# 2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill at the TransAlta Centralia Mine, near Centralia, Washington

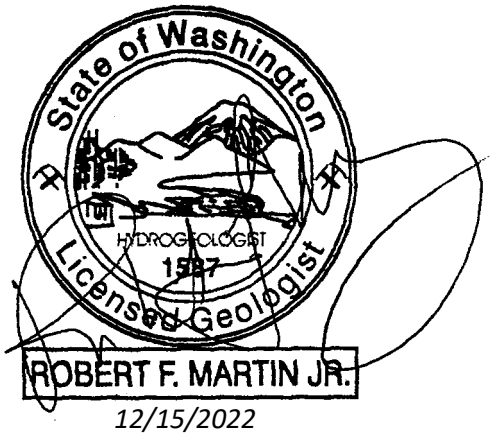
*Prepared for*

TransAlta Centralia Mining LLC

December 2022

Jacobs
999 W. Riverside Ave Suite 500
Spokane, WA 99201
(509) 747-2000

This report has been certified by a Hydrogeologist
licensed in the State of Washington and employed by Jacobs Engineering Group Inc.




*12/15/2022*

Robert Martin, representing:

Jacobs Engineering Group
999 W. Riverside Ave, Suite 500
Spokane, Washington 99201
Office Phone: 509-747-2000
Email: Robert.Martin@jacobs.com

# Contents

## Tables



## Figures

# Acronyms and Abbreviations

| | |
|---|---|
| °C | degrees Celsius |
| CCR | coal combustion residuals |
| CCR SAP | *Groundwater Monitoring Sampling and Analysis Plan for the Limited Purpose Landfill at the TransAlta Centralia Mine* |
| CFR | Code of Federal Regulations |
| DQR | Double Quantification Rule |
| EPA | U.S. Environmental Protection Agency |
| $HNO_3$ | nitric acid |
| LPLF | Limited Purpose Landfill |
| mg/L | milligram per liter |
| SSI | statistically significant increase |
| SWFPR | sitewide false positive rate |
| TCM | TransAlta Centralia Mine |
| UPL | Upper Prediction Limit |
| WAC | Washington Administrative Code |

SECTION 1

# Introduction

This section summarizes the 2022 annual report's purpose and objectives, the document organization, and provides the site description and the status of the monitoring program.

## 1.1 Purpose and Objectives

This document is the 2022 annual report for the Limited Purpose Landfill at the TransAlta Centralia Mine (TCM), as required per *CCR Groundwater Monitoring and Corrective Action* of 40 Code of Federal Regulations (CFR), 257.90(e), *Annual Groundwater Monitoring and Corrective Action Report*. Per the CCR Rule, the minimum requirements for each annual report submittal must include the following (as itemized per 40 CFR 257.90(e) [items 1 through 5]):

1. A map showing the Coal Combustion Residuals (CCR) unit (landfill) and the designated CCR groundwater monitoring network, including upgradient and downgradient wells with well identification numbers
2. The identification of monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description, and the reasons those actions were taken
3. A summary of the groundwater samples that were collected for analysis for each upgradient (or background) and downgradient well, the dates the samples were collected, and whether the sample was required by the detection or assessment monitoring program
4. A narrative discussion of transition between monitoring programs (the date and circumstances of transitioning from detection phase to assessment monitoring), if applicable
5. Other information required per 40 CFR 257.90 through 257.94, interpreted to include the following:
   - A map showing groundwater elevations, inferred groundwater elevation contours, and inferred groundwater flow direction from the sampling events conducted during the year
   - A groundwater elevation hydrograph, including data over the period of record
   - Groundwater flow rates for the semiannual events conducted during the preceding year
   - Results from data quality review and data validation
   - A summary of the statistical method and the respective background (compliance) limits for Detection Monitoring (Appendix III) constituents
   - A summary of any Appendix III constituents that are identified as a statistically significant increase (SSI) greater than background levels

In addition to this technical information, the annual report must also include narrative of the following items:

- Documentation of the status of the monitoring program (that is, detection or assessment phase)
- Key actions completed for the preceding calendar year including alternative source demonstrations
- A description of problems encountered, and actions taken to resolve the problems (if needed)
- Key activities anticipated for the upcoming year

The annual reports are due by January 31 and summarize monitoring results from the preceding year. The CCR Rule requires specific reports and notifications throughout the monitoring process, with up to three forms of submittals:

- The site's operating record (40 CFR 257.105)
- Notifications to the State Director (40 CFR 257.106)
- The publicly accessible internet site (40 CFR 257.107)

## 1.2 Document Organization

The document is organized into the following sections:

- **Section 1. Introduction.** Presents the document purpose and objectives, site description, and status of monitoring program.
- **Section 2. Monitoring Program Description.** Summarizes the groundwater monitoring system design (well network) and the sampling program for the Limited Purpose Landfill.
- **Section 3. Groundwater Monitoring Results.** Summarizes the groundwater monitoring information related to background data collection and the initial compliance event and provides a map showing groundwater elevations and inferred flow direction, estimates of groundwater seepage velocity, and a summary of groundwater quality results for the initial compliance event.
- **Section 4. Statistical Evaluation.** Summarizes the statistical method and the compliance limits and compares the initial compliance results to the compliance limits to determine whether there is an SSI greater than background conditions for the Appendix III constituents.
- **Section 5. Alternative Source Demonstration**. Summarizes statistically significant exceedances the detection monitoring results, retesting, confirmation, and documentation of an alternative source demonstration for the confirmed values.
- **Section 6. Summary.** Summarizes the key points of the initial annual report per the CCR regulatory requirements.
- **Section 7. References.** Lists the documents referenced to develop this report.

## 1.3 Site Description

TCM manages the Limited Purpose Landfill, which is approximately 7 miles east of Centralia, Washington (Figure 1). The Limited Purpose Landfill is north of Pit 7 in the Centralia Mine. The site is in the southern half of Section 33, Township 15N, Range 1W; Latitude 46°44'23" North, Longitude 122°49'55". The site address is 913 Big Hanaford Road, and the Property Tax Parcel (Account) Number is 023387001000. The permitted area encompassing the Limited Purpose Landfill is 57 acres, and the actual footprint of the waste disposal area is 18 acres (Figure 2). The Limited Purpose Landfill consists of the waste disposal area, and the surface impoundments immediately south of the waste disposal area to manage leachate generated at the disposal cell.

TransAlta Centralia Generation LLC operates a coal-burning power plant that is located adjacent to TCM and generates residual ash waste; the residual ash waste is disposed of into the Limited Purpose Landfill. The construction of Stage 1 began during the summer of 2009, and the Lewis County Environmental Health Department authorized TCM to begin waste disposal operations effective October 31, 2009. On December 21, 2009, the Lewis County Environmental Health Department amended the facility permit to approve the disposal of residual ash waste in Stage 1 Area A3a, in addition to Areas A1 and A2, which had been approved for disposal in the original permit. The Stage 2 Area of the Limited Purpose Landfill

was constructed in three phases from 2011 through 2014 and was subsequently approved for the receipt of ash waste material.

## 1.4 Status of the Groundwater Monitoring Program

The groundwater monitoring program is currently in the detection phase, as described under 40 CFR 257.94, *Detection Monitoring Program*.

In 2019, the background levels for the Appendix III constituents listed for detection monitoring was updated. The resultant UPLs represent a longer period of monitoring providing an additional 5 monitoring events. Due to the complex behavior of groundwater and need for sufficiently large sample sizes, the EPA Unified Guidance recommends that background levels should be evaluated and possibly updated every four to eight measurements.

Groundwater monitoring was conducted May 4, 2022 and October 10, 2022 for biannual monitoring. Resampling was conducted after the May 4, 2022 event on June 24, 2022 for an exceedance for boron in wells LPLF-2R and LPLF-8, TDS in LPLF-2R, and chloride in LPLF-8. Resampling was conducted after the October 10, 2022 sampling event on November 21, 2022 for boron and TDS in well LPLF-2R. The resampling results were used in an alternative source demonstration, as documented in Section 5 of this report. Based on the demonstrations, the SSI are determined as a result of natural variation in groundwater concentrations from the resaturated spoils beneath the facility.

SECTION 2

# Monitoring Program Description

This section summarizes the CCR groundwater monitoring program for the Limited Purpose Landfill.

## 2.1 Monitoring Program

Groundwater is monitored in accordance with the CCR SAP (CH2M, 2016). Details regarding the site hydrogeology, the stratigraphic sequence, the uppermost aquifer, and the lower aquitard/confining unit are presented in the groundwater monitoring system design document (CH2M, 2017a) posted to the publicly available website and are not reiterated herein. Details regarding the monitoring network, sampling, and field/laboratory quality control are described in the following sections.

## 2.2 Monitoring Network

Effective April 17, 2015, the CCR regulations (specifically, 40 CFR 257.91, *Groundwater Monitoring Systems*) require a facility to install a detection groundwater monitoring system at appropriate locations and depths to yield groundwater samples from the uppermost aquifer and monitoring of all potential contamination pathways. At least one upgradient well must accurately represent the quality of background groundwater unaffected by potential leakage from the CCR unit. The regulations also state that at least three downgradient wells must accurately represent the quality of groundwater passing the waste boundary for the detection of potential groundwater contamination in the uppermost aquifer.

Table 1 summarizes the groundwater monitoring well network and construction details for the Limited Purpose Landfill. Figure 2 shows the designated CCR groundwater monitoring network, which consists of five wells screened in the uppermost aquifer and located around the perimeter of the ash disposal area. Monitoring well LPLF-1 and LPLF-5 are effectively upgradient of the landfill and used to characterize background conditions unaffected by the landfill, and wells LPLF-2R, LPLF-7R, and LPLF-8 are downgradient and designated as compliance wells. As noted in Section 1.4, documentation of the CCR *Groundwater Monitoring Systems* design was submitted to the publicly available website in October 2017, as described in the *Coal Combustion Residual Groundwater Monitoring System Certification for the Limited Purpose Landfill at the Centralia Mine near Centralia, Washington* (CH2M, 2017a).

## 2.3 Groundwater Level Measurement

Static groundwater level measurements are collected during each monitoring event to calculate groundwater elevations, estimate groundwater flow direction, and calculate the groundwater seepage velocity. Groundwater elevations are calculated by subtracting the field measured static depth to water from the surveyed top-of-casing elevations relative to the local vertical datum (NAD 27, Washington State Plane, North 3601, Feet Intl). Field-measured groundwater levels are recorded on field forms (provided in Appendix A) and the groundwater level data are presented in Section 3.

## 2.4 Groundwater Sampling

Each well is equipped with dedicated tubing to facilitate low-flow sampling methods, except for LPLF-1, which is bailed to collect the sample. A peristaltic pump is used to support sampling methods required for low-flow (minimal drawdown) groundwater sampling procedures as described under *Groundwater Sampling Guidelines for Superfund and RCRA Project Managers* (EPA, 2002). In accordance with the low-flow method, purging continues until field parameters have stabilized to acceptable tolerances as outlined in the CCR SAP (CH2M, 2016b). Field parameters are measured using factory-calibrated multiparameter probe. Appendix A includes copies of field sampling forms for sampling events conducted in 2022.

Groundwater samples were collected in laboratory-provided sample containers. Below are the test methods, reporting limits, and preservatives to collect groundwater samples for the Appendix III constituents for detection monitoring.

| Constituent | Analytical Test Method | Reporting Limit (mg/L) | Preservative |
|---|---|---|---|
| Boron | EPA 6010C | 0.01 | $HNO_3$ |
| Calcium | EPA 6010C | 0.05 | $HNO_3$ |
| Chloride | EPA 9056A | 2.5 | Chill to 4°C |
| Fluoride | EPA 9056A | 0.5 | Chill to 4°C |
| pH | SM 4500H B | 0.1 | Chill to 4°C |
| Sulfate | EPA 9056A | 10 | Chill to 4°C |
| Total Dissolved Solids | SM 2540C | 1 | Chill to 4°C |

°C = degrees Celsius
$HNO_3$ = nitric acid
mg/L = milligram per liter

Laboratory analyses were performed by an accredited and certified testing laboratory (ALS, from Kelso, Washington).

## 2.5 Field and Laboratory Quality Control

As described in the CCR SAP (CH2M, 2016b), field and laboratory quality control are guided by the field quality control procedures that included sample labeling, chain-of-custody documentation, and sealing of sample containers following sample collection. Field duplicate and matrix spike (with duplicates) samples are collected during each sampling event. Temperature and method blanks are included with each shipment.

Laboratory quality control procedures included analysis of method blanks, surrogates, duplicates, and matrix spike/matrix spike duplicates. Results from the laboratory quality control are included in the analytical data packages and are included in Appendix B.

SECTION 3

# Groundwater Monitoring Results

This section summarizes the groundwater monitoring results related to the dates of sampling for the monitoring events, groundwater elevations, groundwater flow direction, the estimates of groundwater seepage velocity, and the groundwater quality results from the monitoring events.

## 3.1 Compliance Monitoring Events

The CCR Rule requires at least eight background groundwater monitoring events before the October 17, 2017, deadline to establish background conditions. Monitoring events after the eighth background event are considered initial detection-phase compliance monitoring to determine whether there is an SSI greater than background conditions. Below is a summary of the compliance and resampling events and the respective constituent suites for the sampling events. In 2022 an additional 2 monitoring events were included in the re-evaluation and determination of groundwater conditions.

| Monitoring Event Type/Purpose | Date Completed | Appendix III, Detection Monitoring Constituents | Resampled Wells |
|---|---|---|---|
| Detection/Compliance | May 4, 2022 | Yes | NA |
| Resampling/Confirmation | May 24, 2022 | 3 Constituents (boron, chloride, and TDS) | LPLF-2R, LPLF-8 |
| Detection/Compliance | October 10, 2022 | Yes | NA |
| Resampling/Confirmation | November 21, 2022 | 2 Constituents (boron and TDS) | LPLF-2R |

## 3.2 Groundwater Levels and Hydrographs

Table 2 summarizes the groundwater measurements from the 2022 groundwater monitoring program. Figure 3 shows the groundwater elevation hydrograph from the CCR network wells from the initial monitoring events conducted from November 2016 through November 2022. In general, groundwater elevations are relatively similar to historical levels. Continued monitoring will be used to assess the need to evaluate seasonal patterns, characteristics, or apparent trends in the site hydrograph.

## 3.3 Groundwater Flow Direction

Figures 4 and 5 show the elevation contours and inferred flow direction for the groundwater conditions at the site for May and October 2022, respectively. The groundwater in the uppermost aquifer beneath the Limited Purpose Landfill generally flows to the southwest. Well LPLF-5 had a measurable water level during the May 4, 2022 sampling event but with insufficient volume to collect a sample for analysis. Well LPLF-5 was dry during the October 10, 2022 sampling event. A flow direction to the southwest is consistent with historical groundwater monitoring results.

## 3.4 Groundwater Flow Velocity Estimates

The estimated groundwater seepage velocity is 5 feet per year, which is based on the following equation and hydraulic assumptions and groundwater elevations in the uppermost aquifer:

$$v = \frac{K_a i}{n_e}$$ Equation from Fetter, 1994

where:

| | | |
|---|---|---|
| $v$ | = | groundwater velocity (seepage velocity) |
| $K_a$ | = | average horizontal hydraulic conductivity |
| $i$ | = | horizontal hydraulic gradient |
| $n_e$ | = | effective porosity |

- An average hydraulic conductivity estimate of 0.11 to 0.17 feet per day (equivalent to 3.88 x $10^{-5}$ to 5.82x $10^{-5}$ centimeters per second), which is based on slug test analyses and as summarized in the *Coal Combustion Residual Groundwater Monitoring System Certification for the Limited Purpose Landfill at the Centralia Mine Site near Centralia, Washington* (CH2M, 2017a).
- Hydraulic gradient was consistently 0.02 to 0.03 feet per foot, as measured from Figures 4 and 5. This value is considered a typical but lower value based on previous monitoring performed under the pre-existing WAC program since 2007
- Effective porosity of 0.15 (assumed value generally representative of mine spoils)

## 3.5 Groundwater Quality Results

Table 3 presents the groundwater quality results for the Appendix III constituents from the 2022 groundwater monitoring and resampling events. Groundwater data from the monitoring events are compared to the background conditions per the selected statistical method to determine whether the initial compliance values exceed background concentrations, as presented in Section 4. Resampling was conducted to confirm parameters that represented statistically significant exceedances for those wells and parameters identified.

## 3.6 Data Quality Assessment

The groundwater quality data were reviewed to assess the representativeness and usability of data before performing statistical evaluations as presented in Section 4. The method for performing the data quality review is documented in the CCR SAP (CH2M, 2016b) and follows procedures in the U.S. Environmental Protection Agency (EPA) *National Functional Guidelines for Inorganic Superfund Methods Data Review* (EPA, 2016).

Table 4 is a summary of the data validation that was conducted for each sampling and analysis event. The summary includes review of laboratory analysis receipt, qualifiers, laboratory method blanks, replicant sample results and matrix spike recovery. Additionally, a field duplicate was collected for each detection monitoring event and relative percentage difference calculated for the duplicate sample. Laboratory and field duplicate values were within the data validation limits.

The data quality assessment is that analysis was consistent with the CCR SAP for the site. Based on this review, the field and laboratory methods followed the procedures specified in the CCR SAP, the completeness target/goal of 100 percent was achieved, none of the data were rejected, and data were found to satisfy the data quality objectives to be included for statistical evaluation as presented in Section 4.

SECTION 4

# Statistical Evaluation

This section summarizes the CCR regulatory requirements for statistical evaluation under the detection phase, as well as the selected statistical method, and compares the 2022 monitoring data to determine if monitoring values exceed compliance limits.

## 4.1 Statistical Evaluation Regulatory Requirements

The CCR Rule specifically lists four methods acceptable for statistical analysis (40 CFR 257.93[f]):

1. Parametric or nonparametric analysis of variance
2. Tolerance intervals
3. Prediction intervals (limits)
4. Control charts

Another statistical test method also may be considered if it meets the performance standards listed in 40 CFR 297.93(g). Per the CCR Rule, the selected statistical method was posted to the publicly available website by the October 17, 2017, deadline.

## 4.2 Statistical Evaluation Methods and Compliance Limits

Based on the site-specific groundwater conditions and results from an exploratory evaluation on the background data, the selected statistical method for evaluating groundwater detection monitoring data is a prediction interval (limit) method, which is a statistical method option, per 40 CFR 257.93(f)(3). The prediction interval method will be used separately for each well-constituent pair and was selected because the Appendix III constituents exhibited significant spatial variability, making an upgradient versus downgradient, also known as interwell, comparison infeasible. The method for six of the seven Appendix III constituents (including boron, calcium, chloride, pH, sulfate, and TDS) is an intra-well Prediction Limit; the seventh constituent, fluoride, is handled separately via the Double Quantification Rule (DQR). Per EPA *Unified Guidance* (2009), the DQR is applicable to constituents that exhibit 100 percent no-detect characteristics, and fluoride is 100 percent nondetect during the background period. The DQR method, which is applicable to fluoride only, assumes that a SSI is confirmed if both the original and retest values are confirmed to be detected values. Supplemental details and rationale for method selection are presented in *Coal Combustion Residual Statistical Method for the Limited Purpose Landfill at the Centralia Mine near Centralia, Washington* (CH2M, 2017b), which has been posted to the CCR public website prior to the October 17, 2017, deadline.

EPA's *Unified Guidance* (2009) recommends that prediction limits be combined with retesting for maintaining a low sitewide false positive rate (SWFPR) while providing high statistical power. The exploratory analysis confirmed a "1-of-2" retesting strategy is acceptable and will be used to verify an apparent SSI (that is, an initial SSI for Appendix III constituents). Retesting is an integral part of the statistical methodology for controlling the SWFPR when multiple monitoring locations and parameters are being evaluated. Assuming the "1-of-2" retesting approach, an apparent SSI cannot be confirmed or denied until the results of the resampling event have been obtained.

Following the prediction interval method, the compliance limits were calculated on the CCR Appendix III constituents for the three downgradient compliance wells (LPLF-2R, LPLF-8, and LPLF-7R). The calculation of intra-well prediction limits is used for six of the seven CCR constituents, including boron, calcium, chloride, pH, sulfate, and TDS; fluoride is evaluated separately via the DQR as a result of the 100 percent nondetects during background period. Assuming that sample background data are normally

distributed, or assuming that they can be transformed to fit a normal distribution, then the parametric upper prediction limit (UPL) is based on equation (1) as follows:

$$UPL = \overline{x} + Ks \quad (1)$$

where:

$\overline{x}$ is the sample mean,

s is the sample standard deviation, and

K is a multiplier factor that is chosen based on the evaluation schedule (nE), number of constituents (nc), number of wells (nw), number of background observations (n), overall SWFPR, and the specific retesting scheme selected.

For constituents such as pH, which require both lower and upper prediction limits, equation (2) is used:

$$LPL, UPL = \overline{x} \pm Ks \quad (2)$$

Table 5 presents the background (compliance) limits for each Appendix-III constituent derived from the equations above. For selected constituents exhibiting trends during background period, the background data were detrended before determining the background levels. As shown in Table 5, the constituents in which trends will be accounted for include boron, calcium, and TDS at well LPLF-2R; chloride, sulfate, and TDS at well LPLF-7R; and calcium, sulfate, and TDS at well LPLF-8. For the cases listed as 'no' for trend removal, the UPLs and lower prediction levels are the fixed compliance values to directly compare against future detection monitoring data to determine a SSI above compliance, and will be the levels to use until background is updated in the future. However, for cases listed as 'yes' for trend removal, the UPL is a calculated value dependent on time of sampling using equation (3) as follows:

*Trend accounting UPL = Intercept + slope*(time, in days) + residual value* (3)

Note that the trendline equations and variables for intercept, slope, time, and residual values are shown in Table 5; these UPLs are listed as 'calculated' as they are dependent upon the time when the compliance data were obtained. The time (in days) is assumed as the number of days starting from the initial background event (which was collected on November 14, 2017) to when the compliance data in question were collected (example May 4, 2022, which is 1997 days following the initial event on November 14, 2017). For TDS at well LPLF-2R, transformation was performed using the Tukey power transformation to convert it into a normal distribution before applying the simple regression to determine an appropriate relationship for trend removal.

## 4.3 Statistical Evaluation Results

Table 6 summarizes the monitoring results determined to be confirmed SSI after retesting and therefore identified for further evaluation. The 2022 groundwater monitoring results were less than or within the respective compliance limits, except for the following six cases, boron in LPLF-2R and LPLF-8, chloride in LPLF-8, and total dissolved solids (TDS) in LPLF-2R.

Resampling and confirmation testing were conducted within 90 days after validation of monitoring results and evaluated for potential detection or applicability of an alternative source demonstration. Resampling confirmed the values for boron in LPLF-2R and LPLF-8 and TDS in LPLF-2R. Therefore, resulting in a total of four SSIs.

The remaining detections were determined that an alternative source demonstration was appropriate for the four results. Section 5 discusses the alternative source demonstration and applicability to these confirmed SSI results. It is anticipated that these results will be included in a review of site conditions and groundwater quality variability under changing groundwater elevations.

SECTION 5

# Alternative Source Demonstration

This section presents an alternative source demonstration in response to the confirmed SSIs in accordance with 40 CFR Part 257.94(e)(2).

## 5.1 CCR Rule Regulatory Applicability

In accordance with 40 CFR Part 257.94(e)(2), the site owner has the option to demonstrate that a source other than the regulated unit (ash waste in the LPLF) caused the SSI exceeding background levels before automatically shifting into the assessment phase requirements. The CCR regulations cite examples of alternative sources causing SSIs (for example, error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality).

The CCR regulations require alternative source demonstrations to be completed within 90 days following determination of a valid SSI. The retesting results for the Spring and Fall events were validated for the four SSI and conditions were reviewed within the 90-day period to complete the alternative source demonstration (or the need to shift into assessment monitoring if a successful demonstration is not made). Both demonstrations are included in this section of the 2022 annual report for documentation purposes.

## 5.2 Alternative Source Demonstration

This section presents the technical basis and documentation to support that natural variation in groundwater quality is the reason for the SSIs observed in monitoring wells LPLF-2R and LPLF-8 as shown in Table 6 at the LPLF site. Additional evaluation was conducted looking at the time series for each of these wells and parameters and a statistical trend evaluation to aid in the demonstration evaluation.

### 5.2.1 Site History

The hydrogeological setting of the LPLF is unique in that present-day subsurface conditions were constructed such that surface overburden soils (mine spoils) were excavated during active mining operations in 2006 to expose coal seams within the relatively fine-grained Skookumchuck formation. As part of reclamation efforts following coal mining activities, the mine spoils were backfilled into a pit that includes the present-day footprint of the LPLF. Recharge via precipitation created a shallow zone of saturation within the mine spoils immediately overlying the fine-grained Skookumchuck formation, which is the target groundwater monitoring zone as described in the *Coal Combustion Residual Groundwater Monitoring System Certification for the Limited Purpose Landfill at the Centralia Mine Site near Centralia, Washington* (CH2M, 2017b). The mine spoils are generally characterized as light tan to brown silty loam to silty clay with sand lenses; the underlying Skookumchuck is characterized as a sequence of siltstones, claystones, coal seams, and occasional carbonaceous shales. The stratigraphic sequence beneath the center of the LPLF consists of approximately 80 feet of mine spoils, underlain by relatively thick sequence of fine-grained Skookumchuck, estimated at over 500 feet thick in the area.

The mine spoils were generated by removal of coal seam interburdens and placed back into the mined pit. The interburden comprised silt and claystones with stringers of sub-economical coal. The backfill placement resulted in a highly heterogeneous spoil of pulverized silt and claystone with discrete and localized coal and pyritic debris mixed laterally and vertically. These gravel to cobble sized materials can be acid forming and generate localized suppressed pH in the otherwise alkaline silt and clay spoils, and secondary mobilization of calcium, sulfate and other constituents, subsequently increasing TDS in groundwater. The primary mechanisms required for suppressed pH and changes in groundwater

chemistry are presence of acid forming material, water, and oxygen. Fluctuations in groundwater can influence these as fluctuations allow great oxygen access to moist, acid forming materials.

The presence of acid-forming materials in the spoils can result in elevated TDS and associated dissolved constituents in groundwater with localized increases closer to the material. As groundwater fluctuates, this can either submerge previously unsaturated material or expose saturated material to aerobic conditions in the unsaturated zone. The vertical heterogeneity of these materials results in groundwater conditions that can be highly variable for constituents susceptible to mobilization under suppressed pH conditions within localized areas, within a specific monitoring location.

Prior to the CCR regulations that were enacted in April 2015, TCM characterized the hydrogeological conditions for the LPLF as documented in Section 2 of TransAlta Centralia Mining LLC, Limited Purpose Landfill Solid Waste Permit Application, dated October 2008 (CH2M, 2008). To satisfy Chapter 173-350-500 (Limited Purpose Landfill) Washington Administrative Code (WAC) regulations, TCM initiated background monitoring prior to waste placement from 2007 to present, as described in the Washington State Department of Ecology (Ecology) and Lewis County Environmental Health District-approved Groundwater Monitoring Plan for TransAlta Centralia Mining LLC Limited Purpose Landfill, Amendment 1, July 2011 (CH2M, 2011a). Since 2010, TCM has prepared quarterly and annual groundwater monitoring reports and submitted these to Ecology in accordance with Chapter 173-350[5], Groundwater Monitoring – Data Analysis, Notification, and Reporting. To date, the WAC program remains under detection-phase monitoring status. The existing WAC data collected from 2007 to 2009 pre-date waste placement into the LPLF and were used to document the heterogenous nature of background conditions.

### 5.2.2 Background Monitoring Results

The background monitoring period may not have fully captured the actual natural variation that might be expected to occur in the spoils and under natural groundwater recharge and fluctuations, especially under conditions where groundwater elevations are lower or higher than have been previously observed. The natural groundwater environment can vary from changes in annual precipitation (recharge) and related geochemical changes associated with residence time within the aquifer materials. Background monitoring events conducted over several years or multiple hydrological cycles would better characterize the natural variability in groundwater and yield more data to strengthen statistical power of detection monitoring analyses. These conditions are the basis for the updated background evaluation conducted in 2019 and used in this evaluation (Jacobs, 2019).

Reviewing the site hydrographs in Figure 3 for both wells LPLF-2R and LPLF-8, groundwater elevations have decreased since the initial installation and monitoring. In LPLF-2R boron has increased to a slightly lower and consistent concentration just above the UPL calculated using the initial, 8 months of background sampling. For TDS, it shows the value decreasing, but decreasing at a lower slope that was initially calculated for TDS in well LPLF-2R (both values are calculated values, using a decreasing slope for calculation of UPL values). These results support that the exceedances for boron and TDS in LPLF-2R is a result on continued change in saturated spoils geochemistry, and not associated with release from the landfill, and primarily with stabilization of the groundwater constituents while the calculated UPL uses an ongoing downward trend.

The exceedance for boron in well LPLF-8 is based on the UPL of 0.99 mg/L. The exceedance was 1.01 mg/L for spring. LPLF-8 has always been historically much higher than the other downgradient wells, suggesting that there is an alternative source within the backfilled spoils for the boron in groundwater detected at this location. Boron concentration have increased, and using the full set of data, shows a statistically significant trend at 95 percent confidence level.

Given that LPLF-8 has always exhibited higher concentrations of boron than other downgradient wells, while higher these concentrations are still relatively low, that the change is within about 0.02 mg/L of

change, and that groundwater at this location continues to fluctuate and is at historically low levels, demonstrates that the continued change in boron is due to the nature of the saturated backfill spoils as the alternative source for these results.

As noted in the statistical method certification (CH2M, 2017a) and in accordance with Unified Guidance (EPA, 2009), it is recommended to update background conditions following four to eight sampling events because of the complex behavior of groundwater and the need for sufficiently large sample sizes. Using this principle with semiannual sampling as prescribed under the CCR program, the background values should be reviewed and updated using statistical analysis every 2 to 4 years, assuming no confirmed statistically significant increase is identified. In addition, if hydrogeologic conditions change, then background should be updated to match the latest conditions. Based on this analysis, excluding the initial 8 months of sampling should be considered in future background UPL calculations.

## 5.3 Alternative Source Demonstration Results

Key findings as provided in this alternative source demonstration are summarized as follows:

- 2022 Monitoring and Retesting was conducted in compliance with the CCR program and resulted in confirmed SSI values based on the current CCR program statistical method.
- These values were evaluated and qualified as unrelated to the LPLF waste materials and related to natural variation in groundwater quality within the saturated backfilled spoils.
- These findings are consistent with similar demonstration for the CCR program in previous groundwater monitoring results at the site.
- The CCR program remains under the detection-phase monitoring status per 40 CFR 257.94, *Detection Monitoring Program.*

SECTION 6

# Summary

Key findings developed and/or confirmed from the 2022 annual groundwater report are summarized as follows:

- The groundwater elevations measured during the compliance monitoring events were used to develop a site hydrograph, potentiometric surface, inferred groundwater flow direction, and calculated groundwater flow velocity for the spring and fall monitoring events in 2022.
- Groundwater flow directions, gradients, and flow velocities were consistent with historical measurements.
- Groundwater monitoring results for compliance constituents met the compliance limits except for two parameters, boron in monitoring well LPLF- 8 and boron and TDS in monitoring well LPLF-2R.
- The confirmed SSI's were evaluated and demonstrated to be a source other than the regulated unit (ash landfill) and remains in detection phase monitoring.
- Based on groundwater site conditions, the additional groundwater monitoring results will be reviewed and evaluated for the compliance limits using the selected statistical methodology.

SECTION 7

# References


CH2M HILL Engineers, Inc. (CH2M). 2011b. *TransAlta Centralia Mining Fourth Quarter 2010 Groundwater Monitoring Report.*

CH2M HILL Engineers, Inc. (CH2M). 2016a. *Groundwater Monitoring Well Construction Data Report for the Limited Purpose Landfill at the TransAlta Centralia Mining LLC Site.*

CH2M HILL Engineers, Inc. (CH2M). 2016b. *Groundwater Monitoring Sampling and Analysis Plan for the Limited Purpose Landfill at the TransAlta Centralia Mine LLC.*

CH2M HILL Engineers, Inc. (CH2M). 2017a. *Coal Combustion Residual Groundwater Monitoring System Certification for the Limited Purpose Landfill at the Centralia Mine Site near Centralia, Washington.*

CH2M HILL Engineers, Inc. (CH2M). 2017b. *Coal Combustion Residual Statistical Method Certification for the Limited Purpose Landfill at the Centralia Mine near Centralia, Washington.*

Fetter, C.W. 1994. *Applied Hydrogeology, Third Edition.*

Jacobs. 2019. *Coal Combustion Residual Statistical Method Certification Addendum – Background Evaluation for the Limited Purpose Landfill at the TransAlta Centralia near Centralia, Washington.*

U.S. Environmental Protection Agency (EPA). 2002. *Groundwater Sampling Guidelines for Superfund and RCRA Project Managers.*

U.S. Environmental Protection Agency (EPA). 2009. *Unified Guidance: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities.*

U.S. Environmental Protection Agency (EPA). 2016. *National Functional Guidelines for Inorganic Superfund Methods Data Review*.

# Tables

Table 1. Groundwater Monitoring Well Network

*2022 Annual Groundwater Monitoring Report for Limited Purpose Landfill - TransAlta Centralia Mine LLC*

| Well | Installation Date | Coordinates in NAD27[1] | | Reference Point | | Well Screen Elevation[2] | | Sand Pack Elevation[2] | | Well | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Northing | Easting | Top of Casing Elevation[2] | Top of Ground Elevation[2] | Top | Bottom | Top | Bottom | Depth[3] | Aquifer Unit | Hydraulic Designation |
| LPLF-1 | October 2007 | 520,881.45 | 1,420,272.06 | 347.80 | 344.58 | 305.58 | 285.58 | 309.58 | 282.58 | 59 | Mine Spoils | Up or Cross-Gradient |
| LPLF-5 | August 2008 | 521,931.70 | 1,419,921.73 | 359.90 | 357.88 | 349.88 | 344.88 | 351.38 | 343.38 | 13 | Mine Spoils | Upgradient |
| LPLF-8 | August 2008 | 521,235.37 | 1,419,233.53 | 298.75 | 296.93 | 279.93 | 274.93 | 282.93 | 273.93 | 22 | Mine Spoils | Downgradient |
| LPLF-2R | July 2016 | 521,561.20 | 1,419,130.52 | 296.04 | 293.86 | 10.0 | 263.9 | 275.86 | 262.36 | 31 | Mine Spoils | Downgradient |
| LPLF-7R | July 2016 | 521,180.82 | 1,419,531.95 | 299.00 | 297.04 | 279.7 | 269.7 | 282.04 | 269.04 | 28 | Mine Spoils | Downgradient |

**General Notes:**

1. Well LPLF-1 is low yield and sampled via bailer.

**Column Header Footnotes:**

[1]Washington State Plane Coordinates (NAD27).

[2]All elevations in feet above mean sea level (NGVD29).

[3]Well depth is feet below ground surface (rounded to nearest foot).

Table 2. Groundwater Elevations and Field Parameters

*2022 Annual Groundwater Monitoring Report for Limited Purpose Landfill - TransAlta Centralia Mine LLC*

| Well | Date Sampled | Reference Point Elevation (ft) | Depth to Water (ft btc) | Groundwater Elevation (ft) | Temp (°C) | pH | Dissolved Oxygen (mg/L) | Oxidation Reduction Potential (mV) | Specific Conductivity (uS/cm) | Turbidity (NTU) | Hydraulic Designation | Hydrostratigraphic Unit | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPLF-1 | 5/4/22 | 347.80 | 56.72 | 291.08 | 13.0 | 6.8 | 3.69 | 45 | 3,231 | -- | Up or Cross Gradient | Backfill/Mine Spoils | Sampled via bailer - slow recharge |
| LPLF-1 | 10/10/22 | 347.80 | 56.42 | 291.38 | 13.5 | 6.4 | 2.33 | -- | 3,874 | -- | Up or Cross Gradient | Backfill/Mine Spoils | cloudy/orangish |
| LPLF-5 | 5/4/22 | 359.90 | 10.99 | 348.91 | 12.5 | 6.9 | 2.45 | 91 | 1,519 | -- | Upgradient | Backfill/Mine Spoils | Dry/no water in well. Not sampled. |
| LPLF-5 | 10/10/22 | 359.90 | dry | <344.05 | -- | -- | -- | -- | -- | -- | Upgradient | Backfill/Mine Spoils | Insufficient water. Not sampled. |
| LPLF-8 | 5/4/22 | 298.75 | 8.23 | 290.52 | 13.5 | 5.8 | 1.21 | 30 | 3,432 | -- | Downgradient | Backfill/Mine Spoils | -- |
| LPLF-8 | 5/24/22 | 298.75 | 8.39 | 290.36 | 11.8 | 5.6 | 1.42 | 25 | 3,401 | -- | Downgradient | Backfill/Mine Spoils | Clear |
| LPLF-8 | 10/10/22 | 298.75 | 12.49 | 286.26 | 16.0 | 5.7 | 0.91 | -- | 3,980 | -- | Downgradient | Backfill/Mine Spoils | Clear |
| LPLF-2R | 5/4/22 | 296.04 | 2.20 | 293.84 | 13.0 | 6.4 | 0.92 | 32 | 3,292 | -- | Downgradient | Backfill/Mine Spoils | -- |
| LPLF-2R | 5/24/22 | 296.04 | 2.20 | 293.84 | 12.0 | 6.0 | 1.35 | 21 | 3,319 | -- | Downgradient | Backfill/Mine Spoils | Clear |
| LPLF-2R | 10/10/22 | 296.04 | 4.57 | 291.47 | 16.1 | 6.2 | 0.59 | -- | 3,922 | -- | Downgradient | Backfill/Mine Spoils | Clear |
| LPLF-2R | 11/21/22 | 296.04 | 5.19 | 290.85 | 11.4 | 6.3 | 0.97 | 31 | 3,974 | -- | Downgradient | Backfill/Mine Spoils | Clear |
| LPLF-7R | 5/4/22 | 299.00 | 19.23 | 279.77 | 12.5 | 6.4 | 1.12 | 70 | 2,728 | -- | Downgradient | Backfill/Mine Spoils | -- |
| LPLF-7R | 10/10/22 | 299.00 | 20.60 | 278.40 | 15.8 | 6.1 | 1.01 | -- | 3,268 | -- | Downgradient | Backfill/Mine Spoils | Clear |
| **Water Levels Only** | | | | | | | | | | | | | |
| LPLF-2 | 5/4/22 | 302.26 | 7.91 | 294.35 | -- | -- | -- | -- | -- | -- | Cross-Gradient | Backfill/Mine Spoils | -- |
| LPLF-2 | 10/10/22 | 302.26 | 13.62 | 288.64 | -- | -- | -- | -- | -- | -- | Cross-Gradient | Backfill/Mine Spoils | -- |
| LPLF-3 | 5/4/22 | 295.64 | 4.42 | 291.22 | -- | -- | -- | -- | -- | -- | Cross-Gradient | Backfill/Mine Spoils | -- |
| LPLF-3 | 10/10/22 | 295.64 | 8.77 | 286.87 | -- | -- | -- | -- | -- | -- | Cross-Gradient | Backfill/Mine Spoils | -- |
| LPLF-4 | 5/4/22 | 303.12 | 2.19 | 300.93 | -- | -- | -- | -- | -- | -- | Cross-Gradient | Backfill/Mine Spoils | -- |
| LPLF-4 | 10/10/22 | 303.12 | 8.15 | 294.97 | -- | -- | -- | -- | -- | -- | Cross-Gradient | Backfill/Mine Spoils | -- |

Notes:

" -- " = Not applicable, not available, and/or not measured.

Reference point elevation is top of PVC casing; all elevations are in feet above mean sea level (NAVD88).

Field parameter readings represent final stabilized readings obtained during low-flow purge immediately prior to collection of water-quality sample.

ft = feet

ft btc = feet below top of casing

C = degrees celcius

mg/L = milligrams per liter

mV = millivolts

uS/cm = microsiemens per centimeter

NTU = Nephelometric Turbidity Units

Table 3. Groundwater Analytical Summary

*2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill - TransAlta Centralia Mine LLC*

| **Well** | | | **LPLF-1** | **LPLF-2R** | **LPLF-5** | **LPLF-7R** | **LPLF-8** | **LPLF-2R FD** | **LPLF-2R** | **LPLF-8** | **LPLF-1** | **LPLF-2R** | **LPLF-7R** | **LPLF-8** | **LPLF-8 (FD)** | **LPLF 2R** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | 050422-CCR-LPLF1 | 050422-CCR-LPLF2R | 050422-CCR-LPLF5 | 050422-CCR-LPLF7R | 050422-CCR-LPLF8 | 050422-CCR-LPLF2R | 052422-CCR-LPLF2R | 052422-CCR-LPLF8 | 101022-CCR-LPLF1 | 1010-CCR-LPLF2R | 101022-CCR-LPLF7R | 101022-CCR-LPLF8 | 101022-CCR-LPLF8 FD | 120121-CCR-LPLF2R |
| Sample Date | | | 5/4/2022 | 5/4/2022 | 5/4/2022 | 5/4/2022 | 5/4/2022 | 5/4/2022 | 5/24/2022 | 5/24/2022 | 10/10/2022 | 10/10/2022 | 10/10/022 | 10/10/2022 | 10/10/2022 | 11/21/2022 |
| Hydraulic Designation | | | Up or Cross Gradient | Downgradient | Up Gradient | Downgradient | Downgradient | Downgradient | Downgradient | Downgradient | Up or Cross Gradient | Downgradient | Downgradient | Downgradient | Downgradient | Downgradient |
| **Analyte** | **Method** | **Units** | | | | | | | | | | | | | | |
| Boron | EPA 6010C | mg/L | 0.597 | 0.377 | 0.103 | 0.363 | 1.06 | 0.382 | 0.335 | 1.01 | 0.573 | 0.337 | 0.329 | 0.979 | 0.986 | 0.344 |
| Calcium | EPA 6010C | mg/L | 230 | 442 | 292 | 221 | 399 | 439 | - | - | 225 | 460 | 234 | 395 | 397 | - |
| Chloride | EPA 9056A | mg/L | 4.2 | 8.8 | 3.2 | 10.2 | 7.9 | 8.6 | - | 7.6 | 4.08 | 7.46 | 8.97 | 7.23 | 7.38 | - |
| Fluoride | EPA 9056A | mg/L | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | - | - | 0.06 J | 0.5 U | 0.07 J | 0.5 U | 0.5 U | - |
| Sulfate | EPA 9056A | mg/L | 1,640 | 1,650 | 670 | 1,310 | 1,350 | 1,740 | - | - | 1,540 | 2,170 | 1,280 | 2,160 | 2,150 | - |
| Total Dissolved Solids | SM 2540C | mg/L | 2,990 | 3,310 | 1420 | 2,530 | 3,760 | 3,330 | 3,370 | - | 2,980 | 3,310 | 2,530 | 3,630 | 3,630 | 3,450 |

**Notes:**

Field parameters represent final stabilized readings obtained during sampling immediately prior to sample collection.

Non-detect values reported as "U" with the laboratory method detection limit; "J" is estimated value as determined from data validation. F is for field measurement.

(H) for outside holding time for sample

(MS) for matrix spike recovery outside range

(FD) Field Duplicate outside relative percentage difference

**Acronyms:**

Data qualifiers: U = non-detect value, J = estimated value.

C = degrees celcius

mg/L = milligrams per liter

mV = millivolts

uS/cm = microsiemens per centimeter

NTU = Nephelometric Turbidity Units

**Table 4 Data Validation Summary**

*2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill - TransAlta Centralia Mine LLC*

**Validation Summary 5/4/2022**

No discrepancies noted in sample receipt or in analysis.
No qualifiers noted in the analysis results
Method blank was non-detect
Replicant samples within RPD limits
Matrix Spike recovery values were within recovery limits
Field Duplicate for LPLF-2R, FD RPD within limits

| | | 5/4/2022 | | |
|---|---|---|---|---|
| Pa⁻D | RPD Limi | LPLF-2R | FD | FD RPD |
| TD | 20 | 3310 | 3330 | 0.6% |
| Ch | 20 | 8.8 | 8.6 | -2.3% |
| Su | 20 | 1650 | 1740 | 5.3% |
| Bo | 20 | 0.377 | 0.382 | 1.3% |
| Ca | 20 | 442 | 439 | -0.7% |

**Validation Summary 5/24/2022**

Sample reciept noted that sample CCR-LPLF-2R was out of pH range after preservative was added
No data qualifiers noted in the analysis results
Method blanks were non-detect
Matrix Spike recovery within the % recovery limits
Laboratory replicate sample within RPD

**Validation Summary 10/10/2022**

No discrepancies noted in sample receipt or in analysis.
J qualifiers noted in the analysis results for boron, with very low values near the MDL (LPLF-1, LPLF-2R)
Method blank was non-detect
Replicant samples within RPD limits (noted that fluoride had RPD of 9 with J values)
Matrix Spike recovery values were within recovery limits
Field Duplicate for LPLF-8, FD RPD within limits

| | | 10/10/2022 | | |
|---|---|---|---|---|
| Pa⁻D | RPD Limi | LPLF-8 | FD | FD RPD |
| TD | 20 | 3630 | 3630 | 0.0% |
| Ch | 20 | 7.23 | 7.38 | 2.1% |
| Su | 20 | 2160 | 2150 | -0.5% |
| Bo | 20 | 0.979 | 0.986 | 0.7% |
| Ca | 20 | 395 | 397 | 0.5% |

**Validation Summary 11/1/2022**

No discrepancies noted in sample receipt or in analysis.
No data qualifiers noted in the analysis results
Method blanks were non-detect
Matrix Spike recovery within the % recovery limits
Laboratory replicate sample within RPD

**Table 5 Statistical Method for TransAlta Limited Purpose Landfill**

2022 Annual Report for the Limited Purpose Landfill at the TransAlta Centralia Mine LLC *Updated 2019*

| Well | Constituent | Units | Method | Trending Calculated UPL (if needed) = { Intercept + [Slope* Time(days)] + Residual } Trend Removal | Intercept | Slope | Residual | K-Value | Lower Prediction Levels (LPL) | Upper Prediction Levels (UPL) | Calculated Upper Prediction Limits (compliance values) 5/4/2022 | 5/24/2022 | 10/10/2022 | 11/21/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LPLF-2R | Boron | mg/L | Parametric UPL | Yes | 0.35 | -2.21E-05 | 0.0297 | 2.4 | -- | Calculated | 0.336 | 0.335 | 0.332 | 0.331 |
| LPLF-2R | Calcium | mg/L | Parametric UPL | Yes | -- | -- | -- | 2.4 | -- | 545 | -- | -- | -- | -- |
| LPLF-2R | Chloride | mg/L | Parametric UPL | No | -- | -- | -- | 2.4 | -- | 9.59 | -- | -- | -- | -- |
| LPLF-2R | Fluoride | mg/L | DQR | No | -- | -- | -- | -- | -- | DQR | -- | -- | -- | -- |
| LPLF-2R | pH | pH units | Parametric UPL | No | -- | -- | -- | 2.79 | 5.98 | 7.07 | -- | -- | -- | -- |
| LPLF-2R | Sulfate | mg/L | Parametric UPL | No | -- | -- | -- | 2.4 | -- | 2163 | -- | -- | -- | -- |
| LPLF-2R | TDS | mg/L | Non-Parametric UPL | Yes | 3631 | -0.359 | 201 | 2.4 | -- | Calculated | 3115 | 3108 | 3058 | 3043 |
| LPLF-7R | Boron | mg/L | Parametric UPL | No | -- | -- | -- | 2.4 | -- | 0.421 | -- | -- | -- | -- |
| LPLF-7R | Calcium | mg/L | Parametric UPL | No | -- | -- | -- | 2.4 | -- | 263 | -- | -- | -- | -- |
| LPLF-7R | Chloride | mg/L | Parametric UPL | No | -- | -- | -- | 2.4 | -- | 9.99 | -- | -- | -- | -- |
| LPLF-7R | Fluoride | mg/L | DQR | No | -- | -- | -- | -- | -- | DQR | -- | -- | -- | -- |
| LPLF-7R | pH | pH units | Parametric UPL | No | -- | -- | -- | 2.79 | 6.09 | 6.99 | -- | -- | -- | -- |
| LPLF-7R | Sulfate | mg/L | Parametric UPL | Yes | 944 | 0.758 | 509 | 2.4 | -- | Calculated | 2966 | 2981 | 3086 | 3118 |
| LPLF-7R | TDS | mg/L | Parametric UPL | Yes | 1890 | 0.892 | 607 | 2.4 | -- | Calculated | 4277 | 4295 | 4419 | 4457 |
| LPLF-8 | Boron | mg/L | Parametric UPL | No | -- | -- | -- | 2.4 | -- | 0.99 | -- | -- | -- | -- |
| LPLF-8 | Calcium | mg/L | Parametric UPL | Yes | -- | -- | -- | 2.4 | -- | 441 | -- | -- | -- | -- |
| LPLF-8 | Chloride | mg/L | Parametric UPL | No | -- | -- | -- | 2.4 | -- | 7.84 | -- | -- | -- | -- |
| LPLF-8 | Fluoride | mg/L | DQR | No | -- | -- | -- | -- | -- | DQR | -- | -- | -- | -- |
| LPLF-8 | pH | pH units | Parametric UPL | No | -- | -- | -- | 2.79 | 5.66 | 6.36 | -- | -- | -- | -- |
| LPLF-8 | Sulfate | mg/L | Parametric UPL | Yes | 2124 | 1.14 | 357 | 2.4 | -- | Calculated | 4758 | 4781 | 4939 | 4987 |
| LPLF-8 | TDS | mg/L | Parametric UPL | Yes | 3429 | 0.49 | 445 | 2.4 | -- | Calculated | 4854 | 4864 | 4932 | 4952 |

TIME (days) is the period from Nov. 14, 2016 to time of compliance event.

| start date | days since start | | | |
|---|---|---|---|---|
| 11/14/2016 | 1997 | 2017 | 2156 | 2198 |

**Table 6 Summary of Compliance Value Exceedance**

*2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill - TransAlta Centralia Mine LLC*

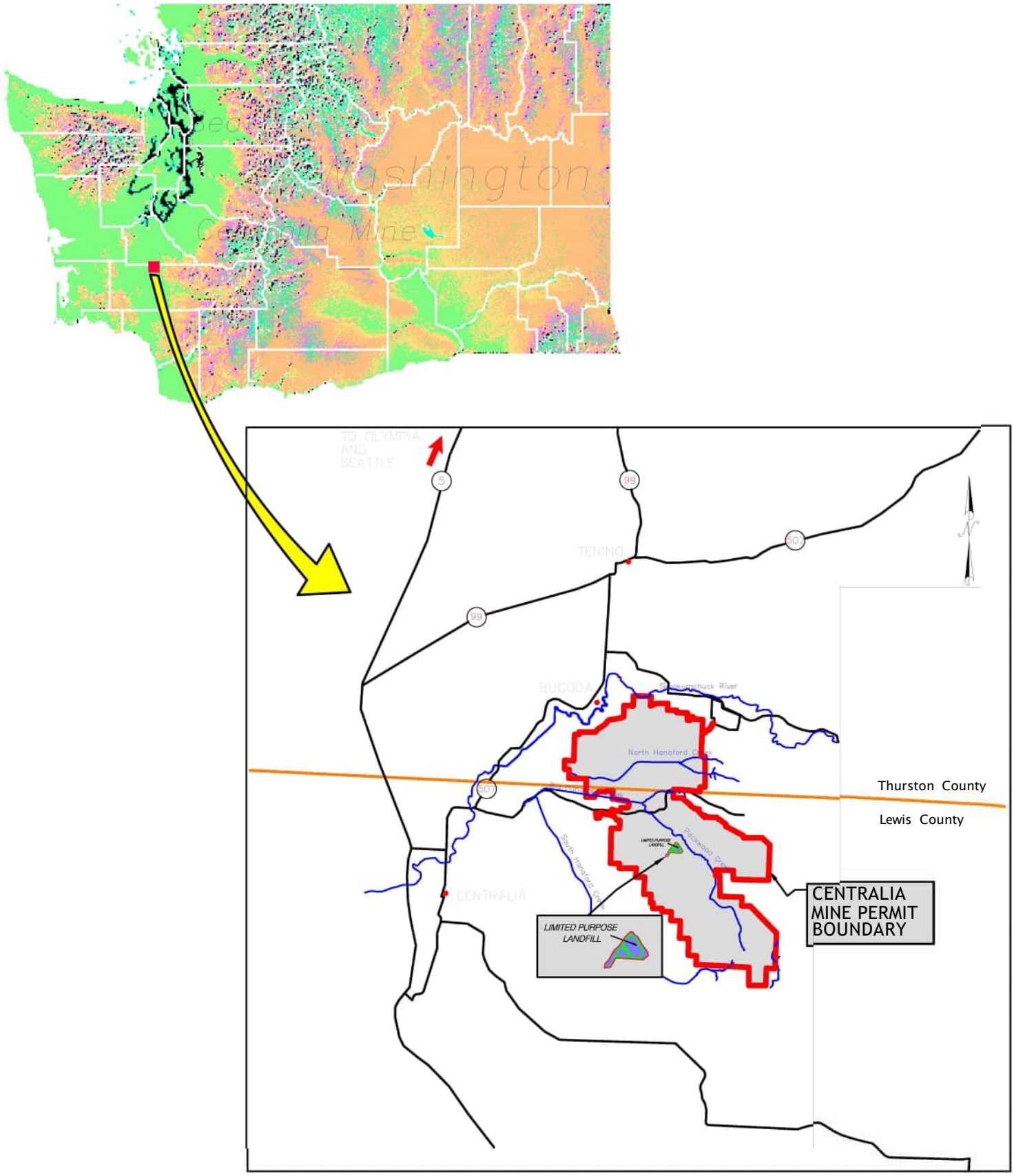
| Well | Sample Date | Parameter | Upper Limit (mg/L) | Sample Result (mg/L) | Resample Date | Upper Limit (mg/L) | ReTest Result (mg/L) | Percent Over UL for Compliance Event | Percent Over UL for the Retesting Event | Percent Change between Compliance and Retesting Event |
|---|---|---|---|---|---|---|---|---|---|---|
| LPLF-2R | 5/4/2022 | **Boron** | **0.34** | 0.38 | 5/24/2022 | **0.34** | 0.34 | 12% | 0.0% | -11.1% |
| LPLF-2R | 5/4/2022 | **TDS** | **3,115** | 3,310 | 5/24/2022 | **3,108** | 3,380 | 6% | 8.8% | 2.1% |
| LPLF-8 | 5/4/2022 | Boron | 0.99 | 1.06 | 5/24/2022 | 0.99 | 1.01 | 7% | 2.0% | -4.7% |
| LPLF-8 | 5/4/2022 | Chloride | 7.84 | 7.90 | 5/24/2022 | 7.84 | 7.60 | 1% | -3.1% | -3.8% |
| LPLF-2R | 10/10/2022 | **Boron** | **0.33** | 0.34 | 11/21/2022 | **0.33** | 0.34 | 2% | 3.9% | 2.1% |
| LPLF-2R | 10/10/2022 | **TDS** | **3058** | 3310 | 11/21/2022 | **3,043** | 3,450 | 8% | 13.4% | 4.2% |

Notes:

**Bold** parameters indicate calculated limits

Four results (highlighted yellow) were confirmed as statistically-significant exceedances for evaluation.

# Figures



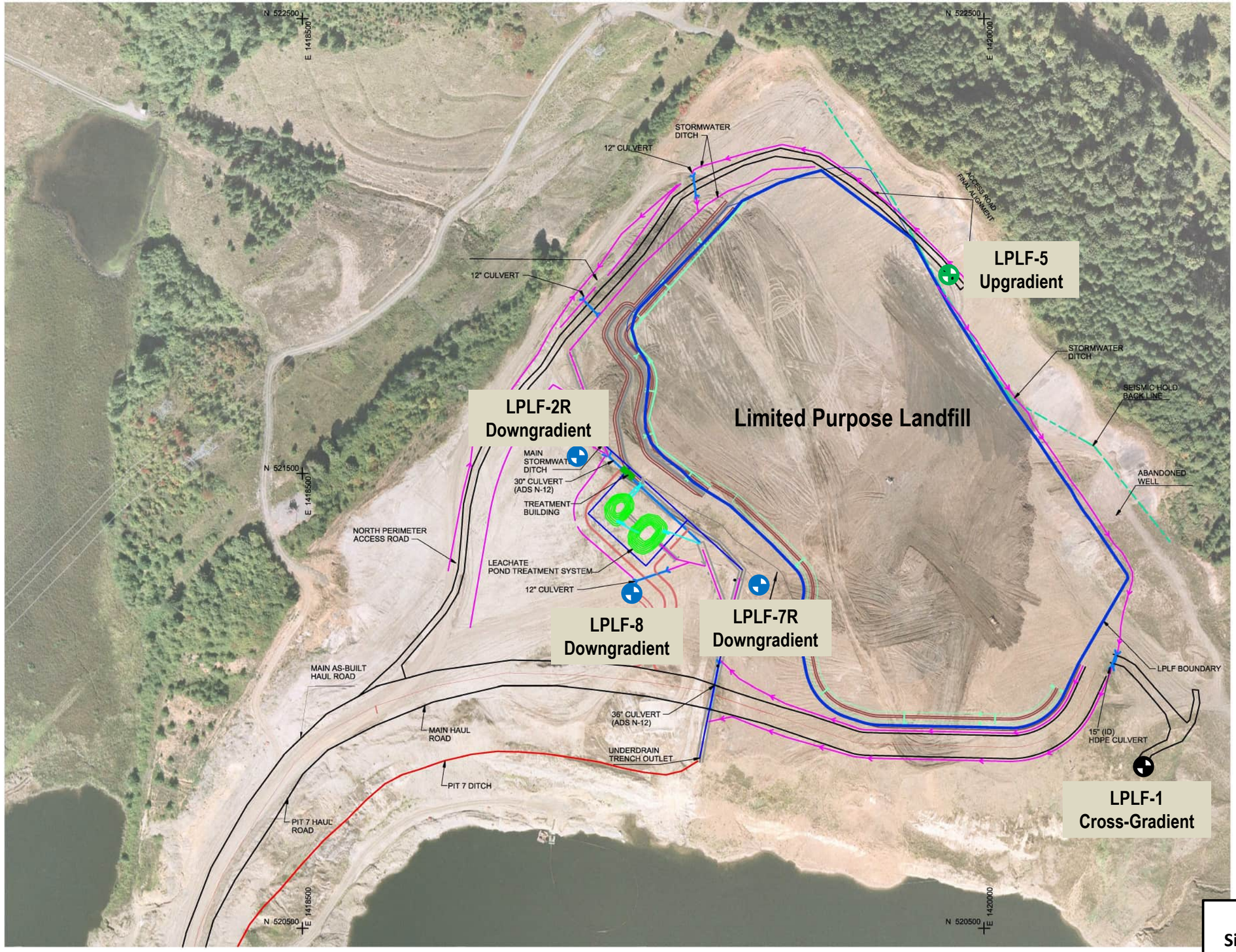

Source: TransAlta Centralia Mining LLC

**Figure 1**

**Vicinity Map**

*2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill - TransAlta Centralia Mine LLC*

Jacobs




LEGEND

- FINAL ROADS
- PIT 7 DITCH
- STORMWATER DITCH
- LPLF FOOTPRINT
- SEISMIC HOLD BACK LINE
- UPGRADIENT MONITORING WELL
- CROSS-GRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL

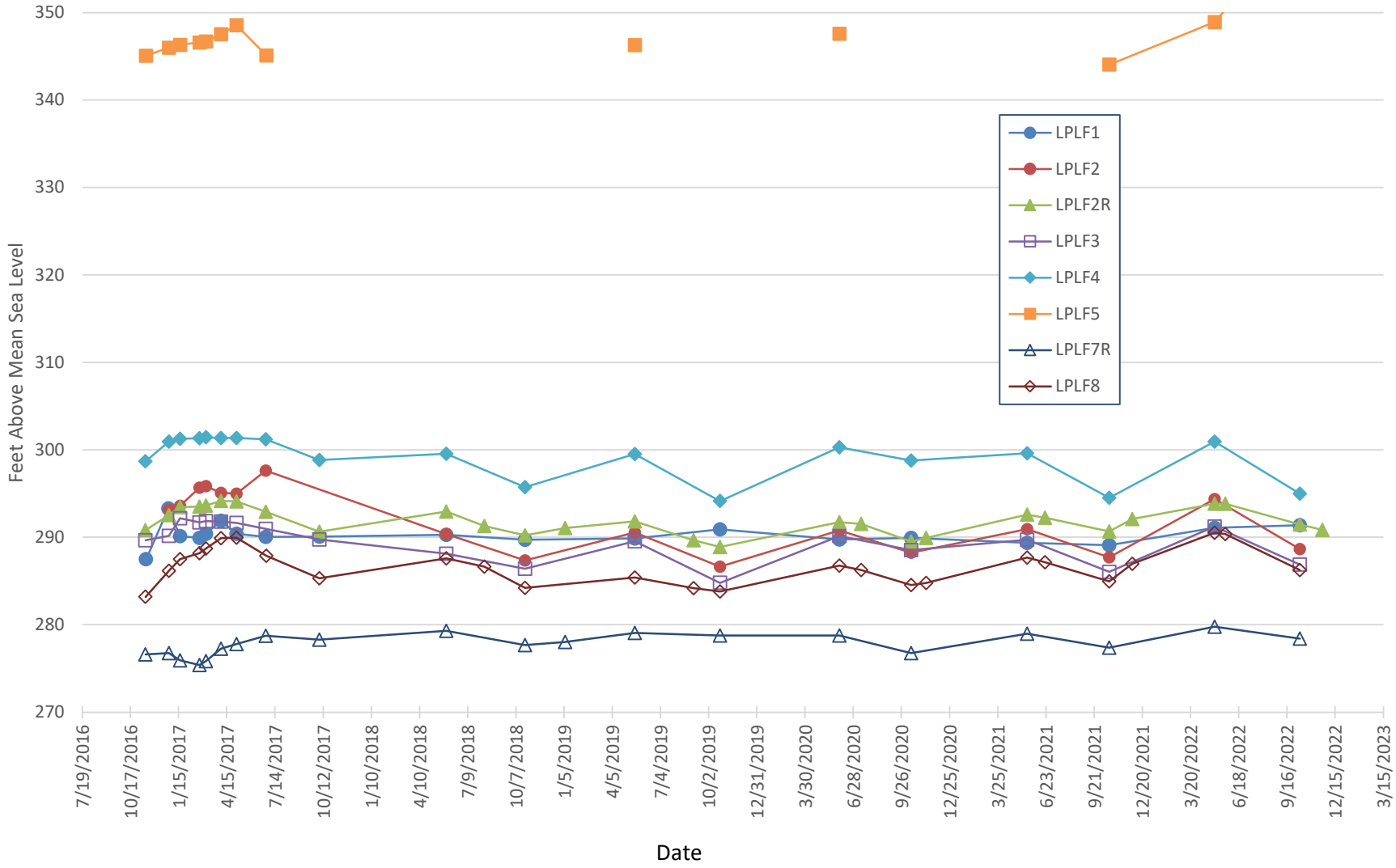
Source: TransAlta Centralia Mining LLC

0 250 500

Scale: feet

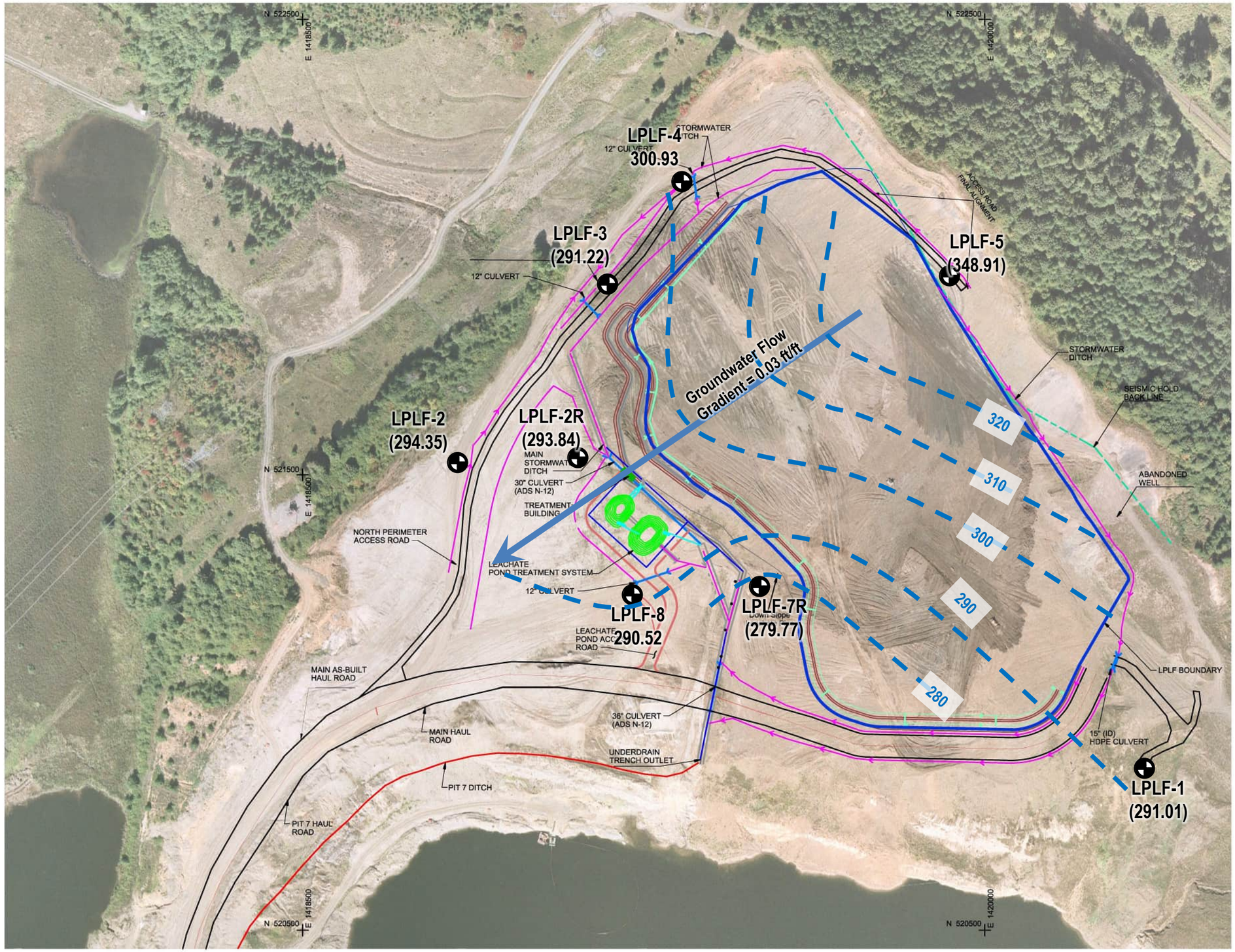
Jacobs

**Figure 2**
**Site Map and Groundwater Monitoring Network**
*2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill - TransAlta Centralia Mine LLC*




Jacobs

**Figure 3. Groundwater Elevation Hydrograph**
*2022 Annual Report for Limited Purpose Landfill*
November 21 2022




FINAL ROADS

PIT 7 DITCH

STORMWATER DITCH

LPLF FOOTPRINT

SEISMIC HOLDBACK LINE

**LPLF-1 (289.86)** GROUNDWATER WELLS AND ELEVATIONS (ft msl)

340 GROUNDWATER ELEVATION CONTOURS (ft msl)

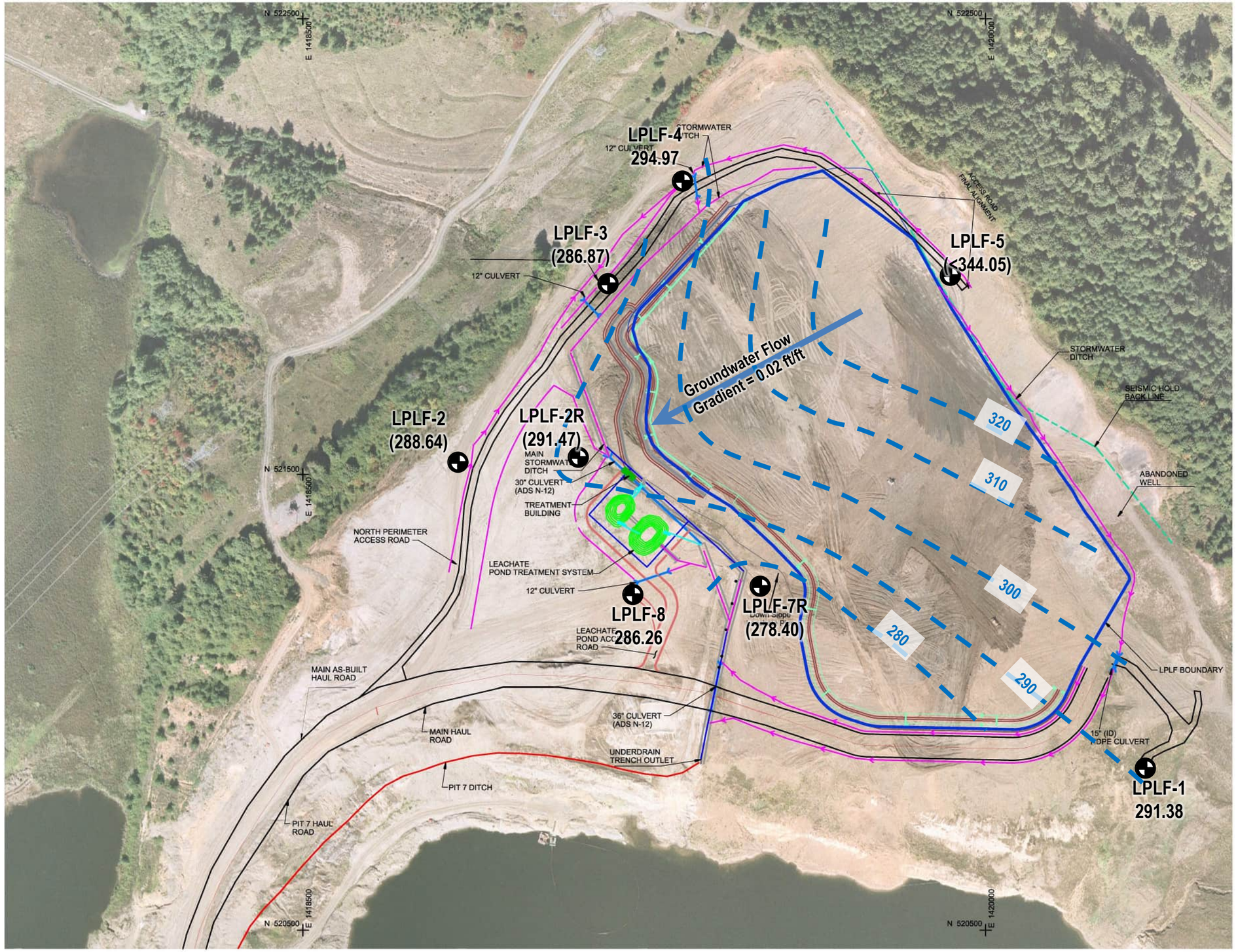
INFERRED GROUNDWATER FLOW DIRECTION

NOTE:
1. Groundwater levels measured June 2, 2020.

Jacobs

0 250 500
Scale: feet

**Figure 4**
**Groundwater Elevations and Flow Map**
*May 4, 2022*
*2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill - TransAlta Centralia Mine LLC*




Jacobs

FINAL ROADS

PIT 7 DITCH

STORMWATER DITCH

LPLF FOOTPRINT

SEISMIC HOLDBACK LINE

**LPLF-1 (289.86)** GROUNDWATER WELLS AND ELEVATIONS (ft msl)

340 GROUNDWATER ELEVATION CONTOURS (ft msl)

INFERRED GROUNDWATER FLOW DIRECTION

NOTE:
1. Groundwater levels measured June 2, 2020.

**Figure 5**
**Groundwater Elevations and Flow Map**
*October 10, 2022*
*2022 Annual Groundwater Monitoring Report for the Limited Purpose Landfill - TransAlta Centralia Mine LLC*

# Appendix A
# Field Forms

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF 1

Field Team: KM / SM Date: 5/4/22

Weather/Temp: Sunny Arrival Time to Well: 8:50

Purge Method: ☐ Bladder ☐ Peristaltic ☐ Grab ☐ Other: Bail **Initial DTW (ft btc):** 56.72

Pump Setting [5]: — Notes:

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | | | | | | | | | |
| 855 | 57.23 | 1600 | 6.80 | 3231 | 3.69 | 13.0 | 45.4 | - | Murky/Sed |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 050422-CCR-LPLF1 **Sample Time:** 855

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF2R

Field Team: SM KM Date: 5/4/22

Weather/Temp: Sunny Arrival Time to Well: 10:35

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 2.20

Pump Setting [5]: 100ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 10:41 | *Begin Pumping* | | | | | | | | |
| 10:46 | 2.50 | 600 | 6.38 | 3308 | 1.57 | 12.7 | 37.8 | | Clear |
| 10:51 | 2.57 | 1000 | 6.37 | 3301 | 1.06 | 12.9 | 35 | | " |
| 10:56 | 2.59 | 1400 | 6.35 | 3292 | 0.92 | 13.0 | 31.9 | | " |
| | 2.49 | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method.

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 050422-CCR-LPLF2R **Sample Time:** 10:56

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☒ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : 050422-CCR-LPLF2R FD QC Sample Time: 11:06

Comments: _____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF5

Field Team: SM KM Date: 5/4/22

Weather/Temp: Sunny Arrival Time to Well: 9:55

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 10.99

Pump Setting [5]: 100 ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 9:57 | *Begin Pumping* | | | | | | | | |
| 10:03 | 11.33 | 600 | 6.97 | 1541 | 3.25 | 12.6 | 83.4 | | clear |
| 10:08 | 11.37 | 1100 | 6.98 | 1533 | 2.75 | 12.6 | 87.3 | | ↓ |
| 10:13 | 11.47 | 1550 | 6.94 | 1519 | 2.45 | 12.5 | 90.8 | | |
| | 11.45 | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 050422-CCR-LPLF5 **Sample Time:** 10:13

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF7R

Field Team: SM KM Date: 5/4/22

Weather/Temp: Sunny ~ Arrival Time to Well: 9:19

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 19.23

Pump Setting [5]: 100 ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 9:22 | *Begin Pumping* | | | | | | | | |
| 9:27 | 19.70 | 350 | 6.59 | 27360 | 2.71 | 13.1 | 76.8 | | clear |
| 9:32 | 20.16 | 700 | 6.33 | 2731 | 1.56 | 12.4 | 73.0 | | " |
| 9:37 | 20.45 | 1100 | 6.35 | 2728 | 1.12 | 12.5 | 70.4 | | " |
| | 20.57 | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 050422-CCR-LPLF7R **Sample Time:** 9:37

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF8

Field Team: SM KM Date: 5/4/22

Weather/Temp: Sunny Arrival Time to Well: 11:23

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 8.23

Pump Setting [5]: 100 ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 11:26 | *Begin Pumping* | | | | | | | | |
| 11:31 | 8.79 | 400 | 5.85 | 3477 | 2.16 | 13.5 | 39.6 | | Clear |
| 11:36 | 9.16 | 900 | 5.81 | 3452 | 1.38 | 13.6 | 32.8 | | " |
| 11:41 | 9.39 | 1300 | 5.80 | 3432 | 1.21 | 13.5 | 30.2 | | " |
| | 9.72 | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 050422-CCR-LPLF8 **Sample Time:** 11:41

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☒ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : 050422-CCR-LPLF8 MS QC Sample Time: 11:50

Comments: 050422-CCR-LPLF8 MSD TIME: 11:46

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF 2

Field Team: KM/SM Date: 5/4/22

Weather/Temp: P Sunny, Breezy Arrival Time to Well: 1031

Purge Method: ☐ Bladder ☐ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 7.91

Pump Setting [5]: ~ Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | | | | | | | | | |
| | Water level only | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** _____ **Sample Time:** _____

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF3

Field Team: KM/SM Date: 5/4/22

Weather/Temp: Sunny, Breezy Arrival Time to Well: 1028

Purge Method: ☐ Bladder ☐ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 4.42

Pump Setting [5]: – Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | | | | | | | | | |
| | Water level only | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** _____ **Sample Time:** _____

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF4

Field Team: KM/SM Date: 5/4/22

Weather/Temp: P Sunny, Breezy Arrival Time to Well: 1025

Purge Method: ☐ Bladder ☐ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 2.19

Pump Setting [5]: — Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | | | | | | | | | |
| | Water level only | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** _____ **Sample Time:** _____

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF 2R

Field Team: SM Date: 5/24/22

Weather/Temp: Cloudy 49° Arrival Time to Well: 7:37

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** (2.20')

Pump Setting [5]: 100ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 743 | *Begin Pumping* | | | | | | | | |
| 748 | (2.44) | 450 | 6.02 | 3317 | 2.83 | 12.2 | 31.3 | | clear |
| 753 | (2.51) | 850 | 6.03 | 3318 | 1.82 | 12.1 | 25.6 | | clear |
| 758 | (2.57) | 1300 | 6.03 | 3319 | 1.35 | 12.0 | 21.3 | | clear |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 052422-CCR-LPLF2R **Sample Time:** 758

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF 8

Field Team: SM Date: 5/24/22

Weather/Temp: Cloudy 50° Arrival Time to Well: 809

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** (8.39)

Pump Setting [5]: 100 ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 812 | *Begin Pumping* | | | | | | | | |
| 817 | (8.83) | 500 | 5.72 | 3407 | 2.75 | 12.0 | 28.4 | | clear |
| 822 | 9.09 | 900 | 5.60 | 3406 | 1.71 | 11.9 | 26.4 | | clear |
| 827 | 9.40 | 1350 | 5.58 | 3401 | 1.42 | 11.8 | 25.2 | | clear |
| | 9.46 | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 052422-CCR-LPLF8 **Sample Time:** 827

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF1

Field Team: KM/SM Date: 10/10/22

Weather/Temp: Sunny, Breezy 55° Arrival Time to Well: 1051

Purge Method: ☐ Bladder ☐ Peristaltic ☐ Grab ☒ Other: Bailer **Initial DTW (ft btc):** (56.42)

Pump Setting [5]: N/A Notes:

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| 1055 | (56.70) | 1500 | 6.44 | 3874 | 2.33 | 13.5 | | | Cloudy/ orangish |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 101022~~LPLF1~~-CCR-LPLF1 **Sample Time:** 10:55

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF2R

Field Team: KM/SM Date: 10/10/22

Weather/Temp: Sunny, windy Arrival Time to Well: 1123

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** (4.57)

Pump Setting [5]: 100 ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (gal) | pH | Sp. Cond. (mS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 1126 | *Begin Pumping* | | | | | | | | |
| 1131 | (4.71) | 600 | 6.21 | 3915 | 1.17 | 16.0 | | | clear |
| 1136 | (4.77) | 1100 | 6.21 | 3934 | 0.77 | 16.3 | | | clear |
| 1141 | (4.87) | 1500 | 6.19 | 3922 | 0.59 | 16.1 | | | " |
| | (4.87) | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 101022-CCR-LPLF2R **Sample Time:** 1141

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (GAL): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF8

Field Team: SM / KM Date: 10/10/22

Weather/Temp: Sunny / Warm Arrival Time to Well: Noon

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** (12.49)

Pump Setting [5]: (00 ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (gal) | pH | Sp. Cond. (mS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 1207 | *Begin Pumping* | | | | | | | | |
| 1212 | (13.07) | 600 | 5.79 | 4004 | 1.44 | 16.4 | | | clear |
| 1217 | (13.43) | 900 | 5.71 | 3962 | 1.19 | 17.1 | | | clear |
| 1222 | (13.82) | 1300 | 5.70 | 3980 | 0.91 | 16.0 | | | clear |
| | (14.20) | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 101022-CCR-LPLF8 **Sample Time:** 1222

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☒ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (GAL): _____

QC Sample ID : 101022-CCR-LPLF8-FD QC Sample Time: 1227

Comments: _____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF 7R

Field Team: KM/SM Date: 10/10/22

Weather/Temp: Sunny, warm Arrival Time to Well: 1237

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** 20.60

Pump Setting [5]: 100ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 1239 | *Begin Pumping* | | | | | | | | |
| 1244 | (20.75) | 350 | 6.15 | 3318 | 1.79 | 16.9 | | | Clear |
| 1249 | (20.90) | 800 | 6.12 | 3276 | 1.16 | 15.7 | | | Clear |
| 1254 | (21.04) | 1200 | 6.12 | 3268 | 1.01 | 15.8 | | | Clear |
| | (21.33) | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method
[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO
[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 101022 - CCR - LPLF 7R **Sample Time:** 12:54

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)
☐ Appendix IV (total metals, Radium 226, and Radium 228).
☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☒ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : 101022 - CCR - LPLF 7R MS QC Sample Time: 1300

Comments: 101022 - CCR - LPLF 7R MSD 1306

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF 5

Field Team: KM / SM Date:

Weather/Temp: Sunny, windy Arrival Time to Well: 1110

Purge Method: ☐ Bladder ☐ Peristaltic ☐ Grab ☐ Other: **Initial DTW (ft btc):** 15.85

Pump Setting [5]: Notes:

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | Dry | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** **Sample Time:**

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml):

QC Sample ID : QC Sample Time:

Comments:

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** CPL52

Field Team: KM/SM Date:

Weather/Temp: Sunny, windy Arrival Time to Well: 1119

Purge Method: ☐ Bladder ☐ Peristaltic ☐ Grab ☐ Other: **Initial DTW (ft btc):** 13.62

Pump Setting [5]: Notes:

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | Water level only | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** **Sample Time:**

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml):

QC Sample ID : QC Sample Time:

Comments:

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF3

Field Team: KM | SM Date: 10/10/22

Weather/Temp: Sunny, Breezy Arrival Time to Well: 1116

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☒ Other: _____ **Initial DTW (ft btc):** 8.77

Pump Setting [5]: _____ Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | water level only | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** _____ **Sample Time:** _____

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF4

Field Team: KM/SM Date: 10/18/22

Weather/Temp: Sunny, Breezy Arrival Time to Well: 11:14

Purge Method: ☐ Bladder ☑ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** (3.15)

Pump Setting [5]: — Notes: —

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| | *Begin Pumping* | | | | | | | | |
| | Water level only | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** _____ **Sample Time:** _____

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

_____

# Groundwater Purging and Sampling Form

SITE: TCM Project Number: CCR **Well ID:** LPLF 2R

Field Team: SM Date: 11/21/22

Weather/Temp: Cloudy, cool Arrival Time to Well: 9:35

Purge Method: ☐ Bladder ☒ Peristaltic ☐ Grab ☐ Other: _____ **Initial DTW (ft btc):** (5.19)

Pump Setting [5]: 100 ml/min Notes: _____

| Field Parameters | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Time [1] | DTW [2] | Purge Vol. (ml) | pH | Sp. Cond. (uS/cm) | DO (mg/L) | Temp (°C) | ORP (mV) | Turbidity (NTU) | Note color, odor, etc. |
| 9:42 | *Begin Pumping* | | | | | | | | |
| 9:47 | (5.23) | 600 | 6.33 | 3946 | 3.09 | 11.3 | 41.4 | | Clear |
| 952 | (5.27) | 1050 | 6.29 | 3986 | 1.42 | 11.1 | 38.0 | | Clear |
| 957 | (5.40) | 1600 | 6.26 | 3974 | 0.97 | 11.4 | 30.7 | | Clear |
| | (5.37) | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Stabilization Criteria [3] | - | - | ± 0.1 units | ± 3% | ± 0.3 mg/L | - | ± 10 mV | ± 10% [4] | - |

[1] Collect field parameters in consistent 3-5 minute intervals for Low-Flow method [2] DTW: Total drawdown should not exceed 0.33 ft for Low-Flow method

[3] Stabilization achieved after 3 successive readings for Low-Flow method; minimum parameter subset: pH, sp. cond., and turbidity or DO

[4] For turbidity readings > 10 NTUs [5] Low-flow target purge rate is 0.1 - 0.5 L/min (0.03 - 0.13 gal/min)

**Sample ID:** 112122 - CCR - LPLF 2R **Sample Time:** 9:57

**Analysis:** ☐ Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and TDS)

☐ Appendix IV (total metals, Radium 226, and Radium 228).

☐ Other, specify _____

QC SAMPLE : ☐ Field Duplicate ☐ MS/MSD ☐ EQ Rinsate Blank TOTAL PURGED (ml): _____

QC Sample ID : _____ QC Sample Time: _____

Comments: _____

# Appendix B
# Laboratory Reports

May 16, 2022 Service Request No:K2204751

Dennis Morr
Transalta Centralia Mining, LLC
913 Big Hanaford Rd
Centralia, WA 98531

**Laboratory Results for: LPLF CCR**

Dear Dennis,

Enclosed are the results of the sample(s) submitted to our laboratory May 04, 2022
For your reference, these analyses have been assigned our service request number **K2204751.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

for Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

# Narrative Documents

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2204751
**Date Received:** 05/04/2022

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

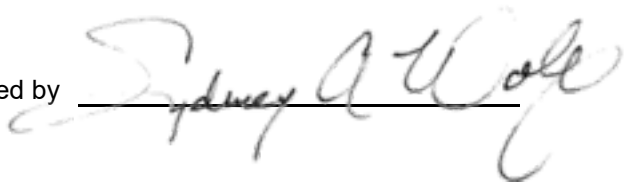
Six ground water samples were received for analysis at ALS Environmental on 05/04/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Metals:**

No significant anomalies were noted with this analysis.

**General Chemistry:**

No significant anomalies were noted with this analysis.

Approved by  Date 05/16/2022

## SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

| CLIENT ID: 050422-CCR-LPLF1 | | | Lab ID: K2204751-001 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Solids, Total Dissolved | 2990 | | | 10 | mg/L | SM 2540 C |
| Chloride | 4.2 | | | 1.0 | mg/L | 9056A |
| Sulfate | 1640 | | | 100 | mg/L | 9056A |
| Boron | 0.597 | | | 0.021 | mg/L | 6010C |
| Calcium | 230 | | | 0.021 | mg/L | 6010C |

| CLIENT ID: 050422-CCR-LPLF2R | | | Lab ID: K2204751-002 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Solids, Total Dissolved | 3310 | | | 10 | mg/L | SM 2540 C |
| Chloride | 8.8 | | | 1.0 | mg/L | 9056A |
| Sulfate | 1650 | | | 100 | mg/L | 9056A |
| Boron | 0.377 | | | 0.021 | mg/L | 6010C |
| Calcium | 442 | | | 0.021 | mg/L | 6010C |

| CLIENT ID: 050422-CCR-LPLF2R FD | | | Lab ID: K2204751-003 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Solids, Total Dissolved | 3330 | | | 10 | mg/L | SM 2540 C |
| Chloride | 8.6 | | | 1.0 | mg/L | 9056A |
| Sulfate | 1740 | | | 100 | mg/L | 9056A |
| Boron | 0.382 | | | 0.021 | mg/L | 6010C |
| Calcium | 439 | | | 0.021 | mg/L | 6010C |

| CLIENT ID: 050422-CCR-LPLF8 | | | Lab ID: K2204751-004 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Solids, Total Dissolved | 3760 | | | 10 | mg/L | SM 2540 C |
| Chloride | 7.9 | | | 1.0 | mg/L | 9056A |
| Sulfate | 1350 | | | 100 | mg/L | 9056A |
| Boron | 1.06 | | | 0.021 | mg/L | 6010C |
| Calcium | 399 | | | 0.021 | mg/L | 6010C |

| CLIENT ID: 050422-CCR-LPLF7R | | | Lab ID: K2204751-005 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Solids, Total Dissolved | 2530 | | | 10 | mg/L | SM 2540 C |
| Chloride | 10.2 | | | 1.0 | mg/L | 9056A |
| Sulfate | 1310 | | | 100 | mg/L | 9056A |
| Boron | 0.363 | | | 0.021 | mg/L | 6010C |
| Calcium | 221 | | | 0.021 | mg/L | 6010C |

| CLIENT ID: 050422-CCR-LPLF5 | | | Lab ID: K2204751-006 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Solids, Total Dissolved | 1420 | | | 10 | mg/L | SM 2540 C |
| Chloride | 3.2 | | | 1.0 | mg/L | 9056A |
| Sulfate | 670 | | | 100 | mg/L | 9056A |

## SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

| CLIENT ID: 050422-CCR-LPLF5 | | | Lab ID: K2204751-006 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Boron | 0.103 | | | 0.021 | mg/L | 6010C |
| Calcium | 292 | | | 0.021 | mg/L | 6010C |

# Sample Receipt Information

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

**Client:** Transalta Centralia Mining, LLC **Service Request:**K2204751
**Project:** LPLF CCR

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| K2204751-001 | 050422-CCR-LPLF1 | 5/4/2022 | 0855 |
| K2204751-002 | 050422-CCR-LPLF2R | 5/4/2022 | 1056 |
| K2204751-003 | 050422-CCR-LPLF2R FD | 5/4/2022 | 1106 |
| K2204751-004 | 050422-CCR-LPLF8 | 5/4/2022 | 1141 |
| K2204751-005 | 050422-CCR-LPLF7R | 5/4/2022 | 0937 |
| K2204751-006 | 050422-CCR-LPLF5 | 5/4/2022 | 1013 |

ADDRESS 1317 South 13th Ave., Kelso, WA 98626
PHONE 1 360 577 7222 FAX 1 360 636 1068

Part of the ALS Group A Campbell Brothers Limited Company

**Work Order No.:** Chain of Custody K2204751

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project Manager:** | Steve Mahr | | | **Bill to:** | Steve Mahr | | |
| **Client Name:** | TransAlta Centralia Mining Company | | | **Company:** | TransAlta Centralia Mining | | |
| **Address:** | 913 Big Hanaford Road | | | **Address:** | 913 Big Hanaford Road | | |
| **City, State ZIP:** | Centralia, WA 98531 | | | **City, State ZIP:** | Centralia, WA 98531 | | |
| **Email:** | steve_mahr@transalta.com | **Phone:** | 360-330-8140 | **Email:** | steve_mahr@transalta.com | **po#** | |
| Project Name: | LPLF CCR | | | | | | |
| Project Number: | | | | | | | |
| P.O. Number: | 4700092639 Line 30 | | | | | | |
| Sampler's Name: | Steve Mahr | | | | | | |

**SAMPLE RECEIPT**

| | | | | |
|---|---|---|---|---|
| Temperature (°C): | | Temp Blank Present | | |
| Received Intact: | Yes | No | N/A | Wet Ice / Blue Ice |
| Cooler Custody Seals: | Yes | No | N/A | Total Containers: |
| Sample Custody Seals: | Yes | No | N/A | |

**REQUESTED ANALYSIS**

**TAT**

- ☐ Routine 21day
- ☐ Same Day 100%
- ☐ Next Day ***
- ☐ 3 Day
- ☐ 5 Day 50%

**Surcharges. Please call for availability**

**Due Date:**

**Comments**

| Sample Identification | Matrix | Date Sampled | Time Sampled | Lab ID | No. of Containers | | SM 2540 C / TDS | 9056A / Chloride | 9056A / F | 9056A / SO4 | 6010C / Metals T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 050422-CCR-LPLF1 | GW | 05/04/2022 | 8:55 | | 2 | | X | X | X | X | X |
| 050422-CCR-LPLF2R | GW | 05/04/2022 | 10:56 | | 2 | | X | X | X | X | X |
| 050422-CCR-LPLF2R FD | GW | 05/04/2022 | 11:06 | | 2 | | X | X | X | X | X |
| 050422-CCR-LPLF8 | GW | 05/04/2022 | 11:41 | | 2 | | X | X | X | X | X |
| 050422-CCR-LPLF8 MS | GW | 05/04/2022 | 11:50 | | 2 | | X | X | X | X | X |
| 050422-CCR-LPLF8 MSD | GW | 05/04/2022 | 11:46 | | 2 | | X | X | X | X | X |
| 050422-CCR-LPLF7R | GW | 05/04/2022 | 9:37 | | 2 | | X | X | X | X | X |
| 050422-CCR-LPLF5 | GW | 05/04/2022 | 10:13 | | 2 | | X | X | X | X | X |

| | |
|---|---|
| Dissolved | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |
| Total | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |

**Additional Methods Available Upon Request**

| RELINQUISHED BY | | | RECEIVED BY | | |
|---|---|---|---|---|---|
| Print Name | Signature | Date/Time | Print Name | Signature | Date/Time |
| Steve Mahr | | 05/04/2022 3:30 | | | 5/4/22 1530 |

PM KL

# Cooler Receipt and Preservation Form

Client TransAlta Centralia Mining Company Service Request K22 047 51

Received: 5/4/22 Opened: 5/4/22 By: RH Unloaded: 5/4/22 By: RH

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

| Temp Blank | Sample Temp | IR Gun | Cooler #/COC ID / NA | Out of temp indicate with "X" | PM Notified If out of temp | Tracking Number NA | Filed |
|---|---|---|---|---|---|---|---|
| 4.2 | — | IR02 | | — | — | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Under filled Overfilled

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---|---|---|
| | | |
| | | |
| | | |

| Sample ID | Bottle Count Bottle Type | Head-space | Broke | pH | Reagent | Volume added | Reagent Lot Number | Initials | Time |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

SHORT HOLD TIME

Notes, Discrepancies, Resolutions: _____

_____

# Miscellaneous Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated value. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.<br>*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |
| H | The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. |
| J | The result is an estimated value. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.<br>*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimated value. |
| J | The result is an estimated value. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.<br>*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso**
**State Certifications, Accreditations, and Licenses**

| Agency | Web Site | Number |
|---|---|---|
| Alaska DEH | http://dec.alaska.gov/eh/lab/cs/csapproval.htm | UST-040 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0339 |
| Arkansas - DEQ | http://www.adeq.state.ar.us/techsvs/labcert.htm | 88-0637 |
| California DHS (ELAP) | http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx | 2795 |
| DOD ELAP | http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm | L16-58-R4 |
| Florida DOH | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E87412 |
| Hawaii DOH | http://health.hawaii.gov/ | - |
| ISO 17025 | http://www.pjlabs.com/ | L16-57 |
| Louisiana DEQ | http://www.deq.louisiana.gov/page/la-lab-accreditation | 03016 |
| Maine DHS | http://www.maine.gov/dhhs/ | WA01276 |
| Minnesota DOH | http://www.health.state.mn.us/accreditation | 053-999-457 |
| Nevada DEP | http://ndep.nv.gov/bsdw/labservice.htm | WA01276 |
| New Jersey DEP | http://www.nj.gov/dep/enforcement/oqa.html | WA005 |
| New York - DOH | https://www.wadsworth.org/regulatory/elap | 12060 |
| North Carolina DEQ | https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification | 605 |
| Oklahoma DEQ | http://www.deq.state.ok.us/CSDnew/labcert.htm | 9801 |
| Oregon – DEQ (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | WA100010 |
| South Carolina DHEC | http://www.scdhec.gov/environment/EnvironmentalLabCertification/ | 61002 |
| Texas CEQ | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704427 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C544 |
| Wyoming (EPA Region 8) | https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water- | - |
| Kelso Laboratory Website | www.alsglobal.com | NA |

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR/

**Service Request:** K2204751

**Sample Name:** 050422-CCR-LPLF1
**Lab Code:** K2204751-001
**Sample Matrix:** Ground Water

**Date Collected:** 05/4/22
**Date Received:** 05/4/22

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

**Sample Name:** 050422-CCR-LPLF2R
**Lab Code:** K2204751-002
**Sample Matrix:** Ground Water

**Date Collected:** 05/4/22
**Date Received:** 05/4/22

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

**Sample Name:** 050422-CCR-LPLF2R FD
**Lab Code:** K2204751-003
**Sample Matrix:** Ground Water

**Date Collected:** 05/4/22
**Date Received:** 05/4/22

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

**Sample Name:** 050422-CCR-LPLF8
**Lab Code:** K2204751-004
**Sample Matrix:** Ground Water

**Date Collected:** 05/4/22
**Date Received:** 05/4/22

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR/ | | |

| | | | |
|---|---|---|---|
| **Sample Name:** | 050422-CCR-LPLF7R | **Date Collected:** | 05/4/22 |
| **Lab Code:** | K2204751-005 | **Date Received:** | 05/4/22 |
| **Sample Matrix:** | Ground Water | | |

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

| | | | |
|---|---|---|---|
| **Sample Name:** | 050422-CCR-LPLF5 | **Date Collected:** | 05/4/22 |
| **Lab Code:** | K2204751-006 | **Date Received:** | 05/4/22 |
| **Sample Matrix:** | Ground Water | | |

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

# Sample Results

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 08:55 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF1 | **Basis:** | NA |
| **Lab Code:** | K2204751-001 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.597** | mg/L | 0.021 | 1 | 05/10/22 13:03 | 05/05/22 | |
| Calcium | 6010C | **230** | mg/L | 0.021 | 1 | 05/10/22 13:03 | 05/05/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 10:56 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2204751-002 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.377** | mg/L | 0.021 | 1 | 05/10/22 13:06 | 05/05/22 | |
| Calcium | 6010C | **442** | mg/L | 0.021 | 1 | 05/10/22 13:06 | 05/05/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 11:06 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF2R FD | **Basis:** | NA |
| **Lab Code:** | K2204751-003 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.382** | mg/L | 0.021 | 1 | 05/10/22 13:09 | 05/05/22 | |
| Calcium | 6010C | **439** | mg/L | 0.021 | 1 | 05/10/22 13:09 | 05/05/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 11:41 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2204751-004 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **1.06** | mg/L | 0.021 | 1 | 05/10/22 12:49 | 05/05/22 | |
| Calcium | 6010C | **399** | mg/L | 0.021 | 1 | 05/10/22 12:49 | 05/05/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 09:37 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF7R | **Basis:** | NA |
| **Lab Code:** | K2204751-005 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.363** | mg/L | 0.021 | 1 | 05/10/22 13:12 | 05/05/22 | |
| Calcium | 6010C | **221** | mg/L | 0.021 | 1 | 05/10/22 13:12 | 05/05/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 10:13 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF5 | **Basis:** | NA |
| **Lab Code:** | K2204751-006 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.103** | mg/L | 0.021 | 1 | 05/10/22 13:22 | 05/05/22 | |
| Calcium | 6010C | **292** | mg/L | 0.021 | 1 | 05/10/22 13:22 | 05/05/22 | |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 08:55 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF1 | **Basis:** | NA |
| **Lab Code:** | K2204751-001 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **4.2** | mg/L | 1.0 | 10 | 05/12/22 17:28 | |
| Fluoride | 9056A | ND U | mg/L | 2.0 | 10 | 05/12/22 17:28 | |
| Sulfate | 9056A | **1640** | mg/L | 100 | 1000 | 05/12/22 18:12 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 08:55 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF1 | **Basis:** | NA |
| **Lab Code:** | K2204751-001 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **2990** | mg/L | 10 | 1 | 05/09/22 16:35 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 10:56 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2204751-002 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **8.8** | mg/L | 1.0 | 10 | 05/12/22 18:23 | |
| Fluoride | 9056A | ND U | mg/L | 2.0 | 10 | 05/12/22 18:23 | |
| Sulfate | 9056A | **1650** | mg/L | 100 | 1000 | 05/12/22 18:34 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 10:56 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2204751-002 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3310** | mg/L | 10 | 1 | 05/09/22 16:35 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 11:06 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF2R FD | **Basis:** | NA |
| **Lab Code:** | K2204751-003 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **8.6** | mg/L | 1.0 | 10 | 05/12/22 18:44 | |
| Fluoride | 9056A | ND U | mg/L | 2.0 | 10 | 05/12/22 18:44 | |
| Sulfate | 9056A | **1740** | mg/L | 100 | 1000 | 05/12/22 18:55 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 11:06 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF2R FD | **Basis:** | NA |
| **Lab Code:** | K2204751-003 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3330** | mg/L | 10 | 1 | 05/09/22 16:35 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 11:41 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2204751-004 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **7.9** | mg/L | 1.0 | 10 | 05/12/22 15:08 | |
| Fluoride | 9056A | ND U | mg/L | 2.0 | 10 | 05/12/22 15:08 | |
| Sulfate | 9056A | **1350** | mg/L | 100 | 1000 | 05/12/22 16:45 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 11:41 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2204751-004 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3760** | mg/L | 10 | 1 | 05/09/22 16:35 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 09:37 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF7R | **Basis:** | NA |
| **Lab Code:** | K2204751-005 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **10.2** | mg/L | 1.0 | 10 | 05/12/22 19:06 | |
| Fluoride | 9056A | ND U | mg/L | 2.0 | 10 | 05/12/22 19:06 | |
| Sulfate | 9056A | **1310** | mg/L | 100 | 1000 | 05/12/22 19:17 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 09:37 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF7R | **Basis:** | NA |
| **Lab Code:** | K2204751-005 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **2530** | mg/L | 10 | 1 | 05/09/22 16:35 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 10:13 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF5 | **Basis:** | NA |
| **Lab Code:** | K2204751-006 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **3.2** | mg/L | 1.0 | 10 | 05/12/22 19:28 | |
| Fluoride | 9056A | ND U | mg/L | 2.0 | 10 | 05/12/22 19:28 | |
| Sulfate | 9056A | **670** | mg/L | 100 | 1000 | 05/12/22 19:39 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 10:13 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 15:30 |
| **Sample Name:** | 050422-CCR-LPLF5 | **Basis:** | NA |
| **Lab Code:** | K2204751-006 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **1420** | mg/L | 10 | 1 | 05/09/22 16:35 | |

# QC Summary Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | KQ2207163-01 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | ND U | mg/L | 0.021 | 1 | 05/10/22 12:44 | 05/05/22 | |
| Calcium | 6010C | ND U | mg/L | 0.021 | 1 | 05/10/22 12:44 | 05/05/22 | |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | 05/04/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 |
| | | **Date Analyzed:** | 05/10/22 |
| | | **Date Extracted:** | 05/5/22 |

**Matrix Spike Summary**
**Total Metals**

| | | | |
|---|---|---|---|
| **Sample Name:** | 050422-CCR-LPLF8 | **Units:** | mg/L |
| **Lab Code:** | K2204751-004 | **Basis:** | NA |
| **Analysis Method:** | 6010C | | |
| **Prep Method:** | EPA CLP ILM04.0 | | |

**Matrix Spike**
KQ2207163-04

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 1.06 | 1.50 | 0.500 | 89 | 75-125 |
| Calcium | 399 | 412 | 10.0 | 132 # | 75-125 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.**

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project** | LPLF CCR | **Date Collected:** | 05/04/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 |
| | | **Date Analyzed:** | 05/10/22 |

## Replicate Sample Summary
## Total Metals

| | | | |
|---|---|---|---|
| **Sample Name:** | 050422-CCR-LPLF8 | **Units:** | mg/L |
| **Lab Code:** | K2204751-004 | **Basis:** | NA |

| Analyte Name | Analysis Method | MRL | Sample Result | Duplicate Sample KQ2207163-03 Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| Boron | 6010C | 0.021 | 1.06 | 1.04 | 1.05 | 2 | 20 |
| Calcium | 6010C | 0.021 | 399 | 399 | 399 | <1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2204751
**Date Analyzed:** 05/10/22

## Lab Control Sample Summary
## Total Metals

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
KQ2207163-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 6010C | 0.495 | 0.500 | 99 | 80-120 |
| Calcium | 6010C | 11.9 | 12.5 | 96 | 80-120 |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2204751-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 1 | 05/12/22 14:57 | |
| Fluoride | 9056A | ND U | mg/L | 0.20 | 1 | 05/12/22 14:57 | |
| Sulfate | 9056A | ND U | mg/L | 0.10 | 1 | 05/12/22 14:57 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2204751-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | 1 | 05/09/22 16:35 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2204751-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 1 | 05/12/22 20:33 | |
| Fluoride | 9056A | ND U | mg/L | 0.20 | 1 | 05/12/22 20:33 | |
| Sulfate | 9056A | ND U | mg/L | 0.10 | 1 | 05/12/22 20:33 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2204751-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | 1 | 05/09/22 16:35 | |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:**K2204751
**Date Collected:**05/04/22
**Date Received:**05/04/22
**Date Analyzed:**5/12/22

## Duplicate Matrix Spike Summary
## General Chemistry Parameters

**Sample Name:** 050422-CCR-LPLF8
**Lab Code:** K2204751-004

**Units:**mg/L
**Basis:**NA

| | | | Matrix Spike K2204751-004MS | | | Duplicate Matrix Spike K2204751-004DMS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Method** | **Sample Result** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Fluoride | 9056A | ND U | 40.2 | 40.0 | 100 | 40.2 | 40.0 | 100 | 80-120 | <1 | 20 |
| Chloride | 9056A | 7.9 | 47.1 | 40.0 | 98 | 47.1 | 40.0 | 98 | 80-120 | <1 | 20 |
| Sulfate | 9056A | 1350 | 5300 | 4000 | 99 | 5390 | 4000 | 101 | 90-110 | 2 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2204751 |
| **Project** | LPLF CCR | **Date Collected:** | 05/04/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/04/22 |
| | | **Date Analyzed:** | 05/09/22 - 05/12/22 |

## Replicate Sample Summary
## General Chemistry Parameters

| | | | |
|---|---|---|---|
| **Sample Name:** | 050422-CCR-LPLF8 | **Units:** | mg/L |
| **Lab Code:** | K2204751-004 | **Basis:** | NA |

| Analyte Name | Analysis Method | MRL | Sample Result | Duplicate Sample K2204751-004DUP Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | 1.0 | 7.9 | 8.1 | 8.00 | 2 | 20 |
| Fluoride | 9056A | 2.0 | ND U | ND U | NC | NC | 20 |
| Solids, Total Dissolved | SM 2540 C | 10 | 3760 | 3780 | 3770 | <1 | 5 |
| Sulfate | 9056A | 100 | 1350 | 1320 | 1330 | 2 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2204751
**Date Analyzed:** 05/09/22 - 05/12/22

**Lab Control Sample Summary**
**General Chemistry Parameters**

**Units:**mg/L
**Basis:**NA

**Lab Control Sample**
K2204751-LCS1

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Chloride | 9056A | 4.99 | 5.00 | 100 | 80-120 |
| Fluoride | 9056A | 5.01 | 5.00 | 100 | 90-110 |
| Solids, Total Dissolved | SM 2540 C | 1880 | 1920 | 98 | 85-115 |
| Sulfate | 9056A | 5.07 | 5.00 | 101 | 90-110 |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2204751
**Date Analyzed:** 05/09/22 - 05/12/22

## Lab Control Sample Summary
## General Chemistry Parameters

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
K2204751-LCS2

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Chloride | 9056A | 4.99 | 5.00 | 100 | 80-120 |
| Fluoride | 9056A | 5.01 | 5.00 | 100 | 90-110 |
| Solids, Total Dissolved | SM 2540 C | 1880 | 1920 | 98 | 85-115 |
| Sulfate | 9056A | 5.12 | 5.00 | 102 | 90-110 |

June 16, 2022 Service Request No:K2205657

Dennis Morr
Transalta Centralia Mining, LLC
913 Big Hanaford Rd
Centralia, WA 98531

**Laboratory Results for: LPLF CCR**

Dear Dennis,

Enclosed are the results of the sample(s) submitted to our laboratory May 24, 2022
For your reference, these analyses have been assigned our service request number **K2205657.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Kelley Lovejoy

Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

# Narrative Documents

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2205657
**Date Received:** 05/24/2022

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

Two ground water samples were received for analysis at ALS Environmental on 05/24/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Metals:**

No significant anomalies were noted with this analysis.

**General Chemistry:**

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 06/16/2022

## SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

| CLIENT ID: 052422-CCR-LPLF2R | | | Lab ID: K2205657-001 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Solids, Total Dissolved | 3370 | | | 10 | mg/L | SM 2540 C |
| Boron | 0.335 | | | 0.021 | mg/L | 6010C |

| CLIENT ID: 052422-CCR-LPLF8 | | | Lab ID: K2205657-002 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Chloride | 7.6 | | | 1.0 | mg/L | 9056A |
| Boron | 1.01 | | | 0.021 | mg/L | 6010C |

# Sample Receipt Information

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| K2205657-001 | 052422-CCR-LPLF2R | 5/24/2022 | 0758 |
| K2205657-002 | 052422-CCR-LPLF8 | 5/24/2022 | 0827 |

ADDRESS 1317 South 13th Ave., Kelso, WA 98626
PHONE 1 360 577 7222 FAX 1 360 636 1068

Part of the ALS Group A Campbell Brothers Limited Company

Work Order No.: R2205657

Chain of Custody

| | | | | | |
|---|---|---|---|---|---|
| **Project Manager:** | Steve Mahr | | | **Bill to:** | Steve Mahr |
| **Client Name:** | TransAlta Centralia Mining Company | | | **Company:** | TransAlta Centralia Mining |
| **Address:** | 913 Big Hanaford Road | | | **Address:** | 913 Big Hanaford Road |
| **City, State ZIP:** | Centralia, WA 98531 | | | **City, State ZIP:** | Centralia, WA 98531 |
| **Email:** | steve_mahr@transalta.com | **Phone:** 360-330-8140 | | **Email:** | steve_mahr@transalta.com **po#** |
| Project Name: | LPLF CCR | | | | |
| Project Number: | | | | | |
| P.O. Number: | 4700092639 Line 30 | | | | |
| Sampler's Name: | Steve Mahr | | | | |

**SAMPLE RECEIPT**

| | | | | |
|---|---|---|---|---|
| Temperature (°C): | | Temp Blank Present | | |
| Received Intact: | Yes | No | N/A | Wet Ice / Blue Ice |
| Cooler Custody Seals: | Yes | No | N/A | Total Containers: |
| Sample Custody Seals: | Yes | No | N/A | |

**REQUESTED ANALYSIS**

**TAT**

- ☐ Routine 21day
- ☐ Same Day 100%
- ☐ Next Day ***
- ☐ 3 Day
- ☐ 5 Day 50%

**Surcharges. Please call for availability**

**Due Date:**

| Sample Identification | Matrix | Date Sampled | Time Sampled | Lab ID | No. of Containers | SM 2540 C / TDS | 9056A / Chloride | 9056A / F | 9056A / SO4 | 6010C / Metals T | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 052422-CCR-LPLF2R | GW | 05/24/2022 | 7:58 | | 2 | X | | | | X | TDS, Boron only |
| 052422-CCR-LPLF8 | GW | 05/24/2022 | 8:27 | | 2 | | X | | | X | Boron, Chloride only |

| | |
|---|---|
| Dissolved | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |
| Total | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |

**Additional Methods Available Upon Request**

| RELINQUISHED BY | | | RECEIVED BY | | |
|---|---|---|---|---|---|
| Print Name | Signature | Date/Time | Print Name | Signature | Date/Time |
| Steve Mahr | | 05/24/2022 1042 | R Hauck | | 5/24/221042 |

PM KL

# Cooler Receipt and Preservation Form

Client TransAlta Service Request K22 205657

Received: 5/24/22 Opened: 5/24/22 By: [illegible] Unloaded: 5/24/22 By: [illegible]

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

| Temp Blank | Sample Temp | IR Gun | Cooler #/COC ID / NA | Out of temp indicate with "X" | PM Notified if out of temp | Tracking Number NA | Filed |
|---|---|---|---|---|---|---|---|
| 5.6 | | IR02 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA ~~Y~~ KM N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Under filled Overfilled

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---|---|---|
| | | |
| | | |
| | | |

| Sample ID | Bottle Count Bottle Type | Head-space | Broke | pH | Reagent | Volume added | Reagent Lot Number | Initials | Time |
|---|---|---|---|---|---|---|---|---|---|
| 052422-CCR-LPLT2R | 125 pl. | | | X | $HNO_3$ | .5mL | RE160C | KM | 1120 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Notes, Discrepancies, Resolutions: 052422-CCR-LPLT2R Still out of pH range after .5mL $HNO_3$ added

# Miscellaneous Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated value. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |
| H | The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. |
| J | The result is an estimated value. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimated value. |
| J | The result is an estimated value. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso**
**State Certifications, Accreditations, and Licenses**

| Agency | Web Site | Number |
|---|---|---|
| Alaska DEH | http://dec.alaska.gov/eh/lab/cs/csapproval.htm | UST-040 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0339 |
| Arkansas - DEQ | http://www.adeq.state.ar.us/techsvs/labcert.htm | 88-0637 |
| California DHS (ELAP) | http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx | 2795 |
| DOD ELAP | http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm | L16-58-R4 |
| Florida DOH | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E87412 |
| Hawaii DOH | http://health.hawaii.gov/ | - |
| ISO 17025 | http://www.pjlabs.com/ | L16-57 |
| Louisiana DEQ | http://www.deq.louisiana.gov/page/la-lab-accreditation | 03016 |
| Maine DHS | http://www.maine.gov/dhhs/ | WA01276 |
| Minnesota DOH | http://www.health.state.mn.us/accreditation | 053-999-457 |
| Nevada DEP | http://ndep.nv.gov/bsdw/labservice.htm | WA01276 |
| New Jersey DEP | http://www.nj.gov/dep/enforcement/oqa.html | WA005 |
| New York - DOH | https://www.wadsworth.org/regulatory/elap | 12060 |
| North Carolina DEQ | https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification | 605 |
| Oklahoma DEQ | http://www.deq.state.ok.us/CSDnew/labcert.htm | 9801 |
| Oregon – DEQ (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | WA100010 |
| South Carolina DHEC | http://www.scdhec.gov/environment/EnvironmentalLabCertification/ | 61002 |
| Texas CEQ | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704427 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C544 |
| Wyoming (EPA Region 8) | https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water- | - |
| Kelso Laboratory Website | www.alsglobal.com | NA |

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | | |

| | | | |
|---|---|---|---|
| **Sample Name:** | 052422-CCR-LPLF2R | **Date Collected:** | 05/24/22 |
| **Lab Code:** | K2205657-001 | **Date Received:** | 05/24/22 |
| **Sample Matrix:** | Ground Water | | |

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| SM 2540 C | | JBYMAN |

| | | | |
|---|---|---|---|
| **Sample Name:** | 052422-CCR-LPLF8 | **Date Collected:** | 05/24/22 |
| **Lab Code:** | K2205657-002 | **Date Received:** | 05/24/22 |
| **Sample Matrix:** | Ground Water | | |

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | ABOYER | AMCKORNEY |
| 9056A | | NFOTH |

| | | | |
|---|---|---|---|
| **Sample Name:** | 052422-CCR-LPLF8 | **Date Collected:** | 05/24/22 |
| **Lab Code:** | K2205657-002.R01 | **Date Received:** | 05/24/22 |
| **Sample Matrix:** | Ground Water | | |

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 9056A | | NFOTH |

# Sample Results

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 07:58 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 10:42 |
| **Sample Name:** | 052422-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2205657-001 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.335** | mg/L | 0.021 | 1 | 05/31/22 13:47 | 05/31/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 08:27 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 10:42 |
| **Sample Name:** | 052422-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2205657-002 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **1.01** | mg/L | 0.021 | 1 | 05/31/22 13:59 | 05/31/22 | |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 07:58 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 10:42 |
| **Sample Name:** | 052422-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2205657-001 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3370** | mg/L | 10 | 1 | 05/27/22 12:29 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 08:27 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 10:42 |
| **Sample Name:** | 052422-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2205657-002 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **7.6** | mg/L | 1.0 | 10 | 06/11/22 12:16 | |

# QC Summary Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | KQ2208733-01 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | ND U | mg/L | 0.021 | 1 | 05/31/22 13:42 | 05/31/22 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 |
| | | **Date Analyzed:** | 05/31/22 |
| | | **Date Extracted:** | 05/31/22 |

## Matrix Spike Summary
## Total Metals

| | | | |
|---|---|---|---|
| **Sample Name:** | 052422-CCR-LPLF2R | **Units:** | mg/L |
| **Lab Code:** | K2205657-001 | **Basis:** | NA |
| **Analysis Method:** | 6010C | | |
| **Prep Method:** | EPA CLP ILM04.0 | | |

### Matrix Spike
KQ2208733-04

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 0.335 | 0.733 | 0.500 | 80 | 75-125 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.**

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 |
| | | **Date Analyzed:** | 05/31/22 |

**Replicate Sample Summary**

**Total Metals**

| | | | |
|---|---|---|---|
| **Sample Name:** | 052422-CCR-LPLF2R | **Units:** | mg/L |
| **Lab Code:** | K2205657-001 | **Basis:** | NA |

| Analyte Name | Analysis Method | MRL | Sample Result | Duplicate Sample KQ2208733-03 Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| Boron | 6010C | 0.021 | 0.335 | 0.337 | 0.336 | <1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR/052422
**Sample Matrix:** Ground Water

**Service Request:** K2205657
**Date Analyzed:** 05/31/22

## Lab Control Sample Summary
## Total Metals

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
KQ2208733-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 6010C | 0.469 | 0.500 | 94 | 80-120 |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2205657-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 1 | 06/10/22 14:56 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2205657-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | 1 | 05/27/22 12:29 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2205657-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 1 | 06/10/22 19:20 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2205657-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | 1 | 05/27/22 12:29 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2205657-MB3 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 1 | 06/10/22 23:13 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 |
| | | **Date Analyzed:** | 06/11/22 |
| | | **Date Extracted:** | NA |

## Duplicate Matrix Spike Summary
## Chloride

| | | | |
|---|---|---|---|
| **Sample Name:** | 052422-CCR-LPLF8 | **Units:** | mg/L |
| **Lab Code:** | K2205657-002 | **Basis:** | NA |
| **Analysis Method:** | 9056A | | |
| **Prep Method:** | None | | |

| | | Matrix Spike | | | Duplicate Matrix Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | K2205657-002MS | | | K2205657-002DMS | | | | | |
| **Analyte Name** | **Sample Result** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Chloride | 7.6 | 44.8 | 40.0 | 93 | 44.7 | 40.0 | 93 | 80-120 | <1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.**

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project** | LPLF CCR/052422 | **Date Collected:** | 05/24/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 05/24/22 |
| | | **Date Analyzed:** | 06/11/22 |

## Replicate Sample Summary
## General Chemistry Parameters

| | | | |
|---|---|---|---|
| **Sample Name:** | 052422-CCR-LPLF8 | **Units:** | mg/L |
| **Lab Code:** | K2205657-002 | **Basis:** | NA |

| Analyte Name | Analysis Method | MRL | Sample Result | Duplicate Sample K2205657-002DUP Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| Chloride | 9056A | 1.0 | 7.6 | 7.6 | 7.58 | <1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR/052422
**Sample Matrix:** Ground Water

**Service Request:** K2205657
**Date Analyzed:** 05/27/22 - 06/10/22

## Lab Control Sample Summary
## General Chemistry Parameters

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
K2205657-LCS1

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Chloride | 9056A | 4.73 | 5.00 | 95 | 80-120 |
| Solids, Total Dissolved | SM 2540 C | 1850 | 1920 | 96 | 85-115 |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Analyzed:** | 06/10/22 |
| **Sample Matrix:** | Ground Water | **Date Extracted:** | NA |

## Lab Control Sample Summary
## Chloride

| | | | |
|---|---|---|---|
| **Analysis Method:** | 9056A | **Units:** | mg/L |
| **Prep Method:** | None | **Basis:** | NA |
| | | **Analysis Lot:** | 767076 |

| Sample Name | Lab Code | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Lab Control Sample | K2205657-LCS2 | 4.72 | 5.00 | 94 | 80-120 |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2205657 |
| **Project:** | LPLF CCR/052422 | **Date Analyzed:** | 06/10/22 |
| **Sample Matrix:** | Ground Water | **Date Extracted:** | NA |

**Lab Control Sample Summary**
**Chloride**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 9056A | **Units:** | mg/L |
| **Prep Method:** | None | **Basis:** | NA |
| | | **Analysis Lot:** | 767076 |

| Sample Name | Lab Code | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Lab Control Sample | K2205657-LCS3 | 4.73 | 5.00 | 95 | 80-120 |

November 09, 2022 Service Request No:K2211783

Dennis Morr
Transalta Centralia Mining, LLC
913 Big Hanaford Rd
Centralia, WA 98531

**Laboratory Results for: LPLF CCR**

Dear Dennis,

Enclosed are the results of the sample(s) submitted to our laboratory October 10, 2022
For your reference, these analyses have been assigned our service request number **K2211783.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Kelley Lovejoy

Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

# Narrative Documents

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2211783
**Date Received:** 10/10/2022

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

Five ground water samples were received for analysis at ALS Environmental on 10/10/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Metals:**

No significant anomalies were noted with this analysis.

**General Chemistry:**

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 11/09/2022

## SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

| CLIENT ID: 101022-CCR-LPLF1 | | | Lab ID: K2211783-001 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Boron | 0.573 | | 0.003 | 0.021 | mg/L | 6010C |
| Calcium | 225 | | 0.003 | 0.021 | mg/L | 6010C |
| Chloride | 4.08 | | 0.15 | 0.50 | mg/L | 9056A |
| Fluoride | 0.06 | J | 0.02 | 0.50 | mg/L | 9056A |
| Solids, Total Dissolved | 2980 | | | 20 | mg/L | SM 2540 C |
| Sulfate | 1540 | | 5 | 50 | mg/L | 9056A |

| CLIENT ID: 1010-CCR-LPLF2R | | | Lab ID: K2211783-002 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Boron | 0.337 | | 0.003 | 0.021 | mg/L | 6010C |
| Calcium | 460 | | 0.003 | 0.021 | mg/L | 6010C |
| Chloride | 7.46 | | 0.15 | 0.50 | mg/L | 9056A |
| Solids, Total Dissolved | 3310 | | | 20 | mg/L | SM 2540 C |
| Sulfate | 2170 | | 5 | 50 | mg/L | 9056A |

| CLIENT ID: 101022-CCR-LPLF8 | | | Lab ID: K2211783-003 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Boron | 0.979 | | 0.003 | 0.021 | mg/L | 6010C |
| Calcium | 395 | | 0.003 | 0.021 | mg/L | 6010C |
| Chloride | 7.23 | | 0.15 | 0.50 | mg/L | 9056A |
| Solids, Total Dissolved | 3630 | | | 20 | mg/L | SM 2540 C |
| Sulfate | 2160 | | 5 | 50 | mg/L | 9056A |

| CLIENT ID: 101022-CCR-LPLF8 FD | | | Lab ID: K2211783-004 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Boron | 0.986 | | 0.003 | 0.021 | mg/L | 6010C |
| Calcium | 397 | | 0.003 | 0.021 | mg/L | 6010C |
| Chloride | 7.38 | | 0.15 | 0.50 | mg/L | 9056A |
| Solids, Total Dissolved | 3630 | | | 20 | mg/L | SM 2540 C |
| Sulfate | 2150 | | 5 | 50 | mg/L | 9056A |

| CLIENT ID: 101022-CCR-LPLF7R | | | Lab ID: K2211783-005 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Boron | 0.329 | | 0.003 | 0.021 | mg/L | 6010C |
| Calcium | 234 | | 0.003 | 0.021 | mg/L | 6010C |
| Chloride | 8.97 | | 0.15 | 0.50 | mg/L | 9056A |
| Fluoride | 0.07 | J | 0.02 | 0.50 | mg/L | 9056A |
| Solids, Total Dissolved | 2530 | | | 20 | mg/L | SM 2540 C |
| Sulfate | 1280 | | 5 | 50 | mg/L | 9056A |

# Sample Receipt Information

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

**Client:** Transalta Centralia Mining, LLC **Service Request:**K2211783
**Project:** LPLF CCR

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| K2211783-001 | 101022-CCR-LPLF1 | 10/10/2022 | 1055 |
| K2211783-002 | 1010-CCR-LPLF2R | 10/10/2022 | 1141 |
| K2211783-003 | 101022-CCR-LPLF8 | 10/10/2022 | 1222 |
| K2211783-004 | 101022-CCR-LPLF8 FD | 10/10/2022 | 1227 |
| K2211783-005 | 101022-CCR-LPLF7R | 10/10/2022 | 1254 |

ADDRESS 1317 South 13th Ave., Kelso, WA 98626
PHONE 1 360 577 7222 FAX 1 360 636 1068
Part of the ALS Group A Campbell Brothers Limited Company

K2211783

**Work Order No.:**

Chain of Custody

| | | | | | |
|---|---|---|---|---|---|
| **Project Manager:** | Steve Mahr | | **Bill to:** | Steve Mahr | |
| **Client Name:** | TransAlta Centralia Mining Company | | **Company:** | TransAlta Centralia Mining | |
| **Address:** | 913 Big Hanaford Road | | **Address:** | 913 Big Hanaford Road | |
| **City, State ZIP:** | Centralia, WA 98531 | | **City, State ZIP:** | Centralia, WA 98531 | |
| **Email:** | steve_mahr@transalta.com | **Phone:** 360-330-8140 | **Email:** | steve_mahr@transalta.com | **po#** |
| Project Name: | LPLF CCR | | | | |
| Project Number: | | | | | |
| P.O. Number: | 4700092639 Line 30 | | | | |
| Sampler's Name: | Steve Mahr | | | | |

**SAMPLE RECEIPT**

| | | | | |
|---|---|---|---|---|
| Temperature (°C): | | Temp Blank Present | | |
| Received Intact: | Yes | No | N/A | Wet Ice / Blue Ice |
| Cooler Custody Seals: | Yes | No | N/A | Total Containers: |
| Sample Custody Seals: | Yes | No | N/A | |

**REQUESTED ANALYSIS**

**TAT**

- ☐ Routine 21day
- ☐ Same Day 100%
- ☐ Next Day ***
- ☐ 3 Day
- ☐ 5 Day 50%

**Surcharges. Please call for availability**

**Due Date:**

**Comments**

| Sample Identification | Matrix | Date Sampled | Time Sampled | Lab ID | No. of Containers | | SM 2540 C / TDS | 9056A / Chloride | 9056A / F | 9056A / SO4 | 6010C / Metals T |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 101022-CCR-LPLF1 | GW | 10/10/2022 | 10:55 | | 2 | | X | X | X | X | X |
| 1010-CCR-LPLF2R | GW | 10/10/2022 | 11:41 | | 2 | | X | X | X | X | X |
| 101022-CCR-LPLF8 | GW | 10/10/2022 | 12:22 | | 2 | | X | X | X | X | X |
| 101022-CCR-LPLF8 FD | GW | 10/10/2022 | 12:27 | | 2 | | X | X | X | X | X |
| 101022-CCR-LPLF7R | GW | 10/10/2022 | 12:54 | | 2 | | X | X | X | X | X |
| 101022-CCR-LPLF7R MS | GW | 10/10/2022 | 13:00 | | 2 | | X | X | X | X | X |
| 101022-CCR-LPLF7R MSD | GW | 10/10/2022 | 13:06 | | 2 | | X | X | X | X | X |

| | |
|---|---|
| Dissolved | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |
| Total | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |

**Additional Methods Available Upon Request**

| RELINQUISHED BY | | | RECEIVED BY | | |
|---|---|---|---|---|---|
| Print Name | Signature | Date/Time | Print Name | Signature | Date/Time |
| Kacie Marko | Kacie Marko | 10/10/2022 1541 | | | 10·10·22 1541 |

PM VL

# Cooler Receipt and Preservation Form

Client Trans Atlan Service Request K2211783

Received: 10/10/22 Opened: 10/10/22 By: AP Unloaded: 10/10/22 By: AP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

| Temp Blank | Sample Temp | IR Gun | Cooler #/COC ID / NA | Out of temp indicate with "X" | PM Notified if out of temp | Tracking Number NA | Filed |
|---|---|---|---|---|---|---|---|
| 4.2 | | IR01 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Under filled Overfilled

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---|---|---|
| | | |
| | | |
| | | |

| Sample ID | Bottle Count Bottle Type | Head-space | Broke | pH | Reagent | Volume added | Reagent Lot Number | Initials | Time |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Notes, Discrepancies, Resolutions: _____

*1/13/22* *Page of*

# Miscellaneous Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated value. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |
| H | The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. |
| J | The result is an estimated value. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimated value. |
| J | The result is an estimated value. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso**
**State Certifications, Accreditations, and Licenses**

| Agency | Web Site | Number |
|---|---|---|
| Alaska DEH | http://dec.alaska.gov/eh/lab/cs/csapproval.htm | UST-040 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0339 |
| Arkansas - DEQ | http://www.adeq.state.ar.us/techsvs/labcert.htm | 88-0637 |
| California DHS (ELAP) | http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx | 2795 |
| DOD ELAP | http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm | L16-58-R4 |
| Florida DOH | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E87412 |
| Hawaii DOH | http://health.hawaii.gov/ | - |
| ISO 17025 | http://www.pjlabs.com/ | L16-57 |
| Louisiana DEQ | http://www.deq.louisiana.gov/page/la-lab-accreditation | 03016 |
| Maine DHS | http://www.maine.gov/dhhs/ | WA01276 |
| Minnesota DOH | http://www.health.state.mn.us/accreditation | 053-999-457 |
| Nevada DEP | http://ndep.nv.gov/bsdw/labservice.htm | WA01276 |
| New Jersey DEP | http://www.nj.gov/dep/enforcement/oqa.html | WA005 |
| New York - DOH | https://www.wadsworth.org/regulatory/elap | 12060 |
| North Carolina DEQ | https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification | 605 |
| Oklahoma DEQ | http://www.deq.state.ok.us/CSDnew/labcert.htm | 9801 |
| Oregon – DEQ (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | WA100010 |
| South Carolina DHEC | http://www.scdhec.gov/environment/EnvironmentalLabCertification/ | 61002 |
| Texas CEQ | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704427 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C544 |
| Wyoming (EPA Region 8) | https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water- | - |
| Kelso Laboratory Website | www.alsglobal.com | NA |

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

**Client:** Transalta Centralia Mining, LLC **Service Request:** K2211783
**Project:** LPLF CCR/

**Sample Name:** 101022-CCR-LPLF1 **Date Collected:** 10/10/22
**Lab Code:** K2211783-001 **Date Received:** 10/10/22
**Sample Matrix:** Ground Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | SSOLADEY | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

**Sample Name:** 1010-CCR-LPLF2R **Date Collected:** 10/10/22
**Lab Code:** K2211783-002 **Date Received:** 10/10/22
**Sample Matrix:** Ground Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | SSOLADEY | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

**Sample Name:** 101022-CCR-LPLF8 **Date Collected:** 10/10/22
**Lab Code:** K2211783-003 **Date Received:** 10/10/22
**Sample Matrix:** Ground Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | SSOLADEY | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

**Sample Name:** 101022-CCR-LPLF8 FD **Date Collected:** 10/10/22
**Lab Code:** K2211783-004 **Date Received:** 10/10/22
**Sample Matrix:** Ground Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | SSOLADEY | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR/ | | |

| | | | |
|---|---|---|---|
| **Sample Name:** | 101022-CCR-LPLF7R | **Date Collected:** | 10/10/22 |
| **Lab Code:** | K2211783-005 | **Date Received:** | 10/10/22 |
| **Sample Matrix:** | Ground Water | | |

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | SSOLADEY | AMCKORNEY |
| 9056A | | NFOTH |
| SM 2540 C | | JBYMAN |

# Sample Results

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 10:55 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF1 | **Basis:** | NA |
| **Lab Code:** | K2211783-001 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.573** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:02 | 10/18/22 | |
| Calcium | 6010C | **225** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:02 | 10/18/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 11:41 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 1010-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2211783-002 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.337** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:13 | 10/18/22 | |
| Calcium | 6010C | **460** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:13 | 10/18/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2211783-003 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.979** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:16 | 10/18/22 | |
| Calcium | 6010C | **395** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:16 | 10/18/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:27 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF8 FD | **Basis:** | NA |
| **Lab Code:** | K2211783-004 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.986** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:19 | 10/18/22 | |
| Calcium | 6010C | **397** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:19 | 10/18/22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:54 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF7R | **Basis:** | NA |
| **Lab Code:** | K2211783-005 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.329** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:22 | 10/18/22 | |
| Calcium | 6010C | **234** | mg/L | 0.021 | 0.003 | 1 | 10/19/22 14:22 | 10/18/22 | |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 10:55 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF1 | **Basis:** | NA |
| **Lab Code:** | K2211783-001 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **4.08** | mg/L | 0.50 | 0.15 | 5 | 11/06/22 05:29 | |
| Fluoride | 9056A | **0.06 J** | mg/L | 0.50 | 0.02 | 5 | 11/06/22 05:29 | |
| Sulfate | 9056A | **1540** | mg/L | 50 | 5 | 500 | 11/05/22 14:11 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 10:55 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF1 | **Basis:** | NA |
| **Lab Code:** | K2211783-001 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **2980** | mg/L | 20 | - | 1 | 10/13/22 17:29 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 11:41 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 1010-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2211783-002 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **7.46** | mg/L | 0.50 | 0.15 | 5 | 11/06/22 05:38 | |
| Fluoride | 9056A | ND U | mg/L | 0.50 | 0.02 | 5 | 11/06/22 05:38 | |
| Sulfate | 9056A | **2170** | mg/L | 50 | 5 | 500 | 11/05/22 14:19 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 11:41 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 1010-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2211783-002 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3310** | mg/L | 20 | - | 1 | 10/13/22 17:29 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2211783-003 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **7.23** | mg/L | 0.50 | 0.15 | 5 | 11/06/22 05:47 | |
| Fluoride | 9056A | ND U | mg/L | 0.50 | 0.02 | 5 | 11/06/22 05:47 | |
| Sulfate | 9056A | **2160** | mg/L | 50 | 5 | 500 | 11/05/22 14:28 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF8 | **Basis:** | NA |
| **Lab Code:** | K2211783-003 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3630** | mg/L | 20 | - | 1 | 10/13/22 17:29 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:27 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF8 FD | **Basis:** | NA |
| **Lab Code:** | K2211783-004 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **7.38** | mg/L | 0.50 | 0.15 | 5 | 11/06/22 05:55 | |
| Fluoride | 9056A | ND U | mg/L | 0.50 | 0.02 | 5 | 11/06/22 05:55 | |
| Sulfate | 9056A | **2150** | mg/L | 50 | 5 | 500 | 11/06/22 00:41 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:27 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF8 FD | **Basis:** | NA |
| **Lab Code:** | K2211783-004 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3630** | mg/L | 20 | - | 1 | 10/13/22 17:29 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:54 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF7R | **Basis:** | NA |
| **Lab Code:** | K2211783-005 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | **8.97** | mg/L | 0.50 | 0.15 | 5 | 11/06/22 04:54 | |
| Fluoride | 9056A | **0.07 J** | mg/L | 0.50 | 0.02 | 5 | 11/06/22 04:54 | |
| Sulfate | 9056A | **1280** | mg/L | 50 | 5 | 500 | 11/05/22 11:20 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 12:54 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 15:41 |
| **Sample Name:** | 101022-CCR-LPLF7R | **Basis:** | NA |
| **Lab Code:** | K2211783-005 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **2530** | mg/L | 20 | - | 1 | 10/13/22 17:29 | |

# QC Summary Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | KQ2217656-01 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | ND U | mg/L | 0.021 | 0.003 | 1 | 10/19/22 13:57 | 10/18/22 | |
| Calcium | 6010C | ND U | mg/L | 0.021 | 0.003 | 1 | 10/19/22 13:57 | 10/18/22 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | 10/10/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 |
| | | **Date Analyzed:** | 10/19/22 |
| | | **Date Extracted:** | 10/18/22 |

## Matrix Spike Summary
## Total Metals

| | | | |
|---|---|---|---|
| **Sample Name:** | 101022-CCR-LPLF7R | **Units:** | mg/L |
| **Lab Code:** | K2211783-005 | **Basis:** | NA |
| **Analysis Method:** | 6010C | | |
| **Prep Method:** | EPA CLP ILM04.0 | | |

### Matrix Spike
KQ2217656-05

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 0.329 | 0.806 | 0.500 | 96 | 75-125 |
| Calcium | 234 | 247 | 10.0 | 127 # | 75-125 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.**

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project** | LPLF CCR | **Date Collected:** | 10/10/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 |
| | | **Date Analyzed:** | 10/19/22 |

## Replicate Sample Summary
## Total Metals

| | | | |
|---|---|---|---|
| **Sample Name:** | 101022-CCR-LPLF7R | **Units:** | mg/L |
| **Lab Code:** | K2211783-005 | **Basis:** | NA |

| Analyte Name | Analysis Method | MRL | MDL | Sample Result | Duplicate Sample KQ2217656-06 Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | 0.021 | 0.003 | 0.329 | 0.330 | 0.330 | <1 | 20 |
| Calcium | 6010C | 0.021 | 0.003 | 234 | 234 | 234 | <1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2211783
**Date Analyzed:** 10/19/22

## Lab Control Sample Summary
## Total Metals

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
KQ2217656-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 6010C | 0.525 | 0.500 | 105 | 80-120 |
| Calcium | 6010C | 12.4 | 12.5 | 99 | 80-120 |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND | U | mg/L | 0.10 | 0.03 | 1 | 11/05/22 17:53 | |
| Fluoride | 9056A | ND | U | mg/L | 0.10 | 0.003 | 1 | 11/05/22 17:53 | |
| Sulfate | 9056A | ND | U | mg/L | 0.10 | 0.01 | 1 | 11/04/22 19:10 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | - | 1 | 10/13/22 17:29 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 0.03 | 1 | 11/05/22 22:22 | |
| Fluoride | 9056A | ND U | mg/L | 0.10 | 0.003 | 1 | 11/05/22 22:22 | |
| Sulfate | 9056A | ND U | mg/L | 0.10 | 0.01 | 1 | 11/04/22 22:39 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | - | 1 | 10/13/22 17:29 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB3 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 0.03 | 1 | 11/06/22 01:00 | |
| Fluoride | 9056A | ND U | mg/L | 0.10 | 0.003 | 1 | 11/06/22 01:00 | |
| Sulfate | 9056A | ND U | mg/L | 0.10 | 0.01 | 1 | 11/05/22 13:13 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB4 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | ND U | mg/L | 0.10 | 0.03 | 1 | 11/06/22 04:46 | |
| Fluoride | 9056A | ND U | mg/L | 0.10 | 0.003 | 1 | 11/06/22 04:46 | |
| Sulfate | 9056A | ND U | mg/L | 0.10 | 0.01 | 1 | 11/05/22 17:53 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB5 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Sulfate | 9056A | ND U | mg/L | 0.10 | 0.01 | 1 | 11/05/22 22:22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB6 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Sulfate | 9056A | ND U | mg/L | 0.10 | 0.01 | 1 | 11/06/22 01:00 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2211783-MB7 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|---|
| Sulfate | 9056A | ND U | mg/L | 0.10 | 0.01 | 1 | 11/06/22 04:46 | |

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:**K2211783
**Date Collected:**10/10/22
**Date Received:**10/10/22
**Date Analyzed:**11/05/22 - 11/06/22

## Duplicate Matrix Spike Summary
## General Chemistry Parameters

**Sample Name:** 101022-CCR-LPLF7R
**Lab Code:** K2211783-005

**Units:**mg/L
**Basis:**NA

| | | | Matrix Spike | | | Duplicate Matrix Spike | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | K2211783-005MS | | | K2211783-005DMS | | | | | |
| **Analyte Name** | **Method** | **Sample Result** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Chloride | 9056A | 8.97 | 28.2 | 20.0 | 96 | 28.3 | 20.0 | 97 | 80-120 | <1 | 20 |
| Fluoride | 9056A | 0.07 J | 19.1 | 20.0 | 95 | 19.2 | 20.0 | 96 | 80-120 | <1 | 20 |
| Sulfate | 9056A | 1280 | 3320 | 2000 | 102 | 3310 | 2000 | 102 | 90-110 | <1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project** | LPLF CCR | **Date Collected:** | 10/10/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 10/10/22 |
| | | **Date Analyzed:** | 10/13/22 - 11/06/22 |

## Replicate Sample Summary
## General Chemistry Parameters

| | | | |
|---|---|---|---|
| **Sample Name:** | 101022-CCR-LPLF7R | **Units:** | mg/L |
| **Lab Code:** | K2211783-005 | **Basis:** | NA |

| Analyte Name | Analysis Method | MRL | MDL | Sample Result | Duplicate Sample K2211783-005DUP Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 9056A | 0.50 | 0.15 | 8.97 | 9.00 | 8.98 | <1 | 20 |
| Fluoride | 9056A | 0.50 | 0.02 | 0.07 J | 0.06 J | 0.0670 | 9 | 20 |
| Solids, Total Dissolved | SM 2540 C | 20 | - | 2530 | 2540 | 2540 | <1 | 5 |
| Sulfate | 9056A | 50 | 5 | 1280 | 1280 | 1280 | <1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2211783
**Date Analyzed:** 11/04/22 - 11/05/22

## Lab Control Sample Summary
## General Chemistry Parameters

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
K2211783-LCS2

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Chloride | 9056A | 4.80 | 5.00 | 96 | 80-120 |
| Fluoride | 9056A | 4.92 | 5.00 | 98 | 90-110 |
| Sulfate | 9056A | 5.01 | 5.00 | 100 | 90-110 |

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2211783
**Date Analyzed:** 11/04/22 - 11/05/22

## Lab Control Sample Summary
## General Chemistry Parameters

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
K2211783-LCS3

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Chloride | 9056A | 4.82 | 5.00 | 96 | 80-120 |
| Fluoride | 9056A | 4.93 | 5.00 | 99 | 90-110 |
| Sulfate | 9056A | 5.02 | 5.00 | 100 | 90-110 |

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2211783
**Date Analyzed:** 11/05/22 - 11/06/22

## Lab Control Sample Summary
## General Chemistry Parameters

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
K2211783-LCS4

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Chloride | 9056A | 4.84 | 5.00 | 97 | 80-120 |
| Fluoride | 9056A | 4.95 | 5.00 | 99 | 90-110 |
| Sulfate | 9056A | 5.00 | 5.00 | 100 | 90-110 |

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2211783
**Date Analyzed:** 11/05/22 - 11/06/22

## Lab Control Sample Summary
## General Chemistry Parameters

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
K2211783-LCS5

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Chloride | 9056A | 4.85 | 5.00 | 97 | 80-120 |
| Fluoride | 9056A | 4.97 | 5.00 | 99 | 90-110 |
| Sulfate | 9056A | 4.99 | 5.00 | 100 | 90-110 |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Analyzed:** | 11/05/22 |
| **Sample Matrix:** | Ground Water | **Date Extracted:** | NA |

## Lab Control Sample Summary
## Sulfate

| | | | |
|---|---|---|---|
| **Analysis Method:** | 9056A | **Units:** | mg/L |
| **Prep Method:** | None | **Basis:** | NA |
| | | **Analysis Lot:** | 784194 |

| Sample Name | Lab Code | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Lab Control Sample | K2211783-LCS6 | 5.01 | 5.00 | 100 | 90-110 |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Analyzed:** | 11/06/22 |
| **Sample Matrix:** | Ground Water | **Date Extracted:** | NA |

**Lab Control Sample Summary**
**Sulfate**

| | | | |
|---|---|---|---|
| **Analysis Method:** | 9056A | **Units:** | mg/L |
| **Prep Method:** | None | **Basis:** | NA |
| | | **Analysis Lot:** | 784194 |

| Sample Name | Lab Code | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Lab Control Sample | K2211783-LCS7 | 5.03 | 5.00 | 101 | 90-110 |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Analyzed:** | 11/06/22 |
| **Sample Matrix:** | Ground Water | **Date Extracted:** | NA |

## Lab Control Sample Summary
## Sulfate

| | | | |
|---|---|---|---|
| **Analysis Method:** | 9056A | **Units:** | mg/L |
| **Prep Method:** | None | **Basis:** | NA |
| | | **Analysis Lot:** | 784194 |

| Sample Name | Lab Code | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Lab Control Sample | K2211783-LCS8 | 5.05 | 5.00 | 101 | 90-110 |

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2211783 |
| **Project:** | LPLF CCR | **Date Analyzed:** | 10/13/22 |
| **Sample Matrix:** | Ground Water | **Date Extracted:** | NA |

## Duplicate Lab Control Sample Summary
## General Chemistry Parameters

| | | | |
|---|---|---|---|
| **Analysis Method:** | SM 2540 C | **Units:** | mg/L |
| **Prep Method:** | None | **Basis:** | NA |
| | | **Analysis Lot:** | 781208 |

| | Lab Control Sample K2211783-LCS1 | | | Duplicate Lab Control Sample K2211783-DLCS1 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Solids, Total Dissolved | 1870 | 1920 | 97 | 1870 | 1920 | 97 | 85-115 | <1 | 5 |

December 02, 2022 Service Request No:K2213779

Dennis Morr
Transalta Centralia Mining, LLC
913 Big Hanaford Rd
Centralia, WA 98531

**Laboratory Results for: LPLF CCR**

Dear Dennis,

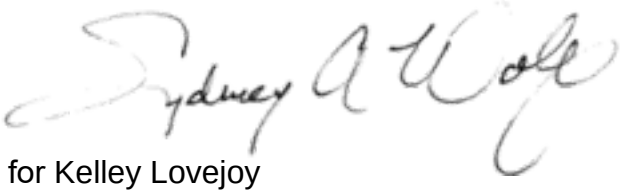
Enclosed are the results of the sample(s) submitted to our laboratory November 21, 2022
For your reference, these analyses have been assigned our service request number **K2213779.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**



for Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

# Narrative Documents

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2213779
**Date Received:** 11/21/2022

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

**Sample Receipt:**

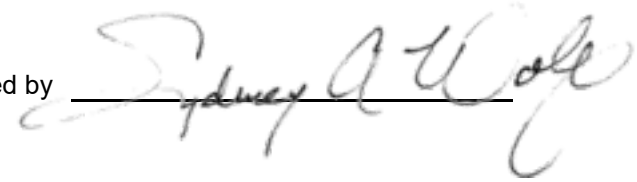
One ground water sample was received for analysis at ALS Environmental on 11/21/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

**Metals:**

No significant anomalies were noted with this analysis.

**General Chemistry:**

No significant anomalies were noted with this analysis.

Approved by  Date 12/02/2022

## SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

| CLIENT ID: 112122-CCR-LPLF2R | | | Lab ID: K2213779-001 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Boron | 0.344 | | | 0.021 | mg/L | 6010C |
| Solids, Total Dissolved | 3450 | | | 20 | mg/L | SM 2540 C |

# Sample Receipt Information

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

**Client:** Transalta Centralia Mining, LLC **Service Request:**K2213779
**Project:** LPLF CCR

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| K2213779-001 | 112122-CCR-LPLF2R | 11/21/2022 | 0957 |

ADDRESS 1317 South 13th Ave., Kelso, WA 98626
PHONE 1 360 577 7222 FAX 1 360 636 1068

Part of the ALS Group A Campbell Brothers Limited Company

**Work Order No.:** M2213779

Chain of Custody

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Project Manager:** | Steve Mahr | | | **Bill to:** | Steve Mahr | | |
| **Client Name:** | TransAlta Centralia Mining Company | | | **Company:** | TransAlta Centralia Mining | | |
| **Address:** | 913 Big Hanaford Road | | | **Address:** | 913 Big Hanaford Road | | |
| **City, State ZIP:** | Centralia, WA 98531 | | | **City, State ZIP:** | Centralia, WA 98531 | | |
| **Email:** | steve_mahr@transalta.com | **Phone:** | 360-330-8140 | **Email:** | steve_mahr@transalta.com | **po#** | |
| Project Name: | LPLF CCR | | | | | | |
| Project Number: | | | | | | | |
| P.O. Number: | 4700092639 Line 30 | | | | | | |
| Sampler's Name: | Steve Mahr | | | | | | |

**SAMPLE RECEIPT**

| | | | | | |
|---|---|---|---|---|---|
| Temperature (°C): | | Temp Blank Present | | | |
| Received Intact: | Yes | No | N/A | Wet Ice / Blue Ice | |
| Cooler Custody Seals: | Yes | No | N/A | Total Containers: | |
| Sample Custody Seals: | Yes | No | N/A | | |

**REQUESTED ANALYSIS**

**TAT**

- ☐ Routine 21day
- ☐ Same Day 100%
- ☐ Next Day ***
- ☐ 3 Day
- ☐ 5 Day 50%

**Surcharges. Please call for availability**

**Due Date:**

| Sample Identification | Matrix | Date Sampled | Time Sampled | Lab ID | No. of Containers | | SM 2540 C / TDS | 9056A / Chloride | 9056A / F | 9056A / SO4 | 6010C / Metals T | | | | | | | | | | | | | **Comments** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | |
| 112122-CCR-LPLF2R | GW | 11/21/2022 | 9:57 | | 2 | | X | | | | X | | | | | | | | | | | | | TDS, Boron only |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |

| | |
|---|---|
| Dissolved | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |
| Total | Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Se, Si, Sn, Sr, Tl, V, Zn, Zr |

**Additional Methods Available Upon Request**

| **RELINQUISHED BY** | | | **RECEIVED BY** | | |
|---|---|---|---|---|---|
| Print Name | Signature | Date/Time | Print Name | Signature | Date/Time |
| **Steve Mahr** | | 11/21/2022 | Naomi Rederson | | 11/21/22 1527 |
| | | | | | |

PM MC

# Cooler Receipt and Preservation Form

Client TransAltra Service Request K22 13779

Received: 11/21/22 Opened: 11/21/22 By: AP Unloaded: 11/21/22 By: AP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

| Temp Blank | Sample Temp | IR Gun | Cooler #/COC ID / NA | Out of temp indicate with "X" | PM Notified if out of temp | Tracking Number NA | Filed |
|---|---|---|---|---|---|---|---|
| 4.0 | — | IR01 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

4. Was a Temperature Blank present in cooler? NA (Y) N If yes, notate the temperature in the appropriate column above:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA (Y) N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. (NA) Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* (*Baggies*) *Bubble Wrap* *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
8. Were samples received in good condition (unbroken) NA (Y) N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA (Y) N
10. Did all sample labels and tags agree with custody papers? NA (Y) N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
13. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
14. Was C12/Res negative? (NA) Y N
15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? (NA) Y N Under filled Overfilled

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---|---|---|
| | | |
| | | |
| | | |

| Sample ID | Bottle Count Bottle Type | Head-space | Broke | pH | Reagent | Volume added | Reagent Lot Number | Initials | Time |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Notes, Discrepancies, Resolutions: _____

# Miscellaneous Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated value. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.<br>*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |
| H | The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. |
| J | The result is an estimated value. |
| E | The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.<br>*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a matrix interference. |
| X | See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimated value. |
| J | The result is an estimated value. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results. |
| U | The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.<br>*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution. |
| i | The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference. |
| X | See case narrative. |
| Q | See case narrative. One or more quality control criteria was outside the limits. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso**
**State Certifications, Accreditations, and Licenses**

| Agency | Web Site | Number |
|---|---|---|
| Alaska DEH | http://dec.alaska.gov/eh/lab/cs/csapproval.htm | UST-040 |
| Arizona DHS | http://www.azdhs.gov/lab/license/env.htm | AZ0339 |
| Arkansas - DEQ | http://www.adeq.state.ar.us/techsvs/labcert.htm | 88-0637 |
| California DHS (ELAP) | http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx | 2795 |
| DOD ELAP | http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm | L16-58-R4 |
| Florida DOH | http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm | E87412 |
| Hawaii DOH | http://health.hawaii.gov/ | - |
| ISO 17025 | http://www.pjlabs.com/ | L16-57 |
| Louisiana DEQ | http://www.deq.louisiana.gov/page/la-lab-accreditation | 03016 |
| Maine DHS | http://www.maine.gov/dhhs/ | WA01276 |
| Minnesota DOH | http://www.health.state.mn.us/accreditation | 053-999-457 |
| Nevada DEP | http://ndep.nv.gov/bsdw/labservice.htm | WA01276 |
| New Jersey DEP | http://www.nj.gov/dep/enforcement/oqa.html | WA005 |
| New York - DOH | https://www.wadsworth.org/regulatory/elap | 12060 |
| North Carolina DEQ | https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification | 605 |
| Oklahoma DEQ | http://www.deq.state.ok.us/CSDnew/labcert.htm | 9801 |
| Oregon – DEQ (NELAP) | http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx | WA100010 |
| South Carolina DHEC | http://www.scdhec.gov/environment/EnvironmentalLabCertification/ | 61002 |
| Texas CEQ | http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html | T104704427 |
| Washington DOE | http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html | C544 |
| Wyoming (EPA Region 8) | https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water- | - |
| Kelso Laboratory Website | www.alsglobal.com | NA |

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LOD | Limit of Detection |
| LOQ | Limit of Quantitation |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

Analyst Summary report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR/ | | |

| | | | |
|---|---|---|---|
| **Sample Name:** | 112122-CCR-LPLF2R | **Date Collected:** | 11/21/22 |
| **Lab Code:** | K2213779-001 | **Date Received:** | 11/21/22 |
| **Sample Matrix:** | Ground Water | | |

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 6010C | SSOLADEY | AMCKORNEY |
| SM 2540 C | | JBYMAN |

# Sample Results

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR | **Date Collected:** | 11/21/22 09:57 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 11/21/22 15:27 |
| **Sample Name:** | 112122-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2213779-001 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | **0.344** | mg/L | 0.021 | 1 | 12/01/22 11:23 | 11/28/22 | |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR | **Date Collected:** | 11/21/22 09:57 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 11/21/22 15:27 |
| **Sample Name:** | 112122-CCR-LPLF2R | **Basis:** | NA |
| **Lab Code:** | K2213779-001 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | **3450** | mg/L | 20 | 1 | 11/23/22 15:39 | |

# QC Summary Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

# Metals

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | KQ2220930-01 | | |

## Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Date Extracted | Q |
|---|---|---|---|---|---|---|---|---|
| Boron | 6010C | ND U | mg/L | 0.021 | 1 | 12/01/22 11:19 | 11/28/22 | |

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR | **Date Collected:** | 11/21/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 11/21/22 |
| | | **Date Analyzed:** | 12/1/22 |
| | | **Date Extracted:** | 11/28/22 |

## Matrix Spike Summary
## Total Metals

| | | | |
|---|---|---|---|
| **Sample Name:** | 112122-CCR-LPLF2R | **Units:** | mg/L |
| **Lab Code:** | K2213779-001 | **Basis:** | NA |
| **Analysis Method:** | 6010C | | |
| **Prep Method:** | EPA CLP ILM04.0 | | |

### Matrix Spike
KQ2220930-03

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 0.344 | 0.803 | 0.500 | 92 | 75-125 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.**

**ALS Group USA, Corp.**

**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project** | LPLF CCR | **Date Collected:** | 11/21/22 |
| **Sample Matrix:** | Ground Water | **Date Received:** | 11/21/22 |
| | | **Date Analyzed:** | 12/01/22 |

## Replicate Sample Summary
## Total Metals

| | | | |
|---|---|---|---|
| **Sample Name:** | 112122-CCR-LPLF2R | **Units:** | mg/L |
| **Lab Code:** | K2213779-001 | **Basis:** | NA |

| Analyte Name | Analysis Method | MRL | Sample Result | Duplicate Sample KQ2220930-04 Result | Average | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|
| Boron | 6010C | 0.021 | 0.344 | 0.348 | 0.346 | 1 | 20 |

**Results flagged with an asterisk (*) indicate values outside control criteria.**

**Results flagged with a pound (#) indicate the control criteria is not applicable.**

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

**Client:** Transalta Centralia Mining, LLC
**Project:** LPLF CCR
**Sample Matrix:** Ground Water

**Service Request:** K2213779
**Date Analyzed:** 12/01/22

## Lab Control Sample Summary
## Total Metals

**Units:**mg/L
**Basis:**NA

### Lab Control Sample
KQ2220930-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Boron | 6010C | 0.500 | 0.500 | 100 | 80-120 |

# General Chemistry

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2213779-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | 1 | 11/23/22 15:39 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR | **Date Collected:** | NA |
| **Sample Matrix:** | Ground Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2213779-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Solids, Total Dissolved | SM 2540 C | ND U | mg/L | 5.0 | 1 | 11/23/22 15:39 | |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | Transalta Centralia Mining, LLC | **Service Request:** | K2213779 |
| **Project:** | LPLF CCR | **Date Analyzed:** | 11/23/22 |
| **Sample Matrix:** | Ground Water | **Date Extracted:** | NA |

**Lab Control Sample Summary**
**Solids, Total Dissolved**

| | | | |
|---|---|---|---|
| **Analysis Method:** | SM 2540 C | **Units:** | mg/L |
| **Prep Method:** | None | **Basis:** | NA |
| | | **Analysis Lot:** | 786385 |

| Sample Name | Lab Code | Result | Spike Amount | % Rec | % Rec Limits |
|---|---|---|---|---|---|
| Lab Control Sample | K2213779-LCS | 1870 | 1920 | 98 | 85-115 |