LANDAU ASSOCIATES

MONITORING WELL MW-23 DECOMMISSIONING AND REPLACEMENT REPORT

WWP Central Steam Plant
Oil Spill Remediation
Spokane, Washington

September 1, 2023

Prepared for

Avista Corporation
1411 East Mission Avenue
Spokane, Washington

SPOKANE
10 North Post Street, Ste 218, Spokane, WA 99201 T 509.327.9737

Monitoring Well MW-23
Decommissioning and Replacement Report
WWP Central Steam Plant
Oil Spill Remediation
Spokane, Washington

This document was prepared by, or under the direct supervision of, the technical professionals noted below.

Document prepared by: _____ Dan Gray, LG
Project Geologist

Document reviewed by: _____ Shane Kostka, LG
Senior Geologist

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Project Coordinator:	tac

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LIST OF ABBREVIATIONS AND ACRONYMS

Avista ..... Avista Corporation
bgs ..... below ground surface
CAP ..... cleanup action plan
Ecology ..... Washington State Department of Ecology
EPA ..... US Environmental Protection Agency
GPR ..... ground penetrating radar
IDW ..... investigation-derived waste
Landau ..... Landau Associates, Inc.
MTCA ..... Model Toxics Control Act
NAD83 ..... North American Datum of 1983
NAVD88 ..... North American Vertical Datum of 1988
NTU ..... nephelometric turbidity unit
NWTPH-Dx ..... Northwest total petroleum hydrocarbon diesel-range extended
PVC ..... polyvinyl chloride
RCRA ..... Resource Conservation and Recovery Act
ROW ..... right-of-way
Site ..... Central Steam Plant site
UST ..... underground storage tank
WAC ..... Washington Administrative Code
WWP ..... Washington Water Power Company

1.0 INTRODUCTION

This document was prepared on behalf of Avista Corporation (Avista), formerly the Washington Water Power Company (WWP), by Landau Associates, Inc. (Landau) and presents the details of decommissioning groundwater compliance monitoring well MW-23 and the construction and development of the replacement groundwater compliance monitoring well at the Central Steam Plant site (Site) located in Spokane, Washington (Figure 1). In conjunction with monitoring well decommissioning and construction, Landau investigated the integrity of the vent pipes associated with the Site remediation system passive air introduction wells. This document also presents the results of the passive air introduction vent pipe investigation.

1.1 Site Description and Background

The Central Steam Plant was constructed in 1915 and provided steam heat and electrical power to downtown Spokane until operations ceased in 1986. Seven concrete underground storage tanks (USTs) were used to store Bunker C fuel oil for steam plant operations. In June of 1982, WWP reported a release of Bunker C from one of the USTs to the Washington State Department of Ecology (Ecology).

Site cleanup activities are being performed in accordance with the cleanup action plan (CAP) developed by Ecology (Ecology 1996a), per the terms presented in the WWP/Ecology Amended Consent Decree (Ecology 1996b). As defined in the Amended Consent Decree (Ecology 1996b), the Site consists of the area affected by petroleum hydrocarbons in soil above Model Toxics Control Act (MTCA) Method A cleanup levels. Because hazardous substances are contained on the Site, the groundwater point of compliance was established as close as practicable to the edge of the contained hazardous substances, not to exceed the northern boundary of Steam Plant Square (Ecology 1996a). Since 1998, compliance monitoring activities, including groundwater performance monitoring, have been performed in accordance with the final compliance monitoring plan (AGI 1998). Groundwater performance monitoring is conducted semiannually to evaluate whether groundwater performance standards have been met and includes groundwater sampling and laboratory analysis, and measurement of groundwater elevations.

1.2 Monitoring Well MW-23 and Passive Air Introduction Wells Description and Background

Compliance monitoring well MW-23 was located in West Railroad Alley, near the intersection of West Railroad Alley and South Post Street (Figure 2) and was part of the network of compliance monitoring wells used for groundwater performance monitoring. During recent monitoring events, localized subsidence has been observed in the area of West Railroad Alley surrounding the monitoring well. During the most recent monitoring event conducted in March 2023, the well cap on MW-23 was observed to have failed, and surface water from the alleyway and the southern adjoining parking lot may have entered the well.

Monitoring well MW-23 was also originally designed to be one of the five Site passive air introduction wells (in conjunction with the bioventing system, the wells passively draw air from a vertical riser vent to optimize fresh air entry into the subsurface). In conjunction with preparation of the monitoring well decommissioning work plan, Landau observed that the vertical riser for passive air introduction (the vertical riser was formerly located on the north wall of the elevated railroad tracks, south of MW-23) and a portion of the horizontal piping connecting MW-23 to the vertical riser had been removed. It is likely that these features were removed during renovations of the Diamond parking lot south of the well. Per a conversation with Ecology on June 12, 2023, the replacement monitoring well was not planned to be constructed as a passive air introduction well.

Following the observation that the passive air introduction system at MW-23 had been removed, the integrity of the vent pipes for the remaining four passive air injection wells (MW-2, MW-6, MW-8, and MW-22) were investigated.

2.0 MONITORING WELL REPLACEMENT ACTIVITIES

This section describes the activities conducted during monitoring well replacement and includes monitoring well MW-23 decommissioning, replacement monitoring well MW-23R construction and development, and the management of residual wastes from the investigation.

2.1 New Monitoring Well Installation and Development

Installation of the replacement monitoring well, MW-23R (Ecology Well ID BNW281), was completed on June 30, 2023. The location of replacement monitoring well MW-23R was selected to be proximate to MW-23, as close as practicable to the edge of the contained hazardous substances, outside the area of localized subsidence, and clear of any identified subsurface utilities or structures.

Prior to the commencement of drilling activities, underground utilities were marked by a public utility locating service in the vicinity of the proposed replacement monitoring well location. In addition, Landau visited the Site with a private utility locator to mark the proposed boring/monitoring well location and private utilities in the surrounding area. Ground penetrating radar (GPR) was used to attempt to locate any subsurface structures, impediments, or additional nonconductive utilities near the proposed drilling area.

The initial location selected for the replacement monitoring well was approximately 15 feet south of monitoring well MW-23, near the northern edge of the Diamond parking lot located south of West Railroad Alley. Utilizing sonic drilling techniques, a boring was advanced to 35-feet below ground surface (bgs). The Latah Formation (a series of late Miocene lacustrine sedimentary deposits) was observed from 33.5 feet to 35 feet bgs. During previous investigations at the Site, the Latah Formation was generally observed to be overlying basalt bedrock. Within a layer of coarse sand identified within the Latah Formation from approximately 34 to 34.1 feet bgs, field observations indicated the potential presence of free product, and drilling for the initial location of the replacement monitoring well was terminated owing to the potential presence of free product. Bedrock was not encountered in this boring. The boring location, boring MW-23F, was abandoned, backfilled with bentonite chips, and paved to match the existing grade (Figure 3).

A second replacement monitoring well location, monitoring well MW-23R, was selected within the City of Spokane right-of-way (ROW) southeast of monitoring well MW-23, based on locations of underground utilities, areas of subsidence, and drill-rig access constraints. A boring was advanced to competent basalt bedrock at 35 feet bgs utilizing sonic drilling technology. The Latah Formation was observed from approximately 33.5 to 34 feet bgs. Basalt was observed from approximately 34 to 35 feet bgs (the bottom of the boring). No evidence of contamination was observed in the boring. A 2-inch polyvinyl chloride (PVC) monitoring well was constructed in accordance with Washington Administrative Code (WAC) 173-160-420 using a screened interval of 24 to 34 feet bgs. The screened interval was chosen to match as closely as possible the construction of the screened interval for monitoring well MW-23, which was keyed slightly into the Latah formation. The monitoring well was backfilled with 12/20 silica sand from 35 feet to 22 feet bgs, from approximately 1 foot below the screen to 2 feet above the screen. The remainder of the boring was backfilled with bentonite from a depth of 22 feet bgs

to 2 feet bgs. A standard-density, traffic-rated well monument was installed and set in place with concrete from 2 feet bgs to the existing grade.

Following installation of monitoring well MW-23R, ground surface elevation, horizontal coordinates, and the top of casing elevation were surveyed by a professional surveyor. Ground surface elevation and horizontal coordinates for abandoned boring MW-23F were also surveyed. The survey was completed using a vertical datum (North American Vertical Datum of 1988 [NAVD88]) and a horizontal datum (North American Datum of 1983 [NAD83]). This is consistent with the datums used for the most recent survey completed in 2022. Details of the boring and of the constructed monitoring well and survey information are presented in the boring and monitoring well logs in Appendix A.

On July 20, 2023, monitoring well MW-23R was developed by Landau utilizing surging and pumping methods using a Waterra D25 foot valve and attached surge block. Approximately 30 well volumes were purged from the well, and turbidity readings were observed to be as low as 74 nephelometric turbidity units (NTUs) after purging. Lower turbidity was not achievable during well development and, based on the significant volume of water removed from the well, purging was determined to be complete.

2.2 Existing Monitoring Well Decommissioning

On June 30, 2023, monitoring well MW-23 (Ecology Well ID ABJ939) was decommissioned by the drilling contractor in accordance with WAC 173-160-460. Prior to decommissioning, all sampling materials and well casing obstructions (e.g., bailers, string) were removed from the well casing. Following removal of well casing obstructions, the drilling contractor filled the entirety of the well casing with bentonite chips, hydrated the chips with approximately 5 gallons of potable water, and capped the casing and filled the existing monument with concrete to match ground surface conditions.

2.3 Waste Management

Investigation-derived waste (IDW) from boring MW-23F and monitoring well MW-23R were stored in Washington State Department of Transportation-approved steel, 55-gallon drums. Cuttings from the boring and the monitoring well were kept in separate drums, and composite soil samples were collected from each drum for waste characterization purposes.

The drums were temporarily stored in a secure subsurface parking lot near the Site remediation system control room. The drums were picked up by Avista and held at their hazardous waste management building pending receipt of characterization analytical results.

Purge water generated from well development was pumped to 5-gallon buckets. A composite sample was collected from the purge water buckets for waste characterization and disposal purposes and the buckets were labeled and transported by Landau to Avista's hazardous waste management building for storage pending characterization analytical results.

Soil and purge water waste characterization samples were analyzed for diesel- and motor oil-range petroleum hydrocarbons using Ecology's Northwest total petroleum hydrocarbon extended-range diesel analytical method (NWTPH-Dx) and for Resource Conservation and Recovery Act (RCRA) 8 metals

(arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) plus copper, nickel, and zinc using US Environmental Protection Agency (EPA) 6000/7000 series methods. Laboratory analytical services were provided by Eurofins Test America in Spokane Valley, Washington, an Ecology-accredited laboratory. Analytical results for the waste characterization samples are provided in Tables 1 and 2. Copies of the laboratory analytical reports are included in Appendix B.

3.0 PASSIVE AIR INTRODUCTION SYSTEM INVESTIGATION ACTIVITIES

This section describes the activities associated with investigating the integrity of the vent pipes of the remaining four passive air injection wells (MW-2, MW-6, MW-8, and MW-22).

On May 16, 2023, Landau performed an initial investigation of the integrity of the four remaining passive air introduction wells. Landau determined that the top of the vertical riser pipe (a downturned 180-degree elbow to prevent stormwater and debris from entering the air introduction system) for the passive air introduction system for monitoring well MW-8 (located in the surface parking lot west of the Davenport parking garage) was cut. The remainder of the passive air introduction wells (MW-2, MW-6, and MW-22) were observed to be in good condition.

On July 20, 2023, the vent piping associated with passive air introduction well MW-8 was further investigated to determine if the passive air introduction system for the well was intact and not obstructed. A 1⅜-inch diameter sewer camera was passed through the remaining vertical riser portion of the vent piping. Large amounts of trash, debris, and rust were observed within the vertical pipe, and the camera was not able to view or enter the horizontal portion of the vent pipe. It was also determined that the horizontal portion of the vent pipe leading from MW-8 had been removed. It is likely the horizontal piping was removed during renovations of the surface parking lot. The camera was also passed through the vertical portion of the well to the groundwater table. The well appeared to be in good condition, and no former connections related to the passive air introduction system were identified.

Two 90-degree, galvanized steel elbows and a galvanized steel coupler were installed on top of the remaining portion of the vertical vent pipe to prevent future water and debris from entering the pipe.

4.0 CONCLUSIONS

Replacement monitoring well MW-23R was installed as close as practicable to the edge of the contained hazardous substances at the Site. The replacement well will be sampled during the second semiannual 2023 groundwater performance monitoring event. The vent piping associated with passive air introduction well MW-8 is no longer intact, and the well no longer acts as a passive air introduction well; however, the well appears to be in good condition and can still be used for semiannual groundwater elevation monitoring.

5.0 USE OF THIS REPORT

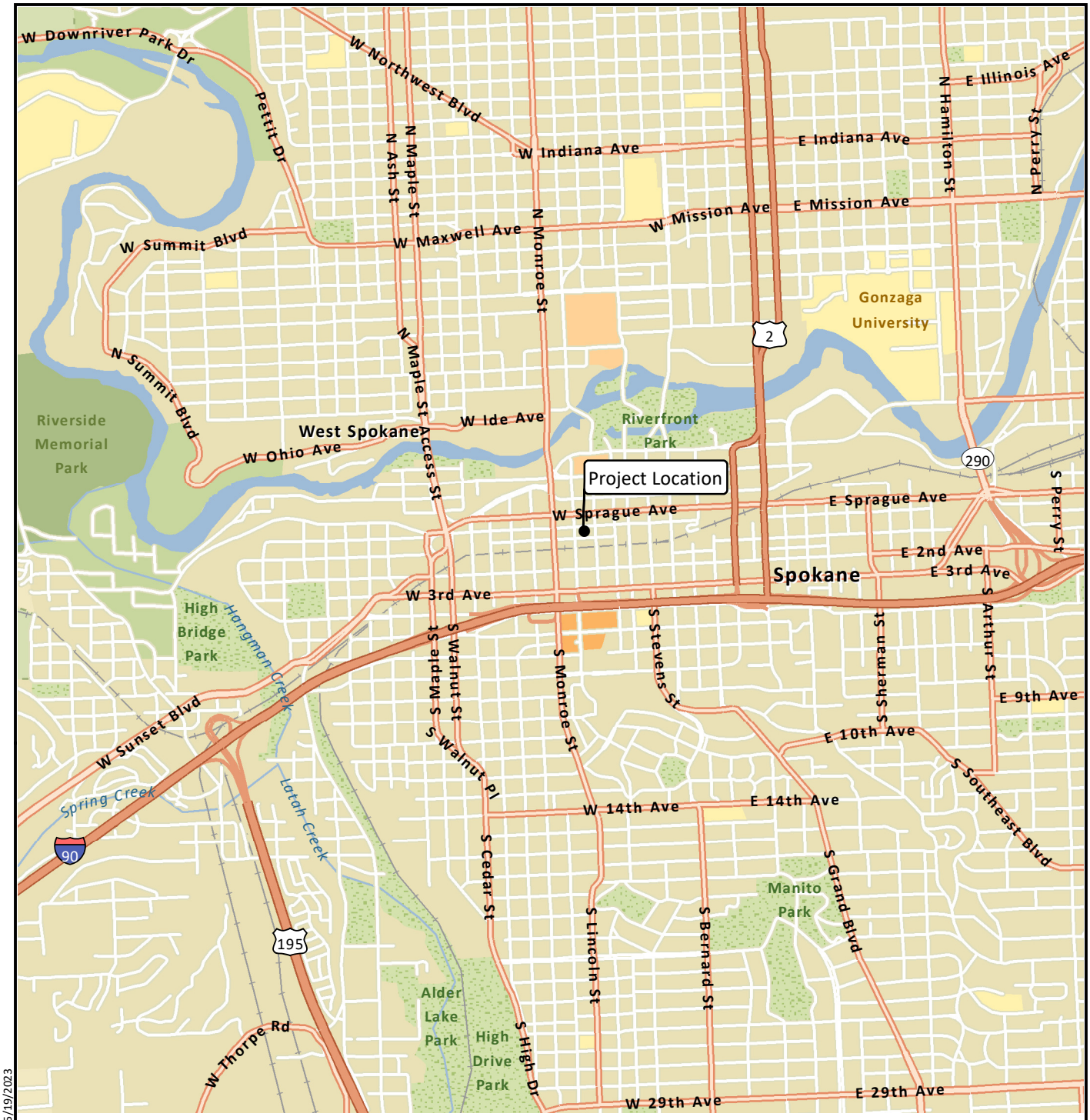
This report has been prepared for the exclusive use of Avista Corporation for specific application to decommissioning groundwater compliance monitoring well MW-23 and the construction and development of the replacement groundwater compliance monitoring well at the Central Steam Plant site in Spokane, Washington. The reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau, shall be at the user's sole risk. Landau warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. Landau makes no other warranty, either express or implied.

6.0 REFERENCES

AGI. 1998. Final Cleanup Action Report, Central Steam Plant Oil Spill Remediation, Spokane, Washington. AGI Technologies. June 5.

Ecology. 1996a. Washington Department of Ecology Eastern Regional Office Toxics Cleanup Program: Final Cleanup Action Plan, WWP Central Steam Plant Site. November 22.

Ecology. 1996b. Amended Consent Decree No. 94-2-05788-4, State of Washington, Department of Ecology, Plaintiff, v. The Washington Water Power Company, Defendant. Washington State Department of Ecology.



N

0 0.5 1

Miles

Data Source: Esri.

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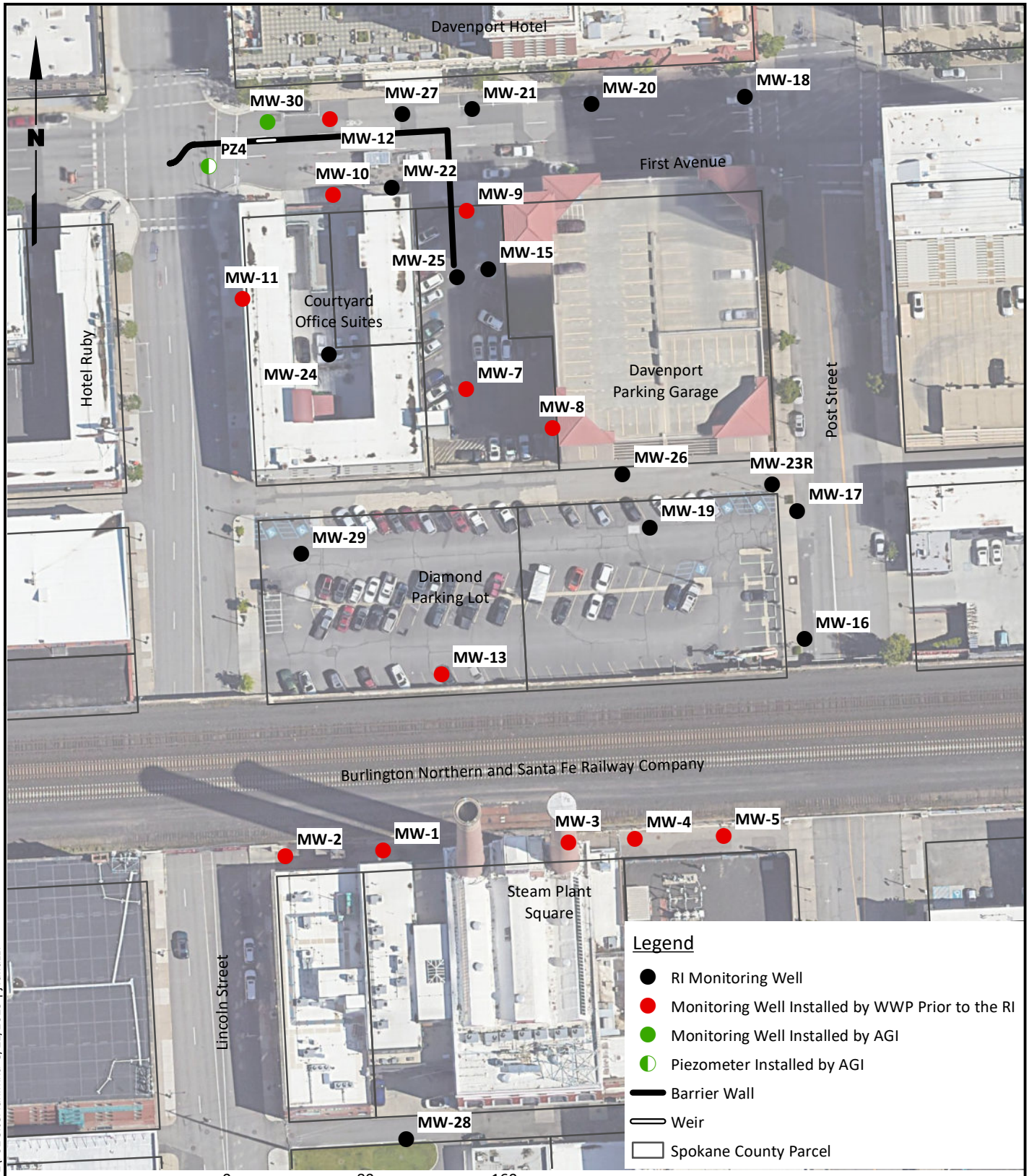
Central Steam Plant Oil Spill Remediation Spokane, Washington	**Site Location Map**	Figure 1



Data Source: Spokane County GIS, 2023
Base Map Source: Google Earth Imagery

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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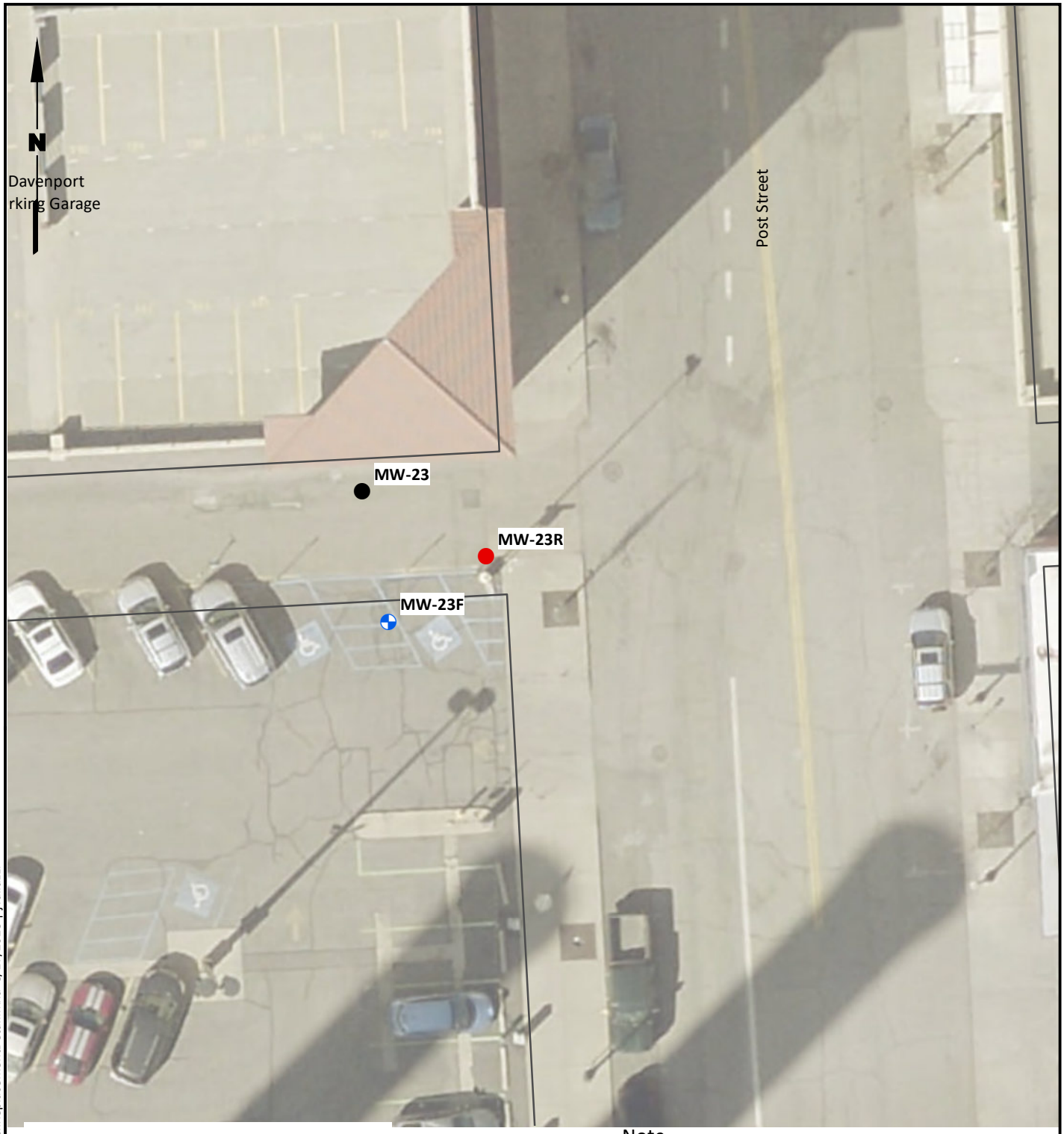
Central Steam Plant Oil Spill Remediation Spokane, Washington	**Site Plan and Monitoring Well Locations**	Figure 2



Legend

- MW-23: Decommissioned Monitoring Well
- MW-23R: Replacement Monitoring Well
- MW-23F: Boring
- Spokane County Parcel

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 20 40

Scale in Feet

Data Source: Spokane County GIS, 2023
Base Map Source: Esri World Imagery

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Central Steam Plant Oil Spill Remediation Spokane, Washington	**Monitoring Well Replacement Detail**	Figure 3

Table 1
MW-23 Replacement Investigation Derived Waste Soil Analytical Results
WWP Central Steam Plant Site
Spokane, Washington

Analyte	Sample Location, Laboratory SDG, Sample Date	
	MW-23F-IDW 590-20947-1 6/30/2023	MW-23R-IDW 590-20947-1 6/30/2023
Total Petroleum Hydrocarbons (mg/kg; NWTPH-Dx/-Gx)		
Diesel Range Organics	10 U	**15**
Residual Range Organics	26 U	**85**
Total Metals (mg/kg; SW-846 6010D/7471B)		
Arsenic	**11**	**10**
Barium	**40**	**45**
Cadmium	3.9 U	4.1 U
Chromium	**8.0**	**8.7**
Copper	16 U	16 U
Lead	**41**	**97**
Mercury	41 U	41 U
Nickel	**6.7**	**7.0**
Selenium	19 U	20 U
Silver	4.8 U	5.1 U
Zinc	**61**	**210**

Notes:

Bold text indicates detected analyte**.**

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

Acronyms/Abbreviations:

IDW = investigation-derived waste

mg/kg = milligrams per kilogram

NWTPH-Dx/-Gx = Northwest total petroleum hydrocarbon diesel-range/gasoline-range extended

SDG = sample delivery group

Table 2
MW-23 Replacement Investigation Derived Waste Water Analytical Results
WWP Central Steam Plant Site
Spokane, Washington

Analyte	Sample Location, Laboratory SDG, Sample Date MW-23R-IDW 590-21120-1 7/20/2023
Total Petroleum Hydrocarbons (µg/L; NWTPH-Dx/-Gx)	
Diesel Range Organics	230 U
Residual Range Organics	380 U
Total Metals (µg/kg; SW-846 6010D/7471B)	
Arsenic	**17**
Barium	**89**
Cadmium	2.0 U
Chromium	**11**
Copper	**16**
Lead	**10**
Mercury	0.20 U
Nickel	15 U
Selenium	40 U
Silver	2.0 U
Zinc	35 U

Notes:

Bold text indicates detected analyte**.**

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

Acronyms/Abbreviations:

IDW = investigation-derived waste

µg/kg = micrograms per kilogram

µg/L = micrograms per liter

NWTPH-Dx/-Gx = Northwest total petroleum hydrocarbon diesel-range/gasoline-range extended

SDG = sample delivery group

APPENDIX A

Boring and Monitoring Well Logs

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with low plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand; elastic silt
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50% - "GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50% - "very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30% - "gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15% - "with gravel," "with sand," "with silt," etc.
	≤ 5% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted.

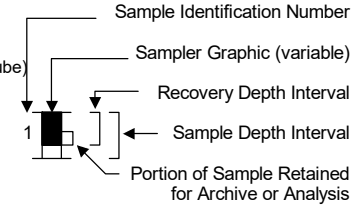
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key

SAMPLER TYPE & METHOD

Graphic	Code	Description
☒	a	3.25-in OD, 2.42-in ID Split Spoon
⧓	b	2.00-in OD, 1.50-in ID Split Spoon
◧	c	Thin-Wall Sampler (aka Shelby Tube)
◪	d	Grab Sample
◧	e	Single-Tube Core Barrel
◧	f	Double-Tube Core Barrel
☒	g	2.50-in OD, 2.00-in ID WSDOT
☒	h	3.00-in OD, 2.37-in ID Mod. Calif.
☒	i	Other - See text if applicable
	1	300-lb Hammer, 30-inch Drop
	2	140-lb Hammer, 30-inch Drop
	3	Direct Push
	4	Vibrocore
	5	Other - See text if applicable
	6	Piston Extraction

SAMPLE NUMBER & INTERVAL



Groundwater

- ▽ Approximate water level at time of drilling (ATD)
- ▼ Approximate water level at time after drilling/excavation/well

Field and Lab Test Data

Code	Description
WOR	Weight of Rod
WOH	Weight of Hammer
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
UU	Triaxial Unconsolidated Undrained (UU) Strength
CU	Triaxial Consolidated Undrained (CU) Strength
Consol	1-D Consolidation Test
Perm	Permeability Test
CA	Chemical Analysis

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Central Steam Plant
Monitoring Well MW-23
Replacement
Spokane, Washington

Soil Classification System and Key

Figure A-1

MW-23R

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Rotosonic

Ground Elevation (ft): 1898.31

Drilled By: Anderson Environmental Contracting

Depth (ft)	Elevation	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Description
0							AC	Asphalt
							GM	**(ASPHALT)**
								Gray, silty, fine to coarse GRAVEL with sand; no odor, no sheen (medium dense, dry)
								(FILL)
	1895							
5			e4					At 5-feet below the ground surface, becomes siltier with brick fragments, cobbles, and black-gray mortar pieces
							SP	At 6-feet below the ground surface, becomes moist
	1890							Brown to gray, fine to coarse SAND with fine gravel and trace silt; no odor, no sheen (loose, damp)
10							SM	Gray to brown, silty, fine to medium SAND with trace fine gravel and brick fragments; no odor, no sheen (medium dense, moist to wet)
	1885						SP-SM	Brown to gray, fine to coarse SAND with silt and trace fine gravel; no odor, no sheen (medium dense to dense, damp)
								(ALLUVIUM)
15			e4					
	1880						SP	Brown to gray, fine to medium SAND with trace silt; no odor, no sheen (loose to medium dense, damp)
20								At 19-feet below ground surface, grades to without silt
	1875		e4					
25								

GROUNDWATER

Water Level

Monitoring Well Detail
(DOE#: BNW281)

6 in

- Flush-mounted monument with locking cap set in concrete
- 2-inch diameter, Schedule 40, PVC well casing
- Bentonite chips

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

236040.17 8/16/23 N:\PROJECTS\0236040.GPJ WELL LOG W/ ELEVATION

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Central Steam Plant
Monitoring Well MW-23
Replacement
Spokane, Washington

Log of Monitoring Well
MW-23R

Figure
A-2
(1 of 2)

MW-23R

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Rotosonic

Ground Elevation (ft): 1898.31

Drilled By: Anderson Environmental Contracting

Monitoring Well Detail
(DOE#: BNW281)

Depth (ft)	Elevation	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Description
25							SP	Brown to gray, fine to medium SAND with trace silt; no odor, no sheen (loose to medium dense, damp)
			e4					
	1870							At 28-feet below ground surface, becomes wet
30								
			e4				SP	Brown, medium SAND; no odor, no sheen (loose, wet)
	1865						ML	Black to brown, sandy SILT with lenses of coarse sand; no odor, no sheen (very stiff to hard, moist to wet) **(LATAH FORMATION)**
35							BST	Black, weathered BASALT (very dense, dry) **(BEDROCK)**
40								
45								
50								

Water Level: ATD

Threaded end cap

12/20 sand pack

2-inch diameter, Schedule 40, PVC screen (0.020-inch slot size)

Boring Completed 06/30/23
Total Depth of Boring = 35.0 ft.

Monitoring Well Completed 06/30/23
Elevation at Top of Monitoring Well Casing = 1897.90 ft.
Total Depth of Monitoring Well = 35.0 ft.

Point located at State Plane Coordinates:
North: 257897.91
East: 2480457.68

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

236040.17 8/16/23 N:\PROJECTS\0236040.GPJ WELL LOG W/ ELEVATION

LANDAU ASSOCIATES

Central Steam Plant Monitoring Well MW-23 Replacement Spokane, Washington	Log of Monitoring Well MW-23R	Figure A-2 (2 of 2)

MW-23F

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Rotosonic Ground Elevation (ft): 1898.78 Drilled By: Anderson Environmental Contracting	Water Level
0							AC	Asphalt	
							GM	**(ASPHALT)**	
			e4					Brown, silty, fine to coarse GRAVEL with sand and trace cobbled; no odor, no sheen (medium dense, dry)	
								(FILL)	
	1895							At 4-feet below ground surface, becomes moist with bricks and cobbles	
5							SM	Brown to dark gray, silty, fine to coarse SAND with trace gravel; no odor, no sheen (loose to medium dense, dry)	
			e4						
	1890								
10							SP-SM	Brown to gray, fine to coarse SAND with fine gravel and trace silt; no odor, no sheen (loose to medium dense, damp)	
			e4					**(ALLUVIUM)**	
	1885								
15									
			e4						
	1880								
20									
			e4						
	1875							At 24-feet below the ground surface, becomes siltier with minor cementation of	
25									

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

236040.17 8/16/23 N:\PROJECTS\0236040.GPJ SOIL BORING LOG W/ ELEV

LANDAU ASSOCIATES

Central Steam Plant
Monitoring Well MW-23
Replacement
Spokane, Washington

Log of Soil Boring MW-23F

Figure
A-3
(1 of 2)

MW-23F

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Elevation	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Rotosonic Ground Elevation (ft): 1898.78 Drilled By: Anderson Environmental Contracting	Water Level
25							SP-SM	sand grains	
							SP	Brown, medium SAND; no odor, no sheen (loose to medium dense, damp)	
			e4						
	1870							At 29-feet below ground surface, becomes wet	▽ ATD
30									
			e4						
	1865						ML	Black to brown, sandy SILT with lenses of coarse sand; no odor, no sheen (very stiff to hard, moist to wet) **(LATAH FORMATION)**	
35								At 34-feet below ground surface, field observations indicate the potential presence of free product DNAPL present within a 0.1-foot coarse sand interbed within the Latah Formation	

Boring Completed 06/30/23
Total Depth of Boring = 35.0 ft.

Point located at State Plane Coordinates:
North: 257888.83
East: 2480444.11

40

45

50

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

236040.17 8/16/23 N:\PROJECTS\0236040.GPJ SOIL BORING LOG W/ ELEV

LANDAU ASSOCIATES

Central Steam Plant
Monitoring Well MW-23
Replacement
Spokane, Washington

Log of Soil Boring MW-23F

Figure
A-3
(2 of 2)

APPENDIX B

Analytical Laboratory Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Shane Kostka
Landau & Associates, Inc.
10 North Post Street, Suite 218
Spokane, Washington 99201

Generated 7/19/2023 12:17:27 PM

JOB DESCRIPTION

CSP MW-23 Replacement/0236040 010

JOB NUMBER

590-20947-1

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

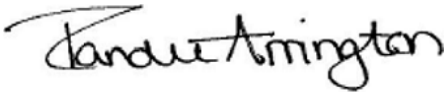
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



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Authorized for release by
Randee Arrington, Business Unit Manager
Randee.Arrington@et.eurofinsus.com
(509)924-9200

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Receipt Checklists 8
Client Sample Results 9
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Chronicle 13
Certification Summary 14
Method Summary 15

Job ID: 590-20947-1

Laboratory: Eurofins Spokane

Narrative

Receipt
The samples were received on 7/5/2023 1:35 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 6.2º C.

GC Semi VOA
Method NWTPH-Dx: Detected hydrocarbons in the diesel range appear to be due to oil overlap in the following samples: MW-23R-IDW-230630 (590-20947-2) and (590-20947-A-2-B DU).

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

Metals
Method 6010D: The low level initial calibration verification (ICVL) associated with batch 590-42442 recovered below the lower control limit for Zinc. The samples associated with this ICV were 10x the spike amount for the affected analytes; therefore, the data have been reported.

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

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

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

Definitions/Glossary

Client: Landau & Associates, Inc. Job ID: 590-20947-1
Project/Site: CSP MW-23 Replacement/0236040 010

Qualifiers

Metals

Qualifier	Qualifier Description
^1-	Initial Calibration Verification (ICV) is outside acceptance limits, low biased.

Glossary

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

Sample Summary

Client: Landau & Associates, Inc.
Job ID: 590-20947-1
Project/Site: CSP MW-23 Replacement/0236040 010

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-20947-1	MW-23F-IDW-230630	Solid	06/30/23 18:30	07/05/23 13:35
590-20947-2	MW-23R-IDW-230630	Solid	06/30/23 18:30	07/05/23 13:35

Chain-of-Custody Record

LANDAU ASSOCIATES

☐ Seattle/Edmonds (425) 778-0907 ☒ Spokane (509) 327-9737
☐ Tacoma (253) 926-2493 ☐ Portland (503) 542-1080
☐ _____

Date 7/5/23
Page 1 of 1

Turnaround Time:
Standard ✓
Accelerated _____

Project Name CSP MW 23 Replacement Project No 023640 010
Project Location/Event CSP MW 23 Replacement IDW, Pasco, WA
Sampler's Name D Gray
Project Contact Shane Kostka
Send Results To "

Special Handling Requirements:

Shipment Method: Hand
Stored on ice: (Yes) / No

Sample I D	Date	Time	Matrix	No of Containers	NWTPH-Dx	RCRA 8 + Cu, Ni, Zn (Leach)	Testing Parameters	Observations/Comments
MW-23F-IDW-230630	6/30/23	1830	S	1	X	X		
MW 23R IDW 230630	6/30/23	1630	S	1	X	X		

590-20947 Chain of Custody

__ Allow water samples to settle, collect aliquot from clear portion ☐

__ NWTPH-Dx Acid wash cleanup ☐
Silica gel cleanup ☐

__ Dissolved metal samples were field filtered

Other 5.9, 6.2
1R0006

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name Dan Gray	Printed Name Macky Morris	Printed Name	Printed Name
Company Landau	Company EET 3RJ	Company	Company
Date 7/5/23 Time 13:35	Date 7/5/23 Time 13:35	Date Time	Date Time

WHITE COPY Laboratory YELLOW COPY Project File PINK COPY Client Representative

10/2018

7/19/2023

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 590-20947-1

Login Number: 20947

List Source: Eurofins Spokane

List Number: 1

Creator: Morris, Mackenzie 1

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

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Client Sample ID: MW-23F-IDW-230630
Lab Sample ID: 590-20947-1
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35
Percent Solids: 96.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg	☼	07/13/23 10:37	07/13/23 18:11	1
Residual Range Organics (RRO) (C25-C36)	ND		26		mg/Kg	☼	07/13/23 10:37	07/13/23 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*92*		*50 - 150*	*07/13/23 10:37*	*07/13/23 18:11*	*1*
n-Triacontane-d62	*96*		*50 - 150*	*07/13/23 10:37*	*07/13/23 18:11*	*1*

Client Sample ID: MW-23R-IDW-230630
Lab Sample ID: 590-20947-2
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35
Percent Solids: 94.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	**15**		10		mg/Kg	☼	07/13/23 10:37	07/13/23 18:33	1
Residual Range Organics (RRO) (C25-C36)	**85**		26		mg/Kg	☼	07/13/23 10:37	07/13/23 18:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*91*		*50 - 150*	*07/13/23 10:37*	*07/13/23 18:33*	*1*
n-Triacontane-d62	*98*		*50 - 150*	*07/13/23 10:37*	*07/13/23 18:33*	*1*

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-23F-IDW-230630
Lab Sample ID: 590-20947-1
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35
Percent Solids: 96.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**11**		4.8		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Barium	**40**		4.8		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Cadmium	ND		3.9		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Chromium	**8.0**		4.8		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Copper	ND		16		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Lead	**41**		12		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Nickel	**6.7**		4.8		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Selenium	ND		19		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Silver	ND		4.8		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5
Zinc	**61**	**^1-**	19		mg/Kg	☼	07/17/23 10:10	07/18/23 14:23	5

Client Sample ID: MW-23R-IDW-230630
Lab Sample ID: 590-20947-2
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35
Percent Solids: 94.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**10**		5.1		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Barium	**45**		5.1		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Cadmium	ND		4.1		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Chromium	**8.7**		5.1		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Copper	ND		16		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Lead	**97**		12		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Nickel	**7.0**		5.1		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Selenium	ND		20		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5
Silver	ND		5.1		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5

Method: SW846 6010D - Metals (ICP) (Continued)

Client Sample ID: MW-23R-IDW-230630 **Lab Sample ID: 590-20947-2**
Date Collected: 06/30/23 18:30 **Matrix: Solid**
Date Received: 07/05/23 13:35 **Percent Solids: 94.6**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	210	^1-	20		mg/Kg	☼	07/17/23 10:10	07/18/23 14:27	5

Method: SW846 7471B - Mercury (CVAA)

Client Sample ID: MW-23F-IDW-230630 **Lab Sample ID: 590-20947-1**
Date Collected: 06/30/23 18:30 **Matrix: Solid**
Date Received: 07/05/23 13:35 **Percent Solids: 96.3**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		41		ug/Kg	☼	07/17/23 10:25	07/17/23 14:29	1

Client Sample ID: MW-23R-IDW-230630 **Lab Sample ID: 590-20947-2**
Date Collected: 06/30/23 18:30 **Matrix: Solid**
Date Received: 07/05/23 13:35 **Percent Solids: 94.6**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		41		ug/Kg	☼	07/17/23 10:25	07/17/23 14:31	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 590-42375/1-A
Matrix: Solid
Analysis Batch: 42384

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 42375

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		10		mg/Kg		07/13/23 10:37	07/13/23 17:06	1
Residual Range Organics (RRO) (C25-C36)	ND		25		mg/Kg		07/13/23 10:37	07/13/23 17:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*83*		*50 - 150*	*07/13/23 10:37*	*07/13/23 17:06*	*1*
n-Triacontane-d62	*83*		*50 - 150*	*07/13/23 10:37*	*07/13/23 17:06*	*1*

Lab Sample ID: LCS 590-42375/2-A
Matrix: Solid
Analysis Batch: 42384

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 42375

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Diesel Range Organics (DRO) (C10-C25)			66.7	61.1		mg/Kg		92	50 - 150		
Residual Range Organics (RRO) (C25-C36)			66.7	61.6		mg/Kg		92	50 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*88*		*50 - 150*
n-Triacontane-d62	*89*		*50 - 150*

Lab Sample ID: 590-20947-2 DU
Matrix: Solid
Analysis Batch: 42384

Client Sample ID: MW-23R-IDW-230630
Prep Type: Total/NA
Prep Batch: 42375

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	15			13.3		mg/Kg	☼			10	40
Residual Range Organics (RRO) (C25-C36)	85			73.8		mg/Kg	☼			15	40

Surrogate	*DU %Recovery*	*DU Qualifier*	*Limits*
o-Terphenyl	*89*		*50 - 150*
n-Triacontane-d62	*97*		*50 - 150*

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 590-42411/2-A
Matrix: Solid
Analysis Batch: 42442

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 42411

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		1.3		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Barium	ND		1.3		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Cadmium	ND		1.0		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Chromium	ND		1.3		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Copper	ND		4.0		mg/Kg		07/17/23 10:10	07/18/23 21:22	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: MB 590-42411/2-A
Matrix: Solid
Analysis Batch: 42442

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 42411

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		3.0		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Nickel	ND		1.3		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Selenium	ND		5.0		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Silver	ND		1.3		mg/Kg		07/17/23 10:10	07/18/23 21:22	1
Zinc	ND	^1-	5.0		mg/Kg		07/17/23 10:10	07/18/23 21:22	1

Lab Sample ID: LCS 590-42411/1-A
Matrix: Solid
Analysis Batch: 42442

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 42411

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	91.4		mg/Kg		91	80 - 120
Barium	100	91.6		mg/Kg		92	80 - 120
Cadmium	50.0	47.3		mg/Kg		95	80 - 120
Chromium	50.0	47.3		mg/Kg		95	80 - 120
Copper	50.0	45.2		mg/Kg		90	80 - 120
Lead	50.0	50.3		mg/Kg		101	80 - 120
Nickel	50.0	49.4		mg/Kg		99	80 - 120
Selenium	100	91.8		mg/Kg		92	80 - 120
Silver	5.00	5.50		mg/Kg		110	80 - 120
Zinc	50.0	48.5	^1-	mg/Kg		97	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-42412/9-A
Matrix: Solid
Analysis Batch: 42423

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 42412

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		50		ug/Kg		07/17/23 10:25	07/17/23 13:43	1

Lab Sample ID: LCS 590-42412/8-A
Matrix: Solid
Analysis Batch: 42423

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 42412

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Hg	200	182		ug/Kg		91	80 - 120

Lab Chronicle

Client: Landau & Associates, Inc.
Job ID: 590-20947-1
Project/Site: CSP MW-23 Replacement/0236040 010

Client Sample ID: MW-23F-IDW-230630
Lab Sample ID: 590-20947-1
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	42343	MRV	EET SPK	07/10/23 15:59

Client Sample ID: MW-23F-IDW-230630
Lab Sample ID: 590-20947-1
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35
Percent Solids: 96.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3550C			42375	MRV	EET SPK	07/13/23 10:37
Total/NA	Analysis	NWTPH-Dx		1	42384	NMI	EET SPK	07/13/23 18:11
Total/NA	Prep	3050B			42411	AMB	EET SPK	07/17/23 10:10
Total/NA	Analysis	6010D		5	42442	AMB	EET SPK	07/18/23 14:23
Total/NA	Prep	7471B			42412	AMB	EET SPK	07/17/23 10:25
Total/NA	Analysis	7471B		1	42423	AMB	EET SPK	07/17/23 14:29

Client Sample ID: MW-23R-IDW-230630
Lab Sample ID: 590-20947-2
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	42343	MRV	EET SPK	07/10/23 15:59

Client Sample ID: MW-23R-IDW-230630
Lab Sample ID: 590-20947-2
Date Collected: 06/30/23 18:30
Matrix: Solid
Date Received: 07/05/23 13:35
Percent Solids: 94.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3550C			42375	MRV	EET SPK	07/13/23 10:37
Total/NA	Analysis	NWTPH-Dx		1	42384	NMI	EET SPK	07/13/23 18:33
Total/NA	Prep	3050B			42411	AMB	EET SPK	07/17/23 10:10
Total/NA	Analysis	6010D		5	42442	AMB	EET SPK	07/18/23 14:27
Total/NA	Prep	7471B			42412	AMB	EET SPK	07/17/23 10:25
Total/NA	Analysis	7471B		1	42423	AMB	EET SPK	07/17/23 14:31

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: Landau & Associates, Inc. Job ID: 590-20947-1
Project/Site: CSP MW-23 Replacement/0236040 010

Laboratory: Eurofins Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Landau & Associates, Inc.
Job ID: 590-20947-1
Project/Site: CSP MW-23 Replacement/0236040 010

Method	Method Description	Protocol	Laboratory
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	EET SPK
6010D	Metals (ICP)	SW846	EET SPK
7471B	Mercury (CVAA)	SW846	EET SPK
Moisture	Percent Moisture	EPA	EET SPK
3050B	Preparation, Metals	SW846	EET SPK
3550C	Ultrasonic Extraction	SW846	EET SPK
7471B	Preparation, Mercury	SW846	EET SPK

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

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ANALYTICAL REPORT

PREPARED FOR

Attn: Shane Kostka
Landau & Associates, Inc.
10 North Post Street, Suite 218
Spokane, Washington 99201

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JOB DESCRIPTION

CSP MW-23 Replacement/0230040

JOB NUMBER

590-21120-1

Eurofins Spokane
11922 East 1st Ave
Spokane WA 99206

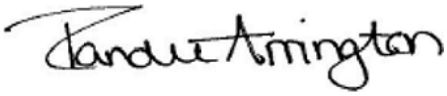
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization



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Authorized for release by
Randee Arrington, Business Unit Manager
Randee.Arrington@et.eurofinsus.com
(509)924-9200

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Case Narrative

Client: Landau & Associates, Inc.
Project/Site: CSP MW-23 Replacement/0230040

Job ID: 590-21120-1

Job ID: 590-21120-1

Laboratory: Eurofins Spokane

Narrative

Receipt
The sample was received on 7/20/2023 3:44 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 15.7º C.

Receipt Exceptions
The following sample was received at the laboratory outside the required temperature criteria: MW-23R-IDW-Water (590-21120-1). The sample is considered acceptable since it was collected and submitted to the laboratory on the same day and there is evidence that the chilling process has begun.

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

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

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

Definitions/Glossary

Client: Landau & Associates, Inc. Job ID: 590-21120-1
Project/Site: CSP MW-23 Replacement/0230040

Glossary

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

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: CSP MW-23 Replacement/0230040

Job ID: 590-21120-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-21120-1	MW-23R-IDW-Water	Water	07/20/23 15:10	07/20/23 15:44

Chain-of-Custody Record

LANDAU ASSOCIATES

☐ Seattle/Edmonds (425) 778-0907 ☒ Spokane (509) 327-9737
☐ Tacoma (253) 926-2493 ☐ Portland (503) 542 1080
☐ ____

Date 7/20/23
Page 1 of 1

Turnaround Time:
Standard X
Accelerated ____

Project Name CSP MW23 Replacement Project No. 023804.10
Project Location/Event Spokane, WA / Well Development IDW
Sampler's Name Dan Gray
Project Contact Shane Kostka
Send Results To ____

Testing Parameters

Sample I.D.	Date	Time	Matrix	No of Containers	NWTPH Dx	RCRA 8 + Cu, Pb, Zn (total)
MW-23R IDW Water	7/20/23	1511O	GW	2	X	X

Special Handling Requirements: ____
Shipment Method: Hand
Stored on ice: (Yes) No

Observations/Comments

__ Allow water samples to settle, collect aliquot from clear portion ☐
__ NWTPH Dx Acid wash cleanup ☐ Silica gel cleanup ☐
__ Dissolved metal samples were field filtered

Other 15.4, 15.7 1R006

590-21120 Chain of Custody

Relinquished by	Received by	Relinquished by	Received by
Signature	Signature	Signature	Signature
Printed Name Dan Gray	Printed Name Macky Morris	Printed Name	Printed Name
Company Landau	Company EET 890	Company	Company
Date 7/20/23 Time 343p	Date 7/20/23 Time 15:44	Date Time	Date Time

WHITE COPY Laboratory YELLOW COPY Project File PINK COPY Client Representative

10/2018

Eurofins Spokane
11922 East 1st Ave
Spokane, WA 99206
Phone: 509-924-9200 Fax: 509-924-9290

Chain of Custody Record

eurofins
Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Arrington, Randee E	Carrier Tracking No(s):	COC No: 590-8058.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Randee.Arrington@et.eurofinsus.com	State of Origin: Washington	Page: Page 1 of 1
Company: Eurofins Environment Testing Northwest,		Accreditations Required (See note): State Program - Washington		Job #: 590-21120-1
Address: 5755 8th Street East,	Due Date Requested: 8/2/2023			
City: Tacoma	TAT Requested (days):			
State, Zip: WA, 98424				
Phone: 253-922-2310(Tel)	PO #:			
Email:	WO #:			
Project Name: CSP MW-23 Replacement	Project #: 59002630			
Site:	SSOW#:			

Analysis Requested

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

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020B/3005A (MOD) RCRA + Cu, Ni & Zn	Total Number of containers	Special Instructions/Note:
MW-23-IDW-Water (590-21120-1)	7/20/23	15:10 Pacific		Water				X	1	

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

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

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

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		7/21 11:00		KHanley	7/22/23 0935	
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: IR9 19.0/19.3

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 590-21120-1

Login Number: 21120
List Number: 1
Creator: Morris, Mackenzie 1

List Source: Eurofins Spokane

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

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 590-21120-1

Login Number: 21120
List Number: 2
Creator: Presley, Kim A

List Source: Eurofins Seattle
List Creation: 07/24/23 09:21 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	IR9=19.0c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Client Sample ID: MW-23R-IDW-Water
Date Collected: 07/20/23 15:10
Date Received: 07/20/23 15:44

Lab Sample ID: 590-21120-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.23		mg/L		07/27/23 15:10	07/28/23 18:12	1
Residual Range Organics (RRO) (C25-C36)	ND		0.38		mg/L		07/27/23 15:10	07/28/23 18:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*87*		*50 - 150*	*07/27/23 15:10*	*07/28/23 18:12*	*1*
n-Triacontane-d62	*97*		*50 - 150*	*07/27/23 15:10*	*07/28/23 18:12*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-23R-IDW-Water
Date Collected: 07/20/23 15:10
Date Received: 07/20/23 15:44

Lab Sample ID: 590-21120-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.017**		0.0050		mg/L		07/24/23 17:12	07/25/23 17:39	5
Barium	**0.089**		0.0060		mg/L		07/24/23 17:12	07/25/23 17:39	5
Cadmium	ND		0.0020		mg/L		07/24/23 17:12	07/25/23 17:39	5
Chromium	**0.011**		0.0040		mg/L		07/24/23 17:12	07/25/23 17:39	5
Copper	**0.016**		0.010		mg/L		07/24/23 17:12	07/25/23 17:39	5
Lead	**0.010**		0.0020		mg/L		07/24/23 17:12	07/25/23 17:39	5
Nickel	ND		0.015		mg/L		07/24/23 17:12	07/25/23 17:39	5
Selenium	ND		0.040		mg/L		07/24/23 17:12	07/25/23 17:39	5
Silver	ND		0.0020		mg/L		07/24/23 17:12	07/25/23 17:39	5
Zinc	ND		0.035		mg/L		07/24/23 17:12	07/25/23 17:39	5

Method: SW846 7470A - Mercury (CVAA)

Client Sample ID: MW-23R-IDW-Water
Date Collected: 07/20/23 15:10
Date Received: 07/20/23 15:44

Lab Sample ID: 590-21120-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		07/21/23 10:34	07/24/23 14:56	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 590-42623/1-A
Matrix: Water
Analysis Batch: 42630

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 42623

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.24		mg/L		07/27/23 15:10	07/28/23 15:09	1
Residual Range Organics (RRO) (C25-C36)	ND		0.40		mg/L		07/27/23 15:10	07/28/23 15:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*85*		*50 - 150*	*07/27/23 15:10*	*07/28/23 15:09*	*1*
n-Triacontane-d62	*96*		*50 - 150*	*07/27/23 15:10*	*07/28/23 15:09*	*1*

Lab Sample ID: LCS 590-42623/2-A
Matrix: Water
Analysis Batch: 42630

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 42623

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Diesel Range Organics (DRO) (C10-C25)	1.60	1.50		mg/L		94	50 - 150
Residual Range Organics (RRO) (C25-C36)	1.60	1.30		mg/L		81	50 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*93*		*50 - 150*
n-Triacontane-d62	*103*		*50 - 150*

Lab Sample ID: LCSD 590-42623/3-A
Matrix: Water
Analysis Batch: 42630

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 42623

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	1.60	1.46		mg/L		91	50 - 150	3	25
Residual Range Organics (RRO) (C25-C36)	1.60	1.26		mg/L		79	50 - 150	3	25

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*94*		*50 - 150*
n-Triacontane-d62	*102*		*50 - 150*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 580-432498/16-A
Matrix: Water
Analysis Batch: 432685

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 432498

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050		mg/L		07/24/23 17:12	07/25/23 17:36	5
Barium	ND		0.0060		mg/L		07/24/23 17:12	07/25/23 17:36	5
Cadmium	ND		0.0020		mg/L		07/24/23 17:12	07/25/23 17:36	5
Chromium	ND		0.0040		mg/L		07/24/23 17:12	07/25/23 17:36	5
Copper	ND		0.010		mg/L		07/24/23 17:12	07/25/23 17:36	5

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 580-432498/16-A
Matrix: Water
Analysis Batch: 432685

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 432498

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.0020		mg/L		07/24/23 17:12	07/25/23 17:36	5
Nickel	ND		0.015		mg/L		07/24/23 17:12	07/25/23 17:36	5
Selenium	ND		0.040		mg/L		07/24/23 17:12	07/25/23 17:36	5
Silver	ND		0.0020		mg/L		07/24/23 17:12	07/25/23 17:36	5
Zinc	ND		0.035		mg/L		07/24/23 17:12	07/25/23 17:36	5

Lab Sample ID: LCS 580-432498/17-A
Matrix: Water
Analysis Batch: 432685

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 432498

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.00	1.03		mg/L		103	80 - 120
Barium	1.00	0.903		mg/L		90	80 - 120
Cadmium	1.00	0.932		mg/L		93	80 - 120
Chromium	1.00	1.07		mg/L		107	80 - 120
Copper	1.00	1.10		mg/L		110	80 - 120
Lead	1.00	0.996		mg/L		100	80 - 120
Nickel	1.00	1.06		mg/L		106	80 - 120
Selenium	1.00	0.999		mg/L		100	80 - 120
Silver	1.00	1.00		mg/L		100	80 - 120
Zinc	1.00	0.896		mg/L		90	80 - 120

Lab Sample ID: LCSD 580-432498/18-A
Matrix: Water
Analysis Batch: 432685

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 432498

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.00	1.04		mg/L		104	80 - 120	1	20
Barium	1.00	0.916		mg/L		92	80 - 120	1	20
Cadmium	1.00	0.948		mg/L		95	80 - 120	2	20
Chromium	1.00	1.10		mg/L		110	80 - 120	3	20
Copper	1.00	1.11		mg/L		111	80 - 120	1	20
Lead	1.00	1.00		mg/L		100	80 - 120	1	20
Nickel	1.00	1.08		mg/L		108	80 - 120	2	20
Selenium	1.00	0.996		mg/L		100	80 - 120	0	20
Silver	1.00	1.01		mg/L		101	80 - 120	1	20
Zinc	1.00	0.918		mg/L		92	80 - 120	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 590-42505/2-A
Matrix: Water
Analysis Batch: 42558

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 42505

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20		ug/L		07/21/23 10:34	07/24/23 14:35	1

Client: Landau & Associates, Inc.
Job ID: 590-21120-1
Project/Site: CSP MW-23 Replacement/0230040

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 590-42505/1-A
Matrix: Water
Analysis Batch: 42558

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 42505

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			2.00	1.80		ug/L		90	80 - 120		

Lab Chronicle

Client: Landau & Associates, Inc.
Job ID: 590-21120-1
Project/Site: CSP MW-23 Replacement/0230040

Client Sample ID: MW-23R-IDW-Water
Lab Sample ID: 590-21120-1
Date Collected: 07/20/23 15:10
Matrix: Water
Date Received: 07/20/23 15:44

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			42623	MRV	EET SPK	07/27/23 15:10
Total/NA	Analysis	NWTPH-Dx		1	42630	NMI	EET SPK	07/28/23 18:12
Total Recoverable	Prep	3005A			432498	JLS	EET SEA	07/24/23 17:12
Total Recoverable	Analysis	6020B		5	432685	FCW	EET SEA	07/25/23 17:39
Total/NA	Prep	7470A			42505	AMB	EET SPK	07/21/23 10:34
Total/NA	Analysis	7470A		1	42558	AMB	EET SPK	07/24/23 14:56

Laboratory References:

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

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Job ID: 590-21120-1
Project/Site: CSP MW-23 Replacement/0230040

Laboratory: Eurofins Spokane

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C569	01-07-24

Laboratory: Eurofins Seattle

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-004	02-19-25
ANAB	Dept. of Defense ELAP	L2236	01-19-25
ANAB	Dept. of Energy	L2236	01-19-25
ANAB	ISO/IEC 17025	L2236	01-19-25
California	State	2954	07-07-23 *
Florida	NELAP	E87575	06-30-23 *
Louisiana (All)	NELAP	03073	07-01-24
Maine	State	WA01273	05-02-24
Montana (UST)	State	NA	04-14-27
New Jersey	NELAP	WA014	06-30-24
New York	NELAP	11662	03-31-24
Oregon	NELAP	4167	07-07-23 *
US Fish & Wildlife	US Federal Programs	A20571	06-30-23 *
USDA	US Federal Programs	525-23-4-22573	01-04-26
Washington	State	C788	07-13-23 *
Wisconsin	State	399133460	08-31-23

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Landau & Associates, Inc.
Project/Site: CSP MW-23 Replacement/0230040

Job ID: 590-21120-1

Method	Method Description	Protocol	Laboratory
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	EET SPK
6020B	Metals (ICP/MS)	SW846	EET SEA
7470A	Mercury (CVAA)	SW846	EET SPK
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET SEA
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET SPK
7470A	Preparation, Mercury	SW846	EET SPK

Protocol References:

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

EET SPK = Eurofins Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200