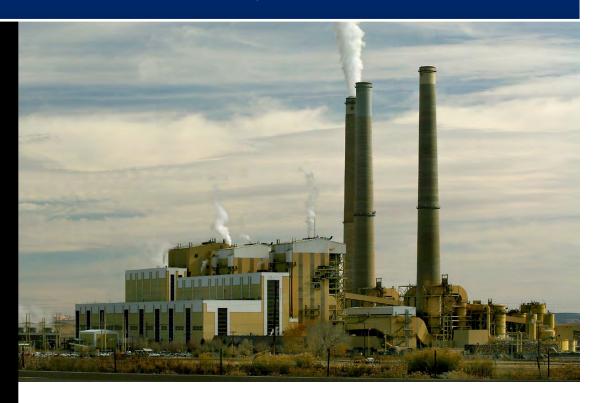
# Groundwater Monitoring & Corrective Action Report CCR Landfill - Hunter Power Plant Castle Dale, Utah

January 2022





# **Prepared For:**

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Attachment B: Field Summary Report – October 2021 Event
Attachment C: Remedy Selection Progress Report - October 2021



# **ACRONYMS**

AMSL Above Mean Sea Level

bgs Below Ground Surface

CCR Coal Combustion Residuals

CFR U.S. Code of Federal Regulations

EPA U.S. Environmental Protection Agency

FGD Flue-Gas Desulfurization

SAP Sampling and Analysis Plan

SSL Statistically Significant Level

UTL Upper Tolerance Limit



# 1.0 **CURRENT STATUS - § 257.90(e)(6)**

This Groundwater Monitoring and Corrective Action Report was prepared for PacifiCorp by Water and Environmental Technologies. It was prepared to comply with the requirements detailed in *Code of Federal Regulations* § 257.90(e) (*CCR Rule*).

The Hunter Power Plant is located in Emery County, approximately three miles south of Castle Dale, Utah. After dewatering and treatment, Flue Gas De-sulfurization (FGD) waste, fly ash and bottom ash are disposed of in the CCR Landfill. As a result, it is considered a CCR unit. The following provides the status of the groundwater monitoring and corrective action program at the end of 2021.

- (i) The CCR Landfill was undergoing assessment / corrective measures monitoring at the start of 2021.
- (ii) The CCR Landfill remained in assessment / corrective measures monitoring at the end of 2021.
- (iii) Following completion of initial detection monitoring and prior to October 17, 2017, statistically significant levels (SSLs) above site-specific background concentrations were noted for the following Appendix III constituents:
- (A) Boron, calcium, chloride, fluoride, pH, sulfate and TDS.
- (B) The CCR Landfill program transitioned to assessment monitoring on January 15, 2018. SSLs above groundwater protection standards were noted in 2018, 2019, and 2020.
- (iv) SSLs above groundwater protection standards were noted for the following Appendix IV constituents in 2021.
- (A) Cobalt, lithium, and molybdenum.
- (B) An assessment of corrective measures was initiated on January 14, 2019.
- (C) A public meeting was held July 23, 2019.
- (D) The assessment of corrective measures was completed on June 11, 2019.
- (v) A remedy was selected on November 12, 2020.
- (vi) A supplemental investigation began in the summer of 2021 and will continue in the spring of 2022 to augment the remedy. The CCR Landfill groundwater monitoring program was transitioned to corrective measures monitoring in November 2020.

# 1.1 Summary of Previous Work

Detection monitoring was initiated in September of 2015 to ensure a minimum of eight independent measurements were acquired, prior to the October 17, 2017 requirement in the CCR Rule. PacifiCorp met this requirement and provided the findings of initial detection monitoring in the first Groundwater Monitoring and Corrective Action Report for the CCR Landfill (WET 2018).

The results of detection monitoring revealed all Appendix III constituents exceeded site-specific background concentrations. Based on these findings, the CCR Landfill monitoring program transitioned to assessment monitoring in 2018. Two rounds of sampling were completed in 2018,



groundwater protection standards were established for the CCR Landfill, and assessment monitoring results were compared to these standards. These comparisons revealed Appendix IV constituents: lithium and molybdenum exhibited SSLs above their groundwater protection standards.

Once Appendix IV constituents exhibited SSLs, an investigation to characterize the nature and extent of the release was initiated. An assessment of corrective measures began January 14, 2019 and was completed on June 11, 2019. A public meeting was held in Huntington, Utah on July 23, 2019, to discuss the proposed alternatives and solicit public input. Based on the public input, additional sampling and investigation was conducted to delineate the nature and extent of impacts, and to support the assessment of corrective measures.

An inspection of the current condition and operation of the horizontal well capture system was completed on August 20, 2019, November 12, 2019 and November 2020. Additional groundwater collected in 2019 and 2020 was used to further evaluate the effectiveness of the current system and evaluate the need for any further actions.

The nature and extent report was updated with the additional data from the investigations and placed in the plant operating record on August 27, 2020. The corrective measures report was reviewed and based on the additional data a remedy was selected and placed on the BHE webpage on November 12, 2020. The corrective measures sampling and analysis plan (SAP) was completed in concert with the remedy selection report and was also placed in the Plant operating record October 12, 2020.

# 1.2 Report Purpose and Organization

The following sections provide a status update for activities initiated or completed at the Hunter Power Plant CCR Landfill, during the 2021 monitoring period. They also summarize any issues or problems encountered, and their resolutions. Each required element of the annual report is displayed below and is referenced to specific sections of the report where the required information can be found:

- Document the status of the Groundwater Monitoring and Corrective Action Program;
- Summarize key actions completed;
- Describe any problems encountered;
- Discuss actions taken to resolve problems; and
- Define key activities for the upcoming year.

The Annual Groundwater Monitoring and Corrective Action Report also includes the following required elements:

• A map showing the CCR unit and all CCR Monitoring Program background (or upgradient) and downgradient monitoring wells, and their identification numbers (Figure 1).



- Identifies any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.
- A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required for detection or assessment monitoring.
- A narrative discussion of any transition between monitoring programs (i.e. transitioning from detection monitoring to assessment monitoring) in addition to identifying constituents detected at a statistically significant increase over background levels.
- Other information required to be included as specified in § 257.90 through § 257.98 of the *CCR Rule* not listed above, is also included in the report.

## 2.0 GROUNDWATER MONITORING NETWORK

The detection / assessment monitoring network for the CCR Landfill was installed using appropriate spacing, location and depth as defined by the Code of Federal Regulations, 40 CFR, Part 257 and 261, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; CCR Rule* § 257.91 (a) (1) and § 257.91 (b) to adequately monitor groundwater both hydraulically upgradient and downgradient of the site.

When installed in 2015, the CCR detection / assessment monitoring network consisted of four upgradient / background wells spanning the extent of the CCR Landfill east to west, and include: ELF-1D, ELF-2, ELF-9, and ELF-10. Downgradient monitoring wells for the CCR Landfill include seven locations placed to capture groundwater as it passes the waste unit boundary, along the groundwater flow path which generally travels from west to east as it passes across the CCR Landfill. The downgradient monitoring wells include the following: ELF-3, ELF-4, ELF-5, ELF-6, ELF-7, ELF-8, and ELF-11.

Once SSLs above groundwater protection standards were noted for the CCR Landfill in 2018, an investigation was initiated to determine the nature and extent of impacted groundwater. To augment the initial monitoring network, three new wells were installed in November of 2018 east and downgradient of the CCR Landfill at the Plant boundary. The three wells included: ELF-12, ELF-13, and ELF-14 (Figure 1). These wells were incorporated into the groundwater monitoring program in 2019 and continue to undergo semi-annual monitoring in accordance with the CCR Rule throughout remedy selection and implementation. in the monitoring network throughout active operations and until attainment is reached in downgradient water.

# 2.1 Monitoring Well Decommissioning & Replacement in 2021

No wells were replaced or decommissioned for the Hunter Landfill monitoring network in 2021.

# 2.2 Additions to the Monitoring Network in 2021

No new wells were added to the Hunter Landfill monitoring network in 2021.



# 3.0 GROUNDWATER MONITORING

The CCR Landfill was transitioned to assessment monitoring in 2018. Two rounds of sampling and analysis annually in 2018 and 2019 to comply with the CCR Rule. Statistical analyses were completed comparing downgradient well results with groundwater protection standards. All of the samples underwent analysis in accordance with the requirements defined in the CCR Rule. In addition, water level and field data were acquired each time the wells were sampled, in accordance with the SAP.

With the implementation of the selected remedy, the CCR Landfill monitoring network was transitioned to corrective measures monitoring in November 2020. This program incorporates both the original monitoring network and the additional downgradient wells listed in Section 2.0. All of the network wells were used for the 2021 analysis of compliance with CCR requirements and will remain in the monitoring network throughout active operations and post-closure care / monitoring once the CCR Landfill is closed.

Table 1 provides assessment / corrective measures monitoring data collected for the CCR Landfill in 2021. Attachments A and B contain field summary reports for the March and October 2021 sampling events. They consist of groundwater contour maps, data validation, statistical analyses, field data sheets, and laboratory data packages for each event.

# 3.1 Continuation - Assessment / Corrective Measures Monitoring

In accordance with the CCR Rule, the CCR Landfill remains in assessment / corrective measures monitoring. Two rounds of groundwater monitoring were completed in 2021, to assess water quality, by comparing concentrations in downgradient wells to groundwater protection standards established during assessment monitoring. The comparisons for the March and October 2021 sampling events are summarized in Tables 2 and 3.

Table 2 indicates cobalt (ELF-8, and ELF-11) and molybdenum (ELF-8) exhibited SSLs above their groundwater protection standards for the March 2021 event. Table 3 indicates cobalt (ELF-8 and ELF-11), lithium (ELF-11, and ELF-14) and molybdenum (ELF-8) exhibited SSLs above their groundwater protection standards for the October 2021 event.

Monitoring well ELF-14 is a downgradient facility bounding well. The lithium concentration in ELF-14 has varied between 4.01 to 4.79 over its 3.5-yr monitoring period. With only seven measurements, monitoring data for this well has not achieved the EPA recommendation of 8 events for statistical significance. The fall lithium concentration (4.66 mg/l) in ELF-14 was not the maximum concentration recorded in this well (which was 4.79 mg/L in May of 2019) but exceeded the background UTL because concentrations in the background wells have reduced over time, possibly due to several factors effecting ground water at the facility. Additional investigation was planned and is underway as the exceedance could represent a natural variation in background water quality, residual contamination, or other possible scenarios.



# 4.0 SELECTION OF REMEDY

The potential remedies for the CCR Landfill at the Hunter Power Plant were assessed in the Corrective Measures Assessment completed in 2019 utilizing the criteria in § 257.96 Assessment of Corrective Measures. A public meeting was conducted July 23, 2019 to present the findings of the Nature and Extent investigation and Corrective Measures Assessment. Public comments were solicited during the meeting and over the ensuing 30 days. Additional site characterization was conducted in 2019 to address the public concerns and to provide supplemental information to aid in selecting a remedy. The remedy for the CCR Landfill at the Plant was selected based on the criteria and evaluation factors in 40 CFR § 257.97 - Selection of Remedy and was posted to the Plant operating record on October 12, 2020.

The primary element of the selected remedy is the capture of groundwater through operation of horizontal wells installed beneath the landfill to collect leachate and impacted groundwater. The groundwater capture system at the CCR Landfill has operated since 2015 and has proven effective in reducing groundwater impacts and will remain in place. Existing groundwater monitoring data indicates the capture system has contained groundwater impacts to an area immediately downgradient of the waste unit boundary.

A supplemental investigation is underway to determine if the existing horizontal wells require augmentation in order to meet performance criteria. Initial drilling efforts completed in 2021 did not reach the desired depths to evaluate potential liquid in the landfill. Additional drilling will be completed during the first quarter of 2022 to determine if additional groundwater capture is needed. If deemed necessary, PacifiCorp will proceed with implementation of additional groundwater capture wells, in accordance with the remedy selection report.

#### 5.0 REMEDY IMPLEMENTATION

The horizontal well collection system at the Hunter CCR Landfill has been in operation since 2015 and has continued collection of leachate and impacted groundwater through 2021. Pending the findings of the 2022 supplemental investigation which will include drilling directly into the landfill to determine how much water is present, the current system may remain as the primary element of the remedy or additional groundwater capture wells will be installed to augment the existing system.

#### 6.0 PROBLEMS & RESOLUTIONS

Monitoring wells ELF-1D (spring), ELF-3 (spring and fall), ELF-5 (spring and fall), ELF-6 (spring and fall), ELF-7 (spring), and ELF-10 (spring) did not produce sufficient water to support sampling. No other problems were noted during the 2021 monitoring period.



# 7.0 UPCOMING YEAR

During 2022, it is anticipated PacifiCorp will complete the following activities at the CCR Landfill:

# **Semi-Annual Monitoring**

- Conduct the first semi-annual assessment / corrective measures monitoring event;
- Perform statistical analysis of data;
- Conduct the second semi-annual assessment / corrective measures monitoring event;
- Perform statistical analysis of data; and
- Develop the Annual Groundwater Monitoring and Corrective Action Report.

#### **Corrective Measures**

- Complete installation and sampling of additional monitoring wells;
- Continue operating existing horizontal wells;
- Drill vertical test wells into the landfill contents to assess potential water content;
- Install monitoring wells in the ash to monitor effectiveness of system;
- Evaluate data to determine if additional corrective measures are appropriate; and
- Implement additional corrective measures if necessary.



# 8.0 REFERENCES

- EPA 2017. National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA-540-R-201 7-001, January 2017.
- EPA 2010. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater from Monitoring Wells, EPASOP-GW 001, January 2010.
- EPA 1989. Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December 1989.
- WET, 2019. Corrective Measures Assessment, Hunter Power Plant, Castle Dale, Utah. June 2019.
- WET, 2017. Sampling and Analysis Plan & Well Documentation, CCR Landfill Hunter Power Plant, Castle Dale, Utah, Revision 1, October 2017.



# **FIGURES**





1,600 800 2,400



# **HUNTER POWER PLANT**

CCR Sample Locations

Job#: PERCM052

FIGURE 1 Date: 1/26/2022

Path: M:\PERC\PERC\_CCR\GIS\2021\_CCR\_Sampling\Hunter\GIS\Fall\Hunter\_PERC\_Fall\_GWE.aprx, Author: jleprowse



# **TABLES**

Table 1. Hunter Power Plant - As	h Landfill Assessment	Monitoring Results
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Tubic	T. Humer	Power Plant	- A3II Lai	Idilli A3	J	IVIOITIE	ornig it	CSUITS	Appendix	· III									Anne	ndix IV						
								1	Appendix	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1	T					T		Арре	IIIIII		I		T	1	
																										Radium
SAMPLE I	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	В	Ca	CI	F	pН	SO <sub>4</sub>	TDS	Sb	As	Ва	Be	Cd	Cr	Co	Pb	Li	Hg	Мо	Se	TI	226+228
						mg/L C	2 mg/L Q	mg/L C	) mg/L	Q s.u Q	mg/L Q	mg/L Q	mg/L C	) mg/L	Q mg/L (	) mg/L	Q mg/L	Q mg/L (	2 mg/L	Q mg/L (	mg/L Q	mg/L Q	mg/L Q	mg/L (	Q mg/L C	Q pCi/L Q
		9/18/2015	5669.55	84.43	5585.12		enough wate		`   0/		0/ 1-3		., .,	·	- 0,		~	· ,	., 0,			, , , , , , , , , , , , , , , , , , ,	or ,	, <i>,</i>	. 5,	
		11/10/2015		NM	NM	NS - Not e	enough wate	r																		
		12/1/2015		84.41	5585.14	NS - Not e	enough wate	r																		
		1/12/2016		84.25	5585.30	NS - Not e	enough wate	r																		
		2/2/2016		84.14	5585.41	NS - Not e	enough wate	r																		
		3/9/2016		NM	NM	NS - Not e	enough wate	r																		
		4/6/2016		83.45	5586.10		enough wate																			
		5/4/2016		83.60	5585.95		enough wate																			
ELF-1D	Background	5/9/2017		82.60	5586.95		enough wate																			
		8/2/2017		82.35	5587.20	NS - Not e	enough wate	r					.0.00000	1 .0 00000	0.0402		.0.000500		0.00543		242	.0.000450	0.0465	.0.00000		2.62
		2/15/2018		98.82 99.87	5570.73	NA Not o							<0.00200	<0.00200	0.0103	<0.00200	<0.000500	<0.00200	0.00542	<0.00200	2.12	<0.000150	0.0165	<0.00200	<0.00200	2.63
		5/30/2018 5/8/2019		99.87 81.81	5569.68 5587.74	2.23	enough wate	6880	<0.100	7.02	7730	26800	<0.00400	<0.00200	0.0085	<0.00200	<0.000500	0.0023	<0.00400	<0.00200	2.20 J+	<0.0000900	0.0207	<0.00200	<0.00200	1.23
		8/20/2019		83.22	5586.33	2.23	366 J+		<0.200	7.02	8640	27000	<0.00400	<0.00200	0.0084	<0.00200	<0.000500	<0.0023	<0.00400	<0.00200	2.19	<0.0000900 UJ	0.0207	<0.00200	<0.00200	1.09
		5/13/2020		83.89	5585.66	2.10		6640	<0.100	7.30	8940	28700 J	<0.00400	<0.00200	0.0103	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.96	<0.0000900	0.0153	<0.00200	<0.00200	2.20
		10/29/2020		85.48	5584.07		enough wate		10.100	7.50	05-70	20,00   1	10.00400	10.00200	0.0103	10.00200	10.000000	10.00200	10.00400	10.00200	1.50	.0.0000500	0.0133	10.00200	10.00200	2.20
		3/24/2021		83.21	5586.34		enough wate																			
		10/26/2021		82.66	5586.89	1.94	393	7200	0.163	7.17 J+	10700 J-	25000	<0.00400	<0.00200	0.0104	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.89	<0.0000900 UJ	0.00866	<0.00200	<0.00200	4.4
		9/18/2015	5612.02	20.20	5591.82	3.31	419	469	0.500	7.30	8150	11400	<0.001	<0.001	<0.05	<0.001	<0.001	<0.001	0.00600	0.00100	1.50	<0.0001	0.0030	0.60800	<0.0005	2.30
		11/10/2015		20.65	5591.37	3.27	419	444	<0.1	7.22	7870	11300	<0.002	<0.002	0.0092	<0.002	<0.0005	<0.002	<0.004	<0.002	4.93	<0.00015	0.0034	0.55600	<0.002	0.80
		12/1/2015		21.02	5591.00	3.24	392	461	<0.1	7.21	8320	11500	<0.002	<0.002	0.0128	<0.002	<0.0005	<0.002	0.00559	<0.002	3.97	<0.00015	0.0038	0.53000	<0.002	8.10 J+
		1/12/2016		21.29	5590.73	3.38	420	473	0.277	7.24	8180	12300	<0.002	<0.002	0.0207	<0.002	<0.0005	<0.002	0.01140	<0.002	4.08	<0.00015	0.0043	0.49900	<0.002	1.99
		2/2/2016		21.43	5590.59	3.50	410	471	0.100	7.14	7350	12000	<0.002	<0.002	0.0119	<0.002	<0.0005	<0.002	0.00501	<0.002	3.93	<0.00015	0.0031	0.45000	<0.002	1.25
		3/9/2016		21.56	5590.46	3.48	395	430	<0.1	7.21	7190	11400	<0.002	<0.002	0.0138	<0.002	<0.0005	<0.002	0.00767	<0.002	2.14	<0.00015	0.0039	0.45100	<0.002	2.87
		4/7/2016		21.67	5590.35	3.33	404	457	<0.1	7.16	8370	12400	<0.002	<0.002	0.0091	<0.002	<0.0005	0.0110	<0.004	<0.002	1.34	<0.00015	0.0051	0.46300	<0.002	0.94
		5/4/2016		21.69	5590.33	3.15	364	439	0.103	7.76	8040	11700	<0.002	<0.002	0.0095	<0.002	<0.0005	<0.002	<0.004	<0.002	1.45	<0.00015	0.0030	0.39800	<0.002	0.85
ELF-2	Background	9/8/2016 5/9/2017		22.12 22.21	5589.90 5589.81	3.25	428 enough wate	446	0.299	7.30	7950	12300	<0.002	<0.002	0.0085	<0.002	<0.0005	<0.002	<0.004	<0.002	3.50	<0.00015	0.0029	0.36600	<0.002	0.61
CLF-Z	Background	8/2/2017		22.21	5589.88	3.11		363	<0.100	7.42	7950	11600	<0.00200	<0.00200	0.0120	<0.00200	<0.000500	<0.00200	0.00565	<0.00200	1.54	<0.000150	0.0032	0.19800	<0.00200	1.37
		2/15/2018		22.14	5589.72	NA	363	303	\0.100	7.42	7330	11000	<0.00200	<0.00200	0.0120	<0.00200	<0.000500	<0.00200	0.00503	<0.00200	1.61	<0.000150	0.0032	0.08790	<0.00200	2.29
		5/30/2018		22.24	5589.78	3.58	369 J-	245	0.192	7.12	6030	12000	<0.00100	<0.00200	0.0100	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.75 J-	<0.000150 J-	0.0026	0.07660	<0.00200	0.99
		5/8/2019		22.53	5589.49	3.77	430	222	0.310	7.17	6950	12200	<0.00400	<0.00200	0.0099	<0.00200	<0.000500	0.0024	<0.00400	<0.00200	1.76 J+	<0.0000900	0.0031	0.03190	<0.00200	0.82
		8/20/2019		22.72	5589.30	3.53		218	<0.100	7.43	6780	12600	<0.00400	<0.00200	0.0084	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.52	<0.0000900 UJ	0.0026	0.03400	<0.00200	1.49
		5/13/2020		23.22	5588.80	3.38	398	197	<0.100	7.27	6830	12000	<0.00400	<0.00200	0.0104	<0.00200	<0.000500	<0.00200	0.00600	<0.00200	1.59	<0.0000900	0.0028	0.00566	<0.00200	2.17
		10/29/2020		24.69	5587.33	3.18	356	199	<0.100	7.51 J	7900	12200	<0.00400	<0.00200	0.0097	<0.00200	<0.000500	<0.00200	0.00438	<0.00200	1.42	<0.0000900	<0.00200	0.00423	<0.00200	2.08
		3/24/2021		23.38	5588.64	3.32	394	213	0.464	7.34	8720	11700	<0.00400	<0.00200	0.0099	<0.00200	<0.000500	<0.00200	0.00481	<0.00200	1.47	<0.0000900	0.0027	0.00309	<0.00200	1.63
		10/26/2021		23.63	5588.39	3.12	400	213 J	+ 0.393	7.46 J+	8400 J-	12200	<0.00400	<0.00200	0.01020	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.87	<0.0000900 UJ	0.00218	0.00456	<0.00200	1.1
		9/18/2015	5661.00	NM	NM		enough wate																			
		11/10/2015		NM	NM		enough wate																			
		12/1/2015		NM	NM		enough wate																			
		1/12/2016		51.14	5609.86		nough wate		0.376	7.00	6470	0420	<b>*0.003</b>	0.00400	0.0704	-0.003 T	40 000F	0.0457	1 40 004	0.00435	2.40	40.0004F	0.0002	0.00434	40.003	114
		2/2/2016		36.85	5624.15 5637.37	<5.00 1.61		284	0.276	7.86	6470 8030	9420	<0.002	0.00499	0.0794	<0.002	<0.0005	0.0157	<0.004	0.00435	2.48	<0.00015	0.0983	0.00424	<0.002	1.14
		3/9/2016 4/7/2016		23.63	5637.37 5637.51	1.61	84.2 112	469 316	0.260 <0.100	7.86	7080	11900	<0.002 <0.002	0.00674	0.0411	<0.002 <0.002	<0.0005 <0.0005	0.0056 0.0183	<0.004 0.00498	<0.002 0.00549	0.724	<0.00015 <0.00015	0.1580 0.1290	<0.002 <0.002	<0.002	2.60
		5/4/2016		23.47	5637.53	1.30	64.6	282	1.29	7.75	6850	10100	<0.002	0.00546	0.0323	<0.002	<0.0005	0.0036	<0.004	<0.002	1.03	<0.00015	0.1220	<0.002	<0.002	0.64
		9/8/2016		23.40	5637.60			352	1.65	8.03	6750	10600	<0.002	0.00524	0.0189	<0.002	<0.0005	<0.002	<0.004	<0.002	1.60	<0.00015	0.1230	<0.002	<0.002	0.66
		5/9/2017		23.39	5637.61		enough wate				1 2.22		1	1	1 2.2 2.2		1	0.00=	1	1 2.22		1 0.0000		1 1	1 0.00_ 1	1 0.00
ELF-9	Background	8/2/2017		31.38	5629.62	1.32	91.9	446	1.27	7.94	6900	12000	<0.00200	0.01140	0.1020	<0.00200	0.00053	0.0201	0.00520	0.00768	0.748	<0.000150	0.1410	<0.00200	<0.00200	1.84
		8/29/2017		22.01	5638.99	1.50	53.9	391	1.16	7.94	5830	10500	<0.00200	0.00622	0.0165	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.801	<0.000150	0.1060	<0.00200	<0.00200	2.23
		9/15/2017		23.32	5637.68	1.39	60.3	359	1.84	8.06	5600	11900	<0.00200	0.00762	0.0348	<0.00200	<0.000500	0.0053	<0.00400	<0.00200	0.783	<0.000150	0.1170	<0.00200	<0.00200	1.92
		2/15/2018		22.81	5638.19	NA							<0.00200	0.0117	0.0767	<0.00200	<0.000500	0.0137	<0.00400	0.00489	0.74	<0.000150	0.1270	<0.00200	<0.00200	1.38
		5/30/2018		23.25	5637.75		52.7 J-		1.19	7.89	5460	11200	<0.00100	0.00824	0.0137	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.10 J-	<0.000150 J-	0.1090	<0.00200	<0.00200	0.70
		5/8/2019		23.24	5637.76	1.87		527	1.43	7.95	5750	10300	<0.00400	0.0096	0.0126	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.759 J+	<0.0000900	0.1130	<0.00200	<0.00200	1.34
		8/20/2019		23.25	5637.75	1.91	57.7 J+		<0.200	7.51	5930	10700	<0.00400	0.00663	0.0134	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.888	<0.0000900 UJ	0.0679	<0.00200	<0.00200	1.50
		5/13/2020		23.09	5637.91	1.49	57.1	595	0.799	7.82	7280	9900 J	<0.00400	0.00725	0.0128	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.06	<0.0000900	0.0768	<0.00200	<0.00200	1.56
		10/29/2020		23.14	5637.86	1.27	48.9	442	0.708	8.05	6530	10900	<0.00400	0.00678	0.0126	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.873	<0.0000900	0.0657	<0.00200	<0.00200	1.36
		3/24/2021		23.01	5637.99	1.45	67.1	464	1.560	8.01 J+		10800	<0.00400	0.00506	0.0122	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	0.944	<0.0000900	0.0569	<0.00200	<0.00200	2.26
		10/26/2021		22.93	5638.07	1.33	56.4	515 J	+ 1.84	8.19 J+	7100 J-	11400	<0.00400	0.00622	0.0118	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	1.210	<0.0000900 UJ	0.0571	<0.00200	<0.00200	<0.85 U

NS: Not Sampled

NM: Not Measured

GWE: Ground Water Elevation

DTW: Depth to Water TOC: Top of Casing

AMSL: Above Mean Sea Level

Q: Data Validation Qualifier

J: Estimated

J+: Overestimated
UJ: Estimated Non-Detect

	1		1.0	10	36331116111	- IIII	Jinig ix		Append	iv III									Anne	ndix IV						
								1	Аррене	1 1	1	1		T			T		Дрре	IIGIA IV		1	I	1		
																										Radium
SAMPLE II	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	В	Ca	Cl	F	pН	SO <sub>4</sub>	TDS	Sb	As	Ва	Ве	Cd	Cr	Co	Pb	Li	Hg	Mo	Se	TI	226+228
																										220+228
						ma/1 0	\ ma/I   0	/1 O	/I	0 10			/1 C	/I	0		0/1	0/1 0	) ma/l	Q mg/L Q	/I	mg/L Q	/1 O	mg/L C		Q pCi/L Q
		0/19/2015	F620 F7	FO 64	FF60.03				mg/L	Q s.u Q	mg/L   Q	mg/L   Q	mg/L C	mg/L	Q mg/L Q	mg/L	Q mg/L	Q mg/L Q	Į mg/L	Q   mg/L   Q	(  mg/L   Q	mg/L Q	mg/L Q	mg/L C	( mg/L (	Q   pci/L   Q
		9/18/2015	5620.57	50.64	5569.93		nough wate		.0.4	7.40	140000	27200	.0.000	0.00000	0.0504	1 .0 000	0.00056	0.0057	1 0 00700	0.00240	1 450	1 .0 00045	0.4450	0.44000	10.000	0.70
		11/10/2015		43.09	5577.48	1.56		6790	<0.1	7.10	19900	37200	<0.002	0.00292	0.0501	<0.002	0.00056	0.0057	0.00788	0.00318	4.59	<0.00015	0.1150	0.41000	<0.002	0.70
		12/1/2015		44.21	5576.36	1.68		7530	3.98	7.21	20100	40300	<0.002	<0.002	0.0329	<0.002	0.00051	<0.002	0.00550	<0.002	3.49	<0.00015	0.1240	0.29000	<0.002	14.20 J+
		1/12/2016		46.50	5574.07		484		4.36	7.41	19800	40100	<0.002	<0.002	0.0353	<0.002	0.00058	<0.002	0.00493	<0.002	3.60	<0.00015	0.1240	0.15700	<0.002	1.14
		2/2/2016		46.09	5574.48		nough wate																			
		3/9/2016		47.82	5572.75		nough wate				1			1			1		1	1		1	1	T T		
		4/7/2016		47.35	5573.22		479		3.97	7.15		38400	<0.002	0.00366	0.0519	<0.002	0.00060	0.0050	0.00444	0.00325	0.841	<0.00015	0.1180	0.14600	<0.002	2.66
		5/4/2016		48.73	5571.84		470		3.87	8.37	19300	37800	<0.002	0.00929	0.0863	<0.002	0.00110	0.0164	0.00793	0.01200	1.12	<0.00015	0.1070	0.10500	<0.002	3.10
		9/8/2016		48.05	5572.52		nough wate																			
		5/9/2017		45.41	5575.16		nough wate						, ,	1 1								, ,		, ,	,	
ELF-10	Background	8/2/2017		46.80	5573.77	1.64	509		<0.100		17300	38600	<0.00200	<0.00200	0.0391	<0.00200	0.00056	0.0084	0.00411	0.00217	2.09	<0.000150	0.0871	0.00903	<0.00200	0.46
		8/29/2017		48.10	5572.47	1.84	500	6960	<0.100	7.28	16800	38200	<0.00200	<0.00200	0.0205	<0.00200	<0.000500	0.0020	<0.00400	<0.00200	1.53	<0.000150	0.0855	0.00821	<0.00200	3.56
		9/15/2017		51.74	5568.83	1.6	445	5710	0.244	7.23	13100	39600	<0.00200	<0.00200	0.0601	<0.00200	<0.000500	0.0065	<0.00400	0.00311	2.20	<0.000150	0.0795	0.01050	<0.00200	3.42
		2/15/2018		49.84	5570.73	NA			_				<0.00200	<0.00200	0.0679	<0.00200	<0.000500	0.0052	0.00429	0.00252	1.88	<0.000150	0.0618	<0.00200	<0.00200	2.30
		5/30/2018		50.89	5569.68	1.73	468 J-		<0.100	6.99	10000	35300	<0.00100	<0.00200	0.0304	<0.00200	<0.000500	0.0024	<0.00400	<0.00200	2.17 J-	<0.000150 J-	0.0546	<0.00200	<0.00200	2.20
		5/8/2019		48.77	5571.80	2.12	543	9900	<0.100	6.88	10300	35200	<0.00400	<0.00200	0.0184	<0.00200	<0.000500	<0.00200	0.00558	<0.00200	1.76 J+	<0.0000900	0.0516	<0.00200	<0.00200	2.47
		8/20/2019		51.64	5568.93	NS - Not e	nough wate	r																		
		5/12/2020		49.21	5571.36	1.59	474	11800	<0.100	6.85	9230	33600	<0.00400	<0.00200	0.0145	<0.00200	<0.000500	0.0030	0.00432	<0.00200	2.90	<0.0000900	0.0331	0.00234	<0.00200	2.41
		10/28/2020		50.42	5570.15	1.54	407	12100	<0.100	7.79 J	8610	32900	<0.00400	<0.00200	0.0155	<0.00200	<0.000500	0.0022	0.00421	<0.00200	2.18	<0.0000900	0.0341	<0.00200	<0.00200	1.10 U
		3/24/2021		51.09	5569.48	NS - Not e	nough wate	r																		
		10/26/2021		49.23	5571.34	1.50	504	13100	<0.100	7.46 J+	9910 J-	39900	<0.00400	<0.00200	0.0147	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.89	<0.0000900 UJ	0.0142	<0.00200	<0.00200	2.39
		9/18/2015	5604.78	34.37	5570.41	NS - Not e	nough wate	r																		
		11/10/2015		NM	NM	NS - Not e	nough wate	r																		
		12/1/2015		34.40	5570.38	NS - Not e	nough wate	r																		
		1/12/2016		34.30	5570.48	NS - Not e	nough wate	r																		
		2/2/2016		34.25	5570.53	NS - Not e	nough wate	r																		
		3/9/2016		NM	NM	NS - Not e	nough wate	r																		
		4/7/2016		34.30	5570.48	NS - Not e	nough wate	r																		
		5/4/2016		NM	NM	NS - Not e	nough wate	r																		
		9/8/2016		34.02	5570.76	NS - Not e	nough wate	r																		
ELF-3	Downgradient	5/9/2017		33.43	5571.35		nough wate																			
		8/2/2017		33.32	5571.46	1.01	492	609	<0.100	7.79	33000	47700	<0.00200	<0.00200	0.0150	<0.00200	<0.000500	<0.00200	0.00455	<0.00200	4.20	<0.000150	0.0320	0.16900	<0.00200	3.76
		2/15/2018		34.04	5570.74	NA							<0.00200	<0.00200	0.0118	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.67	<0.000150	0.0335	0.12500	<0.00200	2.22
		5/30/2018		34.80	5569.98	NS - Not e	nough wate	r																		
		5/8/2019		31.75	5573.03	1.51	465	768	<0.100	7.52	27700	50700	<0.00400	0.00205	0.0391	<0.00200	0.00078	0.0042	0.02140	0.00605	3.26 J+	<0.0000900	0.0209	0.50200	<0.00200	3.61
		8/20/2019		30.30	5574.48	<5.00	431 J+	642	<0.400	7.79	32000	50400	<0.00400	<0.00200	0.0111	<0.00200	<0.000500	0.0025	<0.00400	<0.00200	2.81	<0.0000900 UJ	0.0187	0.61700	<0.00200	3.04
		5/13/2020		30.75	5574.03	1.08	455	840	<0.100	7.47	35100	49300	<0.00400	<0.00200	0.0405	<0.00200	<0.000500	0.0022	0.01590	0.00491	3.16	<0.0000900	0.0172	0.52100	<0.00200	5.41
		10/28/2020		30.89	5573.89	1.05	390	545	<0.100	7.66 J	28800	48600	<0.00400	<0.00200	0.0107	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	3.61	<0.0000900	0.0157	0.45000	<0.00200	1.32 U
		3/24/2021		NM	NM	NS - Not e	nough wate	r																		
		10/26/2021		33.80	5570.98	NS - Not e	nough wate	r																		
		9/18/2015	5581.50	15.03	5566.47	4.66	526	2320	0.300	7.20	5790	10400	<0.001	< 0.001	<0.05	<0.001	<0.001	0.0020 J+	+ 0.00800	<0.001	1.70	<0.0001	0.0010	0.00400 J-	<0.0005	2.10
		11/10/2015		14.97	5566.53	4.93	486	2040	4.46	6.94	5350	11200	<0.002	<0.002	0.0116	<0.002	<0.0005	<0.002	0.00583	<0.002	5.41	<0.00015	0.0026	0.00496	<0.002	1.60
		12/1/2015		15.12	5566.38	4.88	482	2370	3.67	7.01	6240	11400	<0.002	<0.002	0.0118	<0.002	<0.0005	<0.002	0.00591	<0.002	4.31	<0.00015	0.0026	0.00486	<0.002	11.59 J+
		1/12/2016		15.22	5566.28	5.02		2500	3.93	7.52	5900	12400	<0.002	<0.002	0.0155	<0.002	<0.0005	<0.002	< 0.004	<0.002	4.43	<0.00015	0.0030	0.00471	<0.002	1.39
		2/2/2016		15.25	5566.25	5.19	495	2170	4.25	6.97	5410	11500	<0.002	<0.002	0.0119	<0.002	<0.0005	<0.002	0.00582	<0.002	4.39	<0.00015	0.0025	0.00352	<0.002	3.60
		3/9/2016		15.36	5566.14	4.96	496	2240	4.06	7.03	5290	11200	<0.002	<0.002	0.0153	<0.002	<0.0005	<0.002	0.00729	<0.002	2.37	<0.00015	0.0031	0.00360	<0.002	2.20
		4/6/2016		15.38	5566.12	4.77	519	2320	3.63	6.97	6110	11300	<0.002	<0.002	0.0139	<0.002	<0.0005	<0.002	0.00675	<0.002	2.96	<0.00015	0.0026	0.00365	<0.002	0.62
		5/4/2016		14.41	5567.09			2280	<0.1	7.16	6010	11600	<0.002	<0.002	0.0123	<0.002	<0.0005	<0.002	0.00637	<0.002	1.40	<0.00015	0.0024	0.00281	<0.002	1.98
		9/8/2016		NM	NM		nough wate						<u> </u>	I.							l l	· · · · · · · · · · · · · · · · · · ·				
ELF-4	Downgradient	— · · · · · ·		16.05	5565.45		nough wate																			
		8/2/2017		16.25	5565.25	4.35	483	2240	<0.100	7.21	5750	11600	<0.00200	<0.00200	0.0115	<0.00200	<0.000500	<0.00200	0.00611	<0.00200	1.65	<0.000150	0.0027	0.00255	<0.00200	2.57
		2/15/2018		16.52	5564.98	NA		, ,			-		<0.00200	<0.00200	0.0141	<0.00200	<0.000500	0.0044	0.00833	<0.00200	1.71	<0.000150	0.0026	<0.00200	<0.00200	1.57
		5/30/2018		16.53	5564.97		456 J-	2200	0.339	6.98	5290	11700	<0.00100	<0.00200	0.0116	<0.00200	<0.000500	<0.00200	0.00666	<0.00200	1.78 J-	<0.000150 J-		<0.00200	<0.00200	1.81
		5/8/2019		16.49	5565.01	5.00		1980	0.187	7.06	4800	11800	<0.00400	<0.00200	0.0118	<0.00200	<0.000500	<0.00200	0.00593	<0.00200	1.82 J+	<0.0000900	0.0027	<0.00200	<0.00200	1.72
		8/20/2019		16.88	5564.62	4.98	507 J+		0.941	7.22	4890	12200	<0.00400	<0.00200	0.0103	<0.00200	<0.000500	<0.00200	0.00637	<0.00200	1.71	<0.0000900 UJ	0.0024	<0.00200	<0.00200	2.73
		5/13/2020		17.34	5564.16	4.60		2470	<0.100	6.89	6260	12100	<0.00400	<0.00200	0.0104	<0.00200	<0.000500	<0.00200	0.00553	<0.00200	1.69	<0.0000900	0.0046	<0.00200	<0.00200	2.00
		10/28/2020		17.70	5563.80	4.74		2170	0.212	7.40 J		12900	<0.00400	<0.00200	0.0111	<0.00200	<0.000500	<0.00200	0.00638	<0.00200	1.62	<0.0000900	0.0026	<0.00200	<0.00200	1.53 U
		3/24/2021		17.89	5563.61	4.77		2420	0.396	7.13	6290	12000	<0.00400	<0.00200	0.0119	<0.00200	<0.000500	<0.00200	0.00594	<0.00200	1.58	<0.0000900	0.0021	<0.00200	<0.00200	2.17
		10/26/2021		18.10	5563.40	4.36		2220	0.319	7.23 J+		12400	<0.00400	<0.00200	0.0118	<0.00200	<0.000500	<0.00200	0.00608	<0.00200	1.82	<0.0000900 UJ		<0.00200	<0.00200	1.45
		10/20/2021	<u> </u>	10.10	3303.70	7.50	7,3	2220	0.313	7.2J JT	0200 J-	12-700	10.00700	10.00200	0.0110	10.00200	10.000300	10.00200	0.00000	10.00200	1.02	.0.000000000000000	0.00220	10.00200	10.00200	1.73

NS: Not Sampled NM: Not Measured GWE: Ground Water Elevation DTW: Depth to Water TOC: Top of Casing

AMSL: Above Mean Sea Level

Q: Data Validation Qualifier

J: Estimated

J+: Overestimated UJ: Estimated Non-Detect

**Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results** 

Table	i. Hunter	Power Plant	- ASII Lai	Iuiiii As		WOITE	ornig K	CSUITS	Append	iv III									Δnne	endix IV						
									Append	<u> </u>	1	1			<del></del>			Т	Арре	iluix IV		1	T	T	1	T
																										Radium
SAMPLE ID	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft	) B	Ca	Cl	F	pН	SO <sub>4</sub>	TDS	Sb	As	Ва	Ве	Cd	Cr	Со	Pb	Li	Hg	Мо	Se	TI	226+228
						mg/L (	Q mg/L Q	mg/L Q	mg/L	Q s.u C	( mg/L Q	mg/L Q	mg/L C	Q mg/L	Q mg/L (	Q mg/L	Q mg/L (	Q mg/L Q	) mg/L	Q mg/L (	Q mg/L Q	mg/L Q	mg/L Q	mg/L (	Q mg/L	Q pCi/L Q
		9/18/2015	5577.79	16.61	5561.18	5.44	464	4250	0.40	7.20	11200	21000	<0.001	<0.001	<0.05	<0.001	<0.001	0.0040	<0.005	<0.001	3.70	<0.0001	0.0020	0.05200 J	+ <0.0005	3.20
		11/10/2015		16.20	5561.59	5.89	499	4110	<0.1	6.98	11100	22600	<0.002	<0.002	0.0131	<0.002	<0.0005	<0.002	<0.004	<0.002	13.7	<0.00015	0.0045	0.04530	<0.002	1.70
		12/2/2015		16.74	5561.05	5.53	480	4150	3.49	6.99	11200	21000	<0.002	<0.002	0.0097	<0.002	<0.0005	<0.002	<0.004	<0.002	9.96	<0.00015	0.0044	0.03760	<0.002	10.36 J+
		1/12/2016		16.85	5560.94	6.20	503	4210	4.85	7.26	11100	21300	<0.002	<0.002	0.0112	<0.002	<0.0005	<0.002	0.00402	<0.002	11.7	<0.00015	0.0045	0.03640	<0.002	1.56
		2/2/2016		16.52	5561.27	6.10	481	3750	3.96	7.04	9890	21000	<0.002	<0.002	0.0097	<0.002	<0.0005	<0.002	<0.004	<0.002	10.6	<0.00015	0.0046	0.03250	<0.002	1.61
		3/9/2016		16.47	5561.32	6.55	492	4170	4.62	7.05	10300	22300	<0.002	<0.002	0.0123	<0.002	<0.0005	<0.002	0.00413	<0.002	5.83	<0.00015	0.0050	0.02970	<0.002	2.89
		4/6/2016		16.31	5561.48	5.35	476	3700	3.53	7.10	11200	19200	<0.002	<0.002	0.0179	<0.002	<0.0005	0.0022	0.00457	<0.002	3.10	<0.00015	0.0045	0.03370	<0.002	3.70
		5/4/2016		15.35	5562.44	5.99	465	3900	<0.1	7.19	10700	21100	<0.002	<0.002	0.0151	<0.002	<0.0005	<0.002	0.00424	<0.002	5.68	<0.00015	0.0044	0.03060	<0.002	1.75
		9/8/2016		17.30	5560.49	6.03	491	3980	<0.1	7.03	10300	20600	<0.002	<0.002	0.0170	<0.002	<0.0005	0.0023	0.00409	<0.002	8.64	<0.00015	0.0042	0.03970	<0.002	2.02
ELF-5	Downgradient	5/9/2017		17.13	5560.66		enough wate																			
		8/2/2017		NM	NM		enough wate	r							0.0400						1.05		1 00010			
		2/15/2018		18.00	5559.79	NA 7.64	450 1	1420	0.104	7.04	11100	27000	<0.00200	<0.00200	0.0103	<0.00200 <0.00200	<0.000500	<0.00200	<0.00400	<0.00200	4.35	<0.000150	0.0046	0.01810	<0.00200	1.81 2.37
		5/30/2018		17.98 18.58	5559.81	7.61	459 J-	3180	0.104 0.108	7.04	11100 8640	27800 21600	<0.00100 <0.00400	<0.00200 <0.00200	0.0117 0.0138		<0.000500	<0.00200	0.00430 0.01020	<0.00200	6.85 J-	<0.000150 J-	0.0050	0.02500	<0.00200	2.85
		5/8/2019 8/20/2019		18.69	5559.21 5559.10	6.06 8.7	510 J+		0.108	7.09	12300	24000	<0.00400	0.00200	0.0138	<0.00200 <0.00200	<0.000500 <0.000500	<0.00200 0.0044	0.01020	<0.00200 0.00246	4.29 J+ 5.93	<0.000900 U.		0.00913 0.01270	<0.00200 <0.00200	2.85
		5/13/2020		17.74	5560.05		enough wate		0.962	7.23	12300	24000	<0.00400	0.00212	0.0267	<0.00200	<0.000500	0.0044	0.00618	0.00246	5.93	[<0.0000900] 0.	0.0072	0.01270	<0.00200	2.77
		10/28/2020		18.75	5559.04		enough wate																			
		3/24/2021		NM	NM		enough wate																			
		10/26/2021		NM	NM		enough wate																			
		9/18/2015	5579.61	15.97	5563.64	14.3		5650	0.60	7.20	9470	22100	<0.001	<0.002	<0.05	<0.001	<0.001	0.0010 J+	0.02700	<0.001	5.80	<0.0001	<0.001	0.28400	<0.0005	4.70
		11/10/2015		16.02	5563.59	16.0	518	4670	<0.10	6.78	9130	19500	<0.002	<0.002	0.0102	<0.002	<0.0005	<0.002	0.02260	<0.002	18.7	<0.00015	<0.002	0.07970	<0.002	1.40
		12/1/2015		16.09	5563.52	14.4	454	4850	4.03	7.03	10300	19500	<0.002	<0.002	0.0094	<0.002	<0.0005	<0.002	0.02080	<0.002	14.6	<0.00015	<0.002	0.08870	<0.002	33.62 J+
		1/12/2016		16.20	5563.41	14.6	505	NA	NA	NA	NA	NA	<0.002	<0.002	0.0105	<0.002	<0.0005	<0.002	0.02080	<0.002	15.1	<0.00015	<0.002	0.08920	<0.002	1.68
		2/2/2016		16.29	5563.32	13.6	493	4060	5.13	6.94	8800	20100	<0.002	<0.002	0.0093	<0.002	<0.0005	<0.002	0.01910	<0.002	14.2	<0.00015	<0.002	0.08280	<0.002	2.26
		3/9/2016		16.26	5563.35	15.7	500	1190	5.07	6.90	930	20800	<0.002	<0.002	0.0109	<0.002	<0.0005	<0.002	0.02060	<0.002	7.20	<0.00015	<0.002	0.09590	<0.002	2.70
		4/6/2016		16.30	5563.31	13.3	491	4890	4.87	7.04	9910	20200	<0.002	<0.002	0.0089	<0.002	<0.0005	<0.002	0.01780	<0.002	1.63	<0.00015	<0.002	0.09510	<0.002	1.93
		5/4/2016		16.12	5563.49	12.6	491	4630	<0.1	7.40	8400	19600	<0.002	<0.002	0.0115	<0.002	<0.0005	<0.002	0.01860	<0.002	7.92	<0.00015	<0.002	0.09170	<0.002	1.53
		9/8/2016		NM	NM		enough wate																			
ELF-6	Downgradient	5/9/2017		16.52	5563.09		enough wate																			
		8/2/2017		NM	NM		enough wate	r															1	1		
		2/15/2018		16.30	5563.31	NA							<0.00200	<0.00200	0.0099	<0.00200	<0.000500	<0.00200	0.01470	<0.00200	5.50	<0.000150	0.0024	0.09240	<0.00200	1.76
		5/30/2018		17.87	5561.74		enough wate		1	1 1	1 =0.0		T = ====										1			
		5/8/2019		17.62	5561.99		539		0.139	7.06	7840	23700	<0.00400	<0.00200	0.0159	<0.00200	<0.000500	<0.00200	0.03580	<0.00200	5.56 J+	<0.0000900	<0.00200	0.00795	<0.00200	5.23
		8/20/2019		18.25 NM	5561.36		enough wate																			
		5/13/2020 10/28/2020		NM	NM NM	_	enough wate																			
		3/24/2021		NM	NM		enough wate																			
		10/26/2021		NM	NM		enough wate																			
		9/18/2015	5579.81	13.24	5566.57	1.72		2800	0.40	7.10	8720	15300	<0.001	<0.001	<0.05	<0.001	<0.001	<0.001	<0.005	<0.001	2.00	<0.0001	<0.001	0.45500	<0.0005	3.00
		11/10/2015	5575.01	13.42	5566.39	1.86		2600	4.00	6.93	8650	19200	<0.001	<0.001	0.0101	<0.001	<0.001	<0.001	0.00529	<0.001	6.83	<0.0001	0.0024	0.39200	<0.002	1.50
		12/1/2015		13.60	5566.21	1.98	471	2790	3.12	6.99	9050	16800	<0.002	<0.002	0.0112	<0.002	<0.0005	<0.002	0.00528	<0.002	5.41	<0.00015	0.0028	0.40800	<0.002	9.80 J+
		1/12/2016		13.68	5566.13	1.79	480	2910	4.36	7.11	9140	14900	<0.002	<0.002	0.0126	<0.002	<0.0005	<0.002	0.00604	<0.002	5.67	<0.00015	0.0026	0.40000	<0.002	1.27
		2/2/2016		13.67	5566.14	1.81	469	2660	4.63	6.13	8250	17100	<0.002	<0.002	0.0100	<0.002	<0.0005	<0.002	0.00428	<0.002	5.35	<0.00015	0.0021	0.37300	<0.002	3.84
		3/9/2016		13.77	5566.04	1.79	443	2710	3.37	7.01	8180	16800	<0.002	<0.002	0.0120	<0.002	<0.0005	<0.002	0.00668	<0.002	2.73	<0.00015	0.0030	0.38300	<0.002	2.90
		4/6/2016		13.76	5566.05	1.70	485	2850	3.19	6.94	9580	16500	<0.002	<0.002	0.0093	<0.002	0.00050	<0.002	0.00447	<0.002	2.64	<0.00015	0.0023	0.42100	<0.002	1.39
		5/4/2016		13.87	5565.94	1.58	445	2650	<0.1	7.16	8680	16900	<0.002	<0.002	0.0098	<0.002	<0.0005	<0.002	0.00483	<0.002	0.639	<0.00015	0.0021	0.36000	<0.002	1.64
		9/8/2016		14.12	5565.69			2660	<0.1	7.07	8640	18100	<0.002	<0.002	0.0096	<0.002	<0.0005	<0.002	0.00498	<0.002	4.59	<0.00015	0.0024	0.36000	<0.002	2.34
ELF-7	Downgradient			16.27	5563.54		enough wate		, .	,			1		,							,		,	, ,	, ,
		8/2/2017		14.37	5565.44		476	2480	<0.100	7.13	8680	17800	<0.00200	<0.00200	0.0124	<0.00200	<0.000500	<0.00200	0.00816	<0.00200	2.12	<0.000150	0.0025	0.25300	<0.00200	2.28
		2/15/2018		14.71	5565.10	NA	1 46: 1	0.55		1		1=01	<0.00200	<0.00200	0.0107	<0.00200	<0.000500	<0.00200	0.00613	<0.00200	2.13	<0.000150	0.0025	0.17500	<0.00200	1.35
		5/30/2018		14.25	5565.56	1.86	444 J-		0.329	6.99	8460	17200	<0.00100	<0.00200	0.0088	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.49 J-	<0.000150 J-	0.0025	0.13600	<0.00200	1.63
		5/8/2019		14.86	5564.95	1.86		2710	0.132	7.03	8260	17200	<0.00400	<0.00200	0.0095	<0.00200	<0.000500	<0.00200	0.00530	<0.00200	2.23 J+	<0.0000900	0.0023	0.06620	<0.00200	2.26
		8/20/2019		15.22	5564.59		459 J+		3.88	7.19	9480	19500	<0.00400	<0.00200	0.0119	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.23	<0.0000900 U.	0.0027	0.08190	<0.00200	2.22
		5/13/2020		15.80	5564.01		542		<0.100	6.73	10200	18700	<0.00400	<0.00200	0.0100	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.73	<0.0000900	0.0037	0.02050	<0.00200	1.73
		10/28/2020 3/24/2021		16.12 NM	5563.69 NM		enough wate																			
									0.220	7.33 J	1 0610	19400	<0.00400	<0.00200	0.0101	<0.00200	<0.000500	<0.00200	<0.00400	<0.00200	2.42	<0.00000001 II	J 0.0024	0.03110	<0.00200	<0.85
		10/26/2021		16.29	5563.52	7.8	401	298U	0.330	7.33 J	- אסדס J-	10400	<0.00400	<0.00200	0.0101	<u.uu2uu< td=""><td>&lt;0.000500</td><td>&lt;0.00200</td><td>&lt;0.00400</td><td>&lt;0.00200</td><td>2.42</td><td>\U.UUUU9UU U.</td><td>0.0024</td><td>0.03110</td><td>&lt;0.00200</td><td>&lt;0.85</td></u.uu2uu<>	<0.000500	<0.00200	<0.00400	<0.00200	2.42	\U.UUUU9UU U.	0.0024	0.03110	<0.00200	<0.85

NS: Not Sampled

NM: Not Measured

GWE: Ground Water Elevation

DTW: Depth to Water

TOC: Top of Casing AMSL: Above Mean Sea Level Q: Data Validation Qualifier

J: Estimated

J+: Overestimated

UJ: Estimated Non-Detect

**Table 1. Hunter Power Plant - Ash Landfill Assessment Monitoring Results** 

		l otter i lant							Append	lix III										App	endix IV						
SAMPLE IE	WELL TYPE	COLLECTION DATE	TOC AMSL (ft)	DTW (ft)	GWE AMSL (ft)	В	Ca	CI	F	рН	SO <sub>4</sub>	TDS	Sb	As	Ва	Ве		Cd	Cr	Co	Pb	Li	Hg	Мо	Se	ті	Radium 226+228
						mg/L C	) mg/L O	mg/L O	mg/I	Q s.u Q	mg/L O	mg/L Q	mg/L Q	mg/L	Q mg/L (	Q mg/L	O mg	/L Q	mg/L Q	mg/I	O mg/l	Q mg/L Q	mg/L (	Q mg/L Q	mg/L (	Q mg/L	Q pCi/L Q
		9/18/2015	5584.50	8.37	5576.13	26.6	628	2320	1.40	7.60	3120	7430	<0.001	0.002	0.0700	<0.001	0.010		0.0130	0.19600	0.01200	3.50	<0.0001	0.4370	<0.004	<0.002	3.60
		11/10/2015		8.15	5576.35	30.4	577	2160	<0.1	7.30	3140	7690	<0.002	<0.002	0.0163	<0.002	0.000	-	<0.002	0.14700	0.00527	10.7	<0.00015	0.5220	<0.002	<0.002	2.20
		12/1/2015		8.29	5576.21	30.2	586	2370	0.874	7.52	3410	8070	<0.002	<0.002	0.0275	<0.002	0.000		0.0035	0.15000	0.00536	8.59	<0.00015	0.4880	<0.002	<0.002	18.90 J+
		1/12/2016		8.32	5576.18	29.7	623	2380 J+	1.04	7.62	3130	8340	<0.002	<0.002	0.0218	<0.002	0.000	099	0.0022	0.20000	0.00473	9.43	<0.00015	0.4590	<0.002	<0.002	1.80
		2/2/2016		8.14	5576.36	27.2	579	2180	<0.100	7.47	2970	7860	<0.002	<0.002	0.0140	<0.002	<0.00	005	<0.002	0.01430	<0.002	8.79	<0.00015	0.0173	0.00716	<0.002	1.98
		3/9/2016		8.26	5576.24	26.6	590	2240	0.837	7.48	2950	7580	<0.002	0.00299	0.0533	<0.002	0.00	113	0.0089	0.20200	0.00682	5.09	<0.00015	0.4330	<0.002	<0.002	3.70
		4/6/2016		8.40	5576.10	25.4	609	2300	<0.100	7.46	3390	7440	<0.002	<0.002	0.0244	<0.002	0.00	114	0.0029	0.16600	0.00545	<0.1	<0.00015	0.4810	<0.002	<0.002	2.60
		5/4/2016		8.45	5576.05	25.4	588	2190	0.946	7.61	3170	7900	<0.002	0.00224	0.0507	<0.002	0.00	105	0.0097	0.17200	0.00657	4.40	<0.00015	0.4310	<0.002	<0.002	2.40
		9/8/2016		8.66	5575.84	27.4	595	2350	1.33	7.53	3280	8010	<0.002	<0.002	0.0120	<0.002	0.00	170	<0.002	0.14500	0.00628	7.77	<0.00015	0.4710	<0.002	<0.002	2.10
ELF-8	Downgradient	5/9/2017		8.60	5575.90		nough wate		1			, ,											, ,		, ,		
		8/2/2017		8.79	5575.71	31.6	623	2110	1.69	7.54	3260	8420	<0.00200	<0.00200	0.0212	<0.00200			0.0023	0.16100	0.01260	3.54	<0.000150	0.4780	<0.00200	<0.00200	1.07
		2/15/2018		8.56	5575.94	NA	I I .	1 1		T T	T I	T ==== T	<0.00200	<0.00200	0.0130	<0.00200		-	<0.00200	0.19700	0.00633	3.68	<0.000150	0.4310	<0.00200	<0.00200	1.24
		5/30/2018		8.81	5575.69	28.7	537 J-		0.975	7.47	2820	7920	<0.00100	<0.00200	0.0114	<0.00200		-	<0.00200	0.18800	0.00737	3.95 J-	<0.000150 J	J- 0.4410	<0.00200	<0.00200	1.98
		5/8/2019		8.49	5576.01	29.8	606	2100	1.13	7.49	2980	9400	<0.00400	<0.00200	0.0110	<0.00200			<0.00200	0.20100	0.00643	4.03 J+	<0.0000900	0.3990	<0.00200	<0.00200	2.25
		8/20/2019		9.17 8.94	5575.33 5575.56	30.2		1920	<0.100	7.41	3130	8240 8340	<0.00400 <0.00400	<0.00200	0.0124	<0.00200			<0.00200 <0.00200	0.19000 0.20700	0.00762	3.42 3.85	<0.0000900 U	0.4550 0.3900	<0.00200 <0.00200	<0.00200 <0.00200	2.15 1.65
		5/13/2020 10/28/2020		10.52	5573.98	31.8 27.6	635 527	2250 1910	0.885 0.957	7.51 7.74 J	3540 3220	8380	<0.00400	<0.00200 <0.00200	0.0111 0.0115	<0.00200			<0.00200	0.20700	0.00724 0.00786	3.20	<0.0000900	0.4300	<0.00200	<0.00200	2.11
		3/24/2021		8.96	5575.54	28.8	562	2340	1.630	7.74	3720	7820	<0.00400	<0.00200	0.0113	<0.00200		-	<0.00200	0.22800	0.00780	3.24	<0.0000900	0.4210	<0.00200	<0.00200	2.74
		10/25/2021		9.11	5575.39	30.6	578	2040	1.30	7.76 J+		8140	<0.00400	<0.00200	0.0160	<0.00200			<0.00200	0.198	0.00847	3.81	<0.0000900 L	JJ 0.394	<0.00200	<0.00200	2.19 U
		9/18/2015	5597.32	28.03	5569.29	14.4	432	1230	0.500	7.50	10200	14300	<0.001	<0.001	<0.05	<0.001	<0.0	_	<0.001	0.01700	<0.001	3.20	<0.0001	0.0160	0.00700	<0.005	1.20
		11/10/2015	3337.32	28.09	5569.23	16.3	419	1180	<0.1	7.40	9890	15200	<0.002	<0.002	0.0203	<0.002	<0.00	-	<0.002	0.01510	<0.002	10.2	<0.00015	0.0253	0.00644	<0.002	1.20
		12/1/2015		28.45	5568.87	17.0	410	1290	<0.1	7.39	10900	17600	<0.002	<0.002	0.0189	<0.002	<0.00	-	<0.002	0.01530	<0.002	8.58	<0.00015	0.0210	0.00753	<0.002	31.52 J+
		1/12/2016		28.42	5568.90		nough wate					1															1 2 2 1
		2/2/2016		28.38	5568.94	16.3	414	952	<0.100	7.24	7910	15600	<0.002	<0.002	0.0139	<0.002	<0.00	005	<0.002	0.01430	<0.002	8.49	<0.00015	0.0174	0.00739	<0.002	2.12
		3/9/2016		28.46	5568.86	18.1	413	4290	<0.100	7.32	9020	15700	<0.002	<0.002	0.0224	<0.002	<0.00	005	<0.002	0.01310	<0.002	4.33	<0.00015	0.0241	0.00545	<0.002	3.23
		4/6/2016		28.41	5568.91	15.2	412	1230	<0.100	7.28	11100	15800	<0.002	<0.002	0.0191	<0.002	<0.00	005	<0.002	0.01470	<0.002	3.29	<0.00015	0.0214	0.00700	<0.002	1.24
		5/4/2016		28.31	5569.01	14.9	399	1170	<0.100	8.01	10000	15700	<0.002	<0.002	0.0245	<0.002	<0.00	-	<0.002	0.01400	<0.002	4.31	<0.00015	0.0205	0.00666	<0.002	2.78
		9/8/2016		28.20	5569.12	17.3	434	1180	<0.100	7.24	10000	16200	<0.002	<0.002	0.0163	<0.002	<0.00	005	<0.002	0.01260	<0.002	6.44	<0.00015	0.0201	0.00885	<0.002	0.95
ELF-11	Downgradient	5/9/2017		28.13	5569.19		nough wate																				
		8/2/2017		28.36	5568.96	NS - Not e	enough wate	r					1 1	T	T T						T	1 1	T	T T	T T	TT	1 1
		2/15/2018		28.20	5569.12	NA	1	1 000			T ==== 1	1.5700	<0.00200	<0.00200	0.0193	<0.00200			<0.00200	0.01540	<0.00200	3.43	<0.000150	0.0220	0.05560	<0.00200	2.03
		5/30/2018		28.19	5569.13	18.8	406 J-		0.136	7.23 7.23	8780	16700	<0.00100	<0.00200	0.0168	<0.00200			<0.00200	0.02020	<0.00200	3.99 J-	<0.000150 J	J- 0.0201	0.07270	<0.00200	1.83
		5/8/2019 8/20/2019		28.10 28.31	5569.22 5569.01	17.8 17.8	436 442 J+	1100	0.173 <0.100	8.02	9980 9910	16800 17000	<0.00400 <0.00400	<0.00200 <0.00200	0.0142 0.0151	<0.00200		-	<0.00200 <0.00200	0.01460 0.01510	<0.00200 <0.00200	3.49 J+ 3.36	<0.0000900 L	0.0183 JJ 0.0186	0.06490 0.06270	<0.00200 <0.00200	2.48
		5/12/2020		28.11	5569.01	16.1	420	1000	<0.100	7.25	10700	18500	<0.00400	<0.00200	0.0131	<0.00200			<0.00200	0.01310	<0.00200	3.44	<0.0000900	0.0200	0.06270	<0.00200	2.46
		10/28/2020		30.28	5567.04	15.6	384	1040	<0.100		10800	17800	<0.00400	<0.00200	0.0138	<0.00200		-	<0.00200	0.01980	<0.00200	3.15	<0.0000900	0.0183	0.06690	<0.00200	2.75 U
		3/24/2021		28.09	5569.23	15.2	415	1230	0.435	7.38 J+		19100	<0.00400	<0.00200	0.0219	<0.00200		-	0.0026	0.02130	0.00210	3.4	<0.0000900	0.0164	0.08830	<0.00200	3.32
		10/25/2021		28.09	5569.23	16.1	444	1110	<0.100		12100 J-	17500 J+	<0.00400	<0.00200	0.0122	<0.00200			<0.00200	0.0194	<0.00200	4.37	<0.0000900 L	JJ 0.0182	0.1070	<0.00200	1.92
		11/2/2018	5569.99	19.35	5550.64	1.36 J		732	0.262	7.65	11400	21700	<0.00400	<0.00200	0.0207	<0.00200			<0.00200	<0.00400	<0.00200	0.820	<0.000150	<0.00200	<0.00200	<0.00200	4.80
		5/8/2019		19.59	5550.40	1.68		500	0.341		12200	20100	<0.00400	<0.00200	0.0192	<0.00200			<0.00200	<0.00400	<0.00200	0.839 J+	<0.0000900	<0.00200	<0.00200	<0.00200	2.25
		8/20/2019		NM	NM	1.68	169 J+	428	<0.100	7.73	11400	19900	<0.00400	<0.00200	0.0165	<0.00200	<0.000	0500	<0.00200	<0.00400	<0.00200	0.792	<0.0000900 L	JJ <0.00200	<0.00200	<0.00200	2.83
ELF-12	Downgradient	5/12/2020		20.15	5549.84	1.32	151	414	0.896	7.53	11200	19200	<0.00400	<0.00200	0.0099	<0.00200	<0.000	0500	<0.00200	<0.00400	<0.00200	0.937	<0.0000900	<0.00200	<0.00200	<0.00200	3.12
		10/28/2020		20.48	5549.51	1.31	139	392	<0.100	8.05 J	11900	18600	<0.00400	<0.00200	0.0101	<0.00200	<0.000	0500	<0.00200	<0.00400	<0.00200	0.738	<0.0000900	<0.00200	<0.00200	<0.00200	2.42 U
		3/24/2021		20.86	5549.13	1.25	172	640	0.700	7.64 J+	13500	15600	<0.00400	<0.00200	0.0099	<0.00200	<0.000	0500	<0.00200	<0.00400	<0.00200	0.820	<0.0000900	<0.00200	<0.00200	<0.00200	4.26
		10/25/2021		20.79	5549.20	1.25	173	605 J+	0.590	7.85 J+	13300 J-	19000	<0.00400	<0.00200	0.0096	<0.00200	<0.00	0500	<0.00200	<0.00400	<0.00200	1.340	<0.0000900 L	JJ <0.00200	<0.00200	<0.00200	2.85
		11/2/2018	5559.43	3.82	5555.61		+ 471 J-		<0.100	7.24	7470	17900	<0.00400	<0.00200	0.0573	<0.00200	1 1		<0.00200	0.00471	<0.00200	1.72	<0.000150	<0.00200	<0.00200	<0.00200	2.26
		5/8/2019		3.10	5556.33	0.703		2730	<0.100	7.03	7730	16700	<0.00400	<0.00200	0.0111	<0.00200			<0.00200	<0.00400	<0.00200	2.06 J+	<0.0000900	<0.00200	<0.00200	<0.00200	1.58
		8/20/2019		NM	NM	0.732		2420	0.798	7.25	7370	17300	<0.00400	<0.00200	0.0110	<0.00200		-	<0.00200	0.00407	<0.00200	1.86	<0.0000900 L	JJ <0.00200	<0.00200	<0.00200	2.07
ELF-13	Downgradient	5/12/2020		3.52	5555.91	0.536		2770	<0.100	7.05	8300	17000	<0.00400	<0.00200	0.0097	<0.00200			<0.00200	<0.00400	<0.00200	1.82	<0.0000900	<0.00200	<0.00200	<0.00200	2.49
		10/28/2020		4.63	5554.80	0.609		2720	<0.100		8870	16800	<0.00400	<0.00200	0.0100	<0.00200			<0.00200	0.00421	<0.00200	1.74	<0.0000900	<0.00200	<0.00200	<0.00200	2.32
		3/24/2021		4.20	5555.23	0.580		3160	0.243	7.18 J+		16500	<0.00400	<0.00200	0.0092	<0.00200			<0.00200	0.00432	<0.00200	1.84	<0.0000900	<0.00200	<0.00200	<0.00200	2.72
		10/25/2021	5560.91	4.36	5555.07	0.556	459	2810	0.200	7.44 J+		19900	<0.00400	<0.00200	0.00980	<0.00200			<0.00200	0.00426	<0.00200	2.36	<0.0000900 U	JJ <0.00200	<0.00200	<0.00200	2.69
		11/2/2018	2200.91	6.30	5554.61	3.0 J-		3830	0.173	7.56 7.13	7450	20500	<0.00400	<0.00200	0.0464	<0.00200		-	<0.00200	0.01310	<0.00200	4.01	<0.000150	<0.00520	0.00401	<0.00200	1.60 2.58
		5/8/2019 8/20/2019		6.07 NM	5554.84 NM	3.09	534 496 J+	5070	<0.100 0.589	7.13	7280 7280	19700 19800	<0.00400 <0.00400	<0.00200 <0.00200	0.0327 0.0137	<0.00200			0.0089 <0.00200	0.00976 0.00912	0.00241 <0.00200	4.79 J+ 4.58	<0.0000900 C	0.0039 JJ 0.0043	0.00512 0.00664	<0.00200 <0.00200	2.58
ELF-14	Downgradient			6.48	5554.43	2.32		4160	<0.100	7.49	8220	19400	<0.00400	<0.00200	0.0137	<0.00200		-	<0.00200	0.00912	<0.00200	4.58	<0.0000900	0.0039	0.00664	<0.00200	2.69
- L-14	Downgraulent	10/28/2020		6.00	5554.91	2.79	443	3880	<0.100	7.52 7.67 J		18800	<0.00400	<0.00200	0.0102	<0.00200			<0.00200	0.00728	<0.00200	4.12	<0.0000900	0.0039	0.00296	<0.00200	2.12 U
		3/24/2021		6.74	5554.17	2.79		4770	0.413	7.07 J		16900	<0.00400	<0.00200	0.0129	<0.00200			<0.00200	0.00841	<0.00200	4.13	<0.0000900	0.0040	0.00373	<0.00200	2.12 0
		10/25/2021		6.76	5554.15	2.13		4050	0.332	7.42 J+		19600	<0.00400	<0.00200		<0.00200			<0.00200	0.01040	<0.00200	4.66	<0.0000900 L		0.00314	<0.00200	2.19
		10/23/2021	l .	0.70	3337.13	2.70	7.77	7030	0.332	,. <del>,</del> , ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,,	2110 1-	15000	10.00400	10.00200	0.0130	10.00200	. \0.000	.500	.0.00200	0.01040	10.00200	4.00	.0.00000000	0.003//	0.00377	10.00200	2.13

NS: Not Sampled

NM: Not Measured

GWE: Ground Water Elevation

DTW: Depth to Water

TOC: Top of Casing

AMSL: Above Mean Sea Level

Q: Data Validation Qualifier

J: Estimated

J+: Overestimated

UJ: Estimated Non-Detect



**Table 2.** Summary of Groundwater Quality Comparisons – March 2021 Event

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	None Exceed
Arsenic	0.0117	0.01	0.0117	None Exceed
Barium	0.102	2.0	2.0	None Exceed
Beryllium	0.002	0.004	0.004	None Exceed
Cadmium	0.0011	0.0050	0.0050	None Exceed
Chromium	0.0201	0.1000	0.1000	None Exceed
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride Appx IV	4.36	4.0	4.36	None Exceed
Lead	0.012	0.015	0.015	None Exceed
Lithium	4.54	0.04	4.54	None Exceed
Mercury	0.0002	0.002	0.002	None Exceed
Molybdenum	0.158	0.100	0.158	ELF-8
Radium	6.1	5.0	6.1	None Exceed
Selenium	0.608	0.050	0.608	None Exceed
Thallium	0.002	0.002	0.002	None Exceed



Table 3. Summary of Groundwater Quality Comparisons – October 2021 Event

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	None Exceed
Arsenic	0.0117	0.01	0.0117	None Exceed
Barium	0.102	2.0	2.0	None Exceed
Beryllium	0.002	0.004	0.004	None Exceed
Cadmium	0.0011	0.0050	0.0050	None Exceed
Chromium	0.020	0.1000	0.1000	None Exceed
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride Appx IV	4.36	4.0	4.36	None Exceed
Lead	0.012	0.015	0.015	None Exceed
Lithium	4.35	0.04	4.35	ELF-11, ELF-14
Mercury	0.0002	0.002	0.002	None Exceed
Molybdenum	0.158	0.100	0.158	ELF-8
Radium	6.3	5.0	6.3	None Exceed
Selenium	0.608	0.050	0.608	None Exceed
Thallium	0.002	0.002	0.002	None Exceed



# **ATTACHMENT A:**

Field Summary Report – March 2021 Event



**Facility Name:** Hunter Power Plant – CCR Landfill

**Event Description:** Assessment Monitoring

Event Dates: March 24, 2021

Field Personnel: Dennis Vanderbeek, Brad Giles

**ACTIVITY SUMMARY.** PacifiCorp personnel arrived onsite March 24, 2021 and performed groundwater sampling at Hunter CCR Landfill. Prior to collecting samples, field instruments were calibrated, followed by the collection of water levels in the CCR monitoring wells. After recording water levels, the wells were purged in accordance with the EPA low-flow method. Field parameters were monitored during well purging in accordance with the site-specific sampling and analysis plan (SAP). Once field parameters met the SAP stabilization requirements, groundwater samples were collected for Appendix III and Appendix IV constituents. All calibration data and field measurements were recorded on the WET electronic field form. The wells that underwent sampling during this sampling event included:

- ELF-11
- ELF-12
- ELF-13
- ELF-14
- ELF-1D
- ELF-2

- ELF-3
- ELF-4
- ELF-5
- ELF-6
- ELF-7
- ELF-8
- ELF-9

The following details dates for conducting field work and post-field work data processing:

• Date fieldwork completed: 03/24/2021

• Dates unvalidated lab data received: 06/07/2021

• Data validation completion date: 06/28/2021

After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to American West Analytical Laboratories (AWAL) in Salt Lake City, Utah for analysis. Samples arrived at AWAL on 03/26/2021. AWAL subcontracted Radium analyses to ALS Global in Fort Collins, Colorado. Samples arrived at ALS on 03/31/2021. The following information is attached to this summary as a supplement:

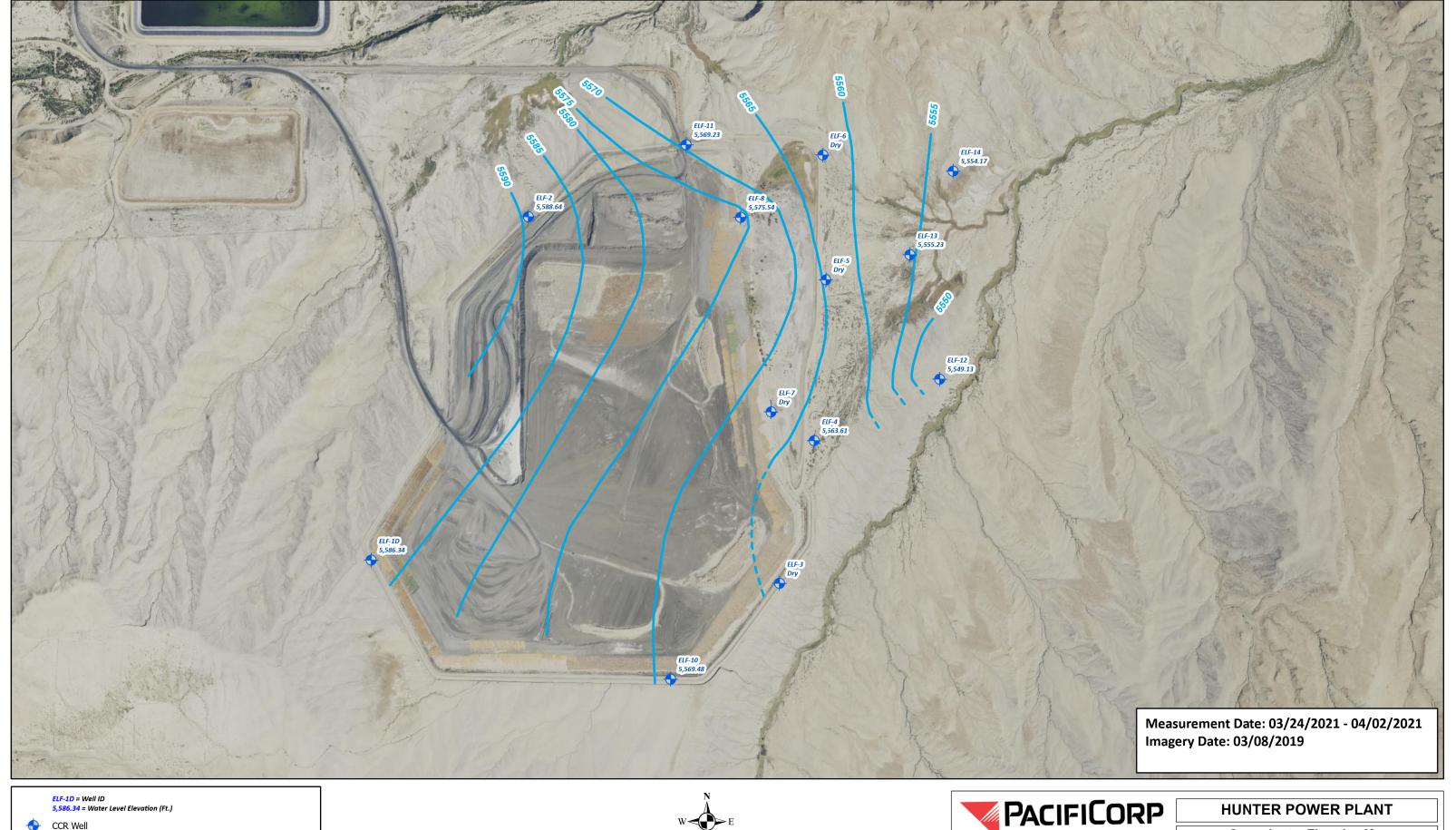
- Attachment A: Groundwater Contour Map
- Attachment B: Data Validation Summary
- Attachment C: Statistical Analysis
- Attachment D: Field Data Sheets
- Attachment E: Laboratory Analytical Reports

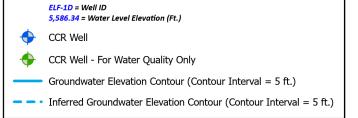
**SAP DEVIATIONS.** Wells ELF-3, ELF-5, ELF-6, ELF-7, ELF-10, and ELF-1D did not have enough water to sample.



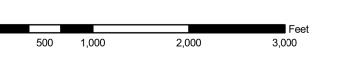
# **Attachment A:**

Groundwater Contour Map











# Job#: PERCM052

Groundwater Elevation Map CCR Landfill

Date: 1/26/2022

**Attachment A** 

Path: M:\PERC\PERC\_CCR\GIS\2021\_CCR\_Sampling\Hunter\GIS\Spring\Hunter\_PERC\_Spring\_GWE.aprx, Author:



# **Attachment B:**

Data Validation Summary

# DATA VALIDATION SUMMARY CCR COMPLIANCE SAMPLING

Facility Name:	Hunter Power	Plant
Validator:	Janelle Garza (	(6/26/2021)
Reviewer:	Marcus Hollan	d (06/28/2021)
Laboratory:		t Analytical Laboratories; Salt Lake City, UT ries; Fort Collins, CO (third party lab for Ra analyses)
Laboratory Work Order#:	2103745	
Sample Media:	Aqueous	
Review Element:	Complete / Criteria Met? (Yes/No)	If no, describe:
Chain of Custody:	Yes	
Field Documentation:	Yes	
Holding Times & Sample Preservation:	No	pH was analyzed past the 15-minute holding time. Laboratory pH was compared against field pH. All samples were qualified as estimated high (J+).
Calibrations:	Yes	
Blanks:	Yes	
Laboratory Control Sample:	Yes	
Duplicates:	No	Laboratory Lab ID 2103748-009ADUP  ❖ TDS RPD was 12.2%, above the limit of 5%. The lab flagged this high RPD due to suspected sample non-homogeneity or matrix interference. No qualification required.
Matrix Spike:	No	Lab ID 2103745-002BMS/D (Sample ID ELF-4)  ❖ Calcium was recovered at -90.8% (MS) and 207% (MSD), outside the limits of 70-130%. The lab flagged these poor recoveries, indicating the analyte concentration was too high for accurate MS recovery and/or RPD. No qualification required.

# **Overall Assessment:**

Out of 230 total data points, 220 data points (95.7%) remain unqualified and are considered quantitative data. The remaining 10 data points (4.3%) were qualified as estimated due to holding time exceedances and are considered qualitative data. No data points were rejected; thus, this sample delivery group is 100% complete and usable.



# **Attachment C:**

Statistical Analysis

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- Table C.4. Comparison of downgradient wells to the Groundwater Protection Standard

#### 1.0 INTRODUCTION

This appendix contains a statistical analysis of the data collected from the groundwater monitoring wells associated with the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah. Methods used to compare upgradient with downgradient wells vary depending on the characteristics of the upgradient well data. Upgradient well data were analyzed for outliers, normality, non-detects, and other characteristics that affect the comparison measures. A comprehensive statistical analysis is presented along with a discussion of the methods used to compare upgradient with downgradient water quality. Table C.1 lists the upgradient and downgradient wells that are used in this analysis. Note that if a well appears in Table C.1 and not in the tables and figures in this appendix it means that no samples were able to be collected from that well.

**Table C.1**. Upgradient and downgradient wells for the CCR Landfill.

Upgradient Well	Downgradient Well
ELF-1D	ELF-3
ELF-2	ELF-4
ELF-9	ELF-5
ELF-10	ELF-6
	ELF-7
	ELF-8
	ELF-11
	ELF-12
	ELF-13
	ELF-14

#### 2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of this statistical analysis was to establish background values from the upgradient well data, and compare these to the downgradient well data to determine if the downgradient water quality has been impacted by the CCR Landfill. Familiarity with numerical and distributional characteristics of the upgradient wells aids in computing appropriate limits and in correctly interpreting those limits. This section contains a statistical summary of the upgradient well data. It is essential to understand the statistical characteristics of the data, prior to making the upgradient / downgradient well comparison. This understanding helps to ensure the appropriate calculations have been done and comparisons are completed using the proper statistical measures. The mean, standard deviation, quartiles, and other statistical quantities and corresponding graphs are presented in the following sections.

# 2.1 Data Analysis Techniques

The following sections summarize the statistical tools and techniques, used to evaluate upgradient well data from the CCR Landfill.

# 2.1.1 Mean

One measure of primary interest is the center of the data. The average ( $\bar{x}$ ), or the mean, is the most commonly used measure of the central tendency of the data. However, it can be heavily influenced by outliers and by asymmetric data. The mean is calculated using Equation (1):

$$\overline{x} = \frac{\sum_{i=1}^{n} x_i}{n} \tag{1}$$

Where:

 $\overline{x}$  = mean

n = number of observations

 $x_i = i^{th}$  observation.

#### 2.1.2 Standard Deviation

Another quantity of interest is the spread of the data. The standard deviation (s) is the most commonly used measure of spread, as it is easy to interpret and is used in many other statistical methods. Because it is calculated using the average, it is also sensitive to outliers and affected by data that are not symmetric. The standard deviation is calculated using Equation (2):

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{n-1}}$$
 (2)

Where:

s = standard deviation

n = number of observations

 $x_i = i^{th}$  observation

 $\bar{x}$  = mean of the observations.

#### 2.1.3 Coefficient of Variance

The coefficient of variance (CV) is a relative measure of variation in the sample data which expresses the standard deviation relative to the mean. The CV is expressed as a percentage and provides a direct comparison to the standard deviations of two different data sets. It is important to note the mean of the data may be very close to or very far away from zero and the spread may be independent of the distance from the mean to zero. Therefore, no firm guidelines have been established for interpreting the CV.

The CV was calculated for each detected analyte in each data grouping using Equation (3):

$$CV = \frac{s}{\overline{X}} \times 100\% \tag{3}$$

Where:

s = standard deviation

 $\bar{X}$  = mean of the observations

# 2.1.4 Quartiles and the Five Number Summary

The five-number summary is a set of five numbers that are used to assess the spread of the data. It consists of the minimum value, first quartile, median, third quartile, and maximum of the data value. The first quartile is the 25<sup>th</sup> percentile of the data, the median is the 50<sup>th</sup> percentile of the data, and the third quartile is the 75<sup>th</sup> percentile of the data. The 25<sup>th</sup> percentile of the data is the number such that 25% of the data are less than that number and 75% of the data are above the 25<sup>th</sup> percentile. The median and third quartiles are found in a similar manner.

#### 2.2 Visual Tools

It is difficult to review numerical summary statistics and identify the degree of symmetry or normality of data without the aid of visual tools. In completing the statistical analysis for the CCR Landfill, histograms and dot plots were developed for each of the analytes with at least one detectable observation. All graphs were developed using the R Statistical Package (R Core Team 2021).

# 2.2.1 Histograms

Histograms display the distribution and symmetry of the data. The data are displayed in such a way, that deviations from a normal (i.e., bell shaped) distribution can easily be observed. Outliers are also often identifiable in a histogram. Histograms for the upgradient wells were generated using both non-detects and detected results. The method detection limits (MDL) are plotted on the histogram with a blue line to show which observations are non-detects.

If an analyte has more than one MDL there will be more than one blue line on the histogram. Figure C.1 below is a histogram of fluoride data for the upgradient wells for the CCR Landfill. It is provided here to illustrate data distribution using a histogram. All of the histograms used to examine the analytes from the CCR Landfill upgradient well data, are provided at the end of this appendix in Figure C.3.

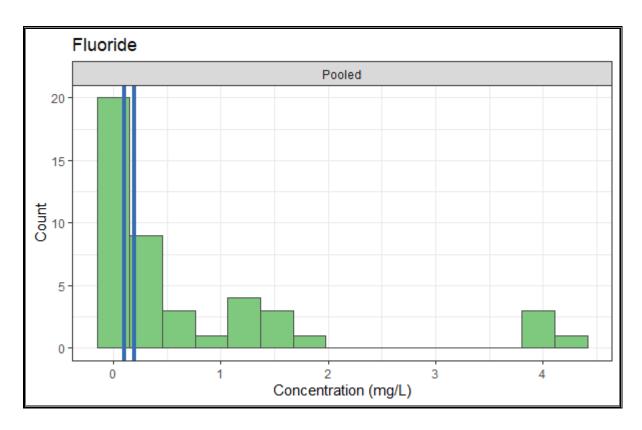


Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells.

# 2.2.2 Dot Plots

A dot plot is a graphical tool used to determine the spread of the data and to look for outliers. Each measured concentration is plotted on the graph so that non-detects and outliers are clearly visible. The MDL for non-detects are shown as green points on the plot. Figure C.2 uses the same fluoride data points used to develop the Figure C.1. Several of the points are non-detects and the concentrations in well ELF-10 are larger than those in the other wells. All of the dot plots used to examine the CCR Landfill upgradient well data are provided at the end of this appendix in Figure C.3.

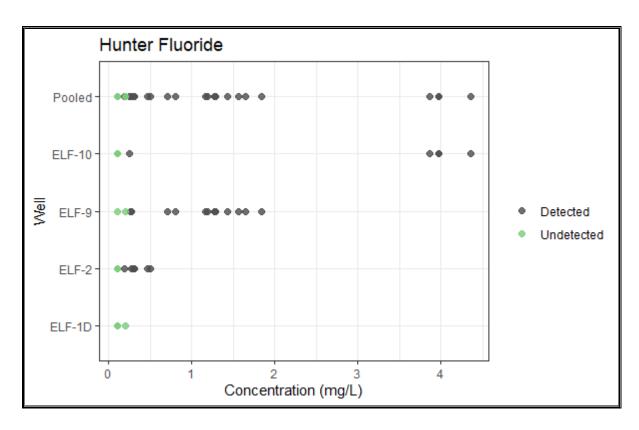


Figure C.2. Dot plot of fluoride data the CCR Landfill upgradient wells

# 2.2.3 Outliers

Outliers are data points that are notably larger or smaller than the rest of the data set and may indicate a problem with the data point or the data set as a whole. Examples which may be indicative of outliers include: 1) a misreported or erroneous concentration, 2) analytical error(s), or 3) natural variations in groundwater concentrations. Outliers are generally not omitted from project data simply because they are outliers. Rather, the result is examined individually or by project, to ensure the outlier does not represent an erroneous result or another concern warranting either additional sampling or omission of the outlier from the data analysis. There are reasonable situations when it is appropriate to remove outliers. For example, if outliers which represent exceedingly low concentrations are used to compute background concentrations, they may result in background levels which are too conservative. Conversely, use of excessively high outlier concentrations to compute background values, may result in an overestimation of background concentrations resulting in false-negative comparisons for downgradient groundwater quality.

Outliers were detected in the cadmium, cobalt, lead, and radium data CCR Landfill data. However, none of the outliers are extreme enough to warrant removal from the dataset. The MDLs for the non-detects in the boron upgradient data were 5 mg/L and the largest detected value was less than 4 mg/L. This is an unusually large MDL and its inclusion would have resulted in a Groundwater Protection Standard (GWPS) that was larger than any concentration detected in the upgradient wells. Thus, the non-detects were removed from the upgradient boron data and are not included in any tables or graphs in this appendix.

#### 2.2.4 Treatment of Non-Detects

Non-detect values are common in environmental data. When present in data sets, non-detects produce difficulties in computing statistical metrics because reliable values cannot be assigned. Substituting a value such as the MDL or one-half of the MDL for non-detects are common practices. However, use of the detection limit, or one-half of the detection limit, can produce unstable or unreliable results (EPA 2009). Statistical methods, such as Kaplan-Meier (Helsel 2004), can be used to appropriately evaluate data sets containing significant quantities of non-detects, by producing estimates of the survival probability function for non-detects. These estimates can then be used to compute summary statistics on the data set. However, Kaplan-Meier does not perform well if more than 50% of the results are non-detects or if fewer than eight detections are available for evaluation.

The arsenic, cadmium, chromium, cobalt, and lead data have more than 50% non-detects. Antimony, beryllium, mercury, and thallium were not detected in any of the samples. Thus, statistical analysis cannot be done for those analytes. The fluoride and selenium data have more than 15% non-detects, but more than half of the data are detected. As a result, Kaplan-Meier was used to compute means, standard deviations, and statistical limits used to compare the upgradient to downgradient water quality for fluoride and selenium.

# 2.3 Summary Results

Table C.2 provides summary statistics for the CCR Landfill upgradient well data. Although the data from the upgradient wells were combined when compared to the downgradient wells, the summary statistics presented in this section are separated by well and are presented as pooled data. The data are presented in this way, due to observed differences between the different wells for many of the analytes. These tables in conjunction with the histograms and normal-quantile plots, provide information about differences between wells and the data properties of the combined data. Note that summary stats were only computed for analytes and wells with at least 50% detects and at least eight detected samples. Analytes that were not detected in any upgradient well samples are not listed in Table C.2.

**Table C.2.** Summary statistics for the CCR Landfill upgradient wells

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Arsenic	ELF-1D	4	0	< 0.002	NA	NA	NA
Arsenic	ELF-2	17	0	< 0.002	NA	NA	NA
Arsenic	ELF-9	15	15	0.007	0.007	0.002	29
Arsenic	ELF-10	13	3	< 0.002	NA	NA	NA
Arsenic	Pooled	49	18	< 0.002	NA	NA	NA
Barium	ELF-1D	4	4	0.0094	NA	NA	NA
Barium	ELF-2	17	16	0.0100	0.0133	0.0099	74

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Barium	ELF-9	15	15	0.0189	0.0382	0.0329	86
Barium	ELF-10	13	13	0.0353	0.0402	0.0220	55
Barium	Pooled	49	48	0.0138	0.0278	0.0255	92
Boron	ELF-1D	3	3	2.19	NA	NA	NA
Boron	ELF-2	16	16	3.33	3.36	0.175	5
Boron	ELF-9	13	13	1.45	1.49	0.205	14
Boron	ELF-10	12	12	1.61	1.66	0.174	10
Boron	Pooled	44	44	1.86	2.26	0.872	39
Cadmium	ELF-1D	4	0	< 0.0005	NA	NA	NA
Cadmium	ELF-2	17	0	< 0.0005	NA	NA	NA
Cadmium	ELF-9	15	1	< 0.0005	NA	NA	NA
Cadmium	ELF-10	13	6	< 0.0005	NA	NA	NA
Cadmium	Pooled	49	7	< 0.0005	NA	NA	NA
Calcium	ELF-1D	3	3	366	NA	NA	NA
Calcium	ELF-2	16	16	401	400	22.7	6
Calcium	ELF-9	14	14	59.5	73.7	31.9	43
Calcium	ELF-10	12	12	472	474	34.7	7
Calcium	Pooled	45	45	394	316	170	54
Chloride	ELF-1D	3	3	6640	NA	NA	NA
Chloride	ELF-2	16	16	435	359	118	33
Chloride	ELF-9	14	14	404	408	90.1	22
Chloride	ELF-10	12	12	7530	8254	2012	24
Chloride	Pooled	45	45	461	2899	3758	130
Chromium	ELF-1D	4	1	< 0.002	NA	NA	NA
Chromium	ELF-2	17	2	< 0.002	NA	NA	NA
Chromium	ELF-9	15	7	< 0.002	NA	NA	NA
Chromium	ELF-10	13	10	0.0030	0.005	0.004	84
Chromium	Pooled	49	20	< 0.002	NA	NA	NA
Cobalt	ELF-1D	4	1	< 0.004	NA	NA	NA
Cobalt	ELF-2	17	10	0.0048	0.0054	0.0019	36
Cobalt	ELF-9	15	2	< 0.004	NA	NA	NA
Cobalt	ELF-10	13	10	0.0043	0.0050	0.0014	28
Cobalt	Pooled	49	23	< 0.004	NA	NA	NA
Fluoride	ELF-1D	3	0	< 0.1	NA	NA	NA
Fluoride	ELF-2	16	8	0.100	0.19	0.14	72

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Fluoride	ELF-9	14	12	1.18	0.98	0.59	60
Fluoride	ELF-10	12	5	< 0.1	NA	NA	NA
Fluoride	Pooled	45	25	0.20	0.76	1.15	151
Lead	ELF-1D	4	0	< 0.002	NA	NA	NA
Lead	ELF-2	17	1	< 0.002	NA	NA	NA
Lead	ELF-9	15	4	< 0.002	NA	NA	NA
Lead	ELF-10	13	6	< 0.002	NA	NA	NA
Lead	Pooled	49	11	< 0.002	NA	NA	NA
Lithium	ELF-1D	4	4	2.16	NA	NA	NA
Lithium	ELF-2	17	17	1.61	2.32	1.21	52
Lithium	ELF-9	15	15	0.888	1.04	0.457	44
Lithium	ELF-10	13	13	2.17	2.33	1.06	45
Lithium	Pooled	49	49	1.60	1.92	1.09	57
Molybdenum	ELF-1D	4	4	0.0163	NA	NA	NA
Molybdenum	ELF-2	17	16	0.0031	0.0032	0.0007	23
Molybdenum	ELF-9	15	15	0.113	0.1074	0.0293	27
Molybdenum	ELF-10	13	13	0.0855	0.0827	0.0333	40
Molybdenum	Pooled	49	48	0.0546	0.0573	0.0516	90
рН	ELF-1D	3	3	7.27	NA	NA	NA
рН	ELF-2	16	16	7.26	7.30	0.165	2
рН	ELF-9	14	14	7.94	7.91	0.149	2
pН	ELF-10	12	12	7.18	7.27	0.429	6
pН	Pooled	45	45	7.30	7.47	0.388	5
Radium	ELF-1D	4	4	1.72	NA	NA	NA
Radium	ELF-2	17	17	1.49	1.91	1.73	90
Radium	ELF-9	15	15	1.38	1.49	0.60	40
Radium	ELF-10	13	13	2.41	3.06	3.50	114
Radium	Pooled	49	49	1.56	2.08	2.14	103
Selenium	ELF-1D	4	0	< 0.002	NA	NA	NA
Selenium	ELF-2	17	17	0.366	0.280	0.229	82
Selenium	ELF-9	15	1	< 0.002	NA	NA	NA
Selenium	ELF-10	13	9	0.009	0.088	0.132	149
Selenium	Pooled	49	27	0.0042	0.121	0.192	158
Sulfate	ELF-1D	3	3	8640	NA	NA	NA
Sulfate	ELF-2	16	16	7925	7661	727	9

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Sulfate	ELF-9	14	14	6640	6566	772	12
Sulfate	ELF-10	12	12	17050	15428	4817	31
Sulfate	Pooled	45	45	7950	9444	4450	47
TDS	ELF-1D	3	3	27000	NA	NA	NA
TDS	ELF-2	16	16	12000	11913	405	3
TDS	ELF-9	14	14	10650	10759	773	7
TDS	ELF-10	12	12	38000	37267	2478	7
TDS	Pooled	45	45	12000	19354	11726	61

Table C.3 provides the five-number summaries for the CCR Landfill upgradient wells. As with the summary statistics, a five-number summary was computed for each well as well as for the pooled data. If a minimum or a quartile falls within the range of non-detects it is denoted using a less-than (<) symbol. Analytes that were not detected in any of the upgradient well samples are not listed in Table C.3.

**Table C.3.** Five-number summary for the CCR Landfill upgradient wells.

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Arsenic	ELF-1D	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Arsenic	ELF-2	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002
Arsenic	ELF-9	0.005	0.006	0.007	0.008	0.0117
Arsenic	ELF-10	< 0.002	< 0.002	< 0.002	< 0.002	0.0093
Arsenic	Pooled	< 0.001	< 0.002	< 0.002	0.0055	0.0117
Barium	ELF-1D	0.0084	0.0084	0.0094	0.0103	0.0103
Barium	ELF-2	< 0.0084	0.0095	0.0100	0.012	0.050
Barium	ELF-9	0.0122	0.0131	0.0189	0.0589	0.102
Barium	ELF-10	0.0145	0.0205	0.0353	0.0519	0.0863
Barium	Pooled	< 0.0084	0.0103	0.0138	0.0353	0.102
Boron	ELF-1D	2.10	2.15	2.19	2.21	2.23
Boron	ELF-2	3.11	3.25	3.33	3.49	3.77
Boron	ELF-9	1.27	1.35	1.45	1.57	1.91
Boron	ELF-10	1.48	1.56	1.61	1.69	2.12
Boron	Pooled	1.27	1.54	1.86	3.26	3.77
Cadmium	ELF-1D	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	ELF-2	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.001

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Cadmium	ELF-9	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005
Cadmium	ELF-10	< 0.0005	< 0.0005	< 0.0005	0.0006	0.0011
Cadmium	Pooled	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0011
Calcium	ELF-1D	353	360	366	372	377
Calcium	ELF-2	356	390	401	419	430
Calcium	ELF-9	48.9	57.1	59.5	79.9	166
Calcium	ELF-10	407	454	472	488	543
Calcium	Pooled	48.9	91.9	394	430	543
Chloride	ELF-1D	6430	6535	6640	6760	6880
Chloride	ELF-2	197	221	435	458	473
Chloride	ELF-9	282	354	404	460	595
Chloride	ELF-10	5710	7080	7530	9068	12100
Chloride	Pooled	197	363	461	6790	12100
Chromium	ELF-1D	< 0.002	< 0.002	< 0.002	0.0021	0.0023
Chromium	ELF-2	< 0.001	< 0.002	< 0.002	< 0.002	0.011
Chromium	ELF-9	< 0.002	< 0.002	< 0.002	0.0096	0.0201
Chromium	ELF-10	< 0.002	0.0020	0.0030	0.0057	0.0164
Chromium	Pooled	< 0.001	< 0.002	< 0.002	0.0050	0.0201
Cobalt	ELF-1D	< 0.004	< 0.004	< 0.004	0.0044	0.0054
Cobalt	ELF-2	< 0.004	< 0.004	0.0048	0.0060	0.0114
Cobalt	ELF-9	< 0.004	< 0.004	< 0.004	< 0.004	0.0052
Cobalt	ELF-10	< 0.004	0.0041	0.0043	0.0055	0.0079
Cobalt	Pooled	< 0.004	< 0.004	< 0.004	0.0052	0.0114
Fluoride	ELF-1D	< 0.1	< 0.1	<0.1	< 0.15	< 0.2
Fluoride	ELF-2	< 0.1	< 0.1	0.100	0.2825	0.500
Fluoride	ELF-9	< 0.1	0.384	1.18	1.395	1.84
Fluoride	ELF-10	< 0.1	< 0.1	<0.1	3.90	4.36
Fluoride	Pooled	< 0.1	< 0.1	0.20	1.16	4.36
Lead	ELF-1D	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Lead	ELF-2	< 0.001	< 0.002	< 0.002	< 0.002	0.0020
Lead	ELF-9	< 0.002	< 0.002	< 0.002	0.0032	0.0077
Lead	ELF-10	< 0.002	< 0.002	< 0.002	0.0031	0.012
Lead	Pooled	< 0.001	< 0.002	< 0.002	< 0.002	0.012
Lithium	ELF-1D	1.96	2.08	2.16	2.19	2.20
Lithium	ELF-2	1.34	1.50	1.61	3.50	4.93
Lithium	ELF-9	0.724	0.771	0.888	1.06	2.48

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Lithium	ELF-10	0.841	1.76	2.17	2.90	4.59
Lithium	Pooled	0.724	1.06	1.60	2.19	4.93
Molybdenum	ELF-1D	0.0153	0.0159	0.0163	0.0175	0.0207
Molybdenum	ELF-2	< 0.002	0.0028	0.0031	0.0034	0.0050
Molybdenum	ELF-9	0.0569	0.0875	0.113	0.125	0.158
Molybdenum	ELF-10	0.0331	0.0546	0.0855	0.115	0.124
Molybdenum	Pooled	< 0.002	0.0034	0.0546	0.109	0.158
рН	ELF-1D	7.02	7.15	7.27	7.29	7.30
рН	ELF-2	7.12	7.20	7.26	7.36	7.76
рН	ELF-9	7.51	7.86	7.94	8.03	8.06
рН	ELF-10	6.85	7.00	7.18	7.31	8.37
рН	Pooled	6.85	7.21	7.30	7.86	8.37
Radium	ELF-1D	1.09	1.20	1.72	2.31	2.63
Radium	ELF-2	0.61	0.94	1.49	2.17	8.10
Radium	ELF-9	0.64	1.15	1.38	1.88	2.60
Radium	ELF-10	0.46	1.14	2.41	3.10	14.2
Radium	Pooled	0.46	1.10	1.56	2.30	14.2
Selenium	ELF-1D	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Selenium	ELF-2	0.0031	0.034	0.366	0.463	0.608
Selenium	ELF-9	< 0.002	< 0.002	< 0.002	< 0.002	0.0042
Selenium	ELF-10	< 0.002	< 0.002	0.009	0.146	0.410
Selenium	Pooled	< 0.002	< 0.002	0.0042	0.157	0.608
Sulfate	ELF-1D	7730	8185	8640	8790	8940
Sulfate	ELF-2	6030	7130	7925	8158	8720
Sulfate	ELF-9	5460	5855	6640	7035	8030
Sulfate	ELF-10	8610	10225	17050	19825	20700
Sulfate	Pooled	5460	6850	7950	8940	20700
TDS	ELF-1D	26800	26900	27000	27850	28700
TDS	ELF-2	11300	11575	12000	12225	12600
TDS	ELF-9	9420	10325	10650	11125	12000
TDS	ELF-10	32900	35275	38000	38850	40300
TDS	Pooled	9420	11300	12000	32900	40300

#### 3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON

Groundwater quality was assessed using upper tolerance limits (UTLs) and the Maximum Contaminant Levels (MCL) for each of the Appendix III and IV analytes. The data measured from the upgradient/background wells were used to compute a UTL, which serves as the background value. The larger of the UTL and MCL was used as the Groundwater Protection Standard (GWPS). Data obtained from the downgradient wells were compared point-by-point to the GWPSs to determine if the site complies with the *Final Rule*. The software package Sanitas© v.2016, was used to compute the UTLs. As part of this evaluation, groundwater data were examined for characteristics that impact how the UTL was computed. These characteristics include the:

- Number of non-detect results
- Data distribution
- Site-wide false-positive rate (SWFPR)
- Spatial and seasonal variability.

Summary statistics and other statistical characteristics of the data are discussed in the previous section. These characteristics were used to compute the appropriate UTL for each analyte.

### 3.1 Groundwater Protection Standards

The shape or distribution of the data was assessed to ensure that the most appropriate UTL was used for comparison purposes. The most efficient UTL is a parametric UTL that assumes the data follow a normal distribution. If the data do not follow a normal distribution, a non-parametric UTL is typically used. Thus, the data for each analyte are assessed to determine if a parametric UTL can be computed from the data. The parametric UTL is computed using the formula below:

$$UTL = \bar{X} + \kappa \times S$$

Where:

 $\overline{X}$  = the average of the background data

 $\kappa$  = multiplier from EPA Unified Guidance, March 2009

S = standard deviation of the background data

#### 3.1.1 Normal Distribution

Histograms and dot plots were used to visually inspect the data for deviations from normality and to determine if outliers are present. This examination reveals the outliers are present in the cadmium, cobalt, lead, and radium data. The Shapiro-Wilk test was used to assess normality in conjunction with the normal quantile plots. If the p-value associated with the test was greater than or equal to 0.05, the data are considered normally distributed and a parametric UTL was computed using the upgradient measurements. If the p-value is less than 0.05, then the maximum detected value was used as the UTL.

*Note:* The 0.05 p-value is not a hard and fast rule. Parametric UTLs were computed for analytes whose p-values were sufficiently close to 0.05 as determined by the Sanitas software (Sanitas 2016).

If the data for an analyte were not normally distributed, the ladder of powers method was used to determine if a reasonable transformation existed that would produce normal data. The ladder of powers tests different monotonic transformations of the data, such as the natural logarithm or square, to see if the transformed data have a normal distribution. If a transformation within the ladder of powers can be found that produces normal data, a parametric UTL was computed using the transformed data. If a transformation was identified, it was applied to both upgradient / background and downgradient groundwater data prior to comparison.

A non-parametric UTL was computed for data that are not normally distributed and cannot be transformed. The non-parametric UTL is the largest value measured in the upgradient / background wells. Table C.4 summarizes the results of the Shapiro-Wilk test for each of the Appendix III and IV analytes where at least 50% of the measurements were detects. An appropriate transformation was found for lithium and radium. Non-parametric UTLs were computed for all of the analytes except for lithium and radium.

**Table C.4.** Shapiro-Wilk Test for the CCR Landfill upgradient wells.

Analyte	W-Statistic	P-Value	Normal
Barium	0.7500	< 0.0001	No
Boron	0.8188	< 0.0001	No
Calcium	0.7961	< 0.0001	No
Chloride	0.6976	< 0.0001	No
Fluoride	0.6249	< 0.0001	No
Lithium	0.8675	< 0.0001	No
Cube Root of Lithium	0.9401	0.0149	Yes
Molybdenum	0.8545	< 0.0001	No
рН	0.9233	0.0055	No
Radium	0.5299	< 0.0001	No
LN of Radium	0.9475	0.0293	Yes
Selenium	0.6650	< 0.0001	No
Sulfate	0.7034	< 0.0001	No
TDS	0.7031	< 0.0001	No

## 3.1.2 Upper Tolerance Limits and Groundwater Protection Standard

This section contains the GWPS computed for each analyte. Table C.5 lists the UTL, MCL, and GWPS for each of the analytes in the upgradient wells. The following criteria were used for determining each GWPS:

• If more than 50% of the data were detected and have a normal distribution, a parametric UTL was computed.

- If the data were not normally distributed or more than 50% of the data were nondetects, the greater of the largest MDL and maximum detected value was used as the UTL.
- If all of the upgradient samples were non-detects, the largest MDL was used as the UTL.
- The larger of the MCL and the UTL was used as the GWPS.
- Fluoride is compared to both the MCL and the UTL if the MCL exceeds the UTL, to meet the criteria for Appendix III constituents.

Figure C.4 shows graphs that were constructed for each of the analytes that had at least one detectable measurement in the downgradient wells. The graphs illustrate the GWPS as a horizontal line with the measurements from each of the downgradient wells plotted on the same graph. Non-detects are represented by hollow gray circles on the graphs. These graphs clearly depict how the downgradient measurements compare to the GWPS.

Results above the GWPS line represent values exceeding the GWPS. As the graphs illustrate, boron, calcium, cobalt, and molybdenum exceed the GWPS. Table C.5 list the GWPSs and the wells that exceed the GWPS for each analyte (Figure C.4). GWPS plots are not provided for analytes that were not detected in any downgradient samples.

Table C.5. Comparison of downgradient wells to the Groundwater Protection Standard

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	Within Limit
Arsenic	0.0117	0.01	0.0117	Within Limit
Barium	0.102	2.0	2.0	Within Limit
Beryllium	0.002	0.004	0.004	Within Limit
Boron	3.77	NA	3.77	ELF-4, ELF-8, ELF-11
Cadmium	0.0011	0.0050	0.0050	Within Limit
Calcium	543	NA	543	ELF-8
Chloride	12100	NA	12100	Within Limit
Chromium	0.0201	0.1000	0.1000	Within Limit
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	Within Limit
Fluoride Appendix III	4.36	NA	4.36	Within Limit
Lead	0.012	0.015	0.015	Within Limit
Lithium	4.54	0.04	4.54	Within Limit
Mercury	0.0002	0.002	0.002	Within Limit
Molybdenum	0.158	0.100	0.158	ELF-8

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
pH Acidic Range	6.85	NA	6.85	Within Limit
pH Basic Range	8.37	NA	8.37	Within Limit
Radium	6.1	5.0	6.1	Within Limit
Selenium	0.608	0.050	0.608	Within Limit
Sulfate	20700	NA	20700	Within Limit
TDS	40300	NA	40300	Within Limit
Thallium	0.002	0.002	0.002	Within Limit

### 4.0 CONCLUSIONS

Groundwater data was collected from the CCR Landfill monitoring network at the Hunter Power Plant. A comprehensive data analysis was completed on the upgradient wells to ensure that comparisons between upgradient and downgradient wells were done correctly.

During the March 2021 sampling event, statistically significant increases (SSIs) above background were noted for Appendix III constituents:

- Boron
- Calcium

SSIs above groundwater protection standards were noted for Appendix IV constituents:

- Cobalt
- Molybdenum

## 5.0 REFERENCES

- EPA, 2009, "Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities Unified Guidance," EPA 530/R-09-007, U.S. Environmental Protection Agency, March 2009.
- Helsel, Dennis, 2004, Nondetects and Data Analysis: Statistic for Censored Environmental Data, New York: Wiley Interscience.
- R Core Team, 2021, R: A Language and Environment for Statistical Computing, <a href="https://www.R-project.org">https://www.R-project.org</a>, R Foundation for Statistical Computing, Vienna, Austria.
- Sanitas Technologies, 2016, Sanitas, www.sanitastech.com, Shawnee, Kansas.

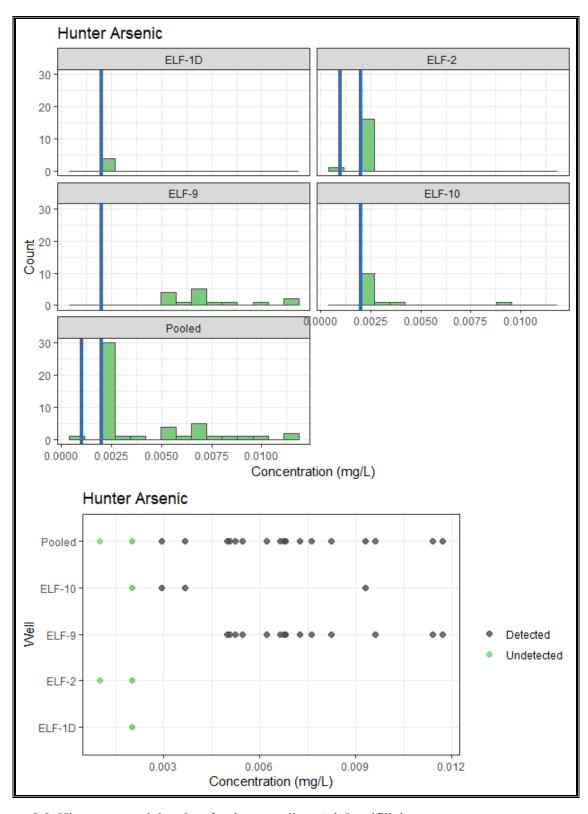


Figure C.3. Histograms and dot plots for the upgradient Ash Landfill data.

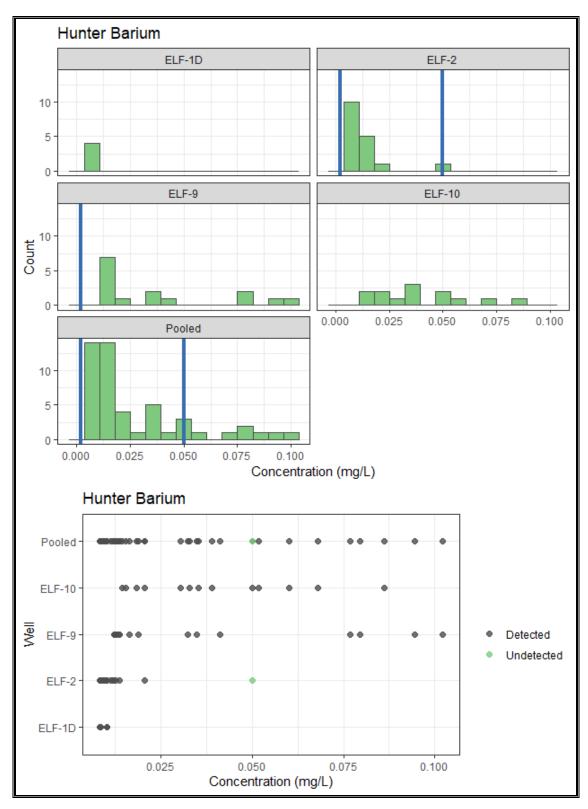


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

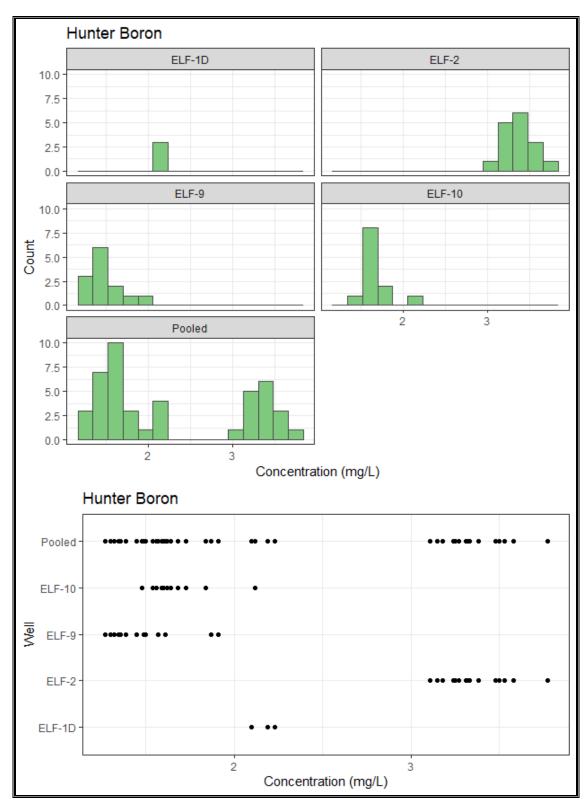


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

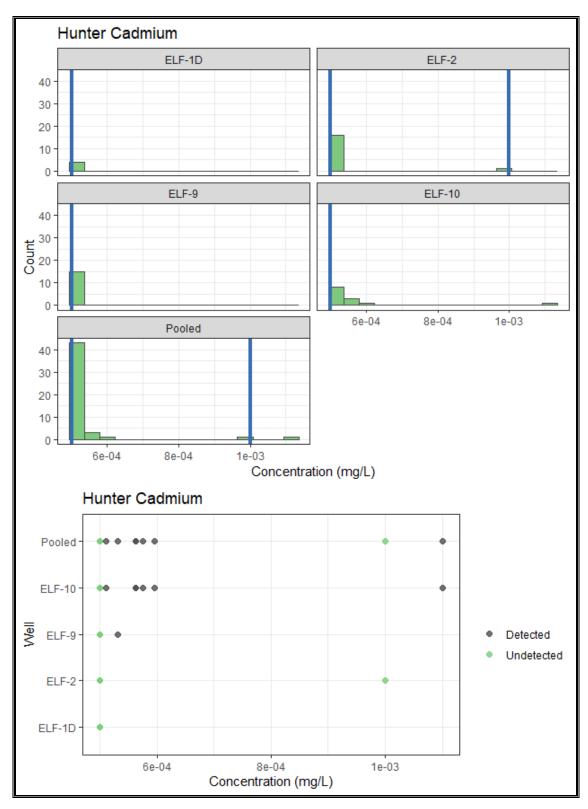


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

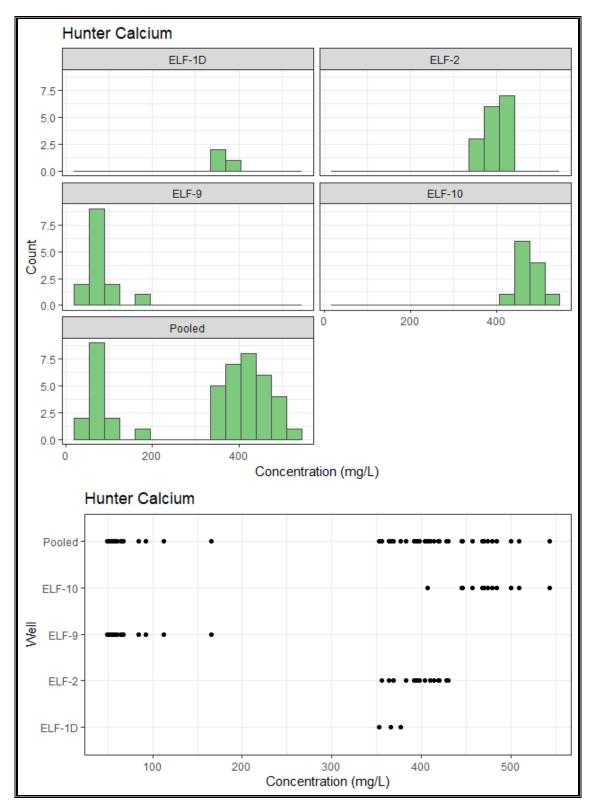


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

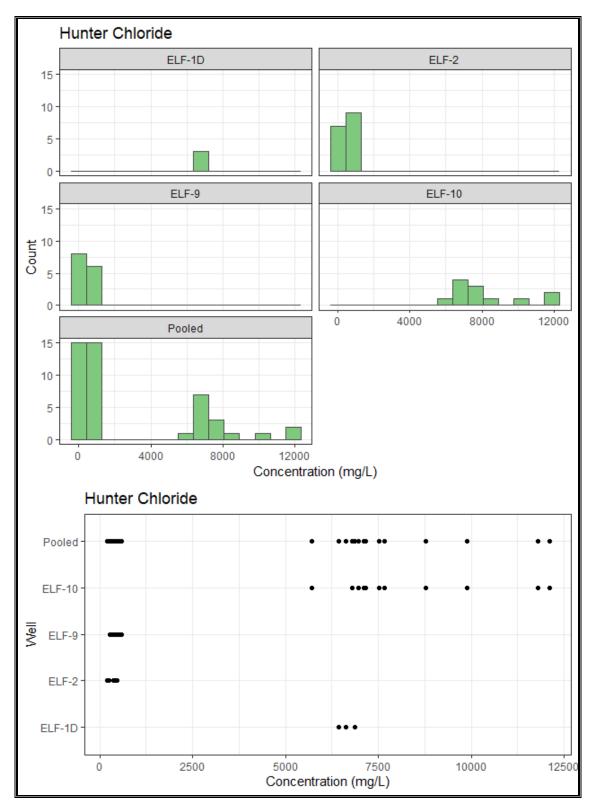


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

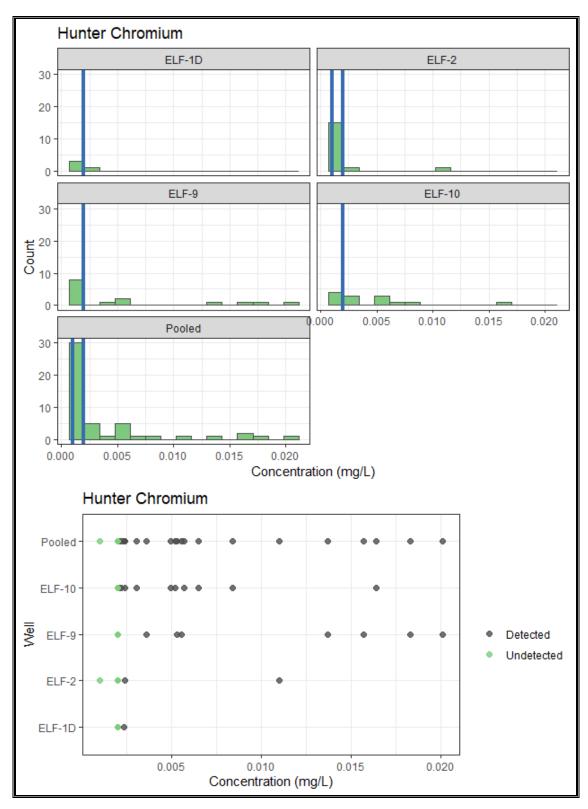


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

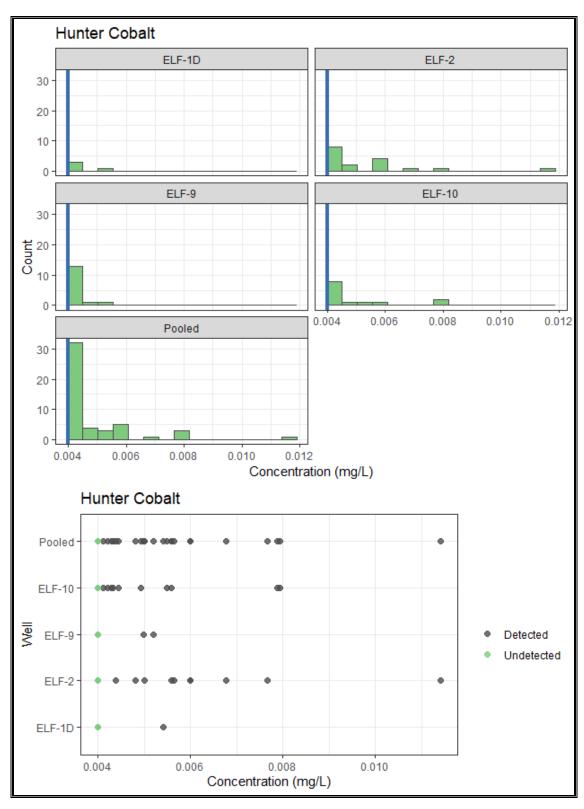


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

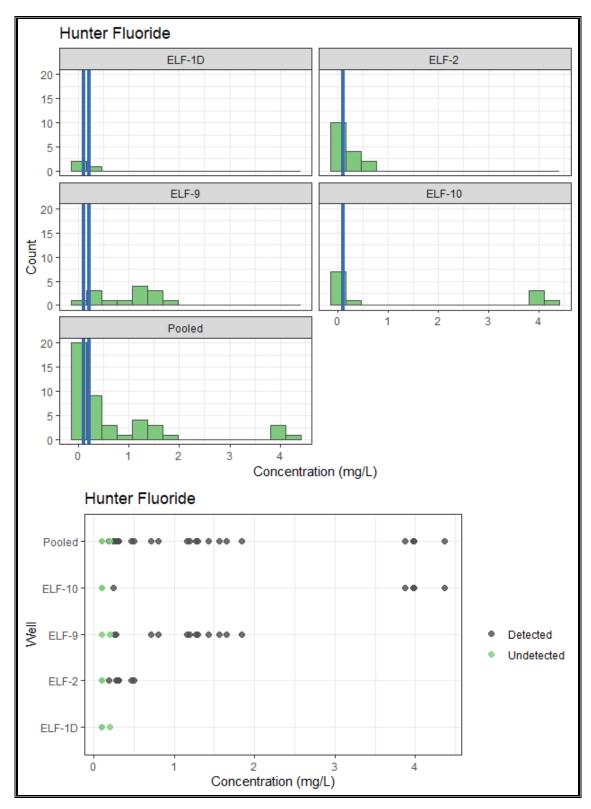


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

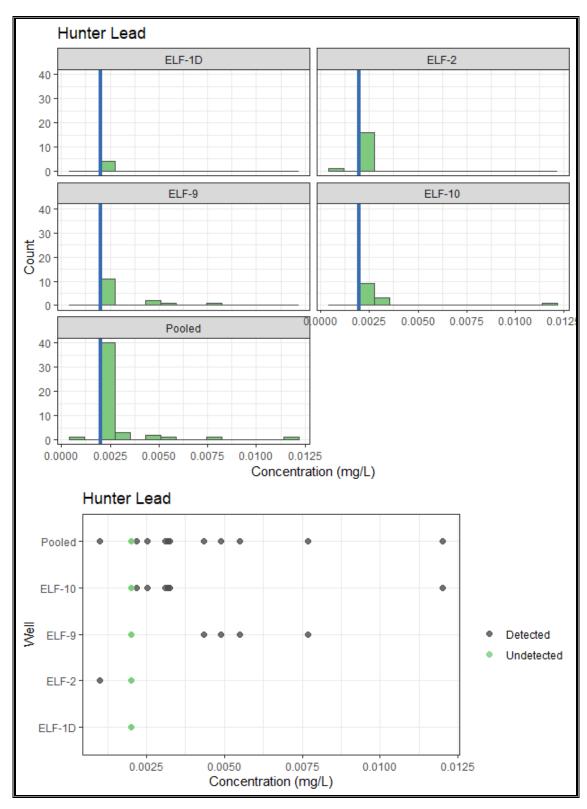


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

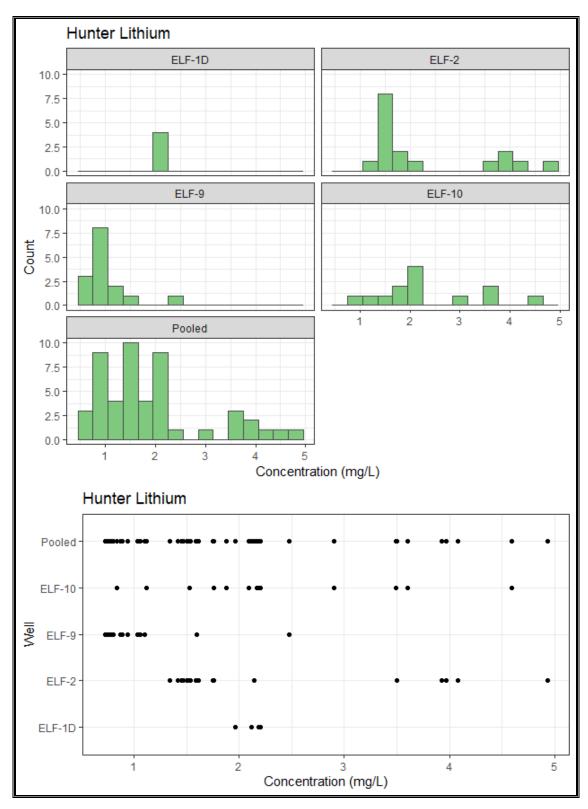


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

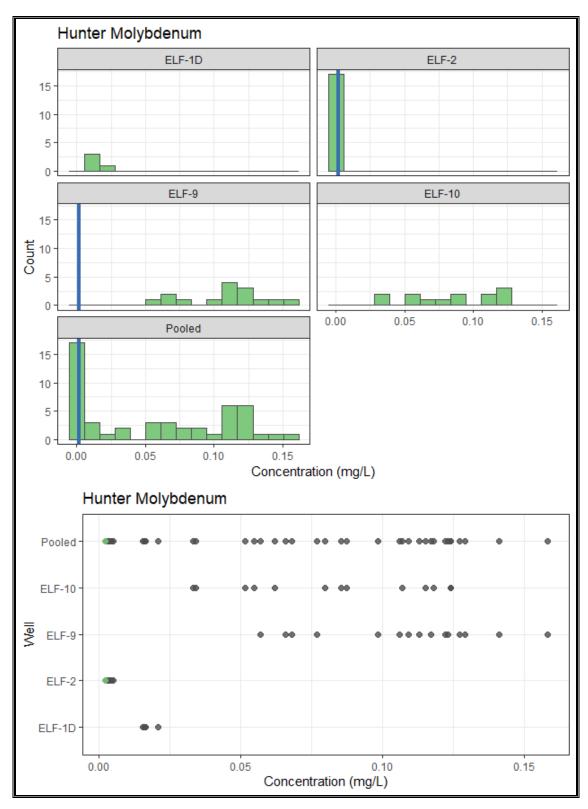


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

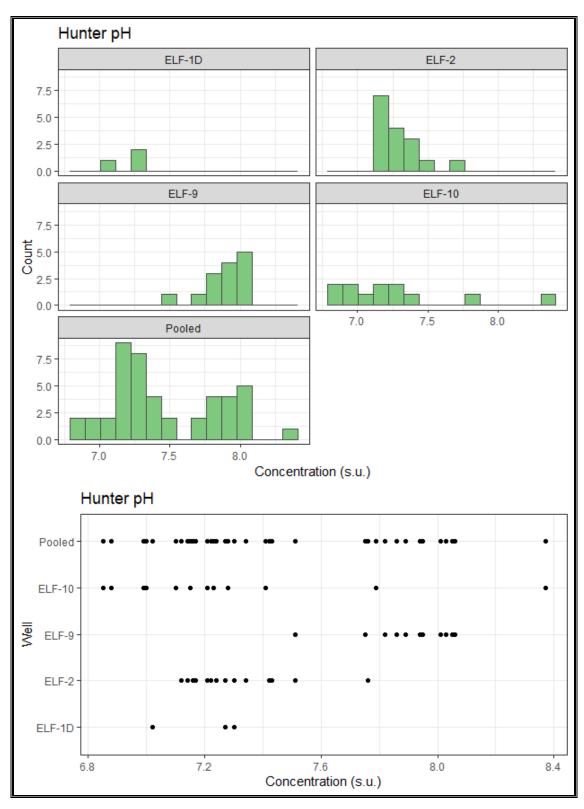


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

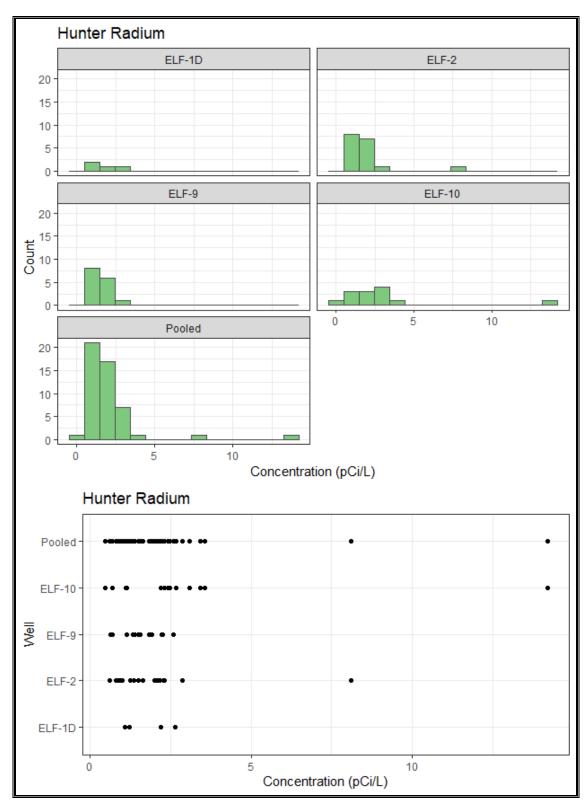


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

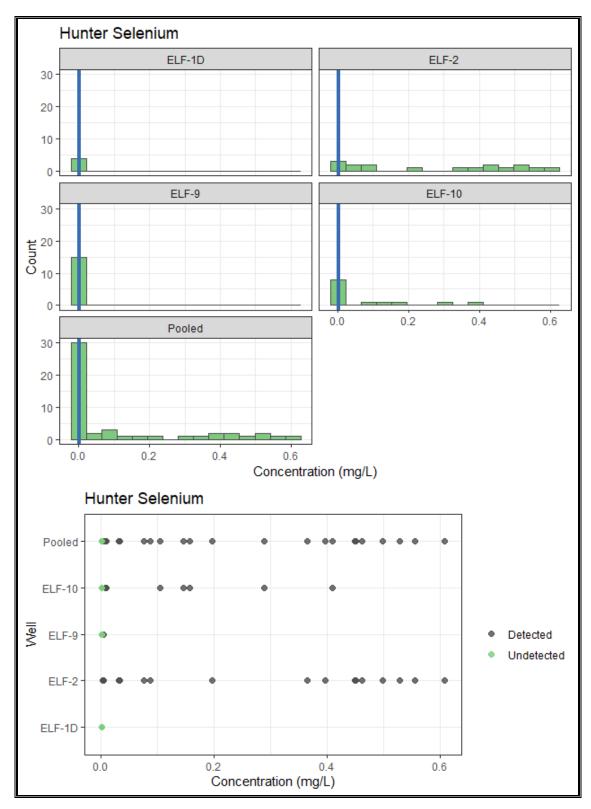


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

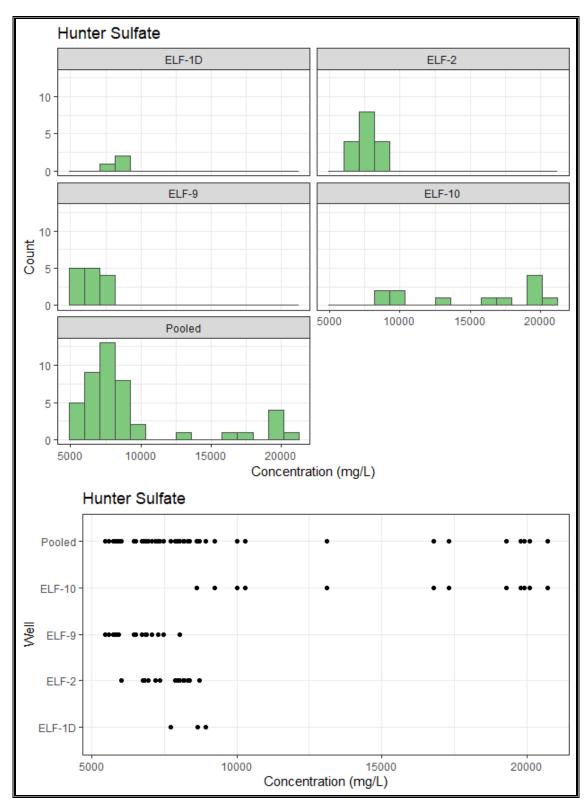


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

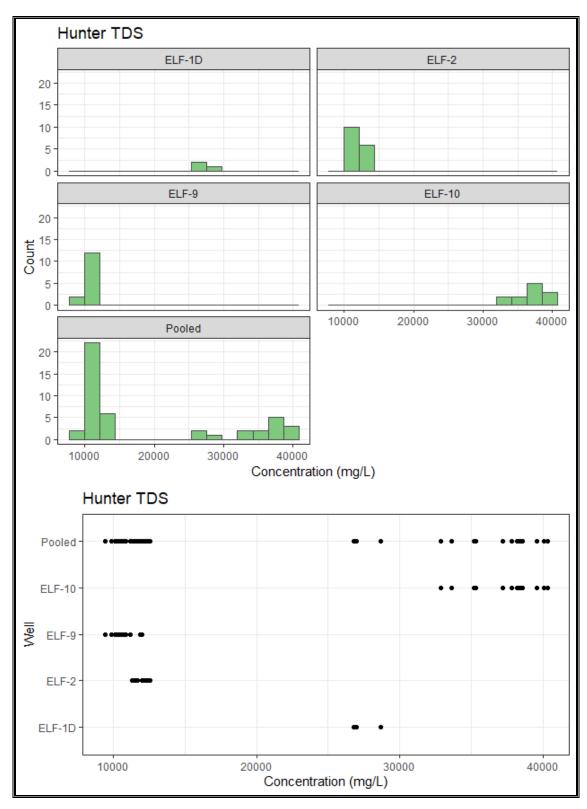


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

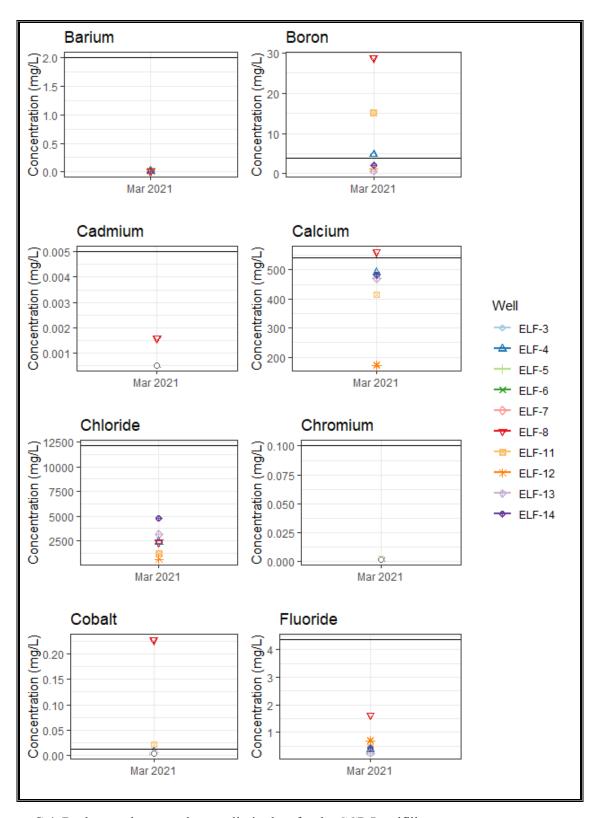


Figure C.4. Background upper tolerance limit plots for the CCR Landfill.

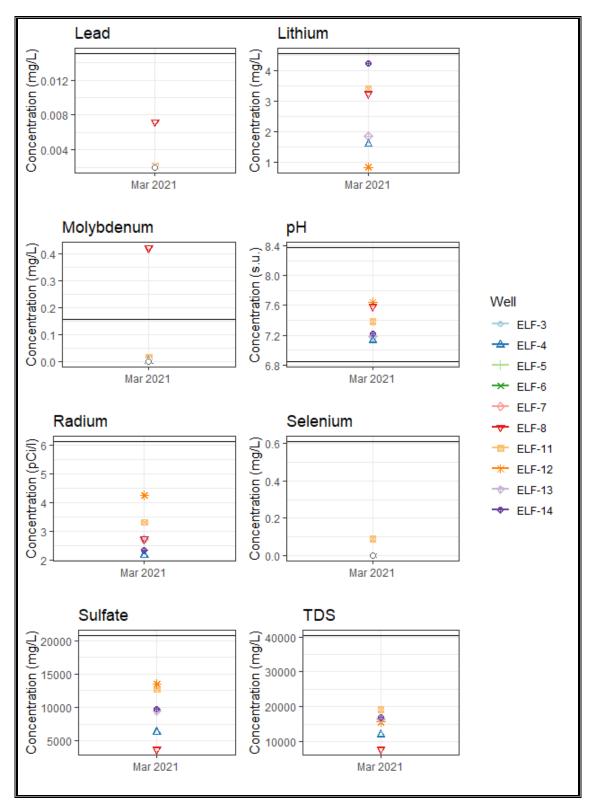


Figure C.4 (cont.). Background upper tolerance limit plots for the CCR Landfill.



# **Attachment D:**

Field Data Sheets



480 East Park Street Butte, Montana 59701 Phone: 406-782-5220 Fax: 406-723-1537

GROUNDWATER SAMPLING FORM						
Project Name	Hunter Power Plant	Hunter Power Plant Project Location Castle Dale UT				
Job number(s)	PERCM052	Sample ID	ELF-11			
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021			
Decon Method	Dedicated Equipment	Sample Time	10:36			
Sampler(s) Initials	ampler(s) Initials DV Depth to Water (ft.) 28.09					
Field Conditions	Windy 33°F Mostly clear					

			FIELD PARAM	ETERS		
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1008	13.0	19,600	2.55	7.04	221	53
1018	13.0	19,800	1.49	7.08	216	34.2
1030	13.0	19,900	1.46	7.08	214	33.6
1036	13.0	20,100	1.44	7.06	209	34.1

SAMPLE COLLECTION						
APPENDIX FOR	CURRENT SAMPLE	3				
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS			
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
3	(1) 250 mL poly	HNO3	Total metals			
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
	COMMENTS (ODSERVATIONS					

Like yellow water. Mostly clear. Filled four bottles.



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GROUNDWATER SAMPLING FORM					
Project Name Hunter Power Plant Project Location Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-8		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	11:16		
Sampler(s) Initials	impler(s) Initials DV Depth to Water (ft.) 8.96				
Field Conditions	Clear, 36°F, Windy,		<u>.</u>		

	FIELD PARAMETERS					
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1049	11.9	11,100	1.43	7.41	215	56.3
1058	11.9	11,100	0.88	7.41	215	3.5
1109	11.9	11,100	0.87	7.42	213	2.1
1116	12.0	11,100	0.84	7.42	211	0

SAMPLE COLLECTION						
APPENDIX FOR	CURRENT SAMPLE	3				
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS			
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
3	(1) 250 mL poly	HNO3	Total metals			
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
	COMMENTS/ORSEDVATIONS					

Good producer, water cleared nice.



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GROUNDWATER SAMPLING FORM					
Project Name         Hunter Power Plant         Project Location         Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-14		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	12:20		
Sampler(s) Initials	npler(s) Initials DV Depth to Water (ft.) 6.74				
Field Conditions	Clear, 36°F, Windy,		<u>.</u>		

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1140	10.2	23,200	1.20	7.11	206	1,000
1148	10.1	23,200	0.92	7.08	204	169
1159	10.1	23,300	0.87	7.07	203	151
1210	10.0	23,300	0.84	7.06	202	142
1220	10.0	23,300	0.82	7.06	201	139

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	3			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMME	NTS/ORSERVATIONS		

Was very muddy to begin with but cleared up. Good producer



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GROUNDWATER SAMPLING FORM						
Project Name	Hunter Power Plant	Project Location	Castle Dale UT			
Job number(s)	PERCM052	Sample ID	ELF-13			
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021			
Decon Method	Dedicated Equipment	Sample Time	13:05			
Sampler(s) Initials	Sampler(s) Initials DV Depth to Water (ft.) 4.20					
Field Conditions	Windy, 38°F, Clear skies					

			FIELD PARAM	IETERS		
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1232	10.2	20,400	0.96	6.88	213	0
1245	10.3	20,400	0.92	6.87	214	0
1255	10.3	20,400	0.86	6.87	215	0
1305	10.4	20,400	0.83	6.86	215	0

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	3			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMME	NTS/ORSERVATIONS		

Group B duplicate taken at this well. Filled eight bottles



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GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s)	PERCM052	Sample ID	ELF-6		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	14:13		
Sampler(s) Initials DV Depth to Water (ft.) 0					
Field Conditions Clear skies 40°F. Windy					

	FIELD PARAMETERS					
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMME	NTS/OBSERVATIONS		

This well is dry.



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GROUNDWATER SAMPLING FORM				
Project Name	Hunter Power Plant	Project Location	Castle Dale UT	
Job number(s)	PERCM052	Sample ID	ELF-4	
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021	
Decon Method	Dedicated Equipment	Sample Time	14:40	
Sampler(s) Initials DV		Depth to Water (ft.)	17.89	
Field Conditions	Clear and sunny. 40°F. Windy		•	

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1410	12.8	14,800	1.01	6.84	221	4
1420	12.8	14,800	0.96	6.86	222	2.3
1430	12.8	14,800	0.94	6.87	223	1.2
1440	12.8	14,800	0.95	6.88	223	0.5

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	3			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMME	NTS/ORSEDVATIONS		

Good producer. Clearwater.



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GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s)	PERCM052	Sample ID	ELF-12		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	15:30		
Sampler(s) Initials	DV	Depth to Water (ft.)	20.86		
Field Conditions	Clear skies, 42°F, Light wind				

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1450	13.1	22,100	1.16	7.38	-1	311
1500	12.8	22,200	1.13	7.41	-42	164
1510	13.0	22,300	1.09	7.42	-44	143
1520	12.7	22,400	1.08	7.41	-49	147
1530	12.7	22,400	1.05	7.42	-52	139

	SAMPLE COLLECTION				
APPENDIX FOR CURRENT SAMPLE		3			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
COMMENTS/ORSERVATIONS					

Good producer. Water level continues to drop slightly. Water clearing up



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GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s) PERCM052		Sample ID	ELF-7		
Sampling Method Low Flow Bladder Pump		Sample Date	March 24, 2021		
Decon Method Dedicated Equipment		Sample Time	15:57		
Sampler(s) Initials DV		Depth to Water (ft.)	NA		
Field Conditions	Clear skies 42°F		<u>.</u>		

	FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)	

	SAMPLE COLLECTION				
APPENDIX FOR CURRENT SAMPLE		Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
COMMENTS / ORSEDVATIONS					

This well is dry.



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GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s)	PERCM052	Sample ID	ELF-3		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method Dedicated Equipment		Sample Time	16:25		
Sampler(s) Initials DV		Depth to Water (ft.)	NA		
Field Conditions Clear skies 42°F. No wind			•		

	FIELD PARAMETERS					
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

	SAMPLE COLLECTION				
APPENDIX FOR CURRENT SAMPLE		3			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
COMMENTS/OBSERVATIONS					

Water in well almost completely dry after first field measurements. Waited approximately 45 minutes no water for samples.



480 East Park Street Butte, Montana 59701 Phone: 406-782-5220 Fax: 406-723-1537

GROUNDWATER SAMPLING FORM					
Project Name         Hunter Power Plant         Project Location         Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-9		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	18:10		
Sampler(s) Initials DV Depth to Water (ft.)			23.01		
Field Conditions	Windy 42°F Partly cloudy				

			FIELD PARAM	ETERS		
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1720	12.7	15,700	1.11	7.79	173	0
1730	12.4	14,800	0.89	7.76	164	0
1740	12.3	14,600	0.86	7.75	139	0
1750	12.2	14,500	0.79	7.78	140	0
1810	12.2	14,400	0.78	7.81	130	0

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	3			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
	COMMENTS/OBSERVATIONS				

Well water level dropping. Clear water.



480 East Park Street Butte, Montana 59701 Phone: 406-782-5220 Fax: 406-723-1537

GROUNDWATER SAMPLING FORM					
Project Name         Hunter Power Plant         Project Location         Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-2		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	19:10		
Sampler(s) Initials DV Depth to Water (ft.) 23.38					
Field Conditions	Windy, 36°F, Mostly cloudy	·	·		

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1830	12.3	13,300	0.96	7.07	195	9.1
1840	12.3	13,400	0.94	7.04	204	8.4
1850	12.3	13,400	0.91	7.01	206	8.9
1910	12.3	13,400	0.90	7.02	207	8.6

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	3			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
	COMMENTS/OBSERVATIONS				

Good producer, mostly clear.



480 East Park Street Butte, Montana 59701 Phone: 406-782-5220 Fax: 406-723-1537

GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s)	PERCM052	Sample ID	ELF-10		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	12:00		
Sampler(s) Initials	mpler(s) Initials DV		51.09		
Field Conditions	NA				

	FIELD PARAMETERS					
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	3&4			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
	COMMENTS/ORSERVATIONS				

Not enough water to sample.



480 East Park Street Butte, Montana 59701 Phone: 406-782-5220 Fax: 406-723-1537

GROUNDWATER SAMPLING FORM					
Project Name         Hunter Power Plant         Project Location         Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-5		
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021		
Decon Method	Dedicated Equipment	Sample Time	12:05		
Sampler(s) Initials DV		Depth to Water (ft.)	NA		
Field Conditions	NA		·		

	FIELD PARAMETERS					
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

	SAMPLE COLLECTION				
APPENDIX FOR	CURRENT SAMPLE	3&4			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
	COMMENTS / ORSEDVATIONS				

No water above pump - water level at bottom of pump - roots held pump in well



480 East Park Street Butte, Montana 59701 Phone: 406-782-5220 Fax: 406-723-1537

GROUNDWATER SAMPLING FORM								
Project Name	Hunter Power Plant	Project Location	Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-1D					
Sampling Method	Low Flow Bladder Pump	Sample Date	March 24, 2021					
Decon Method	Dedicated Equipment	Sample Time	12:10					
Sampler(s) Initials	DV	Depth to Water (ft.)	83.21					
Field Conditions	NA		•					

	FIELD PARAMETERS										
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)					

	SAMPLE COLLECTION								
APPENDIX FOR	CURRENT SAMPLE	3&4							
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS						
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228						
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury						
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite						
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity						
3	(1) 250 mL poly	HNO3	Total metals						
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite						
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity						
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228						
4	(1) 250 mL poly	HNO3	Total metals, Total mercury						
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite						
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity						
		COMME	NTS/ORSERVATIONS						

Not enough water to sample.



### **Attachment E:**

Laboratory Analytical Reports



Jeff Tucker PacifiCorp 1407 West North Temple, #280 Salt Lake City, UT 84116

TEL: (801) 220-2989

RE: Hunter Power Plant - CCR

3440 South 700 West

Salt Lake City, UT 84119

Dear Jeff Tucker: Lab Set ID: 2103745

American West Analytical Laboratories (AWAL) is accredited by The National

state accredited in Colorado, Idaho, New Mexico, Wyoming, and Missouri.

American West Analytical Laboratories received sample(s) on 3/26/2021 for the analyses presented in the following report.

Phone: (801) 263-8686 Toll Free: (888) 263-8686

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

All analyses were performed in accordance to the NELAP protocols unless noted otherwise. Accreditation scope documents are available upon request. If you have any questions or concerns regarding this report please feel free to call.

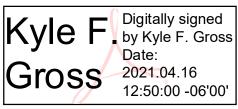
Environmental Laboratory Accreditation Program (NELAP) in Utah and Texas; and is

Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Thank You.



Approved by:

Laboratory Director or designee

Sample(s) were subcontracted for the following analyses:

Radiological Testing



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-001

**Client Sample ID:** ELF-2

**Collection Date:** 3/24/2021 1910h **Received Date:** 3/26/2021 1225h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 857h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	0.00988	
Phone: (801) 263-8686	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	3/30/2021 1203h	4/6/2021 1808h	E200.7	0.500	3.32	
Toll Free: (888) 263-8686	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1612h	E200.7	10.0	394	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00400	0.00481	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	3/30/2021 1203h	4/6/2021 1808h	E200.7	0.100	1.47	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1249h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	0.00268	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	0.00309	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1118h	E200.8	0.00200	< 0.00200	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-002

Client Sample ID: ELF-4

**Collection Date:** 3/24/2021 1440h **Received Date:** 3/26/2021 1225h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 901h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	0.0119	
Phone: (801) 263-8686	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	3/30/2021 1203h	4/6/2021 1810h	E200.7	0.500	4.77	
Toll Free: (888) 263-8686 Fax: (801) 263-8687	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.000500	< 0.000500	
	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1614h	E200.7	10.0	491	2
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00400	0.00594	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	3/30/2021 1203h	4/6/2021 1810h	E200.7	0.100	1.58	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1307h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	0.00210	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1122h	E200.8	0.00200	< 0.00200	

QA Officer

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-003

**Client Sample ID:** ELF-8

**Collection Date:** 3/24/2021 1116h **Received Date:** 3/26/2021 1225h

Analytical Results

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 912h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	0.0112	
Dhana. (901) 262, 9696	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	< 0.00200	
Phone: (801) 263-8686	Boron	mg/L	3/30/2021 1203h	4/6/2021 1627h	E200.7	5.00	28.8	
Toll Free: (888) 263-8686	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.000500	0.00158	
Fax: (801) 263-8687	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1627h	E200.7	10.0	562	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00400	0.228	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	0.00719	
	Lithium	mg/L	3/30/2021 1203h	4/6/2021 1818h	E200.7	0.100	3.24	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1309h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	0.421	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	< 0.00200	
- ( 201 21 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1142h	E200.8	0.00200	< 0.00200	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-004

**Client Sample ID:** ELF-9

**Collection Date:** 3/24/2021 1810h **Received Date:** 3/26/2021 1225h

**Analytical Results** 

TOTAL METALS

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Antimony	mg/L	3/30/2021 1203h	4/6/2021 915h	E200.8	0.00400	< 0.00400	
Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	0.00506	
Barium	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	0.0122	
Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	< 0.00200	
Boron	mg/L	3/30/2021 1203h	4/6/2021 1630h	E200.7	0.500	1.45	
Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.000500	< 0.000500	
Calcium	mg/L	3/30/2021 1203h	4/6/2021 1659h	E200.7	5.00	67.1	
Chromium	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	< 0.00200	
Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00400	< 0.00400	
Lead	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	< 0.00200	
Lithium	mg/L	3/30/2021 1203h	4/6/2021 1630h	E200.7	0.100	0.944	
Mercury	mg/L	3/31/2021 1210h	4/5/2021 1311h	E245.1	0.0000900	< 0.0000900	
Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	0.0569	
Selenium	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	< 0.00200	
Thallium	mg/L	3/30/2021 1203h	4/1/2021 1146h	E200.8	0.00200	< 0.00200	
	Antimony Arsenic Barium Beryllium Boron Cadmium Calcium Chromium Cobalt Lead Lithium Mercury Molybdenum Selenium	Antimony mg/L Arsenic mg/L Barium mg/L Beryllium mg/L Boron mg/L Cadmium mg/L Calcium mg/L Chromium mg/L Chromium mg/L Lead mg/L Lithium mg/L Mercury mg/L Molybdenum mg/L Selenium mg/L	Compound         Units         Prepared           Antimony         mg/L         3/30/2021 1203h           Arsenic         mg/L         3/30/2021 1203h           Barium         mg/L         3/30/2021 1203h           Beryllium         mg/L         3/30/2021 1203h           Boron         mg/L         3/30/2021 1203h           Cadmium         mg/L         3/30/2021 1203h           Calcium         mg/L         3/30/2021 1203h           Chromium         mg/L         3/30/2021 1203h           Cobalt         mg/L         3/30/2021 1203h           Lead         mg/L         3/30/2021 1203h           Mercury         mg/L         3/31/2021 1210h           Molybdenum         mg/L         3/30/2021 1203h           Selenium         mg/L         3/30/2021 1203h	Compound         Units         Prepared         Analyzed           Antimony         mg/L         3/30/2021 1203h         4/6/2021 915h           Arsenic         mg/L         3/30/2021 1203h         4/1/2021 1146h           Barium         mg/L         3/30/2021 1203h         4/1/2021 1146h           Beryllium         mg/L         3/30/2021 1203h         4/1/2021 1146h           Boron         mg/L         3/30/2021 1203h         4/6/2021 1630h           Cadmium         mg/L         3/30/2021 1203h         4/1/2021 1146h           Calcium         mg/L         3/30/2021 1203h         4/1/2021 1146h           Chromium         mg/L         3/30/2021 1203h         4/1/2021 1146h           Cobalt         mg/L         3/30/2021 1203h         4/1/2021 1146h           Lead         mg/L         3/30/2021 1203h         4/1/2021 1146h           Lithium         mg/L         3/30/2021 1203h         4/6/2021 1630h           Mercury         mg/L         3/30/2021 1203h         4/6/2021 1311h           Molybdenum         mg/L         3/30/2021 1203h         4/1/2021 1146h           Selenium         mg/L         3/30/2021 1203h         4/1/2021 1146h	Compound         Units         Prepared         Analyzed         Used           Antimony         mg/L         3/30/2021 1203h         4/6/2021 915h         E200.8           Arsenic         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8           Barium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8           Beryllium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8           Boron         mg/L         3/30/2021 1203h         4/6/2021 1630h         E200.7           Cadmium         mg/L         3/30/2021 1203h         4/6/2021 1659h         E200.7           Chromium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8           Cobalt         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8           Lead         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8           Lithium         mg/L         3/30/2021 1203h         4/6/2021 1630h         E200.7           Mercury         mg/L         3/30/2021 1203h         4/6/2021 1630h         E200.7           Molybdenum         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8           Selenium	Compound         Units         Prepared         Analyzed         Used         Limit           Antimony         mg/L         3/30/2021 1203h         4/6/2021 915h         E200.8         0.00400           Arsenic         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.00200           Barium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.00200           Beryllium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.00200           Boron         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.000500           Cadmium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.000500           Calcium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.00200           Chromium         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.00200           Cobalt         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.00200           Lead         mg/L         3/30/2021 1203h         4/1/2021 1146h         E200.8         0.00200           Lithium         mg/L         3/30/2021 120	Compound         Units         Prepared         Analyzed         Used         Limit         Result           Antimony         mg/L         3/30/2021 1203h         4/6/2021 915h         E200.8         0.00400         < 0.00400



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-005 **Client Sample ID:** ELF-11

**Collection Date:** 3/24/2021 1036h **Received Date:** 3/26/2021 1225h

Analytical Results TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 919h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	0.0219	
Phone: (801) 263-8686	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	3/30/2021 1203h	4/6/2021 1640h	E200.7	5.00	15.2	
Toll Free: (888) 263-8686	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1640h	E200.7	10.0	415	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	0.00258	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00400	0.0213	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	0.00210	
	Lithium	mg/L	3/30/2021 1203h	4/7/2021 1733h	E200.7	0.100	3.40	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1314h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	0.0164	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	0.0883	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1203h	E200.8	0.00200	< 0.00200	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-006 **Client Sample ID:** ELF-12

**Collection Date:** 3/24/2021 1530h **Received Date:** 3/26/2021 1225h

Analytical Results

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 923h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	0.00990	
Phone: (801) 263-8686	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	3/30/2021 1203h	4/7/2021 1736h	E200.7	0.500	1.25	
Toll Free: (888) 263-8686	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1643h	E200.7	10.0	172	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00400	< 0.00400	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	3/30/2021 1203h	4/7/2021 1736h	E200.7	0.100	0.820	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1316h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	< 0.00200	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1207h	E200.8	0.00200	< 0.00200	



Jose Rocha QA Officer

# **INORGANIC ANALYTICAL REPORT**

Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-007 **Client Sample ID:** ELF-13

**Collection Date:** 3/24/2021 1305h **Received Date:** 3/26/2021 1225h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 937h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	0.00916	
DL (901) 262 9696	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	< 0.00200	
Phone: (801) 263-8686	Boron	mg/L	3/30/2021 1203h	4/7/2021 1738h	E200.7	0.500	0.580	
Toll Free: (888) 263-8686 Fax: (801) 263-8687	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.000500	< 0.000500	
	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1646h	E200.7	10.0	471	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00400	0.00432	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	3/30/2021 1203h	4/7/2021 1738h	E200.7	0.100	1.84	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1318h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	< 0.00200	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1211h	E200.8	0.00200	< 0.00200	

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Jose Rocha QA Officer

# **INORGANIC ANALYTICAL REPORT**

Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-008 **Client Sample ID:** ELF-14

**Collection Date:** 3/24/2021 1220h **Received Date:** 3/26/2021 1225h

Analytical Results

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 941h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	0.0106	
Phone: (801) 263-8686	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	< 0.00200	
to force of the second of the second of	Boron	mg/L	3/30/2021 1203h	4/7/2021 1741h	E200.7	0.500	2.15	
Toll Free: (888) 263-8686 Fax: (801) 263-8687	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.000500	< 0.000500	
	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1648h	E200.7	10.0	482	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00400	0.00701	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	3/30/2021 1203h	4/7/2021 1741h	E200.7	0.100	4.23	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1320h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	0.00303	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	0.00314	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1215h	E200.8	0.00200	< 0.00200	

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Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-009 **Client Sample ID:** Duplicate (CCR)

**Collection Date:** 3/24/2021

**Received Date:** 3/26/2021 1225h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 945h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	0.00894	
Phone: (801) 263-8686	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	< 0.00200	
to find the second of the second	Boron	mg/L	3/30/2021 1203h	4/7/2021 1744h	E200.7	0.500	0.574	
Toll Free: (888) 263-8686	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1651h	E200.7	10.0	460	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00400	0.00418	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	3/30/2021 1203h	4/7/2021 1744h	E200.7	0.100	1.85	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1322h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	< 0.00200	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1219h	E200.8	0.00200	< 0.00200	

Jose Rocha QA Officer

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Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-010

Client Sample ID: Field Blank (CCR)
Collection Date: 3/24/2021 1930h
Received Date: 3/26/2021 1225h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	3/30/2021 1203h	4/6/2021 948h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
Phone: (801) 263-8686	Beryllium	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	3/30/2021 1203h	4/6/2021 1709h	E200.7	0.500	< 0.500	
Toll Free: (888) 263-8686	Cadmium	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	3/30/2021 1203h	4/6/2021 1709h	E200.7	1.00	< 1.00	
e-mail: awal@awal-labs.com	Chromium	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00400	< 0.00400	
web: www.awal-labs.com	Lead	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	3/30/2021 1203h	4/6/2021 1709h	E200.7	0.100	< 0.100	
	Mercury	mg/L	3/31/2021 1210h	4/5/2021 1324h	E245.1	0.0000900	< 0.0000900	
Kyle F. Gross	Molybdenum	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
Laboratory Director	Selenium	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	3/30/2021 1203h	4/1/2021 1223h	E200.8	0.00200	< 0.00200	
	·							

Jose Rocha QA Officer

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Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-001

**Client Sample ID:** ELF-2

**Collection Date:** 3/24/2021 1910h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686

Fax: (801) 263-8687 e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 1810h	E300.0	200	213	
Fluoride	mg/L		4/5/2021 040h	E300.0	0.100	0.464	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.34	H
Sulfate	mg/L		4/4/2021 1810h	E300.0	1,000	8,720	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	100	11,700	

H - Sample was received outside of the holding time.

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Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-002

Client Sample ID: ELF-4

**Collection Date:** 3/24/2021 1440h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 1838h	E300.0	100	2,420	
Fluoride	mg/L		4/5/2021 108h	E300.0	0.200	0.396	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.13	H
Sulfate	mg/L		4/4/2021 1838h	E300.0	500	6,290	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	100	12,000	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-003

**Client Sample ID:** ELF-8

**Collection Date:** 3/24/2021 1116h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 1906h	E300.0	100	2,340	
Fluoride	mg/L		4/5/2021 136h	E300.0	0.200	1.63	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.58	H
Sulfate	mg/L		4/4/2021 1906h	E300.0	500	3,720	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	100	7,820	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-004

**Client Sample ID:** ELF-9

**Collection Date:** 3/24/2021 1810h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

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Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 1934h	E300.0	40.0	464	
Fluoride	mg/L		4/5/2021 204h	E300.0	0.200	1.56	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	8.01	H
Sulfate	mg/L		4/4/2021 1934h	E300.0	200	7,470	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	100	10,800	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-005 **Client Sample ID:** ELF-11

**Collection Date:** 3/24/2021 1036h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

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Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 2057h	E300.0	200	1,230	
Fluoride	mg/L		4/5/2021 231h	E300.0	0.100	0.435	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.38	H
Sulfate	mg/L		4/4/2021 2057h	E300.0	1,000	12,700	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	500	19,100	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-006 **Client Sample ID:** ELF-12

**Collection Date:** 3/24/2021 1530h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

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Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 2125h	E300.0	200	640	
Fluoride	mg/L		4/5/2021 259h	E300.0	0.100	0.700	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.64	H
Sulfate	mg/L		4/4/2021 2125h	E300.0	1,000	13,500	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	500	15,600	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-007 **Client Sample ID:** ELF-13

**Collection Date:** 3/24/2021 1305h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

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Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 2249h	E300.0	100	3,160	
Fluoride	mg/L		4/5/2021 423h	E300.0	0.200	0.243	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.18	H
Sulfate	mg/L		4/4/2021 2249h	E300.0	500	9,410	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	500	16,500	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-008 **Client Sample ID:** ELF-14

**Collection Date:** 3/24/2021 1220h **Received Date:** 3/26/2021 1225h

### **Analytical Results**

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Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 2316h	E300.0	100	4,770	
Fluoride	mg/L		4/5/2021 451h	E300.0	0.200	0.413	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.22	H
Sulfate	mg/L		4/4/2021 2316h	E300.0	500	9,740	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	500	16,900	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-009 **Client Sample ID:** Duplicate (CCR)

**Collection Date:** 3/24/2021

**Received Date:** 3/26/2021 1225h

### **Analytical Results**

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Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/4/2021 2344h	E300.0	100	3,130	
Fluoride	mg/L		4/5/2021 519h	E300.0	0.100	0.207	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	7.17	H
Sulfate	mg/L		4/4/2021 2344h	E300.0	500	9,400	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	100	15,200	



Contact: Jeff Tucker

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2103745-010

Client Sample ID: Field Blank (CCR)
Collection Date: 3/24/2021 1930h
Received Date: 3/26/2021 1225h

### **Analytical Results**

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Kyle F. Gross Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		4/5/2021 547h	E300.0	0.100	< 0.100	
Fluoride	mg/L		4/5/2021 547h	E300.0	0.100	< 0.100	
рН @ 25° С	pH Units		3/26/2021 1503h	SM4500-H+B	1.00	8.03	H
Sulfate	mg/L		4/5/2021 547h	E300.0	0.500	< 0.500	
Total Dissolved Solids	mg/L		3/29/2021 1300h	SM2540C	10.0	< 10.0	

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Jose Rocha QA Officer

Laboratory Director Kyle F. Gross

**OC SUMMARY REPORT** 

Jeff Tucker Contact:

OC Tyne: LCS Dept:

Hunter Power Plant - CCR PacifiCorp Lab Set ID: 2103745

Client:

	Qual
	RPD Limit
	% RPD
	RPD Ref. Amt
	Limits
	%REC
TCS	Spike Ref. Amount
QC Type:	Amount Spiked
	Reporting Limit
	MDL
	Method
	Units
R	Result
Hunter Power Plant - CCR	
Project:	Analyte

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: LCS Test Code: 200.	LCS-76284 200.7-W	Date Analyzed: Date Prepared:	04/06/2021 1609h 03/3 0/2021 1203h	1609h 1203h										
Boron		1.12	mg/L	E200.7	0.0449	0.500	1.000	0	112	85 - 115				
Calcium		9.59	mg/L	E200.7	0.170	1.00	10.00	0	95.9	85 - 115				
Lithium		1.03	mg/L	E200.7	0.0239	0.100	1.000	0	103	80 - 120				
Lab Sample ID: LCS-76283	5-76283	Date Analyzed: 04/01/2021 1114h	04/01/2021	1114h										
Test Code: 200.	200.8-W	Date Prepared:	03/30/2021 1203h	1203h										
Arsenic		0.205	mg/L	E200.8	0.000298	0.00200	0.2000	0	103	85 - 115				
Barium		0.195	mg/L	E200.8	0.000544	0.00200	0.2000	0	7.76	85 - 115				
Beryllium		0.211	mg/L	E200.8	0.000198	0.00200	0.2000	0	106	85 - 115				
Cadmium		0.195	mg/L	E200.8	0.0000742	0.000500	0.2000	0	9.76	85 - 115				
Chromium		0.201	mg/L	E200.8	0.000920	0.00200	0.2000	0	100	85 - 115				
Cobalt		0.203	mg/L	E200.8	0.000300	0.00400	0.2000	0	102	85 - 115				
Lead		0.205	mg/L	E200.8	0.000588	0.00200	0.2000	0	102	85 - 115				
Molybdenum		0.198	mg/L	E200.8	0.000884	0.00200	0.2000	0	99.2	85 - 115				
Selenium		0.204	mg/L	E200.8	0.000508	0.00200	0.2000	0	102	85 - 115				
Thallium		0.206	mg/L	E200.8	0.000418	0.00200	0.2000	0	103	85 - 115				
Lab Sample ID: LCS-76283	5-76283	Date Analyzed: 04/06/2021 853h	04/06/2021 8	353h										
Test Code: 200.	200.8-W	Date Prepared:	03/30/2021 1203h	1203h										
Antimony		0.191	mg/L	E200.8	0.000734	0.00400	0.2000	0	95.7	85 - 115				
Lab Sample ID: LCS-76316 Test Code: HG-DW-245	LCS-76316 HG-DW-245.1	Date Analyzed: 04/05/2021 1247h Date Prepared: 03/31/2021 1210h	04/05/2021 1247h 03/31/2021 1210h	1247h 1210h										
Mercury		0.00340	mg/L	E245.1	0.0000396	0.0000900	0.003330	0	102	85 - 115				

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Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

# **OC SUMMARY REPORT**

Contact: Jeff Tucker

Dept: ME QC Type: MBLK

Hunter Power Plant - CCR

Project:

Lab Set ID: 2103745

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: MB-76284 Test Code: 200.7-W	MB-76284 200 7-W	Date Analyzed:	04/06/2021 1607h	1607h 1203h										
		<ul><li>&lt; 0.500</li><li>&lt; 1.00</li><li>&lt; 0.100</li></ul>	mg/L mg/L mg/L	E200.7 E200.7 E200.7	0.0449 0.170 0.0239	0.500 1.00 0.100								
Lab Sample ID: Test Code:	<b>MB-76283</b> 200.8-W	Date Analyzed: Date Prepared:	04/01/2021 1110h 03/3 0/2021 1203h	1110h 1203h										
Arsenic		< 0.00200	mg/L	E200.8	0.000298	0.00200								
Beryllium		< 0.00200	mg/L mg/L	E200.8	0.000198	0.00200								
Cadmium		< 0.000500	mg/L	E200.8	0.0000742	0.000500								
Chromium		< 0.00200	mg/L	E200.8	0.000920	0.00200								
Cobalt		< 0.00400	mg/L	E200.8	0.000300	0.00400								
Lead		< 0.00200	mg/L	E200.8	0.000588	0.00200								
Molybdenum		< 0.00200	mg/L	E200.8	0.000884	0.00200								
Selenium		< 0.00200	mg/L	E200.8	0.000508	0.00200								
Thallium		< 0.00200	mg/L	E200.8	0.000418	0.00200								
le ID:	MB-76283	Date Analyzed:		850h										
Test Code:	Z00.8-W	Date Prepared:	03/30/2021 1203h	1203h										
Antimony		< 0.00400	mg/L	E200.8	0.000734	0.00400								
Lab Sample ID: MB-76316	MB-76316	Date Analyzed:	04/05/2021 1245h	1245h										-
Test Code:	HG-DW-245.1	Date Prepared:	03/31/2021 1210h	1210h										
Mercury		< 0.0000900	mg/L	E245.1	0.0000396	0.00000000								

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Laboratory Director Jose Rocha

Kyle F. Gross

TACATA VALABLE OF

QA Officer

AMERICAN WEST	OC SUMMARY REPORT	
Client: PacifiCorp	Contact: Jeff Tucker	sker
Lab Set ID: 2103745	Dept: ME	
Project: Hunter Power Plant - CCR	QC Type: MS	
	Donough Amount Cailed Do	Por nag

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>2103745-002BMS</b> 200.7-W	Date Analyzed: Date Prepared:	04/06/2021 1622h 03/3 0/2021 1203h	1622h 1203h										
Calcium		482	mg/L	E200.7	1.70	10.0	10.00	491	8.06-	70 - 130				2
Lab Sample ID: Test Code:	<b>2103745-002BMS</b> 200.7-W	Date Analyzed: Date Prepared:	04/06/2021 1813h 03/3 0/2021 1203h	1813h 1203h										
Boron Lithium		5.93 2.59	mg/L mg/L	E200.7 E200.7	0.0449	0.500	1.000	4.77	116	70 - 130 75 - 125				
Lab Sample ID: Test Code:	<b>2103745-002BMS</b> 200.8-W	Date Analyzed: Date Prepared:	04/01/2021 1134h 03/30/2021 1203h	. 1134h 1203h										
Arsenic		0.238	mg/L	E200.8	0.000298	0.00200	0.2000	0.00041	119	75 - 125				
Barium		0.212	mg/L	E200.8	0.000544	0.00200	0.2000	0.0119	100	75 - 125				
Beryllium		0.207	mg/L	E200.8	0.000198	0.00200	0.2000	0	103	75 - 125				
Cadmium		0.201	mg/L	E200.8	0.0000742	0.000500	0.2000	0.000335	100	75 - 125				
Chromium		0.200	mg/L	E200.8	0.000920	0.00200	0.2000	0.000988	5.66	75 - 125				
Cobalt		0.201	mg/L	E200.8	0.000300	0.00400	0.2000	0.00594	97.3	75 - 125				
Lead		0.198	mg/L	E200.8	0.000588	0.00200	0.2000	0	6.86	75 - 125				
Molybdenum		0.227	mg/L	E200.8	0.000884	0.00200	0.2000	0.0021	112	75 - 125				
Selenium		0.224	mg/L	E200.8	0.000508	0.00200	0.2000	0.00144	111	75 - 125				
Thallium		0.194	mg/L	E200.8	0.000418	0.00200	0.2000	0.00064	8.96	75 - 125				
Lab Sample ID:		Date Analyzed:	04/01/2021 1235h	1235h										
Test Code:	Z00.8-W	Date Prepared:	03/30/2021 1203n	1203n										
Arsenic		0.215	mg/L	E200.8	0.000298	0.00200	0.2000	0	108	75 - 125				
Barium		0.275	mg/L	E200.8	0.000544	0.00200	0.2000	0.0759	9.66	75 - 125				
Beryllium		0.220	mg/L	E200.8	0.000198	0.00200	0.2000	0	110	75 - 125				
Cadmium		0.200	mg/L	E200.8	0.0000742	0.000500	0.2000	0	6.66	75 - 125				
Chromium		0.201	mg/L	E200.8	0.000920	0.00200	0.2000	0	100	75 - 125				
Cobalt		0.202	mg/L	E200.8	0.000300	0.00400	0.2000	0	101	75 - 125				

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PacifiCorp

Client:

Lab Set ID: 2103745

Salt Lake City, UT 84119

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Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

# OC SUMMARY REPORT

Contact: Jeff Tucker

Dept: ME

MS QC Type: Hunter Power Plant - CCR Project:

Analyte		Result	Units	Method	MDL	Reporting Limit	Reporting Amount Spiked Spike Ref. Limit Amount	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit Qual	Qual
Lab Sample ID: Test Code:	Lab Sample ID: 2103748-008DMS Test Code: 200.8-W	Date Analyzed: 04/01/2021 1235h Date Prepared: 03/30/2021 1203h	04/01/2021 03/30/2021	1235h 1203h										
Lead		0.206	mg/L	E200.8	0.000588	0.00200	0.2000	0 0	103	75 - 125				
Selenium		0.210	mg/L mg/L	E200.8	0.000508	0.00200	0.2000	0	105	75 - 125				
Thallium		0.209	mg/L	E200.8	0.000418	0.00200	0.2000	0	105	75 - 125				
Lab Sample ID: Test Code:	Lab Sample ID:       2103745-002BMS         Test Code:       200.8-W	Date Analyzed: 04/06/2021 904h Date Prepared: 03/30/2021 1203	04/06/2021 904h 03/30/2021 1203h	904h 1203h										
Antimony		0.214	mg/L	E200.8	0.000734	0.00400	0.2000	0	107	75 - 125				
Lab Sample ID: Test Code:	Lab Sample ID:       2103745-001BMS         Test Code:       HG-DW-245.1	Date Analyzed: 04/05/2021 1258h Date Prepared: 03/31/2021 1210h	04/05/2021 03/31/2021	1258h 1210h										
Mercury		0.00330	mg/L	E245.1	0.0000396	0.0000396 0.0000900	0.003330	0	0.66	80 - 120				

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

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Laboratory Director Kyle F. Gross

Jose Rocha QA Officer

# **OC SUMMARY REPORT**

PacifiCorp

Client:

INALYTICAL LABORATORIE

Jeff Tucker Contact:

ME

Dept:

		RPD Ref. RI
Dept: ME	QC Type: MSD	Reporting Amount Spiked Spike Ref.
Lab Set ID: 2103745	Project: Hunter Power Plant - CCR	

e ID: 2103745-002BMSD Date Analyzed: 512  e ID: 2103745-002BMSD Date Prepared: 5.86 2.00.7-W Date Prepared: 5.86 2.00.8-W Date Prepared: 0.235 0.208 0.199 0.199 0.190 0.195 0.190 0.195 0.19748-008DMSD Date Analyzed: 0.226 0.200 0.195 0.19748-008DMSD Date Analyzed: 0.226 0.200 0.195 0.200 0.200 0.200 0.200 0.200 0.200 0.200 0.200 0.200 0.200 0.200 0.200	Result Units	Method	MDL	Keporting Limit	Amount Spiked	Spike Kef. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
2103745-002BMSD Date Analyzed: 200.7-W Date Prepared: 5.86 2.56 2.103745-002BMSD Date Analyzed: 200.8-W Date Prepared: 0.235 0.208 0.198 0.199 0.200 0.195 0.218 0.195 0.226 0.218 0.195 0.226 0.218 0.195 0.226 0.218 0.195 0.226 0.218 0.201		04/06/2021 1625h 03/30/2021 1203h										
2103745-002BMSD         Date Analyzed:           200.7-W         Date Prepared:           5.86         2.56           2103745-002BMSD         Date Analyzed:           200.8-W         0.235           0.208         0.207           0.198         0.199           0.195         0.226           0.218         0.195           0.218         0.195           0.218         0.218           0.218         0.218           0.218         0.218           0.218         0.218           0.208-W         Date Analyzed:           200.8-W         Date Prepared:           0.223         0.223           0.227         0.201           0.201         0.201           0.201         0.201	mg/L	E200.7	1.70	10.0	10.00	491	207	70 - 130	482	5.98	20	2
5.86 2.56 2.03 200.8-W Date Analyzed: 0.235 0.208 0.207 0.199 0.200 0.195 0.195 0.218 0.196 0.218 0.197 200.8-W Date Analyzed: 0.226 0.218 0.197 0.226 0.218 0.209		04/06/2021 1816h 03/30/2021 1203h										
2103745-002BMSD     Date Analyzed:       200.8-W     Date Prepared:       0.235     0.208       0.207     0.198       0.199     0.200       0.195     0.226       0.218     0.218       0.020     0.218       0.195     0.226       0.208-W     Date Analyzed:       200.8-W     Date Prepared:       0.223     0.223       0.201     0.201       0.202     0.201	T/gm T/zm	E200.7 E200.7	0.0449	0.500	1.000	4.77	110 97.6	70 - 130 75 - 125	5.93	1.14	20	
0.235 0.208 0.207 0.198 0.199 0.200 0.195 0.218 0.195 0.226 0.218 0.197 0.226 0.218 0.197 0.228 0.223 0.223 0.223 0.223		04/01/2021 1138h 03/30/2021 1203h										
0.208 0.207 0.198 0.199 0.200 0.195 0.218 0.190 2103748-008DMSD Date Analyzed: 200.8-W Date Prepared: 0.223 0.223 0.223	mg/L	E200.8	0.000298	0.00200	0.2000	0.00041	117	75 - 125	0.238	1.42	20	
0.207 0.198 0.199 0.200 0.195 0.226 0.218 0.190 200.8-W Date Analyzed: 0.223 0.223 0.223 0.223	3 mg/L	E200.8	0.000544	0.00200	0.2000	0.0119	8.76	75 - 125	0.212	2.14	20	
0.198 0.199 0.200 0.195 0.218 0.196 0.218 0.190 0.218 0.190 0.218 0.190 0.218 0.190 0.218 0.218 0.223 0.223 0.227 0.227 0.227		E200.8	0.000198	0.00200	0.2000	0	103	75 - 125	0.207	0.0796	20	
0.199 0.200 0.195 0.218 0.190 2103748-008DMSD Date Analyzed: 200.8-W Date Prepared: 0.223 0.278 0.222	8 mg/L	E200.8	0.0000742	0.000500	0.2000	0.000335	6.86	75 - 125	0.201	1.47	20	
0.200 0.195 0.226 0.218 0.190 2103748-008DMSD Date Analyzed: 200.8-W Date Prepared: 0.223 0.278 0.222	mg/L	E200.8	0.000920	0.00200	0.2000	0.000988	6.86	75 - 125	0.2	0.661	20	
0.195 0.226 0.218 0.190 2103748-008DMSD Date Analyzed: 200.8-W Date Prepared: 0.223 0.278 0.222	mg/L	E200.8	0.000300	0.00400	0.2000	0.00594	97.3	75 - 125	0.201	0.0270	20	
0.226 0.218 0.190 2103748-008DMSD Date Analyzed: 200.8-W Date Prepared: 0.223 0.278 0.222	1/gm	E200.8	0.000588	0.00200	0.2000	0	97.3	75 - 125	0.198	1.64	20	
0.218 0.190 2103748-008DMSD Date Analyzed: 200.8-W Date Prepared: 0.223 0.278 0.222	mg/L	E200.8	0.000884	0.00200	0.2000	0.0021	112	75 - 125	0.227	0.179	20	
0.190 2103748-008DMSD Date Analyzed: 200.8-W Date Prepared: 0.223 0.278 0.222 0.201	3 mg/L	E200.8	0.000508	0.00200	0.2000	0.00144	108	75 - 125	0.224	2.78	20	
2103748-008DMSD         Date Analyzed:           200.8-W         Date Prepared:           0.223         0.278           0.222         0.201	mg/L	E200.8	0.000418	0.00200	0.2000	0.00064	94.8	75 - 125	0.194	2.14	20	
200.8-W Date Prepared: 0.223 0.278 0.222 0.201		04/01/2021 1239h										
0.223 0.278 0.222 0.201		03/30/2021 1203h										
0.278 0.222 0.201	mg/L	E200.8	0.000298	0.00200	0.2000	0	1111	75 - 125	0.215	3.45	20	
0.201		E200.8	0.000544	0.00200	0.2000	0.0759	101	75 - 125	0.275	1.03	20	
0.201	mg/L	E200.8	0.000198	0.00200	0.2000	0	1111	75 - 125	0.22	0.740	20	
	l mg/L	E200.8	0.0000742	0.000500	0.2000	0	101	75 - 125	0.2	0.771	20	
Chromium 0.207 mg/L		E200.8	0.000920	0.00200	0.2000	0	104	75 - 125	0.201	3.18	20	
Cobalt 0.207 mg/L	7 mg/L	E200.8	0.000300	0.00400	0.2000	0	104	75 - 125	0.202	2.67	20	

Report Date: 4/16/2021 Page 26 of 32

PacifiCorp

Client:

Salt Lake City, UT 84119

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e-mail: awal@awal-labs.com, web: www.awal-labs.com

Laboratory Director Kyle F. Gross

Jose Rocha QA Officer

# OC SUMMARY REPORT

Jeff Tucker Contact:

Dept:

QC Type: MSD Hunter Power Plant - CCR Lab Set ID: 2103745 Project:

Analyte		Result	Units	Method	MDL	Reporting Limit	Reporting Amount Spiked Spike Ref. Limit Amount	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	Lab Sample ID:         2103748-008DMSD           Test Code:         200.8-W	Date Analyzed: 04/01/2021 1239h Date Prepared: 03/30/2021 1203h	04/01/2021 03/30/2021	1239h 1203h										
Lead		0.209	mg/L	E200.8	0.000588	0.00200	0.2000	0	104	75 - 125	0.206	1.23	20	
Molybdenum		0.212	mg/L	E200.8	0.000884	0.00200	0.2000	0	106	75 - 125	0.208	1.94	20	
Selenium		0.214	mg/L	E200.8	0.000508	0.00200	0.2000	0	107	75 - 125	0.21	2.08	20	
Thallium		0.213	mg/L	E200.8	0.000418	0.00200	0.2000	0	106	75 - 125	0.209	1.55	20	
Lab Sample ID: Test Code:	Lab Sample ID:       2103745-002BMSD         Test Code:       200.8-W	Date Analyzed: 04/06/2021 908h Date Prepared: 03/30/2021 1203h	04/06/2021 03/30/2021	908h 1203h										
Antimony		0.216	mg/L	E200.8	0.000734	0.00400	0.2000	0	108	75 - 125	0.214	1.02	20	
Lab Sample ID: Test Code:	Lab Sample ID:         2103745-001BMSD           Test Code:         HG-DW-245.1	Date Analyzed: 04/05/2021 1305h Date Prepared: 03/31/2021 1210h	04/05/2021 03/31/2021	1305h 1210h										
Mercury		0.00336	mg/L	E245.1	0.0000396	0.00000396 0.0000900	0.003330	0	101	80 - 120	0.0033	1.80	20	

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

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e-mail: awal@awal-labs.com, web: www.awal-labs.com

Kyle F. Gross Laboratory Director

Jose Rocha QA Officer

# OC SUMMARY REPORT

Contact: Jeff Tucker

Dept: WC QC Type: DUP

Hunter Power Plant - CCR

Project:

PacifiCorp

Client:

Lab Set ID: 2103745

Analyte	Result	Units	Method	MDL	Reporting Limit	Reporting Amount Spiked Spike Ref. Limit Amount	Ref. ount %REC	Limits	RPD Ref. Amt	% RPD	RPD Limit Qual	Qual
Lab Sample ID:         2103748-004ADUP           Test Code:         PH-4500H+B	Date Analyzed: 03/26/2021 1503h	03/26/202	1 1503h									
pH @ 25° C	7.27	pH Units	SM4500-H+B	1.00	1.00				7.26	0.138	5	Н
Lab Sample ID:         2103745-003ADUP           Test Code:         PH-4500H+B	Date Analyzed: 03/26/2021 1503 h	03/26/202	1 1503h									
pH @ 25° C	7.57	pH Units	SM4500-H+B	1.00	1.00				7.58	0.132	5	Н
Lab Sample ID: 2103745-001ADUP Test Code: TDS-W-2540C	Date Analyzed: 03/29/2021 1300h	03/29/202	1 1300h									
Total Dissolved Solids	11,800	mg/L	SM2540C	80.0	100				11700	0.850	5	
Lab Sample ID: 2103748-009ADUP Test Code: TDS-W-2540C	Date Analyzed: 03/29/2021 1300h	03/29/202	1 1300h									
Total Dissolved Solids	216	mg/L	SM2540C	16.0	20.0				244	12.2	5	<b>(a)</b>

<sup>@</sup> - High RPD due to suspected sample non-homogeneity or matrix interference.

H - Sample was received outside of the holding time.

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Laboratory Director
Jose Rocha
QA Officer

Kyle F. Gross

# OC SUMMARY REPORT

Jeff Tucker QC Type: LCS Contact: Dept: Hunter Power Plant - CCR PacifiCorp Lab Set ID: 2103745 Project: Client:

Analyte	Result	Units	Method	MDL	Reporting Limit	Reporting Amount Spiked Spike Ref. Limit Amount	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit Qual	Qual
Lab Sample ID: LCS-R150566 Test Code: 300.0-W	Date Analyzed: 04/04/2021 1742h	04/04/202	l 1742h										
Chloride Fluoride	5.42	mg/L	E300.0 F300.0	0.0198	0.100	5.000	0	108	90 - 110				
Sulfate	5.41	mg/L mg/L	E300.0	0.0750	0.500	5.000	0	108	90 - 110				
Lab Sample ID: LCS-R150175 Test Code: PH-4500H+B	Date Analyzed: 03/26/2021 1503h	03/26/2021	l 1503h										
pH @ 25° C	9.05	pH Units	SM4500-H+B	1.00	1.00	9.000	0	100	98 - 102				
Lab Sample ID: LCS-R150278 Test Code: TDS-W-2540C	Date Analyzed: 03/29/2021 1300h	03/29/2021	1300h										
Total Dissolved Solids	186	mg/L	SM2540C	8.00	10.0	205.0	0	7.06	80 - 120				



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Laboratory Director Jose Rocha QA Officer

Kyle F. Gross

# OC SUMMARY REPORT

Jeff Tucker Contact:

Dept:

QC Type: MBLK

Hunter Power Plant - CCR

Project:

PacifiCorp

Client:

Lab Set ID: 2103745

					Renorting	Amount Sniked	Snike Ref.			RPD Ref.		RPD	
Analyte	Result	Units	Method	MDL	Limit	Limit Amount	Amount	%REC Limits	Limits	Amt	% RPD	Limit Qual	Qual
Lab Sample ID: MB-R150566 Test Code: 300.0-W	Date Analyzed: 04/04/2021 1714h	04/04/2021	1714h										
Chloride	< 0.100	mg/L	E300.0	0.0198	0.100								
Fluoride	< 0.100	mg/L	E300.0	0.00260	0.100								
Sulfate	< 0.500	mg/L	E300.0	0.0750	0.500								
Lab Sample ID: MB-R150278 Test Code: TDS-W-2540C	Date Analyzed: 03/29/2021 1300h	03/29/2021	1300h										
Total Dissolved Solids	< 10.0	mg/L	SM2540C	8.00	10.0								

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Jose Rocha QA Officer

Laboratory Director Kyle F. Gross

# OC SUMMARY REPORT

Jeff Tucker Contact:

QC Type: MS Dept:

Hunter Power Plant - CCR

Project:

PacifiCorp

Client:

Lab Set ID: 2103745

Analyte	Result	Units	Method	MDL	Reporting Limit	Reporting Amount Spiked Spike Ref. Limit Amount	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2103745-004AMS	Date Analyzed: 04/04/2021 2001h	: 04/04/202	1 2001h										
Test Code: 300.0-W													
Chloride	5,830	mg/L	E300.0	19.8	100	5,000	464	107	90 - 110				
Fluoride	5,340	mg/L	E300.0	2.60	100	5,000	2.16	107	90 - 110				
Sulfate	12,900	mg/L	E300.0	75.0	500	5,000	7470	108	90 - 110				



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OC SUMMARY REPORT

Jeff Tucker Contact:

QC Type: MSD Dept:

Hunter Power Plant - CCR PacifiCorp Lab Set ID: 2103745

Project:

Client:

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2103745-004AMSD  Test Code: 300.0-W	Date Analyzed: 04/04/2021 2029h	04/04/2021	2029h										
Chloride	5,850	mg/L	E300.0	19.8	100	5,000	464	108	90 - 110	5830	0.278	20	
Fluoride	5,350	mg/L	E300.0	2.60	100	5,000	2.16	107	90 - 110	5340	0.307	20	
Sulfate	12,900	mg/L	E300.0	75.0	500	5,000	7470	109	90 - 110	12900	0.611	20	
		0									Ш		

American	American West Analytical Laboratories	atories			Rpt Emailed: OL:	GenericHDD	HC EPDD OC
WORK O	WORK ORDER Summary				Work Order:	Work Order: 2103745	
Client:	PacifiCorp				Due Date: 4/9/2021	4/9/2021	
Client ID:	PAC900		Contact:	Jeff Tucker			
Project:	Hunter Power Plant - CCR		QC Level:	+11 ::	WO Type: Project	Project	
Comments:	QC2+, Include EDD. Footnote report, pH received brad.giles@pacificorp.com.;	pH received outside	of hold. RADS sea	nt to ALS-Ft Collins. Cc	outside of hold. RADS sent to ALS-Ft Collins. Cc dennis.vanderbeek@pacificorp.com and	orp.com and	<b>S</b>
Sample ID	Client Sampte ID	Collected Date	Received Date	Test Code	Matrix	Sel Storage	2
2103745-001A	ELF-2	3/24/2021 1910h	3/26/2021 1225h	300.0-W	Aqueous		-
				3 SEL Analytes: CL F SO4			•
				PH-4500H+B		DF-WC	Ē
				TDS-W-2540C		DF-WC	
Z103745-001B				200.7-W		DF-Metals	
	1000			3 SEL Analytes: B CA LI			
				200.7-W-PR		DF-Metals	 
				200.8-W		DF-Metals	   
				11 SEL Analytes: SB AS B.	11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL		
				200.8-W-PR		DF-Metals	
				HG-DW-245.1		DF-Metals	
				HG-DW-PR		DF-Metals	
2103745-001C			-	OUTSIDE LAB		ALS	2
2103745-002A	ELF-4	3/24/2021 1440h	3/26/2021 1225h	300.0-W	Aqueous	DF-WC	-
		1		3 SEL Analytes: CL F SO4			•
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	İ
Z103/45-002B				200.7-W		DF-Metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		DF-Metals	:   
				200.8-W		DF-Metals	
				11 SEL Analytes: SB AS BA	11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL		:
			<b>I</b>	Z00.8-W-L'K		DF-Metals	İ
				HG-DW-245.1		DF-Metals	
D000 345 01C				HG-DW-PR		DF-Metals	
Z103/45-002C				OUTSIDE LAB		ALS	2
2103745-003A	ELF-8	3/24/2021 1116h	3/26/2021 1225h	300.0-W	Aqueous	DF-WC	]
				3 SEL Analytes: CL F SO4			
				PII-4500H+B		DF-WC	:   
				TDS-W-2540C		DF-WC	
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Client: Pa Sample ID C 2103745-003B E						,
	PacifiCorp			Du	Due Date: 4/9/2021	į
	Client Sample ID	Collected Date	Received Date	Test Code Matrix	Sel Storage	
	ELF-8	3/24/2021 1116h	3/26/2021 1225h	200.7-W Aqueous 3 SEL Analyses: B CA LI	DF-Metals	[
ı				200.7-W-PR	DF-Metals	
!				200.8-W	DF-Metals	
•				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL	) SE TL	
				200.8-W-PR	DF-Metals	
				HG-DW-245.1	DF-Metals	
I				HG-DW-PR	DF-Metals	
Z103745-003C			1.000	OUTSIDE LAB	ALS	
2103745-004A E	ЕЦЕ-9	3/24/2021 1810h	3/26/2021 1225b	300.0-W Aqueous	DF-WC	
				3 SEL Analytes: CL F 504		
				PH-4500H+B	DF-WC	
ı			:	TDS-W-2540C	DF-WC	
2103745-004B				200.7.W	DF-Metals	
i				3 SEL Analytes: B CA LI		
I				200.7-W-PR	DF-Mctals	
				200.8-W	DF-Metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL	) SE TL	į
1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			200.8-W-PR	DF-Metals	
				HG-DW-245.1	DF-Metals	:
1				HG-DW-FR	DF-Metals	
2103745-004C					VTS	2
2103745-005A E	ELF-11	3/24/2021 1036h	3/26/2021 1225h	300.0-W Aqueous 3 SEL Anabres: CL F SO4	DF-WC	-
I				PH-4500H+B	DF-WC	
1				TDS-W-2540C	DF-WC	<u> </u>
2103745-005B			ı	200.7-W	DF-Metals	
				3 SEL Analytes: B CA LI		
				200.7-W-PR	DF-Metals	
I				200.8-W	DF-Metals	
1				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL	!	
ı				200.8-W-PR	DF-Metals	
ı				HG-DW-245.1	DF-Metals	
1			       	HG-DW-PR	DF-Metals	
2103745-005C				OUTSIDE LAB	ALS	2

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WORK OI	WORK ORDER Summary				Work Order: 310374	
Client:	PacifiCorp				Pula Date: 4/0/2021	Page 3 of 4
Sample ID	Client Sample ID	Collected Date	Received Date	Test Code Matrix	Sel Storage	
2103745-006A	E.F-12	3/24/2021 1530h	3/26/2021 1225h	300.0-W Aqueous	DF-WC	
				5 344, Analytes: CL + 304 PH-4500H+B	DF-WC	!
				TDS-W-2540C	DF-WC	 
2103745-006B				200.7-W	DF-Metals	 
				200.7-W-PR	DH Marolis	
		j		200.8-W	DE-Metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL		
				200.8-W-PR	DF-Metals	
				HG-DW-245.1	DF-Metals	:
0.000 345.0016				HG-DW-PR	DF-Metals	
2105/43-006C				OUTSIDE LAB	ALS	£1
2103745-007A	ELF.13	3/24/2021 1305h	3/26/2021 1225h	300.0-W Aqueous	DF-WC	
				3 SEL Analytes: CL F 504		
				PH-4500H+B	DF-WC	
2100048			Ī	TDS-W-2540C	DF-WC	
2103/45-00/B				200.7-W	DF-Metals	
				3 SEL Analyses: B CA LI		
				200.7-W-PR	DF-Metals	
				200.8-W	DF-Metals	}   
			j	11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL	PB MO SE TL	
				200.8-W-PR	DF-Metals	
				HG-DW-245.1	DF-Mctals	   
0100345				HG-DW-PR	DF-Metals	
2103/42-00/C				OUTSIDE LAB	ALS	2
2103745-008A	ELF-14	3/24/2021 1220h	3/26/2021 1225h	300.0-W Aqueous	DF-WC	-
		j		3 SEL Analytes: CL F SO4		•
				PH-450011+B	DF-WC	
				TDS-W-2540C	DF-WC	
2103/45-008B				200.7-W	DF-Metals	
			İ	3 SEL Analytes: B CA LI		
				200.7-W-PR	DF-Metals	
				200.8-W	DF-Metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL		
				200.8-W-PR	DF-Metals	]
			į	HG-DW-245.1	DF-Metals	
Printed: 03/31/21 10:11	LABORATORY CHECK: %M	RT [] CN []	TAT C QC □	LUO ☐ HOK HOK	HOK COC Emailed	

WORK OR	WORK ORDER Summary				Work Order	Work Order: 2103745	Page 4 of 4
Chent:	PacifiCorp				Due Date	Due Date: 4/9/2021	
Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel Storage	
2103745-008B	ELF-14	3/24/2021 1220h	3/26/2021 1225h	HG-DW-PR	Aqueous	DF-Metals	[
2103745-008C				OUTSIDE LAB		ALS	
2103745-009A	Duplicate (CCR)	3/24/2021	3/26/2021 1225h	300.0-W	Aqueous	DF-WC	1
				3 SEL Analyses: CL F SO4			
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	
2103745-009B				200.7-W		DF-Metals	
		:		3 SEL Analytes: B CA LI			
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
				11 SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL	SE CD CR CO PB MO SE TL		
				200.8-W-PR		DF-Metals	
				HG-DW-245.1		DF-Metals	ļ
				HG-DW-PR		DF-Metals	
2103745-009C				OUTSIDE LAB		ALS	7
2103745-010A	Field Blank (CCR)	3/24/2021 1930h	3/26/2021 1225b	300 ft.tV	Adheons	DE-WC	-
				3 SEL Analytes: CL F SO4			•
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	
2103745-010B				200.7-W		DF-Metals	
				3 SEL Analytes: BCA LI			
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
				11 SEL Analytes: SB AS BA	II SEL Analytes: SB AS BA BE CD CR CO PB MO SE TL		,
			!	200.8-W-PR		DF-Motals	
				HG-DW-245.1		DF-Metals	
				HG-DW-PR		DF-Metals	
2103745-010C				OUTSIDE LAB		ALS	2

AWAL Use Only - One or more samples expired upon receipt: Test Code PH-4500H+B

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Analytical Laboratories 3440 S, 700 W. Salt Lake City, UT 84119

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# CHAIN OF CUSTODY

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of 2

Page 1

All analysis will be conducted using NELAP actredeted methods and all data will be reported using AWAL's standard analyte lists and reporting. Errits (PQL) unless specifically requested otherwise and two Chant of Castody and/or attached documentation.

	Fax # (801) 263-8687 Email awalwawat-labs.com	rawal-labs.com		QC Level:		Turn Around Time:	nd Time:	Rush sets received after 4:00 pm are	
	www.awal-labs.com	ш		2+		Standard	ard	considered received on the next business day.	4/9/21
	Client: PacifiCorp Environmental Remediation				'!T'	_		C. Report down to the MDL	Unless other arrangements have been
	Address, 1407 West North Temple Ste 270				4. 'o				made, signed reports will be emailed by
	City, State, Zip: Salt Lake City, UT 84140				*C			G Field Filtered For:	ann ata sair sair ann a mac
	Contact: Jeff Tucker				 Ca, (	13	87		Laboratory Use Only
	Phone #: (801) 220-2989 Cell #:				'PO	\ E34	Z =8 9		CON' Tars Mac
	jeft.tucker@pacificorp.com; dennis.vanderbeek@pacificôrp.com; E-mail: brad.giles@pacificorp.com	@pacificorp.cor	l F			8.00	9ZZ W	G RCRA	Present on Outer Package
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By signing this Chain of Custody you are agreeing to permit AWAL to subcontract any analyses not normally performed at AWAL.

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# American West

# Analytical Laboratories

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AL analysis will be conducted using NELAF accredited methods and all data will be reported using AWALs standard analye hats and reporting limits (PQL) unless specifically requested otherwise on the Chann of Custady and/or attached documentation.

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Phone # (801) 263-8686 Toll Free # (858) 263-8686 3440 S. 700 W. Saft Lake City, UT 84119

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PacifiCom Envivormental Pemadistion	Address: 1407 West North Temple Ste 270	City, State, Zip: Salt Lake City, UT 84140	Contact: Jeff Tucker	(801) 220-2989	•	Project Name: Hunter Power Plant - CCR	Project ₹:	PO Æ:	Sampler Name:	Sample Site ID:	Duplicate (ccR)	Field Blank (ccR)													Rechastrick of 19:	PRINCE NO NESTAGES	Relinantished lan
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By signing this Chain of Custody you are agreeting to permit AWAL to subcontract any analyses not normally performed at AWAL.

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# Preservation Check Sheet

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    pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub>         pH         2 H<sub>2</sub>SO<sub>4</sub><td>Preservative         —COI         —COZ         —COJ         —COJ</td><td>Preservative         —COI         —CO2         —CO3         —CO4         —CO4</td><td>Preservative         —CO1         —CO2         —CO3         —CO4         —CO5</td></td>	Preservative         —COI         ~Co2         ~Co4           pH < 2 H <sub>2</sub> SO <sub>4</sub> pH < 2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH > 12 NaOH         pH < 2 H <sub>2</sub> SO <sub>4</sub> pH         2 NeC5         NeC5         NeC5           pH < 2 H <sub>2</sub> SO <sub>4</sub> pH < 2 H <sub>2</sub> SO <sub>4</sub> pH         2 NeC5         NeC5         NeC5           pH < 2 H <sub>2</sub> SO <sub>4</sub> pH < 2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> pH         2 H <sub>2</sub> SO <sub>4</sub> <td>Preservative         —COI         —COZ         —COJ         —COJ</td> <td>Preservative         —COI         —CO2         —CO3         —CO4         —CO4</td> <td>Preservative         —CO1         —CO2         —CO3         —CO4         —CO5</td>	Preservative         —COI         —COZ         —COJ         —COJ	Preservative         —COI         —CO2         —CO3         —CO4         —CO4	Preservative         —CO1         —CO2         —CO3         —CO4         —CO5

Pour a small amount of sample in the sample lid Procedure:

Pour sample from lid gently over wide range pll paper

Do Not dip the pH paper in the sample bottle or lid

If sample is not preserved, properly list its extension and receiving pH in the appropriate column above

Hag COC, notify client if requested Place client conversation on COC Samples may be adjusted

All samples requiring preservation Frequency:

The sample required additional preservative upon receipt. The sample was received unpreserved.

The sample pH was unadjustable to a pH  $\leq 2$  due to the sample matrix.

The sample was received unpreserved and therefore preserved upon receipt.

due to the sample matrix interference. The sample pH was unadjustable to a pH > \_



# Radium-226 Case Narrative

# **American West Analytical Labs**

Hunter CCR Sampling -- 2103745

Work Order Number: 2103613

- 1. This report consists of the analytical results and supporting documentation for ten water samples received by ALS on 3/31/2021.
- 2. These samples were prepared and analyzed according to the current revisions of SOP 783 and SOP 736. The analyses were completed on 4/22/2021.
- 3. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
- 4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
- 5. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for the laboratory control sample fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. This sample is identified with a "Y1" flag on the final reports.
- 6. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.
- 7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

J3 Wylde	4/26/21
Dakota Wylde	Date
Radiochemistry Primary Data Reviewer	
ICHN M Ob	4/28/21
adiochemistry Final Data Reviewer	Date

# **ALS -- Fort Collins**

# Sample Number(s) Cross-Reference Table

**OrderNum:** 2103613

Client Name: American West Analytical Labs

Client Project Name: Hunter CCR Sampling

Client Project Number: 2103745 Client PO Number: 2103745

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ELF-2	2103613-1		WATER	24-Mar-21	19:10
ELF-4	2103613-2		WATER	24-Mar-21	14:40
ELF-8	2103613-3		WATER	24-Mar-21	11:16
ELF-9	2103613-4		WATER	24-Mar-21	18:10
ELF-11	2103613-5		WATER	24-Mar-21	10:36
ELF-12	2103613-6		WATER	24-Mar-21	15:30
ELF-13	2103613-7		WATER	24-Mar-21	13:05
ELF-14	2103613-8		WATER	24-Mar-21	12:20
Duplicate (CCR)	2103613-9		WATER	24-Mar-21	
Field Blank (CCR)	2103613-10		WATER	24-Mar-21	19:30

# American West

# Analytical Laboratories 3440 S. 700 W. Salt Lake City, UT 84119

Phone # (801) 263-8686 Toll Free # (888) 263-8686

CHAIN OF CUSTODY

All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyte lists and reporting limits (PQL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

AWAL Lab Sample Set #

Page

2003602

Checked at bench nple Labels and COC Record Match? Laboratory Use Only ž Unbroken on Outer Package Y N N NA COC Tape Was:
1 Present on Outer Package
N ples Were: Shipped or hand delivered QC 2+ = Final Report, COC, surrogate, recoveries, MB, LCS, Unbroken on Sample Y N Properly Preserved Ambient or Chilled Received Intact Present on Sample Received Within Holding Times 3 Temperature Due Date: MS/MSD performed on customer sample ~ s Unless other arrangements have been made, signed Samples sent to ALS - Ft. Collins. 5:00 pm on the day they are due reports will be emailed by Sample Comments Known Hazards Report down to the MDL Include EDD:
Lab Filter for: Special Instructions: Field Filtered For. For Compliance With 3/3/12/ 1000 **Turn Around Time:** Standard りついいのれしゅう QC Level: (Separate and combined) ‡ × × × × × × 822 38 622 muibsA: Radium 226 & 228 ≥ 3 3 ≥ 3 ≥ ≥ ₹ ₹ ₹ Sampled 19:10 14:40 11:16 18:10 10:36 15:30 13:05 12:20 19:30 Time Print Name: Received by: Print Name: Received by: Signature ignature 3/24/2021 3/2/2 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 Sampled Fax # (801) 263-8687 Email awal@awal-labs.com Date www.awal-labs.com elona@awal-labs.com; denise@awal-labs.com American West Analytical Laboratories Bruun City, State, Zip: Salt Lake City, UT 84119 Project Name: Hunter CCR Sampling Sample ID: Elona Hayward 3440 S. 700 W. (801) 263-8686 PO#: 2103745 Field Blank (CCR) Client Duplicate (CCR) Address: Contact: Phone #: E-mail: Project #: Sampler Name:

**ELF-12** ELF-13 ELF-14

ELF-11 ELF-9 ELF-8 ELF4



# ALS Environmental - Fort Collins CONDITION OF SAMPLE UPON RECEIPT FORM

Client:	AWAL	Wor	korder No: _	2	103613		
Project Manager:	кмо	Initial	s: TEM	Date:		3/31/21	
					N/A	YES	NO
1. Are airbills / shipping of	documents present and/c	or removable?					
Tracking number: 1Z	9E7 258 03 9848 2693					Х	
2. Are custody seals on <b>s</b>	hipping containers intact	:?			х		
3. Are custody seals on <b>s</b>	ample containers intact?				х		
4. Is there a COC (chain-o	of-custody) present?					х	
5.	nt with samples received quested analyses, etc.)	? (IDs, dates, times,	# of sample	es, # of		х	
6. Are short-hold sample	s present?						Х
7. Are all samples within	holding times for the red	quested analyses?				х	
8. Were all sample conta	iners received intact? (n	ot broken or leakin	g)			х	
9. Is there sufficient sam	ple for the requested ana	alyses?				x	
10. Are samples in proper Guidelines )	containers for requested	d analyses? (form 250	), Sample Han	dling		х	
11. Are all aqueous sampl	es preserved correctly, if	required? (excludi	ng volatiles	)		х	
112.	ing no headspace (VOC, G meter? (i.e. size of green		on) free of	bubbles	х		
13. Were the samples ship	oped on ice?						Х
<sup>14.</sup> Were cooler temperatur	es measured at 0.1-6.0°C?	IR gun used*: #5			RAD ONLY		х
Cooler #:	1						
Temperature (°C):	amb						
# of custody seals on cooler:	0						
External μR/hr reading:	9						
Background μR/hr reading:	11						
Were external μR/hr readings :	 ≤ two times background and withir	n DOT acceptance criteria?	YES				
* Please provide details here	e for NO responses to boxes a	above - for 2 thru 5 &	7 thru 12, no	tify PM &	continue	w/ login.	
Were unpreserved b	bottles pH checked? N/A	All client bott	le ID's vs ALS	S lab ID's o	double-ch	necked by	TM
If applicable, was the client cor	ntacted? YES / NO / NA Conta	ict:			Date/	Time:	
Project Manager Signature	/ Date: Kulled M.			4/01/21			

# PAI 783 Rev 15 Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

**Lab ID:** RE210402-1MB

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 02-Apr-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1

QCBatchID: RE210402-1-2

Run ID: RE210402-1A
Count Time: 15 minutes

Final Aliquot: 995 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.09 +/- 0.11	0.16	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15920	15580	ug	97.8	40 - 110 %	

# **Comments:**

## Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021 ALS -- Fort Collins Page 1 of 1

# PAI 783 Rev 15 Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Lab ID: RE210402-1LCS

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 02-Apr-21
Date Prepared: 02-Apr-21
Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1

QCBatchID: RE210402-1-2 Run ID: RE210402-1A

Count Time: 15 minutes

Final Aliquot: 995 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	45 +/- 11	0	46.79	96.0	67 - 120	P,Y1

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15920	16190	ug	102	40 - 110 %	Y1

# Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021 ALS -- Fort Collins Page 1 of 2

# PAI 783 Rev 15 Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Lab ID: RE210402-1LCSD

Sample Matrix: WATER

**Prep SOP:** PAI 783 Rev 15

Date Collected: 02-Apr-21
Date Prepared: 02-Apr-21
Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1

QCBatchID: RE210402-1-2 Run ID: RE210402-1A

Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	38.9 +/- 9.7	0.2	46.79	83.2	67 - 120	Р

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15920	15310	ug	96.1	40 - 110 %	

# Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID:

Lab ID: RE210402-1LCSD

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 02-Apr-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A

Count Time: 15 minutes

Final Aliquot: 995 ml Prep Basis: Unfiltered

Moisture(%): NA Result Units: pCi/l File Name: Manual Entry

CASNO	Analyte Sample			Duplica	DER	DER			
	Analyte	Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		Lim
13982-63-3	Ra-226	45 +/- 11	0	P,Y1	45 +/- 11	0.2	Р	0.406	2.13

# Comments:

# Duplicate Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 Chemical Yield outside default limits.
- W DER is greater than Warning Limit of 1.42
- D DER is greater than Control Limit of 2.13
- LT Result is less than Request MDC, greater than sample specific MDC
- M Requested MDC not met.
- M3 The requested MDC was not met, but the reported
- activity is greater than the reported MDC.
- L LCS Recovery below lower control limit.
- H LCS Recovery above upper control limit.
  P LCS, Matrix Spike Recovery within control limits.
- N Matrix Spike Recovery outside control limits

Data Package ID: RE2103613-1

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

BDL - Below Detection Limit

NR - Not Reported

Date Printed: Monday, April 26, 2021 ALS -- Fort Collins Page 1 of 1

# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-2 Lab ID: 2103613-1 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA

Result Units: pCi/l File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.07 +/- 0.15	0.26	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15930	15430	ug	96.8	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-4 Lab ID: 2103613-2 Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.32 +/- 0.20	0.19	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15940	14090	ug	88.4	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-8 Lab ID: 2103613-3 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

**Date Collected:** 24-Mar-21 **Date Prepared:** 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.70 +/- 0.28	0.17	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15940	15890	ug	99.7	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-9
Lab ID: 2103613-4

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.26 +/- 0.18	0.22	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15940	14590	ug	91.5	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-11 Lab ID: 2103613-5 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21 Date Prepared: 02-Apr-21 Date Analyzed: 22-Apr-21 Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A Count Time: 15 minutes Report Basis: Unfiltered Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.24 +/- 0.19	0.20	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15950	11750	ug	73.7	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-12 Lab ID: 2103613-6 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21 Date Prepared: 02-Apr-21 Date Analyzed: 22-Apr-21 Prep Batch: RE210402-1 QCBatchID: RE210402-1-2 Run ID: RE210402-1A

Count Time: 15 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.70 +/- 0.42	0.40	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15930	10090	ug	63.3	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-13 Lab ID: 2103613-7 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.33 +/- 0.20	0.22	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15930	14830	ug	93.1	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-14 Lab ID: 2103613-8 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21
Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.19 +/- 0.23	0.35	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15940	11950	ug	75.0	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: Duplicate (CCR)

Lab ID: 2103613-9

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.33 +/- 0.21	0.26	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15930	15200	ug	95.4	40 - 110 %	

# **Comments:**

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

# PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: Field Blank (CCR)

Lab ID: 2103613-10

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 24-Mar-21

Date Prepared: 02-Apr-21

Date Analyzed: 22-Apr-21

Prep Batch: RE210402-1 QCBatchID: RE210402-1-2

Run ID: RE210402-1A Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA

Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.033 +/- 0.081	0.152	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15920	15780	ug	99.1	40 - 110 %	

# Comments:

# Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

## Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2103613-1

Date Printed: Monday, April 26, 2021

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# Radium-228 Case Narrative

# **American West Analytical Labs**

Hunter CCR Sampling -- 2103745

Work Order Number: 2103613

- 1. This report consists of the analytical results for ten water samples received by ALS on 03/31/2021.
- 2. These samples were prepared according to the current revision of SOP 749.
- 3. The samples were analyzed for the presence of <sup>228</sup>Ra by low background gas flow proportional counting of <sup>228</sup>Ac, which is the ingrown progeny of <sup>228</sup>Ra, according to the current revision of SOP 724. The analyses were completed on 04/26/2021.
- 4. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
- 5. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
- 6. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for RA210421-2MB and -2LCS fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. These samples are identified with a "Y1" flag on the final reports.
- 7. No further anomalous situations were noted during the preparation and analysis of these samples. All remaining quality control criteria were met.



The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Jean Anderson
Radiochemistry Primary Data Reviewer

4/28/21

Radiochemistry Final Data Reviewer

Date

# **ALS -- Fort Collins**

# Sample Number(s) Cross-Reference Table

**OrderNum:** 2103613

Client Name: American West Analytical Labs

Client Project Name: Hunter CCR Sampling

Client Project Number: 2103745 Client PO Number: 2103745

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ELF-2	2103613-1		WATER	24-Mar-21	19:10
ELF-4	2103613-2		WATER	24-Mar-21	14:40
ELF-8	2103613-3		WATER	24-Mar-21	11:16
ELF-9	2103613-4		WATER	24-Mar-21	18:10
ELF-11	2103613-5		WATER	24-Mar-21	10:36
ELF-12	2103613-6		WATER	24-Mar-21	15:30
ELF-13	2103613-7		WATER	24-Mar-21	13:05
ELF-14	2103613-8		WATER	24-Mar-21	12:20
Duplicate (CCR)	2103613-9		WATER	24-Mar-21	
Field Blank (CCR)	2103613-10		WATER	24-Mar-21	19:30



# American West

Analytical Laboratories 3440 S. 700 W. Salt Lake City, UT 84119 Phone # (801) 263-8686 Toll Free # (888) 263-8686

# CHAIN OF CUSTODY

All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyte lists and reporting limits (PQL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation.

AWAL Lab Sample Set#

Page

2003602

Checked at bench tiple Labels and COC Record Match? Laboratory Use Only Unbroken on Outer Package ž COC Tape Was:

1 Present on Outer Package
Y N N ples Were: Shipped or hand delivered QC 2+ = Final Report, COC, surrogate, recoveries, MB, LCS, Unbroken on Sample Y N Property Preserved Ambient or Chilled Present on Sampl Received Intact Received Within Holding Times 3 Temperature Due Date: MS/MSD performed on customer sample Unless other arrangements have been made, signed Samples sent to ALS - Ft. Collins. 5:00 pm on the day they are due reports will be emailed by Sample Comments Known Hazards Report down to the MDL

Include EDD:

Lab Filter for: | NELAP | CRRA | CRRA | CRRA | CRRA | SDWA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | CRRA | Special Instructions: ☐ Field Filtered For: For Compliance With 7 3/31/21 **Turn Around Time:** Standard りついいのれしゅう QC Level: (Separate and combined) **‡** × × × × × 228 & 228 muibsA: Radium 226 & 228 3 3 ≥ 3 ≥ ≥ ₹ ≥ ₹ ₹ Sampled 19:10 14:40 11:16 18:10 10:36 15:30 13:05 12:20 19:30 Time Print Name: Received by: Signature Print Name: Received by: Signature 3/24/2021 3/2/2/ 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 3/24/2021 Sampled Fax # (801) 263-8687 Email awal@awal-labs.com Date www.awal-labs.com E.mail: elona@awal-labs.com; denise@awal-labs.com American West Analytical Laboratories Bruun City, State, Zip: Salt Lake City, UT 84119 Project Name: Hunter CCR Sampling Sample ID: Contact: Elona Hayward Phone #: (801) 263-8686 Address: 3440 S. 700 W. PO#: 2103745 Field Blank (CCR) Client Duplicate (CCR) Project #: Sampler Name: ELF-12 ELF-13 ELF-14 ELF-11

ELF-8 ELF-9

ELF-2 ELF4



# ALS Environmental - Fort Collins CONDITION OF SAMPLE UPON RECEIPT FORM

Client:	AWAL	Wor	korder No: _	2	103613		
Project Manager:	кмо	Initial	s: TEM	Date:		3/31/21	
					N/A	YES	NO
1. Are airbills / shipping of	documents present and/c	or removable?					
Tracking number: 1Z	9E7 258 03 9848 2693					Х	
2. Are custody seals on <b>s</b>	hipping containers intact	:?			х		
3. Are custody seals on <b>s</b>	ample containers intact?				х		
4. Is there a COC (chain-o	of-custody) present?					х	
5.	nt with samples received quested analyses, etc.)	? (IDs, dates, times,	# of sample	es, # of		х	
6. Are short-hold sample	s present?						Х
7. Are all samples within	holding times for the red	quested analyses?				х	
8. Were all sample conta	iners received intact? (n	ot broken or leakin	g)			х	
9. Is there sufficient sam	ple for the requested ana	alyses?				x	
10. Are samples in proper Guidelines )	containers for requested	d analyses? (form 250	), Sample Han	dling		х	
11. Are all aqueous sampl	es preserved correctly, if	required? (excludi	ng volatiles	)		х	
112.	ing no headspace (VOC, G meter? (i.e. size of green		on) free of	bubbles	х		
13. Were the samples ship	oped on ice?						Х
<sup>14.</sup> Were cooler temperatur	es measured at 0.1-6.0°C?	IR gun used*: #5			RAD ONLY		х
Cooler #:	1						
Temperature (°C):	amb						
# of custody seals on cooler:	0						
External μR/hr reading:	9						
Background μR/hr reading:	11						
Were external μR/hr readings :	 ≤ two times background and withir	n DOT acceptance criteria?	YES				
* Please provide details here	e for NO responses to boxes a	above - for 2 thru 5 &	7 thru 12, no	tify PM &	continue	w/ login.	
Were unpreserved b	bottles pH checked? N/A	All client bott	le ID's vs ALS	S lab ID's o	double-ch	necked by	TM
If applicable, was the client cor	ntacted? YES / NO / NA Conta	ict:			Date/	Time:	
Project Manager Signature	/ Date: Kulled M.			4/01/21			

# Radium-228 Analysis by GFPC

# PAI 724 Rev 14 Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

**Lab ID:** RA210421-2MB

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 21-Apr-21

Date Prepared: 21-Apr-21

Date Analyzed: 26-Apr-21

Prep Batch: RA210421-2

QCBatchID: RA210421-2-2 Run ID: RA210421-2A

Count Time: 150 minutes

Final Aliquot: 997 ml Result Units: pCi/l

File Name: RAA0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	0.58 +/- 0.40	0.78	1	NA	Y1,U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31560	32380	ug	103	40 - 110 %	Y1

# **Comments:**

## Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021 ALS -- Fort Collins Page 1 of 1

# Radium-228 Analysis by GFPC

# **PAI 724 Rev 14**

# **Laboratory Control Sample(s)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Lab ID: RA210421-2LCS

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 21-Apr-21

Date Prepared: 21-Apr-21

Date Analyzed: 26-Apr-21

Prep Batch: RA210421-2

QCBatchID: RA210421-2-2 Run ID: RA210421-2A

Count Time: 150 minutes

Final Aliquot: 997 ml Result Units: pCi/l

File Name: RAA0426

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Contro I Limits	Lab Qualifier
15262-20-1	Ra-228	24.0 +/- 5.6	0.8	22.11	109	70 - 130	P,Y1

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31560	31830	ug	101	40 - 110 %	Y1

# Comments:

# Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2103613-1

# Radium-228 Analysis by GFPC

# **PAI 724 Rev 14**

# **Laboratory Control Sample(s)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Lab ID: RA210421-2LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 21-Apr-21

Date Prepared: 21-Apr-21

Date Analyzed: 26-Apr-21

Prep Batch: RA210421-2

QCBatchID: RA210421-2-2

Run ID: RA210421-2A

Count Time: 150 minutes

Final Aliquot: 997 ml
Result Units: pCi/l

File Name: RAA0426

CA	SNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Contro I Limits	Lab Qualifier
1526	62-20-1	Ra-228	23.9 +/- 5.6	0.9	22.11	108	70 - 130	Р

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31560	29370	ug	93.1	40 - 110 %	

# Comments:

# Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021 ALS -- Fort Collins Page 2 of 2

# **PAI 724 Rev 14**

## **Duplicate Sample Results (DER)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2103745

Field ID:

Lab ID: RA210421-2LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7 Date Collected: 21-Apr-21

Date Prepared: 21-Apr-21

Date Analyzed: 26-Apr-21

**Prep Batch:** RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A Count Time: 150 minutes

Final Aliquot: 997 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l File Name: RAA0426

CASNO	Analyte Sample		Duplicate			DER	DER		
	Allalyte	Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		Lim
15262-20-1	Ra-228	24.0 +/- 5.6	0.8	P,Y1	24.0 +/- 5.6	0.9	Р	0.0198	2.13

#### **Comments:**

#### **Duplicate Qualifiers/Flags:**

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 Chemical Yield outside default limits.
- W DER is greater than Warning Limit of 1.42
- D DER is greater than Control Limit of 2.13
- LT Result is less than Request MDC, greater than sample specific MDC
- M Requested MDC not met.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L LCS Recovery below lower control limit.
- H LCS Recovery above upper control limit.
- P LCS, Matrix Spike Recovery within control limits.
- N Matrix Spike Recovery outside control limits

Data Package ID: RA2103613-1

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

BDL - Below Detection Limit

NR - Not Reported

**ALS -- Fort Collins** Page 1 of 1 Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-2 Lab ID: 2103613-1 Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 24-Mar-21

Date Prepared: 21-Apr-21 Date Analyzed: 26-Apr-21 Prep Batch: RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	1.63	0.75	1	NA	
15262-20-1	Ra-228	1.63 +/- 0.56	0.75	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31570	29540	ug	93.6	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

- $\ensuremath{\mathsf{U}}\xspace$  Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- $\ensuremath{\mathsf{M}}$  The requested MDC was not met.

#### Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-4
Lab ID: 2103613-2

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 24-Mar-21

Date Prepared: 21-Apr-21

**Date Prepared:** 21-Apr-21 **Date Analyzed:** 26-Apr-21

Prep Batch: RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A Count Time: 150 minutes Report Basis: Unfiltered Final Aliquot: 997 ml Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.17	0.75	1	NA	
15262-20-1	Ra-228	1.85 +/- 0.61	0.75	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31570	30290	ug	95.9	40 - 110 %	

#### **Comments:**

#### Qualifiers/Flags:

 $\ensuremath{\mathsf{U}}\xspace$  - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-8
Lab ID: 2103613-3

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 24-Mar-21

**Date Prepared:** 21-Apr-21 **Date Analyzed:** 26-Apr-21

Prep Batch: RA210421-2

QCBatchID: RA210421-2-2 Run ID: RA210421-2A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.74	0.71	1	NA	
15262-20-1	Ra-228	2.04 +/- 0.63	0.71	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31570	30240	ug	95.8	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

 $\ensuremath{\mathsf{U}}\xspace$  - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-9
Lab ID: 2103613-4

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 24-Mar-21

Date Prepared: 21-Apr-21 Date Analyzed: 26-Apr-21 Prep Batch: RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A ount Time: 150 minutes Final Aliquot: 997 ml Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

d: 21-Apr-21Count Time: 150 minutesResult Units: pCi/ld: 26-Apr-21Report Basis: UnfilteredFile Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.26	0.79	1	NA	
15262-20-1	Ra-228	2.00 +/- 0.65	0.79	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31570	27680	ug	87.7	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

 $\ensuremath{\mathsf{U}}\xspace$  - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

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# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-11 Lab ID: 2103613-5 Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 24-Mar-21

Date Prepared: 21 Apr 21

Date Prepared: 21-Apr-21 Date Analyzed: 26-Apr-21 Prep Batch: RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A Count Time: 150 minutes Report Basis: Unfiltered Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	3.32	0.81	1	NA	
15262-20-1	Ra-228	3.08 +/- 0.87	0.81	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31580	29090	ug	92.1	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

 $\ensuremath{\mathsf{U}}\xspace$  - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

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# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-12 Lab ID: 2103613-6 Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 24-Mar-21

**Date Prepared:** 21-Apr-21 **Date Analyzed:** 26-Apr-21

Prep Batch: RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A Count Time: 150 minutes Report Basis: Unfiltered Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	4.26	0.79	1	NA	
15262-20-1	Ra-228	3.56 +/- 0.97	0.79	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31570	29630	ug	93.9	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

- $\ensuremath{\mathsf{U}}\xspace$  Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- $\ensuremath{\mathsf{M}}$  The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-13
Lab ID: 2103613-7

Sample Matrix: WATER

Date Analyzed: 26-Apr-21

Prep SOP: SOP749 Rev 7

Date Collected: 24-Mar-21

Date Prepared: 21-Apr-21

Prep Batch: RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A Count Time: 150 minutes Report Basis: Unfiltered Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA

Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.72	0.75	1	NA	
15262-20-1	Ra-228	2.39 +/- 0.71	0.75	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31570	29890	ug	94.7	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

 $\ensuremath{\mathsf{U}}\xspace$  - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: ELF-14
Lab ID: 2103613-8

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 24-Mar-21

Date Prepared: 21 Apr 21

Date Prepared: 21-Apr-21 Date Analyzed: 26-Apr-21 Prep Batch: RA210421-2

QCBatchID: RA210421-2-2 Run ID: RA210421-2A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.34	0.77	1	NA	
15262-20-1	Ra-228	2.34 +/- 0.71	0.77	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31580	29900	ug	94.7	40 - 110 %	

#### **Comments:**

#### Qualifiers/Flags:

- $\ensuremath{\mathsf{U}}\xspace$  Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- $\ensuremath{\mathsf{M}}$  The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: Duplicate (CCR)

Lab ID: 2103613-9

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 24-Mar-21

Date Prepared: 21-Apr-21 Date Analyzed: 26-Apr-21 Prep Batch: RA210421-2 QCBatchID: RA210421-2-2

Run ID: RA210421-2A Count Time: 150 minutes Report Basis: Unfiltered Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.72	0.75	1	NA	
15262-20-1	Ra-228	2.39 +/- 0.71	0.75	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31570	30740	ug	97.4	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

 $\ensuremath{\mathsf{U}}\xspace$  - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021

# PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2103613

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2103745

Field ID: Field Blank (CCR)

Lab ID: 2103613-10

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 24-Mar-21

Date Prepared: 21-Apr-21 Date Analyzed: 26-Apr-21 Prep Batch: RA210421-2

QCBatchID: RA210421-2-2 Run ID: RA210421-2A

**Count Time:** 150 minutes **Report Basis:** Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC0426

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.77	1	NA	U
15262-20-1	Ra-228	0.76 +/- 0.42	0.77	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31560	31290	ug	99.1	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

 $\ensuremath{\mathsf{U}}\xspace$  - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2103613-1

Date Printed: Tuesday, April 27, 2021



# **ATTACHMENT B:**

Field Summary Report – October 2021 Event





**Facility Name:** Hunter Power Plant – CCR Landfill

**Event Description:** Assessment Monitoring **Event Dates:** October 25-26, 2021 **Field Personnel:** Dennis Vanderbeek

ACTIVITY SUMMARY. PacifiCorp personnel arrived onsite October 25, 2021 and performed groundwater sampling at Hunter CCR Landfill. Prior to collecting samples, field instruments were calibrated, followed by the collection of water levels in the CCR monitoring wells. After recording water levels, the wells were purged in accordance with the EPA low-flow method. Field parameters were monitored during well purging in accordance with the site-specific sampling and analysis plan (SAP). Once field parameters met the SAP stabilization requirements, groundwater samples were collected for Appendix III and Appendix IV constituents. All calibration data and field measurements were recorded on the WET electronic field form. The wells that underwent sampling during this sampling event included:

•	ELF-10	•	ELF-3
•	ELF-11	•	ELF-4
•	ELF-12	•	ELF-5
•	ELF-13	•	ELF-6
•	ELF-14	•	ELF-7
•	ELF-1D	•	ELF-8
•	ELF-2	•	ELF-9

The following details dates for conducting field work and post-field work data processing:

• Date fieldwork completed: 10/26/2021

• Dates unvalidated lab data received: 12/20/2021

• Data validation completion date: 01/12/2022

After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to American West Analytical Laboratories (AWAL) in Salt Lake City, Utah for analysis. Samples arrived at AWAL on 10/28/2021. AWAL subcontracted Radium analyses to ALS Global in Fort Collins, Colorado. Samples arrived at ALS on 11/01/2021. The following information is attached to this summary as a supplement:

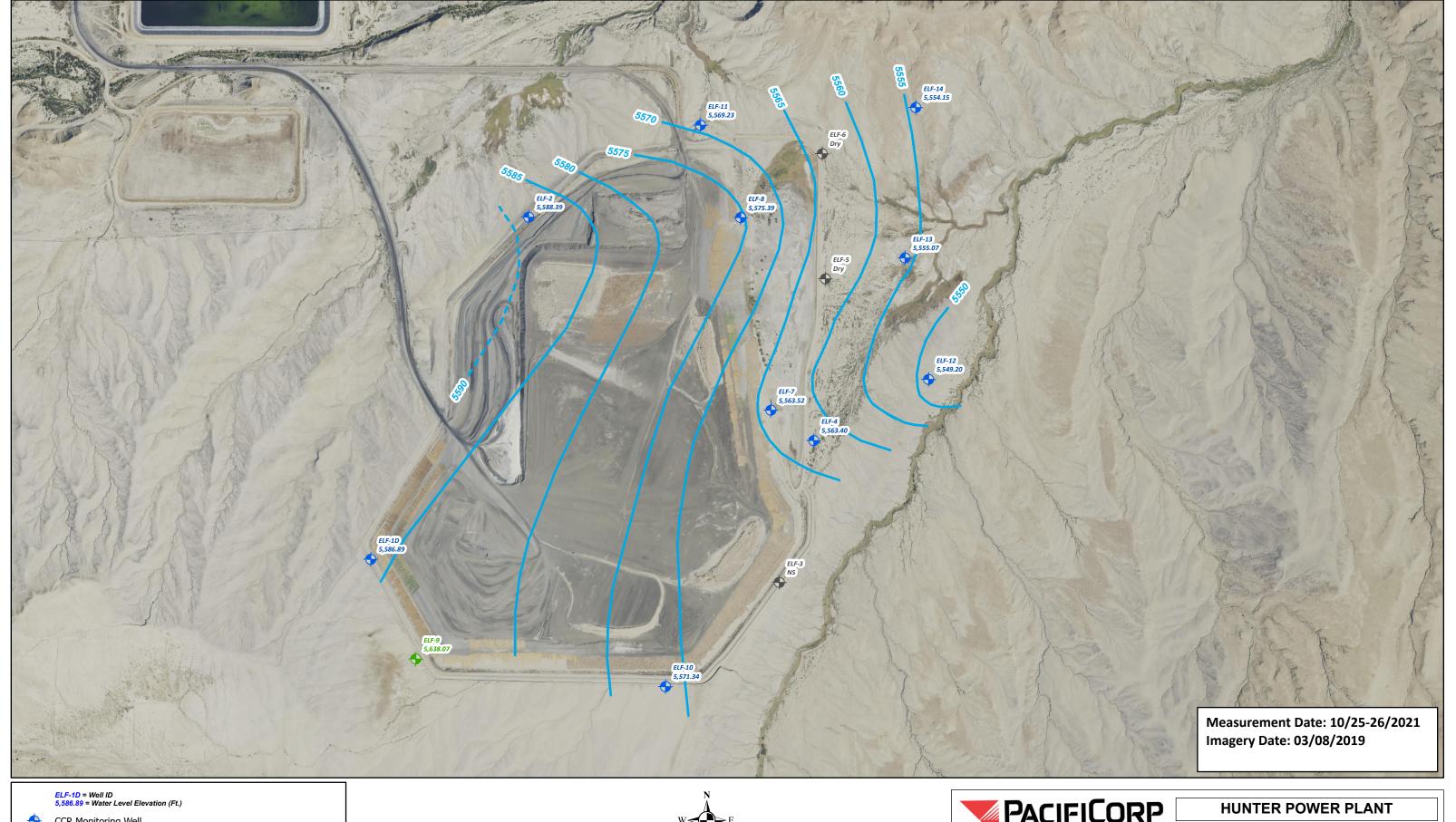
- Attachment A: Groundwater Contour Map
- Attachment B: Data Validation Summary
- Attachment C: Statistical Analysis
- Attachment D: Field Data Sheets
- Attachment E: Laboratory Analytical Reports

**SAP DEVIATIONS.** Wells ELF-3, ELF-5, and ELF-6 did not have enough water to sample.

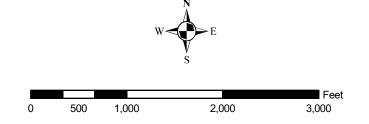


# **Attachment A:**

Groundwater Contour Map









Groundwater Elevation Map CCR Landfill

Job#: PERCM052

**Attachment A** 

Path: M:\PERC\PERC\_CCR\GIS\2021\_CCR\_Sampling\Hunter\GIS\Fall\Hunter\_PERC\_Fall\_GWE.aprx, Author: jhulla



# **Attachment B:**

Data Validation Summary

Facility Name:	Hunter Power l	Plant	
Validator:	Janelle Garza (	1/12/2021)	
Reviewer:	Marcus Hollan	d (1/12/2022)	
Laboratory:		t Analytical Laboratories (AWAL); Salt Lake City, UT ries; Fort Collins, CO	
Laboratory Work Order#:	AWAL: 21107 ALS: 2111019	65	
Sample IDs:		2, ELF-4, Field Blank, ELF-7, ELF-8, ELF-9, ELF-10, I2, ELF-13, ELF-14, Duplicate	
<b>Collection Dates:</b>	October 25-26,	2021	
Sample Media:	Aqueous		
Analytical Parameters:	AWAL:  Major Ions  Chloride and Sulfate by E300.0  Fluoride by A4500-F C  Calcium (Ca) by E200.7  Physical Properties  pH and pH Measurement Temp by A4500-H B  Total Dissolved Solids (TDS) (@ 180 C) by A2540 C  Total Metals by E200.7/8  Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Boron (B), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Lead (Pb), Lithium (Li), Molybdenum (Mo), Selenium (Se), Thallium (Tl)  Total Mercury (Hg) by E245.1  ALS:  Total Radionuclides  Radium 226  Radium 228  Radium 226 + Radium 228		
Review Element:	Complete / Criteria Met? (Yes/No)	If no, describe:	
Chain of Custody:	No	COC date and time for Field Blank was 1/10/1900 at 12:00. The container dates and times were 10/26/2021 11:50. The container dates and times were used.	
Field Documentation:	Yes		
Holding Times & Sample Preservation:	pH in all samples was analyzed past the 15-min holding time. However, lab pH was compared to stabilized field pH. If the lab pH was within +/-the final stabilized field pH, then the lab pH was considered acceptable.  Sample Field Blank, consistent of deionized water, was within an acceptable pH range of 7.0; therefore, no qualification was required All remaining samples were qualified as est high, J+.		
Calibrations:	Yes		

		Field:
Blanks:	No	Sample Field Blank: representing all samples.  Chloride was detected at 0.104 mg/L, above the RL of 0.100 mg/L.  Samples ELF-2, ELF-9, and ELF-12 were qualified as estimated high, J+, due to results ≥RL but <10x FB value and should be reported at the FB result (104 mg/L).  No qualification was required for all remaining samples due to results ≥10x FB value.  TDS was detected at 1,800 mg/L, above the RL of 500 mg/L.  Sample ELF-11 was qualified as estimated high, J+, due to results ≥RL but <10x FB value and should be reported at the FB result (1,800 mg/L).  No qualification was required for all remaining samples due to results ≥10x FB value.
Laboratory Control Sample:	Yes	
Duplicate Samples:	No	<ul> <li>Field ELF-14 (original) and Duplicate (duplicate): representing all samples.</li> <li>❖ Radium 226 RPD was 90.9%, above the limit of 20%. The mean difference was 0.93, below the limit of 3. Therefore, no qualification is required.</li> <li>❖ Radium 228 RPD was 20.4%, above the limit of 20%. The mean difference was 0.37, below the limit of 3. Therefore, no qualification is required.</li> </ul>
Matrix Spike (MS):	Yes	Lab IDs 2110765-002CMS (Sample ID ELF-2) and 2110765-003CMS (Sample ID ELF-4), Method 200.7:  ❖ Calcium was recovered both below and above the control limits of 70-130%: 34.5% with ELF-2 and 270% and 192% with ELF-4. The sample concentrations were >4x spike added; therefore, no qualification was required.  Lab ID 2110765-001CMS (Sample ID ELF-1D), Method 245.1:  ❖ Mercury was recovered at 74.4% and 72.4%, below the limits of 80-120%.  ➤ Sample Field Blank, consistent of DI water, was not evaluated due to the potential matrix interference between DI water and aqueous groundwater.  ➤ All remaining samples were qualified as estimated non-detect, UJ.  Lab ID 2110611-029 (unassociated work order sample), Method 300.0:

		Sulfate was recovered at 83.2% and 80.8%, below the limits of 90-110%.			
		<ul><li>Sample Field Blank, consistent of DI water,</li></ul>			
		was not evaluated due to the potential matrix			
		interference between DI water and aqueous			
		groundwater.			
		All remaining samples were qualified as			
		estimated low, J			
Other:	Yes	Sample ELF-1D arrived with only 200 mL of sample			
	f f	for radionuclide analyses.			

#### **Overall Assessment:**

Out of 299 total data points, 259 data points (86.6%) remain unqualified, or were qualified as non-detect (U), and are considered quantitative. The remaining 40 data points (13.4%) were qualified as estimated due to holding time exceedance (pH), field blank contamination, and poor laboratory accuracy, and are assigned as qualitative. No data points were rejected; therefore, this work order is 100% complete and useable.



# **Attachment C:**

Statistical Analysis





**Facility Name:** Hunter Power Plant – CCR Landfill

**Event Description:** Assessment Monitoring **Event Dates:** October 25-26, 2021 **Field Personnel:** Dennis Vanderbeek

ACTIVITY SUMMARY. PacifiCorp personnel arrived onsite October 25, 2021 and performed groundwater sampling at Hunter CCR Landfill. Prior to collecting samples, field instruments were calibrated, followed by the collection of water levels in the CCR monitoring wells. After recording water levels, the wells were purged in accordance with the EPA low-flow method. Field parameters were monitored during well purging in accordance with the site-specific sampling and analysis plan (SAP). Once field parameters met the SAP stabilization requirements, groundwater samples were collected for Appendix III and Appendix IV constituents. All calibration data and field measurements were recorded on the WET electronic field form. The wells that underwent sampling during this sampling event included:

•	ELF-10	•	ELF-3
•	ELF-11	•	ELF-4
•	ELF-12	•	ELF-5
•	ELF-13	•	ELF-6
•	ELF-14	•	ELF-7
•	ELF-1D	•	ELF-8
•	ELF-2	•	ELF-9

The following details dates for conducting field work and post-field work data processing:

• Date fieldwork completed: 10/26/2021

• Dates unvalidated lab data received: 12/20/2021

• Data validation completion date: 01/12/2022

After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to American West Analytical Laboratories (AWAL) in Salt Lake City, Utah for analysis. Samples arrived at AWAL on 10/28/2021. AWAL subcontracted Radium analyses to ALS Global in Fort Collins, Colorado. Samples arrived at ALS on 11/01/2021. The following information is attached to this summary as a supplement:

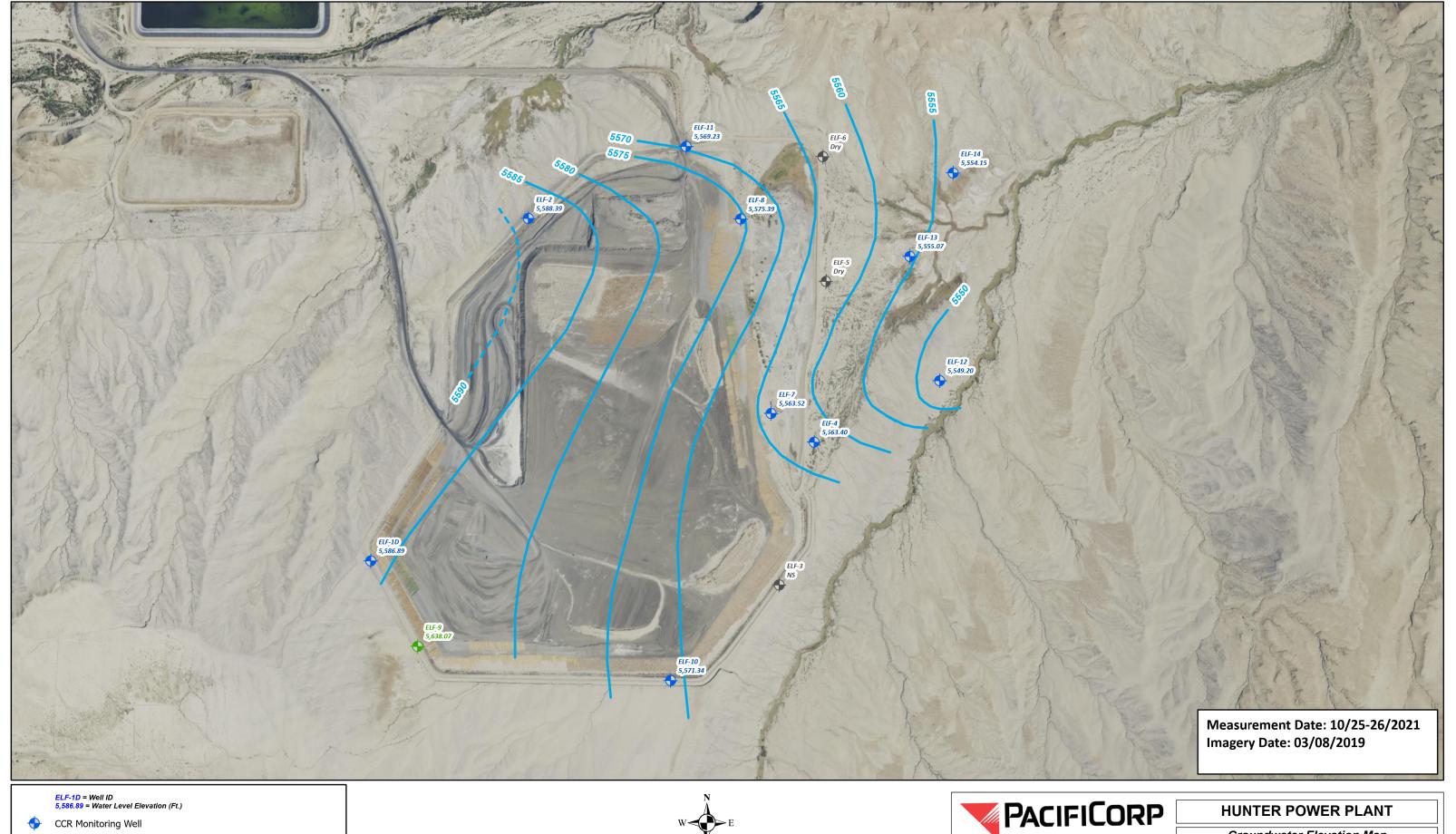
- Attachment A: Groundwater Contour Map
- Attachment B: Data Validation Summary
- Attachment C: Statistical Analysis
- Attachment D: Field Data Sheets
- Attachment E: Laboratory Analytical Reports

**SAP DEVIATIONS.** Wells ELF-3, ELF-5, and ELF-6 did not have enough water to sample.

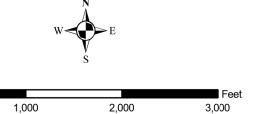


# **Attachment A:**

Groundwater Contour Map







500



Groundwater Elevation Map CCR Landfill

Job#: PERCM052

Date: 1/26/2022

Attachment A

 $\label{path:main} \begin{picture}(t) Path: M:\PERC:\PERC\_CCR:\GIS\2021\_CCR\_Sampling:\Hunter:\GIS\Fall:\Hunter\_PERC\_Fall\_GWE.\ aprx,\ Author:\ jleprowse.\ aprx,\ Author:\ ap$ 



# **Attachment B:**

Data Validation Summary

Facility Name:	Hunter Power l	Plant					
Validator:	Janelle Garza (1/12/2021)						
Reviewer:	Marcus Holland (1/12/2022)						
Laboratory:	American West Analytical Laboratories (AWAL); Salt Lake City, UT ALS Laboratories; Fort Collins, CO						
Laboratory Work Order#:	AWAL: 2110765 ALS: 2111019						
Sample IDs:	ELF-1D, ELF-2, ELF-4, Field Blank, ELF-7, ELF-8, ELF-9, ELF-10, ELF-11, ELF-12, ELF-13, ELF-14, Duplicate						
<b>Collection Dates:</b>	October 25-26,	October 25-26, 2021					
Sample Media:	Aqueous						
Analytical Parameters:	AWAL:  Major Ions  Chloride and Sulfate by E300.0  Fluoride by A4500-F C  Calcium (Ca) by E200.7  Physical Properties  pH and pH Measurement Temp by A4500-H B  Total Dissolved Solids (TDS) (@ 180 C) by A2540 C  Total Metals by E200.7/8  Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Boron (B), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Lead (Pb), Lithium (Li), Molybdenum (Mo), Selenium (Se), Thallium (Tl)  Total Mercury (Hg) by E245.1  ALS:  Total Radionuclides  Radium 226  Radium 228  Radium 226						
Review Element:	Complete / Criteria Met? (Yes/No)	If no, describe:					
Chain of Custody:	No	COC date and time for Field Blank was 1/10/1900 at 12:00. The container dates and times were 10/26/2021 11:50. The container dates and times were used.					
Field Documentation:	Yes						
Holding Times & Sample Preservation:	PH in all samples was analyzed past the 15-minute holding time. However, lab pH was compared to final stabilized field pH. If the lab pH was within +/-0.10 of the final stabilized field pH, then the lab pH was considered acceptable.  Sample Field Blank, consistent of deionized (DI) water, was within an acceptable pH range of 5.5 to 7.0; therefore, no qualification was required.  All remaining samples were qualified as estimated high, J+.						
Calibrations:	Yes						

		Field:				
Blanks:	No	<ul> <li>Field:         <ul> <li>Sample Field Blank: representing all samples.</li> <li>Chloride was detected at 0.104 mg/L, above the RI of 0.100 mg/L.</li> <li>Samples ELF-2, ELF-9, and ELF-12 were qualified as estimated high, J+, due to results ≥RL but &lt;10x FB value and should be reported at the FB result (104 mg/L).</li> <li>No qualification was required for all remaining samples due to results ≥10x FB value.</li> </ul> </li> <li>* TDS was detected at 1,800 mg/L, above the RL of 500 mg/L.</li> <li>Sample ELF-11 was qualified as estimated high, J+, due to results ≥RL but &lt;10x FB value and should be reported at the FB result (1,800 mg/L).</li> <li>No qualification was required for all remaining samples due to results ≥10x FB value.</li> </ul>				
Laboratory Control Sample:	Yes					
Duplicate Samples:	No	<ul> <li>Field ELF-14 (original) and Duplicate (duplicate): representing all samples.</li> <li>❖ Radium 226 RPD was 90.9%, above the limit of 20%. The mean difference was 0.93, below the limit of 3. Therefore, no qualification is required.</li> <li>❖ Radium 228 RPD was 20.4%, above the limit of 20%. The mean difference was 0.37, below the limit of 3. Therefore, no qualification is required.</li> </ul>				
Matrix Spike (MS):	Yes	Lab IDs 2110765-002CMS (Sample ID ELF-2) and 2110765-003CMS (Sample ID ELF-4), Method 200.7:  ❖ Calcium was recovered both below and above the control limits of 70-130%: 34.5% with ELF-2 and 270% and 192% with ELF-4. The sample concentrations were >4x spike added; therefore, no qualification was required.  Lab ID 2110765-001CMS (Sample ID ELF-1D), Method 245.1:  ❖ Mercury was recovered at 74.4% and 72.4%, below the limits of 80-120%.  ➤ Sample Field Blank, consistent of DI water, was not evaluated due to the potential matrix interference between DI water and aqueous groundwater.  ➤ All remaining samples were qualified as estimated non-detect, UJ.  Lab ID 2110611-029 (unassociated work order sample), Method 300.0:				

		Sulfate was recovered at 83.2% and 80.8%, below the limits of 90-110%.			
		<ul><li>Sample Field Blank, consistent of DI water,</li></ul>			
		was not evaluated due to the potential matrix			
		interference between DI water and aqueous			
		groundwater.			
		All remaining samples were qualified as			
		estimated low, J			
Other:	Yes	Sample ELF-1D arrived with only 200 mL of sample			
	f f	for radionuclide analyses.			

#### **Overall Assessment:**

Out of 299 total data points, 259 data points (86.6%) remain unqualified, or were qualified as non-detect (U), and are considered quantitative. The remaining 40 data points (13.4%) were qualified as estimated due to holding time exceedance (pH), field blank contamination, and poor laboratory accuracy, and are assigned as qualitative. No data points were rejected; therefore, this work order is 100% complete and useable.



# **Attachment C:**

Statistical Analysis

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#### 1.0 INTRODUCTION

This appendix contains a statistical analysis of the data collected from the groundwater monitoring wells associated with the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah. Methods used to compare upgradient with downgradient wells vary depending on the characteristics of the upgradient well data. Upgradient well data were analyzed for outliers, normality, non-detects, and other characteristics that affect the comparison measures. A comprehensive statistical analysis is presented along with a discussion of the methods used to compare upgradient with downgradient water quality. Table C.1 lists the upgradient and downgradient wells that are used in this analysis. Note that if a well appears in Table C.1 and not in the tables and figures in this appendix, a sample could not be acquired during the sampling event.

**Table C.1**. Upgradient and downgradient wells for the CCR Landfill.

Upgradient Well	Downgradient Well
ELF-1D	ELF-3
ELF-2	ELF-4
ELF-9	ELF-5
ELF-10	ELF-6
	ELF-7
	ELF-8
	ELF-11
	ELF-12
	ELF-13
	ELF-14

#### 2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of this statistical analysis was to establish background values from the upgradient well data, and compare these to the downgradient well data to determine if the downgradient water quality has been impacted by the CCR Landfill. Familiarity with numerical and distributional characteristics of the upgradient wells aids in computing appropriate limits and in correctly interpreting those limits. This section contains a statistical summary of the upgradient well data. It is essential to understand the statistical characteristics of the data, prior to making the upgradient / downgradient well comparison. This understanding helps to ensure the appropriate calculations have been done and comparisons are completed using the proper statistical measures. The mean, standard deviation, quartiles, and other statistical quantities and corresponding graphs are presented in the following sections.

## 2.1 Data Analysis Techniques

The following sections summarize the statistical tools and techniques, used to evaluate upgradient well data from the CCR Landfill.

#### 2.1.1 Mean

One measure of primary interest is the center of the data. The average ( $\bar{x}$ ), or the mean, is the most commonly used measure of the central tendency of the data. However, it can be heavily influenced by outliers and by asymmetric data. The mean is calculated using Equation (1):

$$\overline{x} = \frac{\sum_{i=1}^{n} x_i}{n} \tag{1}$$

Where:

 $\bar{x}$  = mean

n = number of observations

 $x_i = i^{th}$  observation.

#### 2.1.2 Standard Deviation

Another quantity of interest is the spread of the data. The standard deviation (*s*) is the most commonly used measure of spread, as it is easy to interpret and is used in many other statistical methods. Because it is calculated using the average, it is also sensitive to outliers and affected by data that are not symmetric. The standard deviation is calculated using Equation (2):

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$
 (2)

Where:

s = standard deviation

n = number of observations

 $x_i = i^{th}$  observation

 $\bar{x}$  = mean of the observations.

#### 2.1.3 Coefficient of Variance

The coefficient of variance (CV) is a relative measure of variation in the sample data which expresses the standard deviation relative to the mean. The CV is expressed as a percentage and provides a direct comparison to the standard deviations of two different data sets. It is important to note the mean of the data may be very close to or very far away from zero and the spread may be independent of the distance from the mean to zero. Therefore, no firm guidelines have been established for interpreting the CV.

The CV was calculated for each detected analyte in each data grouping using Equation (3):

$$CV = \frac{s}{\overline{X}} \times 100\% \tag{3}$$

Where:

s = standard deviation

 $\bar{X}$  = mean of the observations

# 2.1.4 Quartiles and the Five Number Summary

The five-number summary is a set of five numbers that are used to assess the spread of the data. It consists of the minimum value, first quartile, median, third quartile, and maximum of the data value. The first quartile is the 25<sup>th</sup> percentile of the data, the median is the 50<sup>th</sup> percentile of the data, and the third quartile is the 75<sup>th</sup> percentile of the data. The 25<sup>th</sup> percentile of the data is the number such that 25% of the data are less than that number and 75% of the data are above the 25<sup>th</sup> percentile. The median and third quartiles are found in a similar manner.

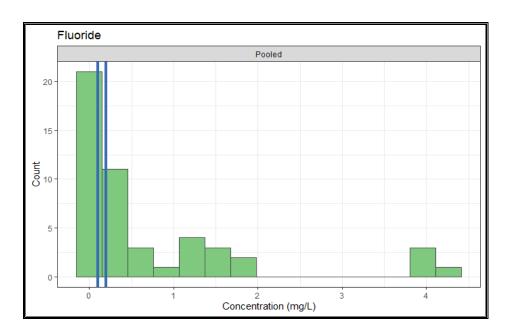
#### 2.2 Visual Tools

It is difficult to review numerical summary statistics and identify the degree of symmetry or normality of data without the aid of visual tools. In completing the statistical analysis for the CCR Landfill, histograms and dot plots were developed for each of the analytes with at least one detectable observation. All graphs were developed using the R Statistical Package (R Core Team 2021).

## 2.2.1 Histograms

Histograms display the distribution and symmetry of the data. The data are displayed in such a way, that deviations from a normal (i.e., bell shaped) distribution can easily be observed. Outliers are also often identifiable in a histogram. Histograms for the upgradient wells were generated using both non-detects and detected results. The method detection limits (MDL) are plotted on the histogram with a blue line to show which observations are non-detects.

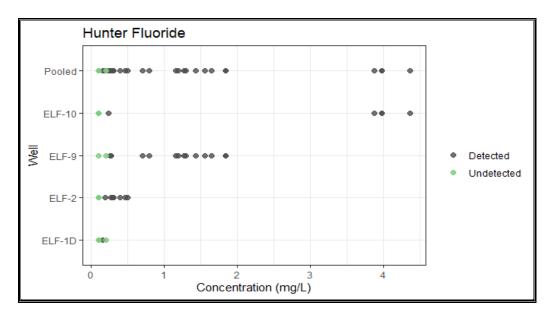
If an analyte has more than one MDL there will be more than one blue line on the histogram. Figure C.1 below is a histogram of fluoride data for the upgradient wells for the CCR Landfill. It is provided here to illustrate data distribution using a histogram. All of the histograms used to examine the analytes from the CCR Landfill upgradient well data, are provided at the end of this appendix in Figure C.3.



**Figure C.1.** Histogram of fluoride data from the CCR Landfill upgradient wells.

#### 2.2.2 Dot Plots

A dot plot is a graphical tool used to determine the spread of the data and to look for outliers. Each measured concentration is plotted on the graph so that non-detects and outliers are clearly visible. The MDL for non-detects are shown as green points on the plot. Figure C.2 uses the same fluoride data points used to develop the Figure C.1. Several of the points are non-detects and the concentrations in well ELF-10 are larger than those in the other wells. All of the dot plots used to examine the CCR Landfill upgradient well data are provided at the end of this appendix in Figure C.3.



**Figure C.2.** Dot plot of fluoride data the CCR Landfill upgradient wells

#### 2.2.3 Outliers

Outliers are data points that are notably larger or smaller than the rest of the data set and may indicate a problem with the data point or the data set as a whole. Examples which may be indicative of outliers include: 1) a misreported or erroneous concentration, 2) analytical error(s), or 3) natural variations in groundwater concentrations. Outliers are generally not omitted from project data simply because they are outliers. Rather, the result is examined individually or by project, to ensure the outlier does not represent an erroneous result or another concern warranting either additional sampling or omission of the outlier from the data analysis. There are reasonable situations when it is appropriate to remove outliers. For example, if outliers which represent exceedingly low concentrations are used to compute background concentrations, they may result in background levels which are too conservative. Conversely, use of excessively high outlier concentrations to compute background values, may result in an overestimation of background concentrations resulting in false-negative comparisons for downgradient groundwater quality.

Outliers were detected in the cadmium, cobalt, lead, and radium data CCR Landfill data. However, none of the outliers are extreme enough to warrant removal from the dataset. The MDLs for the non-detects in the boron upgradient data were 5 mg/L and the largest detected value was less than 4 mg/L. This is an unusually large MDL and its inclusion would have resulted in a Groundwater Protection Standard (GWPS) that was larger than any concentration detected in the upgradient wells. Thus, the non-detects were removed from the upgradient boron data and are not included in any tables or graphs in this appendix.

#### 2.2.4 Treatment of Non-Detects

Non-detect values are common in environmental data. When present in data sets, non-detects produce difficulties in computing statistical metrics because reliable values cannot be assigned. Substituting a value such as the MDL or one-half of the MDL for non-detects are common practices. However, use of the detection limit, or one-half of the detection limit, can produce unstable or unreliable results (EPA 2009). Statistical methods, such as Kaplan-Meier (Helsel 2004), can be used to appropriately evaluate data sets containing significant quantities of non-detects, by producing estimates of the survival probability function for non-detects. These estimates can then be used to compute summary statistics on the data set. However, Kaplan-Meier does not perform well if more than 50% of the results are non-detects or if fewer than eight detections are available for evaluation.

The arsenic, cadmium, chromium, cobalt, and lead data have more than 50% non-detects. Antimony, beryllium, mercury, and thallium were not detected in any of the samples. Thus, statistical analysis cannot be done for those analytes. The fluoride and selenium data have more than 15% non-detects, but more than half of the data are detected. As a result, Kaplan-Meier was used to compute means, standard deviations, and statistical limits used to compare the upgradient to downgradient water quality for fluoride and selenium.

# 2.3 Summary Results

Table C.2 provides summary statistics for the CCR Landfill upgradient well data. Although the data from the upgradient wells were combined when compared to the downgradient wells, the summary statistics presented in this section are separated by well and are presented as pooled data. The data are presented in this way, due to observed differences between the different wells for many of the analytes. These tables in conjunction with the histograms and normal-quantile plots, provide information about differences between wells and the data properties of the combined data. Note that summary stats were only computed for analytes and wells with at least 50% detects and at least eight detected samples. Analytes that were not detected in any upgradient well samples are not listed in Table C.2.

**Table C.2.** Summary statistics for the CCR Landfill upgradient wells

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Arsenic	ELF-1D	5	0	< 0.002	NA	NA	NA
Arsenic	ELF-2	18	0	< 0.002	NA	NA	NA
Arsenic	ELF-9	16	16	0.0068	0.007	0.002	29
Arsenic	ELF-10	14	3	< 0.002	NA	NA	NA
Arsenic	Pooled	53	19	< 0.002	NA	NA	NA
Barium	ELF-1D	5	5	0.0103	NA	NA	NA
Barium	ELF-2	18	17	0.0101	0.0132	0.0096	73
Barium	ELF-9	16	16	0.0177	0.0366	0.0325	89
Barium	ELF-10	14	14	0.0341	0.0384	0.0222	58
Barium	Pooled	53	52	0.0137	0.0266	0.0248	94
Boron	ELF-1D	4	4	2.15	NA	NA	NA
Boron	ELF-2	17	17	3.32	3.35	0.179	5
Boron	ELF-9	14	14	1.42	1.48	0.201	14
Boron	ELF-10	13	13	1.60	1.65	0.172	10
Boron	Pooled	48	48	1.86	2.24	0.863	39
Cadmium	ELF-1D	5	0	< 0.0005	NA	NA	NA
Cadmium	ELF-2	18	0	< 0.0005	NA	NA	NA
Cadmium	ELF-9	16	1	< 0.0005	NA	NA	NA
Cadmium	ELF-10	14	6	< 0.0005	NA	NA	NA
Cadmium	Pooled	53	7	< 0.0005	NA	NA	NA
Calcium	ELF-1D	4	4	372	NA	NA	NA
Calcium	ELF-2	17	17	400	400	22.0	6
Calcium	ELF-9	15	15	58.7	72.6	31.0	43
Calcium	ELF-10	13	13	474	476	34.3	7

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Calcium	Pooled	49	49	394	318	170	54
Chloride	ELF-1D	4	4	6760	NA	NA	NA
Chloride	ELF-2	17	17	430	351	120	34
Chloride	ELF-9	15	15	416	415	91.1	22
Chloride	ELF-10	13	13	7530	8627	2349	27
Chloride	Pooled	49	49	464	3092	3966	128
Chromium	ELF-1D	5	1	< 0.002	NA	NA	NA
Chromium	ELF-2	18	2	< 0.002	NA	NA	NA
Chromium	ELF-9	16	7	< 0.002	NA	NA	NA
Chromium	ELF-10	14	10	0.0027	0.0046	0.0040	86
Chromium	Pooled	53	20	< 0.002	NA	NA	NA
Cobalt	ELF-1D	5	1	< 0.004	NA	NA	NA
Cobalt	ELF-2	18	10	0.0046	0.0053	0.0019	36
Cobalt	ELF-9	16	2	< 0.004	NA	NA	NA
Cobalt	ELF-10	14	10	0.0043	0.0049	0.0014	28
Cobalt	Pooled	53	23	< 0.004	NA	NA	NA
Fluoride	ELF-1D	4	1	< 0.1315	NA	NA	NA
Fluoride	ELF-2	17	9	0.10	0.20	0.14	70
Fluoride	ELF-9	15	13	1.19	1.04	0.61	59
Fluoride	ELF-10	13	5	< 0.1	NA	NA	NA
Fluoride	Pooled	49	28	0.20	0.75	1.12	150
Lead	ELF-1D	5	0	< 0.002	NA	NA	NA
Lead	ELF-2	18	1	< 0.002	NA	NA	NA
Lead	ELF-9	16	4	< 0.002	NA	NA	NA
Lead	ELF-10	14	6	< 0.002	NA	NA	NA
Lead	Pooled	53	11	< 0.002	NA	NA	NA
Lithium	ELF-1D	5	5	2.19	NA	NA	NA
Lithium	ELF-2	18	18	1.68	2.30	1.18	51
Lithium	ELF-9	16	16	0.916	1.05	0.444	42
Lithium	ELF-10	14	14	2.18	2.37	1.02	43
Lithium	Pooled	53	53	1.61	1.94	1.07	55
Molybdenum	ELF-1D	5	5	0.0161	NA	NA	NA
Molybdenum	ELF-2	18	17	0.0030	0.0031	0.0007	24
Molybdenum	ELF-9	16	16	0.1110	0.1042	0.0309	30
Molybdenum	ELF-10	14	14	0.0825	0.0778	0.0369	47

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Molybdenum	Pooled	53	52	0.0516	0.0545	0.0508	93
pН	ELF-1D	4	4	7.22	NA	NA	NA
pН	ELF-2	17	17	7.27	7.31	0.165	2
pН	ELF-9	15	15	7.94	7.93	0.161	2
pН	ELF-10	13	13	7.21	7.29	0.414	6
pН	Pooled	49	49	7.34	7.48	0.388	5
Radium	ELF-1D	5	5	2.2	NA	NA	NA
Radium	ELF-2	18	18	1.43	1.87	1.69	90
Radium	ELF-9	16	15	1.37	1.45	0.60	41
Radium	ELF-10	14	14	2.40	3.01	3.36	112
Radium	Pooled	53	52	1.56	2.08	2.09	100
Selenium	ELF-1D	5	0	< 0.002	NA	NA	NA
Selenium	ELF-2	18	18	0.282	0.265	0.232	88
Selenium	ELF-9	16	1	< 0.002	NA	NA	NA
Selenium	ELF-10	14	9	0.0086	0.082	0.129	157
Selenium	Pooled	53	28	0.0031	0.112	0.187	166
Sulfate	ELF-1D	4	4	8790	NA	NA	NA
Sulfate	ELF-2	17	17	7950	7705	726	9
Sulfate	ELF-9	15	15	6750	6602	756	11
Sulfate	ELF-10	13	13	16800	15004	4859	32
Sulfate	Pooled	49	49	7950	9410	4281	45
TDS	ELF-1D	4	4	26900	NA	NA	NA
TDS	ELF-2	17	17	12000	11929	398	3
TDS	ELF-9	15	15	10700	10801	763	7
TDS	ELF-10	13	13	38200	37469	2482	7
TDS	Pooled	49	49	12000	19580	11740	60

Table C.3 provides the five-number summaries for the CCR Landfill upgradient wells. As with the summary statistics, a five-number summary was computed for each well as well as for the pooled data. If a minimum or a quartile falls within the range of non-detects it is denoted using a less-than (<) symbol. Analytes that were not detected in any of the upgradient well samples are not listed in Table C.3.

**Table C.3.** Five-number summary for the CCR Landfill upgradient wells.

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Arsenic	ELF-1D	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Arsenic	ELF-2	< 0.001	< 0.002	< 0.002	< 0.002	< 0.002
Arsenic	ELF-9	0.0050	0.0060	0.0068	0.0078	0.0117
Arsenic	ELF-10	< 0.002	< 0.002	< 0.002	< 0.002	0.0093
Arsenic	Pooled	< 0.001	< 0.002	< 0.002	0.0055	0.0117
Barium	ELF-1D	0.0084	0.0085	0.0103	0.0103	0.0104
Barium	ELF-2	< 0.0084	0.0095	0.0101	0.0120	0.0500
Barium	ELF-9	0.0118	0.0128	0.0177	0.0500	0.102
Barium	ELF-10	0.0145	0.0189	0.0341	0.0515	0.0863
Barium	Pooled	< 0.0084	0.0103	0.0137	0.0348	0.102
Boron	ELF-1D	1.94	2.06	2.15	2.20	2.23
Boron	ELF-2	3.11	3.24	3.32	3.48	3.77
Boron	ELF-9	1.27	1.34	1.42	1.55	1.91
Boron	ELF-10	1.48	1.54	1.60	1.68	2.12
Boron	Pooled	1.27	1.53	1.86	3.24	3.77
Cadmium	ELF-1D	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	ELF-2	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.001
Cadmium	ELF-9	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005
Cadmium	ELF-10	< 0.0005	< 0.0005	< 0.0005	0.0006	0.0011
Cadmium	Pooled	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0011
Calcium	ELF-1D	353	363	372	381	393
Calcium	ELF-2	356	392	400	419	430
Calcium	ELF-9	48.9	56.8	58.7	75.7	166
Calcium	ELF-10	407	457	474	500	543
Calcium	Pooled	48.9	91.9	394	430	543
Chloride	ELF-1D	6430	6588	6760	6960	7200
Chloride	ELF-2	197	218	430	457	473
Chloride	ELF-9	282	356	416	467	595
Chloride	ELF-10	5710	7120	7530	9900	13100
Chloride	Pooled	197	363	464	6880	13100
Chromium	ELF-1D	< 0.002	< 0.002	< 0.002	< 0.002	0.0023
Chromium	ELF-2	< 0.001	< 0.002	< 0.002	< 0.002	0.0110
Chromium	ELF-9	< 0.002	< 0.002	< 0.002	0.0076	0.0201
Chromium	ELF-10	< 0.002	< 0.002	0.0027	0.0056	0.0164
Chromium	Pooled	< 0.001	< 0.002	< 0.002	0.0036	0.0201
Cobalt	ELF-1D	< 0.004	< 0.004	< 0.004	< 0.004	0.0054

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Cobalt	ELF-2	< 0.004	< 0.004	0.0046	0.0059	0.0114
Cobalt	ELF-9	< 0.004	< 0.004	< 0.004	< 0.004	0.0052
Cobalt	ELF-10	< 0.004	< 0.004	0.0043	0.0054	0.0079
Cobalt	Pooled	< 0.004	< 0.004	< 0.004	0.0050	0.0114
Fluoride	ELF-1D	< 0.1	< 0.1	< 0.1315	0.17	0.20
Fluoride	ELF-2	<0.1	< 0.1	0.10	0.30	0.50
Fluoride	ELF-9	<0.1	0.49	1.19	1.50	1.84
Fluoride	ELF-10	< 0.1	< 0.1	< 0.1	3.87	4.36
Fluoride	Pooled	<0.1	< 0.1	0.2	1.16	4.36
Lead	ELF-1D	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Lead	ELF-2	< 0.001	< 0.002	< 0.002	< 0.002	0.002
Lead	ELF-9	< 0.002	< 0.002	< 0.002	0.0026	0.0077
Lead	ELF-10	< 0.002	< 0.002	< 0.002	0.003	0.012
Lead	Pooled	< 0.001	< 0.002	< 0.002	< 0.002	0.012
Lithium	ELF-1D	1.96	2.12	2.19	2.20	2.89
Lithium	ELF-2	1.34	1.51	1.68	3.16	4.93
Lithium	ELF-9	0.724	0.777	0.916	1.07	2.48
Lithium	ELF-10	0.841	1.79	2.18	2.90	4.59
Lithium	Pooled	0.724	1.10	1.61	2.20	4.93
Molybdenum	ELF-1D	0.0087	0.0153	0.0161	0.0165	0.0207
Molybdenum	ELF-2	< 0.002	0.0027	0.0030	0.0033	0.0050
Molybdenum	ELF-9	0.0569	0.0746	0.1110	0.1240	0.1580
Molybdenum	ELF-10	0.0142	0.0524	0.0825	0.1130	0.1240
Molybdenum	Pooled	< 0.002	0.0034	0.0516	0.1070	0.1580
pН	ELF-1D	7.02	7.13	7.22	7.28	7.30
pН	ELF-2	7.12	7.21	7.27	7.42	7.76
pН	ELF-9	7.51	7.86	7.94	8.04	8.19
pН	ELF-10	6.85	7.00	7.21	7.41	8.37
pН	Pooled	6.85	7.21	7.34	7.86	8.37
Radium	ELF-1D	1.1	1.2	2.2	2.6	4.4
Radium	ELF-2	0.6	1.0	1.4	2.1	8.1
Radium	ELF-9	< 0.64	1.07	1.37	1.86	2.60
Radium	ELF-10	0.5	1.4	2.4	3.0	14.2
Radium	Pooled	0.0	1.1	1.6	2.3	14.2
Selenium	ELF-1D	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Selenium	ELF-2	0.0031	0.0324	0.282	0.460	0.608

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Selenium	ELF-9	< 0.002	< 0.002	< 0.002	< 0.002	0.0042
Selenium	ELF-10	< 0.002	< 0.002	0.0086	0.1357	0.410
Selenium	Pooled	< 0.002	< 0.002	0.0031	0.146	0.608
Sulfate	ELF-1D	7730	8413	8790	9380	10700
Sulfate	ELF-2	6030	7190	7950	8180	8720
Sulfate	ELF-9	5460	5880	6750	7090	8030
Sulfate	ELF-10	8610	10000	16800	19800	20700
Sulfate	Pooled	5460	6900	7950	9230	20700
TDS	ELF-1D	25000	26350	26900	27425	28700
TDS	ELF-2	11300	11600	12000	12200	12600
TDS	ELF-9	9420	10350	10700	11300	12000
TDS	ELF-10	32900	35300	38200	39600	40300
TDS	Pooled	9420	11400	12000	32900	40300

#### 3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON

Groundwater quality was assessed using upper tolerance limits (UTLs) and the Maximum Contaminant Levels (MCL) for each of the Appendix III and IV analytes. The data measured from the upgradient/background wells were used to compute a UTL, which serves as the background value. The larger of the UTL and MCL was used as the Groundwater Protection Standard (GWPS). Data obtained from the downgradient wells were compared point-by-point to the GWPSs to determine if the site complies with the *Final Rule*. The software package Sanitas© v.2016, was used to compute the UTLs. As part of this evaluation, groundwater data were examined for characteristics that impact how the UTL was computed. These characteristics include the:

- Number of non-detect results
- Data distribution
- Site-wide false-positive rate (SWFPR)
- Spatial and seasonal variability.

Summary statistics and other statistical characteristics of the data are discussed in the previous section. These characteristics were used to compute the appropriate UTL for each analyte.

### 3.1 Groundwater Protection Standards

The shape or distribution of the data was assessed to ensure that the most appropriate UTL was used for comparison purposes. The most efficient UTL is a parametric UTL that assumes the data follow a normal distribution. If the data do not follow a normal distribution, a non-parametric UTL is typically used. Thus, the data for each analyte are assessed to determine if a

parametric UTL can be computed from the data. The parametric UTL is computed using the formula below:

$$UTL = \bar{X} + \kappa \times S$$

Where:

 $\bar{X}$  = the average of the background data

 $\kappa$  = multiplier from EPA Unified Guidance, March 2009

S =standard deviation of the background data

## 3.1.1 Normal Distribution

Histograms and dot plots were used to visually inspect the data for deviations from normality and to determine if outliers are present. This examination reveals the outliers are present in the data. The Shapiro-Wilk test was used to assess normality in conjunction with the normal quantile plots. If the p-value associated with the test was greater than or equal to 0.05, the data are considered normally distributed and a parametric UTL was computed using the upgradient measurements. If the p-value is less than 0.05, then the maximum detected value was used as the UTL.

*Note:* The 0.05 p-value is not a hard and fast rule. Parametric UTLs were computed for analytes whose p-values were sufficiently close to 0.05 as determined by the Sanitas software (Sanitas 2016).

If the data for an analyte were not normally distributed, the ladder of powers method was used to determine if a reasonable transformation existed that would produce normal data. The ladder of powers tests different monotonic transformations of the data, such as the natural logarithm or square, to see if the transformed data have a normal distribution. If a transformation within the ladder of powers can be found that produces normal data, a parametric UTL was computed using the transformed data. If a transformation was identified, it was applied to both upgradient / background and downgradient groundwater data prior to comparison.

A non-parametric UTL was computed for data that are not normally distributed and cannot be transformed. The non-parametric UTL is the largest value measured in the upgradient / background wells. Table C.4 summarizes the results of the Shapiro-Wilk test for each of the Appendix III and IV analytes where at least 50% of the measurements were detects. An appropriate transformation was found for lithium and radium. Non-parametric UTLs were computed for all of the analytes except for lithium and radium.

**Table C.4.** Shapiro-Wilk Test for the CCR Landfill upgradient wells.

Analyte	W-Statistic	P-Value	Normal
Barium	0.7272	< 0.0001	No
Boron	0.8196	< 0.0001	No
Calcium	0.7935	< 0.0001	No
Chloride	0.7106	< 0.0001	No
Fluoride	0.6306	< 0.0001	No
Lithium	0.8857	0.0001	No

Analyte	W-Statistic	P-Value	Normal
Square Root of Lithium	0.9396	0.0099	Yes
Molybdenum	0.8502	< 0.0001	No
рН	0.9295	0.0059	No
Radium	0.5520	< 0.0001	No
LN of Radium	0.9558	0.0482	Yes
Selenium	0.6407	< 0.0001	No
Sulfate	0.7119	< 0.0001	No
TDS	0.7133	< 0.0001	No

#### 3.1.2 Upper Tolerance Limits and Groundwater Protection Standard

This section contains the GWPS computed for each analyte. Table C.5 lists the UTL, MCL, and GWPS for each of the analytes in the upgradient wells. The following criteria were used for determining each GWPS:

- If more than 50% of the data were detected and have a normal distribution, a parametric UTL was computed.
- If the data were not normally distributed or more than 50% of the data were nondetects, the greater of the largest MDL and maximum detected value was used as the UTL.
- If all of the upgradient samples were non-detects, the largest MDL was used as the UTL.
- The larger of the MCL and the UTL was used as the GWPS.
- Fluoride is compared to both the MCL and the UTL if the MCL exceeds the UTL, to meet the criteria for Appendix III constituents.

Figure C.4 shows graphs that were constructed for each of the analytes that had at least one detectable measurement in the downgradient wells. The graphs illustrate the GWPS as a horizontal line with the measurements from each of the downgradient wells plotted on the same graph. Non-detects are represented by hollow gray circles on the graphs. These graphs clearly depict how the downgradient measurements compare to the GWPS.

Results above the GWPS line represent values exceeding the GWPS. As the graphs illustrate, boron, calcium, cobalt, lithium, and molybdenum exceed the GWPS. Table C.5 list the GWPSs and the wells that exceed the GWPS for each analyte (Figure C.4). GWPS plots are not provided for analytes that were not detected in any downgradient samples.

Table C.5. Comparison of downgradient wells to the Groundwater Protection Standard

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	Within Limit
Arsenic	0.0117	0.01	0.0117	Within Limit
Barium	0.102	2.0	2.0	Within Limit
Beryllium	0.002	0.004	0.004	Within Limit
Boron	3.77	NA	3.77	ELF-4, ELF-8, ELF-11
Cadmium	0.0011	0.0050	0.0050	Within Limit
Calcium	543	NA	543	ELF-8
Chloride	13100	NA	13100	Within Limit
Chromium	0.020	0.1000	0.1000	Within Limit
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	Within Limit
Fluoride Appendix III	4.36	NA	4.36	Within Limit
Lead	0.012	0.015	0.015	Within Limit
Lithium	4.35	0.04	4.35	ELF-11, ELF-14
Mercury	0.0002	0.002	0.002	Within Limit
Molybdenum	0.158	0.100	0.158	ELF-8
pH Acidic Range	6.85	NA	6.85	Within Limit
pH Basic Range	8.37	NA	8.37	Within Limit
Radium	6.3	5.0	6.3	Within Limit
Selenium	0.608	0.050	0.608	Within Limit
Sulfate	20700	NA	20700	Within Limit
TDS	40300	NA	40300	Within Limit
Thallium	0.002	0.002	0.002	Within Limit

#### 4.0 CONCLUSIONS

Groundwater data was collected from the CCR Landfill monitoring network at the Hunter Power Plant. A comprehensive data analysis was completed on the upgradient wells to ensure that comparisons between upgradient and downgradient wells were performed correctly. During the October 2021 sampling event, statistically significant increases (SSIs) above background were noted for Appendix III constituents:

- Boron
- Calcium

SSIs above groundwater protection standards were noted for Appendix IV constituents:

- Cobalt
- Lithium
- Molybdenum

## 5.0 REFERENCES

- EPA, 2009, "Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities Unified Guidance," EPA 530/R-09-007, U.S. Environmental Protection Agency, March 2009.
- Helsel, Dennis, 2004, *Nondetects and Data Analysis: Statistic for Censored Environmental Data*, New York: Wiley Interscience.
- R Core Team, 2021, *R: A Language and Environment for Statistical Computing*, <a href="https://www.R-project.org">https://www.R-project.org</a>, R Foundation for Statistical Computing, Vienna, Austria.
- Sanitas Technologies, 2016, Sanitas, www.sanitastech.com, Shawnee, Kansas.

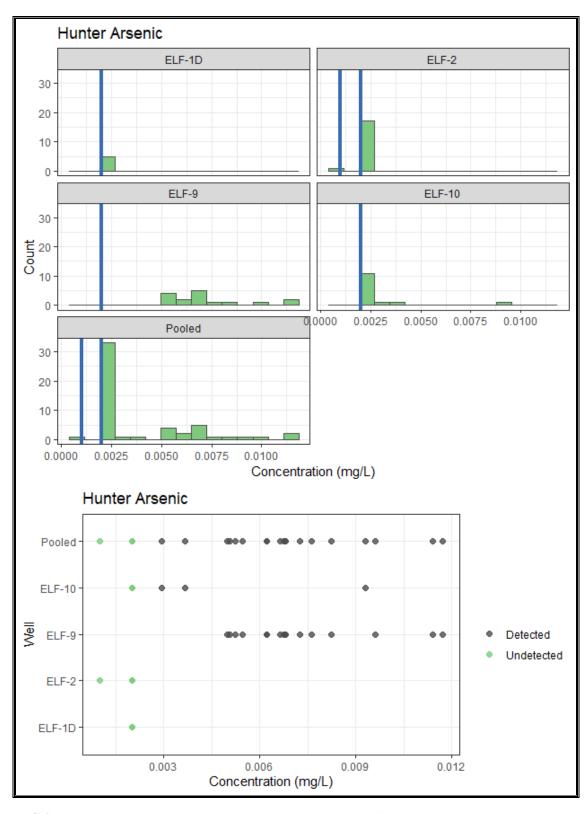


Figure C.3. Histograms and dot plots for the upgradient Ash Landfill data.

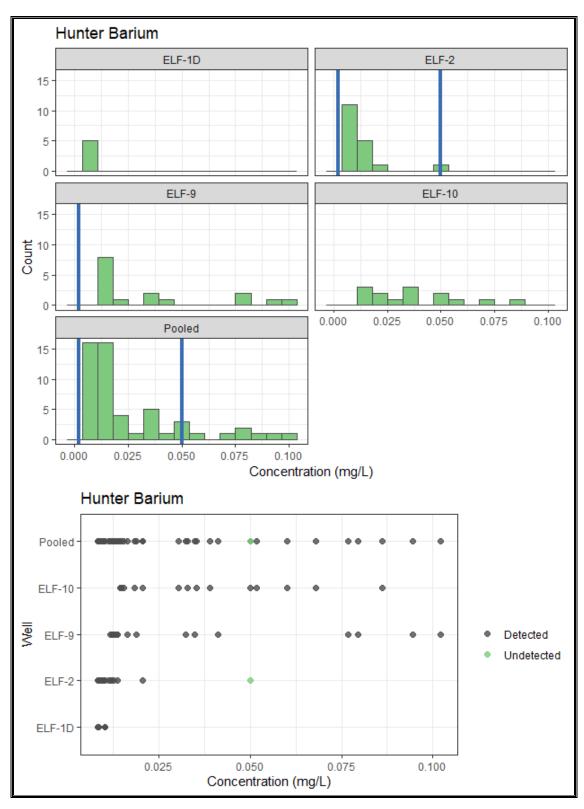


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

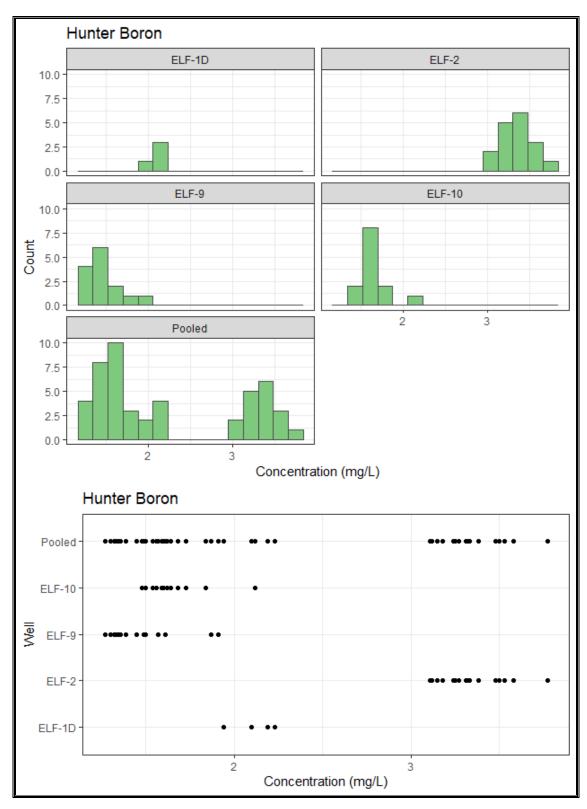


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

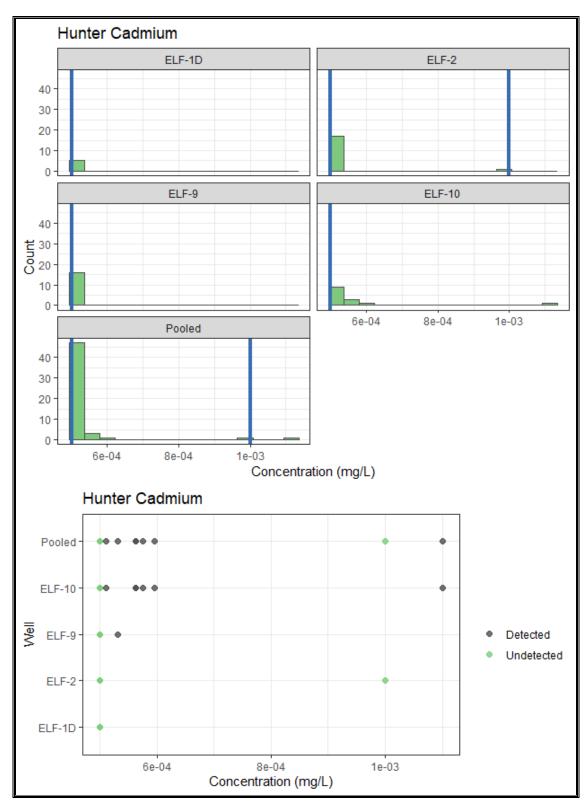


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

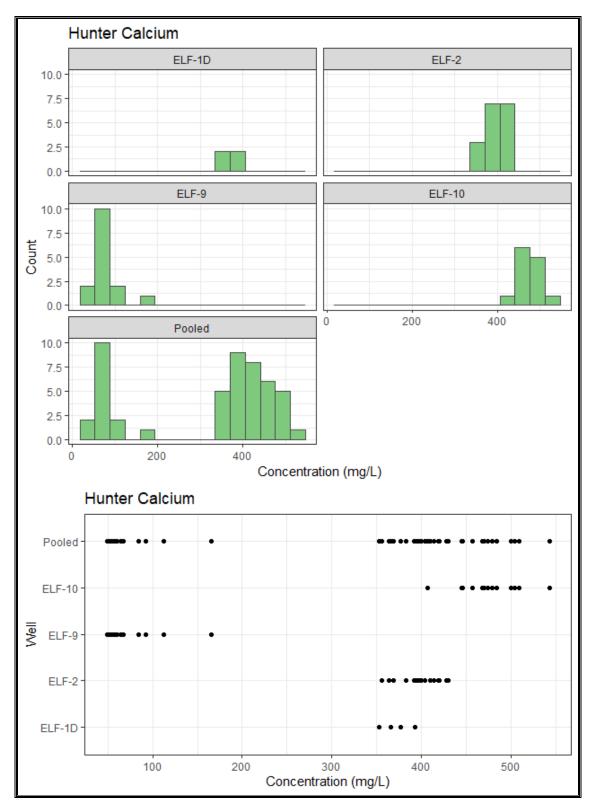


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

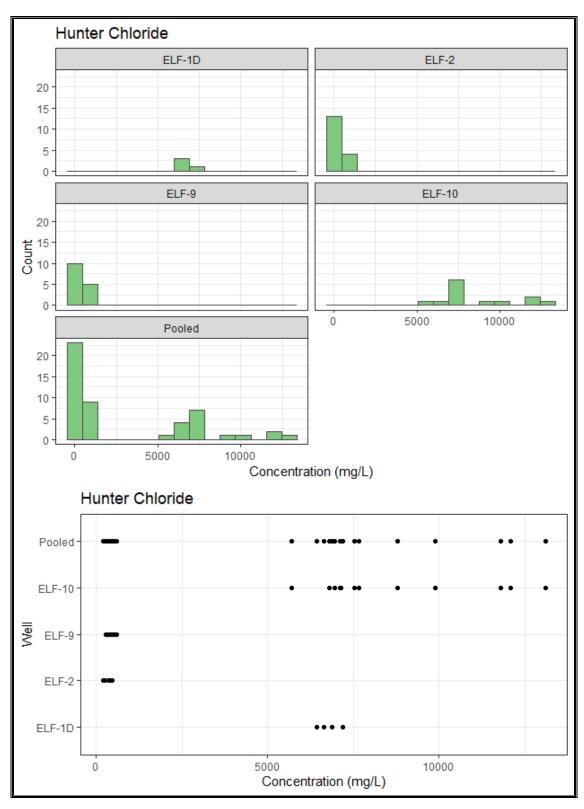


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

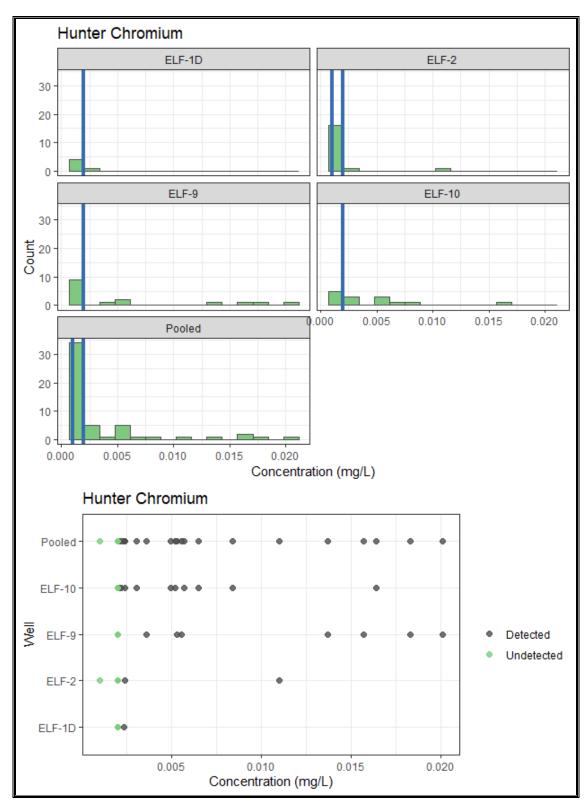


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

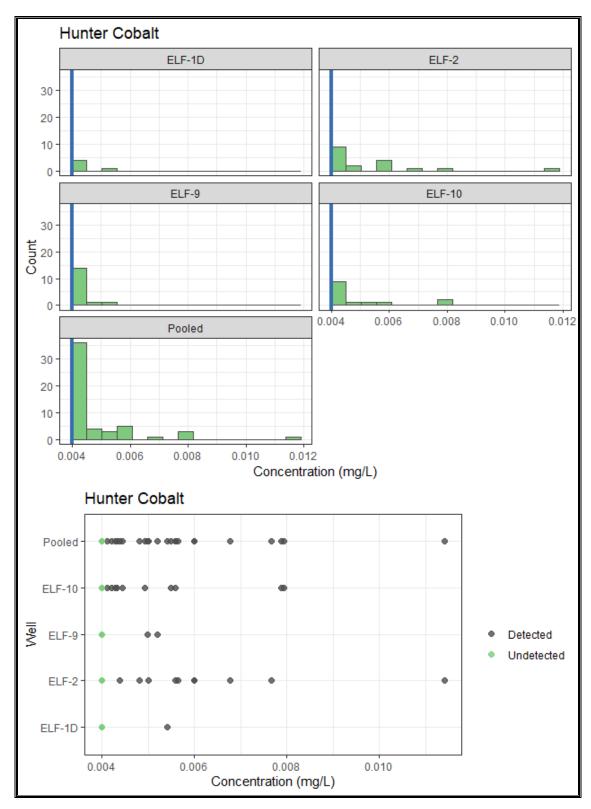


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

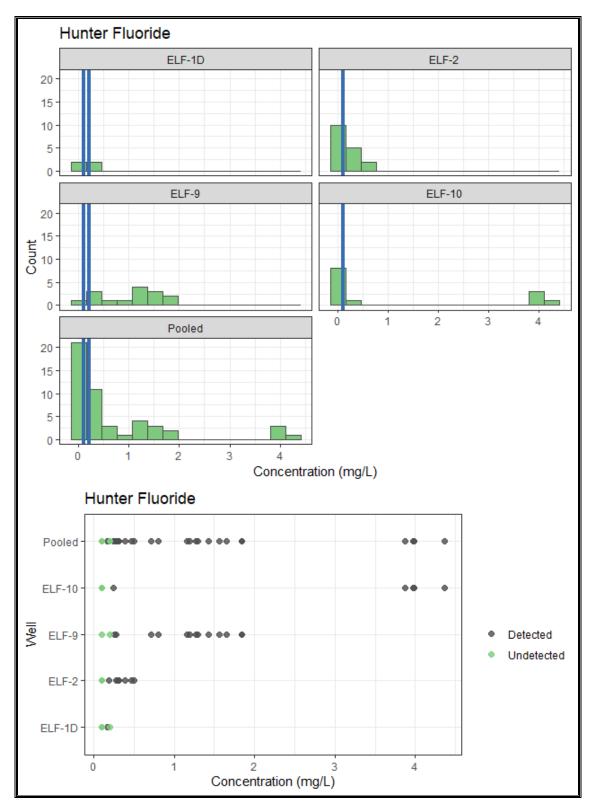


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

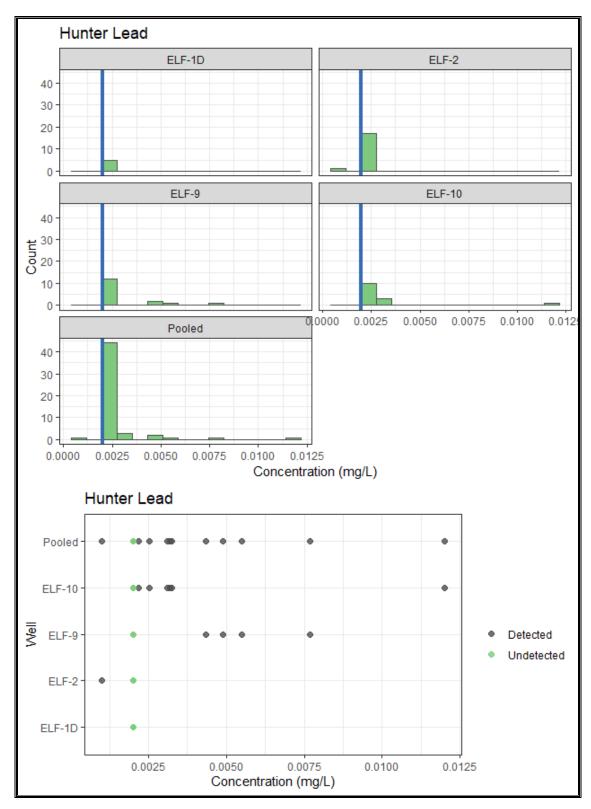


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

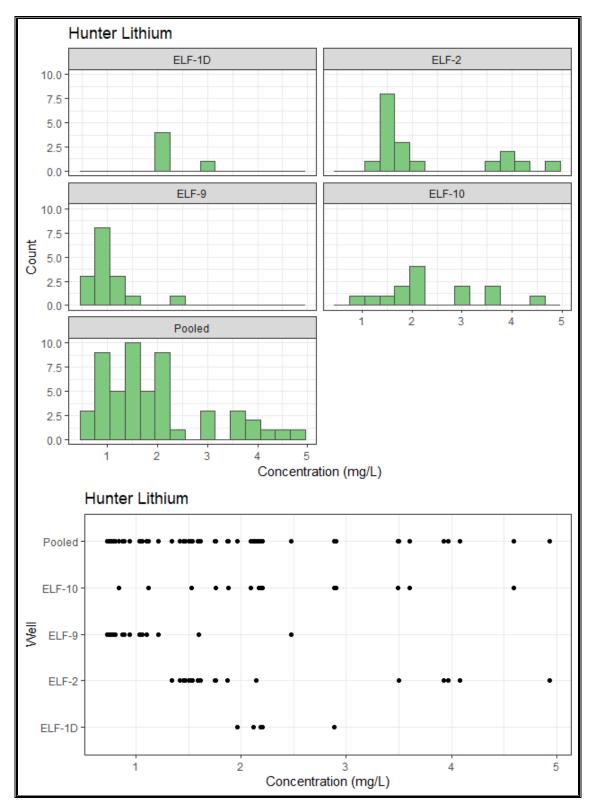


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

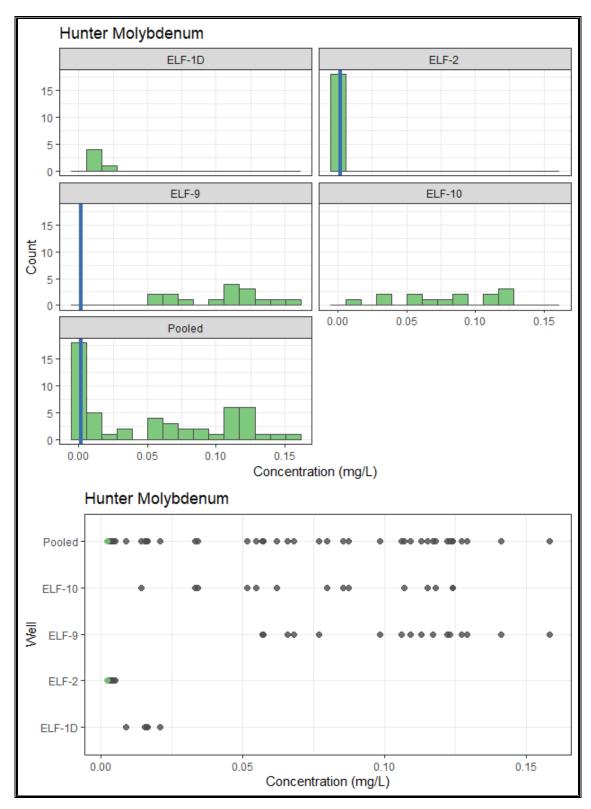


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

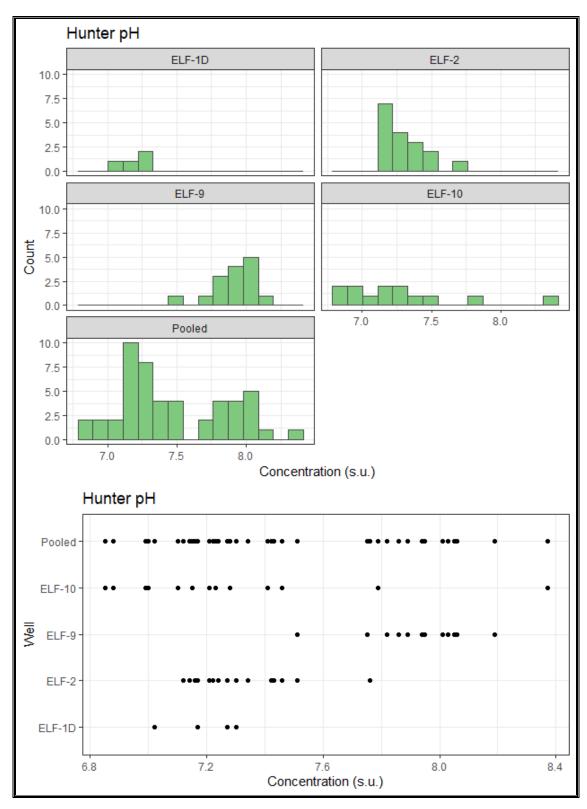


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

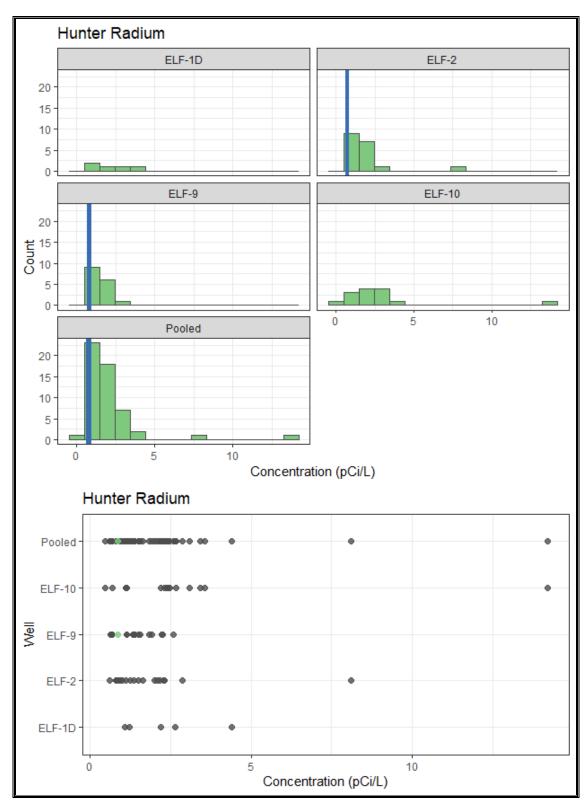


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

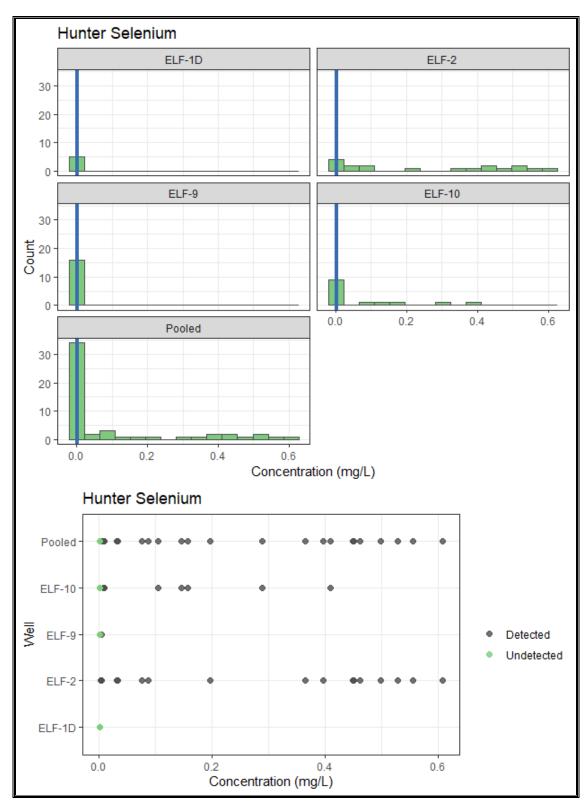


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

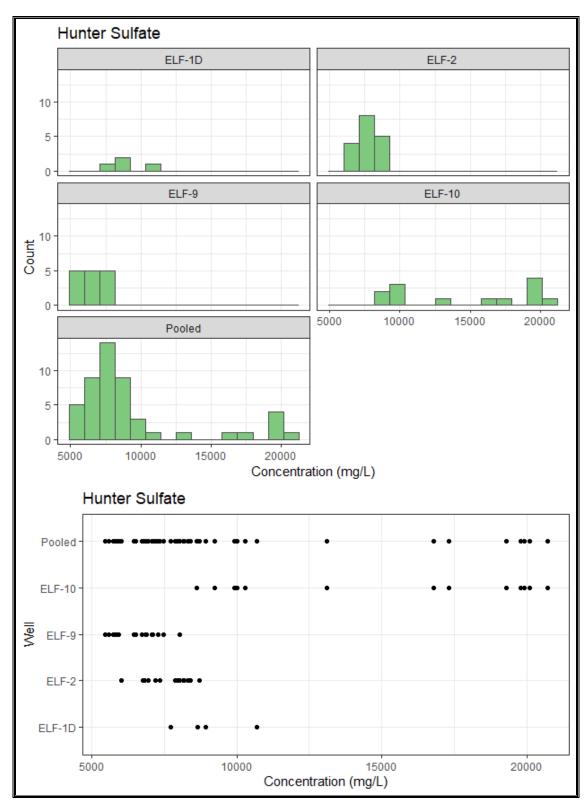


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

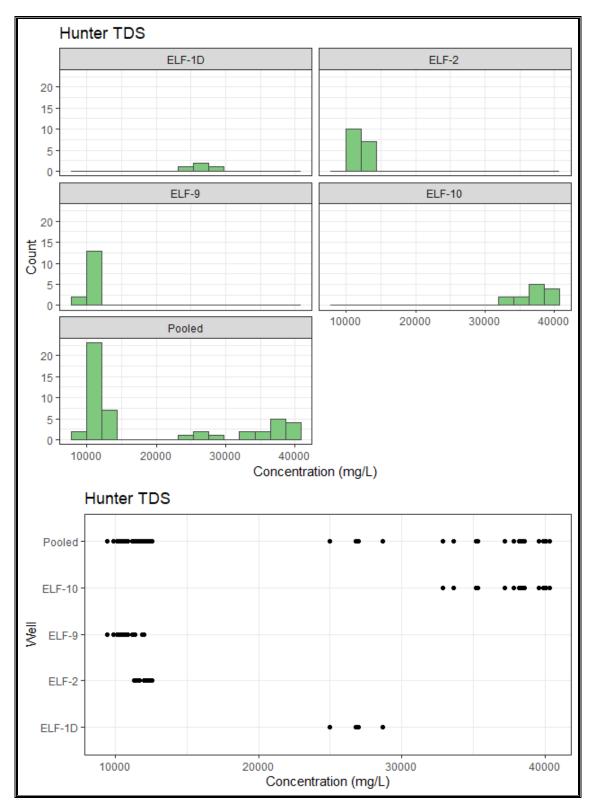


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

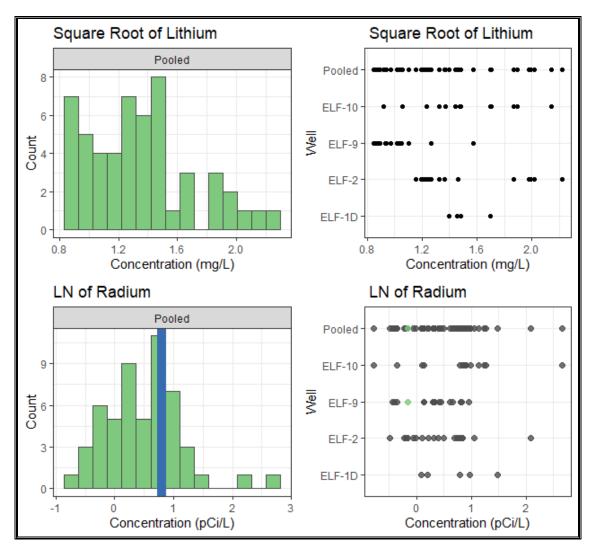


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

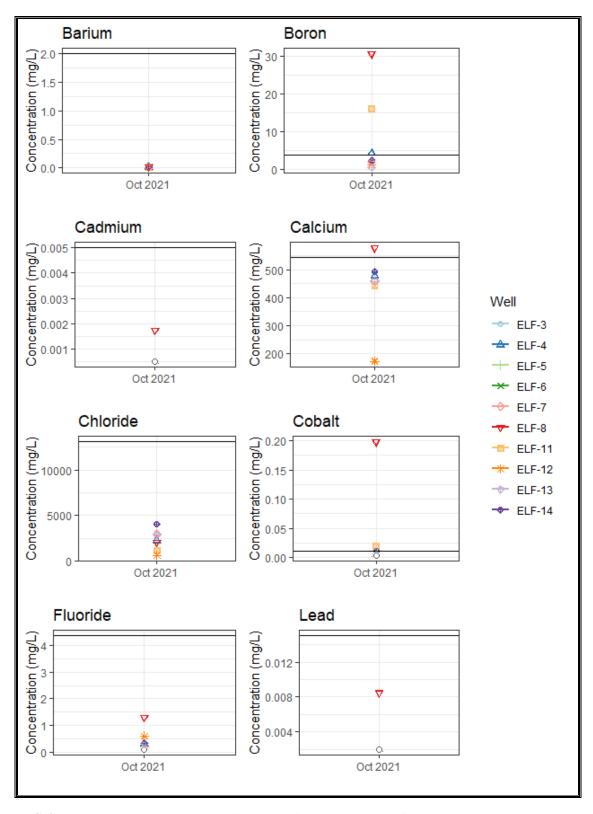


Figure C.4. Background upper tolerance limit plots for the CCR Landfill.

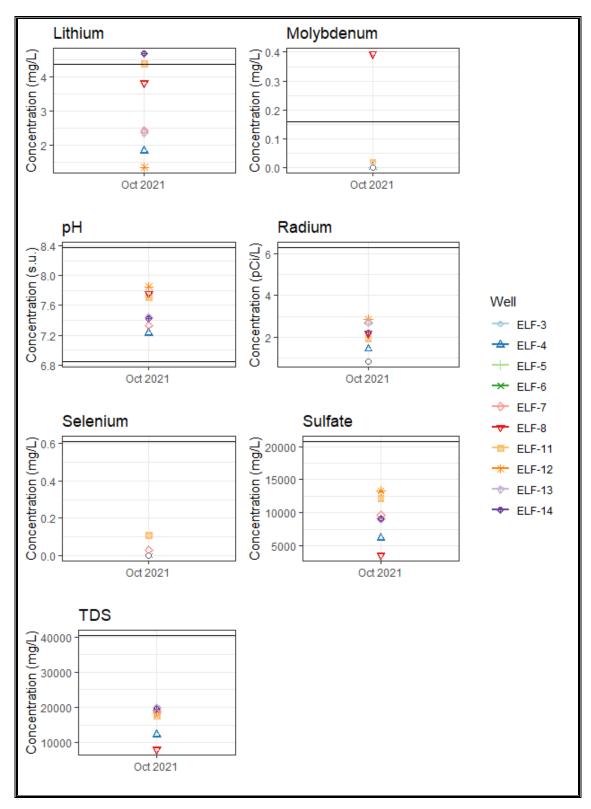


Figure C.4 (cont.). Background upper tolerance limit plots for the CCR Landfill.



# **Attachment D:**

Field Data Sheets



	GROUNDWATER SAMPLING FORM						
Project Name	Hunter Power Plant	Project Location	Castle Dale UT				
Job number(s)	PERCM052	Sample ID	ELF-1D				
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021				
Decon Method	Dedicated Equipment	Sample Time	12:30				
Sampler(s) Initials DV Depth to Water (ft.) 82.66							
Field Conditions Very windy, blowing dust, around 24 mph, Partly cloudy 42°F							

FIELD PARAMETERS							
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)	
1,210	12.5	33,800	1.47	7.04	110	8	
1,220	12.5	34,200	1.33	7.02	107	7.6	
1,230	12.5	34,200	1.34	7.00	105	7.4	
-							

	SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable				
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS			
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
3	(1) 250 mL poly	HNO3	Total metals			
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
		COMMENTS/OF	BSERVATIONS			

Very poor producer no recharge. Took forever to get samples after stabilization



GROUNDWATER SAMPLING FORM							
Project Name	Hunter Power Plant	Project Location	Castle Dale UT				
Job number(s)	PERCM052	Sample ID	ELF-2				
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021				
Decon Method	Dedicated Equipment	Sample Time	13:25				
Sampler(s) Initials	DV	Depth to Water (ft.)	23.63				
Field Conditions	24 mph gusts, partly cloudy, 42°F						

FIELD PARAMETERS							
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)	
1,305	12.9	13,600	1.01	7.18	210	0	
1,315	13.1	13,500	0.97	7.15	213	0	
1,325	13.1	13,400	0.93	7.14	214	0	
-							

	SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable				
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS			
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
3	(1) 250 mL poly	HNO3	Total metals			
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
		COMMENTS/0	DBSERVATIONS			

Good producer, clear water. Water level was dropping but not real fast.



**Consulting Scientists and Engineers** 

480 East Park Street Butte, Montana 59701 Phone: 406-782-5220 Fax: 406-723-1537

GROUNDWATER SAMPLING FORM								
Project Name	Project Name Hunter Power Plant Project Location Castle Dale UT							
Job number(s)	PERCM052	Sample ID	ELF-3					
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021					
Decon Method	Dedicated Equipment	Sample Time	10:00					
Sampler(s) Initials	Sampler(s) Initials DV Depth to Water (ft.) 33.6 Top of pump							
Field Conditions	Partly cloudy, 46°F, windy	·						

	FIELD PARAMETERS							
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)		

	SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable				
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS			
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
3	(1) 250 mL poly	HNO3	Total metals			
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
		COMMENTS/O	RSERVATIONS			

Pulled pump. Depth to water 33.80 feet No sample. History on this will prove it does not recharge within 24 hours. Not enough water to fill sample bottles.



GROUNDWATER SAMPLING FORM								
Project Name	Project Name         Hunter Power Plant         Project Location         Castle Dale UT							
Job number(s)	PERCM052	Sample ID	ELF-4					
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021					
Decon Method	Dedicated Equipment	Sample Time	09:40					
Sampler(s) Initials	Sampler(s) Initials DV Depth to Water (ft.) 18.10							
Field Conditions	Mostly cloudy windy 40°F	<u>.</u>	•					

			FIELD PARAN	<b>IETERS</b>		
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
920	13.2	14,500	1.32	7.04	322	4.1
930	13.1	14,700	1.25	7.03	320	3.4
940	13.1	14,800	1.21	7.03	318	2.1

	SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable				
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS			
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
3	(1) 250 mL poly	HNO3	Total metals			
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
		COMMENTS	/ORSERVATIONS			

Clear water, good producer. Stabilizes quickly



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GROUNDWATER SAMPLING FORM								
Project Name	Project Name Hunter Power Plant Project Location Castle Dale UT							
Job number(s)	PERCM052	Sample ID	ELF-5					
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021					
Decon Method	Dedicated Equipment	Sample Time	09:13					
Sampler(s) Initials	Sampler(s) Initials DV Depth to Water (ft.)							
Field Conditions	Windy, 40°F, overcast	·						

	FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)	

SAMPLE COLLECTION					
APPENDIX FOR	CURRENT SAMPLE	Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMMENTS/OF	SERVATIONS		

Pump was bound by roots in well. But able to remove pump finally and well has 2" water.



GROUNDWATER SAMPLING FORM								
Project Name	Project Name Hunter Power Plant Project Location Castle Dale UT							
Job number(s)	PERCM052	Sample ID	ELF-6					
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021					
Decon Method	Dedicated Equipment	Sample Time	09:06					
Sampler(s) Initials	Sampler(s) Initials DV Depth to Water (ft.)							
Field Conditions	Overcast, 40°F, high wind	•						

	FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)	

SAMPLE COLLECTION			
APPENDIX FOR CURRENT SAMPLE		Not Applicable	
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
COMMENTS/ORSEDVATIONS			

Well is dry. Removed pump to check.



GROUNDWATER SAMPLING FORM						
Project Name	Project Name Hunter Power Plant Project Location Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-7			
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021			
Decon Method	Dedicated Equipment	Sample Time	15:35			
Sampler(s) Initials	DV Depth to Water (ft.) 16.29					
Field Conditions	Very windy partly cloudy, 47°F	·				

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,515	14.2	21,200	2.11	7.08	301	113
1,525	14.2	21,500	2.09	7.05	299	110
1,535	14.3	21,500	2.05	7.05	298	106

SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMMENTS/	OBSERVATIONS		

Good producer. Replaced and lengthened pump to bottom of well



GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s)	PERCM052	Sample ID	ELF-8		
Sampling Method	Low Flow Bladder Pump	Sample Date	October 25, 2021		
Decon Method	Dedicated Equipment	Sample Time	18:30		
Sampler(s) Initials	DV Depth to Water (ft.) 9.11				
Field Conditions	49°F. verv windv. overcastH				

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,810	15.3	11,200	0.93	7.53	254	0
1,820	15.3	11,100	0.91	7.52	252	0
1,830	15.3	11,100	0.90	7.53	250	0

SAMPLE COLLECTION					
APPENDIX FOR	R CURRENT SAMPLE	Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMMENTS/OB	BSERVATIONS		

Very good producer, clear water.



GROUNDWATER SAMPLING FORM					
Project Name Hunter Power Plant Project Location Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-9		
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021		
Decon Method	Dedicated Equipment	Sample Time	23:50		
Sampler(s) Initials DV Depth to Water (ft.) 22.93					
Field Conditions	Heavy wind 47°F partly cloudy		•		

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,120	12.2	14,500	0.68	7.84	39	4.1
1,130	12.2	14,300	0.65	7.88	34	0
1,140	12.2	14,100	0.61	7.93	31	0
1,150	12.2	14,100	0.59	7.94	27	0

SAMPLE COLLECTION						
APPENDIX FO	R CURRENT SAMPLE	Not Applicable				
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS			
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
3	(1) 250 mL poly	HNO3	Total metals			
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228			
4	(1) 250 mL poly	HNO3	Total metals, Total mercury			
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite			
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity			
	COMMENTS/ORSEDVATIONS					

Medium producer. Water level dropping.



GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s)	PERCM052	Sample ID	ELF-10		
Sampling Method	Low Flow Bladder Pump	Sample Date	October 26, 2021		
Decon Method	Dedicated Equipment	Sample Time	10:35		
Sampler(s) Initials	DV Depth to Water (ft.) 49.23				
Field Conditions	Windy, 45°F partly cloudy				

			FIELD PARAN	METERS		
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,015	12.5	46,000	1.25	6.84	334	55
1,025	12.5	46,100	1.17	6.84	331	56.1
1,035	12.5	46,200	1.13	6.82	328	51.8

SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMMENTS/0	DBSERVATIONS		

Very slow recharge. Took a long time to fill all sample bottles. Very poor producer.



GROUNDWATER SAMPLING FORM					
Project Name	Hunter Power Plant	Project Location	Castle Dale UT		
Job number(s)	PERCM052	Sample ID	ELF-11		
Sampling Method	Low Flow Bladder Pump	Sample Date	October 25, 2021		
Decon Method	Dedicated Equipment	Sample Time	17:50		
Sampler(s) Initials	DV	Depth to Water (ft.)	28.09		
Field Conditions	Overcast, windy, 54°F	·			

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,730	13.9	2,030	1.31	7.31	222	98
1,740	13.9	1,990	1.38	7.26	227	96.3
1,750	13.9	2,000	1.28	7.25	228	95.8
-						

SAMPLE COLLECTION				
APPENDIX FO	R CURRENT SAMPLE	Not Applicable		
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS	
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228	
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury	
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite	
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity	
3	(1) 250 mL poly	HNO3	Total metals	
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite	
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity	
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228	
4	(1) 250 mL poly	HNO3	Total metals, Total mercury	
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite	
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity	
		COMMENTS/OF	SERVATIONS	

Very good producer, stabilized quickly



GROUNDWATER SAMPLING FORM						
Project Name	ject Name Hunter Power Plant Project Location Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-12			
Sampling Method	Low Flow Bladder Pump	Sample Date	October 25, 2021			
Decon Method	Dedicated Equipment	Sample Time	17:15			
Sampler(s) Initials	DV Depth to Water (ft.) 20.79					
Field Conditions	55°F, overcast, 18 mph wind					

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,645	13.1	2,230	0.96	7.50	-51	13.9
1,655	13.0	2,230	0.87	7.50	-59	10.5
1,705	13.0	2,240	0.89	7.50	-64	9.4
1,715	12.9	2,250	0.80	7.50	-66	9.3

SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMMENTS	ORSEDVATIONS		

Medium producer, mostly clear



GROUNDWATER SAMPLING FORM					
Project Name         Hunter Power Plant         Project Location         Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-13		
Sampling Method	Low Flow Bladder Pump	Sample Date	October 25, 2021		
Decon Method	Dedicated Equipment	Sample Time	16:35		
Sampler(s) Initials	ials DV Depth to Water (ft.) 4.36				
Field Conditions	55°F, windy, overcast		·		

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,615	13.0	2,020	0.99	7.00	301	0
1,625	13.0	2,020	0.92	6.98	302	0
1,635	12.9	2,020	0.90	6.99	301	0

SAMPLE COLLECTION				
APPENDIX FO	R CURRENT SAMPLE	Not Applicable		
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS	
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228	
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury	
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite	
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity	
3	(1) 250 mL poly	HNO3	Total metals	
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite	
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity	
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228	
4	(1) 250 mL poly	HNO3	Total metals, Total mercury	
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite	
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity	
		COMMENTS/C	BSERVATIONS	

Good producer, stayed clear.



GROUNDWATER SAMPLING FORM						
Project Name	ct Name Hunter Power Plant Project Location Castle Dale UT					
Job number(s)	PERCM052	Sample ID	ELF-14			
Sampling Method	Low Flow Bladder Pump	Sample Date	October 25, 2021			
Decon Method	Dedicated Equipment	Sample Time	15:50			
Sampler(s) Initials	DV Depth to Water (ft.) 6.76					
Field Conditions	57°F, windy, mostly cloudy	·				

FIELD PARAMETERS						
TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,520	15.3	2,310	1.09	6.85	275	59.4
1,530	15.3	2,330	0.98	6.99	265	56
1,540	15.2	2,330	0.94	7.02	260	56.4
1,550	15.2	2,330	0.89	7.03	258	54.1

SAMPLE COLLECTION					
APPENDIX FO	R CURRENT SAMPLE	Not Applicable			
APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS		
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
3	(1) 250 mL poly	HNO3	Total metals		
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228		
4	(1) 250 mL poly	HNO3	Total metals, Total mercury		
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite		
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity		
		COMMENTS/0	DBSERVATIONS		

Duplicate sample also taken at this well.

Good producer, muddy but cleared up a lot.



### **Attachment E:**

Laboratory Analytical Reports



# Radium-226 Case Narrative

# **American West Analytical Labs**

Hunter CCR Sampling -- 2110765

Work Order Number: 2111019

- 1. This report consists of the analytical results and supporting documentation for thirteen water samples received by ALS on 11/1/2021.
- 2. These samples were prepared and analyzed according to the current revisions of SOP 783 and SOP 736. The analysis was completed on 12/17/2021.
- 3. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.
- 4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
- 5. ICP-AES measurement of barium concentrations prior to chemical separation for sample 2111019-4, the method blank, the laboratory control sample, and the LCSD showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero. These samples are identified with a "Z" flag on the Radiochemistry ICP Worksheet, which can be found in Section 5, "Raw Data" of this report.
- 6. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for the LCSD fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. This sample is identified with a "Y1" flag on the final reports.



- 7. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.
- 8. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

J3 Wylde	12/17/21
Dakota Wylde	Date
Radiochemistry Primary Data Reviewer	
GHALM OB	12/17/21
Radiochemistry Final Data Reviewer	Date

# **ALS -- Fort Collins**

# Sample Number(s) Cross-Reference Table

**OrderNum:** 2111019

Client Name: American West Analytical Labs

Client Project Name: Hunter CCR Sampling

Client Project Number: 2110765 Client PO Number: 2110765

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ELF-1D	2111019-1		WATER	26-Oct-21	12:30
ELF-2	2111019-2		WATER	26-Oct-21	13:25
ELF-4	2111019-3		WATER	26-Oct-21	9:40
Field Blank	2111019-4		WATER	26-Oct-21	11:50
ELF-7	2111019-5		WATER	26-Oct-21	15:35
ELF-8	2111019-6		WATER	25-Oct-21	18:30
ELF-9	2111019-7		WATER	26-Oct-21	11:50
ELF-10	2111019-8		WATER	26-Oct-21	10:35
ELF-11	2111019-9		WATER	25-Oct-21	17:50
ELF-12	2111019-10		WATER	25-Oct-21	17:15
ELF-13	2111019-11		WATER	25-Oct-21	16:35
ELF-14	2111019-12		WATER	25-Oct-21	15:50
Duplicate (CCR)	2111019-13		WATER	25-Oct-21	

Chain of Custody

American West Analytical Laboratories

Elona Hayward Contact:

801-263-8686 Phone:

801-263-8687 Fax: Email:

Hunter CCR Sampling / PERCM52-

Project Name:

2110765

Salt Lake City, UT 84119

3440 S. 700 W.

Address:

Lab Sample Se

Turn Around Time ひし Level: 2+

Standard

elona@awal-labs.com

denise@awal-labs.com

1 Shipped or hand delivered Unbroken on Outer Package 4 Received Broken/Leaking Present on Outer Package iscrepancies Between Sample Laboratory Use Only ¥ NA × Unbroken on Sample (Improperly Sealed) 2 Ambient or Chilled 5 Properly Preserved Present on Sample abels and COC Record? 6 Received Within 3 Temperature Holding Times 7 > > performed on client sample in report QC 2+: Include Appropriate Utah state certifications required. Comments S Samples sent to ASE AL Radium 226 + Radium 228 × × × × × × × Aq Aq Aq Aq Aq Sample Matrix Aq Aq Aq Aq # of Containers (7) S N ď 7 12:30 13:25 18:30 12:00 15:35 10:35 17:50 17:15 16:35 Time 9:40 11:50 15:50 Date Sampled 10/26/2021 10/26/2021 1/10/1900 10/26/2021 10/26/2021 10/25/2021 10/26/2021 10/26/2021 10/25/2021 10/25/2021 10/25/2021 10/25/2021 10/25/2021 10/26/21 11:50 Duplicate (CCR) Field Blank Sample ID: ELF-1D ELF-10 ELF-2 ELF-11 CELF-12 ELF-13 2ELF-14 ELF-7 ELF-4 ELF-8 ELF-9

Pint Name

\* Modification to sampling date/time per EH. kmo 11/4/21

Special Instructions: I**nclude project name and PO# on final report and invoice. Email results to both Elona and Denise**.

clinquished by: Signature

eceived by: Signature

Print Name

Time

11/01/2024



# ALS Environmental - Fort Collins CONDITION OF SAMPLE UPON RECEIPT FORM

Client: _		AWAL			Work	order No:	2	111019		
Project Manager: _		KMO			Initials	: <u>AXK</u>	Date:	11/0	1//2021	
								N/A	YES	NO
1. Are airbills / shipping	docume	nts present a	and/or	removabl	e?				V	
Tracking number:									Х	
<ol> <li>Are custody seals on</li> </ol>	shipping	containers i	ntact?						Χ	
3. Are custody seals on	sample c	ontainers in	tact?					Χ		
4. Is there a COC (chain	-of-custo	dy) present?	•						Χ	
Is the COC in agreem containers, matrix, re		-		(IDs, dates	, times, #	of sample	es, # of			х
6. Are short-hold samp	les preser	nt?								Χ
Are all samples withing	n holding	times for th	e requ	ested ana	yses?				Χ	
8. Were all sample con	tainers re	ceived intac	t? (not	broken o	r leaking	g)			Χ	
9. Is there sufficient sar	mple for t	he requeste	d analy	ses?		-				Х
Are samples in prope Guidelines)	er contain	ers for requ	ested a	ınalyses? (	form 250,	Sample Har	ndling		Х	
11. Are all aqueous samp	oles prese	erved correct	tly, if re	equired? (e	excludin	g volatiles	)		Χ	
Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubble > 6 mm (1/4 inch) diameter? (i.e. size of green pea)								Х		
13. Were the samples sh	ipped on	ice?								Χ
14. Were cooler temperatu	ıres meası	ıred at 0.1-6.0	o°C?	IR gun used*:	#5			RAD ONLY		Х
Cooler #:	1	1								
Temperature (°C):	AMB	AMB								
# of custody seals on cooler:	0	1								
External µR/hr reading:	11	10								
Background µR/hr reading:	11	11								
Were external µR/hr reading	Js ≤ two time:	s background and	d within D	OT acceptanc	e criteria?	YES (If no, se	e Form 008.)	l		
* Please provide details he	re for NO r	esponses to b	oxes abo	ove - for 2 t	hru 5 & 7	thru 12, no	tify PM &	continue	w/ login.	
Sample 4 bottles have Sample 1 bottle 2 arri					C diffe	rs .				
Were unpreserved b					ent bottl	e ID's vs AL	S lab ID's o	double-ch	ecked by	AK
If applicable, was the client co	ontacted? Y	ES / NO / NA	Contact:	: /\				Date/1		04/21
Project Manager Signatur	e / Date:	um	//\	1/2				_	1 1/0	/ <del>-1</del> /∠

### View/Print Label

I. Ensure there are no other shipping or tracking labels attached to your package. Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

2. Fold the printed label at the solid line below. Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. GETTING YOUR SHIPMENT TO UPS Customers with a scheduled Pickup

Your driver will pickup your shipment(s) as usual.

Customers without a scheduled Pickup

• Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
• Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you,

please visit the 'Locations' Quick link at ups.com.

UPS Access Point<sup>TM</sup>

UPS Access Point<sup>TM</sup>

2924 SALT LAKE CITY UT 84107-2620 3954

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1931 W 3500 S 4082 S REDWOOD RD

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**FOLD HERE** 





# View/Print Label

- to print the label. print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu l. Ensure there are no other shipping or tracking labels attached to your package. Select the Print button on the
- pouch, affix the folded label using clear plastic shipping tape over the entire label. 2. Fold the printed label at the solid line below. Place the label in a UPS Shipping Pouch. If you do not have a
- 3. CETTING YOUR SHIPMENT TO UPS
- Your driver will pickup your shipment(s) as usual. Customers with a scheduled Pickup
- Customers without a scheduled Pickup

please visit the 'Locations' Quick link at ups.com. UPS Customer Center, Staples@ or Authorized Shipping Outlet near you. To find the location nearest you, • Schedule a Pickup on ups. com to have a UPS driver pickup all of your packages.
• Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box,

4306 S STATE ST 3954 ADVANCE AUTO PARTS STORE UPS Access Point™

**24 T LAKE CITY UT 84107-2620** 

MEZL AVELECT CITY UT 84119-3437 SALT LAKE CITY UT 84123-1132 S 005E W 1E61 4087 2 KEDMOOD KD ADVANCE AUTO PARTS STORE **CAS ZLOKE # 10141** UPS Access Point™ WPS Access PointM

Reference #1: 2110765 **BILLING: P/P** TRACKING #: 1Z 9E7 258 03 9056 3566 N WEST ANALYTICAL LABS ENVIRONMENTA DWT: 24,14,13 AH <u>유</u>

7 of 28

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## **PAI 783 Rev 15 Method Blank Results**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RE211129-1MB

Sample Matrix: WATER

Date Collected: 29-Nov-21

Date Analyzed: 09-Dec-21

**Prep SOP:** PAI 783 Rev 15

Date Prepared: 29-Nov-21

QCBatchID: RE211129-1-2 Run ID: RE211129-1A

Count Time: 30 minutes

Prep Batch: RE211129-1

Final Aliquot: 995 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.09 +/- 0.12	0.20	1	NA	U

## **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15790	15390	ug	97.5	40 - 110 %	

#### **Comments:**

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RE2111019-1

**ALS -- Fort Collins** Page 1 of 2 Date Printed: Friday, December 17, 2021

### PAI 783 Rev 15 Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RE211211-1MB

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15 Date Collected: 11-Dec-21

Date Prepared: 11-Dec-21

Date Analyzed: 17-Dec-21

Prep Batch: RE211211-1

QCBatchID: RE211211-1-1
Run ID: RE211211-1A

Count Time: 20 minutes

Final Aliquot: 993 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.06 +/- 0.18	0.34	1	NA	U

## **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	29970	28690	ug	95.7	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RE2111019-1

Date Printed: Friday, December 17, 2021 ALS -- Fort Collins Page 2 of 2

### **PAI 783 Rev 15**

### **Laboratory Control Sample(s)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RE211129-1LCS

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15 Date Collected: 29-Nov-21 Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1

QCBatchID: RE211129-1-2 Run ID: RE211129-1A

Count Time: 15 minutes

Final Aliquot: 995 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	48 +/- 12	1	46.42	103	67 - 120	Р

## **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15790	15280	ug	96.8	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2111019-1

Date Printed: Friday, December 17, 2021

ALS -- Fort Collins Page 1 of 4

### **PAI 783 Rev 15**

### Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RE211129-1LCSD

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15 Date Collected: 29-Nov-21

Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1

QCBatchID: RE211129-1-2

Run ID: RE211129-1A

Count Time: 15 minutes

Final Aliquot: 995 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	41 +/- 10	0	46.42	88.9	67 - 120	P,Y1

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15790	15970	ug	101	40 - 110 %	Y1

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2111019-1

Page 2 of 4 Date Printed: Friday, December 17, 2021 **ALS -- Fort Collins** 

### **PAI 783 Rev 15**

### Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RE211211-1LCS

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 11-Dec-21 Date Prepared: 11-Dec-21

Date Analyzed: 17-Dec-21

Prep Batch: RE211211-1

QCBatchID: RE211211-1-1 Run ID: RE211211-1A

Count Time: 15 minutes

Final Aliquot: 993 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	41 +/- 10	0	46.42	88.5	67 - 120	Р

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	29960	28740	ug	95.9	40 - 110 %	

#### Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2111019-1

Date Printed: Friday, December 17, 2021

Page 3 of 4 **ALS -- Fort Collins** 

### **PAI 783 Rev 15**

### **Laboratory Control Sample(s)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RE211211-1LCSD

Sample Matrix: WATER

**Prep SOP:** PAI 783 Rev 15

Date Collected: 11-Dec-21 Date Prepared: 11-Dec-21

Date Analyzed: 17-Dec-21

Prep Batch: RE211211-1

QCBatchID: RE211211-1-1

Run ID: RE211211-1A
Count Time: 15 minutes

Final Aliquot: 993 ml Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	44 +/- 11	0	46.42	95.6	67 - 120	Р

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	29980	27830	ug	92.8	40 - 110 %	

#### Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RE2111019-1

Date Printed: Friday, December 17, 2021 ALS -- Fort Collins Page 4 of 4

### **PAI 783 Rev 15**

### **Duplicate Sample Results (DER)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID:

Lab ID: RE211129-1LCSD

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15 Date Collected: 29-Nov-21

Date Prepared: 29-Nov-21
Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A Count Time: 15 minutes Final Aliquot: 995 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l File Name: Manual Entry

CASNO	Analyte	Sample			Duplicate			DER	DER
	Allalyte	Result +/- 2s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		Lim
13982-63-3	Ra-226	48 +/- 12	1	Р	41 +/- 10	0	P,Y1	0.419	2.13

### **Comments:**

### **Duplicate Qualifiers/Flags:**

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 Chemical Yield outside default limits.
- W DER is greater than Warning Limit of 1.42
- D DER is greater than Control Limit of 2.13
- LT Result is less than Request MDC, greater than sample specific MDC
- M Requested MDC not met.
- M3 The requested MDC was not met, but the reported
- activity is greater than the reported MDC.

  L LCS Recovery below lower control limit.
- H LCS Recovery above upper control limit.
- P LCS, Matrix Spike Recovery within control limits.
- N Matrix Spike Recovery outside control limits

Data Package ID: RE2111019-1

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

**BDL** - Below Detection Limit

NR - Not Reported

### PAI 783 Rev 15

### **Duplicate Sample Results (DER)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID:

Lab ID: RE211211-1LCSD

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15 Date Collected: 11-Dec-21

Date Prepared: 11-Dec-21

Date Analyzed: 17-Dec-21

Prep Batch: RE211211-1 QCBatchID: RE211211-1-1

Run ID: RE211211-1A
Count Time: 15 minutes

Final Aliquot: 993 ml Prep Basis: Unfiltered

Moisture(%): NA
Result Units: pCi/l

File Name: Manual Entry

CASNO	Analyta	Sample Duplicate D		DER	DER				
	Analyte	Result +/- 2s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		Lim
13982-63-3	Ra-226	41 +/- 10	0	Р	44 +/- 11	0	Р	0.216	2.13

### **Comments:**

### **Duplicate Qualifiers/Flags:**

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 Chemical Yield outside default limits.
- W DER is greater than Warning Limit of 1.42
- D DER is greater than Control Limit of 2.13
- LT Result is less than Request MDC, greater than sample specific MDC
- M Requested MDC not met.
- M3 The requested MDC was not met, but the reported
- activity is greater than the reported MDC.
- L LCS Recovery below lower control limit.
  H LCS Recovery above upper control limit.
- P LCS, Matrix Spike Recovery within control limits.
- N Matrix Spike Recovery outside control limits

Data Package ID: RE2111019-1

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

**BDL** - Below Detection Limit

NR - Not Reported

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-1D

Lab ID: 2111019-1

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 26-Oct-21
Date Prepared: 11-Dec-21

Date Analyzed: 17-Dec-21

Prep Batch: RE211211-1

QCBatchID: RE211211-1-1 Run ID: RE211211-1A Count Time: 20 minutes

Report Basis: Unfiltered

Final Aliquot: 993 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.07 +/- 0.16	0.29	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	29970	28060	ug	93.6	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

## PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-2
Lab ID: 2111019-2

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 26-Oct-21
Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

**Prep Batch:** RE211129-1 **QCBatchID:** RE211129-1-2

Run ID: RE211129-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered

Moisture(%): NA Result Units: pCi/l File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.06 +/- 0.14	0.26	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	14130	ug	89.4	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-4
Lab ID: 2111019-3

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 26-Oct-21

**Date Prepared**: 29-Nov-21 **Date Analyzed**: 09-Dec-21

Prep Batch: RE211129-1

QCBatchID: RE211129-1-2 Run ID: RE211129-1A Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.32 +/- 0.22	0.23	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	14650	ug	92.7	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

### **PAI 783 Rev 15** Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Field ID: Field Blank Lab ID: 2111019-4

Sample Matrix: WATER

Date Prepared: 29-Nov-21

Prep SOP: PAI 783 Rev 15 QCBatchID: RE211129-1-2 Date Collected: 26-Oct-21 Run ID: RE211129-1A Count Time: 15 minutes

Prep Batch: RE211129-1

Report Basis: Unfiltered Date Analyzed: 09-Dec-21

Final Aliquot: 995 ml Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	-0.03 +/- 0.23	0.45	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15790	13900	ug	88.0	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

### Abbreviations:

- TPU Total Propagated Uncertainty
- MDC Sample specific Minimum Detectable Concentration
- **BDL** Below Detection Limit
- DL Decision Level

Data Package ID: RE2111019-1

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-7

Lab ID: 2111019-5

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 26-Oct-21

Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.41 +/- 0.27	0.30	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	14760	ug	93.5	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-8

Lab ID: 2111019-6

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15

Date Collected: 25-Oct-21

Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.68 +/- 0.35	0.36	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	15390	ug	97.4	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

Date Printed: Friday, December 17, 2021

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### **PAI 783 Rev 15** Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-9 Lab ID: 2111019-7 Sample Matrix: WATER Prep SOP: PAI 783 Rev 15

Date Collected: 26-Oct-21 Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A

Report Basis: Unfiltered

Moisture(%): NA Count Time: 15 minutes Result Units: pCi/l

File Name: Manual Entry

Prep Basis: Unfiltered

Final Aliquot: 995 ml

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.34 +/- 0.22	0.23	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	15570	ug	98.6	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

**BDL** - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-10 Lab ID: 2111019-8 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 26-Oct-21 Date Prepared: 29-Nov-21 Date Analyzed: 09-Dec-21 Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A Count Time: 15 minutes Report Basis: Unfiltered Final Aliquot: 995 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l File Name: Manual Entry

	CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
Ī	13982-63-3	Ra-226	0.59 +/- 0.32	0.24	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	15440	ug	97.7	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-11
Lab ID: 2111019-9

Sample Matrix: WATER

Prep SOP: PAI 783 Rev 15 Date Collected: 25-Oct-21

**Date Prepared**: 29-Nov-21 **Date Analyzed**: 09-Dec-21

Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml Prep Basis: Unfiltered

Moisture(%): NA
Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.31 +/- 0.21	0.22	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	15350	ug	97.2	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

Date Printed: Friday, December 17, 2021

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### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-12 Lab ID: 2111019-10 Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 25-Oct-21

Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A
Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml Prep Basis: Unfiltered

Moisture(%): NA
Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.19 +/- 0.20	0.30	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15790	15100	ug	95.6	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-13
Lab ID: 2111019-11

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 25-Oct-21

Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.57 +/- 0.30	0.31	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15790	15200	ug	96.2	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

### **PAI 783 Rev 15** Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-14 Lab ID: 2111019-12 Sample Matrix: WATER Prep SOP: PAI 783 Rev 15

Date Collected: 25-Oct-21 Date Prepared: 29-Nov-21

Date Analyzed: 09-Dec-21

Prep Batch: RE211129-1

QCBatchID: RE211129-1-2 Run ID: RE211129-1A Count Time: 15 minutes

Report Basis: Unfiltered

Final Aliquot: 995 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.56 +/- 0.30	0.28	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15800	15080	ug	95.4	40 - 110 %	

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

**BDL** - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1

# Radium-226 by Radon Emanation - Method 903.1

### PAI 783 Rev 15 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: Duplicate (CCR)

Lab ID: 2111019-13

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15

Date Collected: 25-Oct-21 Date Prepared: 29-Nov-21 Date Analyzed: 09-Dec-21 Prep Batch: RE211129-1 QCBatchID: RE211129-1-2

Run ID: RE211129-1A Count Time: 15 minutes Report Basis: Unfiltered Final Aliquot: 995 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.21 +/- 0.23	0.36	1	NA	U

### **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15810	15430	ug	97.6	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RE2111019-1



# Radium-228 Case Narrative

# **American West Analytical Labs**

Hunter CCR Sampling -- 2110765

Work Order Number: 2111019

- 1. This report consists of the analytical results and supporting documentation for thirteen water samples received by ALS on 11/1/2021.
- 2. These samples were prepared according to the current revision of SOP 749.
- 3. The samples were analyzed for the presence of <sup>228</sup>Ra by low background gas flow proportional counting of <sup>228</sup>Ac, which is the ingrown progeny of <sup>228</sup>Ra, according to the current revision of SOP 724. The analyses were completed on 12/9/2021.
- 4. The analysis results for these samples reported in units of pCi/L. The samples were not filtered prior to analysis.
- 5. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.
- 6. ICP-AES measurement of barium concentrations prior to chemical separation for the laboratory control sample showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero. This sample is identified with a "Z" flag on the Radiochemistry ICP Worksheet, which can be found in Section 5, "Raw Data" of this report.
- 7. The requested MDC was not met for sample 2111019-12. This sample was counted for a maximum count time of 250 minutes and results are reported without further qualification. This sample is identified with an "M" or an "M3" flag on the final reports. The reported activity for samples identified with an "M3" flag exceeds the achieved MDC.



- 8. Due to uncertainty associated with the ICP-AES determination of barium concentration in the samples, the calculated yield for samples 2111019-10 fell between 100% and 110%. To minimize the potential for low bias, results have been calculated conservatively assuming quantitative chemical yield (100%). The magnitude of the low bias is estimated to be less than 10% of the reported value and is acceptable according the ALS LQAP. This sample is identified with an "Y1" flag on the final reports.
- 9. No further anomalous situations were noted during the preparation and analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Date

Dakota Wylde Radiochemistry Primary Data Reviewer 12/17/21

Radiochemistry Final Data Reviewer

2 of 27

# **ALS -- Fort Collins**

# Sample Number(s) Cross-Reference Table

**OrderNum:** 2111019

Client Name: American West Analytical Labs

Client Project Name: Hunter CCR Sampling

Client Project Number: 2110765 Client PO Number: 2110765

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
ELF-1D	2111019-1		WATER	26-Oct-21	12:30
ELF-2	2111019-2		WATER	26-Oct-21	13:25
ELF-4	2111019-3		WATER	26-Oct-21	9:40
Field Blank	2111019-4		WATER	26-Oct-21	11:50
ELF-7	2111019-5		WATER	26-Oct-21	15:35
ELF-8	2111019-6		WATER	25-Oct-21	18:30
ELF-9	2111019-7		WATER	26-Oct-21	11:50
ELF-10	2111019-8		WATER	26-Oct-21	10:35
ELF-11	2111019-9		WATER	25-Oct-21	17:50
ELF-12	2111019-10		WATER	25-Oct-21	17:15
ELF-13	2111019-11		WATER	25-Oct-21	16:35
ELF-14	2111019-12		WATER	25-Oct-21	15:50
Duplicate (CCR)	2111019-13		WATER	25-Oct-21	

# American West Analytical Laboratories

Chain of Custody

Lab Sample Se



Client: American West Analytical Laboratories

Address: 3440 S. 700 W.

Contact: Elona Hayward

Phone: 801-263-8686

Salt Lake City, UT 84119

Fax: 801-263-8687 Email: elona@awal-labs.com

Turn Around Time

Project Name: Hunter CCR Sampling / PERCM52
PO#: 2//07 65

denise@awal-labs.com

QC Level: 2+

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			Containers	Sample Matrix	Radium 226 + Radium 228										Sac 1 2 3 4	Ship Ambi Temp Recei	Were:  ped or  ient or  peratur  ived Br  roperly	Sealed) N eserved	ivere
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ELF-2	10/26/2021	13:25	2	Aq	х	$\neg$	++	+-1	$\dashv$	十	+	+ +	$\dashv$	QC 2+: Include	-15		ing Tim		
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ELF-8	10/25/2021	18:30	2		x	_	++	╂╾╂	$\dashv$	+	╀	+	+		-   <sup>2</sup>			o Outer Pr	acka
CLF-9	10/26/2021	11:50	2		x	-	++	++1	$\dashv$	╁╌	+	$\vdash$	+		-18	Y	N		IA
ELF-10	10/26/2021	10:35	2		x	+	-	╅┪	+	+	┿	$\vdash$	十		-1 3	Prese		h 1	
2LF-11	10/25/2021	17:50	2	_	x	$\dashv$	++	++	-	+	╁╌	-	+		- 8	Y	N		A
ELF-12	10/25/2021	17:15	2	_	×	10	Sampl	es se	nt to-	٨	1	, <	=		-   4			Sample	
CLF-13	10/25/2021	16:35	2	_	x								1000	cations required.	-1	Y	N	ALT VALUE OF	Α
LF-14	10/25/2021	15:50	2		x			T		T	T	e ce.	T	cations required.	100		Etravia (	ween San	aple
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Print Name



# ALS Environmental - Fort Collins CONDITION OF SAMPLE UPON RECEIPT FORM

Client:		AWAL	_		Workor	der No:	2	111019		
Project Manager:		KMO			nitials:	AXK	Date:	11/0	1//2021	
								N/A	YES	NO
1. Are airbills / shipping	docume	nts present	and/or re	emovable?					V	
Tracking number:									Х	
2. Are custody seals on	shipping	containers i	intact?						Χ	
3. Are custody seals on	sample c	ontainers in	itact?					Х		
4. Is there a COC (chain	-of-custo	dy) present?	?						Χ	
Is the COC in agreem containers, matrix, re		•	•	lDs, dates, ti	mes, # C	of sample	s, # of			х
6. Are short-hold samp	les preser	nt?								Χ
7. Are all samples withi	n holding	times for th	ne reques	sted analys	es?				Χ	
8. Were all sample con	ainers re	ceived intac	t? (not b	oroken or le	eaking)				Χ	
9. Is there sufficient sar	nple for t	he requeste	ed analys	es?						Х
Are samples in prope Guidelines)	er contain	ers for requ	ested an	alyses? (for	m 250, <i>S</i> a	ample Han	dling		Х	
11. Are all aqueous samp	oles prese	rved correc	tly, if req	uired? (ex	cluding	volatiles)			Χ	
Are all samples requi > 6 mm (1/4 inch) dia	•				, radon)	free of b	oubbles	Х		
13. Were the samples sh	ipped on	ice?								Χ
<sup>14.</sup> Were cooler temperatu	ıres meası	red at 0.1-6.	0°C?	IR gun used*:	#5			RAD ONLY		Х
Cooler #:	1	1							_	
Temperature (°C):	AMB	AMB								
# of custody seals on cooler:	0	1								
External µR/hr reading:	11	10								
Background µR/hr reading:	11	11								
Were external µR/hr reading	s ≤ two time:	background and	d within DO	T acceptance ci	riteria? YE	S (If no, see	Form 008.)			
* Please provide details he	re for NO r	esponses to b	oxes abov	e - for 2 thru	ı 5 & 7 th	nru 12, not	ify PM &	continue	w/ login.	
Sample 4 bottles have	10/26/2	2021 11:50	info bu	t the COC	differs					
Sample 1 bottle 2 arri	ved with	only 200m	nl of sam	nple						
Were unpreserved b	ottles pH (	hecked? NA		All clien	t bottle l	D's vs ALS	lab ID's o	double-ch	ecked by	AK
If applicable, was the client c	ontacted? Y	ES / NO / NA	Contact:					Date/1		
Project Manager Signatur	e / Date:	am	-M 01	2				_	11/0	)4/21

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I. Ensure there are no other shipping or tracking labels attached to your package. Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

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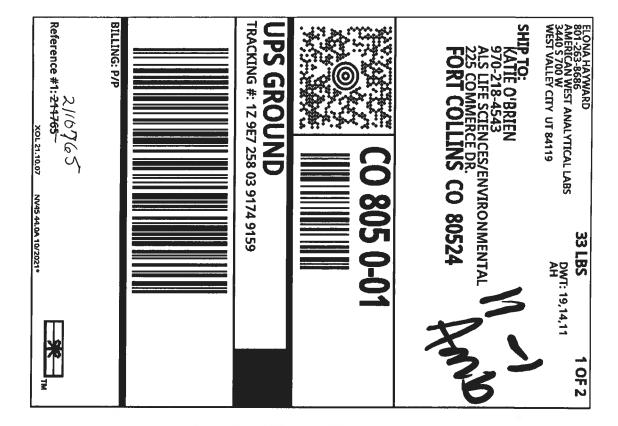
CAS SLOKE # 10741

MEZL APITEK CILK OL 84116-3431 SVFL FVKE CILK OL 84153-1135
1631 M 3200 Z 4085 Z BEDMOOD BD

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Reference #1: 2110765 **BILLING: P/P** TRACKING #: 1Z 9E7 258 03 9056 3566 N WEST ANALYTICAL LABS ENVIRONMENTA DWT: 24,14,13 AH 유

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### PAI 724 Rev 14 Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RA211121-1MB

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7

Date Collected: 21-Nov-21
Date Prepared: 21-Nov-21
Date Analyzed: 09-Dec-21

Prep Batch: RA211121-1

QCBatchID: RA211121-1-1 Run ID: RA211121-1A

Count Time: 150 minutes

Final Aliquot: 997 ml Result Units: pCi/l File Name: RAA1209A

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CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	0.42 +/- 0.43	0.89	1	NA	U

### **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31780	29950	ug	94.2	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Method Blank Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RA211201-3MB

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7

Date Collected: 01-Dec-21
Date Prepared: 01-Dec-21
Date Analyzed: 15-Dec-21

**Prep Batch:** RA211201-3 **QCBatchID:** RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes Final Aliquot: 998 ml Result Units: pCi/l

File Name: RAA1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	0.45 +/- 0.42	0.86	1	NA	U

### **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32410	31630	ug	97.6	40 - 110 %	

#### Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: RA2111019-1

Date Printed: Friday, December 17, 2021 ALS -- Fort Collins Page 2 of 2

### PAI 724 Rev 14

### **Laboratory Control Sample(s)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RA211121-1LCS

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7

Date Collected: 21-Nov-21 Date Prepared: 21-Nov-21 Date Analyzed: 09-Dec-21 Prep Batch: RA211121-1

QCBatchID: RA211121-1-1 Run ID: RA211121-1A

Count Time: 150 minutes

Final Aliquot: 997 ml Result Units: pCi/l

File Name: RAA1209A

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	28.6 +/- 6.7	0.9	22.83	125	70 - 130	Р

### **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31770	30720	ug	96.7	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2111019-1

Date Printed: Friday, December 17, 2021

### **PAI 724 Rev 14**

### **Laboratory Control Sample(s)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RA211121-1LCSD

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7

Date Collected: 21-Nov-21 Date Prepared: 21-Nov-21 Date Analyzed: 09-Dec-21 Prep Batch: RA211121-1 QCBatchID: RA211121-1-1 Run ID: RA211121-1A

Count Time: 150 minutes

Final Aliquot: 997 ml Result Units: pCi/l File Name: RAA1209A

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CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	29.3 +/- 6.8	0.9	22.83	128	70 - 130	Р

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31790	28270	ug	88.9	40 - 110 %	

#### Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

 $\ensuremath{\mathsf{M}}$  - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2111019-1

### PAI 724 Rev 14

### **Laboratory Control Sample(s)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Lab ID: RA211201-3LCSD

Sample Matrix: WATER
Prep SOP: SOP749 Rev 7

Date Collected: 01-Dec-21
Date Prepared: 01-Dec-21
Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3

QCBatchID: RA211201-3-1 Run ID: RA211201-3A

Count Time: 30 minutes

Final Aliquot: 998 ml Result Units: pCi/l

File Name: RAA1215A

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	26.6 +/- 6.5	1.9	22.78	117	70 - 130	P,M3

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32410	29480	ug	91.0	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: RA2111019-1

Date Printed: Friday, December 17, 2021 ALS -- Fort Collins Page 3 of 3

### **PAI 724 Rev 14**

### **Duplicate Sample Results (DER)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID:

Lab ID: RA211121-1LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 21-Nov-21

**Date Prepared:** 21-Nov-21 **Date Analyzed:** 09-Dec-21

Prep Batch: RA211121-1

QCBatchID: RA211121-1-1 Run ID: RA211121-1A Count Time: 150 minutes Final Aliquot: 997 ml Prep Basis: Unfiltered

Moisture(%): NA Result Units: pCi/l File Name: RAA1209A

CASNO	Analyte	Sample			Duplicate			DER	DER
	Allalyte	Result +/- 2s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		Lim
15262-20-1	Ra-228	28.6 +/- 6.7	0.9	Р	29.3 +/- 6.8	0.9	Р	0.0668	2.13

#### **Comments:**

#### **Duplicate Qualifiers/Flags:**

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 Chemical Yield outside default limits.
- $\ensuremath{\mathsf{W}}$  DER is greater than Warning Limit of 1.42
- D DER is greater than Control Limit of 2.13
- LT Result is less than Request MDC, greater than sample specific MDC
- M Requested MDC not met.
- M3 The requested MDC was not met, but the reported
- activity is greater than the reported MDC.
- L LCS Recovery below lower control limit.
  H LCS Recovery above upper control limit.
- P LCS, Matrix Spike Recovery within control limits.
- N Matrix Spike Recovery outside control limits

Data Package ID: RA2111019-1

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

**BDL** - Below Detection Limit

NR - Not Reported

### **PAI 724 Rev 14**

### **Duplicate Sample Results (DER)**

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID:

Lab ID: RA211201-3LCSD

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 01-Dec-21

Date Prepared: 01-Dec-21
Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 30 minutes Final Aliquot: 998 ml
Prep Basis: Unfiltered
Moisture(%): NA

Result Units: pCi/l File Name: RAA1215A

CASNO	Analyte	Sample			Duplicate			DER	DER
	Analyte	Result +/- 2s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		Lim
15262-20-1	Ra-228	NR	NR		26.6 +/- 6.5	NA	P,M3	0.905	2.13

#### Comments:

#### **Duplicate Qualifiers/Flags:**

- $\ensuremath{\mathsf{U}}$  Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 Chemical Yield outside default limits.
- $\ensuremath{\mathsf{W}}$  DER is greater than Warning Limit of 1.42
- D DER is greater than Control Limit of 2.13
- $\ensuremath{\mathsf{LT}}$  Result is less than Request MDC, greater than sample specific MDC
- M Requested MDC not met.
- M3 The requested MDC was not met, but the reported
- activity is greater than the reported MDC.

  L LCS Recovery below lower control limit.
- H LCS Recovery above upper control limit.
- P LCS, Matrix Spike Recovery within control limits.
- N Matrix Spike Recovery outside control limits

Data Package ID: RA2111019-1

Abbreviations:

TPU - Total Propagated Uncertainty

DER - Duplicate Error Ratio

**BDL** - Below Detection Limit

NR - Not Reported

### **PAI 724 Rev 14** Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-1D Lab ID: 2111019-1 Sample Matrix: WATER

Prep SOP: SOP749 Rev 7 Date Collected: 26-Oct-21

Date Prepared: 21-Nov-21 Date Analyzed: 17-Dec-21 Prep Batch: RA211121-1

QCBatchID: RA211121-1-1 Run ID: RA211121-1A

Count Time: 150 minutes Report Basis: Unfiltered

Final Aliquot: 997 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: RAA1209A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	4.4	0.8	1	NA	
15262-20-1	Ra-228	4.4 +/- 1.2	0.8	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	31780	31690	ug	99.7	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-2
Lab ID: 2111019-2

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 26-Oct-21

Date Prepared: 01-Dec-21 Date Analyzed: 15-Dec-21 Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	1.1	0.79	1	NA	
15262-20-1	Ra-228	1.10 +/- 0.48	0.79	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	32100	ug	99.0	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-4

Lab ID: 2111019-3

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 26-Oct-21

Date Prepared: 01-Dec-21 Date Analyzed: 15-Dec-21 Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A
Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l File Name: RAC1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	1.45	0.81	1	NA	
15262-20-1	Ra-228	1.13 +/- 0.49	0.81	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32430	31610	ug	97.5	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

- U Result is less than the sample specific MDC.
- Y1 Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.
- Y2 Chemical Yield outside default limits.
- M3 The requested MDC was not met, but the reported activity is greater than the reported MDC.
- M The requested MDC was not met.

#### Abbreviations

- TPU Total Propagated Uncertainty
- MDC Sample specific Minimum Detectable Concentration
- BDL Below Detection Limit
- DL Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: Field Blank
Lab ID: 2111019-4

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 26-Oct-21

Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A
Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l File Name: RAC1215B

С	ASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
		COMBINED RA (226+228)	0	0.88	1	NA	U
15262	2-20-1	Ra-228	-0.17 +/- 0.38	0.88	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32410	30510	ug	94.1	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-7

Lab ID: 2111019-5

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 26-Oct-21

Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l

File Name: RAC1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.85	1	NA	U
15262-20-1	Ra-228	0.48 +/- 0.42	0.85	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	31780	ug	98.0	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-8

Lab ID: 2111019-6

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 25-Oct-21

Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered Moisture(%): NA

Result Units: pCi/l

File Name: RAC1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.19	0.87	1	NA	
15262-20-1	Ra-228	1.51 +/- 0.58	0.87	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	31440	ug	97.0	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-9

Lab ID: 2111019-7

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7
Date Collected: 26-Oct-21

Date Prepared: 01-Dec-21 Date Analyzed: 15-Dec-21 Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A
Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered

Moisture(%): NA
Result Units: pCi/l
File Name: RAC1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	0	0.85	1	NA	U
15262-20-1	Ra-228	0.84 +/- 0.47	0.85	1	NA	U

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	30580	ug	94.3	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-10

Lab ID: 2111019-8

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 26-Oct-21

Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml

Prep Basis: Unfiltered Moisture(%): NA Result Units: pCi/l File Name: RAC1215B

	CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
		COMBINED RA (226+228)	2.39	0.81	1	NA	
7	15262-20-1	Ra-228	1.80 +/- 0.61	0.81	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32430	32200	ug	99.3	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### **PAI 724 Rev 14** Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-11 Lab ID: 2111019-9 Sample Matrix: WATER

Prep SOP: SOP749 Rev 7 Date Collected: 25-Oct-21 Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered

Moisture(%): NA Result Units: pCi/l File Name: RAC1215B

CASN	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	1.92	0.9	1	NA	
15262-20-1	Ra-228	1.61 +/- 0.60	0.90	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32430	31440	ug	97.0	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### **PAI 724 Rev 14** Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-12 **Lab ID**: 2111019-10 Sample Matrix: WATER

Prep SOP: SOP749 Rev 7 Date Collected: 25-Oct-21 Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered

Moisture(%): NA Result Units: pCi/l File Name: RAA1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.85	0.91	1	NA	
15262-20-1	Ra-228	2.85 +/- 0.85	0.91	1	NA	Y1

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	32850	ug	101	40 - 110 %	Y1

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-13

Lab ID: 2111019-11

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 25-Oct-21

Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered

Moisture(%): NA
Result Units: pCi/l

File Name: RAA1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.69	0.91	1	NA	
15262-20-1	Ra-228	2.12 +/- 0.70	0.91	1	NA	

### **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	31680	ug	97.7	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: ELF-14

Lab ID: 2111019-12

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 25-Oct-21

Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A
Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml Prep Basis: Unfiltered

Moisture(%): NA Result Units: pCi/l File Name: RAA1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2.19	1.18	1	NA	
15262-20-1	Ra-228	1.63 +/- 0.71	1.18	1	NA	M3

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	25260	ug	77.9	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1

### PAI 724 Rev 14 Sample Results

Lab Name: ALS -- Fort Collins

Work Order Number: 2111019

Client Name: American West Analytical Labs
ClientProject ID: Hunter CCR Sampling 2110765

Field ID: Duplicate (CCR)

Lab ID: 2111019-13

Sample Matrix: WATER

Prep SOP: SOP749 Rev 7

Date Collected: 25-Oct-21

Date Prepared: 01-Dec-21

Date Analyzed: 15-Dec-21

Prep Batch: RA211201-3 QCBatchID: RA211201-3-1

Run ID: RA211201-3A Count Time: 150 minutes

Report Basis: Unfiltered

Final Aliquot: 998 ml
Prep Basis: Unfiltered

Moisture(%): NA Result Units: pCi/l File Name: RAA1215B

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
	COMBINED RA (226+228)	2	0.96	1	NA	
15262-20-1	Ra-228	2.00 +/- 0.70	0.96	1	NA	

# **Chemical Yield Summary**

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32420	31580	ug	97.4	40 - 110 %	

#### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: RA2111019-1



Brad Giles PacifiCorp 1407 West North Temple, # 280 Salt Lake City, UT 84116

TEL: (801) 220-2989

RE: Hunter Power Plant - CCR

3440 South 700 West
Salt Lake City, UT 84119

Dear Brad Giles:

American West Analytical Laboratories received sample(s) on 10/28/2021 for the analyses presented in the following report.

Lab Set ID: 2110765

Phone: (801) 263-8686 Toll Free: (888) 263-8686 Fax: (801) 263-8687

e-mail: awal@awal-labs.com

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

American West Analytical Laboratories (AWAL) is accredited by The National Environmental Laboratory Accreditation Program (NELAP) in Utah and Texas; and is state accredited in Colorado, Idaho, New Mexico, Wyoming, and Missouri.

All analyses were performed in accordance to the NELAP protocols unless noted otherwise. Accreditation scope documents are available upon request. If you have any questions or concerns regarding this report please feel free to call.

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Thank You,

Approved by:	
•	Laboratory Director or designee

Sample(s) were subcontracted for the following analyses:

Radiological Testing



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-001 **Client Sample ID:** ELF-1D

**Collection Date:** 10/26/2021 1230h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	0.0104	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	< 0.00200	
, ,	Boron	mg/L	11/1/2021 805h	11/9/2021 1951h	E200.7	0.500	1.94	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 1951h	E200.7	5.00	393	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00400	< 0.00400	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 1951h	E200.7	0.500	2.89	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1047h	E245.1	0.0000900	< 0.0000900	1
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	0.00866	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1845h	E200.8	0.00200	< 0.00200	

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-002

Client Sample ID: ELF-2

**Collection Date:** 10/26/2021 1325h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	0.0102	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	< 0.00200	
· · ·	Boron	mg/L	11/1/2021 805h	11/9/2021 1953h	E200.7	0.500	3.12	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 1953h	E200.7	5.00	400	2
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00400	< 0.00400	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 1953h	E200.7	0.500	1.87	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1057h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	0.00218	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	0.00456	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1849h	E200.8	0.00200	< 0.00200	

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.



Contact: Brad Giles

**Client:** PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-003

Client Sample ID: ELF-4

**Collection Date:** 10/26/2021 940h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	0.0118	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	< 0.00200	
` '	Boron	mg/L	11/1/2021 805h	11/9/2021 2018h	E200.7	1.00	4.36	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2018h	E200.7	10.0	479	2
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00400	0.00608	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2018h	E200.7	1.00	1.82	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1059h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	0.00228	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1921h	E200.8	0.00200	< 0.00200	

QA Officer

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-004 **Client Sample ID:** Field Blank

**Collection Date:** 10/26/2021 1150h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2024h	E200.7	0.100	< 0.100	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2024h	E200.7	1.00	< 1.00	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00400	< 0.00400	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2024h	E200.7	0.100	< 0.100	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1101h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1932h	E200.8	0.00200	< 0.00200	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-005

**Client Sample ID:** ELF-7

**Collection Date:** 10/26/2021 1535h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	0.0101	
Phone: (801) 263-8686 Toll Free: (888) 263-8686 Fax: (801) 263-8687	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2026h	E200.7	1.00	1.80	
	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.000500	< 0.000500	
	Calcium	mg/L	11/1/2021 805h	11/9/2021 2026h	E200.7	10.0	461	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	< 0.00200	
web: www.awal-labs.com	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00400	< 0.00400	
	Lead	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2026h	E200.7	1.00	2.42	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1103h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	0.00236	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	0.0311	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1936h	E200.8	0.00200	< 0.00200	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-006

Collection Potes: 10/25/20

**Collection Date:** 10/25/2021 1830h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	0.0160	
Phone: (801) 263-8686 Toll Free: (888) 263-8686 Fax: (801) 263-8687	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2028h	E200.7	1.00	30.6	
	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.000500	0.00173	
	Calcium	mg/L	11/1/2021 805h	11/9/2021 2028h	E200.7	10.0	578	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	< 0.00200	
web: www.awal-labs.com	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00400	0.198	
	Lead	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	0.00847	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2028h	E200.7	1.00	3.81	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1105h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	0.394	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1940h	E200.8	0.00200	< 0.00200	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-007

Client Sample ID: ELF-9

**Collection Date:** 10/26/2021 1150h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	0.00622	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	0.0118	
Phone: (801) 263-8686 Toll Free: (888) 263-8686 Fax: (801) 263-8687	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2052h	E200.7	0.500	1.33	
	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.000500	< 0.000500	
	Calcium	mg/L	11/1/2021 805h	11/9/2021 2052h	E200.7	5.00	56.4	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	< 0.00200	
web: www.awal-labs.com	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00400	< 0.00400	
	Lead	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2052h	E200.7	0.500	1.21	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1112h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	0.0571	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1944h	E200.8	0.00200	< 0.00200	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-008 **Client Sample ID:** ELF-10

**Collection Date:** 10/26/2021 1035h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	0.0147	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	< 0.00200	
` '	Boron	mg/L	11/1/2021 805h	11/9/2021 2033h	E200.7	1.00	1.50	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2033h	E200.7	10.0	504	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00400	< 0.00400	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2033h	E200.7	1.00	2.89	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1114h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	0.0142	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1948h	E200.8	0.00200	< 0.00200	

Jose Rocha QA Officer



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-009 **Client Sample ID:** ELF-11

**Collection Date:** 10/25/2021 1750h **Received Date:** 10/28/2021 1450h

Analytical Results

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	0.0122	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	< 0.00200	
` '	Boron	mg/L	11/1/2021 805h	11/9/2021 2035h	E200.7	0.500	16.1	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2035h	E200.7	5.00	444	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00400	0.0194	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2035h	E200.7	0.500	4.37	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1116h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	0.0182	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	0.107	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1952h	E200.8	0.00200	< 0.00200	

Jose Rocha QA Officer

Report Date: 11/18/2021 Page 10 of 38



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-010 **Client Sample ID:** ELF-12

**Collection Date:** 10/25/2021 1715h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	0.00960	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2037h	E200.7	0.500	1.25	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2037h	E200.7	5.00	173	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00400	< 0.00400	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2037h	E200.7	0.500	1.34	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1118h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	< 0.00200	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 1956h	E200.8	0.00200	< 0.00200	

Jose Rocha QA Officer

Report Date: 11/18/2021 Page 11 of 38



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-011 **Client Sample ID:** ELF-13

**Collection Date:** 10/25/2021 1635h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	0.00980	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2046h	E200.7	0.500	0.556	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2046h	E200.7	5.00	459	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/5/2021 1223h	E200.8	0.00400	0.00426	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2046h	E200.7	0.500	2.36	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1120h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	< 0.00200	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	< 0.00200	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 2016h	E200.8	0.00200	< 0.00200	

Jose Rocha QA Officer

Report Date: 11/18/2021 Page 12 of 38



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-012 **Client Sample ID:** ELF-14

**Collection Date:** 10/25/2021 1550h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	0.0150	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2048h	E200.7	1.00	2.48	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2048h	E200.7	10.0	494	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/5/2021 1227h	E200.8	0.00400	0.0104	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2048h	E200.7	1.00	4.66	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1122h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	0.00377	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	0.00344	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 2020h	E200.8	0.00200	< 0.00200	

Jose Rocha QA Officer

Report Date: 11/18/2021 Page 13 of 38



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-013 **Client Sample ID:** Duplicate (CCR) **Collection Date:** 10/25/2021

**Received Date:** 10/28/2021 1450h

**Analytical Results** 

TOTAL METALS

3440 South 700 West	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84119	Antimony	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00400	< 0.00400	
	Arsenic	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	< 0.00200	
	Barium	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	0.0152	
Phone: (801) 263-8686	Beryllium	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	< 0.00200	
	Boron	mg/L	11/1/2021 805h	11/9/2021 2050h	E200.7	1.00	2.49	
Toll Free: (888) 263-8686	Cadmium	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.000500	< 0.000500	
Fax: (801) 263-8687	Calcium	mg/L	11/1/2021 805h	11/9/2021 2050h	E200.7	10.0	495	
e-mail: awal@awal-labs.com	Chromium	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	< 0.00200	
	Cobalt	mg/L	11/1/2021 805h	11/5/2021 1231h	E200.8	0.00400	0.00980	
web: www.awal-labs.com	Lead	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	< 0.00200	
	Lithium	mg/L	11/1/2021 805h	11/9/2021 2050h	E200.7	1.00	4.75	
	Mercury	mg/L	11/1/2021 1454h	11/2/2021 1124h	E245.1	0.0000900	< 0.0000900	
Jennifer Osborn	Molybdenum	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	0.00374	
Laboratory Director	Selenium	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	0.00335	
	Thallium	mg/L	11/1/2021 805h	11/4/2021 2023h	E200.8	0.00200	< 0.00200	

Jose Rocha QA Officer

Report Date: 11/18/2021 Page 14 of 38



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-001 **Client Sample ID:** ELF-1D

**Collection Date:** 10/26/2021 1230h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/5/2021 1032h	E300.0	100	7,200	
Fluoride	mg/L		11/9/2021 157h	E300.0	0.100	0.163	
pH @ 25° C	pH Units		10/28/2021 1605h	SM4500-H+B	1.00	7.17	Н
Sulfate	mg/L		11/5/2021 1032h	E300.0	500	10,700	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	25,000	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-002

**Client Sample ID:** ELF-2

**Collection Date:** 10/26/2021 1325h **Received Date:** 10/28/2021 1450h

## **Analytical Results**

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/5/2021 1059h	E300.0	100	213	
Fluoride	mg/L		11/9/2021 316h	E300.0	0.100	0.393	
pH @ 25° C	pH Units		10/28/2021 1605h	SM4500-H+B	1.00	7.46	Н
Sulfate	mg/L		11/5/2021 1059h	E300.0	500	8,400	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	100	12,200	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-003

Client Sample ID: ELF-4

**Collection Date:** 10/26/2021 940h **Received Date:** 10/28/2021 1450h

## **Analytical Results**

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686

Fax: (801) 263-8687 e-mail: awal@awal-labs.com

web: www.awal-labs.com

Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/5/2021 1218h	E300.0	100	2,220	
Fluoride	mg/L		11/9/2021 342h	E300.0	0.100	0.319	
pH @ 25° C	pH Units		10/28/2021 1605h	SM4500-H+B	1.00	7.23	Н
Sulfate	mg/L		11/5/2021 1218h	E300.0	500	6,200	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	100	12,400	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-004 **Client Sample ID:** Field Blank

**Collection Date:** 10/26/2021 1150h **Received Date:** 10/28/2021 1450h

### **Analytical Results**

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686

Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 1442h	E300.0	0.100	0.104	
Fluoride	mg/L		11/8/2021 1442h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	6.07	Н
Sulfate	mg/L		11/8/2021 1442h	E300.0	0.500	< 0.500	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	1,800	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-005

**Client Sample ID:** ELF-7

**Collection Date:** 10/26/2021 1535h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

3440 South 700 West Salt Lake City, UT 84119

Phone: (801) 263-8686

Toll Free: (888) 263-8686 Fax: (801) 263-8687

e-mail: awal@awal-labs.com

web: www.awal-labs.com

Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 1508h	E300.0	100	2,980	
Fluoride	mg/L		11/9/2021 409h	E300.0	0.100	0.330	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	7.33	Н
Sulfate	mg/L		11/8/2021 1508h	E300.0	500	9,610	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	18,400	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-006

Client Sample ID: ELF-8

**Collection Date:** 10/25/2021 1830h **Received Date:** 10/28/2021 1450h

### **Analytical Results**

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 1736h	E300.0	100	2,040	
Fluoride	mg/L		11/9/2021 435h	E300.0	0.100	1.30	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	7.76	Н
Sulfate	mg/L		11/8/2021 1736h	E300.0	500	3,550	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	100	8,140	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-007

**Client Sample ID:** ELF-9

**Collection Date:** 10/26/2021 1150h **Received Date:** 10/28/2021 1450h

#### **Analytical Results**

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 1802h	E300.0	100	515	
Fluoride	mg/L		11/9/2021 501h	E300.0	0.100	1.84	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	8.19	Н
Sulfate	mg/L		11/8/2021 1802h	E300.0	500	7,100	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	100	11,400	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-008 **Client Sample ID:** ELF-10

**Collection Date:** 10/26/2021 1035h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 1829h	E300.0	200	13,100	
Fluoride	mg/L		11/9/2021 620h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	7.46	Н
Sulfate	mg/L		11/8/2021 1829h	E300.0	1,000	9,910	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	39,900	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-009 **Client Sample ID:** ELF-11

**Collection Date:** 10/25/2021 1750h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 1948h	E300.0	100	1,110	
Fluoride	mg/L		11/13/2021 124h	E300.0	0.100	< 0.100	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	<b>7.7</b> 1	Н
Sulfate	mg/L		11/8/2021 1948h	E300.0	500	12,100	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	17,500	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-010 **Client Sample ID:** ELF-12

**Collection Date:** 10/25/2021 1715h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 2014h	E300.0	100	605	
Fluoride	mg/L		11/9/2021 713h	E300.0	0.100	0.590	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	7.85	Н
Sulfate	mg/L		11/8/2021 2014h	E300.0	500	13,300	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	19,000	



**Contact:** Brad Giles

Reporting

Analytical

Method

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-011 **Client Sample ID:** ELF-13

**Collection Date:** 10/25/2021 1635h **Received Date:** 10/28/2021 1450h

H - Sample was received outside of the holding time.

**Analytical Results** 

3440 South 700 West Salt Lake City, UT 84119

Compound **Prepared** Units **Analyzed** Used Limit Result Qual Chloride mg/L 11/8/2021 2041h E300.0 100 2,810 Fluoride 0.100 0.200 mg/L 11/9/2021 740h E300.0 pH @ 25° C 1.00 7.44 pH Units 10/28/2021 1846h SM4500-H+B Η Sulfate mg/L 11/8/2021 2041h E300.0 500 9,040 Total Dissolved Solids mg/L 10/29/2021 1140h SM2540C 500 19,900

**Date** 

Date

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-012 **Client Sample ID:** ELF-14

**Collection Date:** 10/25/2021 1550h **Received Date:** 10/28/2021 1450h

**Analytical Results** 

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 2107h	E300.0	100	4,050	
Fluoride	mg/L		11/9/2021 806h	E300.0	0.100	0.332	
pH @ 25° C	pH Units		10/28/2021 1846h	SM4500-H+B	1.00	7.42	Н
Sulfate	mg/L		11/8/2021 2107h	E300.0	500	9,110	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	19,600	



Contact: Brad Giles

Client: PacifiCorp

**Project:** Hunter Power Plant - CCR

**Lab Sample ID:** 2110765-013 **Client Sample ID:** Duplicate (CCR)

**Collection Date:** 10/25/2021

**Received Date:** 10/28/2021 1450h

#### **Analytical Results**

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Jennifer Osborn Laboratory Director

> Jose Rocha QA Officer

Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Chloride	mg/L		11/8/2021 2133h	E300.0	100	4,100	
Fluoride	mg/L		11/9/2021 832h	E300.0	0.100	0.305	
pH @ 25° C	pH Units		10/28/2021 2005h	SM4500-H+B	1.00	7.47	Н
Sulfate	mg/L		11/8/2021 2133h	E300.0	500	9,170	
Total Dissolved Solids	mg/L		10/29/2021 1140h	SM2540C	500	19,900	



**PacifiCorp** 

**Client:** 

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Jennifer Osborn **Laboratory Director** 

**RPD** 

Jose Rocha **QA** Officer

RPD Ref.

## **OC SUMMARY REPORT**

**Brad Giles Contact:** 

> Dept: ME

**Lab Set ID:** 2110765 QC Type: LCS **Project:** Hunter Power Plant - CCR Reporting Spike Ref. Amount

Analyte		Result	Units	Method	MDL	Limit	Spiked	Amount	%REC	Limits	Amt	% RPD	Limit	Qual
Lab Sample ID: Test Code:	LCS-80502 200.7-W	Date Analyzed: Date Prepared:	11/09/202 11/01/202											
Boron		1.01	mg/L	E200.7	0.00290	0.100	1.000	0	101	85 - 115				
Calcium		10.0	mg/L	E200.7	0.0434	1.00	10.00	0	100	85 - 115				
Lithium		0.984	mg/L	E200.7	0.0130	0.100	1.000	0	98.4	85 - 115				
Lab Sample ID:	LCS-80504	Date Analyzed:	11/04/202	21 1842h										
Test Code:	200.8-W	Date Prepared:	11/01/202	21 805h										
Antimony		0.181	mg/L	E200.8	0.000734	0.00400	0.2000	0	90.5	85 - 115				
Arsenic		0.203	mg/L	E200.8	0.000298	0.00200	0.2000	0	101	85 - 115				
Barium		0.203	mg/L	E200.8	0.000544	0.00200	0.2000	0	101	85 - 115				
Beryllium		0.207	mg/L	E200.8	0.000198	0.00200	0.2000	0	104	85 - 115				
Cadmium		0.199	mg/L	E200.8	0.0000742	0.000500	0.2000	0	99.5	85 - 115				
Chromium		0.200	mg/L	E200.8	0.000920	0.00200	0.2000	0	99.9	85 - 115				
Cobalt		0.183	mg/L	E200.8	0.000300	0.00400	0.2000	0	91.5	85 - 115				
Lead		0.200	mg/L	E200.8	0.000588	0.00200	0.2000	0	99.9	85 - 115				
Molybdenum		0.191	mg/L	E200.8	0.000884	0.00200	0.2000	0	95.6	85 - 115				
Selenium		0.202	mg/L	E200.8	0.000508	0.00200	0.2000	0	101	85 - 115				
Thallium		0.180	mg/L	E200.8	0.000418	0.00200	0.2000	0	90.0	85 - 115				
Lab Sample ID:	LCS-80517	Date Analyzed:	11/02/202	21 1041h										
Test Code:	HG-DW-245.1	Date Prepared:	11/01/202	21 1454h										
Mercury		0.00334	mg/L	E245.1	0.0000396	0.0000900	0.003330	0	100	85 - 115				
														_



**PacifiCorp** 

Hunter Power Plant - CCR

**Client:** 

**Project:** 

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Jennifer Osborn Laboratory Director

Jose Rocha QA Officer

## **QC SUMMARY REPORT**

**Contact:** Brad Giles

**Dept:** ME

QC Type: MBLK

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	MB-80502	Date Analyzed:	11/09/202	1 1940h										
Test Code:	200.7-W	Date Prepared:	11/01/202	1 805h										
Boron		< 0.100	mg/L	E200.7	0.00290	0.100								
Calcium		< 1.00	mg/L	E200.7	0.0434	1.00								
Lithium		< 0.100	mg/L	E200.7	0.0130	0.100								
Lab Sample ID:	MB-80504	Date Analyzed:	11/04/202	1 1838h										
Test Code:	200.8-W	Date Prepared:	11/01/202	1 805h										
Antimony		< 0.00400	mg/L	E200.8	0.000734	0.00400								
Arsenic		< 0.00200	mg/L	E200.8	0.000298	0.00200								
Barium		< 0.00200	mg/L	E200.8	0.000544	0.00200								
Beryllium		< 0.00200	mg/L	E200.8	0.000198	0.00200								
Cadmium		< 0.000500	mg/L	E200.8	0.0000742	0.000500								
Chromium		< 0.00200	mg/L	E200.8	0.000920	0.00200								
Cobalt		< 0.00400	mg/L	E200.8	0.000300	0.00400								
Lead		< 0.00200	mg/L	E200.8	0.000588	0.00200								
Molybdenum		< 0.00200	mg/L	E200.8	0.000884	0.00200								
Selenium		< 0.00200	mg/L	E200.8	0.000508	0.00200								
Thallium		< 0.00200	mg/L	E200.8	0.000418	0.00200								
Lab Sample ID:	MB-80517	Date Analyzed:	11/02/202	1 1039h										
Test Code:	HG-DW-245.1	Date Prepared:	11/01/202	1 1454h										
Mercury		< 0.0000900	mg/L	E245.1	0.0000396	0.0000900								

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Jennifer Osborn Laboratory Director

Jose Rocha QA Officer

## QC SUMMARY REPORT

**Contact:** Brad Giles

**Dept:** ME **QC Type:** MS

**Project:** Hunter Power Plant - CCR

**PacifiCorp** 

**Client:** 

**Lab Set ID:** 2110765

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	2110765-002CMS	Date Analyzed:	11/09/20	21 2007h										
Test Code:	200.7-W	Date Prepared:	11/01/202	21 805h										
Boron		4.14	mg/L	E200.7	0.0145	0.500	1.000	3.12	102	70 - 130				
Calcium		403	mg/L	E200.7	0.217	5.00	10.00	400	34.5	70 - 130				2
Lithium		2.83	mg/L	E200.7	0.0650	0.500	1.000	1.87	96.9	75 - 125				
Lab Sample ID:	2110765-003CMS	Date Analyzed:	11/09/20	21 2020h										
Test Code:	200.7-W	Date Prepared:	11/01/202	21 805h										
Boron		5.60	mg/L	E200.7	0.0290	1.00	1.000	4.36	124	70 - 130				
Calcium		506	mg/L	E200.7	0.434	10.0	10.00	479	270	70 - 130				2
Lithium		2.96	mg/L	E200.7	0.130	1.00	1.000	1.82	115	75 - 125				
Lab Sample ID:	2110765-002CMS	Date Analyzed:	11/04/20	21 1901h										
Test Code:	200.8-W	Date Prepared:	11/01/202	21 805h										
Antimony		0.188	mg/L	E200.8	0.000734	0.00400	0.2000	0	94.2	75 - 125				
Arsenic		0.209	mg/L	E200.8	0.000298	0.00200	0.2000	0	104	75 - 125				
Barium		0.207	mg/L	E200.8	0.000544	0.00200	0.2000	0.0102	98.2	75 - 125				
Beryllium		0.186	mg/L	E200.8	0.000198	0.00200	0.2000	0	92.9	75 - 125				
Cadmium		0.195	mg/L	E200.8	0.0000742	0.000500	0.2000	0.0000863	97.5	75 - 125				
Chromium		0.190	mg/L	E200.8	0.000920	0.00200	0.2000	0	95.0	75 - 125				
Cobalt		0.178	mg/L	E200.8	0.000300	0.00400	0.2000	0.00284	87.5	75 - 125				
Lead		0.187	mg/L	E200.8	0.000588	0.00200	0.2000	0	93.7	75 - 125				
Molybdenum		0.203	mg/L	E200.8	0.000884	0.00200	0.2000	0.00218	100	75 - 125				
Selenium		0.209	mg/L	E200.8	0.000508	0.00200	0.2000	0.00456	102	75 - 125				
Thallium		0.166	mg/L	E200.8	0.000418	0.00200	0.2000	0	83.1	75 - 125				
Lab Sample ID:	2110765-003CMS	Date Analyzed:	11/04/20	21 1925h										
Test Code:	200.8-W	Date Prepared:	11/01/202	21 805h										
Antimony		0.187	mg/L	E200.8	0.000734	0.00400	0.2000	0	93.4	75 - 125				
Arsenic		0.215	mg/L	E200.8	0.000298	0.00200	0.2000	0.0004	107	75 - 125				
Barium		0.213	mg/L	E200.8	0.000544	0.00200	0.2000	0.0118	101	75 - 125				



**PacifiCorp** 

Hunter Power Plant - CCR

**Client:** 

**Project:** 

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Jennifer Osborn Laboratory Director

Jose Rocha QA Officer

## **QC SUMMARY REPORT**

Contact: Brad Giles

**Dept:** ME

**QC Type:** MS

Analyte	Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: 2110765-003CM	S Date Analyzed:	11/04/202	1 1925h										
Test Code: 200.8-W	Date Prepared:	11/01/202	1 805h										
Beryllium	0.189	mg/L	E200.8	0.000198	0.00200	0.2000	0	94.6	75 - 125				
Cadmium	0.191	mg/L	E200.8	0.0000742	0.000500	0.2000	0.000432	95.1	75 - 125				
Chromium	0.199	mg/L	E200.8	0.000920	0.00200	0.2000	0.00115	98.7	75 - 125				
Cobalt	0.181	mg/L	E200.8	0.000300	0.00400	0.2000	0.00608	87.4	75 - 125				
Lead	0.189	mg/L	E200.8	0.000588	0.00200	0.2000	0	94.3	75 - 125				
Molybdenum	0.207	mg/L	E200.8	0.000884	0.00200	0.2000	0.00228	102	75 - 125				
Selenium	0.202	mg/L	E200.8	0.000508	0.00200	0.2000	0.00138	100	75 - 125				
Thallium	0.169	mg/L	E200.8	0.000418	0.00200	0.2000	0.000509	84.4	75 - 125				
Lab Sample ID: 2110765-001CM	S Date Analyzed:	11/02/202	1 1053h										
Test Code: HG-DW-245.1	Date Prepared:	11/01/202	1 1454h										
Mercury	0.00248	mg/L	E245.1	0.0000396	0.0000900	0.003330	0	74.4	80 - 120				1

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.

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Jennifer Osborn **Laboratory Director** 

Jose Rocha **QA** Officer

## **QC SUMMARY REPORT**

**Brad Giles Contact:** 

> Dept: ME QC Type: MSD

**Lab Set ID:** 2110765 **Project:** Hunter Power Plant - CCR

**PacifiCorp** 

**Client:** 

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	2110765-002CMSD	Date Analyzed:	11/09/202											
Test Code:	200.7-W	Date Prepared:	11/01/202	21 805h										
Boron		4.22	mg/L	E200.7	0.0145	0.500	1.000	3.12	110	70 - 130	4.14	1.84	20	
Calcium		411	mg/L	E200.7	0.217	5.00	10.00	400	115	70 - 130	403	1.97	20	
Lithium		2.95	mg/L	E200.7	0.0650	0.500	1.000	1.87	108	75 - 125	2.83	3.94	20	
Lab Sample ID:	2110765-003CMSD	Date Analyzed:	11/09/202	21 2022h										
Test Code:	200.7-W	Date Prepared:	11/01/202	21 805h										
Boron		5.53	mg/L	E200.7	0.0290	1.00	1.000	4.36	117	70 - 130	5.6	1.31	20	
Calcium		499	mg/L	E200.7	0.434	10.0	10.00	479	192	70 - 130	506	1.57	20	2
Lithium		2.94	mg/L	E200.7	0.130	1.00	1.000	1.82	113	75 - 125	2.96	0.708	20	
Lab Sample ID:	2110765-002CMSD	Date Analyzed:	11/04/202	21 1905h										
Test Code:	200.8-W	Date Prepared:	11/01/202	21 805h										
Antimony		0.193	mg/L	E200.8	0.000734	0.00400	0.2000	0	96.3	75 - 125	0.188	2.20	20	
Arsenic		0.212	mg/L	E200.8	0.000298	0.00200	0.2000	0	106	75 - 125	0.209	1.40	20	
Barium		0.210	mg/L	E200.8	0.000544	0.00200	0.2000	0.0102	99.9	75 - 125	0.207	1.58	20	
Beryllium		0.187	mg/L	E200.8	0.000198	0.00200	0.2000	0	93.6	75 - 125	0.186	0.718	20	
Cadmium		0.198	mg/L	E200.8	0.0000742	0.000500	0.2000	0.0000863	98.8	75 - 125	0.195	1.36	20	
Chromium		0.193	mg/L	E200.8	0.000920	0.00200	0.2000	0	96.6	75 - 125	0.19	1.66	20	
Cobalt		0.178	mg/L	E200.8	0.000300	0.00400	0.2000	0.00284	87.7	75 - 125	0.178	0.209	20	
Lead		0.189	mg/L	E200.8	0.000588	0.00200	0.2000	0	94.6	75 - 125	0.187	0.985	20	
Molybdenum		0.206	mg/L	E200.8	0.000884	0.00200	0.2000	0.00218	102	75 - 125	0.203	1.65	20	
Selenium		0.204	mg/L	E200.8	0.000508	0.00200	0.2000	0.00456	99.7	75 - 125	0.209	2.46	20	
Thallium		0.168	mg/L	E200.8	0.000418	0.00200	0.2000	0	84.1	75 - 125	0.166	1.15	20	
Lab Sample ID:	2110765-003CMSD	Date Analyzed:	11/04/202	21 1928h										
Test Code:	200.8-W	Date Prepared:	11/01/202	21 805h										
Antimony		0.190	mg/L	E200.8	0.000734	0.00400	0.2000	0	95.0	75 - 125	0.187	1.65	20	
Arsenic		0.216	mg/L	E200.8	0.000298	0.00200	0.2000	0.0004	108	75 - 125	0.215	0.468	20	
Barium		0.212	mg/L	E200.8	0.000544	0.00200	0.2000	0.0118	100	75 - 125	0.213	0.581	20	



**PacifiCorp** 

**Client:** 

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Jennifer Osborn **Laboratory Director** 

Jose Rocha **QA** Officer

## **QC SUMMARY REPORT**

**Brad Giles Contact:** 

> Dept: ME

**Lab Set ID:** 2110765 QC Type: MSD **Project:** Hunter Power Plant - CCR

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID:	2110765-003CMSD	Date Analyzed:	11/04/202	1 1928h										
Test Code:	200.8-W	Date Prepared:	11/01/202	1 805h										
Beryllium		0.187	mg/L	E200.8	0.000198	0.00200	0.2000	0	93.4	75 - 125	0.189	1.30	20	
Cadmium		0.194	mg/L	E200.8	0.0000742	0.000500	0.2000	0.000432	96.9	75 - 125	0.191	1.90	20	
Chromium		0.191	mg/L	E200.8	0.000920	0.00200	0.2000	0.00115	94.8	75 - 125	0.199	3.99	20	
Cobalt		0.180	mg/L	E200.8	0.000300	0.00400	0.2000	0.00608	87.0	75 - 125	0.181	0.478	20	
Lead		0.186	mg/L	E200.8	0.000588	0.00200	0.2000	0	93.1	75 - 125	0.189	1.34	20	
Molybdenum		0.206	mg/L	E200.8	0.000884	0.00200	0.2000	0.00228	102	75 - 125	0.207	0.743	20	
Selenium		0.205	mg/L	E200.8	0.000508	0.00200	0.2000	0.00138	102	75 - 125	0.202	1.43	20	
Thallium		0.167	mg/L	E200.8	0.000418	0.00200	0.2000	0.000509	83.4	75 - 125	0.169	1.22	20	
Lab Sample ID:	2110765-001CMSD	Date Analyzed:	11/02/202	1 1055h										
Test Code:	HG-DW-245.1	Date Prepared:	11/01/202	1 1454h										
Mercury		0.00241	mg/L	E245.1	0.0000396	0.0000900	0.003330	0	72.4	80 - 120	0.00248	2.80	20	1

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

<sup>&</sup>lt;sup>2</sup> - Analyte concentration is too high for accurate matrix spike recovery and/or RPD.



**PacifiCorp** 

Hunter Power Plant - CCR

**Client:** 

**Project:** 

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Jennifer Osborn Laboratory Director

Jose Rocha QA Officer

## QC SUMMARY REPORT

**Contact:** Brad Giles

**Dept:** WC

QC Type: DUP

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>2110767-001ADUP</b> PH-4500H+B	Date Analyzed	10/28/202	21 1605h										
pH @ 25° C		7.65	pH Units	SM4500-H+B	1.00	1.00					7.58	0.919	5	
Lab Sample ID: Test Code:	<b>2110765-001ADUP</b> PH-4500H+B	Date Analyzed	10/28/202	21 1605h										
pH @ 25° C		7.22	pH Units	SM4500-H+B	1.00	1.00					7.17	0.695	5	Н
Lab Sample ID: Test Code:	<b>2110765-005ADUP</b> PH-4500H+B	Date Analyzed	10/28/202	21 1846h										
pH @ 25° C		7.37	pH Units	SM4500-H+B	1.00	1.00					7.33	0.544	5	Н
Lab Sample ID: Test Code:	<b>2110765-013ADUP</b> PH-4500H+B	Date Analyzed	10/28/202	21 2005h										
pH @ 25° C		7.48	pH Units	SM4500-H+B	1.00	1.00					7.47	0.134	5	Н
Lab Sample ID: Test Code:	<b>2110766-001ADUP</b> PH-4500H+B	Date Analyzed	10/28/202	21 2005h										
pH @ 25° C		7.20	pH Units	SM4500-H+B	1.00	1.00					7.2	0	5	
Lab Sample ID: Test Code:	<b>2110765-001ADUP</b> TDS-W-2540C	Date Analyzed	10/29/202	21 1140h										
Total Dissolved S	folids	25,900	mg/L	SM2540C	400	500					25000	3.54	5	
Lab Sample ID: Test Code:	<b>2110766-001ADUP</b> TDS-W-2540C	Date Analyzed	10/29/202	21 1140h										
Total Dissolved S	solids	7,500	mg/L	SM2540C	80.0	100					7440	0.803	5	

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Jennifer Osborn **Laboratory Director** 

Jose Rocha **QA** Officer

## **QC SUMMARY REPORT**

**Brad Giles Contact:** 

**Lab Set ID:** 2110765 Dept: WC QC Type: LCS **Project:** Hunter Power Plant - CCR Donorting Snike Ref

**Client:** 

**PacifiCorp** 

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	LCS-R158789 300.0-W	Date Analyzed:	11/05/20	21 1006h										
Chloride		4.93	mg/L	E300.0	0.0198	0.100	5.000	0	98.6	90 - 110				
Sulfate		5.07	mg/L	E300.0	0.0750	0.500	5.000	0	101	90 - 110				
Lab Sample ID: Test Code:	LCS-R158918 300.0-W	Date Analyzed:	11/08/20	21 1415h										
Chloride		4.90	mg/L	E300.0	0.0198	0.100	5.000	0	98.1	90 - 110				
Fluoride		4.98	mg/L	E300.0	0.00260	0.100	5.000	0	99.5	90 - 110				
Sulfate		5.05	mg/L	E300.0	0.0750	0.500	5.000	0	101	90 - 110				
<b>Lab Sample ID:</b> Test Code:	LCS-R159107 300.0-W	Date Analyzed:	11/12/20	21 1757h										
Fluoride		5.03	mg/L	E300.0	0.00260	0.100	5.000	0	101	90 - 110				
Lab Sample ID: Test Code:	LCS-R158453 PH-4500H+B	Date Analyzed:	10/28/20	21 1605h										
pH @ 25° C		8.99	pH Units	SM4500-H+B	1.00	1.00	9.000	0	99.9	98 - 102				
Lab Sample ID: Test Code:	LCS-R158457 PH-4500H+B	Date Analyzed:	10/28/20:	21 1846h										
pH @ 25° C		9.00	pH Units	SM4500-H+B	1.00	1.00	9.000	0	100	98 - 102				
<b>Lab Sample ID:</b> Test Code:	LCS-R158458 PH-4500H+B	Date Analyzed:	10/28/20	21 2005h										
pH @ 25° C		9.00	pH Units	SM4500-H+B	1.00	1.00	9.000	0	100	98 - 102				
<b>Lab Sample ID:</b> Test Code:	LCS-R158582 TDS-W-2540C	Date Analyzed:	10/29/20	21 1140h										
Total Dissolved S	Solids	204	mg/L	SM2540C	8.00	10.0	205.0	0	99.5	80 - 120				



**PacifiCorp** 

Hunter Power Plant - CCR

**Client:** 

**Project:** 

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Jennifer Osborn Laboratory Director

Jose Rocha QA Officer

## **QC SUMMARY REPORT**

**Contact:** Brad Giles

**Dept:** WC

QC Type: MBLK

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>MB-R158789</b> 300.0-W	Date Analyzed:	11/05/202	21 940h										
Chloride Sulfate		< 0.100 < 0.500	mg/L mg/L	E300.0 E300.0	0.0198 0.0750	0.100 0.500								
Lab Sample ID: Test Code:	<b>MB-R158918</b> 300.0-W	Date Analyzed:	11/08/202	21 1349h										
Chloride Fluoride Sulfate		< 0.100 < 0.100 < 0.500	mg/L mg/L mg/L	E300.0 E300.0 E300.0	0.0198 0.00260 0.0750	0.100 0.100 0.500								
Lab Sample ID: Test Code:	<b>MB-R159107</b> 300.0-W	Date Analyzed:	11/12/202	21 1732h										
Fluoride		< 0.100	mg/L	E300.0	0.00260	0.100								
Lab Sample ID: Test Code:	<b>MB-R158582</b> TDS-W-2540C	Date Analyzed:	10/29/202	21 1140h										
Total Dissolved S	Solids	< 10.0	mg/L	SM2540C	8.00	10.0								



**PacifiCorp** 

Hunter Power Plant - CCR

**Client:** 

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Jose Rocha QA Officer

## QC SUMMARY REPORT

**Contact:** Brad Giles

**Dept:** WC

QC Type: MS

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>2110765-002AMS</b> 300.0-W	Date Analyzed:	11/05/20	21 1125h										
Chloride		5,170	mg/L	E300.0	19.8	100	5,000	213	99.1	90 - 110				
Sulfate		13,500	mg/L	E300.0	75.0	500	5,000	8400	102	90 - 110				
Lab Sample ID: Test Code:	<b>2110611-029AMS</b> 300.0-W	Date Analyzed:	11/05/20	21 1310h										
Chloride		131	mg/L	E300.0	0.396	2.00	100.0	39.8	91.7	90 - 110				
Sulfate		235	mg/L	E300.0	1.50	10.0	100.0	152	83.2	90 - 110				1
Lab Sample ID: Test Code:	<b>2110765-005AMS</b> 300.0-W	Date Analyzed:	11/08/20	21 1710h										
Chloride		7,860	mg/L	E300.0	19.8	100	5,000	2980	97.6	90 - 110				
Fluoride		4,920	mg/L	E300.0	2.60	100	5,000	0	98.5	90 - 110				
Sulfate		14,200	mg/L	E300.0	75.0	500	5,000	9610	91.1	90 - 110				
Lab Sample ID: Test Code:	<b>2110767-001AMS</b> 300.0-W	Date Analyzed:	11/08/20	21 2226h										•
Chloride		2,960	mg/L	E300.0	9.90	50.0	2,500	483	99.3	90 - 110				
Fluoride		2,450	mg/L	E300.0	1.30	50.0	2,500	2.18	98.1	90 - 110				
Sulfate		5,700	mg/L	E300.0	37.5	250	2,500	3190	100	90 - 110				
Lab Sample ID: Test Code:	<b>2110765-001AMS</b> 300.0-W	Date Analyzed:	11/09/20	21 223h										
Fluoride		10.1	mg/L	E300.0	0.00520	0.200	10.00	0.163	99.7	90 - 110				

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

Report Date: 11/18/2021 Page 37 of 38



**PacifiCorp** 

Hunter Power Plant - CCR

**Client:** 

**Project:** 

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Jennifer Osborn Laboratory Director

Jose Rocha QA Officer

## **QC SUMMARY REPORT**

**Contact:** Brad Giles

**Dept:** WC

QC Type: MSD

Analyte		Result	Units	Method	MDL	Reporting Limit	Amount Spiked	Spike Ref. Amount	%REC	Limits	RPD Ref. Amt	% RPD	RPD Limit	Qual
Lab Sample ID: Test Code:	<b>2110765-002AMSD</b> 300.0-W	Date Analyzed:	11/05/202	21 1151h										
Chloride		5,190	mg/L	E300.0	19.8	100	5,000	213	99.4	90 - 110	5170	0.332	20	
Sulfate		13,500	mg/L	E300.0	75.0	500	5,000	8400	102	90 - 110	13500	0.0286	20	
Lab Sample ID: Test Code:	<b>2110611-029AMSD</b> 300.0-W	Date Analyzed:	11/05/202	21 1337h										
Chloride		131	mg/L	E300.0	0.396	2.00	100.0	39.8	90.8	90 - 110	131	0.677	20	
Sulfate		233	mg/L	E300.0	1.50	10.0	100.0	152	80.8	90 - 110	235	0.995	20	1
Lab Sample ID: Test Code:	<b>2110765-005AMSD</b> 300.0-W	Date Analyzed:	11/08/202	21 1644h										
Chloride		7,910	mg/L	E300.0	19.8	100	5,000	2980	98.5	90 - 110	7860	0.586	20	
Fluoride		4,930	mg/L	E300.0	2.60	100	5,000	0	98.6	90 - 110	4920	0.0934	20	
Sulfate		14,300	mg/L	E300.0	75.0	500	5,000	9610	94.6	90 - 110	14200	1.20	20	
Lab Sample ID: Test Code:	<b>2110767-001AMSD</b> 300.0-W	Date Analyzed:	11/08/202	21 2252h										
Chloride		2,980	mg/L	E300.0	9.90	50.0	2,500	483	99.8	90 - 110	2960	0.437	20	
Fluoride		2,440	mg/L	E300.0	1.30	50.0	2,500	2.18	97.5	90 - 110	2450	0.577	20	
Sulfate		5,710	mg/L	E300.0	37.5	250	2,500	3190	101	90 - 110	5700	0.215	20	
Lab Sample ID: Test Code:	<b>2110765-001AMSD</b> 300.0-W	Date Analyzed:	11/09/202	21 250h										
Fluoride		9.48	mg/L	E300.0	0.00520	0.200	10.00	0.163	93.2	90 - 110	10.1	6.60	20	

<sup>&</sup>lt;sup>1</sup> - Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS.

# **American West Analytical Laboratories**

Rpt Emailed: OL:

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GenericEDD QC

**WORK ORDER Summary** 

Work Order: 2110765

Page 1 of 5

Client:

PacifiCorp

**Contact:** 

Due Date: 11/11/2021

Client ID:

PAC900

**Brad Giles** 

Project: Comments: **Hunter Power Plant - CCR** 

QC Level:

 $\Pi$ +

WO Type: Project

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel Storage	
2110765-001A	ELF-1D	10/26/2021 1230h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	
2110765-001C				200.7-W		DF-Metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
				11 SEL Analytes: SB AS B	4 BE CD CR CO PB MO	SE TL	
				200.8-W-PR		DF-Metals	
				HG-DW-245.1		DF-Metals	
				HG-DW-PR		DF-Metals	
2110765-001D				OUTSIDE LAB		ALS	2
2110765-002A	ELF-2	10/26/2021 1325h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		DF-WC	
			-	TDS-W-2540C		DF-WC	
2110765-002C				200.7-W		DF-Metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
				11 SEL Analytes: SB AS B.	A BE CD CR CO PB MO	SE TL	
				200.8-W-PR		DF-Metals	
				HG-DW-245.1		DF-Metals	
				HG-DW-PR		DF-Metals	
2110765-002D				OUTSIDE LAB		ALS	
2110765-003A	ELF-4	10/26/2021 0940h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC	
				3 SEL Analytes: CL F SO4	!		
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	

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Work Order: **2110765** 

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Client:

PacifiCorn

Client:	PacifiCorp				Dι	e Date: 11/11/2021	
Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel Storage	
2110765-003C	ELF-4	10/26/2021 0940h	10/28/2021 1450h	200.7-W	Aqueous	DF-Metals	
				3 SEL Analytes: B (	CA LI		
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
					B AS BA BE CD CR CO PB MC		
			100	200.8-W-PR		DF-Metals	
				HG-DW-245.1		DF-Metals	
2110765-003D				HG-DW-PR		DF-Metals	
				OUTSIDE LAB		ALS	
2110765-004A	Field Blank	10/26/2021 1150h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC	
				3 SEL Analytes: CL	F SO4		
				PH-4500H+B		DF-WC	
110765 0046				TDS-W-2540C		DF-WC	
110765-004C				200.7-W		DF-Metals	
				3 SEL Analytes: B C	CA LI		
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
				200.8-W-PR	B AS BA BE CD CR CO PB MO	DF-Metals	
				HG-DW-245.1		DF-Metals  DF-Metals	
				HG-DW-PR		DF-Metals	
110765-004D				OUTSIDE LAB		ALS	
110765-005A	ELF-7	10/26/2021 1535h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC	
				3 SEL Analytes: CL	•	DI-WC	
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	
110765-005C				200.7-W		DF-Metals	
				3 SEL Analytes: B C	CA LI		
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
					B AS BA BE CD CR CO PB MO	SE TL	
				200.8-W-PR		DF-Metals	
		ANN	77	HG-DW-245.1		DF-Metals	
110765-005D				HG-DW-PR		DF-Metals	
110/03-003D				OUTSIDE LAB		ALS	

Work Order: **2110765** 

Page 3 of 5

Client:

PacifiCorp

Due Date: 11/11/2021

Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel Storage
2110765-006A	ELF-8	10/25/2021 1830h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC
			-	3 SEL Analytes: CL F SO4		-
				PH-4500H+B		DF-WC
				TDS-W-2540C		DF-WC
2110765-006C				200.7-W		DF-Metals
				3 SEL Analytes: B CA LI		
				200.7-W-PR		DF-Metals
				200.8-W		DF-Metals
			- Senten	11 SEL Analytes: SB AS BA	BE CD CR CO PB MC	SE TL
				200.8-W-PR		DF-Metals
				HG-DW-245.1		DF-Metals
				HG-DW-PR		DF-Metals
110765-006D				OUTSIDE LAB		ALS
110765-007A	ELF-9	10/26/2021 1150h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC
				3 SEL Analytes: CL F SO4		
				PH-4500H+B		DF-WC
				TDS-W-2540C		DF-WC
110765-007C				200.7-W		DF-Metals
				3 SEL Analytes: B CA LI		
				200.7-W-PR		DF-Metals
				200.8-W		DF-Metals
				11 SEL Analytes: SB AS BA	BE CD CR CO PB MC	O SE TL
				200.8-W-PR		DF-Metals
				HG-DW-245.1		DF-Metals
				HG-DW-PR		DF-Metals
110765-007D				OUTSIDE LAB		ALS
110765-008A	ELF-10	10/26/2021 1035h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC
				3 SEL Analytes: CL F SO4		
				PH-4500H+B		DF-WC
				TDS-W-2540C		DF-WC
110765-008C				200.7-W		DF-Metals
				3 SEL Analytes: B CA LI		
				200.7-W-PR		DF-Metals
				200.8-W		DF-Metals
				11 SEL Analytes: SB AS BA	BE CD CR CO PB MC	O SE TL
				200.8-W-PR		DF-Metals
				HG-DW-245.1		DF-Metals

Work Order: **2110765** 

Page 4 of 5

Client:

PacifiCorp

Due Date: 11/11/2021

Sample ID	PacifiCorp  Client Sample ID	Collected Date	Pagaiyad Data	Test Code		e Date: 11/11/2021  Sel Storage
			Received Date		Matrix	
110765-008C	ELF-10	10/26/2021 1035h	10/28/2021 1450h		Aqueous	DF-Metals
110765-008D		.,,		OUTSIDE LAB		ALS
110765-009A	ELF-11	10/25/2021 1750h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC
				3 SEL Analytes: CL F SO4		
	44 44 - 24 - 24 - 24 - 24 - 24 - 24 - 2			PH-4500H+B		DF-WC
				TDS-W-2540C		DF-WC
2110765-009C				200.7-W		DF-Metals
				3 SEL Analytes: B CA LI		
				200.7-W-PR		DF-Metals
				200.8-W		DF-Metals
		, yyanaana	THE DESIGNATION AND THE STREET	11 SEL Analytes: SB AS BA .  200.8-W-PR	BE CD CR CO PB MO	DF-Metals
				HG-DW-245.1		DF-Metals
				HG-DW-245.1 HG-DW-PR		DF-Ivietals  DF-Metals
2110765-009D				OUTSIDE LAB		ALS
2110765-010A	ELF-12	10/25/2021 1715h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC
		10,20,201	10/20/2021 11000	3 SEL Analytes: CL F SO4	. Ada a cap	
				PH-4500H+B		DF-WC
				TDS-W-2540C		DF-WC
2110765-010C				200.7-W		DF-Metals
				3 SEL Analytes: B CA LI		
				200.7-W-PR		DF-Metals
				200.8-W		DF-Metals
				11 SEL Analytes: SB AS BA	BE CD CR CO PB MO	
				200.8-W-PR		DF-Metals
				HG-DW-245.1		DF-Metals
2110565 0105				HG-DW-PR		DF-Metals
2110765-010D				OUTSIDE LAB		ALS
2110765-011A	ELF-13	10/25/2021 1635h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC
	400,000		.1	3 SEL Analytes: CL F SO4	n.a	
				PH-4500H+B		DF-WC
				TDS-W-2540C		DF-WC
				200.7-W		DF-Metals
2110765-011C						
2110765-011C				3 SEL Analytes: B CA LI 200.7-W-PR		DF-Metals

Work Order: **2110765** 

Page 5 of 5

Client:

PacifiCorp

Due Date: 11/11/2021

Client:	PacifiCorp				Due Date	: 11/11/2021	
Sample ID	Client Sample ID	Collected Date	Received Date	Test Code	Matrix	Sel Storage	
2110765-011C	ELF-13	10/25/2021 1635h	10/28/2021 1450h		Aqueous	DF-Metals	1
				11 SEL Analytes: SB AS BA	BE CD CR CO PB MO SE TL		
				200.8-W-PR		DF-Metals	
				HG-DW-245.1		DF-Metals	
				HG-DW-PR		DF-Metals	
2110765-011D				OUTSIDE LAB		ALS	2
2110765-012A	ELF-14	10/25/2021 1550h	10/28/2021 1450h	300.0-W	Aqueous	DF-WC	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	
2110765-012C				200.7-W		DF-Metals	
				3 SEL Analytes: B CA LI			
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
				11 SEL Analytes: SB AS BA	BE CD CR CO PB MO SE TL		
				200.8-W-PR		DF-Metals	
				HG-DW-245.1		DF-Metals	
				HG-DW-PR		DF-Metals	
2110765-012D			View	OUTSIDE LAB		ALS	2
2110765-013A	Duplicate (CCR)	10/25/2021	10/28/2021 1450h		Aqueous	DF-WC	1
				3 SEL Analytes: CL F SO4			
				PH-4500H+B		DF-WC	
				TDS-W-2540C		DF-WC	
2110765-013C				200.7-W		DF-Metals	
		- Allendar - Allendar		3 SEL Analytes: B CA LI			
				200.7-W-PR		DF-Metals	
				200.8-W		DF-Metals	
				11 SEL Analytes: SB AS BA	BE CD CR CO PB MO SE TL		
				200.8-W-PR		DF-Metals	
		ALCO AND AND AND AND AND AND AND AND AND AND		HG-DW-245.1		DF-Metals	
				HG-DW-PR		DF-Metals	
				OUTSIDE LAB		ALS	

Printed: 11/01/21 12:48

LABORATORY CHECK: %M 
RT CN TAT QC LUOT

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COC Emailed

# American West

### CHAIN OF CUSTODY

2110765 **Analytical Laboratories** 3440 S. 700 W. Salt Lake City, UT 84119 All analysis will be conducted using NELAP accredited methods and all data will be reported using AWAL's standard analyte lists and reporting limits (PQL) unless specifically requested otherwise on this Chain of Custody and/or attached documentation Phone # (801) 263-8686 Toll Free # (888) 263-8686 Fax # (801) 263-8687 Email awal@awal-labs.com QC Level: Due Date: Turn Around Time: Rush sets received after 4:00 pm are considered received on the next business day. www.awal-labs.com Standard ☐ Report down to the MDL Client: PacifiCorp Environmental Remediation Unless other arrangements have been ☐ Include EDD: Pb, made, signed reports will be emailed by Address: 1407 West North Temple Ste 270 x Lab Filter for: Metals ŝ 5:00 pm on the day they are due. ☐ Field Filtered For: City, State, Zip: Salt Lake City, UT 84140 ű Laboratory Use Only Contact: Jeff Tucker Ca, Radium A7500-RA: Radium 226 & 228 For Compliance With: Ġ, (801) 220-2989 Phone #: Cell #: Be, Bo, C □ NELAP COC Tape Was: jeff.tucker@pacificorp.com; dennis.vanderbeek@pacificorp.com; □ RCRA 1 Present on Outer Package □ CWA E300.0 ☐ SDWA **Hunter Power Plant - CCR** , **As, Ba, 1** E200.7 / E □ ELAP / A2LA combined) □ NLLAP □ Non-Compliance Chloride / Sulfate Metals: Sb, ☐ Other: Sample Matrix separate & Sampler Name: Known Hazards Date Time Total ] IDS Sample Site ID: # of Mo, Sample Comments Sampled Sampled ELF-1D Х Х missing part of 0-26-21 ELF-2 Х ELF-3 ELF-4 Х Χ 10-26-21 ELF-5 ELF-8 11:50 Χ Х Х Χ 10-26-21 ELF-7 Х Х Х Х ELF-8 18:30 Х Χ ELF-9 Х Χ ELF-10 Х Χ Х Х ELF-11 Х Χ ELF-12 Х Х **ELF-13** W Χ Х Χ ELF-14 W Χ Х Χ Χ Х Special Instructions: 12.850 **CCR** Dennis Vanderbeek ime: 450 2lmaReceived hu Signature Time: Received by: Date. Signature Signature Print Name

## American West Analytical Laboratories

## CHAIN OF CUSTODY

2110765

Al		3440 S. 700 W. Salt Lake City, UT 84119  Phone # (801) 263-8686 Toll Free # (888) 263-8686  Fax # (801) 263-8687 Email awal@awal-labs.com			nalysis									ported using AWAL's standard analyte lists and reporting Custody and/or attached documentation.	AWAL Lab Sample Set # Page 2 of 2
	Fax # (801) 263-8687 Email awal@ www.awal-labs.com					QC Lo				Tu	rn Arour Standa		ne:	Rush sets received after 4:00 pm are considered received on the next business day.	Due Date:
	PacifiCorp Environmental Remediation  1407 West North Temple Ste 270  Salt Lake City, UT 84140  Jeff Tucker  (801) 220-2989  Cell #:  jeff.tucker@pacificorp.com; dennis.vanderbeek@hard.diles@nacificorp.com  Hunter Power Plant - CCR  Sample Site ID:		Time Sampled	A tof Containers		X X TDS A2540C	X X PH A4500-H B	X X Chloride / Sulfate E300.0	X X Fluoride E300.0	Total Metals: Sb, As, Ba, Be, Bo, Cd, Ca, Cr, Co, Pb, Li, Mo, Se, TI, Hg	Standa	Radium A7500-RA: Radium 226 & 228		Report down to the MDL Include EDD: x Lab Filter for: Metals Field Filtered For:  For Compliance With: NELAP RCRA CWA SDWA ELAP/A2LA NLLAP Non-Compliance Other:  Known Hazards & Sample Comments	Unless other arrangements have been made, signed reports will be emailed by 5:00 pm on the day they are due.  Laboratory Use Only  COC Tape Was:  1 Present on Outer Package Y N NA  2 Unbroken on Outer Package Y N NA  3 Present on Sample Y N NA  4 Unbroken on Sample Y N NA  Samples Were:  1 Shipped on hand delivered  2 Ambient of Chilles  3 Temperature  4 Received Intact Y N Checked at bench  6 Received Within Physical Country Holding Times Y N Checked at bench
															Sample Labels and COC Record Match?
Relinquished by: Signature Print Name: Relinquished by:	Jembalch 15 Vanderbeek	Date: 10-18-1   Time; 45 & Date: Time:	Received by: Signature  Print Name: Received by: Signature  Print Name: Received by:	e /	un nh		Tu	// / w	íc	J.	Tii Di Tii	ate: /2 ime: //5 ate: ime:	8/2/	Special Instructions:  GRO	UP B
Signature			Signature												

Lab Set ID:	2110765
pH Lot #:	10818

### **Preservation Check Sheet**

Sample Set Extension and pH

Sample Set Extension and pri																	
Analysis	Preservative	/	2	3	4	5	6	7	8	9	10	11	12	13			
Ammonia	pH <2 H <sub>2</sub> SO <sub>4</sub>																
COD	pH <2 H <sub>2</sub> SO <sub>4</sub>																
Cyanide	pH >10 NaOH																
Metals	pH <2 HNO <sub>3</sub>	Ves	Yes	1/25	1/25	Yes	1/05	Yes	Yes	Ves	Yes	Ves	Yes	1/e5			
NO <sub>2</sub> /NO <sub>3</sub>	pH <2 H <sub>2</sub> SO <sub>4</sub>	1				/			,			7	1	/			
O&G	pH <2 HCL																
Phenols	pH <2 H <sub>2</sub> SO <sub>4</sub>																
Sulfide	pH >9 NaOH, ZnAC																
TKN	pH <2 H <sub>2</sub> SO <sub>4</sub>																
T PO <sub>4</sub>	pH <2 H <sub>2</sub> SO <sub>4</sub>																
Cr VI+	pH >9 (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>																
		ļ															

Procedure:

- 1) Pour a small amount of sample in the sample lid
- 2) Pour sample from lid gently over wide range pH paper
- 3) **Do Not** dip the pH paper in the sample bottle or lid
- 4) If sample is not preserved, properly list its extension and receiving pH in the appropriate column above
- 5) Flag COC, notify client if requested
- 6) Place client conversation on COC
- 7) Samples may be adjusted

Frequency:

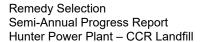
All samples requiring preservation

- \* The sample required additional preservative upon receipt.
- + The sample was received unpreserved.
- ▲ The sample was received unpreserved and therefore preserved upon receipt.
- # The sample pH was unadjustable to a pH  $\leq$  2 due to the sample matrix.
- The sample pH was unadjustable to a pH > \_\_\_\_ due to the sample matrix interference.



## **ATTACHMENT C:**

Remedy Selection Progress Report – October 2021





Date: October 15, 2021
To: Scott Wetzel
From: Dave Erickson

**Subject:** Semi-Annual Progress Report for Selecting and Designing Remedy

**Hunter Power Plant - CCR Landfill** 

In compliance with the requirements of the Coal Combustion Residuals (CCR) *Final Rule*, § 257.97(a), included herein is a semi-annual progress report for remedy selection and design. The Corrective Measures Assessment for the Hunter CCR Landfill was completed and posted to the plant operating record on 4/15/2019. The preferred alternative in the assessment was re-design and/or optimization of the existing horizontal well capture system, to address localized groundwater impacts. To date, the following activities have been completed in the selecting and designing a remedy:

- 6/28/2019: Contract was initiated to complete an inspection of existing horizontal well system and to scope the work needed to evaluate the remedy.
- 7/23/2019: Conducted a public meeting to discuss the results of the corrective measures assessment.
- 8/20/2019: A site visit was completed by the project engineer to inspect and document the current condition of the existing horizontal well system. Research began on inspection, cleaning, and upgrade methods for the existing system.
- **8/26/2019:** Received comments from Heal Utah, Utah Clean Energy, and the Sierra Club. Comments were reviewed and addressed in Remedy Selection Report.
- 9/23/2019: Contract finalized to inspect each horizontal well using a mobile camera. Equipment will be on site during the inspection to clean the wells if warranted.
- 11/12/2019: Inspection caps were removed from the horizontal capture wells in an attempt to inspect well integrity. Well construction prevented the camera from entering the wells to perform the inspections, due to the size of the openings.
- June 2020: The initial vendor tasked with performing inspections was unable to successfully retrofit their camera equipment to fit the well openings. Additional vendor sources to perform the well inspections are being sought for procurement.
- October 2020: Remedy selection report, nature and extent report, and corrective measures sampling and analysis plan were placed in the plant operating record. The remedy selection report was also placed on the CCR website.
- **January 2021:** Performed full inspection of existing horizontal wells. The wells are not in good working order.
- March 2021: An investigation to assess liquids in the landfill waste was attempted using Geoprobe direct push drilling methods. The drilling method could not reach the desired depths. A second attempt using sonic drilling methods is planned for the fall/winter of 2021-22.



Upcoming tasks relative to the CCR Landfill will include the following:

- Complete investigation to determine free liquid levels (if any) in the landfill; and
- Assess the need for design, permitting, and installation of additional horizontal wells.