted to DEQ within 45 days of receipt of the final analytical laboratory report. The report will summarize the field activities and observations, the analytical data results compared to DEQ screening criteria and previous monitoring results, and will present conclusions and recommendations. The groundwater flow direction and laboratory data will be presented in a site map(s).

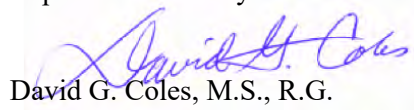
Should you have any questions concerning this Monitoring Plan, please contact the undersigned.

Regards,



Jill Betts, R.G.

Report Reviewed by:



David G. Coles, M.S., R.G.

<sup>1</sup> This list reflects the reduced contaminants of concern as agreed upon by DEQ subsequent to the ROD.

cc: Mr. Scott Briggs, ORRCO  
Mr. Bill Briggs, ORRCO  
Ms. Kate LaRiche Moore, Dunn Carney

Attachment:

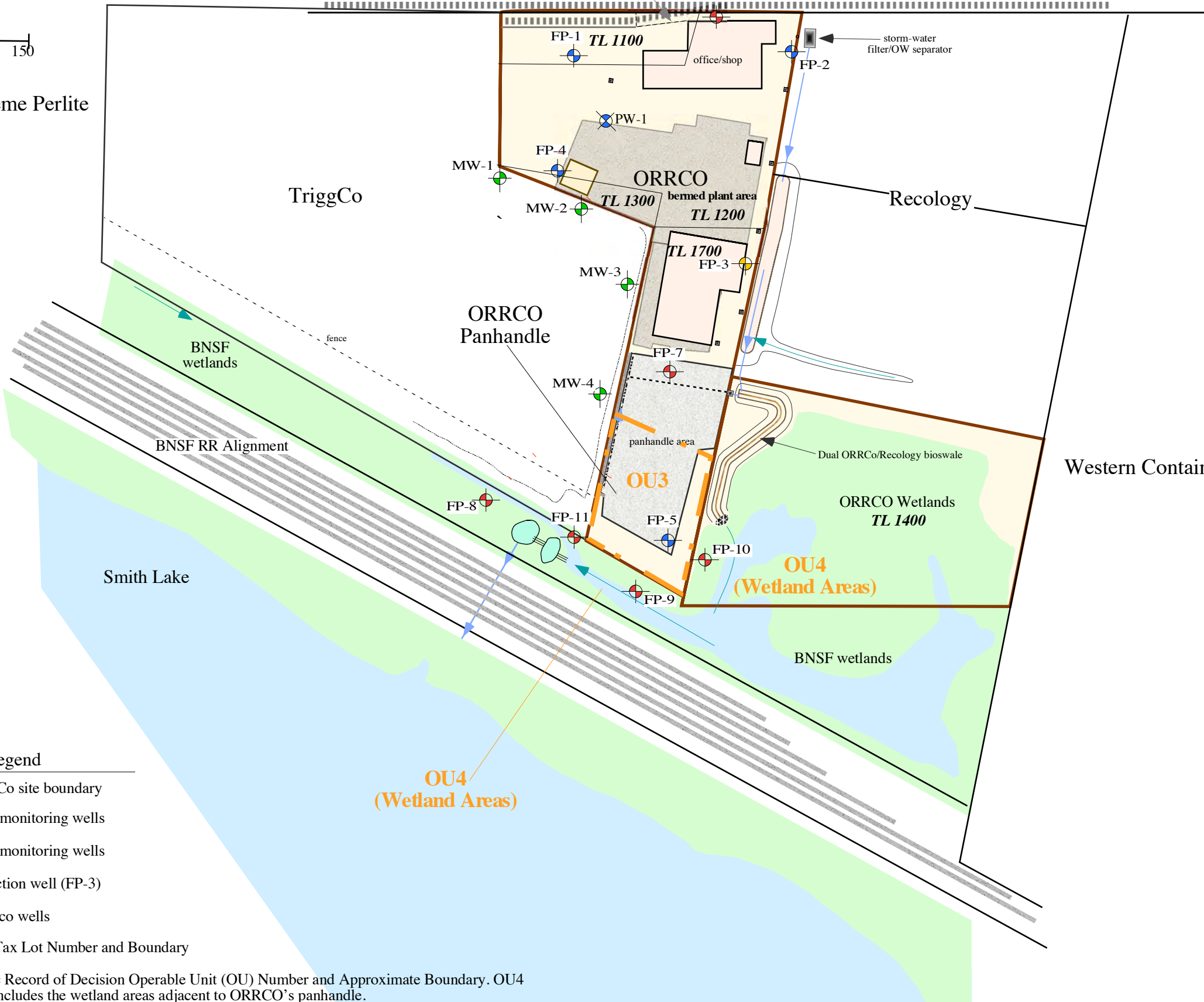
- Figure 1, ORRCO site showing site features including groundwater monitoring wells and Operable Units.



0 150  
Feet

Supreme Perlite

N. Suttle Road



**Legend**

- = ORRCo site boundary
- = 1996 monitoring wells
- = 2005 monitoring wells
- = extraction well (FP-3)
- = Triggco wells

**TL 1700** = Tax Lot Number and Boundary

**OU3** = Record of Decision Operable Unit (OU) Number and Approximate Boundary. OU4 includes the wetland areas adjacent to ORRCo's panhandle.

Note: Diagram based on Benthin Engineering Inc.'s 2006 survey



Approx. Scale: 1" = 150'	Approved By	Date/Revision
		12/2/2020 Rev. 0

Figure 1. ORRCo site showing site features including groundwater monitoring wells and Operable Units.

## **ATTACHMENT C**

**Apex Labs Final Report and Chain of Custody, dated June 24, 2024**



ANALYTICAL REPORT

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: OR100062

Monday, June 24, 2024

Jill Betts
Coles & Betts Environmental Consulting
5741 NE Flanders Street
Portland, OR 97213

RE: A4E1739 - Merit - FPI - ORRCO - 5002

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A4E1739, which was received by the laboratory on 5/30/2024 at 11:54:00AM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample receipt, unless prior arrangements have been made.

Cooler Receipt Information
Acceptable Receipt Temperature is less than, or equal to, 6 degC (not frozen), or received on ice the same day as sampling.
(See Cooler Receipt Form for details)
Default Cooler 5.6 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report. All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.



Apex Laboratories

[Signature]

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager



**ANALYTICAL REPORT**

**Apex Laboratories, LLC**

6700 S.W. Sandburg Street  
Tigard, OR 97223  
503-718-2323  
ORELAP ID: OR100062

<b><u>Coles &amp; Betts Environmental Consulting</u></b> 5741 NE Flanders Street Portland, OR 97213	Project: <b><u>Merit - FPI - ORRCO</u></b> Project Number: <b>5002</b> Project Manager: <b>Jill Betts</b>	<b>Report ID:</b> <b>A4E1739 - 06 24 24 1716</b>
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**ANALYTICAL REPORT FOR SAMPLES**

**SAMPLE INFORMATION**

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FP-3	A4E1739-01	Water	05/29/24 15:33	05/30/24 11:54
FP-7	A4E1739-02	Water	05/29/24 14:18	05/30/24 11:54
FP-5	A4E1739-03	Water	05/29/24 11:30	05/30/24 11:54
FP-9	A4E1739-04	Water	05/29/24 12:46	05/30/24 11:54

Apex Laboratories

*The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.*

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

**Apex Laboratories, LLC**

6700 S.W. Sandburg Street  
Tigard, OR 97223  
503-718-2323  
ORELAP ID: OR100062

<b>Coles &amp; Betts Environmental Consulting</b> 5741 NE Flanders Street Portland, OR 97213	Project: <b>Merit - FPI - ORRCO</b> Project Number: <b>5002</b> Project Manager: <b>Jill Betts</b>	<b>Report ID:</b> A4E1739 - 06 24 24 1716
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**ANALYTICAL SAMPLE RESULTS**

**Diesel and/or Oil Hydrocarbons by NWTPH-Dx**

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
<b>FP-3 (A4E1739-01)</b>				<b>Matrix: Water</b>		<b>Batch: 24F0087</b>			
Diesel	<b>4.69</b>	---	0.377	mg/L	5	06/04/24 21:55	NWTPH-Dx LL		
Oil	ND	---	0.755	mg/L	5	06/04/24 21:55	NWTPH-Dx LL		
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 63 %</i>		<i>Limits: 50-150 %</i>		<i>5</i>	<i>06/04/24 21:55</i>	<i>NWTPH-Dx LL</i>	<i>S-05</i>
<b>FP-7 (A4E1739-02)</b>				<b>Matrix: Water</b>		<b>Batch: 24F0087</b>			
Diesel	<b>2.36</b>	---	0.377	mg/L	5	06/04/24 22:36	NWTPH-Dx LL	<b>F-13</b>	
Oil	ND	---	0.755	mg/L	5	06/04/24 22:36	NWTPH-Dx LL		
<i>Surrogate: o-Terphenyl (Surr)</i>		<i>Recovery: 69 %</i>		<i>Limits: 50-150 %</i>		<i>5</i>	<i>06/04/24 22:36</i>	<i>NWTPH-Dx LL</i>	<i>S-05</i>

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.

Darrell Auvil, Client Services Manager



ANALYTICAL REPORT

**Apex Laboratories, LLC**

6700 S.W. Sandburg Street  
Tigard, OR 97223  
503-718-2323  
ORELAP ID: OR100062

<p><b><u>Coles &amp; Betts Environmental Consulting</u></b> 5741 NE Flanders Street Portland, OR 97213</p>	<p>Project: <b><u>Merit - FPI - ORRCO</u></b> Project Number: <b>5002</b> Project Manager: <b>Jill Betts</b></p>	<p style="text-align: right;"><b>Report ID:</b> <b>A4E1739 - 06 24 24 1716</b></p>
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**ANALYTICAL SAMPLE RESULTS**

**Dissolved Metals by EPA 200.8 (ICPMS)**

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes	
<b>FP-5 (A4E1739-03)</b>					<b>Matrix: Water</b>				
Batch: 24F0401									
Chromium	ND	---	2.00	ug/L	1	06/12/24 15:40	EPA 200.8 (Diss)	FILT1, H-12	
Lead	ND	---	0.200	ug/L	1	06/12/24 15:40	EPA 200.8 (Diss)	FILT1, H-12	
Zinc	ND	---	4.00	ug/L	1	06/12/24 15:40	EPA 200.8 (Diss)	FILT1, H-12	
<b>FP-9 (A4E1739-04)</b>					<b>Matrix: Water</b>				
Batch: 24F0424									
<b>Chromium</b>	<b>20.0</b>	---	10.0	ug/L	5	06/12/24 16:55	EPA 200.8 (Diss)	<b>DISSx, FILT1, H-12</b>	
<b>Lead</b>	<b>41.8</b>	---	1.00	ug/L	5	06/12/24 16:55	EPA 200.8 (Diss)	<b>DISSx, FILT1, H-12</b>	
<b>Zinc</b>	<b>310</b>	---	20.0	ug/L	5	06/12/24 16:55	EPA 200.8 (Diss)	<b>DISSx, FILT1, H-12</b>	

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**ANALYTICAL SAMPLE RESULTS**

**Fluoride by Ion-Specific Electrode (Non-Distilled)**

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
<b>FP-5 (A4E1739-03)</b>				<b>Matrix: Water</b>		<b>Batch: 24F0194</b>		
Fluoride	441	---	10.0	mg/L	1	06/06/24 14:17	SM 4500-F C	
<b>FP-9 (A4E1739-04)</b>				<b>Matrix: Water</b>		<b>Batch: 24F0194</b>		
Fluoride	521	---	10.0	mg/L	1	06/06/24 14:20	SM 4500-F C	

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**ANALYTICAL SAMPLE RESULTS**

**Lab Filtration**

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
<b>FP-5 (A4E1739-03)</b>				<b>Matrix: Water</b>		<b>Batch: 24E1187</b>		
Lab Filtration (prep only)	PREP	---		N/A	1	05/31/24 18:13	NA	H-12
<b>FP-9 (A4E1739-04)</b>				<b>Matrix: Water</b>		<b>Batch: 24E1187</b>		
Lab Filtration (prep only)	PREP	---		N/A	1	05/31/24 18:14	NA	H-12

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**QUALITY CONTROL (QC) SAMPLE RESULTS**

**Diesel and/or Oil Hydrocarbons by NWTPH-Dx**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
<b>Batch 24F0087 - EPA 3510C (Fuels/Acid Ext.)</b>						<b>Water</b>						
<b>Blank (24F0087-BLK1)</b>			Prepared: 06/04/24 11:23 Analyzed: 06/04/24 18:07									
<u>NWTPH-Dx LL</u>												
Diesel	ND	---	0.0800	mg/L	1	---	---	---	---	---	---	
Oil	ND	---	0.160	mg/L	1	---	---	---	---	---	---	
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 85 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<b>LCS (24F0087-BS1)</b>			Prepared: 06/04/24 11:23 Analyzed: 06/04/24 18:28									
<u>NWTPH-Dx LL</u>												
Diesel	0.410	---	0.0800	mg/L	1	0.500	---	82	36-132%	---	---	
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 87 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						
<b>LCS Dup (24F0087-BSD1)</b>			Prepared: 06/04/24 11:23 Analyzed: 06/04/24 18:49									<b>Q-19</b>
<u>NWTPH-Dx LL</u>												
Diesel	0.389	---	0.0800	mg/L	1	0.500	---	78	36-132%	5	30%	
<i>Surr: o-Terphenyl (Surr)</i>		<i>Recovery: 86 %</i>		<i>Limits: 50-150 %</i>		<i>Dilution: 1x</i>						

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**QUALITY CONTROL (QC) SAMPLE RESULTS**

**Dissolved Metals by EPA 200.8 (ICPMS)**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
<b>Batch 24F0401 - Matrix Matched Direct Inject</b>						<b>Water</b>						
<b>Blank (24F0401-BLK1)</b>						Prepared: 06/12/24 08:54 Analyzed: 06/12/24 15:29						
<u>EPA 200.8 (Diss)</u>												
Chromium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	FILT3
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	FILT3
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	FILT3
<b>LCS (24F0401-BS1)</b>						Prepared: 06/12/24 08:54 Analyzed: 06/12/24 15:34						
<u>EPA 200.8 (Diss)</u>												
Chromium	58.4	---	2.00	ug/L	1	55.6	---	105	85-115%	---	---	
Lead	56.9	---	0.200	ug/L	1	55.6	---	102	85-115%	---	---	
Zinc	59.5	---	4.00	ug/L	1	55.6	---	107	85-115%	---	---	
<b>Duplicate (24F0401-DUP1)</b>						Prepared: 06/12/24 08:54 Analyzed: 06/12/24 15:46						
<u>QC Source Sample: FP-5 (A4E1739-03)</u>												
<u>EPA 200.8 (Diss)</u>												
Chromium	ND	---	2.00	ug/L	1	---	ND	---	---	---	20%	FILT1,H-12
Lead	ND	---	0.200	ug/L	1	---	0.177	---	---	***	20%	FILT1,H-12
Zinc	ND	---	4.00	ug/L	1	---	2.49	---	---	***	20%	FILT1,H-12
<b>Matrix Spike (24F0401-MS1)</b>						Prepared: 06/12/24 08:54 Analyzed: 06/12/24 15:53						
<u>QC Source Sample: FP-5 (A4E1739-03)</u>												
<u>EPA 200.8 (Diss)</u>												
Chromium	60.9	---	2.00	ug/L	1	55.6	ND	110	70-130%	---	---	FILT1,H-12
Lead	55.1	---	0.200	ug/L	1	55.6	0.177	99	70-130%	---	---	FILT1,H-12
Zinc	61.3	---	4.00	ug/L	1	55.6	2.49	106	70-130%	---	---	FILT1,H-12

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**QUALITY CONTROL (QC) SAMPLE RESULTS**

**Dissolved Metals by EPA 200.8 (ICPMS)**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
<b>Batch 24F0424 - EPA 3015A - Dissolved</b>						<b>Water</b>						
<b>Blank (24F0424-BLK1)</b>			Prepared: 06/12/24 13:58 Analyzed: 06/12/24 16:44									
<u>EPA 200.8 (Diss)</u>												
Chromium	ND	---	2.00	ug/L	1	---	---	---	---	---	---	
Lead	ND	---	0.200	ug/L	1	---	---	---	---	---	---	
Zinc	ND	---	4.00	ug/L	1	---	---	---	---	---	---	
<b>LCS (24F0424-BS1)</b>			Prepared: 06/12/24 13:58 Analyzed: 06/12/24 16:49									
<u>EPA 200.8 (Diss)</u>												
Chromium	58.0	---	2.00	ug/L	1	55.6	---	104	85-115%	---	---	
Lead	57.9	---	0.200	ug/L	1	55.6	---	104	85-115%	---	---	
Zinc	59.2	---	4.00	ug/L	1	55.6	---	107	85-115%	---	---	
<b>Duplicate (24F0424-DUP1)</b>			Prepared: 06/12/24 13:58 Analyzed: 06/12/24 17:00									
<u>QC Source Sample: FP-9 (A4E1739-04)</u>												
<u>EPA 200.8 (Diss)</u>												
Chromium	20.6	---	10.0	ug/L	5	---	20.0	---	---	3	20%	DISSx, FILT1,H-12
Lead	41.9	---	1.00	ug/L	5	---	41.8	---	---	0.2	20%	DISSx, FILT1,H-12
Zinc	317	---	20.0	ug/L	5	---	310	---	---	2	20%	DISSx, FILT1,H-12
<b>Matrix Spike (24F0424-MS1)</b>			Prepared: 06/12/24 13:58 Analyzed: 06/12/24 17:06									
<u>QC Source Sample: FP-9 (A4E1739-04)</u>												
<u>EPA 200.8 (Diss)</u>												
Chromium	80.0	---	10.0	ug/L	5	55.6	20.0	108	70-130%	---	---	DISSx, FILT1,H-12
Lead	101	---	1.00	ug/L	5	55.6	41.8	107	70-130%	---	---	DISSx, FILT1,H-12
Zinc	376	---	20.0	ug/L	5	55.6	310	119	70-130%	---	---	DISSx, FILT1,H-12

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**QUALITY CONTROL (QC) SAMPLE RESULTS**

**Fluoride by Ion-Specific Electrode (Non-Distilled)**

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
<b>Batch 24F0194 - Method Prep: Aq</b>						<b>Water</b>						
<b>Blank (24F0194-BLK1)</b>			Prepared: 06/06/24 10:16 Analyzed: 06/06/24 14:03									
<u>SM 4500-F C</u>												
Fluoride	ND	---	0.100	mg/L	1	---	---	---	---	---	---	
<b>LCS (24F0194-BS1)</b>			Prepared: 06/06/24 10:16 Analyzed: 06/06/24 14:07									
<u>SM 4500-F C</u>												
Fluoride	10.7	---	0.100	mg/L	1	10.0	---	107	90-114%	---	---	
<b>Matrix Spike (24F0194-MS1)</b>			Prepared: 06/06/24 10:16 Analyzed: 06/06/24 14:12									
<u>QC Source Sample: Non-SDG (A4E1724-01)</u>												
<u>SM 4500-F C</u>												
Fluoride	11.3	---	0.101	mg/L	1	10.0	0.604	107	90-114%	---	---	
<b>Matrix Spike Dup (24F0194-MSD1)</b>			Prepared: 06/06/24 10:16 Analyzed: 06/06/24 14:15									
<u>QC Source Sample: Non-SDG (A4E1724-01)</u>												
Fluoride	11.2	---	0.101	mg/L	1	10.0	0.604	106	90-114%	0.8	5%	

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**SAMPLE PREPARATION INFORMATION**

**Diesel and/or Oil Hydrocarbons by NWTPH-Dx**

Prep: EPA 3510C (Fuels/Acid Ext.)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 24F0087</u>							
A4E1739-01	Water	NWTPH-Dx LL	05/29/24 15:33	06/04/24 11:23	1060mL/2mL	1000mL/2mL	0.94
A4E1739-02	Water	NWTPH-Dx LL	05/29/24 14:18	06/04/24 11:23	1060mL/2mL	1000mL/2mL	0.94

**Dissolved Metals by EPA 200.8 (ICPMS)**

Prep: EPA 3015A - Dissolved

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 24F0424</u>							
A4E1739-04	Water	EPA 200.8 (Diss)	05/29/24 12:46	06/12/24 13:58	45mL/50mL	45mL/50mL	1.00

Prep: Matrix Matched Direct Inject

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 24F0401</u>							
A4E1739-03	Water	EPA 200.8 (Diss)	05/29/24 11:30	06/12/24 08:54	45mL/50mL	45mL/50mL	1.00

**Fluoride by Ion-Specific Electrode (Non-Distilled)**

Prep: Method Prep: Aq

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 24F0194</u>							
A4E1739-03	Water	SM 4500-F C	05/29/24 11:30	06/06/24 10:16	0.1mL/10mL	10mL/10mL	100.00
A4E1739-04	Water	SM 4500-F C	05/29/24 12:46	06/06/24 10:16	0.1mL/10mL	10mL/10mL	100.00

**Lab Filtration**

Prep: Lab Filtration

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
<u>Batch: 24E1187</u>							
A4E1739-03	Water	NA	05/29/24 11:30	05/31/24 18:13	150mL/150mL		NA
A4E1739-04	Water	NA	05/29/24 12:46	05/31/24 18:14	150mL/150mL		NA

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**QUALIFIER DEFINITIONS**

**Client Sample and Quality Control (QC) Sample Qualifier Definitions:**

**Apex Laboratories**

- DISSx** A Dissolved Analysis was requested for this sample, however material present in the preserved container required a 3015A digestion.
- F-13** The chromatographic pattern does not resemble the fuel standard used for quantitation
- FILT1** Sample was lab filtered and acid preserved prior to analysis. See sample preparation section of report for date and time of filtration.
- FILT3** This is a laboratory filtration blank, associated with filtration batch 24E1187. See Prep page of report for associated samples.
- H-12** Sample Analysis or Filtration was performed >15 minutes after sample collection. Consult regulator or permit manager to determine the usability of data for intended use.
- Q-19** Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
- S-05** Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.

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**REPORTING NOTES AND CONVENTIONS:**

**Abbreviations:**

- DET Analyte DETECTED at or above the detection or reporting limit.
- ND Analyte NOT DETECTED at or above the detection or reporting limit.
- NR Result Not Reported
- RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

**Detection Limits: Limit of Detection (LOD)**

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).  
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

**Reporting Limits: Limit of Quantitation (LOQ)**

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

**Reporting Conventions:**

- Basis: Results for soil samples are generally reported on a 100% dry weight basis.  
The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.
  - " dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")  
See Percent Solids section for details of dry weight analysis.
  - " wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.
  - " " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.
- Results for Volatiles analyses on soils and sediments that are reported on a "dry weight" basis include the water miscible solvent (WMS) correction referenced in the EPA 8000 Method guidance documents. Solid and Liquid samples reported on an "As Received" basis do not have the WMS correction applied, as dry weight was not performed.

**QC Source:**

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

**Miscellaneous Notes:**

- " --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.
- " \*\*\* " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

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**REPORTING NOTES AND CONVENTIONS (Cont.):**

**Blanks:**

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to one half of the Reporting Limit (RL). Blank results for gravimetric analyses are evaluated to the Reporting Level, not to half of the Reporting Level.

- For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
- For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.

For further details, please request a copy of this document.

- Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level, if results are not reported to the MDL.

**Preparation Notes:**

**Mixed Matrix Samples:**

**Water Samples:**

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

**Soil and Sediment Samples:**

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

**Sampling and Preservation Notes:**

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

*The results in this report apply to the samples analyzed in accordance with the chain of custody document(s) and updated by any subsequent written communications. This analytical report must be reproduced in its entirety.*

Darrell Auvil, Client Services Manager



**ANALYTICAL REPORT**

**Apex Laboratories, LLC**

6700 S.W. Sandburg Street  
Tigard, OR 97223  
503-718-2323  
ORELAP ID: OR100062

<b><u>Coles &amp; Betts Environmental Consulting</u></b> 5741 NE Flanders Street Portland, OR 97213	Project: <b><u>Merit - FPI - ORRCO</u></b> Project Number: <b>5002</b> Project Manager: <b>Jill Betts</b>	<b>Report ID:</b> <b>A4E1739 - 06 24 24 1716</b>
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**LABORATORY ACCREDITATION INFORMATION**

**ORELAP Certification ID: OR100062 (Primary Accreditation) -**  
**EPA ID: OR01039**

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

**Apex Laboratories**

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation
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All reported analytes are included in Apex Laboratories' current ORELAP scope.

**Secondary Accreditations**

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

**Subcontract Laboratory Accreditations**

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation. Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

**Field Testing Parameters**

Results for Field Tested data are provided by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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**APEX LABS COOLER RECEIPT FORM**

**Client:** Coles & Betts Element WO#: A4E1739

**Project/Project #:** Merit / FPI / ORRCO on Suttle Rd. 5002

**Delivery Info:**  
Date/time received: 5/30/24 @ 1154 By: APL  
Delivered by: Apex  Client  ESS  FedEx  UPS  Radio  Morgan  SDS  Evergreen  Other   
From USDA Regulated Origin? Yes  No

**Cooler Inspection** Date/time inspected: 5/30/24 @ 1154 By: APL  
Chain of Custody included? Yes  No   
Signed/dated by client? Yes  No   
Contains USDA Reg. Soils? Yes  No  Unsure (email RegSoils)

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	<u>5.6</u>						
Custody seals? (Y/N)	<u>N</u>						
Received on ice? (Y/N)	<u>Y</u>						
Temp. blanks? (Y/N)	<u>Y</u>						
Ice type: (Gel/Real/Other)	<u>Gel</u>						
Condition (In/Out):	<u>In</u>						

Cooler out of temp? (Y/N)  Possible reason why: \_\_\_\_\_  
Green dots applied to out of temperature samples? Yes/No   
Out of temperature samples form initiated? Yes/No

**Sample Inspection:** Date/time inspected: 5/30/24 @ 1300 By: KAB  
All samples intact? Yes  No  Comments: \_\_\_\_\_  
Bottle labels/COCs agree? Yes  No  Comments: \_\_\_\_\_  
COC/container discrepancies form initiated? Yes  No   
Containers/volumes received appropriate for analysis? Yes  No  Comments: Unfiltered HNO3 polys provided for dissolved metals  
Do VOA vials have visible headspace? Yes  No  NA   
Comments: \_\_\_\_\_  
Water samples: pH checked: Yes  No  NA  pH appropriate? Yes  No  NA  pH ID: A231172  
Comments: FP-3 ph A @ 3 B @ 7; FP-7 ph A @ 3 B @ 4  
FP-5 ph @ 2; FP-9 ph @ 2 ALL CONTS. Too full to preserve for FP-3 & FP-7.  
Labeled by: KAB Witness: JB ALL LABS 5/31/24 Cooler Inspected by: KAB  
Form Y-003 R-02

Apex Laboratories

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Darrell Auvil, Client Services Manager