

FINAL

BASELINE MONITORING REPORT

**2021 Annual Baseline Monitoring Report
Red Devil Mine, Alaska**

**Contract Number: 140L63-21-C-0001
Amendment P00001**

Submitted to:

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BUREAU OF LAND MANAGEMENT
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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
DO	dissolved oxygen
DoD	Department of Defense
DQO	Data Quality Objectives
E&E	Ecology and Environment Inc.
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study
ID	identification
IDW	Investigation Derived Waste
ICSA	Interference Check Standard A
mg/L	milligrams per liter
MPA	Main Processing Area
MPC	measurement performance criteria
MW	Monitoring Well
ng/L	nanograms per liter
No.	Number
ORP	oxidation reduction potential
PARCC	Precision, Accuracy, Representativeness, Completeness, and Comparability
PPE	personal protective equipment
QAPP	Quality Assurance Project Plan
QC	Quality Control
RDM	Red Devil Mine
Report	2021 Annual Baseline Monitoring Report
RI	Remedial Investigation

SMA Surface Mined Area
Sundance Sundance Consulting, Inc.,

TAL Target Analyte List
TDS Total dissolved solids
TSS Total suspended solids

*Work Plan Final Work Plan, Groundwater and Surface Water Baseline Monitoring,
Red Devil Mine, Alaska*

1 INTRODUCTION

This 2021 Annual Baseline Monitoring Report (Report) presents the findings of the 2021 spring and fall baseline groundwater and surface water monitoring efforts performed at the Red Devil Mine (RDM) site (Figure 1-1). The RDM is an abandoned mercury mine and ore processing facility located on public lands managed by the Bureau of Land Management (BLM) in southwest Alaska. Historical mining activities included underground and surface mining and ore processing. On-site ore processing included crushing, retorting/furnacing, milling, and flotation. Sundance Consulting, Inc. (Sundance), prepared this Report on behalf of the BLM under Contract Number (No.) 140L63-21-C-0001 Amendment P00001.

This Report summarizes the field activities, procedures, and results for the 2021 spring and fall baseline monitoring of groundwater and surface water efforts performed at RDM site.

1.1 PURPOSE AND OBJECTIVES

The purpose of baseline monitoring was to collect surface water and groundwater samples, as well as stream discharge and groundwater elevation data during spring and fall to inform remedial actions at the RDM. Baseline monitoring expands upon work that began during the 2011–2014 Remedial Investigation (RI) (Ecology and Environment Inc. [E&E], 2014) and continued through the 2015–2018 Supplemental RI (E&E, 2018) and simultaneous annual baseline monitoring for groundwater and surface water during spring and fall. The objectives are to:

- Characterize the seasonal variability in groundwater and surface water hydrology and quality; and
- Characterize the long-term (multiple year) variability in groundwater and surface water hydrology and quality.

1.2 PROJECT LOCATION, SETTING, AND AREAS

The RDM site is located approximately 250 miles west of Anchorage, Alaska. Located on the southwest bank of the Kuskokwim River, approximately 2 miles southeast of the village of Red Devil, the site is 8 miles northwest of the village of Sleetmute, and 75 miles northeast of Aniak, the largest village in the region. Fifteen villages are located downstream of Red Devil on the Kuskokwim River. The legal description for the RDM site is Township 19 North, Range 44 West, Southeast Quarter of Section 6, Sleetmute D-4 Quadrangle, Seward Meridian. The RDM site's approximate coordinates are 61° 45' 38.1" north latitude and 157° 18' 42.7" west longitude (North American Datum 1927). The RDM site is in a remote location, and access to the site is available by boat or barge on the Kuskokwim River or by means of an airstrip at the nearby village of Red Devil. An unimproved road leads from the airstrip through the village of Red Devil to the RDM site. Access to the RDM site is restricted by two locked gates, one on the unimproved road and a boat landing along the Kuskokwim River.

Historical mining operations left tailings and other remnants that have affected local soil, surface water, sediment, and groundwater. Based on the locations of tailings and other features, baseline monitoring is focused on surface water and groundwater in the following areas as shown on historical Figure 1-2 (E&E, 2021):

- **Main Processing Area (MPA)**—The MPA contained most of the former site structures and was where ore beneficiation and mineral processing was conducted. The area is split by Red Devil Creek. Underground mine openings (e.g., shafts, adits, and stopes to the surface) and ore processing and mine support facilities (e.g., housing and warehousing) were located on the west side of Red Devil Creek until 1955. After 1955, all ore processing was conducted at structures and facilities on the east side of Red Devil Creek.

The MPA includes three monofills. The monofills are essentially landfills that contain demolished mine structure debris and other material. Two of the monofills, #1 and #3, are unlined. Monofill #2, on the east side of Red Devil Creek, is an engineered and lined containment structure for building debris and materials from the demolished post-1955 retort structure.

- **Surface Mined Area (SMA)**—The SMA is located west of the MPA where historical surface exploration and mining occurred. The SMA is partially underlain by underground mine workings. The “Dolly Sluice” and “Rice Sluice” and their respective deltas on the bank of the Kuskokwim River are associated with the SMA.
- **Vicinity of Proposed Repository**—The Proposed Repository is located uphill of the SMA on the north side of Red Devil Creek.
- **Red Devil Creek**—Red Devil Creek extends from a reservoir upstream of the MPA to the creek’s delta at its confluence with the Kuskokwim River.
- **Seep (RD05)**—The Seep is located on the north bank of Red Devil Creek downgradient of the former mine operations and tailings area.

2 BASELINE MONITORING FIELD ACTIVITIES

All field activities were performed in accordance with the *Final Work Plan, Groundwater and Surface Water Baseline Monitoring, Red Devil Mine, Alaska* ([*Work Plan*], BLM, 2019), and the addendum to the *Work Plan* (Sundance, 2021a). Field activities included tailgate safety meetings, the assessment of the operational status of the monitoring well network, synoptic measurement of groundwater elevations, downloading of transducer data, groundwater sampling, Red Devil Creek and Seep discharge gauging, and surface water sampling. All field documentation, including Tailgate Safety Field Forms, Monitoring Well Integrity Checklists, field notebooks, groundwater sampling forms, surface water sampling forms, and calibration logs, are provided in Attachment 1. Photographic documentation is provided in Attachment 2 and includes a photograph index log with detailed descriptions included in the caption of each photograph collected during the field activities.

Spring and fall field activities occurred between 02 June 2021 and 10 June 2021, and 27 August 2021 and 04 September 2021, respectively. For the spring event, the field team consisted of the field team lead, Colleen Rust, PG, PMP, CPG; Site Health and Safety Officer, George Garner; and Field Technician, Judd Parson. For the fall sampling event, the field team consisted of the field team lead, Judd Parson; Site Health and Safety Officer, George Garner; and Field Technician, Riley Wittler. A tailgate safety meeting was held with the field team before the start of each day. As field conditions changed during the day because of type of activity or site conditions, participants had undocumented impromptu safety breaks to discuss changing conditions and how they may apply to health and safety during field visit activities. Tailgate safety meeting forms are provided in Attachment 1.

An initial site walk was conducted to assess the site conditions, the operational status of the monitoring well network, to clear the trail system from recent deadfall from the previous winter and summer seasons, to perform a synoptic measurement of groundwater elevations across the site within a 24-hour period and downloading of transducer data. The initial site walk was followed by low-flow groundwater sampling and field maintenance of groundwater monitoring wells. After completing groundwater well sampling, the field team performed surface water discharge measurements within Red Devil Creek and Seep and surface water sampling of Red Devil Creek. Each baseline monitoring field activity is further described in the following sections. Associated field documentation of the monitoring well survey, groundwater sampling, and surface water sampling are provided in Attachment 1.

2.1 GROUNDWATER ELEVATIONS

Groundwater elevation during the 2021 baseline monitoring events consisted of the following:

- Measuring static water levels at all accessible monitoring wells at the RDM site within a 24-hour period to collect a “synoptic snapshot” of groundwater levels.
- Downloading of continuous water level measurements from pressure transducers installed within specific monitoring wells.

The groundwater static water levels were measured on 04 June 2021 and 28 August 2021. Static water level measurements were augmented with the continuous water level measurements

collected from pressure transducers installed within specific monitoring wells between the fall of 2017 and fall 2021, as described in the *Work Plan* (BLM, 2019, and Sundance, 2021).

Synaptic groundwater elevations for spring 2021 and fall 2021 are shown on Figure 2-1 and Figure 2-2, respectively, and tabulated in Table 2-1. Pressure transducer data recorded between September 2020 and September 2021 were downloaded during the spring and fall 2021 field events, and the transducers were then reinstalled on monitoring wells MW50, MW51, MW53, MW54, MW56, MW57, MW58, and MW59, as noted on Figure 1-1. Pressure transducer data-logger files containing depth of submersion time series data were corrected for barometric pressure and converted to groundwater elevations. The resulting groundwater elevation time series plots are presented on Figure 2-3.

2.2 RED DEVIL CREEK AND SEEP DISCHARGE GAUGING

During the 2021 baseline monitoring spring and fall events, Red Devil Creek and Seep discharge gauging was conducted at five locations along Red Devil Creek between the creek’s mouth at the Kuskokwim River and the historical reservoir south-southwest of the MPA. Surface water monitoring locations are illustrated on Figure 1-1.

Surface water discharge was measured using the mid-section method at creek monitoring locations following the mid-section methodology described in the *Work Plan* (BLM, 2019). At the Seep (RD05), discharge was measured using the timed fill method described in the *Work Plan* (BLM, 2019). Surface water discharge values are tabulated in Table 2-2.

2.3 GROUNDWATER SAMPLING

Groundwater sampling during the 2021 baseline monitoring spring and fall events was conducted at 26 existing monitoring wells identified on Figure 1-1. Five monitoring wells (MW06, MW16, MW17, MW33, and MW55) were sampled with a peristaltic pump; all others were collected using dedicated bladder pumps. Groundwater samples were collected for the following analyses:

- Total target analyte list (TAL) metals by U.S. Environmental Protection Agency (EPA) Method 6010C/6020A
- Total low-level mercury by EPA Method 1631E
- Dissolved low-level mercury by EPA Method 1631E
- Field water quality parameters including temperature, specific conductivity, dissolved oxygen (DO), pH, oxidation reduction potential (ORP), and turbidity.

Field water quality measurements were collected at each monitoring well prior to groundwater sample collection. Groundwater samples were collected using a low-flow sampling methodologies described in the *Work Plan* (BLM, 2019) with either a peristaltic or dedicated bladder pump with a maximum flow rate of 0.5 liters per minute. Analytical data for groundwater samples collected during the spring and fall events are tabulated in Table 2-3 and Table 2-4, respectfully.

2.4 SURFACE WATER SAMPLING

Surface water sampling during the 2021 baseline monitoring spring and fall events was conducted at five locations from just upstream of Red Devil Mine (historical reservoir) to the point where Red Devil Creek discharges into the Kuskokwim River as identified on Figure 1-1.

Surface water samples were collected for the following analyses and methods:

- Total TAL metals by EPA Method 6010/6020A
- Total low-level mercury by EPA Method 1631E
- Total suspended solids (TSS) by Method SM 2540D
- Total dissolved solids (TDS) by Method SM 2540C
- Inorganic ions by Method MCAWW 300.0
- Nitrate/nitrite (as N) by Method MCAWW 353.2
- Field water quality parameters including temperature, specific conductivity, DO, pH, ORP, and turbidity

Surface water samples were collected using a battery-operated peristaltic pump outfitted with certified-clean, dedicated silicone tubing following sampling methodologies described in the *Work Plan* (BLM, 2019). Analytical data for surface water samples during the spring and fall events are tabulated in Table 2-5 and Table 2-6, respectively.

2.5 SAMPLE HANDLING

Sample handling (e.g., chain-of-custody and field documentation) was conducted as described in the *Work Plan* (BLM, 2019).

2.6 QUALITY CONTROL SAMPLES

Field quality control (QC) samples, including field duplicates, matrix spike, and matrix spike replicates, were collected for all matrices (e.g., groundwater and surface water) and analytes as described in the *Work Plan* (BLM, 2019).

2.7 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste (IDW) generated during the 2021 baseline monitoring spring and fall events included the following:

- Monitoring well purge water.
- Used dedicated and disposable sampling equipment, personal protective equipment, and paper towels.
- Decontamination fluids generated during groundwater sampling.

IDW was managed in accordance with the *Work Plan* (BLM, 2019). Purge water, decontamination water, paper towels, used tubing, and disposable PPE were disposed of in accordance with the procedures described in the *Work Plan* (BLM, 2019 and Sundance, 2021).

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3 DEVIATIONS

During the 2021 baseline monitoring spring and fall field activities, the following deviations were made from the *Work Plan* (BLM, 2019). These deviations did not affect project data quality objectives (DQOs) or final conclusions and recommendations. Deviations resulted from field conditions, field observations, field access, available resources on a remote site, and schedule adjustments. Deviations were documented in the field logbooks provided in Attachment 1. There were three deviations from the *Work Plan* (BLM, 2019):

1. MW42 was unable to be sampled, during the spring field event, after the dedicated bladder pump tubing failed and fell into the monitoring well. Multiple attempts were made to retrieve the tubing; however, it was unable to be repaired during the spring sampling event. The tubing and pump were extricated from the monitoring well, replaced, and sampled during the fall sampling event. Further details are provided in the field notes in Attachment 1.
2. MW29 was unable to be sampled, during the spring field event, after the dedicated bladder pump tubing was found to be missing from the previous contractor. Multiple attempts were made to retrieve the tubing; however, it was unable to be repaired during the spring sampling event. The tubing and pump were extricated from the monitoring well, replaced, and sampled during the fall sampling event. Further details are provided in the field notes in Attachment 1.
3. The location identifications (IDs) of surface water sample 0621RD05SW and 0621RD15SW were misidentified during the spring sampling event. Sample 0621RD05SW was collected from location RD15 and 0621RD15SW was collected from location RD05 (seep). Field notes, discharge measurements, and sample collection forms describe the sample location of RD15 as the seep, which allowed for the correction. The locations of these surface water samples are not representative of their sample IDs, which is referenced in Table 2-5, where their analytical results are displayed. The analytical results are discussed by location relative to other samples to avoid confusion.

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4 BASELINE MONITORING RESULTS

4.1 GROUNDWATER ELEVATION AND SURFACE WATER DISCHARGE MONITORING

Groundwater elevations for all active groundwater wells at RDM were collected during a single 24-hour period during both the spring and fall sampling events. Table 2-1 presents depth to groundwater measurements and calculated groundwater elevations for monitoring wells during the spring and fall 2021 baseline monitoring events. Transducer data were collected from monitoring wells during the same period to allow for pressure and groundwater depth correction. Table 2-1 presents the physically measured groundwater elevations, not the groundwater elevations calculated by pressure transducers.

Surface water discharge measurements were collected during both spring and fall events. Estimated surface water discharge calculations for Red Devil Creek surface water stations during the spring and fall 2021 baseline monitoring events are presented in Table 2-2.

Based on static water elevations, stream elevations, and discharge measurements along Red Devil Creek, and excluding transducer data, groundwater potentiometric surface and surface water discharge maps for the spring and fall 2021 baseline monitoring were generated and are presented on Figure 2-1 and Figure 2-2.

Pressure transducer data was not used to create the potentiometric groundwater surface map (Figure 2-1).

Pressure transducer data-logger files containing depth of submersion time series data were corrected for barometric pressure and converted to groundwater elevations. The resulting groundwater elevation time series plots are presented on Figure 2-3. Spring and Fall groundwater well and stream gauging data is included in Attachment 3.

4.2 GROUNDWATER RESULTS

Analytical results for groundwater samples collected during the spring and fall events are presented in Table 2-3 and Table 2-4. Maps of all sampling locations with corresponding analytical results for antimony, arsenic, total low-level mercury, and dissolved low-level mercury are presented on Figure 4-1 through Figure 4-6. Analytical Laboratory Data reports are included in Attachment 4.

4.2.1 2021 Spring Groundwater Results

Twenty-six primary groundwater samples were collected during the 2021 spring monitoring event. Duplicate samples were collected from the following monitoring wells per the Final Baseline Quality Assurance Project Plan (QAPP), which is included as an appendix to the *Work Plan* (BLM, 2019): MW17, MW27, and MW47. A summary for analytical results for groundwater samples are provided in Table 2-3 and shown on Figure 4-1 through Figure 4-3.

- Antimony was detected in all groundwater samples. Antimony concentrations ranged from 0.13 J to 1,000 micrograms per liter ($\mu\text{g/L}$) with the highest concentration in groundwater sample 0621MW16GW.

- Arsenic was detected in all groundwater samples. Arsenic concentrations ranged from 0.45 J to 1,000 µg/L with the highest concentration in groundwater sample 0621MW26GW.
- Total mercury was detected in all groundwater samples. Total mercury concentrations ranged from 1.64 to 1,530 nanograms per liter (ng/L) with the highest concentration in groundwater sample 0621MW50GW.
- Dissolved mercury was detected in all groundwater samples. Dissolved mercury concentrations ranged from 0.65 to 496 ng/L with the highest concentration in groundwater sample 0621MW27GW.

4.2.2 2021 Fall Groundwater Results

Twenty-eight primary groundwater samples were collected during the 2021 fall event. Duplicate samples were collected from the following three monitoring wells per the QAPP in the *Work Plan* (BLM, 2019): MM33, MW27, and MW47. A summary for analytical results for groundwater samples is provided in Table 2-4 and shown on Figure 4-4 through Figure 4-6.

- Antimony was detected in all groundwater samples but one, 0821MW97GW, a duplicate of 0821MW47GW, which was a non-detect. Antimony concentrations ranged from 0.14 J to 1,300 µg/L with the highest concentration in groundwater sample 0821MW16GW.
- Arsenic was detected in 27 of the 28 primary groundwater samples. Groundwater sample 0821MW47GW was a non-detect. Arsenic concentrations ranged from 0.29 J to 1,300 µg/L with the highest concentration in groundwater sample 0821MW16GW.
- Total mercury was detected in all groundwater samples. Total mercury concentrations ranged from 2.02 to 1,380 ng/L with the highest concentration in groundwater sample 0821MW42GW.
- Dissolved mercury was detected in all groundwater samples. Dissolved mercury concentrations ranged from 0.61 to 874 ng/L with the highest concentration in groundwater sample 0821MW16GW.

4.3 SURFACE WATER RESULTS

Analytical results of surface water sampling conducted during the spring and fall 2021 baseline monitoring event are presented in Table 2-5 and Table 2-6. Data quality assurance review memoranda are provided in Attachment 5. Maps of all sampling locations with corresponding analytical results for antimony, arsenic, mercury are presented on Figure 4-7 through Figure 4-8.

4.3.1 2021 Spring Surface Water Results

During the spring 2021 baseline monitoring event, five surface water samples and one field duplicate sample, 0621RD99SW (field duplicate of 0621RD08SW), were collected from Red Devil Creek. A summary for analytical results for spring surface water samples are provided in Table 2-5 and shown on Figure 4-7.

- Antimony was detected in all surface water samples. Antimony concentrations ranged from 0.0016 to 0.15 J milligrams per liter (mg/L) with the highest concentration in surface water sample 0621RD08SW.

- Arsenic was detected in all surface water samples. Arsenic concentrations ranged from 0.00098 J to 1.3 J mg/L with the highest concentration in surface water sample 0621RD05SW.
- Mercury was detected in all surface water samples. Mercury concentrations ranged from 2.63 to 85.5 J+ ng/L with the highest concentration in surface water sample 0621RD06SW.

4.3.2 2021 Fall Surface Water Results

During the fall 2021 baseline monitoring event, five surface water samples and one field duplicate sample, 0921RD99SW (field duplicate of 0921RD15SW), were collected from Red Devil Creek. A summary for analytical results for fall surface water samples are provided in Table 2-6 and shown on Figure 4-8.

- Antimony was detected in all surface water samples. Antimony concentrations ranged from 0.0014 J+ to 0.13 J mg/L, with the highest concentration in surface water sample 0921RD08SW.
- Arsenic was detected in all surface water samples. Arsenic concentrations ranged from 0.0012 to 0.83 mg/L with the highest concentration in surface water sample 0921RD05SW.
- Mercury was detected in all surface water samples. Mercury concentrations ranged from 5.22 to 311 ng/L with the highest concentration in surface water sample 0921RD08SW.

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5 DATA USABILITY ASSESSMENT

A third-party data validation was performed on 100% of the surface water and groundwater analytical data generated during the 2021 spring and fall sampling events. The validation was inclusive of validation levels Stage 2B (90%) and Stage 4 (10%). The data were validated in accordance with the QAPP (BLM, 2019), EPA *National Functional Guidelines for Inorganic Superfund Methods Data Review* (EPA, 2017), and the *Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories* Version 5.1 (DoD, 2017).

DQOs are both qualitative and quantitative statements that define the type, quality, and quantity of data necessary to support the decision-making process during project activities. To ensure the collection of data of the type and quality required for project decision-making, data validation results were evaluated for the DQO data quality indicators of precision, bias (accuracy), representativeness, comparability, and completeness (formerly precision, accuracy, representativeness, completeness, and comparability [PARCC] parameters), as outlined in the QAPP. Data quality indicators were evaluated according to analytical and field QC activity and associated measurement performance criteria (MPC). The results of the evaluation were used to assess data usability and completeness.

Twenty-seven surface water and groundwater samples were qualified as non-detect for low-level detections in continuing calibration blanks for metals and anions for one or more of the following analytes during the spring sampling event:

- Aluminum
- Antimony
- Chloride
- Chromium
- Nickel
- Potassium
- Thallium
- Zinc

All surface water and groundwater data were qualified as non-detect for low-level detections in method blanks, continuing calibration blanks, initial calibration blanks, equipment blanks, or trip blank samples for metals and low-level mercury analyses for one or more of the following analytes during the fall sampling event:

- Antimony
- Zinc
- Thallium
- Potassium
- Cadmium

- Chromium
- Lead
- Manganese
- low-level Mercury

Blank qualifications did not impact data usability.

No surface water or groundwater data were qualified due to field or analytical precision MPC exceedances during the spring or fall sampling events. There were minor deviations in field precision during spring and fall sampling events.

During the spring sampling event, metals field duplicate pair 580-103791-9/580-103791-16 had RPDs greater than \pm the reporting limit for chromium, iron, and manganese. Metals field duplicate pair 580-103791-10/580-103791-18 had RPDs greater than \pm the reporting limit for chromium and copper. Anion field duplicate pair 580-103791-3/580-103791-6 had an RPD of greater than \pm the reporting limit for total dissolved solids and total suspended solids. Associated sample results were qualified as estimated (J).

During the fall sampling event, metals field duplicate pair 0821MW33GW/0821MW99GW had RPDs greater than \pm the reporting limit for lead and chromium. Metals field duplicate pair 0821MW27GW/0821MW98GW had RPDs greater than \pm the reporting limit for lead. Associated sample results were qualified as estimated (J).

Field precision qualifications did not impact data usability.

Multiple analytes were qualified as estimated (J or UJ) in 33 surface water and groundwater samples due to minor accuracy/bias quality control exceedances (Interference Check Sample A [ICSA]) detections, internal standard recoveries, matrix spike/matrix spike duplicate recoveries) during the fall sampling event.

During the spring sampling event, the laboratory reported results for surface water and groundwater samples above the linear curve range and did not analyze a high linear range check standard. Sample detections reported above the high standard in the calibration curve were qualified as estimated (J) in all samples for the following analytes:

- Calcium
- Magnesium
- Sodium
- Potassium
- Antimony
- Arsenic
- Barium
- Iron
- Manganese

In addition, the initial calibration verification and continuing calibration verification standards for calcium, magnesium, sodium, and potassium did not meet method requirements; therefore, all samples' results were qualified as estimated (J or UJ). Cadmium results were qualified as estimated for five samples due to a positive interference check sample (ICSA) result.

Detections in ten samples were qualified as estimated (J) for anions during the fall sampling event due to holding time exceedances. Both detected and non-detected sample results were qualified as estimated (J or UJ) for anions during the spring sampling event due to an exceedance in cooler temperature (10.1 degrees Celsius [$^{\circ}$ C]) upon receipt at the laboratory. Qualification for holding time and temperature exceedances did not impact data usability.

Accuracy/bias qualifications did not impact data usability.

Analytical laboratory reports are provided in Attachment 4. Further detailed data validation and quality assessment information is provided in the Data Validation Reports in Attachment 5.

5.1 DATA USABILITY ASSESSMENT

The analytical data completeness for the fall and spring sampling events is 100%. No sample results were qualified as rejected (R) or unsuitable for use in project decision-making. Metals, mercury, and anion samples were qualified as estimated (UJ) for low-level field and analytical blank contamination during both events, indicating minor uncertainty in sample representativeness. In addition, sample results were qualified as estimated (J or UJ) for minor deviations in accuracy/bias and field precision during both sampling events, indicating minor uncertainty. However, qualified data are considered acceptable for use in project decision-making.

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6 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

During the 2021 Annual Baseline Monitoring field efforts, samples were collected from groundwater monitoring wells in three areas: the MPA, the SMA, and the vicinity of the Proposed Repository. Additionally, surface water samples were collected from Red Devil Creek and a perennial seep that discharges into Red Devil Creek. The analytical results of these groundwater and surface water samples were reviewed and compared with historical data to identify concentration trends.

6.1 GROUNDWATER CONCLUSIONS

The groundwater analytical results from the 2021 sampling efforts are consistent with results from historical sampling efforts at RDM as seen in *Final 2020 Baseline Monitoring Report, Red Devil Mine, Alaska* (E&E, 2021).

Groundwater elevation results for the 2021 sampling efforts are consistent with trends defined during the RI/Feasibility Study (FS).

The water table surface in the upper SMA and the MPA mimics topography and flows toward Red Devil Creek. Groundwater flow in the lower SMA is locally perturbed by historical mine workings. Although the underground workings have very likely collapsed, this tunnel network is much more conductive than the surrounding bedrock. Consequently, the water table is depressed around the workings. Because the conductivity of the bedrock aquifer is relatively low, the depressed water table extends only a short distance outside of the zone where the tunnel network is prevalent, creating a very steep gradient. The overall effect of the underground workings is very localized (refer to Figure 2-1 and Figure 2-2). In general, groundwater flow within the entire SMA is toward Red Devil Creek.

Continuous groundwater elevation data recorded in 2021 using transducers extends the temporal trends established in previous years, as shown on Figure 2-3. In late spring, groundwater elevations rise quickly to a maximum elevation that correlates with spring breakup. The seasonal maximum elevation lasts only a few days, followed by a recession that extends until the following spring. Water table elevations vary slightly over the summer and fall months in response to local precipitation. Once subsurface freezing becomes prevalent during the winter, water table elevations decrease steadily until the following spring breakup, which is typically in May.

The concentrations of the three primary contaminants of concern (COCs), antimony, arsenic, and mercury, in the groundwater samples from the 2021 baseline monitoring events are within the range expected based on review of data collected during the RI and previous baseline monitoring. Measured concentrations of COCs in individual monitoring wells reflect conditions at that location. The highest COC concentrations occur in the monitoring wells installed in tailings/waste rock in the MPA. Concentrations of these primary COCs are highly variable in the SMA, reflecting the influence of natural mineralization in the immediate vicinity of each monitoring well. In general, groundwater COC concentrations do not appear to be influenced by seasonal water level fluctuations. Graphs of groundwater primary COC concentrations and water level measurements for all monitoring wells are presented on Figure 6-1.

6.2 SURFACE WATER CONCLUSIONS

The surface water analytical results from the 2021 sampling efforts are consistent with results from historical sampling efforts at RDM as seen in *Final 2020 Baseline Monitoring Report, Red Devil Mine* (E&E, 2021).

The 2021 concentrations of the three primary COCs, antimony, arsenic, and mercury, in the surface water samples are within the range established during the RI. The highest concentrations were detected in samples collected from the Seep (RD05). Comparison of COC concentrations with stream discharge data indicate no correlation. Graphs of surface water primary COC concentrations and discharge measurements for all locations are found on Figure 6-2 and Figure 6-3.

6.3 RECOMMENDATIONS

Groundwater sampling and analysis has evolved through the RI/FS phases of this Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) project from characterization to baseline monitoring. Initial goals of groundwater sampling and analysis were consistent with the overall objectives of the RI and were focused primarily on the area along the lower reach of Red Devil Creek referred to as the MPA. Additional monitoring wells have been installed since the initial RI was completed that have broadened our understanding of flow within the bedrock aquifer in areas that are influenced by natural mineralization but are not affected by the tailings and waste rock. The BLM selected a preferred remedial action alternative in 2020 that involves consolidating tailings/waste rock in an engineered repository located in the SMA. Consequently, groundwater characterization emphasizing the area dominated by tailings and a broad range of potential contaminants has transitioned to baseline monitoring of upper elevations (upgradient of the tailings) and more focus on the contaminants that are responsible for most of the environmental risk estimated for the site.

Based on the data collected during the two mobilizations covered by this report, continued monitoring of the same scope is recommended until the Record of Decision is complete and the remedial action has been determined. Baseline monitoring should continue to meet remedial action objectives.

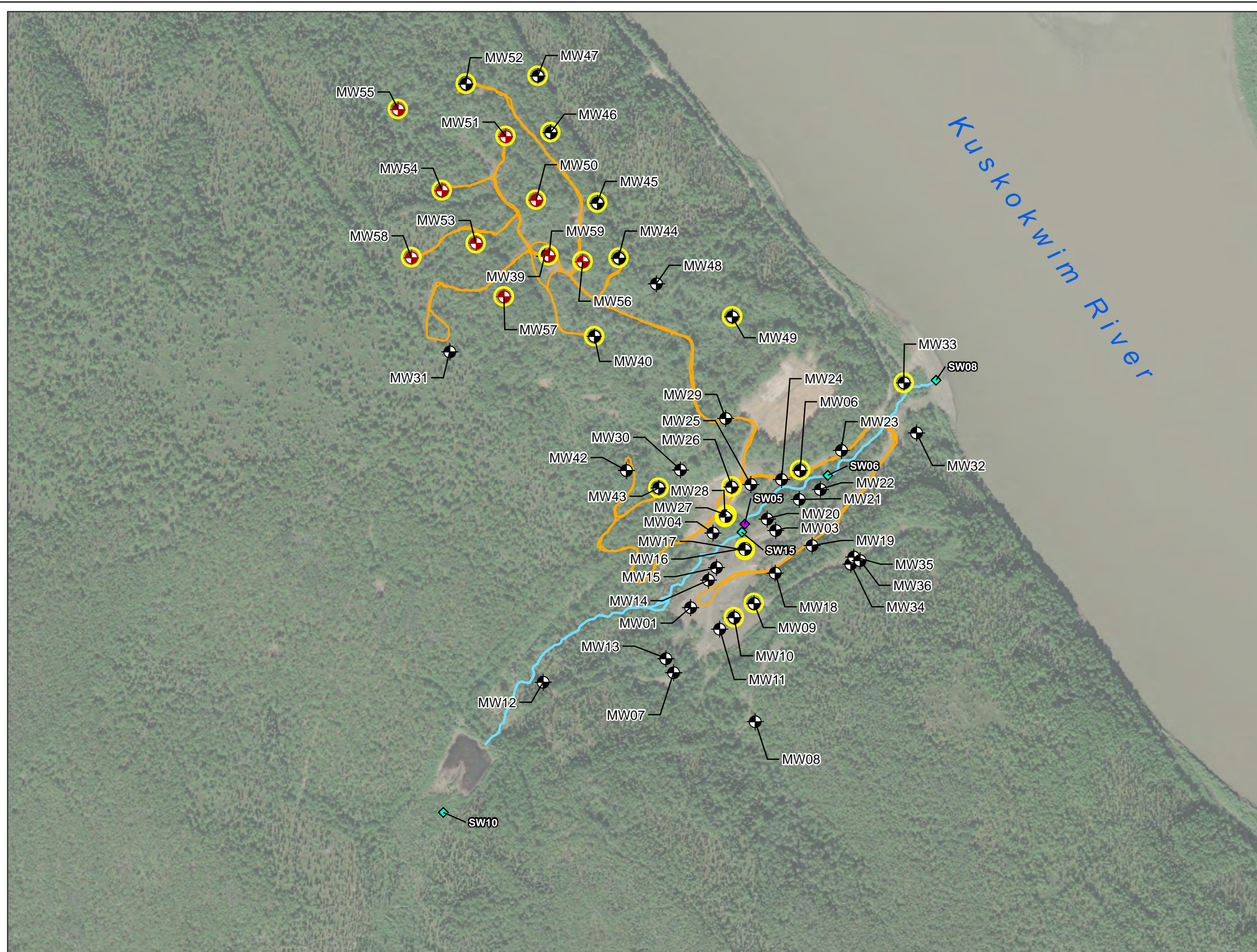
7 REFERENCES

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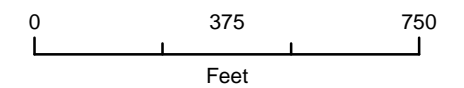
FIGURES

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Legend

- Monitoring Well Location
- Transducer Well Location
- Sampled MW Location
- Surface Water Location
- Seep Location
- ATV Track
- Red Devil Creek

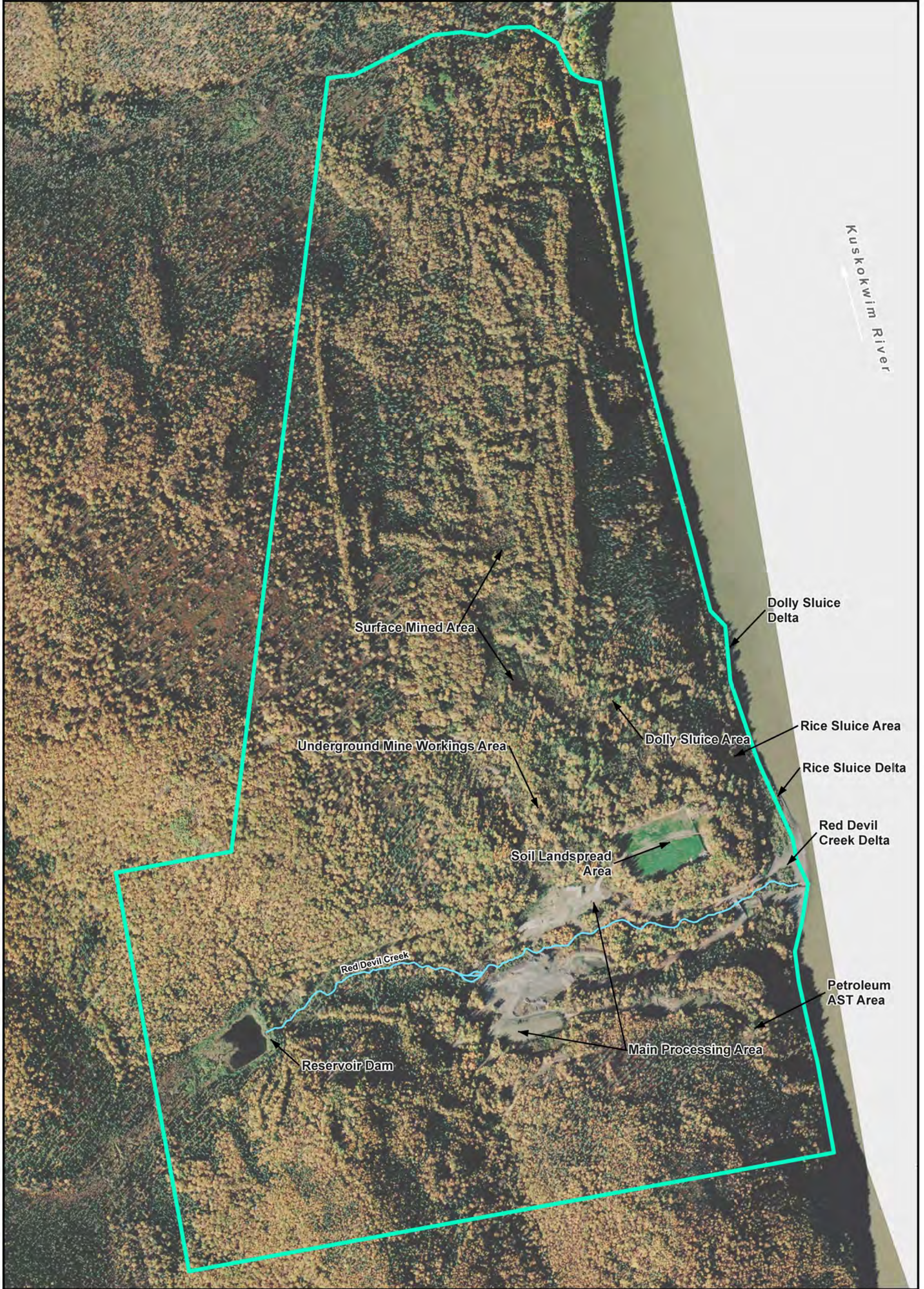



Imagery: Esri, 2013

**2021 Annual Baseline
Summary Report**
Red Devil Mine, Alaska

Surface Water and Monitoring
Well Locations

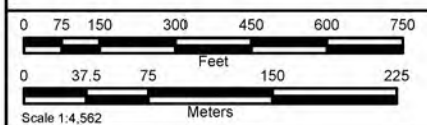
Figure 1-1

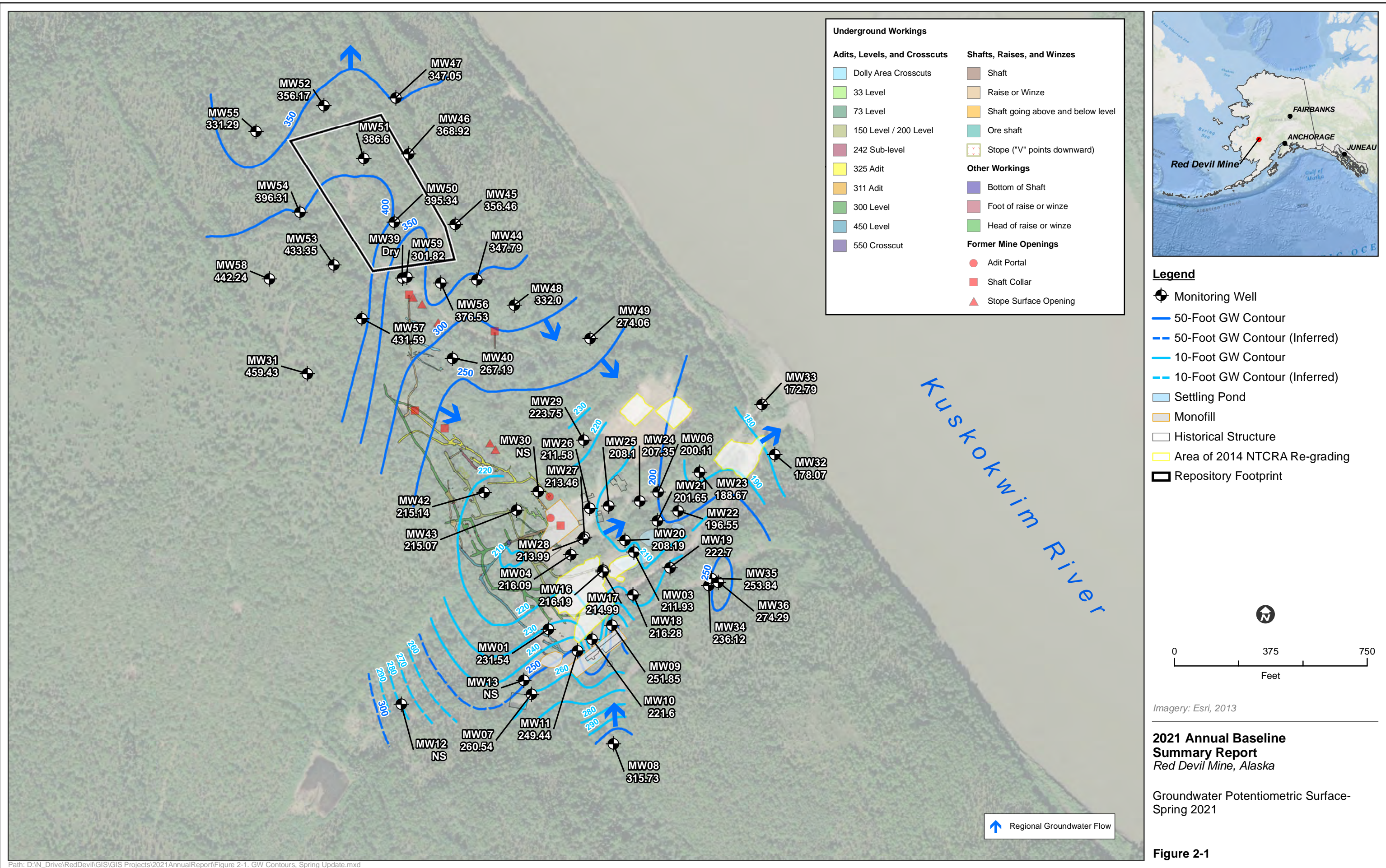


 Upland Area Encompassed by Remedial Investigation

RED DEVIL MINE
Red Devil, Alaska

Figure 1-2
Upland Area Encompassed by Remedial Investigation





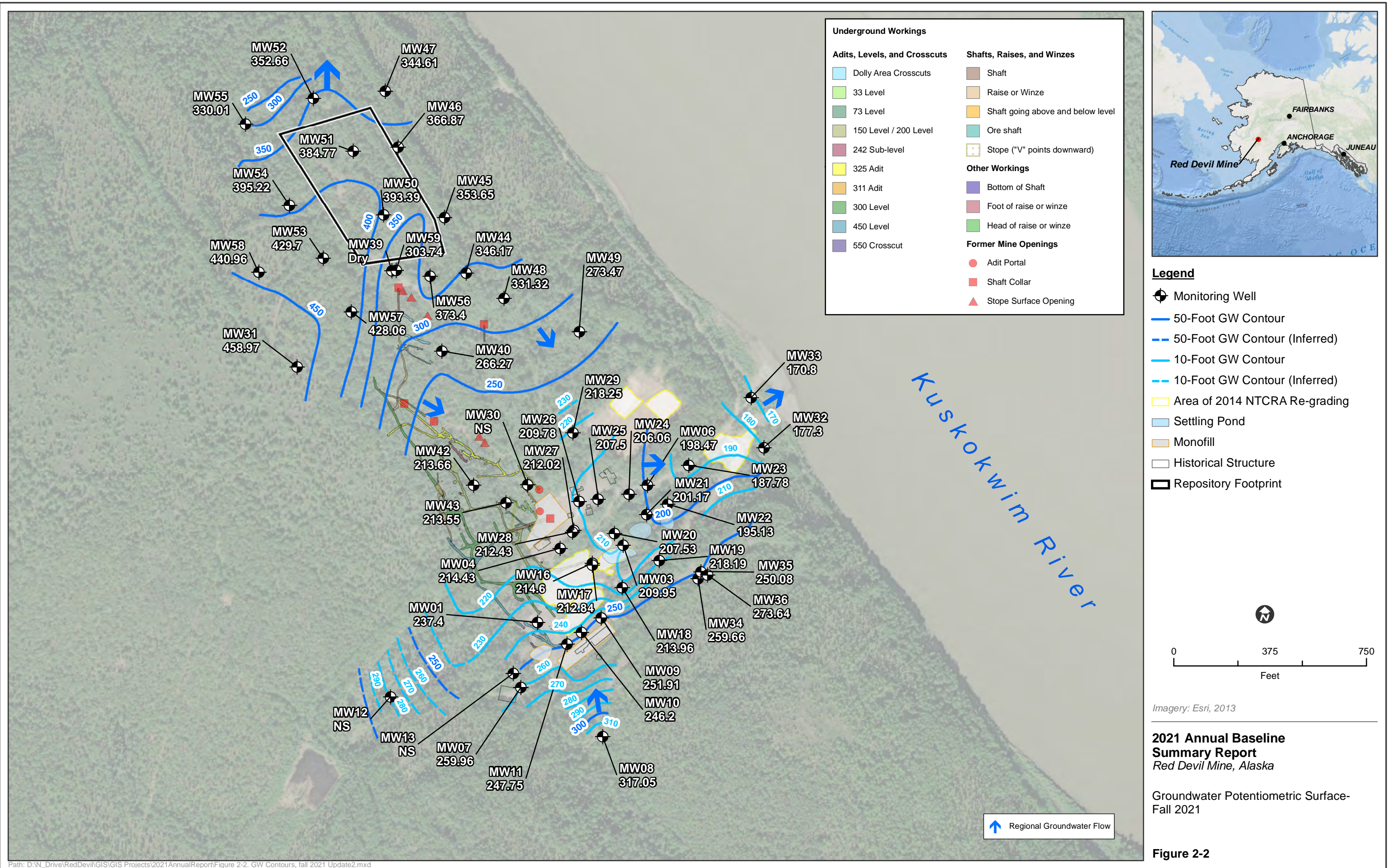


Figure 2-3: Groundwater Elevation Plots

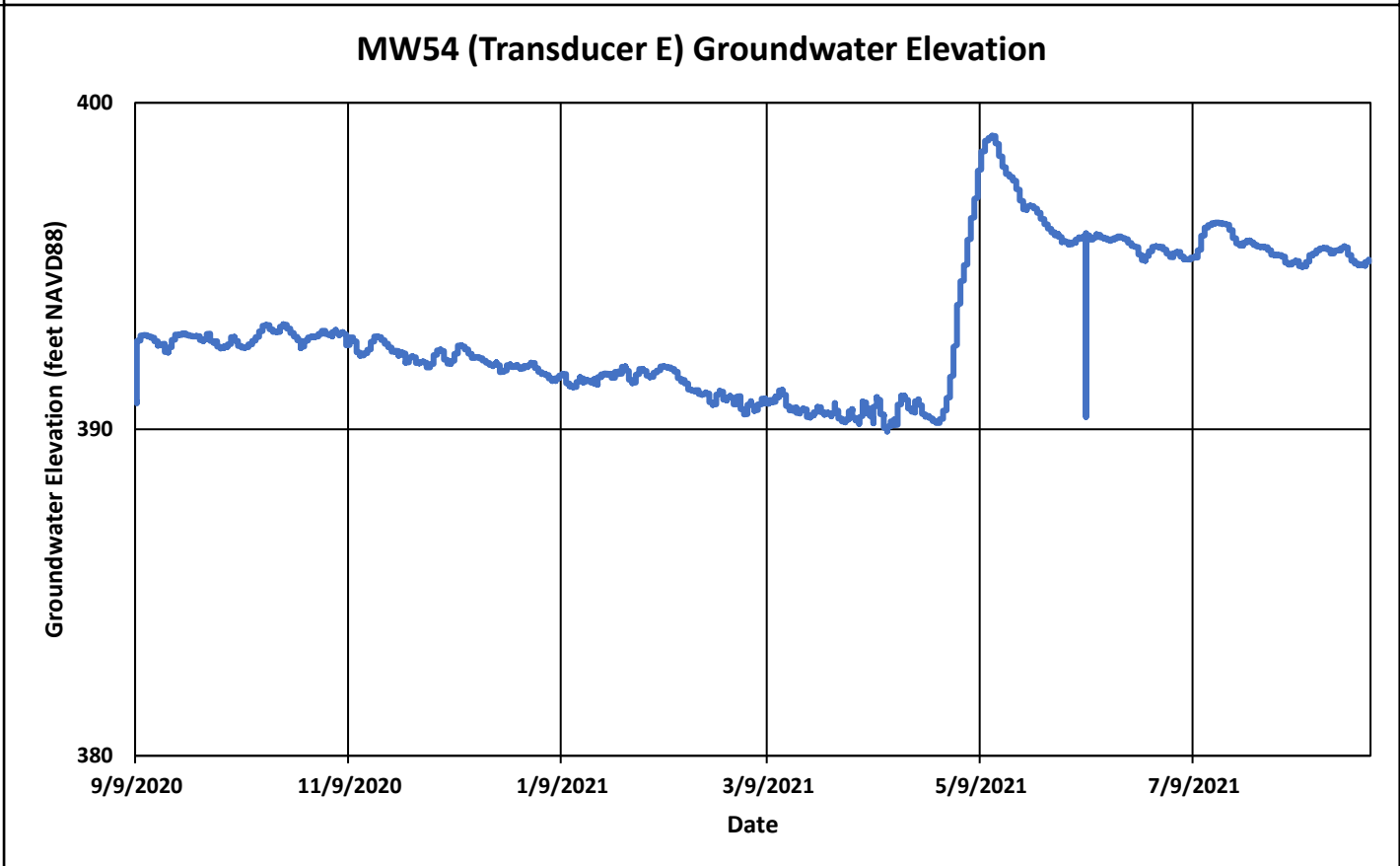
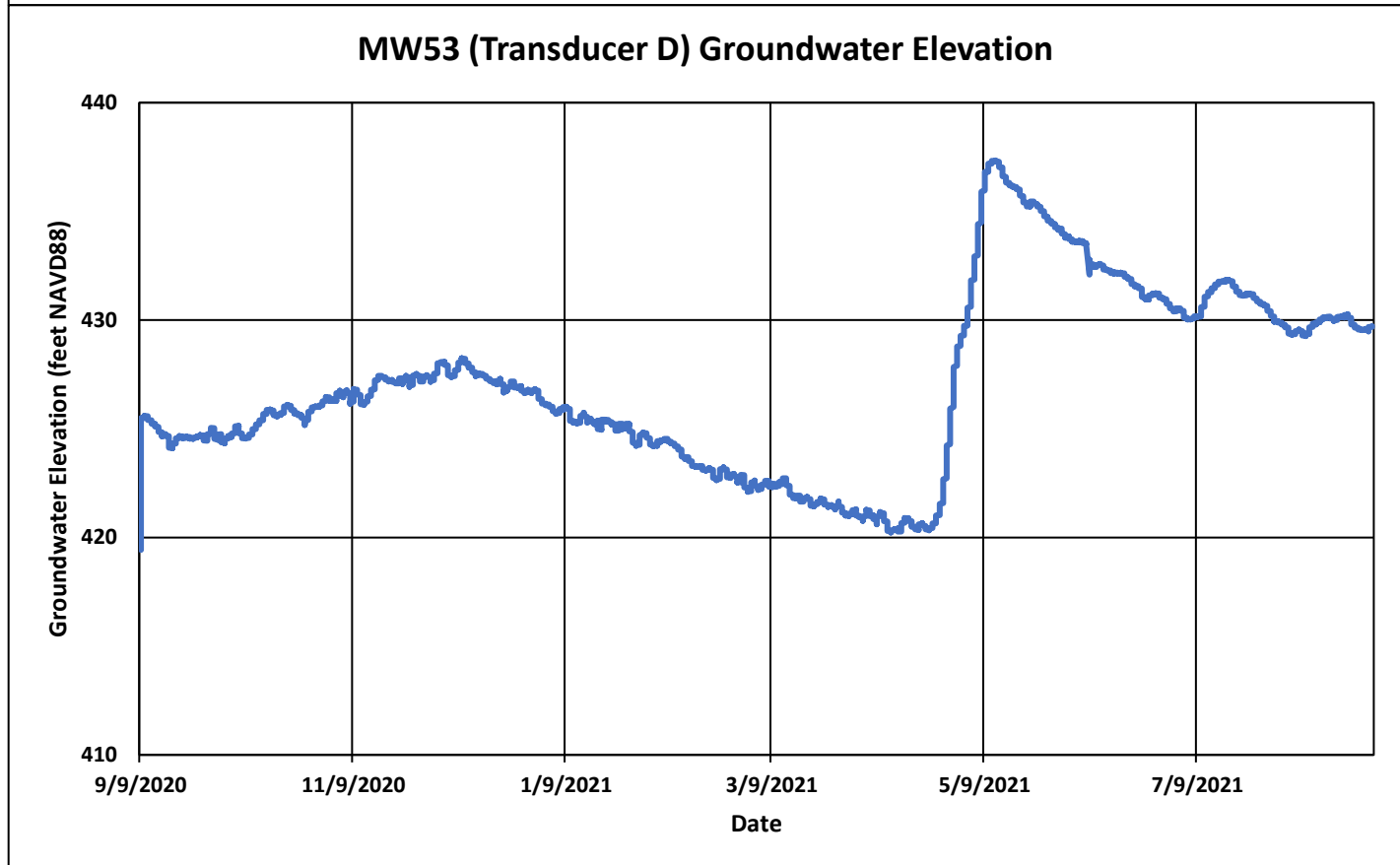
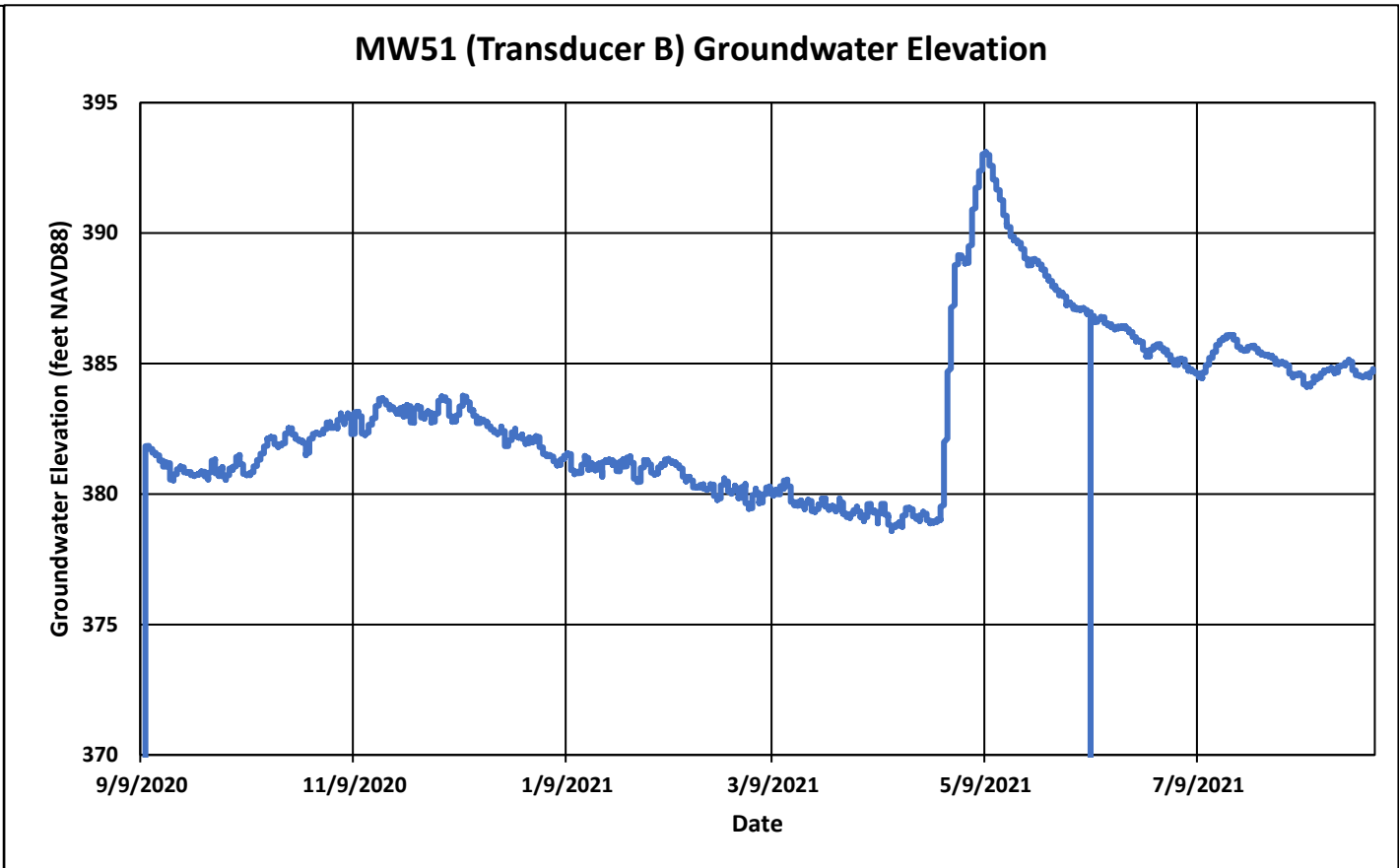
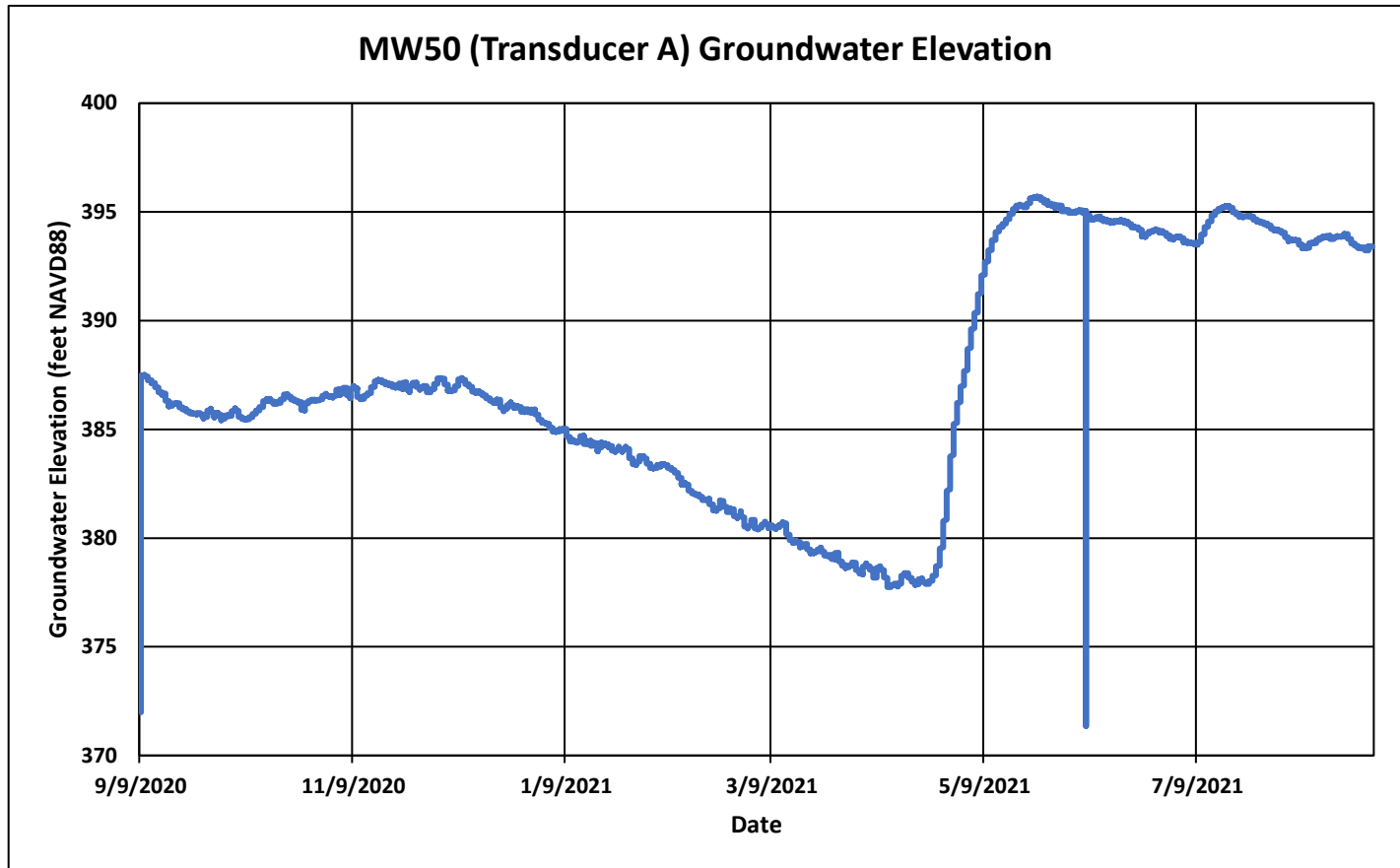
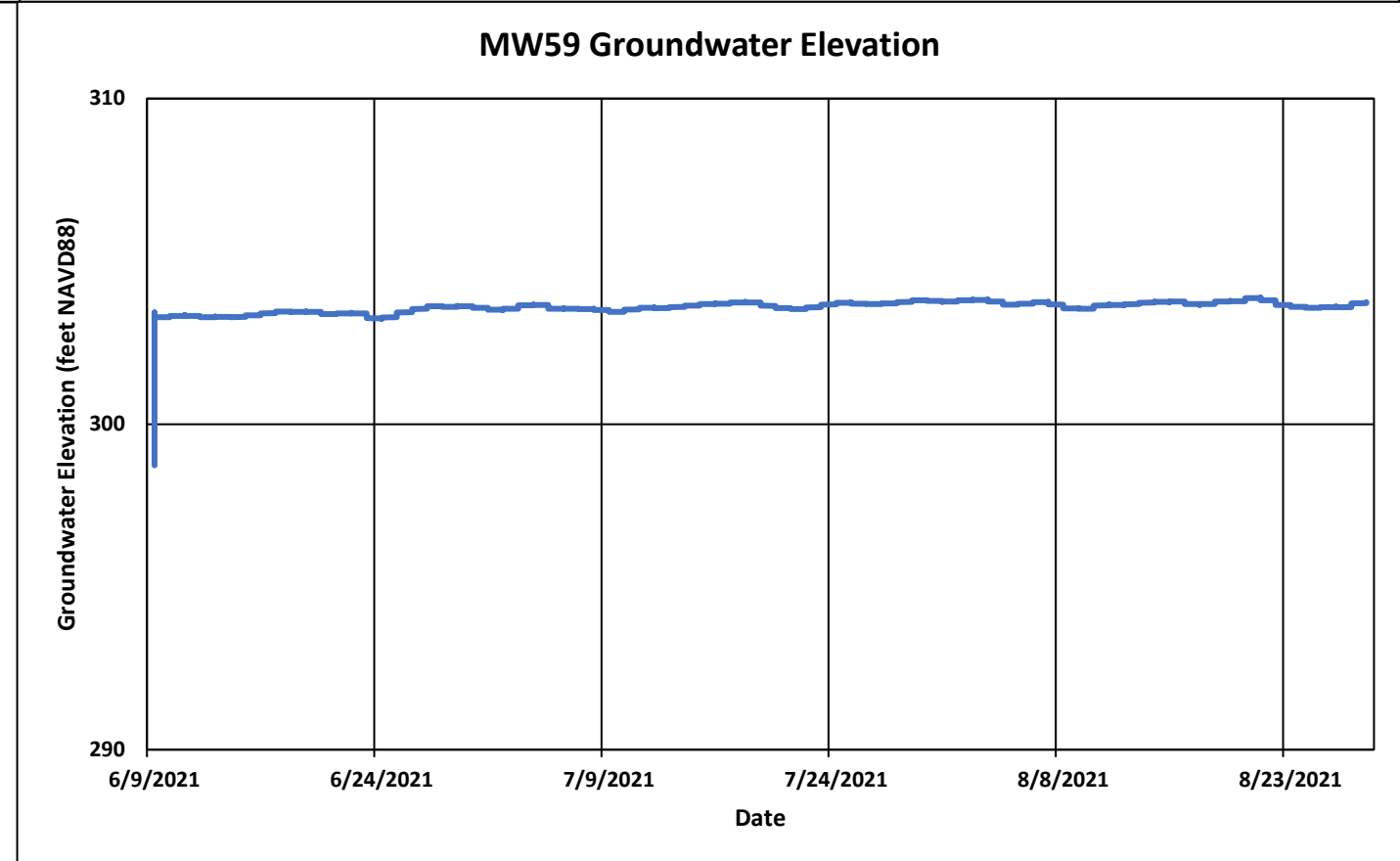
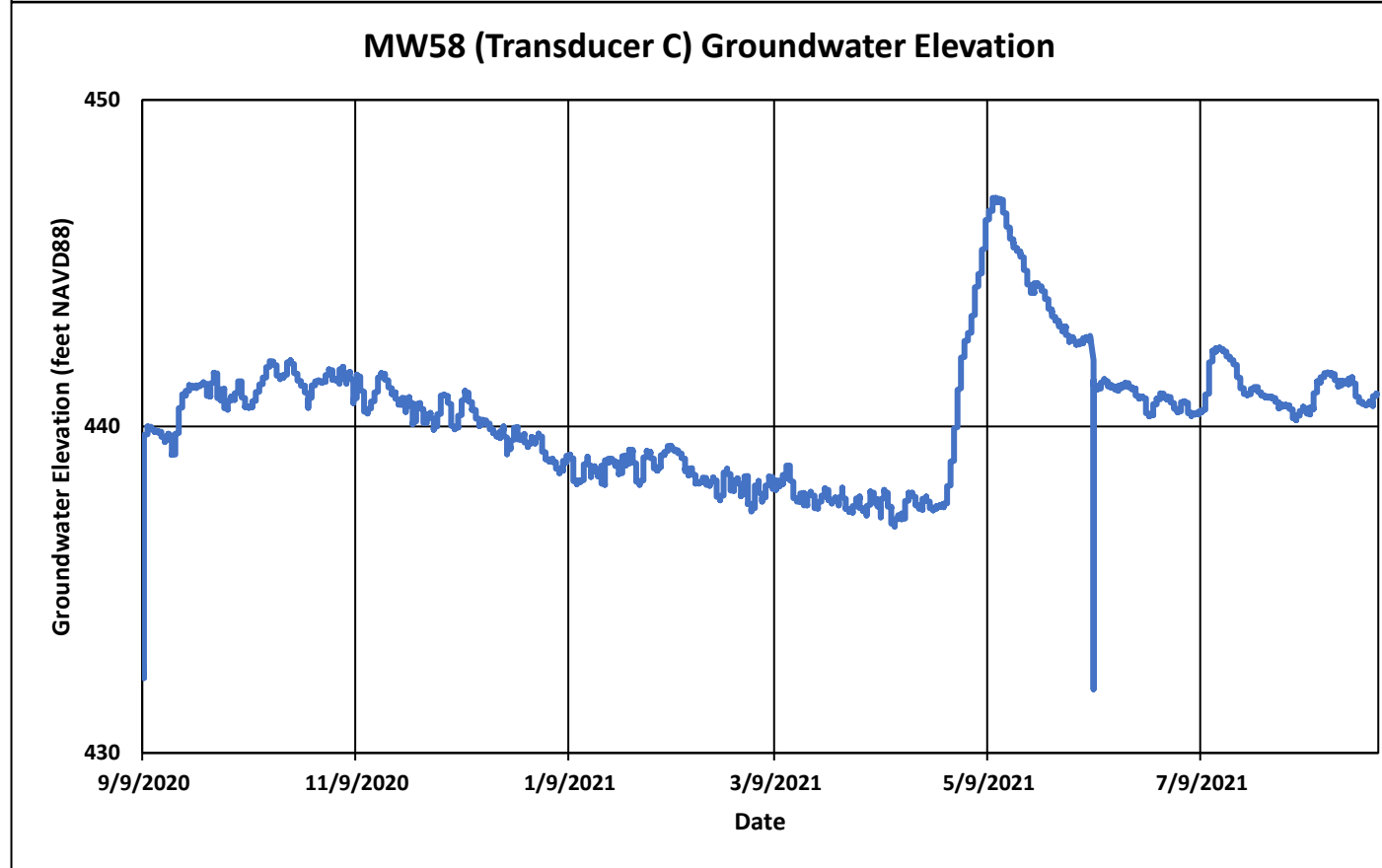
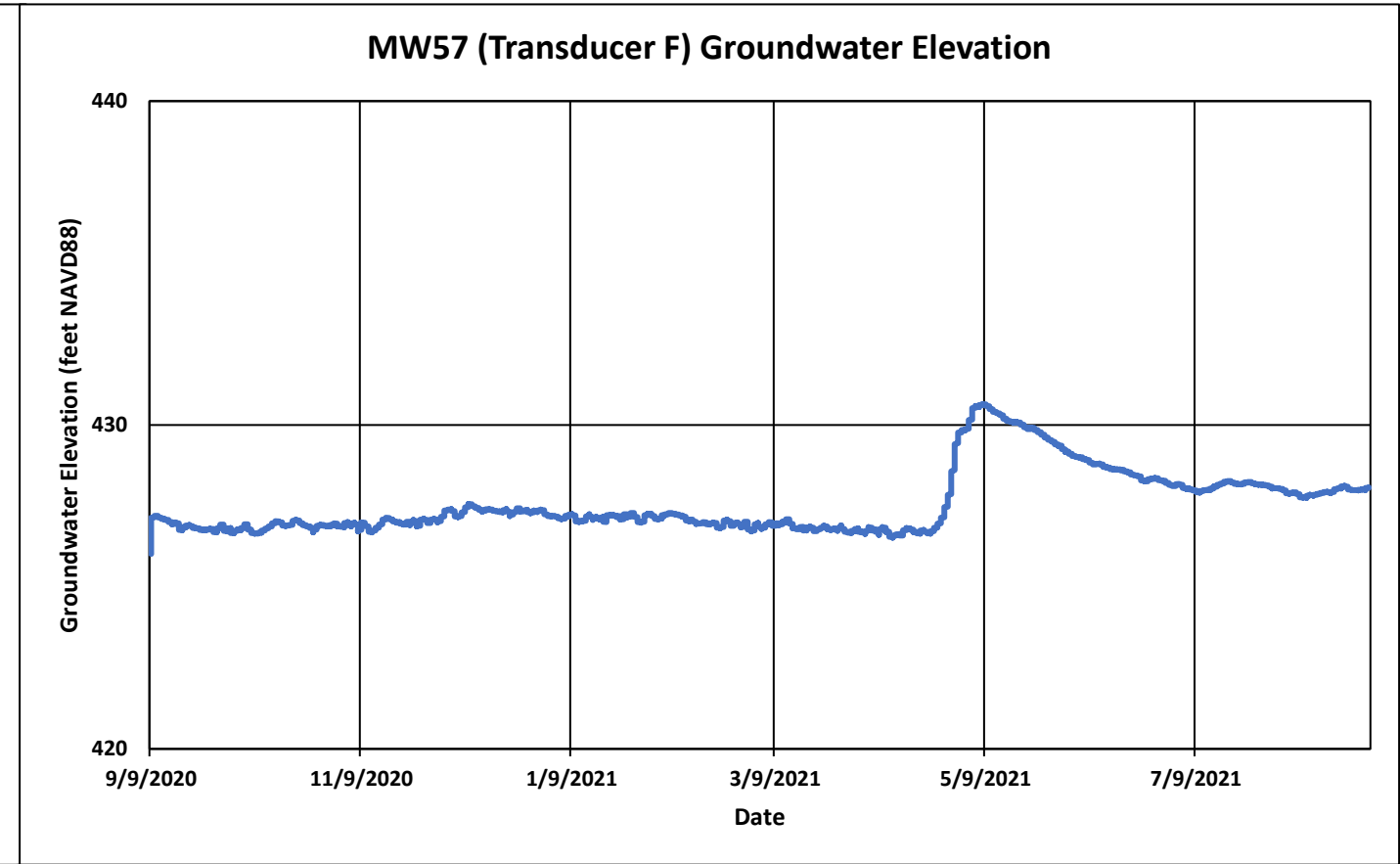
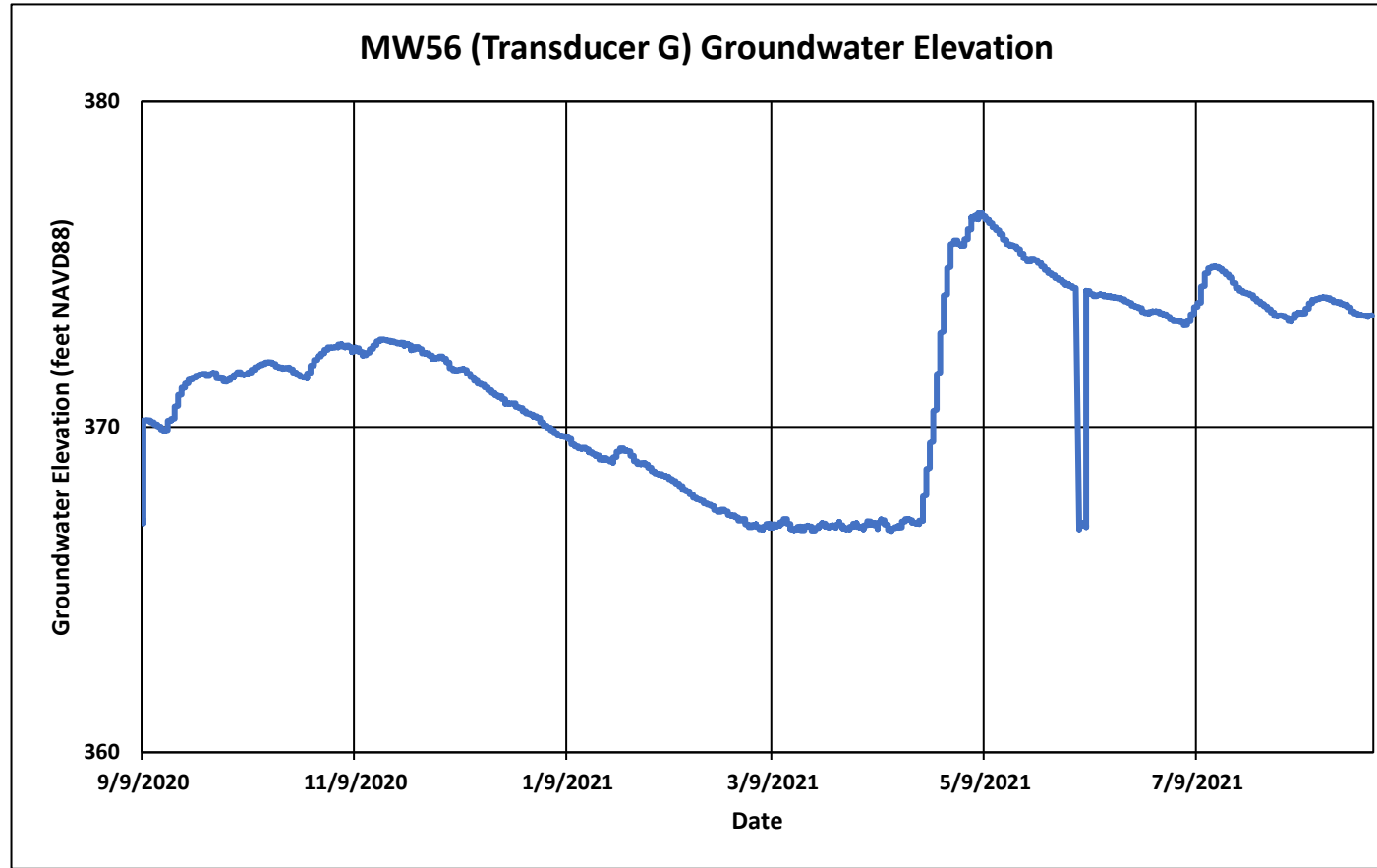
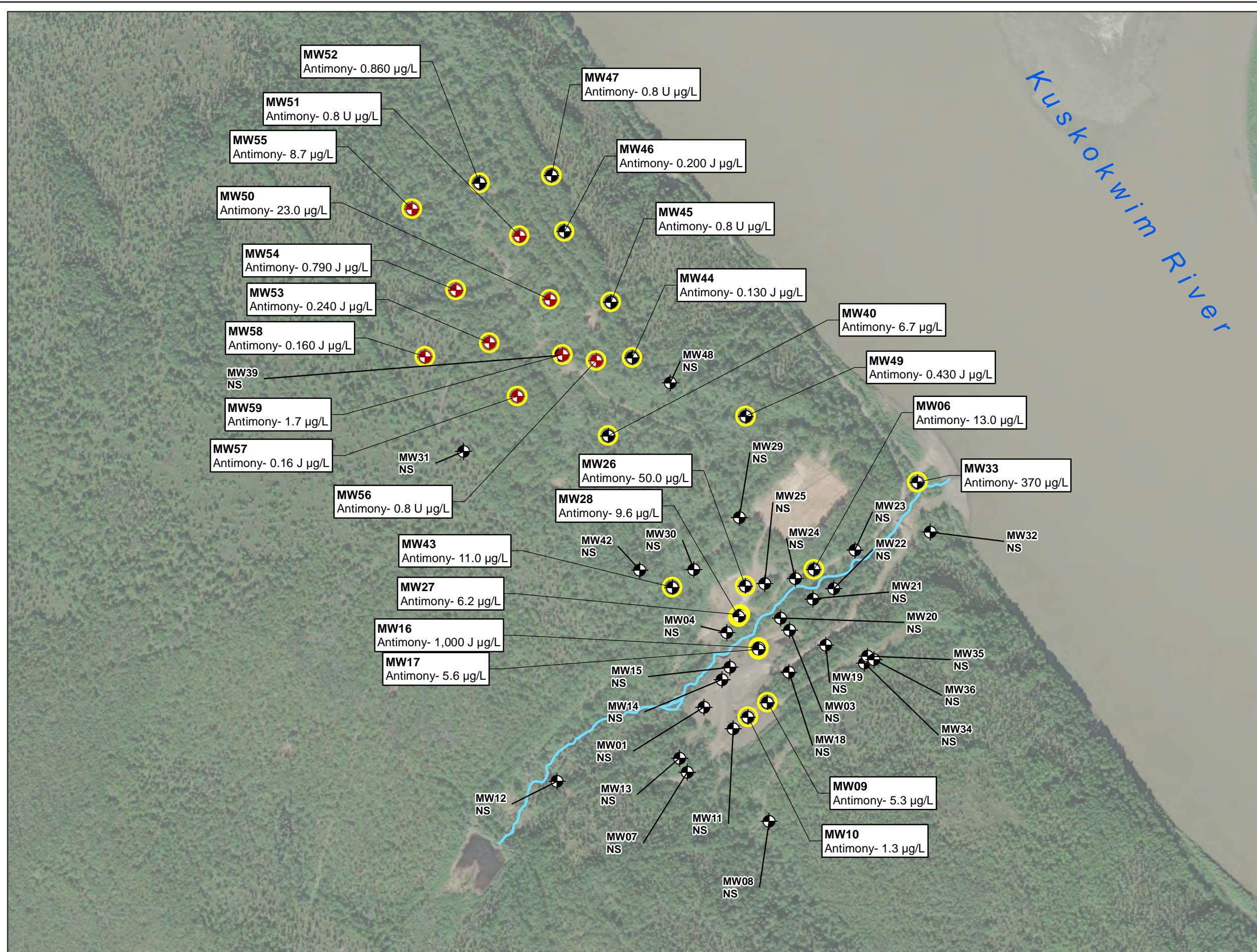


Figure 2-3: Groundwater Elevation Plots

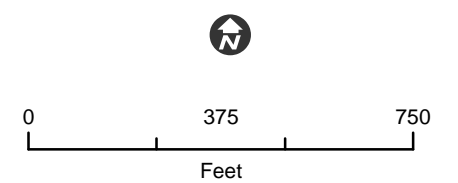




Legend

- Monitoring Well Location
- Transducer Well Location
- Sampled MW Location
- Red Devil Creek

Acronyms and Analytical Notes:
 µg/L = micrograms per liter
 mg/L = milligrams per liter
 ng/L = nanograms per liter
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 The associated result is estimated.
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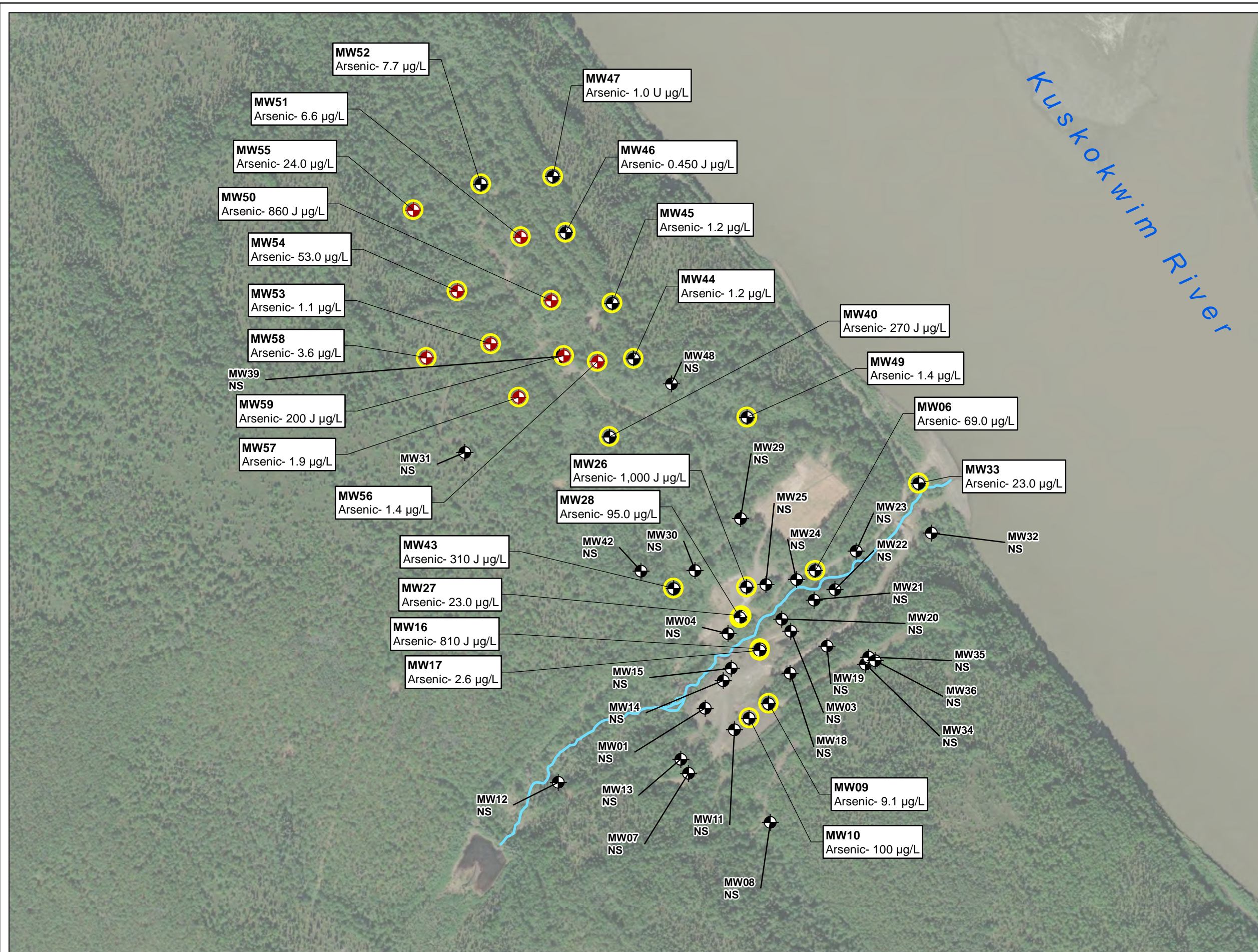


Imagery: Esri, 2013

**2021 Annual Baseline
 Summary Report
 Red Devil Mine, Alaska**

Groundwater Sample Results,
 Spring 2021, Antimony

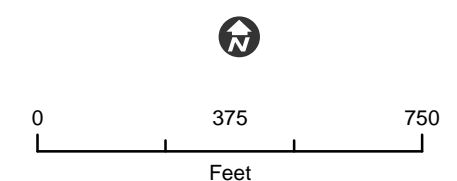
Figure 4-1



Legend

- Monitoring Well Location
- Transducer Well Location
- Sampled MW Location
- Red Devil Creek

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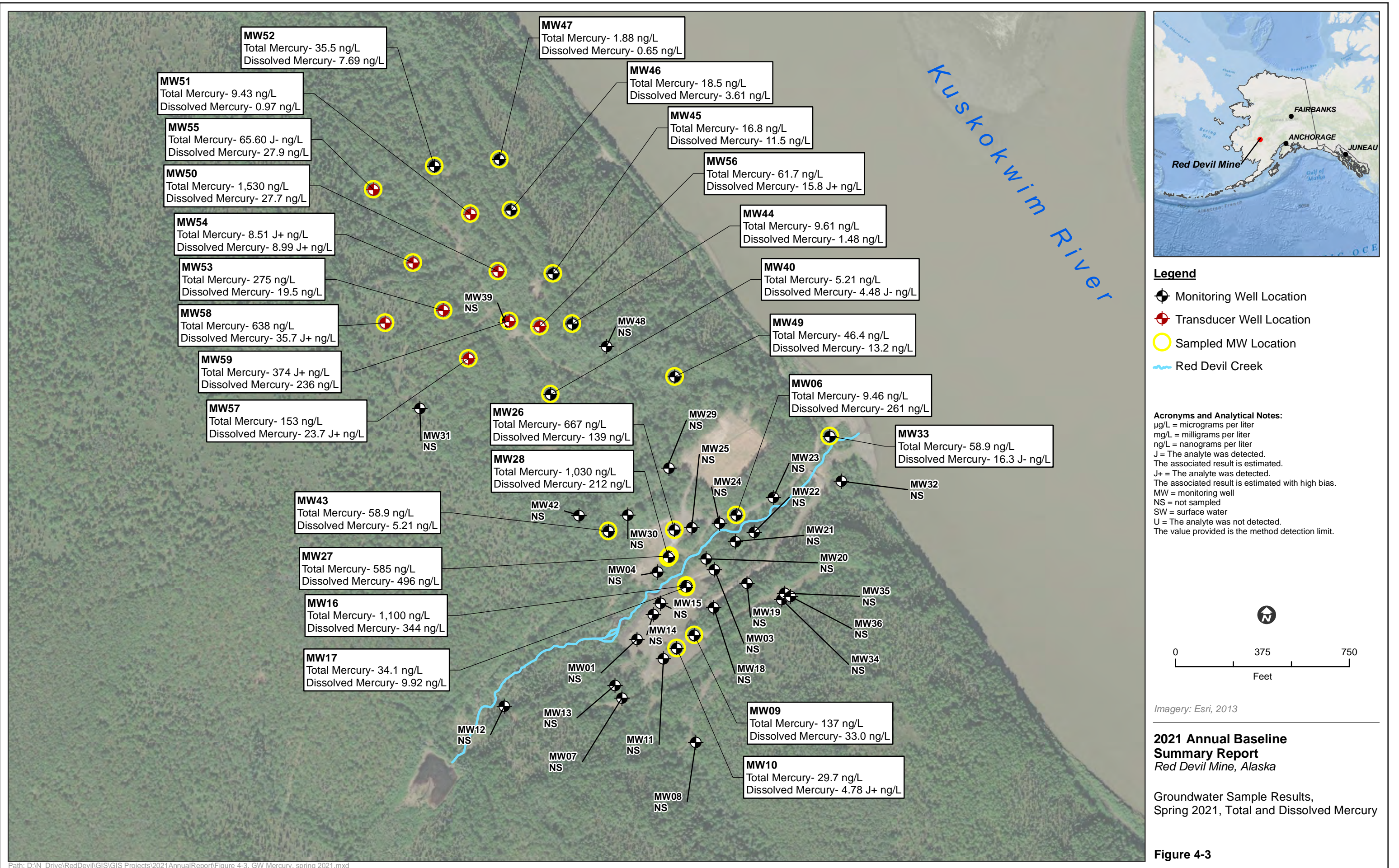


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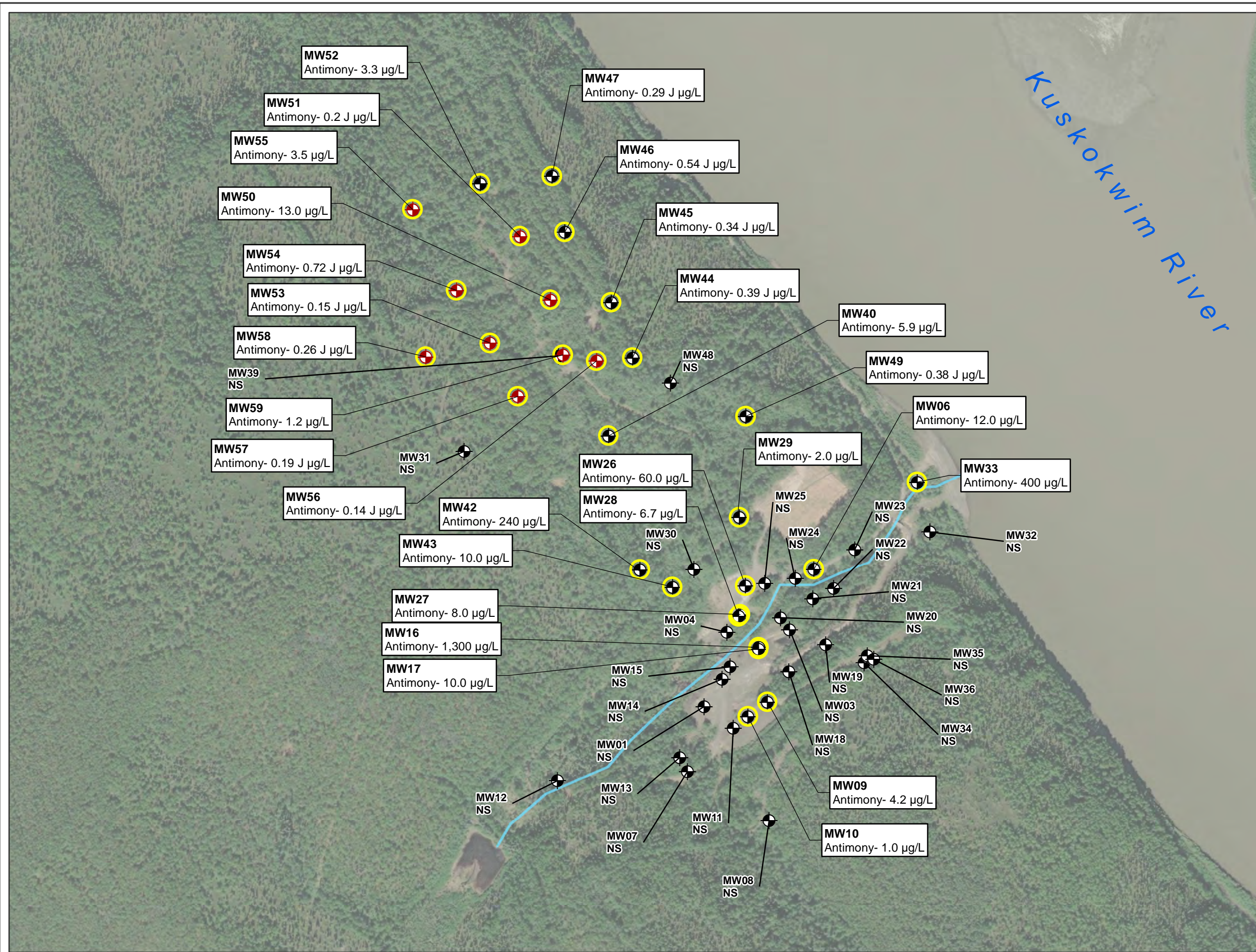
**2021 Annual Baseline
 Summary Report
 Red Devil Mine, Alaska**

Groundwater Sample Results,
 Spring 2021, Arsenic

Figure 4-2



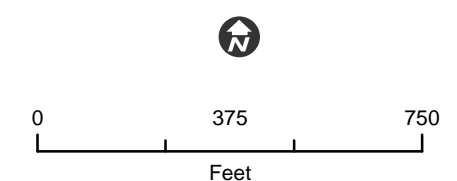
Well ID	Well Type	Total Mercury (ng/L)	Dissolved Mercury (ng/L)
MW52	Monitoring Well	35.5	7.69
MW47	Monitoring Well	1.88	0.65
MW46	Monitoring Well	18.5	3.61
MW45	Monitoring Well	16.8	11.5
MW56	Monitoring Well	61.7	15.8 J+
MW55	Monitoring Well	65.60 J-	27.9
MW51	Monitoring Well	9.43	0.97
MW50	Monitoring Well	1,530	27.7
MW54	Monitoring Well	8.51 J+	8.99 J+
MW53	Monitoring Well	275	19.5
MW58	Monitoring Well	638	35.7 J+
MW59	Monitoring Well	374 J+	236
MW57	Monitoring Well	153	23.7 J+
MW26	Monitoring Well	667	139
MW28	Monitoring Well	1,030	212
MW33	Monitoring Well	58.9	16.3 J-
MW30	Monitoring Well	58.9	5.21
MW27	Monitoring Well	585	496
MW16	Monitoring Well	1,100	344
MW17	Monitoring Well	34.1	9.92
MW09	Monitoring Well	137	33.0
MW10	Monitoring Well	29.7	4.78 J+
MW06	Monitoring Well	9.46	261
MW43	Monitoring Well	58.9	5.21
MW21	Monitoring Well	NS	NS
MW20	Monitoring Well	NS	NS
MW19	Monitoring Well	NS	NS
MW18	Monitoring Well	NS	NS
MW15	Monitoring Well	NS	NS
MW14	Monitoring Well	NS	NS
MW13	Monitoring Well	NS	NS
MW12	Monitoring Well	NS	NS
MW11	Monitoring Well	NS	NS
MW08	Monitoring Well	NS	NS
MW07	Monitoring Well	NS	NS
MW04	Monitoring Well	NS	NS
MW03	Monitoring Well	NS	NS
MW01	Monitoring Well	NS	NS
MW39	Monitoring Well	NS	NS
MW48	Monitoring Well	NS	NS
MW29	Monitoring Well	NS	NS
MW25	Monitoring Well	NS	NS
MW24	Monitoring Well	NS	NS
MW23	Monitoring Well	NS	NS
MW22	Monitoring Well	NS	NS
MW32	Monitoring Well	NS	NS
MW35	Monitoring Well	NS	NS
MW36	Monitoring Well	NS	NS
MW34	Monitoring Well	NS	NS
MW31	Monitoring Well	NS	NS
MW42	Monitoring Well	NS	NS
MW44	Monitoring Well	9.61	1.48
MW40	Monitoring Well	5.21	4.48 J-
MW49	Monitoring Well	46.4	13.2
MW05	Monitoring Well	NS	NS
MW02	Monitoring Well	NS	NS
MW08	Monitoring Well	NS	NS
MW09	Monitoring Well	137	33.0
MW10	Monitoring Well	29.7	4.78 J+
MW11	Monitoring Well	NS	NS
MW12	Monitoring Well	NS	NS
MW13	Monitoring Well	NS	NS
MW14	Monitoring Well	NS	NS
MW15	Monitoring Well	NS	NS
MW16	Monitoring Well	1,100	344
MW17	Monitoring Well	34.1	9.92
MW18	Monitoring Well	NS	NS
MW19	Monitoring Well	NS	NS
MW20	Monitoring Well	NS	NS
MW21	Monitoring Well	NS	NS
MW22	Monitoring Well	NS	NS
MW23	Monitoring Well	NS	NS
MW24	Monitoring Well	NS	NS
MW25	Monitoring Well	NS	NS
MW26	Monitoring Well	667	139
MW27	Monitoring Well	585	496
MW28	Monitoring Well	1,030	212
MW29	Monitoring Well	NS	NS
MW30	Monitoring Well	58.9	5.21
MW31	Monitoring Well	NS	NS
MW32	Monitoring Well	NS	NS
MW33	Monitoring Well	58.9	16.3 J-
MW34	Monitoring Well	NS	NS
MW35	Monitoring Well	NS	NS
MW36	Monitoring Well	NS	NS
MW37	Monitoring Well	NS	NS
MW38	Monitoring Well	NS	NS
MW39	Monitoring Well	NS	NS
MW40	Monitoring Well	5.21	4.48 J-
MW41	Monitoring Well	NS	NS
MW42	Monitoring Well	NS	NS
MW43	Monitoring Well	58.9	5.21
MW44	Monitoring Well	9.61	1.48
MW45	Monitoring Well	16.8	11.5
MW46	Monitoring Well	18.5	3.61
MW47	Monitoring Well	1.88	0.65
MW48	Monitoring Well	NS	NS
MW49	Monitoring Well	46.4	13.2
MW50	Monitoring Well	1,530	27.7
MW51	Monitoring Well	9.43	0.97
MW52	Monitoring Well	35.5	7.69
MW53	Monitoring Well	275	19.5
MW54	Monitoring Well	8.51 J+	8.99 J+
MW55	Monitoring Well	65.60 J-	27.9
MW56	Monitoring Well	61.7	15.8 J+
MW57	Monitoring Well	153	23.7 J+
MW58	Monitoring Well	638	35.7 J+
MW59	Monitoring Well	374 J+	236



Legend

- Monitoring Well Location
- Transducer Well Location
- Sampled MW Location
- Red Devil Creek

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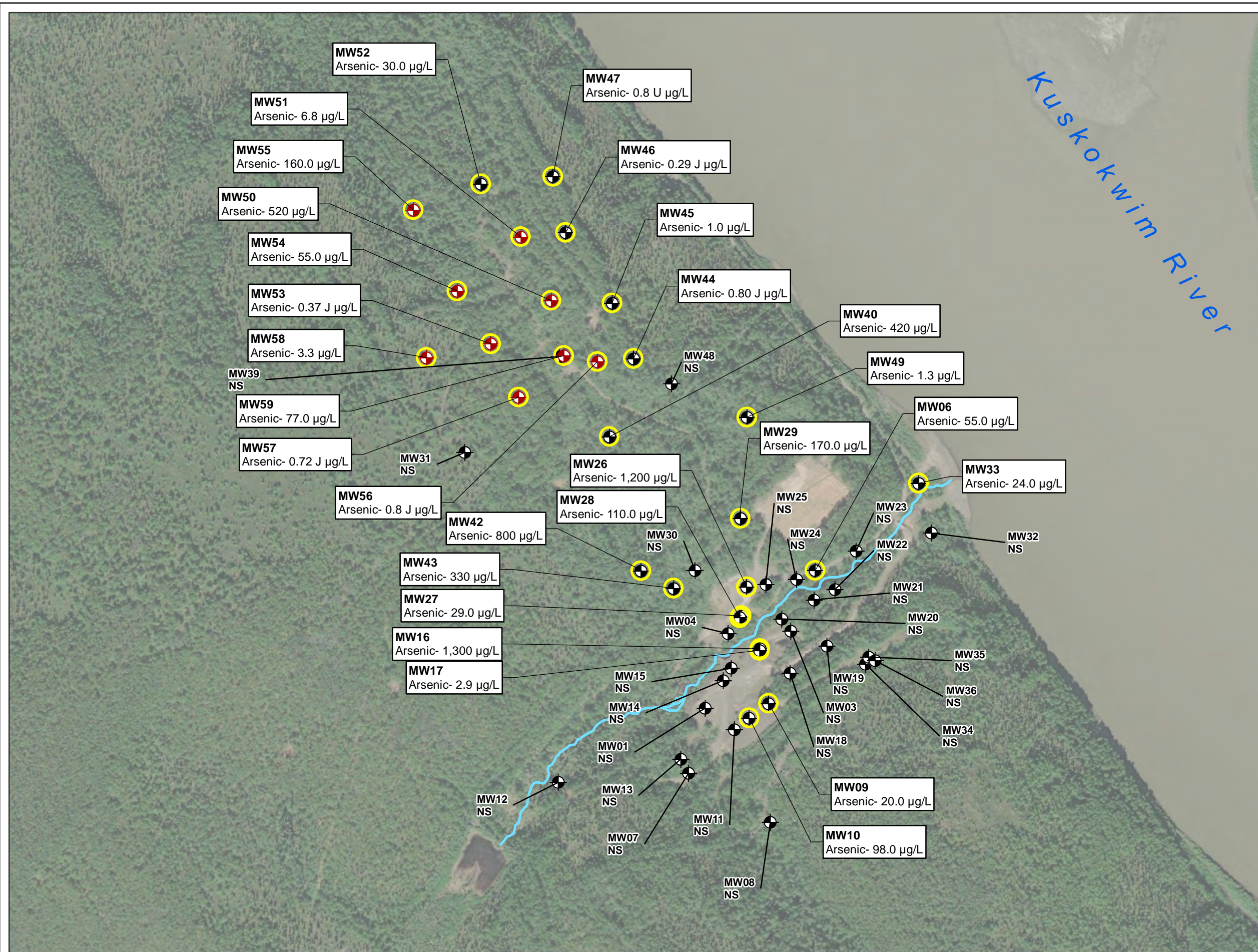


Imagery: Esri, 2013

**2021 Annual Baseline
 Summary Report
 Red Devil Mine, Alaska**

Groundwater Sample Results,
 Fall 2021, Antimony

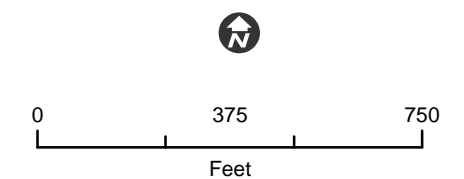
Figure 4-4



Legend

- Monitoring Well Location
- Transducer Well Location
- Sampled MW Location
- Red Devil Creek

Acronyms and Analytical Notes:
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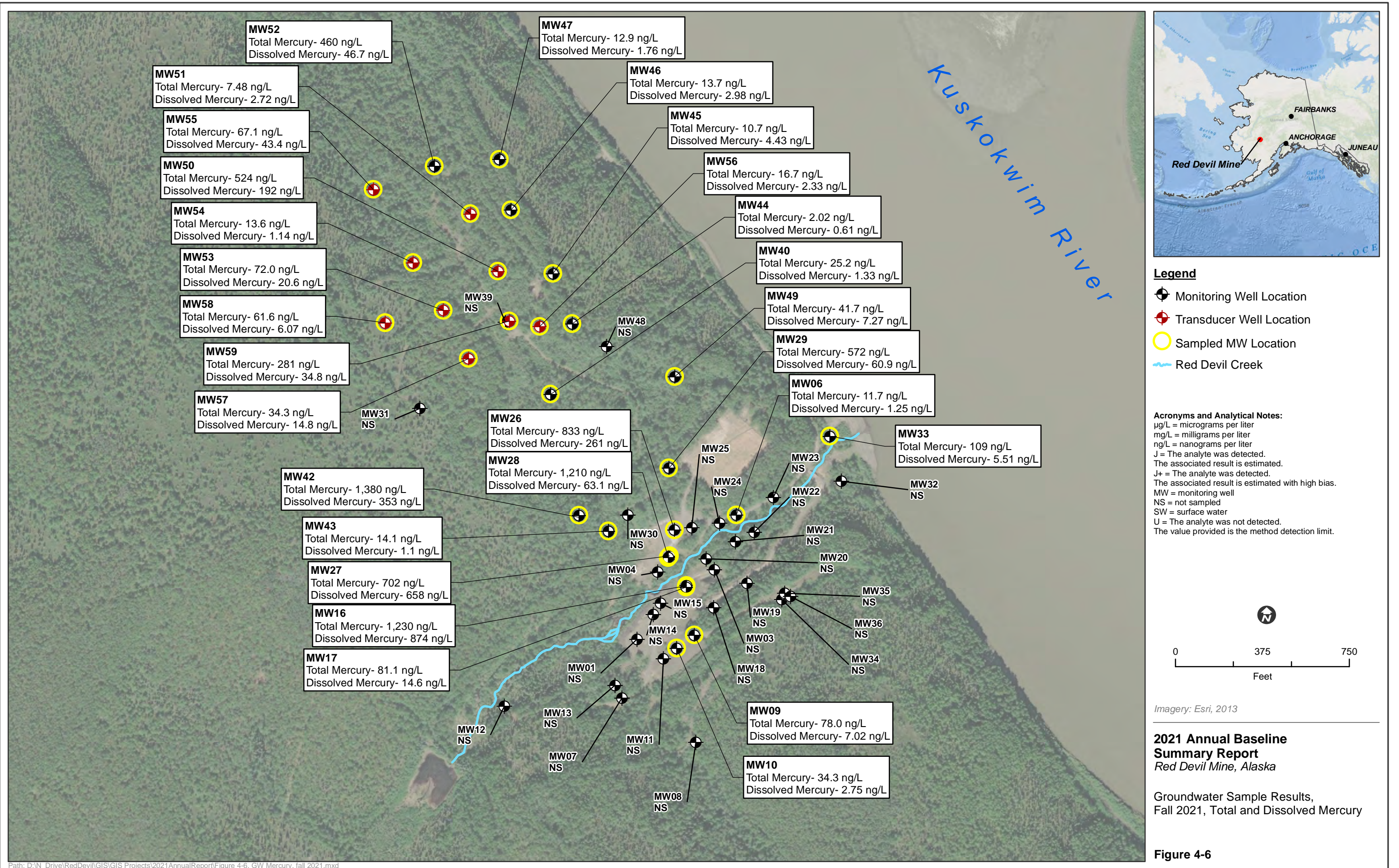


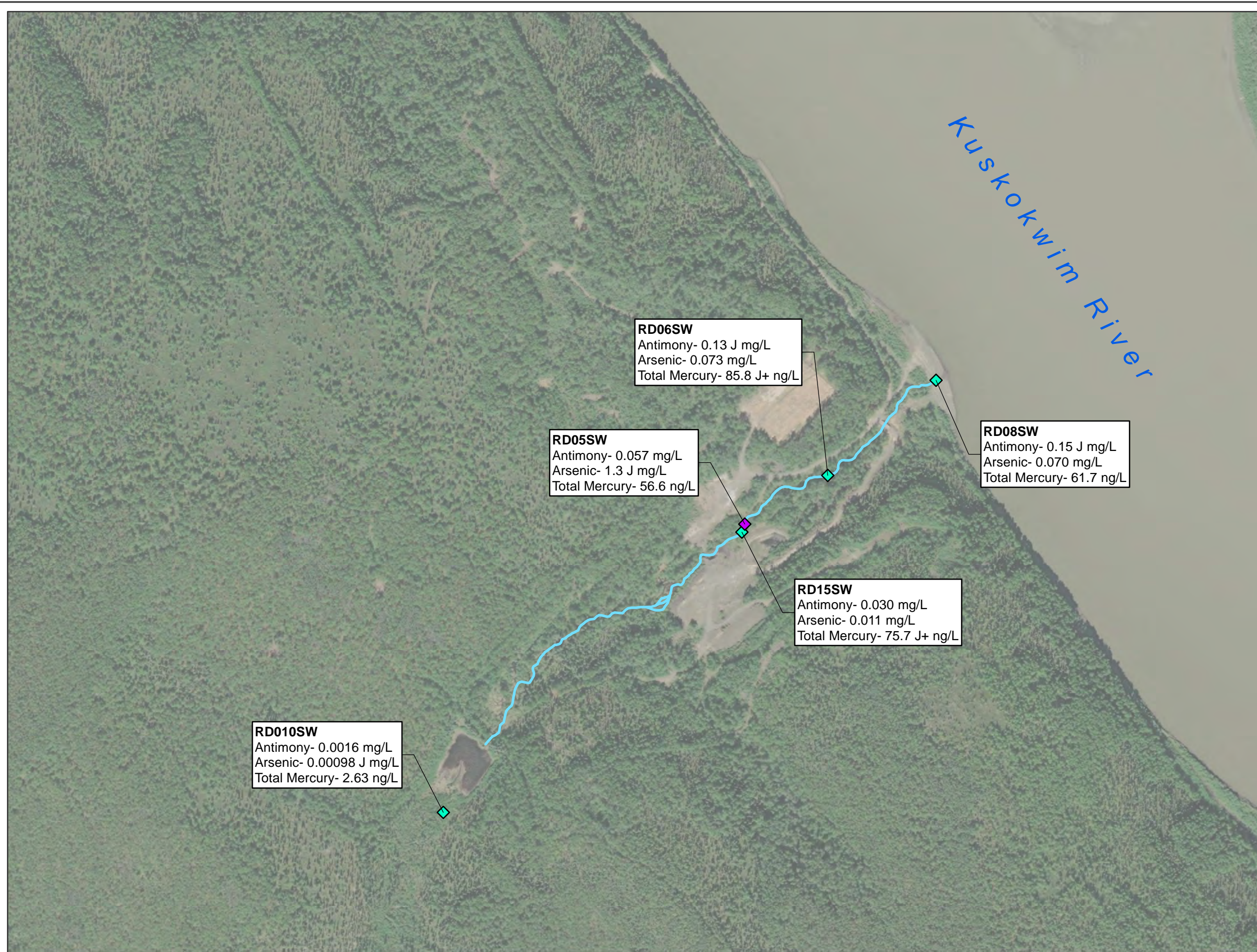
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**2021 Annual Baseline
 Summary Report
 Red Devil Mine, Alaska**

Groundwater Sample Results,
 Fall 2021, Arsenic

Figure 4-5

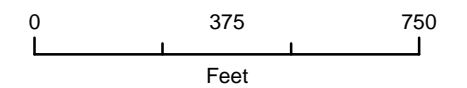




Legend

- ◆ Surface Water Location
- ◆ Seep Location
- ~ Red Devil Creek

Acronyms and Analytical Notes:
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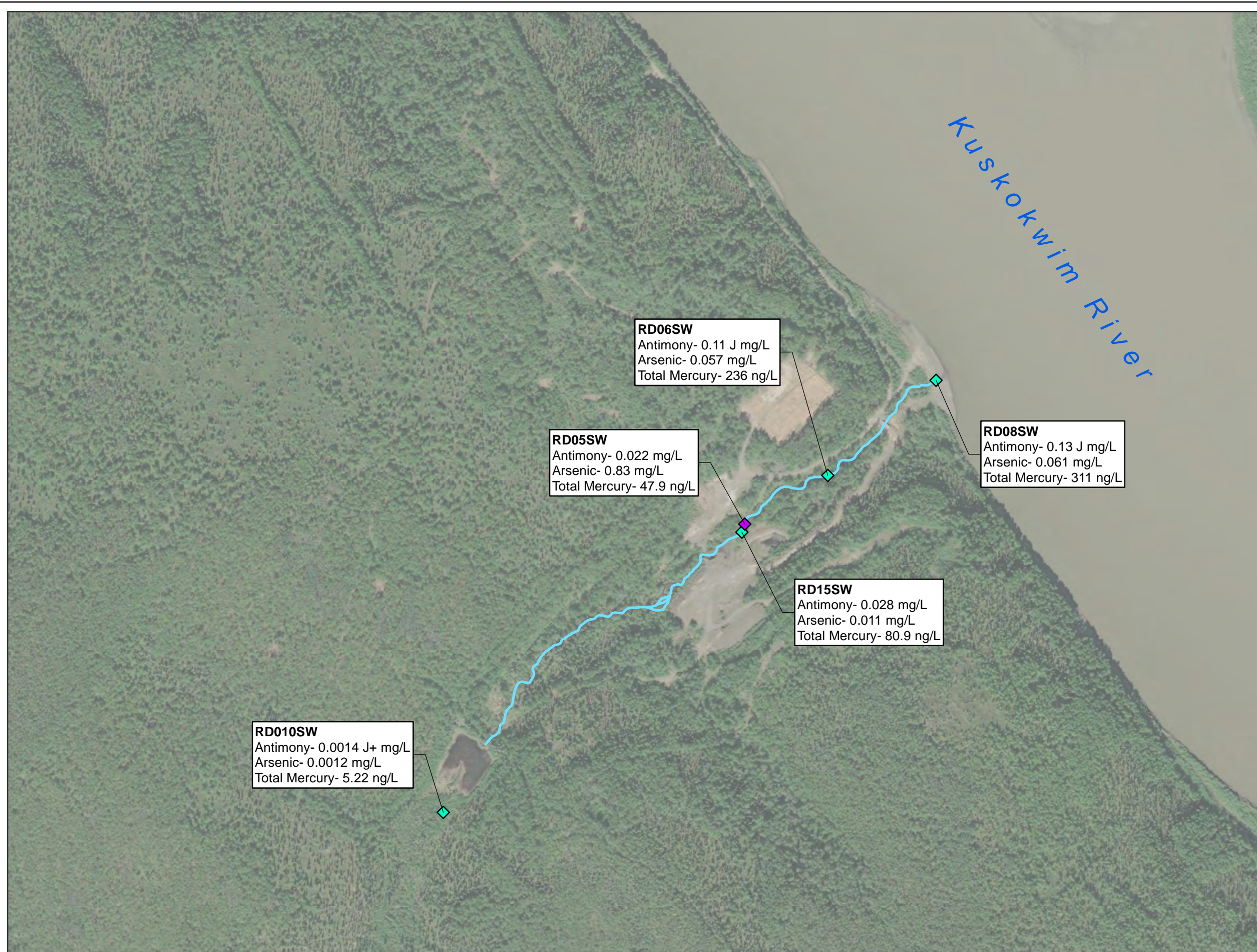


Imagery: Esri, 2013

**2021 Annual Baseline
 Summary Report
 Red Devil Mine, Alaska**

Surface Water Analytical Results-
 Spring 2021

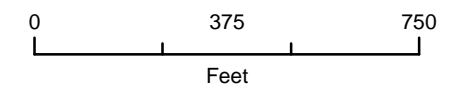
Figure 4-7



Legend

- ◆ Surface Water Location
- ◆ Seep Location
- ~ Red Devil Creek

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 U = The analyte was not detected.
 The value provided is the method detection limit.



Imagery: Esri, 2013

**2021 Annual Baseline
 Summary Report
 Red Devil Mine, Alaska**

Surface Water Analytical Results-
 Fall 2021

Figure 4-8

RD06SW
 Antimony- 0.11 J mg/L
 Arsenic- 0.057 mg/L
 Total Mercury- 236 ng/L

RD05SW
 Antimony- 0.022 mg/L
 Arsenic- 0.83 mg/L
 Total Mercury- 47.9 ng/L

RD08SW
 Antimony- 0.13 J mg/L
 Arsenic- 0.061 mg/L
 Total Mercury- 311 ng/L

RD15SW
 Antimony- 0.028 mg/L
 Arsenic- 0.011 mg/L
 Total Mercury- 80.9 ng/L

RD010SW
 Antimony- 0.0014 J+ mg/L
 Arsenic- 0.0012 mg/L
 Total Mercury- 5.22 ng/L

Figure 6-1. Groundwater Analytical Plots

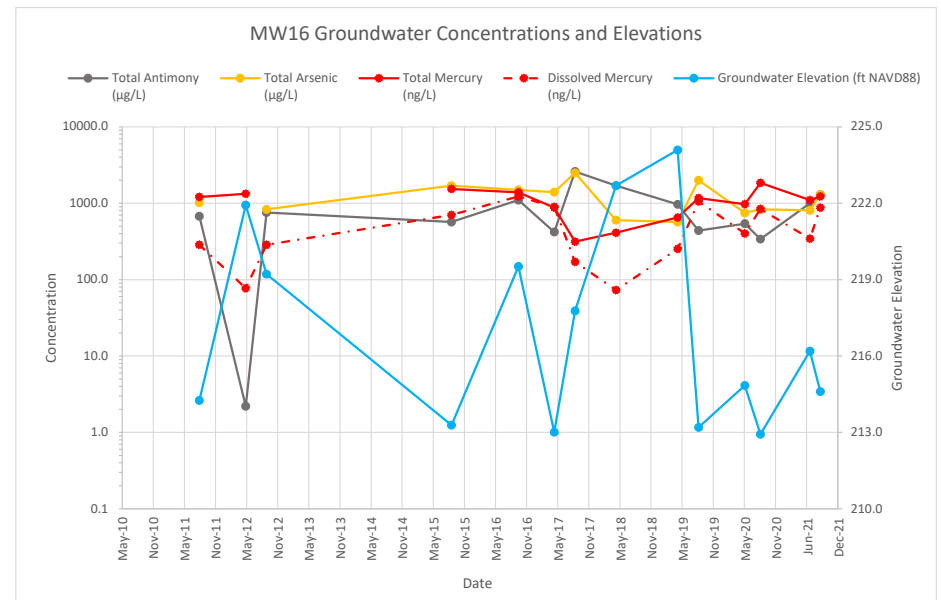
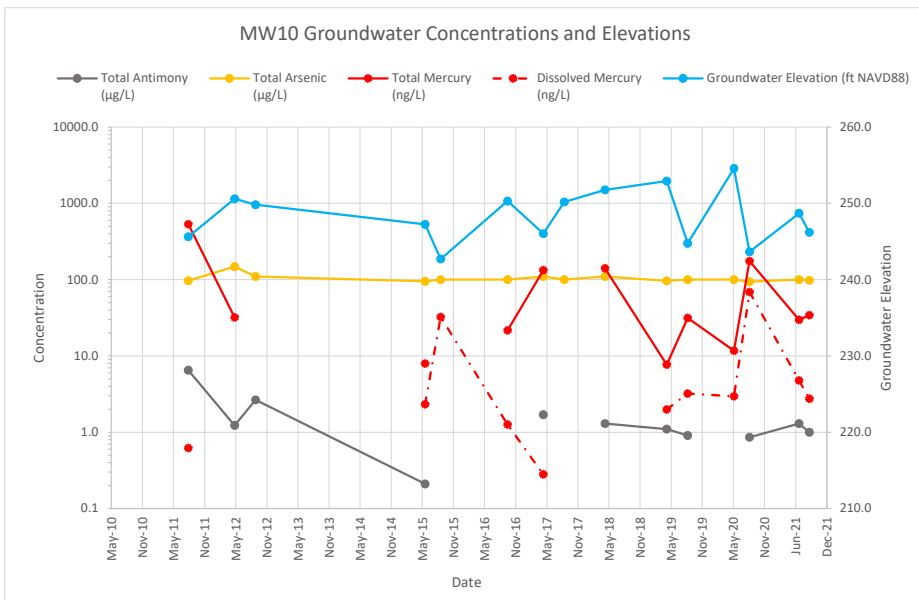
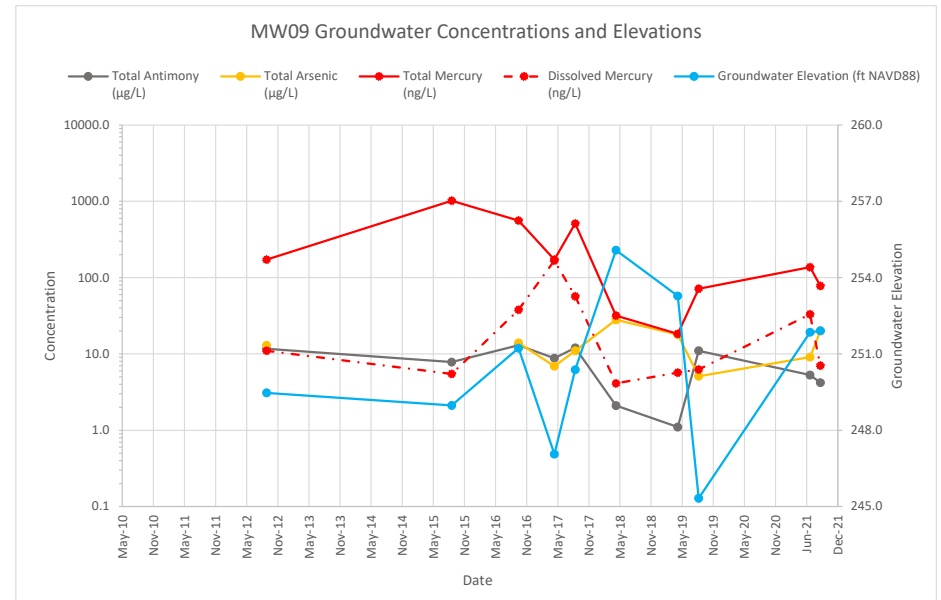
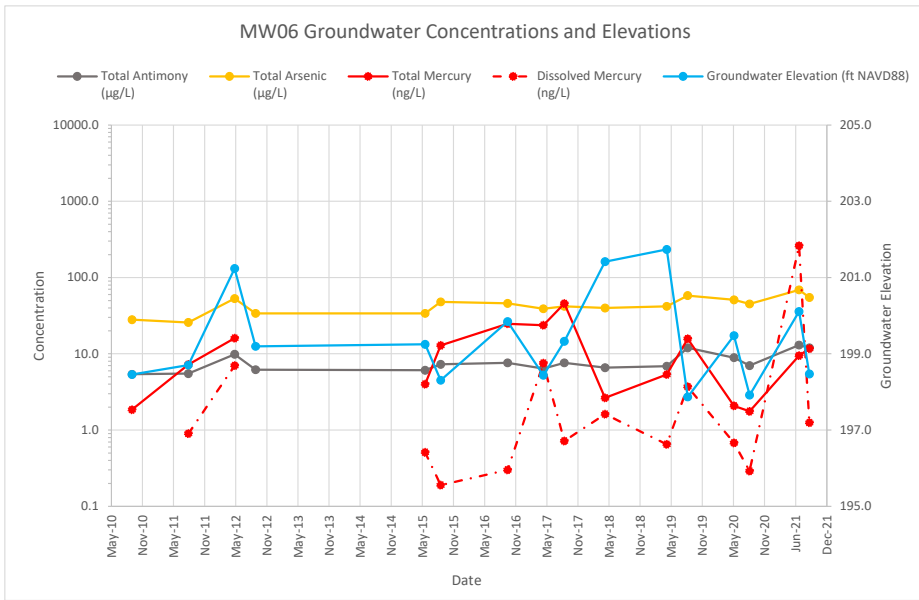


Figure 6-1. Groundwater Analytical Plots

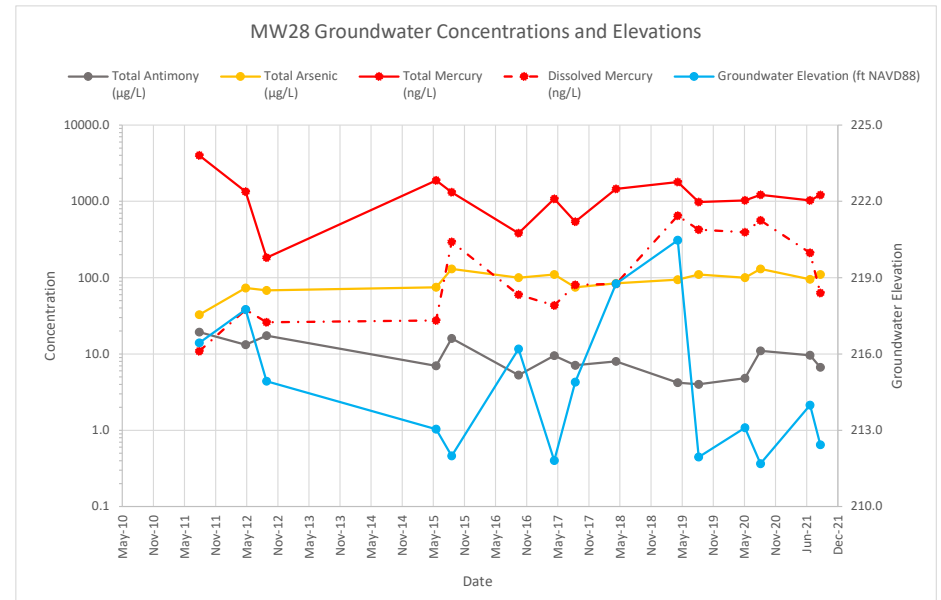
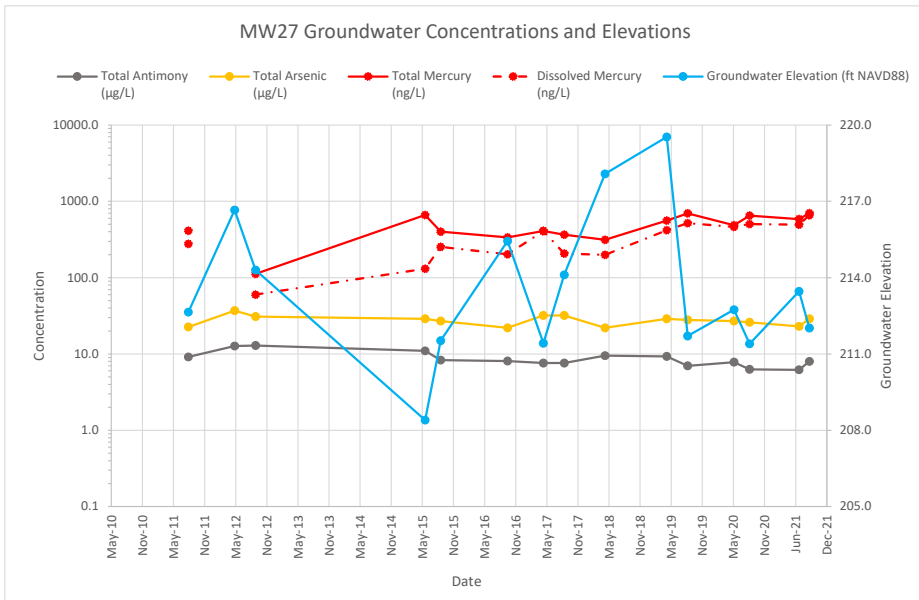
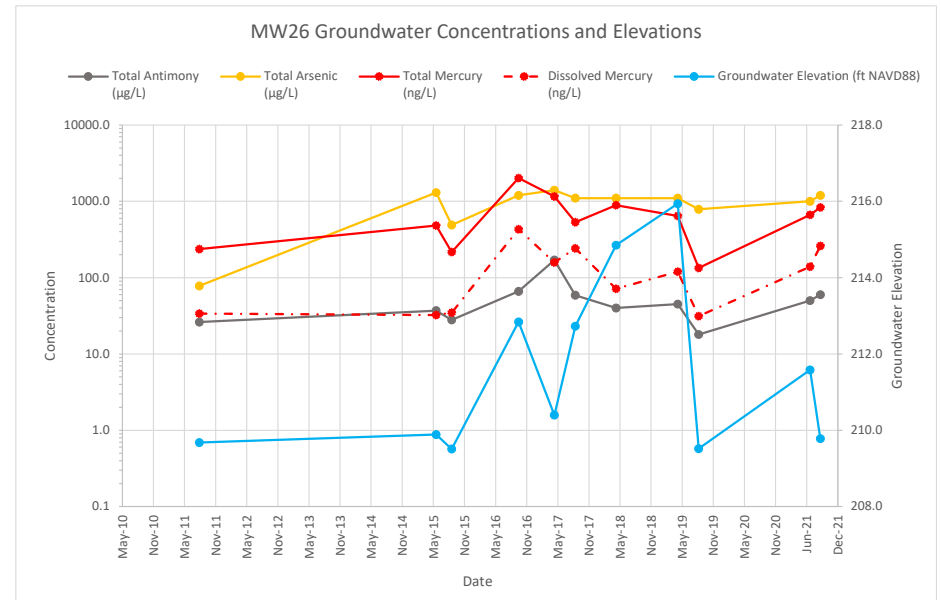
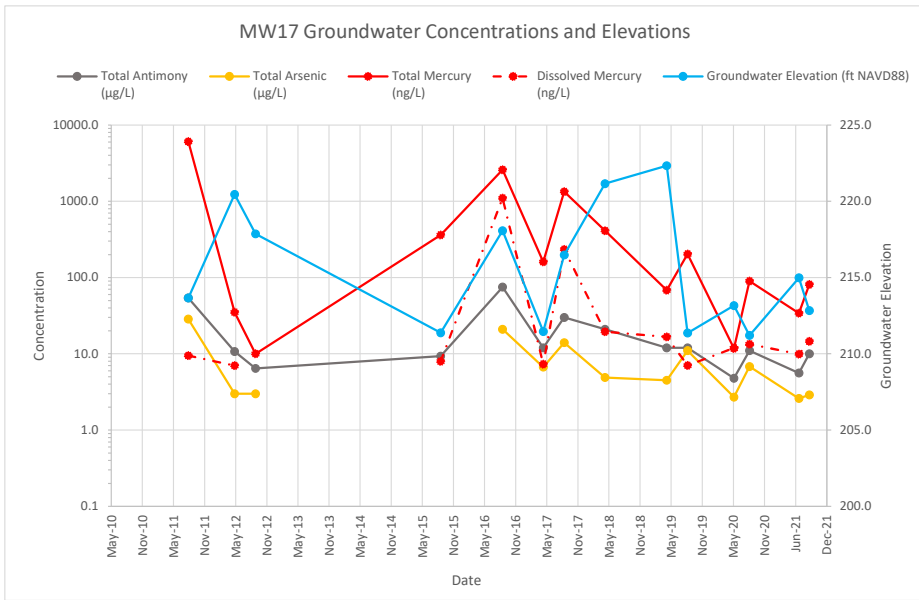


Figure 6-1. Groundwater Analytical Plots

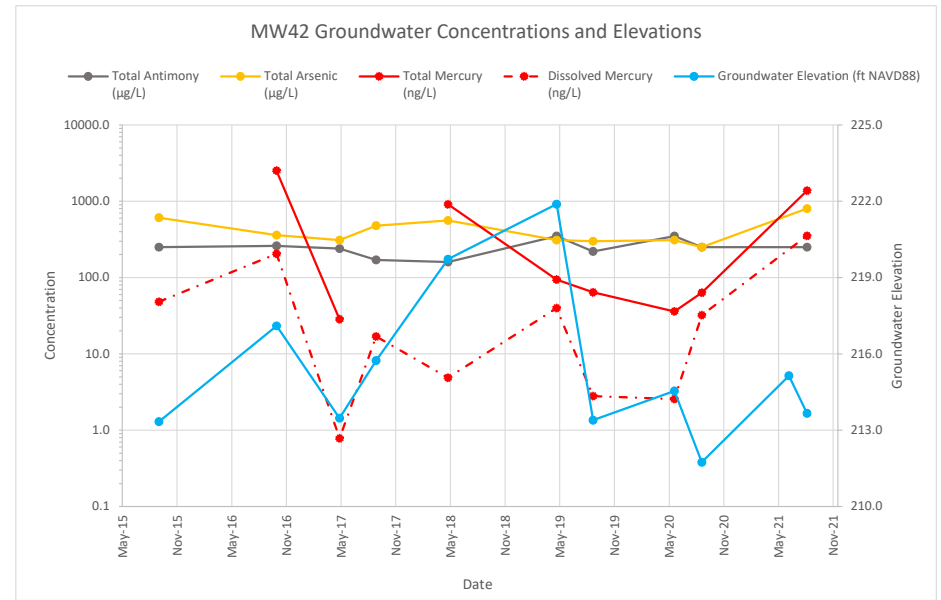
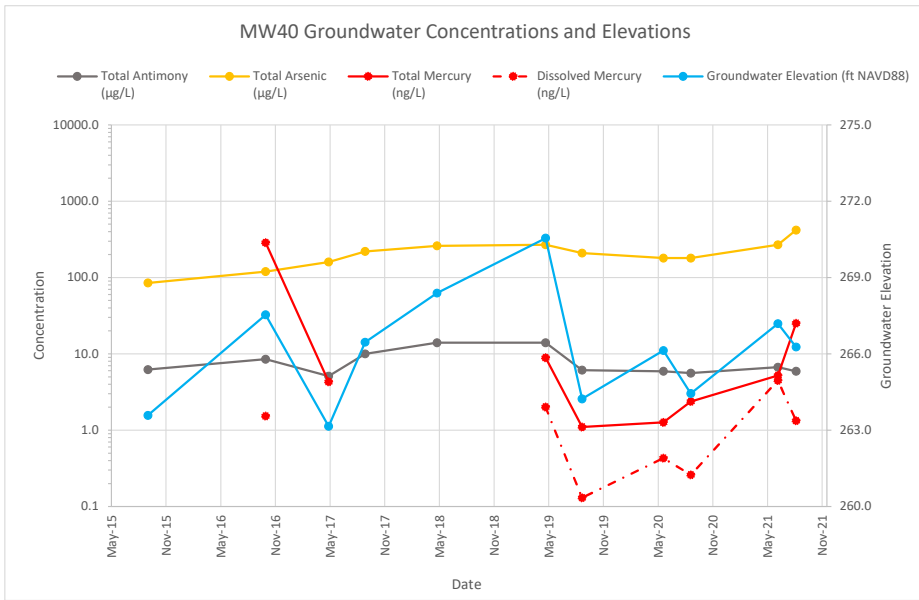
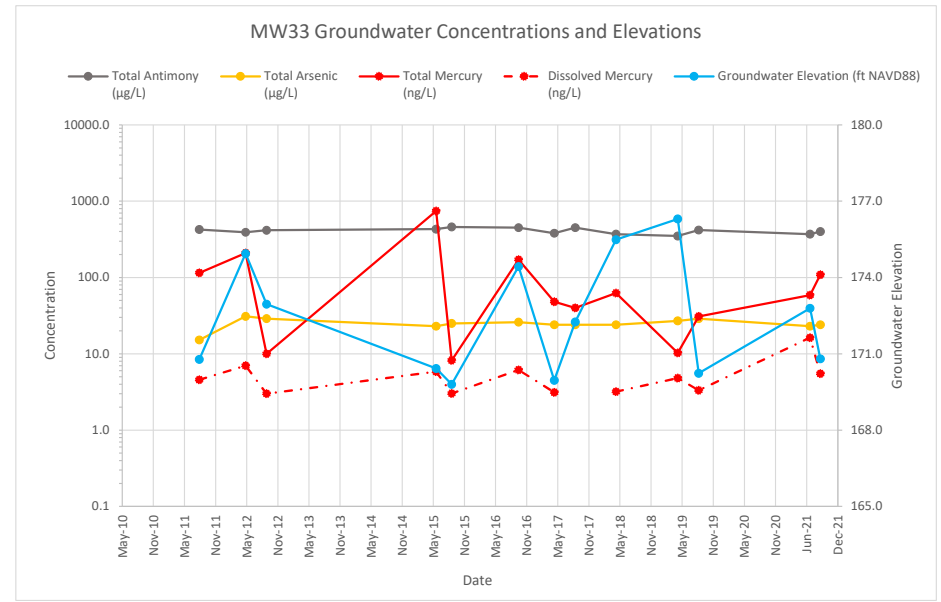
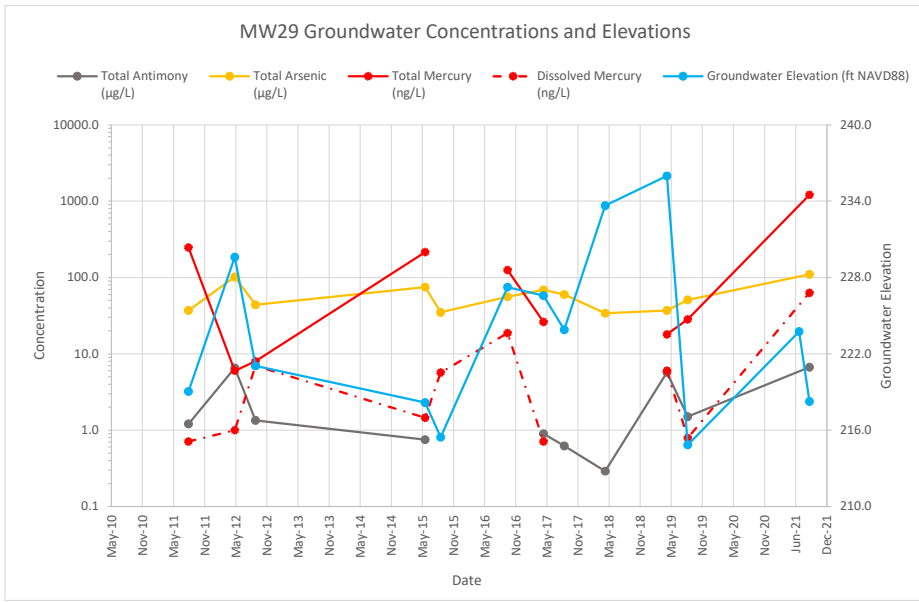


Figure 6-1. Groundwater Analytical Plots

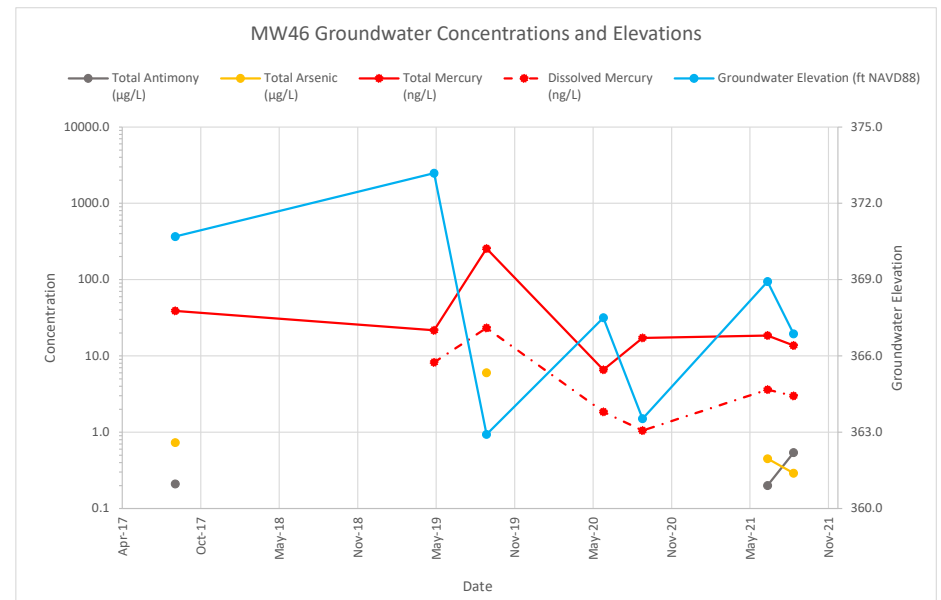
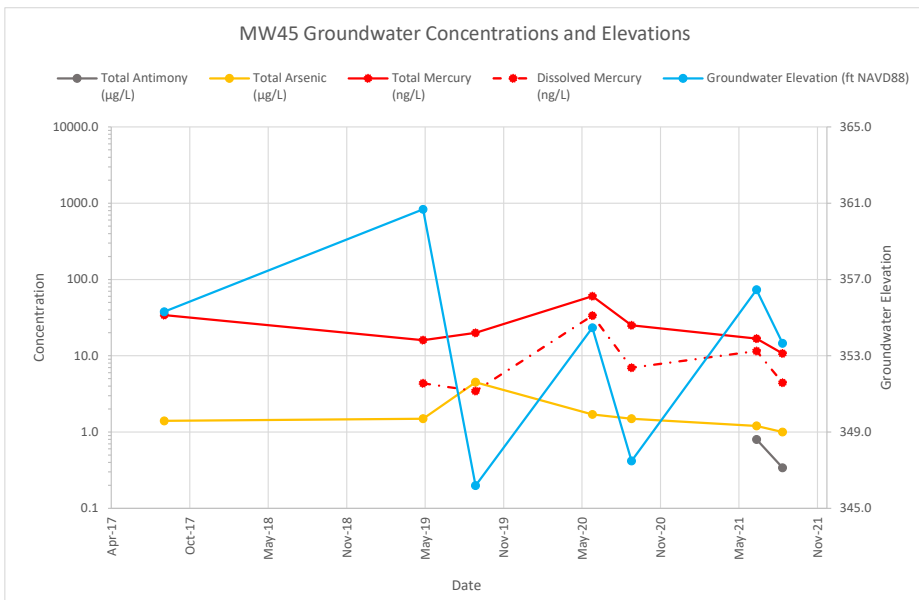
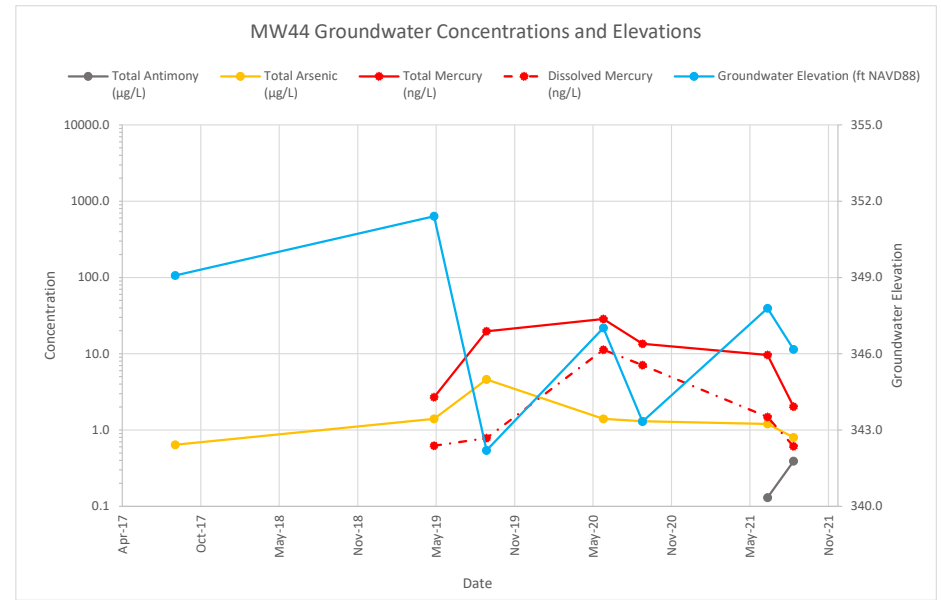
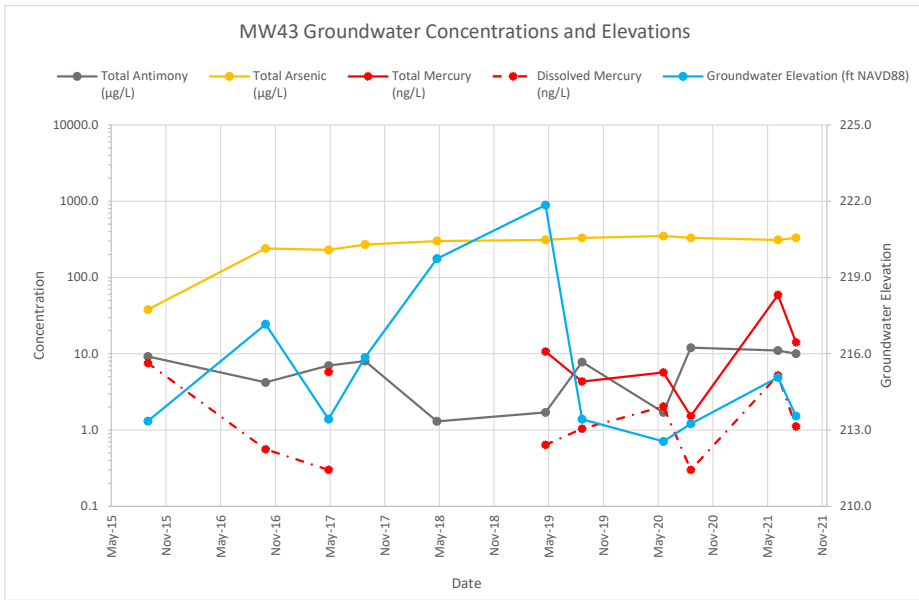


Figure 6-1. Groundwater Analytical Plots

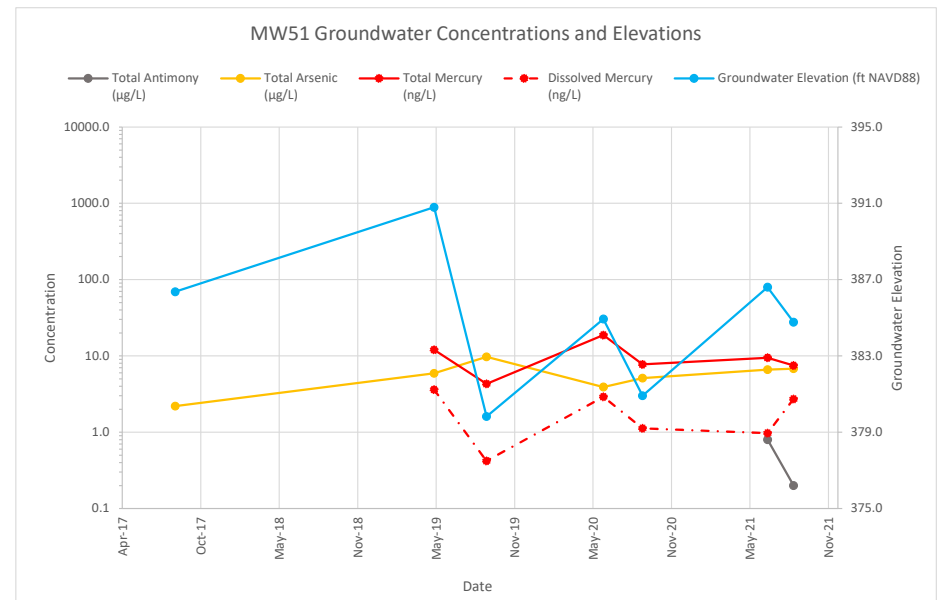
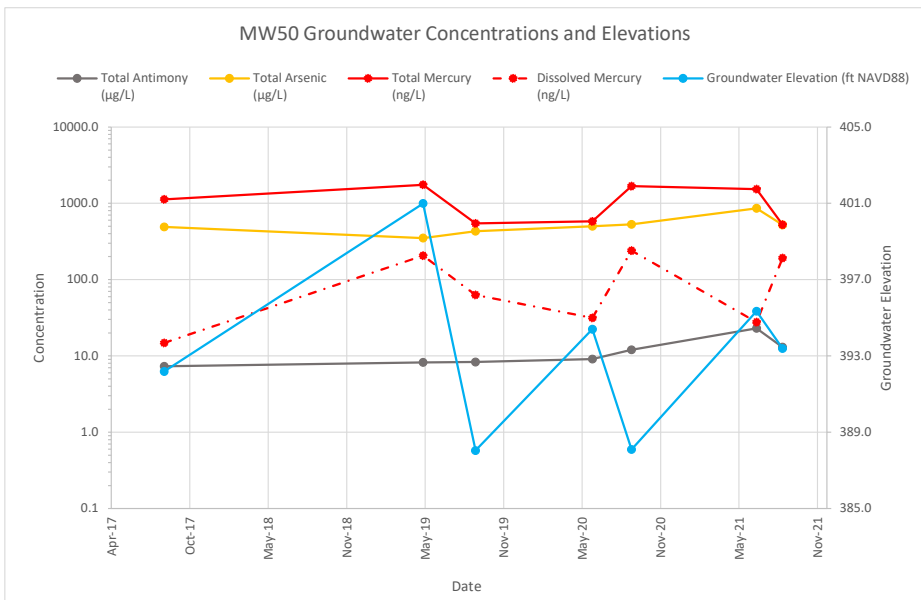
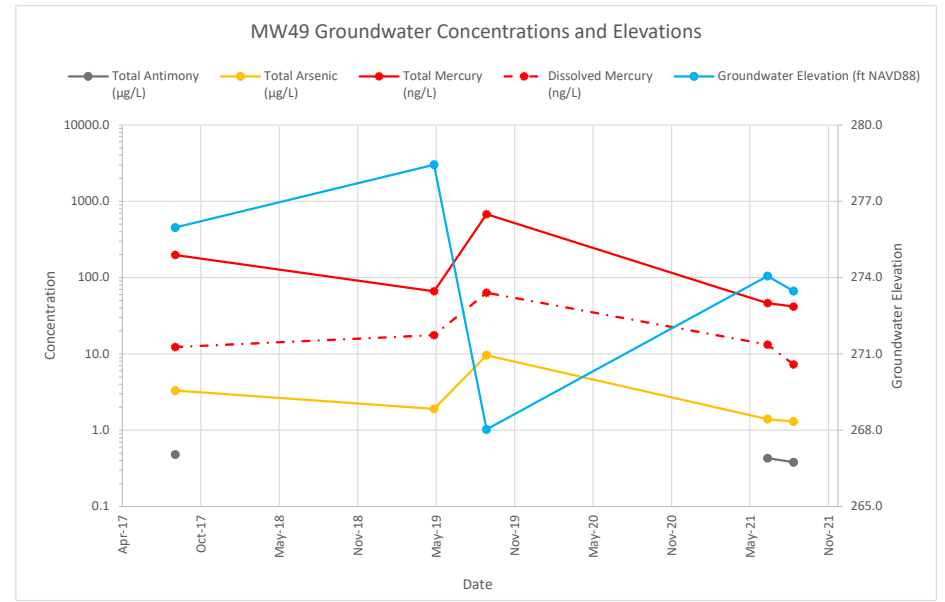
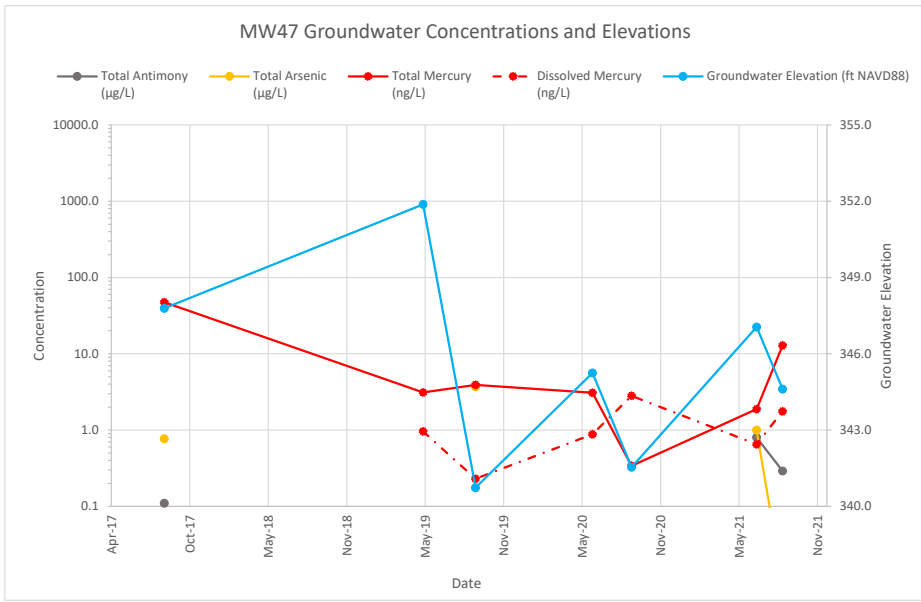


Figure 6-1. Groundwater Analytical Plots

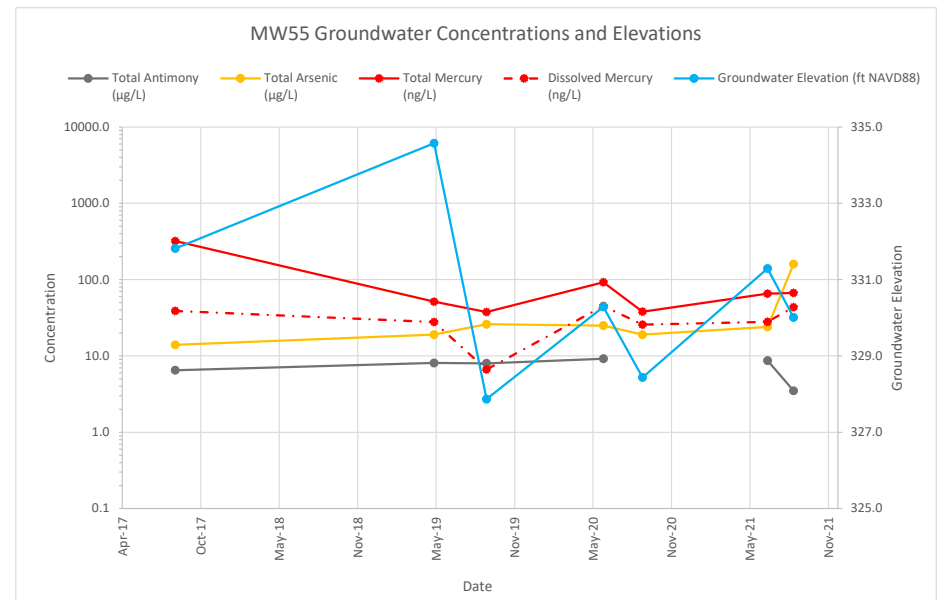
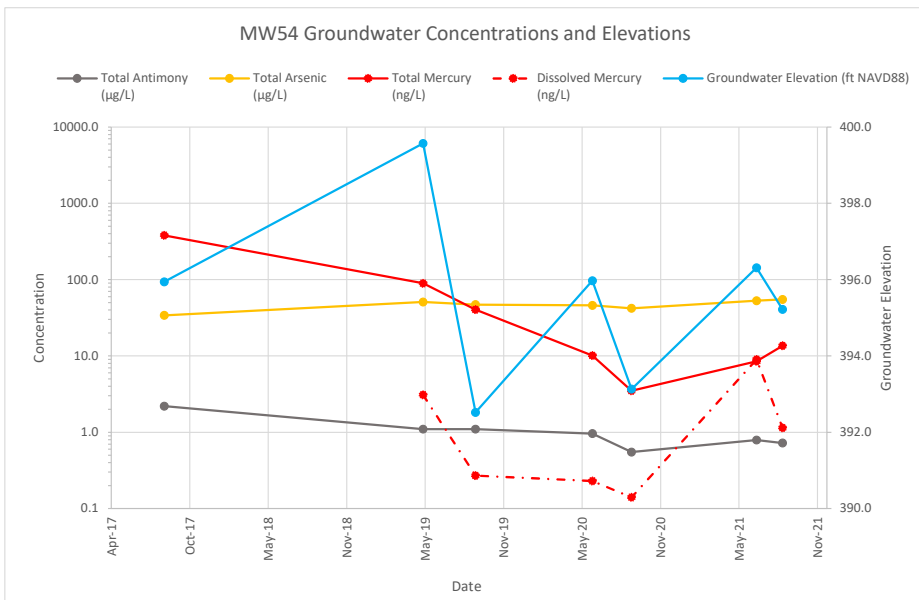
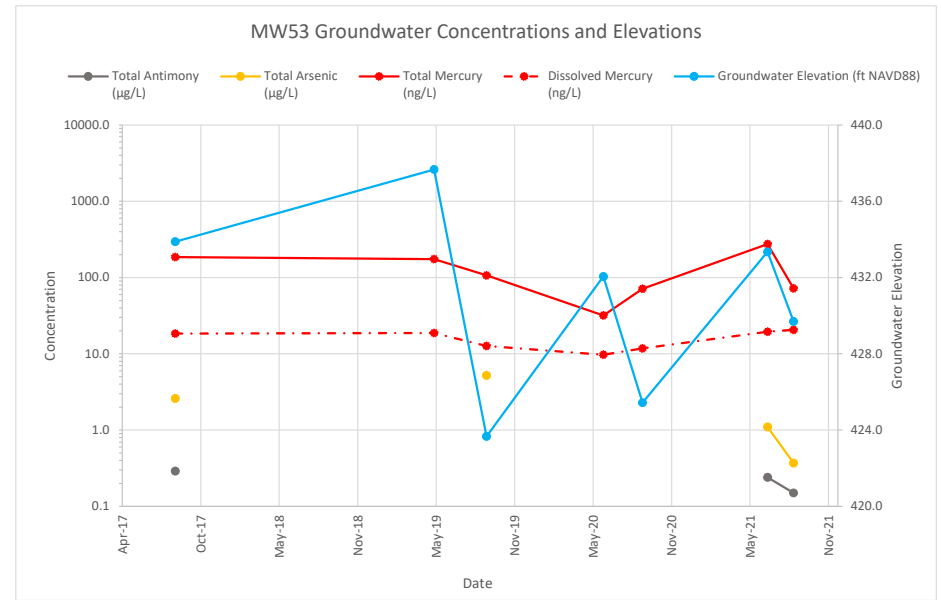
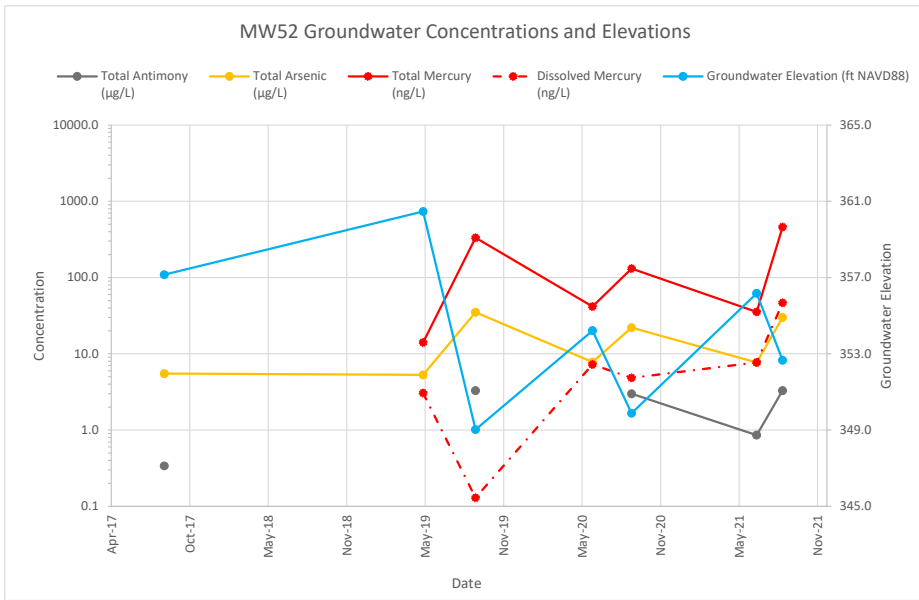


Figure 6-1. Groundwater Analytical Plots

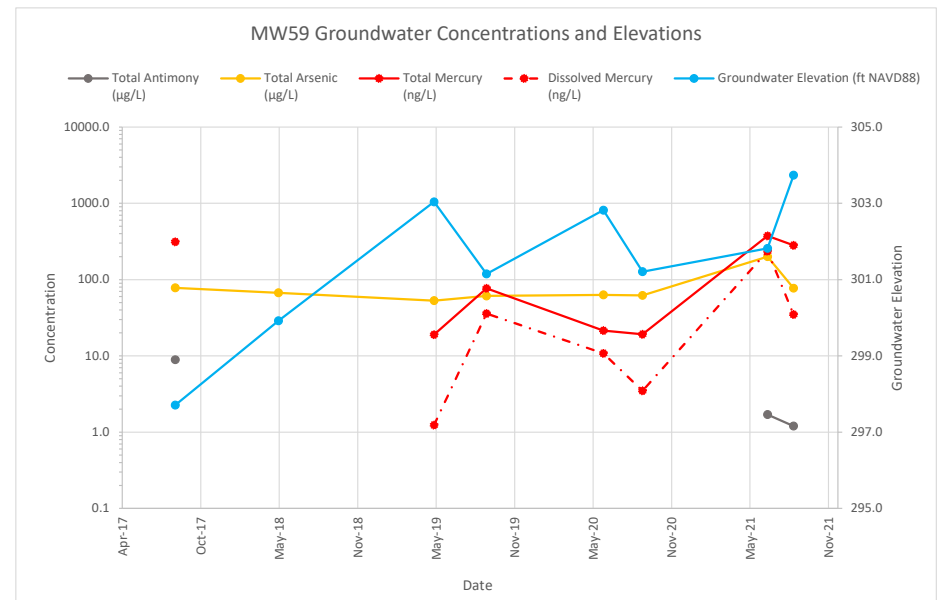
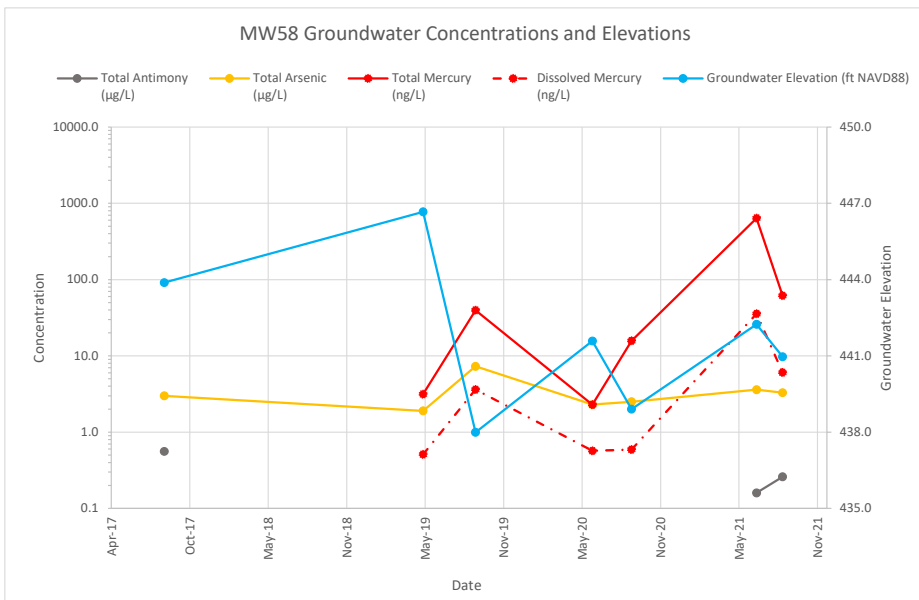
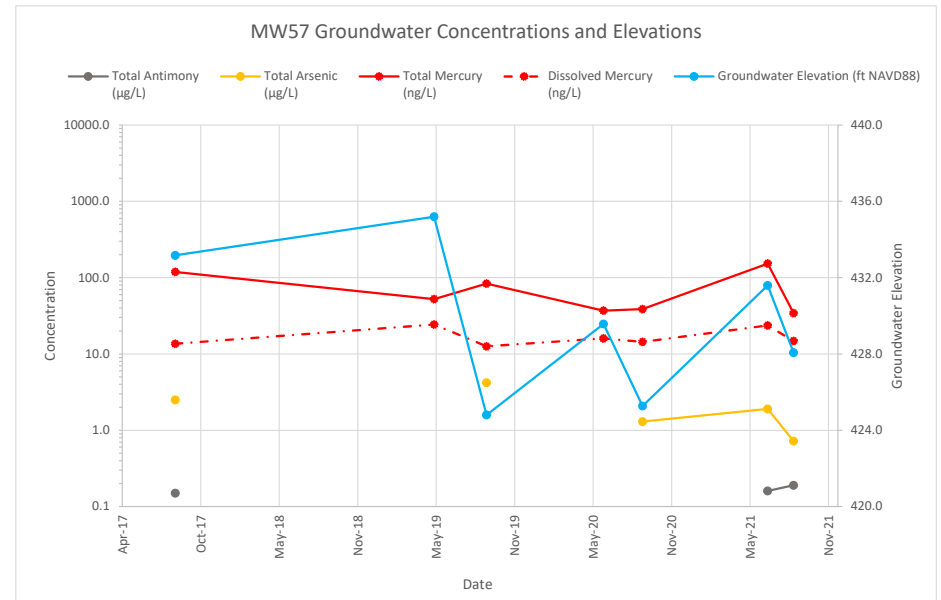
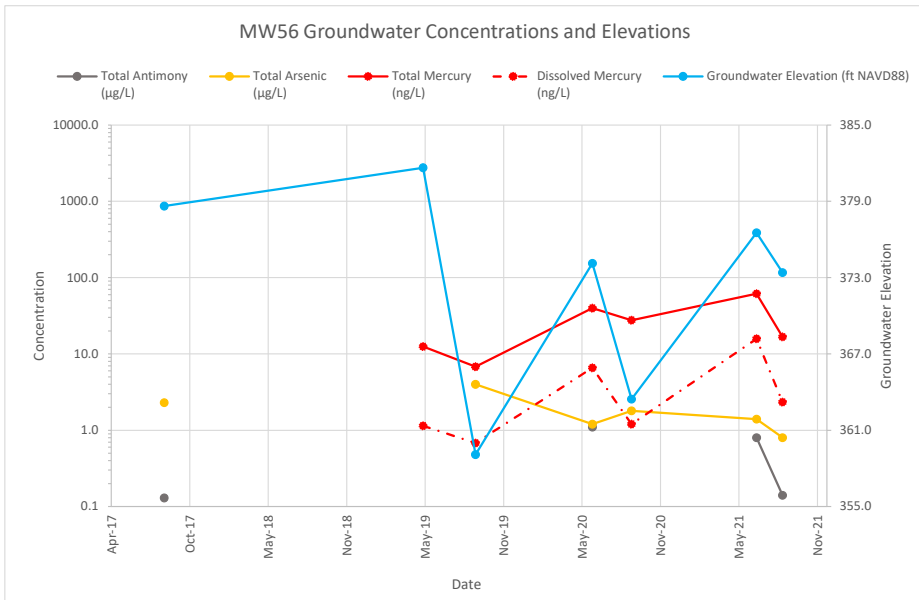


Figure 6-2. Surface Water Analytical Plots

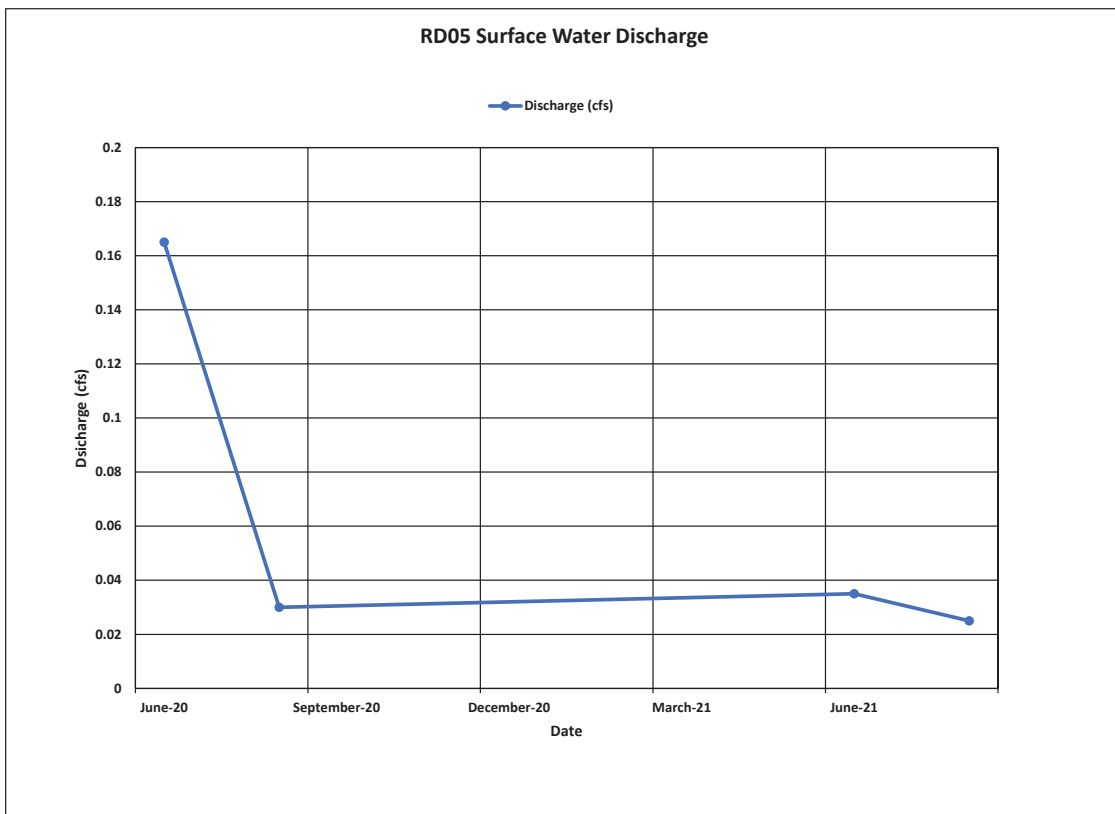
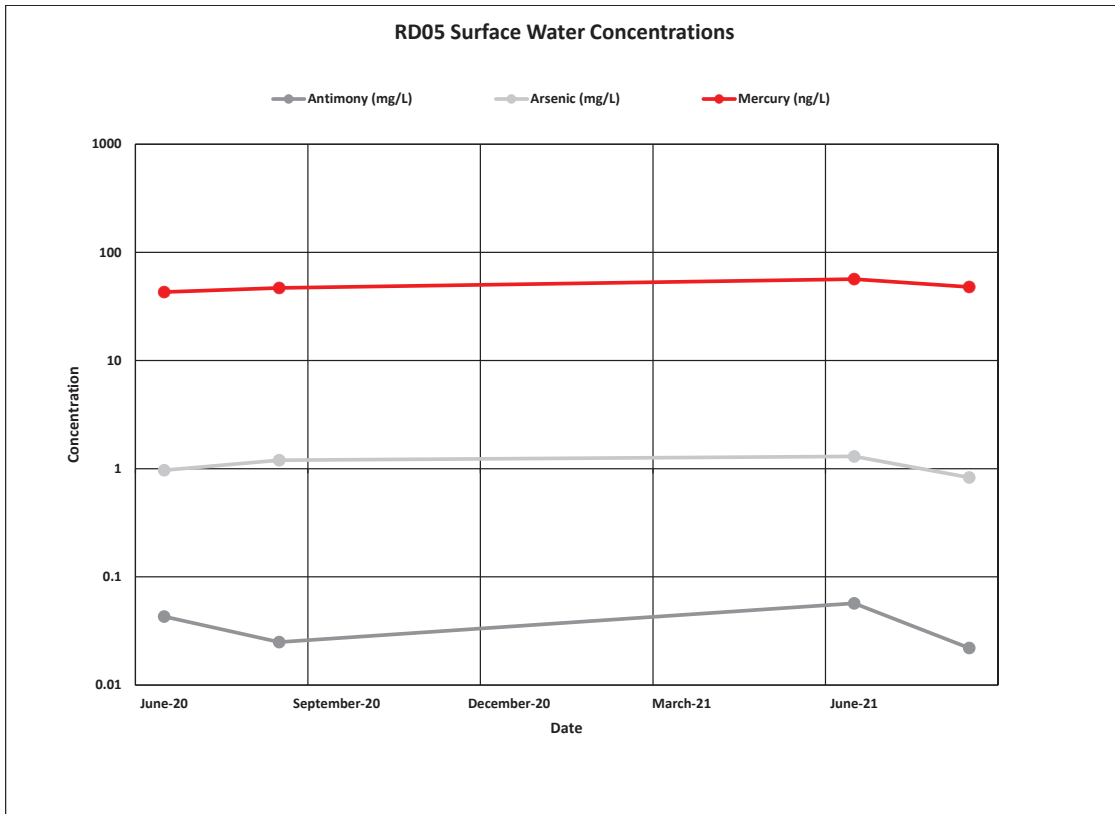


Figure 6-2. Surface Water Analytical Plots

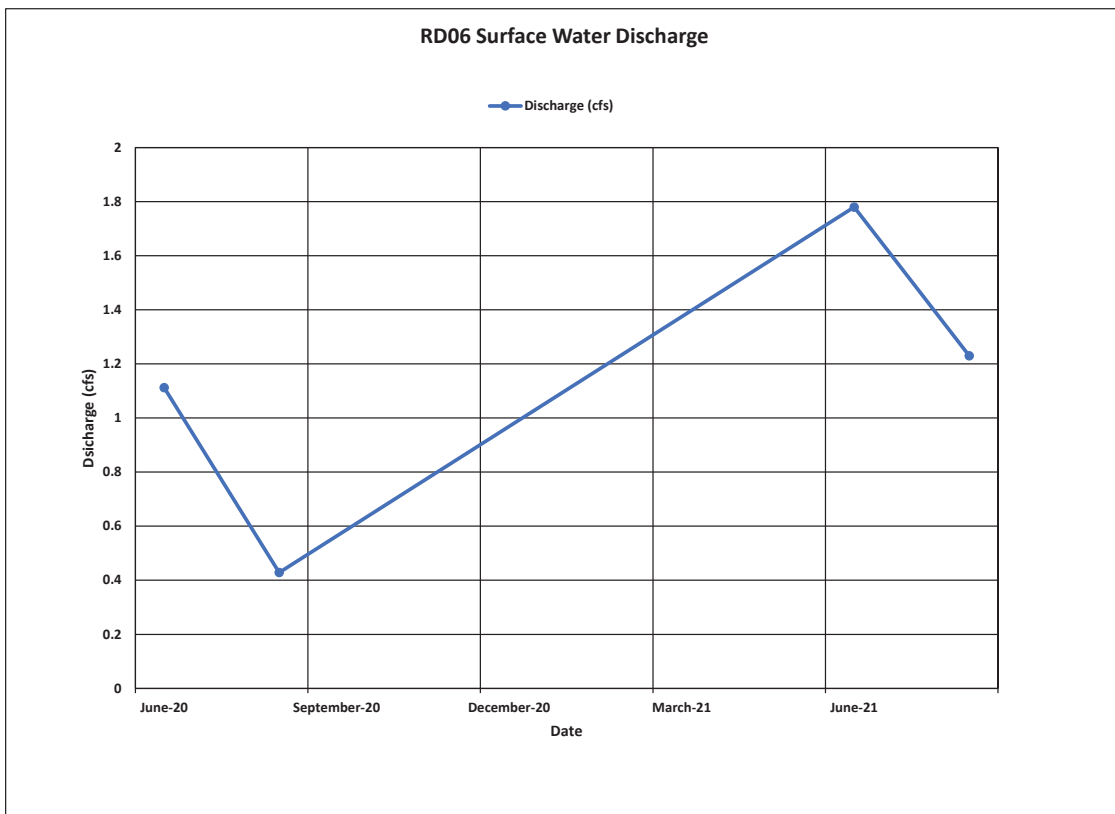
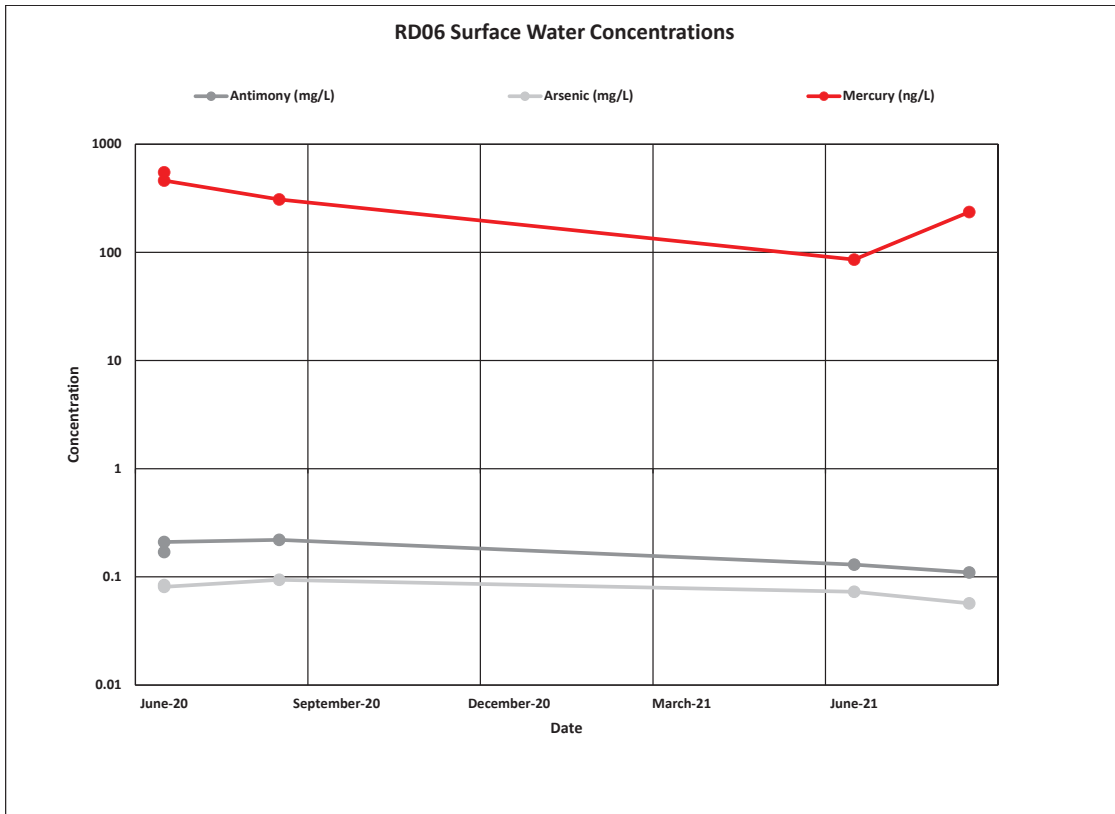


Figure 6-2. Surface Water Analytical Plots

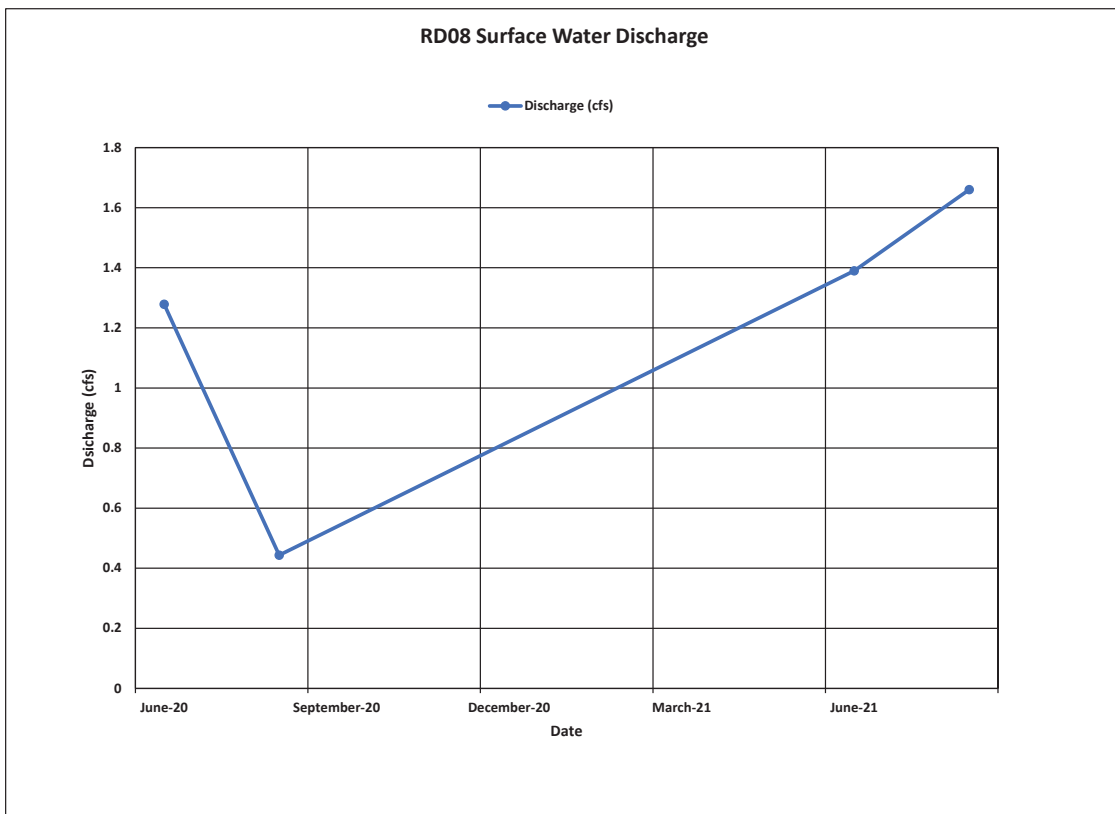
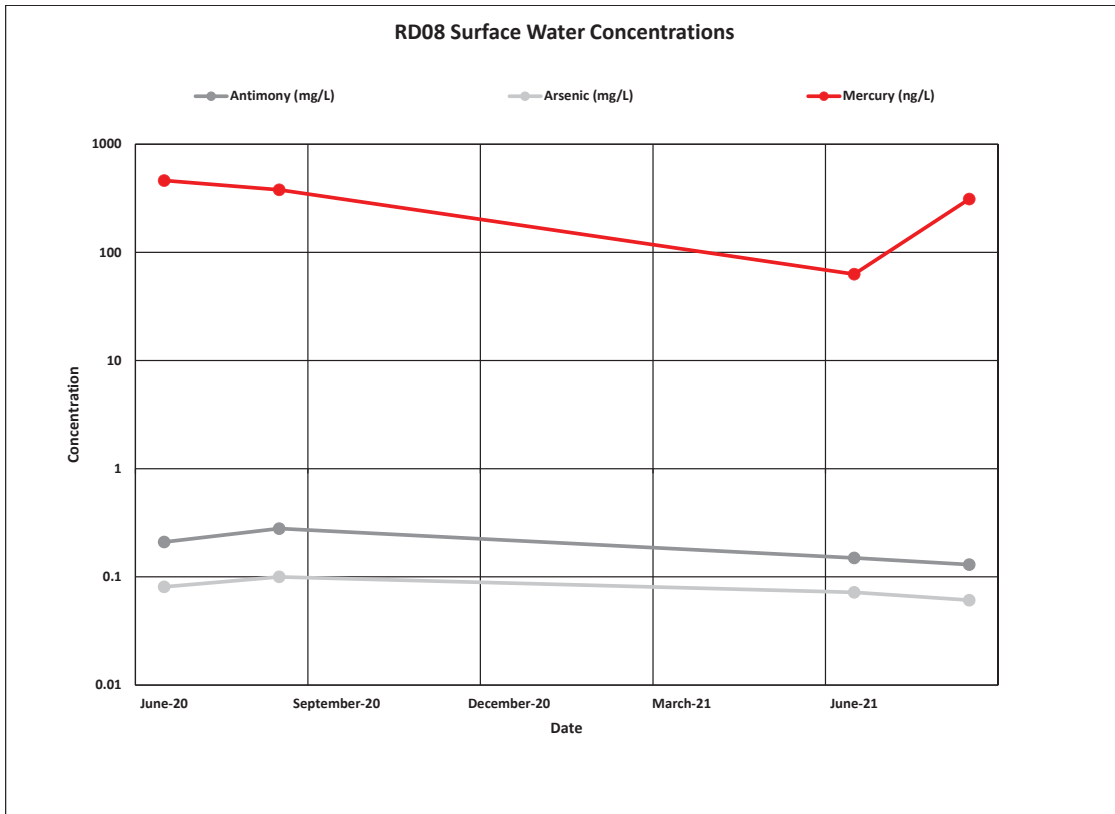


Figure 6-2. Surface Water Analytical Plots

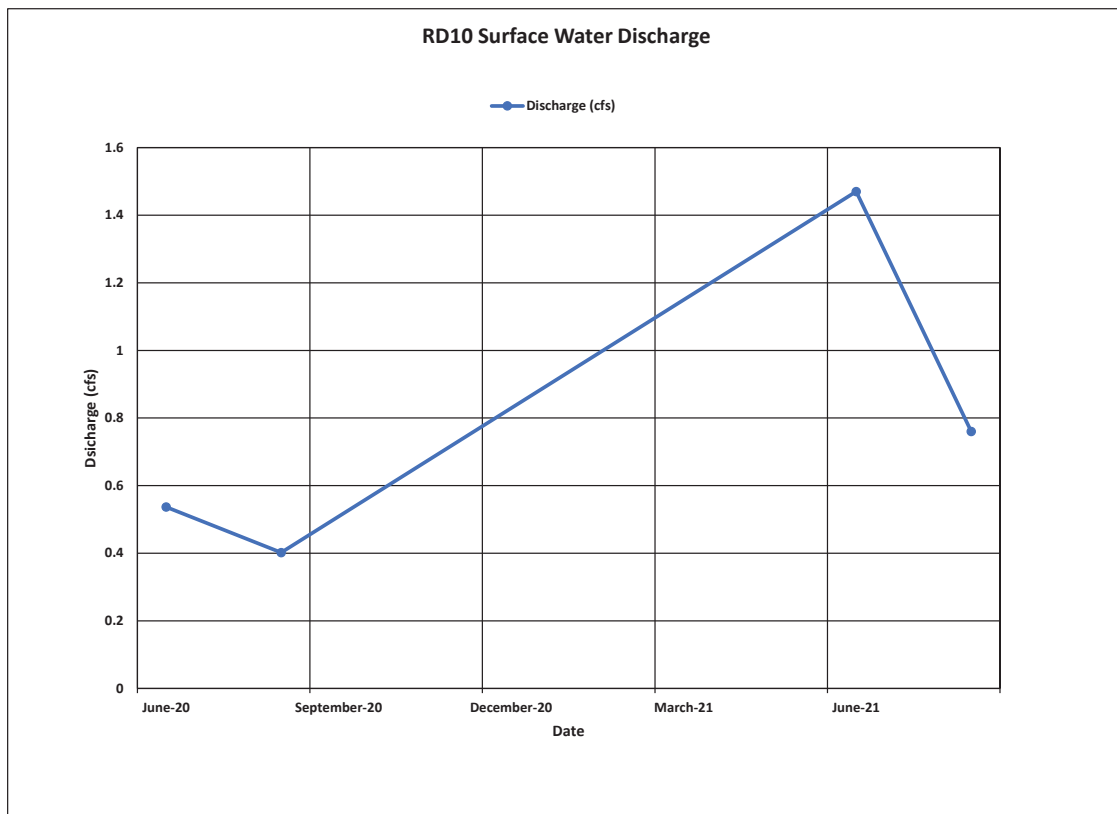
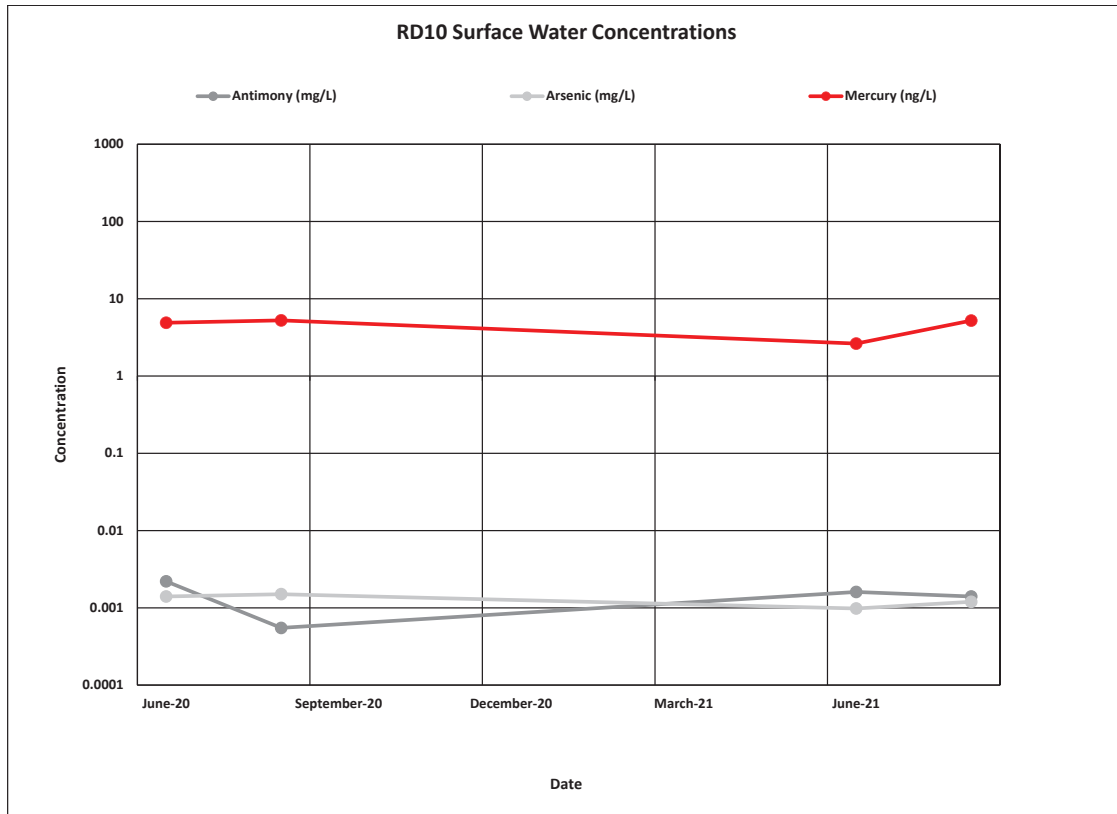


Figure 6-2. Surface Water Analytical Plots

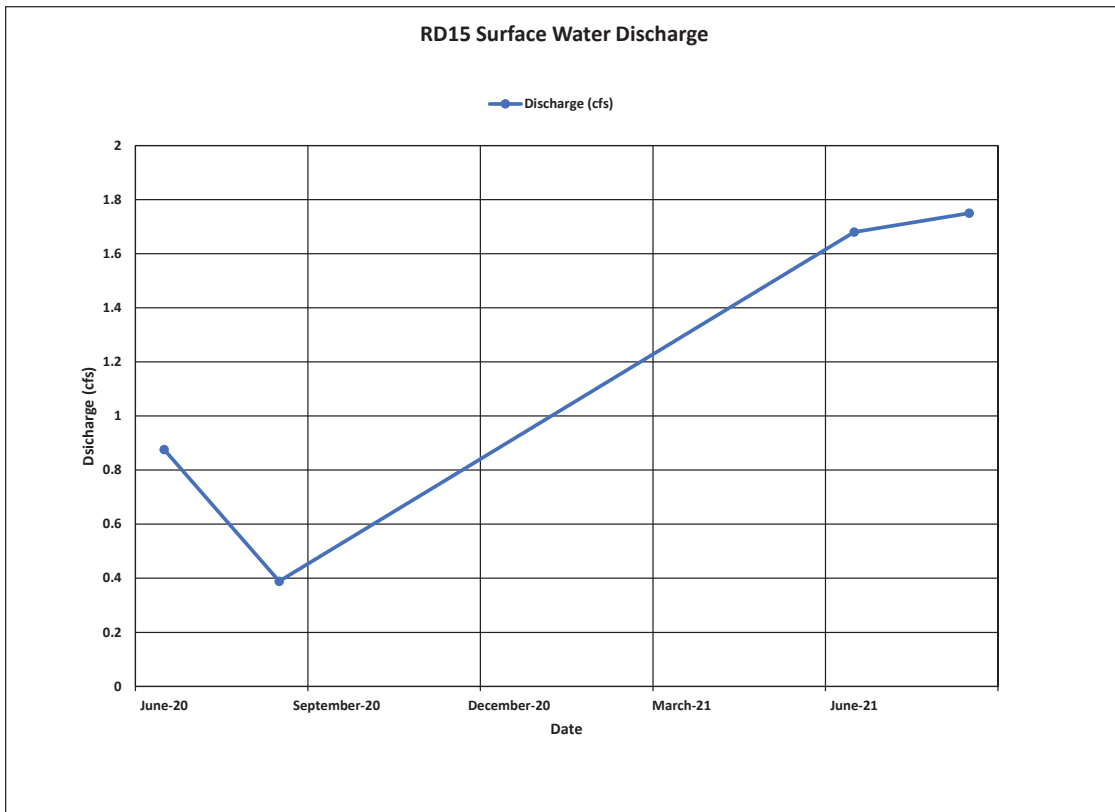
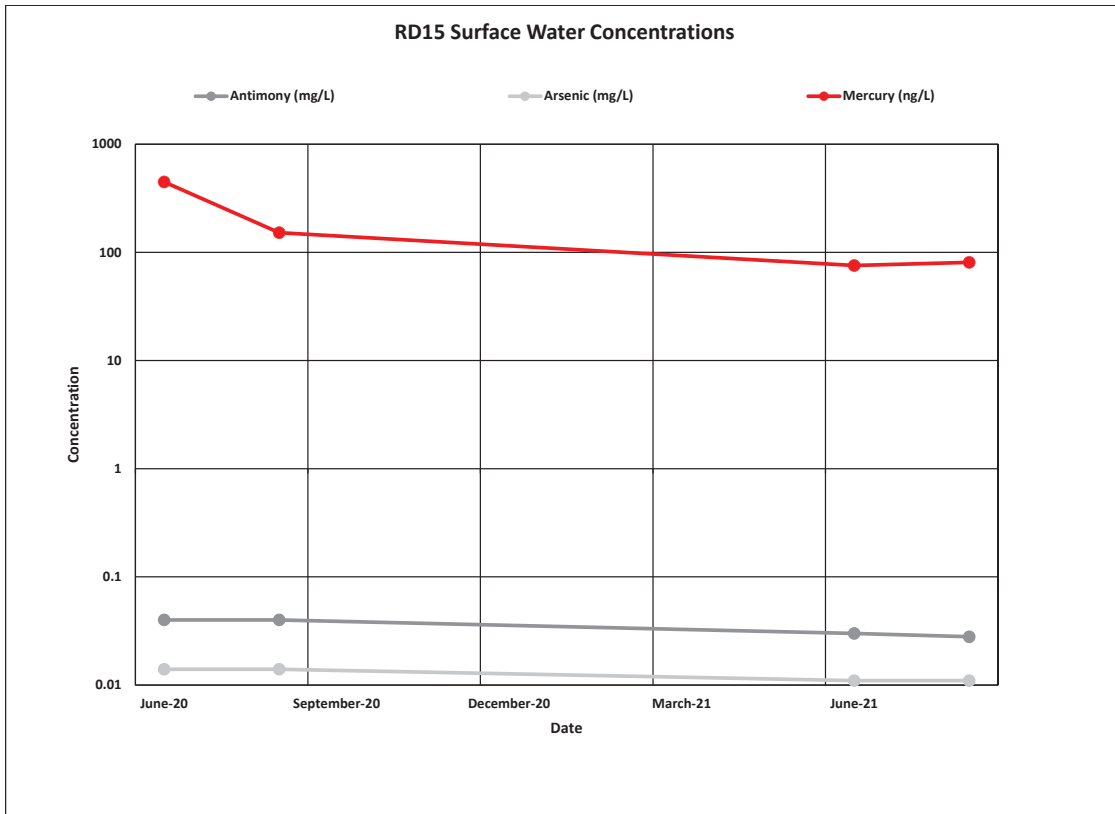


Figure 6-3. Red Devil Creek and Seep Contaminant Concentrations

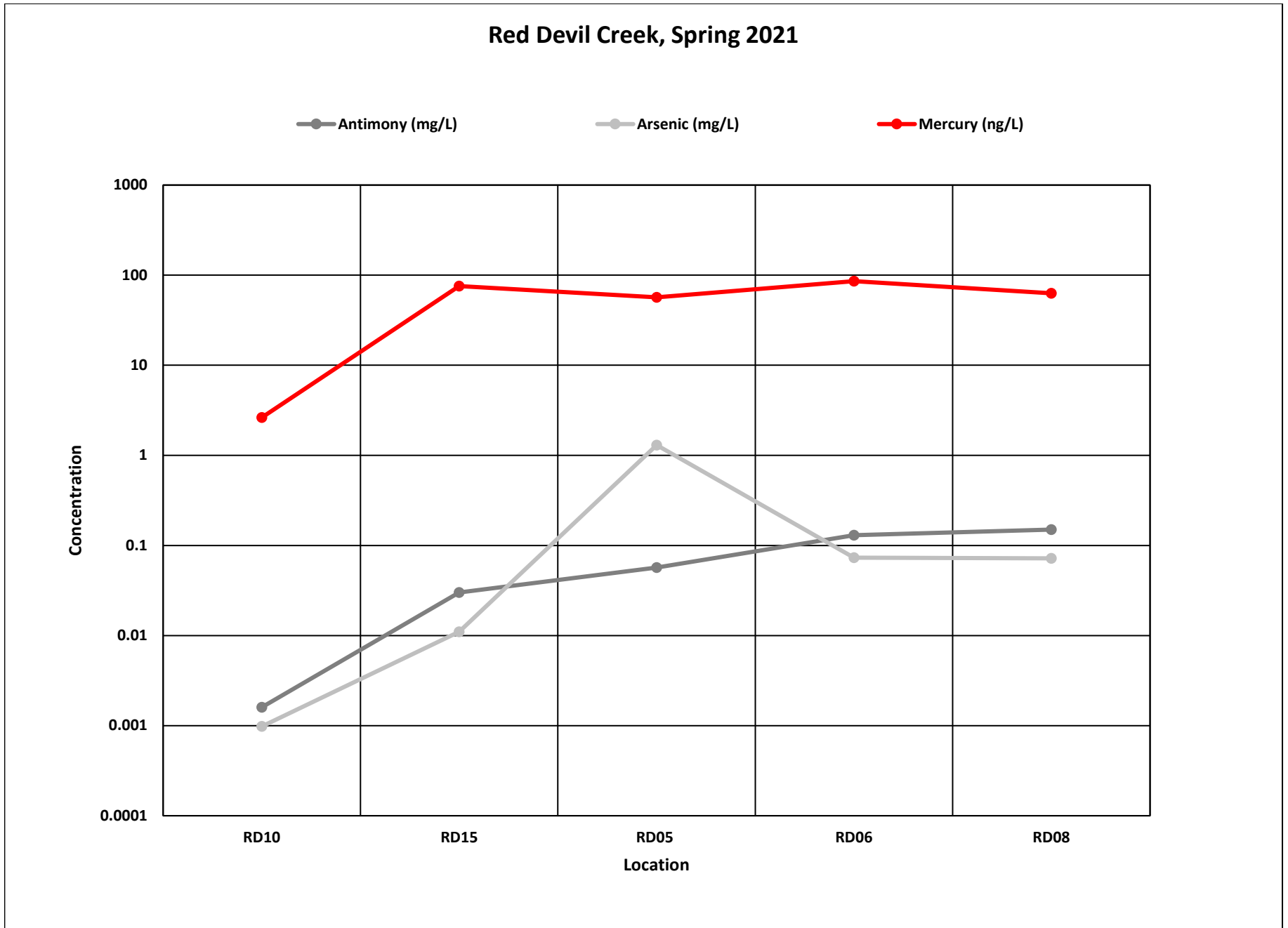
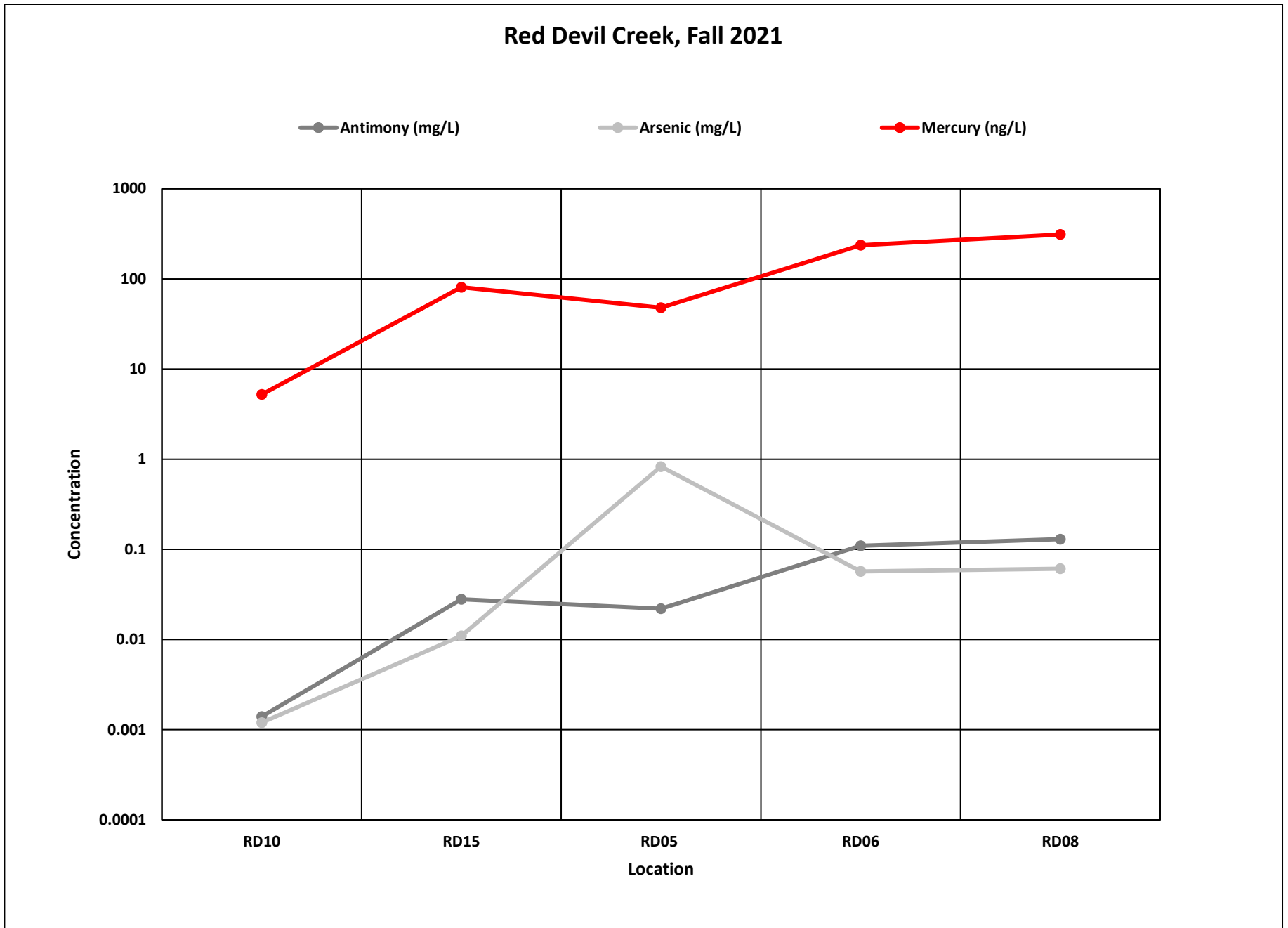


Figure 6-3. Red Devil Creek and Seep Contaminant Concentrations



TABLES

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Table 2-1: Monitoring Well Construction and Groundwater Depth Information

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW01											
MW01	B01	29.5	19.0 - 29.1	254.51	257.51	17.8 - TD	NR	21.50	6/17/2020	14:20	236.01
MW01	B01	29.5	19.0 - 29.1	254.51	257.51	17.8 - TD	NR	22.07	9/2/2020	12:13	235.44
MW01	B01	29.5	19.0 - 29.1	254.51	257.51	17.8 - TD	NR	25.97	6/4/2021	7:42	231.54
MW01	B01	29.5	19.0 - 29.1	254.51	257.51	17.8 - TD	NR	20.11	8/28/2021	9:19	237.40
MW03											
MW03	B03	25.5	15.0 - 25.0	228.37	230.77	19.0 - TD	NR	20.14	6/17/2020	13:30	210.63
MW03	B03	25.5	15.0 - 25.0	228.37	230.77	19.0 - TD	NR	22.65	9/2/2020	13:11	208.12
MW03	B03	25.5	15.0 - 25.0	228.37	230.77	19.0 - TD	NR	18.84	6/4/2021	9:50	211.93
MW03	B03	25.5	15.0 - 25.0	228.37	230.77	19.0 - TD	NR	20.82	8/28/2021	11:05	209.95
MW04											
MW04	B04	30.5	20.0 - 30.0	239.92	242.12	25.3 - TD	NR	27.12	6/17/2020		215.00
MW04	B04	30.5	20.0 - 30.0	239.92	242.12	25.3 - TD	NR	28.9	9/2/2020	17:25	213.22
MW04	B04	30.5	20.0 - 30.0	239.92	242.12	25.3 - TD	NR	26.03	6/4/2021	11:29	216.09
MW04	B04	30.5	20.0 - 30.0	239.92	242.12	25.3 - TD	NR	27.69	8/28/2021	12:50	214.43
MW06											
MW06	B06	23.5	13.0 - 23.0	214.99	217.49	20.0 - TD	NR	18.01	6/17/2020	16:21	199.48
MW06	B06	23.5	13.0 - 23.0	214.99	217.49	20.0 - TD	NR	19.57	9/2/2020	17:53	197.92
MW06	B06	23.5	13.0 - 23.0	214.99	217.49	20.0 - TD	NR	17.38	6/4/2021	11:58	200.11
MW06	B06	23.5	13.0 - 23.0	214.99	217.49	20.0 - TD	NR	19.02	8/28/2021	11:55	198.47
MW07											
MW07	B07	21.5	11.0 - 21.0	278.39	280.89	14.8 - TD	NR	20.66	6/17/2020	15:38	260.23
MW07	B07	21.5	11.0 - 21.0	278.39	280.89	14.8 - TD	NR	23.14	9/2/2020	12:59	257.75
MW07	B07	21.5	11.0 - 21.0	278.39	280.89	14.8 - TD	NR	20.35	6/4/2021	9:15	260.54
MW07	B07	21.5	11.0 - 21.0	278.39	280.89	14.8 - TD	NR	20.93	8/28/2021	10:32	259.96
MW08											
MW08	11MP01SB	16.0	5.0 - 15.0	328.92	331.32	2.5 - 4.0, 10.5 - TD	NR	14.3	6/17/2020	16:04	317.02
MW08	11MP01SB	16.0	5.0 - 15.0	328.92	331.32	2.5 - 4.0, 10.5 - TD	NR	15.4	9/2/2020	12:43	315.92
MW08	11MP01SB	16.0	5.0 - 15.0	328.92	331.32	2.5 - 4.0, 10.5 - TD	NR	15.6	6/4/2021	9:04	315.73
MW08	11MP01SB	16.0	5.0 - 15.0	328.92	331.32	2.5 - 4.0, 10.5 - TD	NR	14.3	8/28/2021	10:25	317.05
MW09											
MW09	11MP17SB	31.0	20.0 - 30.0	274.88	277.28	14.0 - 16.0, 31.0 - TD	NR	27.33	6/17/2020	15:39	249.95
MW09	11MP17SB	31.0	20.0 - 30.0	274.88	277.28	14.0 - 16.0, 31.0 - TD	NR	27.26	9/2/2020	12:29	250.02

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW09	11MP17SB	31.0	20.0 - 30.0	274.88	277.28	14.0 - 16.0, 31.0 - TD	NR	25.43	6/4/2021	8:20	251.85
MW09	11MP17SB	31.0	20.0 - 30.0	274.88	277.28	14.0 - 16.0, 31.0 - TD	NR	25.37	8/28/2021	9:48	251.91
MW10											
MW10	11MP14SB	61.0	50.0 - 60.0	274.31	276.21	48.0 - TD	NR	21.65	6/17/2020	14:25	254.56
MW10	11MP14SB	61.0	50.0 - 60.0	274.31	276.21	48.0 - TD	NR	32.56	9/2/2020	12:23	243.65
MW10	11MP14SB	61.0	50.0 - 60.0	274.31	276.21	48.0 - TD	NR	27.50	6/4/2021	8:08	248.71
MW10	11MP14SB	61.0	50.0 - 60.0	274.31	276.21	48.0 - TD	NR	30.01	8/28/2021	9:43	246.20
MW11											
MW11	11MP12SB	23.0	12.0 - 22.0	268.70	271.30	--	NR	21.42	6/17/2020	15:18	249.88
MW11	11MP12SB	23.0	12.0 - 22.0	268.70	271.30	--	NR	23.82	9/2/2020	12:21	247.48
MW11	11MP12SB	23.0	12.0 - 22.0	268.70	271.30	--	NR	21.86	6/4/2021	7:55	249.44
MW11	11MP12SB	23.0	12.0 - 22.0	268.70	271.30	--	NR	23.55	8/28/2021	9:38	247.75
MW12											
MW12	11RD13SB	15.0	4.0 - 14.0	263.22	265.62	1.0 - TD	NR	NR	6/17/2020	--	Inner casing damaged from settling of outer casing, preventing access for DTW measurements.
MW12	11RD13SB	15.0	4.0 - 14.0	263.22	265.62	1.0 - TD	NR	NR	9/2/2020	--	
MW12	11RD13SB	15.0	4.0 - 14.0	263.22	265.62	1.0 - TD	NR	NR	6/4/2021	9:25	
MW12	11RD13SB	15.0	4.0 - 14.0	263.22	265.62	1.0 - TD	NR	NR	8/28/2021	10:44	
MW13											
MW13	11MP20SB	32.0	21.0 - 31.0	274.30	276.70	27.0 - TD	31.65	DRY	6/17/2020	15:52	Dry (Water Elevation <243.3 feet bgs)
MW13	11MP20SB	32.0	21.0 - 31.0	274.30	276.70	27.0 - TD	NR	NR	9/2/2020	12:55	Frost jacked, unusable for DTW measurements
MW13	11MP20SB	32.0	21.0 - 31.0	274.30	276.70	27.0 - TD	NR	28.5	6/4/2021	9:20	
MW13	11MP20SB	32.0	21.0 - 31.0	274.30	276.70	27.0 - TD	31.72	DRY	8/28/2021	10:37	
MW14											
MW14	11MP25SB	36.0	25.0 - 35.0	246.71	249.01	25.7 - TD	--	--	--	--	Decommissioned in 2014 NTCRA
MW15											
MW15	11MP29SB	26.0	15.0 - 25.0	242.63	244.93	16.2 - TD	--	--	--	--	Decommissioned in 2014 NTCRA
MW16											
MW16	11MP30SB	22.0	11.0 - 21.0	226.09	228.09	16.0 - TD	NR	13.25	6/17/2020	15:52	214.84
MW16	11MP30SB	22.0	11.0 - 21.0	226.09	228.09	16.0 - TD	NR	15.17	9/2/2020	12:00	212.92
MW16	11MP30SB	22.0	11.0 - 21.0	226.09	228.09	16.0 - TD	NR	11.90	6/4/2021	9:45	216.19
MW16	11MP30SB	22.0	11.0 - 21.0	226.09	228.09	16.0 - TD	NR	13.49	8/28/2021	11:01	214.60
MW17											
MW17	11MP91SB	52.5	41.5 - 51.5	226.36	228.66	25.0 - 33.0, 33.0 - TD	NR	15.49	6/17/2020	13:25	213.17

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW17	11MP91SB	52.5	41.5 - 51.5	226.36	228.66	25.0 - 33.0, 33.0 - TD	NR	17.45	9/2/2020	12:06	211.21
MW17	11MP91SB	52.5	41.5 - 51.5	226.36	228.66	25.0 - 33.0, 33.0 - TD	NR	13.67	6/4/2021	9:40	214.99
MW17	11MP91SB	52.5	41.5 - 51.5	226.36	228.66	25.0 - 33.0, 33.0 - TD	NR	15.82	8/28/2021	10:58	212.84
MW18											
MW18	11MP31SB	40.0	29.0 - 39.0	241.33	243.83	38.0 - TD	NR	29.62	6/17/2020	13:23	214.21
MW18	11MP31SB	40.0	29.0 - 39.0	241.33	243.83	38.0 - TD	NR	31.81	9/2/2020	13:46	212.02
MW18	11MP31SB	40.0	29.0 - 39.0	241.33	243.83	38.0 - TD	NR	27.55	6/4/2021	10:23	216.28
MW18	11MP31SB	40.0	29.0 - 39.0	241.33	243.83	38.0 - TD	NR	29.87	8/28/2021	11:18	213.96
MW19											
MW19	11MP33SB	43.0	32.0 - 42.0	237.70	240.00	39.0 - TD	NR	20.25	6/17/2020	13:17	219.75
MW19	11MP33SB	43.0	32.0 - 42.0	237.70	240.00	39.0 - TD	NR	27.11	9/2/2020	13:50	212.89
MW19	11MP33SB	43.0	32.0 - 42.0	237.70	240.00	39.0 - TD	NR	17.30	6/4/2021	10:32	222.70
MW19	11MP33SB	43.0	32.0 - 42.0	237.70	240.00	39.0 - TD	NR	21.81	8/28/2021	11:24	218.19
MW20											
MW20	11MP38SB	15.5	4.5 - 14.5	212.90	215.20	6.5 - TD	NR	7.4	6/17/2020	13:33	207.80
MW20	11MP38SB	15.5	4.5 - 14.5	212.90	215.20	6.5 - TD	NR	8.56	9/2/2020	13:18	206.64
MW20	11MP38SB	15.5	4.5 - 14.5	212.90	215.20	6.5 - TD	NR	7.01	6/4/2021	9:58	208.19
MW20	11MP38SB	15.5	4.5 - 14.5	212.90	215.20	6.5 - TD	NR	7.67	8/28/2021	11:09	207.53
MW21											
MW21	11MP39SB	17.5	6.5 - 16.5	208.23	210.13	7.0 - TD	NR	8.81	6/17/2020	13:37	201.32
MW21	11MP39SB	17.5	6.5 - 16.5	208.23	210.13	7.0 - TD	NR	10.32	9/2/2020	13:24	199.81
MW21	11MP39SB	17.5	6.5 - 16.5	208.23	210.13	7.0 - TD	NR	8.48	6/4/2021	10:08	201.65
MW21	11MP39SB	17.5	6.5 - 16.5	208.23	210.13	7.0 - TD	NR	8.96	8/28/2021	11:40	201.17
MW22											
MW22	11MP40SB	15.5	4.5 - 14.5	203.10	205.10	7.8 - TD	NR	9.4	6/17/2020	13:39	195.70
MW22	11MP40SB	15.5	4.5 - 14.5	203.10	205.10	7.8 - TD	NR	10.79	9/2/2020	13:29	194.31
MW22	11MP40SB	15.5	4.5 - 14.5	203.10	205.10	7.8 - TD	NR	8.55	6/4/2021	10:13	196.55
MW22	11MP40SB	15.5	4.5 - 14.5	203.10	205.10	7.8 - TD	NR	9.97	8/28/2021	11:37	195.13
MW23											
MW23	11MP66SB	29.0	18.0 - 28.0	201.96	204.16	20.0 - TD	NR	15.89	6/17/2020	16:27	188.27
MW23	11MP66SB	29.0	18.0 - 28.0	201.96	204.16	20.0 - TD	NR	16.71	9/2/2020	17:59	187.45
MW23	11MP66SB	29.0	18.0 - 28.0	201.96	204.16	20.0 - TD	NR	15.49	6/4/2021	12:03	188.67
MW23	11MP66SB	29.0	18.0 - 28.0	201.96	204.16	20.0 - TD	NR	16.38	8/28/2021	11:51	187.78
MW24											
MW24	11MP62SB	30.0	19.0 - 29.0	221.41	223.51	20.0 - TD	NR	17.18	6/17/2020	21:30	206.33
MW24	11MP62SB	30.0	19.0 - 29.0	221.41	223.51	20.0 - TD	NR	18.54	9/2/2020	17:49	204.97
MW24	11MP62SB	30.0	19.0 - 29.0	221.41	223.51	20.0 - TD	NR	16.16	6/4/2021	11:56	207.35

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW24	11MP62SB	30.0	19.0 - 29.0	221.41	223.51	20.0 - TD	NR	17.45	8/28/2021	11:58	206.06
MW25											
MW25	11MP89SB	42.0	31.0 - 41.0	237.56	239.76	32.0 - TD	NR	32.11	6/17/2020	16:41	207.65
MW25	11MP89SB	42.0	31.0 - 41.0	237.56	239.76	32.0 - TD	NR	32.94	9/2/2020	17:39	206.82
MW25	11MP89SB	42.0	31.0 - 41.0	237.56	239.76	32.0 - TD	NR	31.66	6/4/2021	11:47	208.10
MW25	11MP89SB	42.0	31.0 - 41.0	237.56	239.76	32.0 - TD	NR	32.26	8/28/2021	12:39	207.50
MW26											
MW26	11MP52SB	43.0	32.0 - 42.0	244.03	245.93	34.0 - TD	NR	35.73	6/17/2020	16:32	210.20
MW26	11MP52SB	43.0	32.0 - 42.0	244.03	245.93	34.0 - TD	NR	37.50	9/2/2020	17:36	208.43
MW26	11MP52SB	43.0	32.0 - 42.0	244.03	245.93	34.0 - TD	NR	34.35	6/4/2021	11:43	211.58
MW26	11MP52SB	43.0	32.0 - 42.0	244.03	245.93	34.0 - TD	NR	36.15	8/28/2021	12:34	209.78
MW27											
MW27	11MP60SB	34.0	23.0 - 33.0	241.04	242.94	29.0 - TD	NR	30.2	6/17/2020	16:51	212.74
MW27	11MP60SB	34.0	23.0 - 33.0	241.04	242.94	29.0 - TD	NR	31.54	9/2/2020	17:32	211.40
MW27	11MP60SB	34.0	23.0 - 33.0	241.04	242.94	29.0 - TD	NR	29.48	6/4/2021	11:40	213.46
MW27	11MP60SB	34.0	23.0 - 33.0	241.04	242.94	29.0 - TD	NR	30.92	8/28/2021	12:43	212.02
MW28											
MW28	11MP88SB	64.0	53.0 - 63.0	239.94	241.94	49.0 - TD	NR	28.84	6/17/2020	16:47	213.10
MW28	11MP88SB	64.0	53.0 - 63.0	239.94	241.94	49.0 - TD	NR	30.25	9/2/2020	17:30	211.69
MW28	11MP88SB	64.0	53.0 - 63.0	239.94	241.94	49.0 - TD	NR	27.95	6/4/2021	11:33	213.99
MW28	11MP88SB	64.0	53.0 - 63.0	239.94	241.94	49.0 - TD	NR	29.51	8/28/2021	12:46	212.43
MW29											
MW29	11MP41SB	70.0	59.0 - 69.0	280.35	282.25	61.0 - TD	NR	62.68	6/17/2020	20:10	219.57
MW29	11MP41SB	70.0	59.0 - 69.0	280.35	282.25	61.0 - TD	NR	NR	9/2/2020	17:11	<217.75 feet
MW29	11MP41SB	70.0	59.0 - 69.0	280.35	282.25	61.0 - TD	NR	58.50	6/4/2021	16:22	223.75
MW29	11MP41SB	70.0	59.0 - 69.0	280.35	282.25	61.0 - TD	NR	64.00	9/1/2021	15:00	218.25
MW30											
MW30	11SM31SB	53.0	42.0 - 52.0	275.71	277.41	45.0 - TD	NR	54.29	6/17/2020	20:15	Suspected Dry (Water Elevation <223.7 feet)
MW30	11SM31SB	53.0	42.0 - 52.0	275.71	277.41	45.0 - TD	NR	54.25	9/2/2020	17:18	Suspected Dry (Water Elevation <223.7 feet)
MW30	11SM31SB	53.0	42.0 - 52.0	275.71	277.41	45.0 - TD	NR	53.66	6/4/2021	16:30	Suspected Dry (Water Elevation <223.7 feet)
MW30	11SM31SB	53.0	42.0 - 52.0	275.71	277.41	45.0 - TD	NR	54.19	8/28/2021	16:21	Suspected Dry (Water Elevation <223.7 feet)

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW31											
MW31	11UP11SB	44.8	33.8 - 43.8	495.79	497.99	34.0 - TD	NR	41.12	6/17/2020	21:12	456.87
MW31	11UP11SB	44.8	33.8 - 43.8	495.79	497.99	34.0 - TD	44.95	DRY	9/2/2020	16:11	Suspected Dry (Water Elevation <452 feet)
MW31	11UP11SB	44.8	33.8 - 43.8	495.79	497.99	34.0 - TD	NR	38.56	6/4/2021	15:45	459.43
MW31	11UP11SB	44.8	33.8 - 43.8	495.79	497.99	34.0 - TD	NR	39.02	8/28/2021	15:09	458.97
MW32											
MW32	11RD05SB	25.0	14.0 - 24.0	194.38	196.58	16.5 - TD	NR	19.11	6/17/2020	13:10	177.47
MW32	11RD05SB	25.0	14.0 - 24.0	194.38	196.58	16.5 - TD	NR	21.06	9/2/2020	16:52	175.52
MW32	11RD05SB	25.0	14.0 - 24.0	194.38	196.58	16.5 - TD	NR	18.51	6/4/2021	10:41	178.07
MW32	11RD05SB	25.0	14.0 - 24.0	194.38	196.58	16.5 - TD	NR	19.28	8/28/2021	11:31	177.30
MW33											
MW33	11RD20SB	23.0	12.0 - 22.0	176.62	178.92	10.5 - TD	NR	6.62	6/17/2020	13:00	172.30
MW33	11RD20SB	23.0	12.0 - 22.0	176.62	178.92	10.5 - TD	NR	8.74	9/2/2020	11:05	170.18
MW33	11RD20SB	23.0	12.0 - 22.0	176.62	178.92	10.5 - TD	NR	6.13	6/4/2021	16:49	172.79
MW33	11RD20SB	23.0	12.0 - 22.0	176.62	178.92	10.5 - TD	NR	8.12	8/28/2021	16:53	170.80
MW34											
MW34	AST5 MW1	NR	NR	290.95	294.25	--	NR	58.13	6/4/2021	8:35	236.12
MW34	AST5 MW1	NR	NR	290.95	294.25	--	NR	34.59	8/28/2021	9:55	259.66
MW35											
MW35	AST5 MW2	NR	NR	285.76	289.26	--	NR	35.42	6/4/2021	8:42	253.84
MW35	AST5 MW2	NR	NR	285.76	289.26	--	NR	39.18	8/28/2021	9:59	250.08
MW36											
MW36	AST5 MW3	NR	NR	286.33	290.03	--	NR	15.74	6/4/2021	8:49	274.29
MW36	AST5 MW3	NR	NR	286.33	290.03	--	NR	16.39	8/28/2021	10:02	273.64
MW39											
MW39	SM67	84.0	63 - 83	432.83	435.26	--	85.10	Dry (>84)	9/2/2020	15:52	Dry (Water Elevation <349.8 feet)
MW39	SM67	84.0	63 - 83	432.83	435.26	--	NR	84.81	6/4/2021	14:40	Dry (Water Elevation <349.8 feet)
MW39	SM67	84.0	63 - 83	432.83	435.26	--	NR	84.79	8/28/2021	15:35	Dry (Water Elevation <349.8 feet)
MW40											
MW40	SM68c	140.0	119 - 139	392.86	395.18	--	NR	129.05	6/17/2020	21:02	266.13
MW40	SM68c	140.0	119 - 139	392.86	395.18	--	NR	130.74	9/2/2020	15:40	264.44
MW40	SM68c	140.0	119 - 139	392.86	395.18	--	NR	127.99	6/4/2021	14:29	267.19

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW40	SM68c	140.0	119 - 139	392.86	395.18	--	NR	128.91	8/28/2021	15:45	266.27
MW42											
MW42	SM70b	140.0	119 - 139	339.85	342.34	--	NR	127.8	6/17/2020	18:47	214.54
MW42	SM70b	140.0	119 - 139	339.85	342.34	--	--	130.6	9/2/2020	17:39	211.74
MW42	SM70b	140.0	119 - 139	339.85	342.34	--	NR	127.2	6/4/2021	11:08	215.14
MW42	SM70b	140.0	119 - 139	339.85	342.34	--	NR	128.7	8/28/2021	16:31	213.66
MW43											
MW43	SM71b	118.5	98 - 118	300.87	303.69	--	NR	91.14	6/17/2020	18:38	212.55
MW43	SM71b	118.5	98 - 118	300.87	303.69	--	NR	90.44	9/2/2020	17:32	213.25
MW43	SM71b	118.5	98 - 118	300.87	303.69	--	NR	88.62	6/4/2021	11:18	215.07
MW43	SM71b	118.5	98 - 118	300.87	303.69	--	NR	90.14	8/28/2021	16:38	213.55
MW44											
MW44	SM72	69	48-68	378.92	381.59	--	NR	34.57	6/17/2020	10:30	347.02
MW44	SM72	69	48-68	378.92	381.59	--	NR	38.25	9/2/2020	16:24	343.34
MW44	SM72	69	48-68	378.92	381.59	--	NR	33.80	6/4/2021	16:02	347.79
MW44	SM72	69	48-68	378.92	381.59	--	NR	35.42	8/28/2021	15:56	346.17
MW45											
MW45	SM73	82	61-81	397.70	400.37	--	NR	45.9	6/17/2020	10:38	354.47
MW45	SM73	82	61-81	397.70	400.37	--	NR	52.88	9/2/2020	15:25	347.49
MW45	SM73	82	61-81	397.70	400.37	--	NR	43.91	6/4/2021	13:35	356.46
MW45	SM73	82	61-81	397.70	400.37	--	NR	46.72	8/28/2021	13:40	353.65
MW46											
MW46	SM74	57	36-56	399.62	402.50	--	NR	35	6/17/2020	10:44	367.50
MW46	SM74	57	36-56	399.62	402.50	--	NR	38.97	9/2/2020	15:18	363.53
MW46	SM74	57	36-56	399.62	402.50	--	NR	33.58	6/4/2021	13:27	368.92
MW46	SM74	57	36-56	399.62	402.50	--	NR	35.63	8/28/2021	13:32	366.87
MW47											
MW47	SM75	67	46-66	380.67	383.67	--	NR	38.42	6/17/2020	20:52	345.25
MW47	SM75	67	46-66	380.67	383.67	--	NR	42.13	9/2/2020	15:12	341.54
MW47	SM75	67	46-66	380.67	383.67	--	NR	36.62	6/4/2021	13:14	347.05
MW47	SM75	67	46-66	380.67	383.67	--	NR	39.06	8/28/2021	13:25	344.61
MW48											
MW48	SM76	44.5	23-43	348.87	351.51	--	NR	20.44	6/17/2020	20:22	331.07
MW48	SM76	44.5	23-43	348.87	351.51	--	NR	23.19	9/2/2020	16:32	328.32
MW48	SM76	44.5	23-43	348.87	351.51	--	NR	19.51	6/4/2021	16:13	332.00
MW48	SM76	44.5	23-43	348.87	351.51	--	NR	20.19	8/28/2021	16:02	331.32
MW49											
MW49	SM77	61.7	40-60	301.15	303.78	--	NR	30.25	6/17/2020	20:02	273.53
MW49	SM77	61.7	40-60	301.15	303.78	--	NR	34.51	9/2/2020	16:40	269.27
MW49	SM77	61.7	40-60	301.15	303.78	--	NR	29.72	6/4/2021	16:36	274.06

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW49	SM77	61.7	40-60	301.15	303.78	--	NR	30.31	8/28/2021	16:10	273.47
MW50											
MW50	SM78	92	71-91	439.58	442.6501	--	NR	48.25	6/17/2020	20:58	394.40
MW50	SM78	92	71-91	439.58	442.6501	--	NR	54.56	9/2/2020	14:27	388.09
MW50	SM78	92	71-91	439.58	442.6501	--	NR	47.31	6/4/2021	15:15	395.34
MW50	SM78	92	71-91	439.58	442.6501	--	NR	49.26	8/28/2021	14:30	393.39
MW51											
MW51	SM79	77	56-76	422.38	425.05	--	NR	40.12	6/17/2020	21:11	384.93
MW51	SM79	77	56-76	422.38	425.05	--	NR	44.14	9/2/2020	14:10	380.91
MW51	SM79	77	56-76	422.38	425.05	--	NR	38.45	6/4/2021	14:55	386.60
MW51	SM79	77	56-76	422.38	425.05	--	NR	40.28	8/28/2021	14:03	384.77
MW52											
MW52	SM80	56	35-55	383.91	386.83	--	NR	32.61	6/17/2020	20:12	354.22
MW52	SM80	56	35-55	383.91	386.83	--	NR	36.94	9/2/2020	14:55	349.89
MW52	SM80	56	35-55	383.91	386.83	--	NR	30.66	6/4/2021	13:08	356.17
MW52	SM80	56	35-55	383.91	386.83	--	NR	34.17	8/28/2021	13:17	352.66
MW53											
MW53	SM81	62	41-61	460.82	463.7785	--	NR	31.72	6/17/2020	21:33	432.06
MW53	SM81	62	41-61	460.82	463.7785	--	NR	38.34	9/2/2020	14:44	425.44
MW53	SM81	62	41-61	460.82	463.7785	--	NR	30.43	6/4/2021	15:35	433.35
MW53	SM81	62	41-61	460.82	463.7785	--	NR	34.08	8/28/2021	14:56	429.70
MW54											
MW54	SM82	50	29-49	423.01	425.7406	--	NR	29.77	6/17/2020	20:48	395.97
MW54	SM82	50	29-49	423.01	425.7406	--	NR	32.61	9/2/2020	14:18	393.13
MW54	SM82	50	29-49	423.01	425.7406	--	NR	29.43	6/4/2021	15:05	396.31
MW54	SM82	50	29-49	423.01	425.7406	--	NR	30.52	8/28/2021	14:17	395.22
MW55											
MW55	SM83	27	10-20	341.26	344.09	--	23.65	13.8	6/17/2020	20:00	330.29
MW55	SM83	27	10-20	341.26	344.09	--	NR	15.65	9/2/2020	15:01	328.44
MW55	SM83	27	10-20	341.26	344.09	--	NR	12.80	6/4/2021	13:00	331.29
MW55	SM83	27	10-20	341.26	344.09	--	NR	14.08	8/28/2021	13:10	330.01
MW56											
MW56	SM84	76	55-75	408.55	411.329	--	NR	37.21	6/17/2020	20:24	374.12
MW56	SM84	76	55-75	408.55	411.329	--	NR	47.88	9/2/2020	15:33	363.45
MW56	SM84	76	55-75	408.55	411.329	--	NR	34.80	6/4/2021	13:43	376.53
MW56	SM84	76	55-75	408.55	411.329	--	NR	37.93	8/28/2021	13:46	373.40
MW57											
MW57	SM85	60	37.5-57.5	461.00	463.8141	--	NR	34.24	6/17/2020	20:41	429.57
MW57	SM85	60	37.5-57.5	461.00	463.8141	--	NR	38.54	9/2/2020	16:03	425.27
MW57	SM85	60	37.5-57.5	461.00	463.8141	--	NR	32.22	6/4/2021	15:53	431.59

Monitoring Well ID	Soil Boring ID	Reported Well Total Depth As Constructed (feet bgs)	Reported Screened Interval (feet bgs)	Surveyed Ground Elevation (feet NAVD88)	Surveyed Top of Casing Elevation (feet NAVD88)	GW Observed During Drilling (feet bgs)	Measured Well Total Depth (feet below TOC)	Static Water Level			GW Elevation (feet NAVD88)
								Depth (feet below TOC)	Date	Time	
MW57	SM85	60	37.5-57.5	461.00	463.8141	--	NR	35.75	8/28/2021	15:17	428.06
MW58											
MW58	SM86	58	36.62-56.62	469.84	472.7246	--	NR	31.14	6/17/2020	21:24	441.58
MW58	SM86	58	36.62-56.62	469.84	472.7246	--	NR	33.82	9/2/2020	14:35	438.90
MW58	SM86	58	36.62-56.62	469.84	472.7246	--	NR	30.48	6/4/2021	15:25	442.24
MW58	SM86	58	36.62-56.62	469.84	472.7246	--	NR	31.76	8/28/2021	14:43	440.96
MW59											
MW59	SM87	161.5	140-160	432.63	435.4785	--	NR	132.66	6/17/2020	20:28	302.82
MW59	SM87	161.5	140-160	432.63	435.4785	--	NR	134.27	9/2/2020	15:55	301.21
MW59	SM87	161.5	140-160	432.63	435.4785	--	NR	133.66	6/4/2021	14:46	301.82
MW59	SM87	161.5	140-160	432.63	435.4785	--	NR	131.74	8/28/2021	15:28	303.74

Notes
 Elevation datum: NAVD88 calculated using GEOID09.
 TOC refers to the top of PVC inner casing.

Acroynms and Abbreviations

- | | |
|--|--|
| bgs = below ground surface | NTCRA = non-time-critical removal action |
| GW = groundwater | PVC = polyvinyl chloride |
| ID = Identification | TD = Total depth |
| NAVD88 = North American Vertical Datum, 1988 | TOC = Top of Casing |
| NR = Not Recorded | -- = No information avialable |

Table 2-2. Red Devil Creek and Seep Discharge Gauging

Location ¹	Average Spring	Average Fall	Estimated Discharge (cfs)															
			18-Aug-11	26-May-12	12-Sep-12	19-Jun-15	2-Sep-15	28-Sep-16	1-Jun-17	16-Sep-17	27-Sep-17	19-May-18	18-May-19	10-Sep-19	17-Jun-20	2-Sep-20	9-Jun-21	3-Sep-21
RD02	--	5.96	5.96	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
RD03	--	4.09	4.09	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
RD10	5.67	2.73	5.52	12.18	4.64	1.25	0.48	2.45	1.20	5.22	NR	11.60	11.47	0.42	0.54	0.40	1.47	0.76
RD14	6.67	2.57	--	--	--	1.41	0.54	3.01	1.54	6.35	NR	10.84	12.87	0.37	NR	NR	NR	NR
RD04	12.67	4.70	5.95	12.67	3.45	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
RD12	10.53	6.02	8.24	10.53	3.79	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
RD13	--	--	--	--	--	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
RD15	5.79	2.37	--	--	--	1.40	0.67	3.53	1.91	6.85	NR	15.80	13.04	0.41	0.88	0.39	1.68	1.75
RD05 (seep)	0.15	0.14	0.18	NR	0.16	0.23	0.19	0.35	0.01	0.05	NR	0.33	0.12	0.01	0.17	0.03	0.04	0.03
RD16	6.88	0.54	--	--	--	1.61	0.60	NR	NR	NR	NR	NR	12.14	0.47	NR	NR	NR	NR
RD09	7.80	3.77	5.98	13.36	3.40	1.40	0.80	2.43	1.55	6.23	NR	14.87	NR	NR	NR	NR	NR	NR
RD06	7.00	3.54	6.81	14.47	3.80	1.54	0.79	5.51	1.26	7.08	NR	13.69	15.15	0.33	1.11	0.43	1.78	1.23
RD07	--	5.61	7.61	NR	3.61	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
RD08	6.35	3.48	7.19	14.20	3.09	1.90	0.81	NR	2.15	7.38	5.21	10.41	13.12	0.26	1.28	0.44	1.39	1.66

Notes:

¹ Locations are organized from upstream to downstream along Red Devil Creek to the Kuskokwim River.

Acronyms and Abbreviations:

cfs = cubic feet per second

NR = Not Recorded; Station not monitored

RD = Red Devil

-- = Station not established

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Table 2-3. Groundwater Baseline Analytical Data - Spring 2021

Analyte	Station ID		Units	MW06	MW09	MW10	MW16	MW17	MW26	MW27	MW28	MW33	MW40	
	Geographic Area			Pre-1955 MPA										Surface Mined Area
	Sample ID			0621MW06GW	0621MW09GW	0621MW10GW	0621MW16GW	0621MW17GW	0621MW26GW	0621MW27GW	0621MW28GW	0621MW33GW	0621MW40GW	
	Method													
Metals														
Aluminum	Metals (ICP)	6020B	µg/L	40.000 U	89.000	45.000	1200.000	40.000 U	40.000 U	40.000 U	740.000	51.000	10.000 J	
Antimony	Metals (ICP/MS)	6020B	µg/L	13.000	5.300	1.300	1000.000 J	5.600	50.000	6.200	9.600	370.000	6.700	
Arsenic	Metals (ICP/MS)	6020B	µg/L	69.000	9.100	100.000	810.000 J	2.600	1000.000 J	23.000	95.000	23.000	270.000 J	
Barium	Metals (ICP/MS)	6020B	µg/L	90.000	520.000 J	96.000	58.000	41.000	450.000 J	37.000	60.000	31.000	140.000 J	
Beryllium	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	
Cadmium	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.190 J+	0.400 U	0.250 J+	0.400 U	0.400 U	0.089 J+	0.400 U	0.400 U	0.400 U	
Calcium	Metals (ICP)	6020B	µg/L	34000.000 J	37000.000 J	22000.000 J	32000.000 J	23000.000 J	65000.000 J	88000.000 J	41000.000 J	19000.000 J	53000.000 J	
Chromium	Metals (ICP/MS)	6020B	µg/L	0.230 J	0.820	0.540 J	0.740 J	3.900	0.560 J	2.600	3.600	0.570 J	0.250 J	
Cobalt	Metals (ICP/MS)	6020B	µg/L	2.000	1.700	0.160 J	9.500	0.068 J	20.000	2.800	2.900	0.057 J	28.000	
Copper	Metals (ICP/MS)	6020B	µg/L	2.000 U	3.100	2.000 U	2.400	1.600 J	1.100 J	1.600 J	2.400	2.000 U	2.000 U	
Iron	Metals (ICP)	6020B	µg/L	5200.000 J	750.000	1400.000	12000.000 J	470.000	43000.000 J	110.000	1600.000	120.000	760.000	
Lead	Metals (ICP/MS)	6020B	µg/L	0.068 J	0.430	0.170 J	1.100	0.400 U	0.130 J	0.073 J	0.290 J	0.100 J	0.400 U	
Magnesium	Metals (ICP)	6020B	µg/L	29000.000 J	24000.000 J	30000.000 J	59000.000 J	15000.000 J	36000.000 J	49000.000 J	28000.000 J	12000.000 J	50000.000 J	
Manganese	Metals (ICP/MS)	6020B	µg/L	650.000 J	4900.000 J	160.000 J	5700.000 J	6.300	6100.000 J	1900.000 J	810.000 J	4.200	310.000 J	
Nickel	Metals (ICP/MS)	6020B	µg/L	3.100	3.700	0.810 J	5.600	3.000 U	18.000	37.000	8.000	1.000 J	100.000	
Potassium	Metals (ICP)	6020B	µg/L	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	3000.000 J	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	
Selenium	Metals (ICP/MS)	6020B	µg/L	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	
Silver	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	
Sodium	Metals (ICP)	6020B	µg/L	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	15000.000 J	11000.000 J	10000.000 UJ	10000.000 UJ	
Thallium	Metals (ICP/MS)	6020B	µg/L	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	
Vanadium	Metals (ICP/MS)	6020B	µg/L	4.000 U	0.540 J	0.490 J	1.400 J	0.470 J	4.000 U	4.000 U	2.200 J	4.000 U	4.000 U	
Zinc	Metals (ICP/MS)	6020B	µg/L	7.000 U	9.000 J+	1.800 J	7.000 U	7.000 U	7.000 U	14.000 J+	7.000 U	1.500 J	3.300 J	
Mercury	Metals (ICP/MS)	7470A	µg/L	0.300 U	0.300 U	0.300 UJ	1.100 J-	0.300 UJ	0.590	0.150 J	0.570	0.300 U	0.300 U	
Total Low Level Mercury														
Mercury	Total Mercury	EPA 1631E	ng/L	9.46	137.00	29.70	1100.00	34.10	667.00	585.00	1030.00	58.90	5.21	
Dissolved Low Level Mercury														
Mercury	Dissolved Mercury	EPA 1631E	ng/L	261.00	33.00	4.78 J+	344.00	9.92	139.00	496.00	212.00	16.30 J-	4.48 J-	
Field Water Quality Parameters														
Temperature	Field Measurement		Deg C	4.76	8.61	5.12	6.39	6.89	8.09	4.91	10.3	6.38	7.22	
pH	Field Measurement		pH Units	6.8	6.94	7.32	6.41	7.22	6.64	6.25	6.97	6.4	7.09	
Conductivity	Field Measurement		µS/cm	222	198	193	356	128	423	402	252	117	331	
Turbidity	Field Measurement		NTU	9.87	8.36	1.95	38.34	1.47	9.09	1.71	30.36	3.29	4.87	
Dissolved Oxygen	Field Measurement		mg/L	1.41	2.79	0.31	1.2	8.54	3.49	1.44	0.98	8.79	2.42	
Oxidation-Reduction Potential	Field Measurement		mV	24.6	31.5	-244.0	76.1	177.5	-11.5	202.2	62.2	189.8	98	

Acronyms and Abbreviations

ADEC = Alaska Department of Environmental Conservation
 Deg C = Degrees Celsius.
 EPA = United States Environmental Protection Agency
 GC/MS = Gas Chromatography/Mass Spectrometry
 ICP/ MS = Inductively coupled plasma/mass spectrometry
 mg/L = milligrams per liter
 mS/cm = Millisiemens per centimeter
 mV = Millivolts
 ng/L = Nanograms per liter
 NTU = Nephelometric turbidity units
 µg/L = micrograms per liter

Data Qualifiers:

J = The analyte was detected. The associated result is estimated.
 J+ = The analyte was detected. The associated result is estimated with high bias.
 J- = The analyte was detected. The associated result is estimated low bias.
 U = The analyte was analyzed for but not detected. The value provided is the method detection limit.
 UJ = The analyte was analyzed for but not detected. The associated reporting limit is estimated.

Table 2-3. Groundwater Baseline Analytical Data - Spring 2021

Analyte	Station ID		Units	MW43	MW44	MW45	MW46	MW47	MW49	MW50	MW51	MW52	MW53	
	Geographic Area			Surface Mined Area	Vicinity of the Proposed Repository									
	Sample ID			0621MW43GW	0621MW44GW	0621MW45GW	0621MW46GW	0621MW47GW	0621MW49GW	0621MW50GW	0621MW51GW	0621MW52GW	0621MW53GW	
	Method													
Metals														
Aluminum	Metals (ICP)	6020B	µg/L	87.000	85.000	140.000	110.000	9.900 J	48.000	240.000	69.000	57.000	350.000	
Antimony	Metals (ICP/MS)	6020B	µg/L	11.000	0.130 J	0.800 U	0.200 J	0.800 U	0.430 J	23.000	0.800 U	0.860	0.240 J	
Arsenic	Metals (ICP/MS)	6020B	µg/L	310.000 J	1.200	1.200	0.450 J	1.000 U	1.400	860.000 J	6.600	7.700	1.100	
Barium	Metals (ICP/MS)	6020B	µg/L	120.000 J	29.000	2.200	4.100	0.780 J	2.800	310.000 J	37.000	12.000	150.000 J	
Beryllium	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	
Cadmium	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.037 J+	0.400 U	0.400 U	
Calcium	Metals (ICP)	6020B	µg/L	25000.000 J	43000.000 J	21000.000 J	16000.000 J	17000.000 J	13000.000 J	76000.000 J	27000.000 J	13000.000 J	21000.000 J	
Chromium	Metals (ICP/MS)	6020B	µg/L	0.540 J	0.480 J	0.590 J	0.580 J	0.220 J	0.790 J	1.300	0.600 J	0.790 J	1.300	
Cobalt	Metals (ICP/MS)	6020B	µg/L	32.000	3.000	0.130 J	0.095 J	0.400 U	0.190 J	2.500	2.100	4.500	1.700	
Copper	Metals (ICP/MS)	6020B	µg/L	8.400	2.000 U	2.000 U	2.000 U	2.000 U	0.990 J	0.750 J	0.620 J	0.990 J	1.100 J	
Iron	Metals (ICP)	6020B	µg/L	2800.000 J	1400.000	170.000	130.000	20.000 J	63.000 J	3700.000 J	810.000	150.000	560.000	
Lead	Metals (ICP/MS)	6020B	µg/L	0.350 J	0.047 J	0.110 J	0.042 J	0.400 U	0.400 U	0.280 J	0.400 U	0.069 J	0.250 J	
Magnesium	Metals (ICP)	6020B	µg/L	17000.000 J	33000.000 J	17000.000 J	14000.000 J	17000.000 J	8200.000 J	55000.000 J	22000.000 J	6800.000 J	9700.000 J	
Manganese	Metals (ICP/MS)	6020B	µg/L	2500.000 J	720.000 J	5.600	6.500	5.300	290.000	950.000 J	270.000 J	230.000 J	510.000 J	
Nickel	Metals (ICP/MS)	6020B	µg/L	92.000	2.900 J	0.700 J	0.830 J	0.250 J	3.000	7.000	1.500 J	7.200	2.900 J	
Potassium	Metals (ICP)	6020B	µg/L	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	
Selenium	Metals (ICP/MS)	6020B	µg/L	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	
Silver	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.400 U	0.076 J	0.031 J	0.400 U	0.400 U	0.170 J	0.400 U	0.110 J	0.400 U	
Sodium	Metals (ICP)	6020B	µg/L	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	
Thallium	Metals (ICP/MS)	6020B	µg/L	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	
Vanadium	Metals (ICP/MS)	6020B	µg/L	4.000 U	4.000 U	0.560 J	0.480 J	4.000 U	4.000 U	0.960 J	4.000 U	4.000 U	1.300 J	
Zinc	Metals (ICP/MS)	6020B	µg/L	7.100	1.700 J	2.800 J	3.900 J	7.000 U	2.600 J	7.000	2.100 J	6.800 J	3.900 J	
Mercury	Metals (ICP/MS)	7470A	µg/L	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.710	0.300 U	0.300 U	0.260 J	
Total Low Level Mercury														
Mercury	Total Mercury	EPA 1631E	ng/L	58.90	9.61	16.80	18.5	1.88	46.40	1530.00	9.43	35.5	275.00	
Dissolved Low Level Mercury														
Mercury	Dissolved Mercury	EPA 1631E	ng/L	5.21	1.48	11.50	3.61	0.65	13.20	27.70	0.97	7.69	19.50	
Field Water Quality Parameters														
Temperature	Field Measurement		Deg C	6.2	3.44	3.55	3.47	3.42	6.04	5.5	3.88	3.76	4.64	
pH	Field Measurement		pH Units	6.51	6.97	6.77	6.54	6.73	6.1	6.77	6.72	6.1	6.48	
Conductivity	Field Measurement		µS/cm	144	216	105	92	99	71	391	144	64	95	
Turbidity	Field Measurement		NTU	6.59	8.41	4.23	6.9	1.31	2.57	22.92	8.81	4.75	7.02	
Dissolved Oxygen	Field Measurement		mg/L	2.41	0.68	8.91	8.24	8.93	5.65	4.78	3.74	12.59	7.57	
Oxidation-Reduction Potential	Field Measurement		mV	83.3	64.2	196.1	194.6	199.1	147.3	78	150.1	210.5	194.6	

Acronyms and Abbreviations

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Table 2-3. Groundwater Baseline Analytical Data - Spring 2021

Analyte	Station ID		Units	MW54	MW55	MW56	MW57	MW58	MW59	Duplicate of MW47	Duplicate of MW27	Duplicate of MW17	
	Geographic Area			Vicinity of the Proposed Repository						Vicinity of the Proposed Repository		Pre-1955 MPA	
	Sample ID			0621MW54GW	0621MW55GW	0621MW56GW	0621MW57GW	0621MW58GW	0621MW59GW	0621MW97GW	0621MW98GW	0621MW99GW	
	Method												
Metals													
Aluminum	Metals (ICP)	6020B	µg/L	12.000 J	20.000 J	120.000	600.000	600.000	2700.000	40.000 U	40.000 U	40.000 U	
Antimony	Metals (ICP/MS)	6020B	µg/L	0.790 J	8.700	0.800 U	0.160 J	0.160 J	1.700	0.800 U	5.800	4.600	
Arsenic	Metals (ICP/MS)	6020B	µg/L	53.000	24.000	1.400	1.900	3.600	200.000 J	1.000 U	22.000	2.500	
Barium	Metals (ICP/MS)	6020B	µg/L	140.000 J	130.000 J	91.000	13.000	120.000 J	420.000 J	0.910 J	37.000	41.000	
Beryllium	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.200 J	0.400 U	0.400 U	0.400 U	
Cadmium	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.400 U	0.081 J+	0.400 U	
Calcium	Metals (ICP)	6020B	µg/L	47000.000 J	23000.000 J	54000.000 J	8200.000 J	33000.000 J	62000.000 J	16000.000 J	87000.000 J	23000.000 J	
Chromium	Metals (ICP/MS)	6020B	µg/L	0.260 J	0.410 J	0.670 J	2.200	1.500	8.400	0.520 J	1.300	0.420 J	
Cobalt	Metals (ICP/MS)	6020B	µg/L	1.400	3.900	4.100	0.260 J	0.740	2.800	0.400 U	2.600	0.400 U	
Copper	Metals (ICP/MS)	6020B	µg/L	2.000 U	1.100 J	2.000 U	0.720 J	1.200 J	6.300	2.000 U	7.600	2.000 U	
Iron	Metals (ICP)	6020B	µg/L	2800.000 J	14000.000 J	190.000	420.000	2400.000 J	4900.000 J	23.000 J	95.000 J	25.000 J	
Lead	Metals (ICP/MS)	6020B	µg/L	0.400 U	0.078 J	0.066 J	0.085 J	0.210 J	0.980	0.090 J	0.640	0.400 U	
Magnesium	Metals (ICP)	6020B	µg/L	40000.000 J	15000.000 J	44000.000 J	3700.000 J	23000.000 J	53000.000 J	16000.000 J	49000.000 J	15000.000 J	
Manganese	Metals (ICP/MS)	6020B	µg/L	380.000 J	840.000 J	2200.000 J	13.000	110.000 J	440.000 J	7.000	1800.000 J	2.000 U	
Nickel	Metals (ICP/MS)	6020B	µg/L	6.400	8.000	14.000	2.200 J	3.200	9.400	3.000 U	34.000	3.000 U	
Potassium	Metals (ICP)	6020B	µg/L	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	
Selenium	Metals (ICP/MS)	6020B	µg/L	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	8.000 U	
Silver	Metals (ICP/MS)	6020B	µg/L	0.060 J	0.400 U	0.400 U	0.400 U	0.400 U	0.030 J	0.400 U	0.400 U	0.400 U	
Sodium	Metals (ICP)	6020B	µg/L	10000.000 UJ	10000.000 U	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	10000.000 UJ	15000.000 J	10000.000 UJ	
Thallium	Metals (ICP/MS)	6020B	µg/L	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	1.000 U	
Vanadium	Metals (ICP/MS)	6020B	µg/L	4.000 U	4.000 U	0.690 J	1.900 J	2.400 J	10.000	4.000 U	4.000 U	4.000 U	
Zinc	Metals (ICP/MS)	6020B	µg/L	7.000 U	8.100	2.000 J	3.000 J	2.600 J	8.300	7.000 U	18.000 J+	7.000 U	
Mercury	Metals (ICP/MS)	7470A	µg/L	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.380	0.300 U	0.240 J-	0.300 U	
Total Low Level Mercury													
Mercury	Total Mercury	EPA 1631E	ng/L	8.51 J+	65.60 J-	61.70	153.00	638.00	374.00 J+	1.64	523.00	38.10	
Dissolved Low Level Mercury													
Mercury	Dissolved Mercury	EPA 1631E	ng/L	8.99 J+	27.90	15.80 J+	23.70 J+	35.70 J+	236.00	0.68 J+	400.00	10.50	
Field Water Quality Parameters													
Temperature	Field Measurement		Deg C	4.17	4.5	4.57	4.17	3.96	9.85	3.42	4.91	6.89	
pH	Field Measurement		pH Units	7.03	6.21	6.73	5.89	7.22	7.03	6.73	6.25	7.22	
Conductivity	Field Measurement		µS/cm	243	150	273	45	162	418	99	402	128	
Turbidity	Field Measurement		NTU	9.04	26.79	8.35	8.21	68.78	112.2	1.31	1.71	1.47	
Dissolved Oxygen	Field Measurement		mg/L	2.93	0.54	3.27	10.66	2.25	5.97	8.93	1.44	8.54	
Oxidation-Reduction Potential	Field Measurement		mV	25.1	74.5	138.9	248	42.3	53.8	199.1	202.2	177.5	

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 UJ = The analyte was analyzed for but not detected. The associated reporting limit is estimated.

Table 2-4. Groundwater Baseline Analytical Data - Fall 2021

Analyte	Station ID		Units	MW06	MW09	MW10	MW16	MW17	MW26	MW27	MW28	MW29	MW33	
	Geographic Area			Pre-1955 MPA										
	Sample ID			0821MW06GW	0821MW09GW	0821MW10GW	0821MW16GW	0821MW17GW	0821MW26GW	0821MW27GW	0821MW28GW	0921MW29GW	0821MW33GW	
	Method													
Metals														
Aluminum	Metals (ICP)	6020B	µg/L	12.00 J	MW09	10.00 J	39.00 J	10.00 J	68.00	40.00 U	210.00	1900.00	140.00	
Antimony	Metals (ICP/MS)	6020B	µg/L	12.00	4.20	1.00 J+	1300.00	10.00	60.00	8.00	6.70	2.00 J+	400.00 J	
Arsenic	Metals (ICP/MS)	6020B	µg/L	55.00	20.00	98.00	1300.00	2.90	1200.00	29.00	110.00	170.00	24.00	
Barium	Metals (ICP/MS)	6020B	µg/L	87.00	380.00	89.00	76.00	43.00	540.00	32.00	50.00	250.00	29.00	
Beryllium	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.24 J	0.40 U	
Cadmium	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.04 J	0.40 U	0.36 J	0.40 U	0.04 J	0.40 U	0.40 U	0.40 U	0.40 U	
Calcium	Metals (ICP)	6010D	µg/L	28000.00	31000.00	18000.00	37000.00	22000.00	55000.00	75000.00	36000.00	50000.00	14000.00	
Chromium	Metals (ICP/MS)	6020B	µg/L	0.80 U	0.80 U	0.20 J	0.49 J	0.80 U	1.00 J+	0.80 UJ	0.82	7.30	0.80 U	
Cobalt	Metals (ICP/MS)	6020B	µg/L	2.30	0.63	0.07 J	13.00	0.40	14.00	3.30	2.90	2.20	0.10 J	
Copper	Metals (ICP/MS)	6020B	µg/L	2.00 U	1.30 J	ND	1.50 J	2.00 U	2.60	0.62 J	0.92 J	6.30	1.00 J	
Iron	Metals (ICP)	6020B	µg/L	5000.00	1800.00	1000.00	21000.00	32.00 J	47000.00	100.00	1200.00	5700.00	200.00	
Lead	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.34 J	0.08 J	0.30 J	0.40 U	1.10	0.51 J	0.15 J	1.40	0.68 J	
Magnesium	Metals (ICP)	6010D	µg/L	25000.00	20000.00	27000.00	69000.00	16000.00	32000.00	45000.00	27000.00	48000.00	10000.00	
Manganese	Metals (ICP/MS)	6020B	µg/L	710.00	2400.00	150.00	8700.00	2.00 U	6200.00	1800.00	810.00	440.00	8.50	
Nickel	Metals (ICP/MS)	6020B	µg/L	3.50	1.50 J	0.26 J	4.50	3.00 U	9.50	29.00	7.00	7.60	1.10 J	
Potassium	Metals (ICP)	6010D	µg/L	3300.00 U	3300.00 U	1000.00 J	2700.00 J	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	
Selenium	Metals (ICP/MS)	6020B	µg/L	8.00 U	8.00 U	8.00 U	ND	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	
Silver	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.40 U	0.40 U	ND	0.40 U	0.40 U	0.40 U	0.40 U	0.03 J+	0.40 U	
Sodium	Metals (ICP)	6010D	µg/L	4000.00	3000.00	3300.00	6800.00	2800.00	4500.00	13000.00	10000.00	2500.00	4000.00	
Thallium	Metals (ICP/MS)	6020B	µg/L	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	
Vanadium	Metals (ICP/MS)	6020B	µg/L	4.00 U	4.00 U	4.00 U	0.65 J	4.00 U	4.00 U	4.00 U	0.60 J	7.40	0.59 J	
Zinc	Metals (ICP/MS)	6020B	µg/L	2.70 J+	4.50 J+	7.00 U	5.50 J+	7.00 U	8.70 J+	11.00 J+	2.30 J+	9.90 J+	1.80 J+	
Mercury	Metals (ICP/MS)	7470A	µg/L	0.30 UJ	0.30 UJ	0.30 UJ	0.68 J	0.30 UJ	0.59	0.30 U	0.41 J	0.30	0.30 UJ	
Total Low Level Mercury														
Mercury	Total Mercury	EPA 1631E	ng/L	11.70	78.00	34.30	1230.00	81.10	833.00	702.00	1210.00	572.00	109.00	
Dissolved Low Level Mercury														
Mercury	Dissolved Mercury	EPA 1631E	ng/L	3.18 U	7.02	2.75	874.00	14.60	261.00	658.00	63.10	60.90	5.51	
Field Water Quality Parameters														
Temperature	Field Measurement		Deg C	5.54	5.46	5.19	7.71	7.22	9.69	5.5	5.23	11.37	6.6	
pH	Field Measurement		pH Units	6.74	6.33	4.49	6.49	7.34	6.52	5.14	6.36	6.91	6.55	
Conductivity	Field Measurement		µS/cm	240	171	182	542	159	829	444	236	304	119	
Turbidity	Field Measurement		NTU	9.58	8.54	1.43	6.21	1.11	25.95	1.44	9.72	105.2	8.33	
Dissolved Oxygen	Field Measurement		mg/L	0.58	1.20	0.30	0.73	7.83	5.00	0.8	0.37	1.32	5.24	
Oxidation-Reduction Potential	Field Measurement		mV	47.8	-6.4	153.5	46.8	156	-4.5	-30.1	-43.8	6.2	222	

Acronyms and Abbreviations

ADEC = Alaska Department of Environmental Conservation
 Deg C = Degrees Celsius.
 EPA = United States Environmental Protection Agency
 GC/MS = Gas Chromatography/Mass Spectrometry
 ICP/MS = Inductively coupled plasma/mass spectrometry
 mg/L = milligrams per liter
 mS/cm = Millisiemens per centimeter
 mV = Millivolts
 ng/L = Nanograms per liter
 NTU = Nephelometric turbidity units
 µg/L = micrograms per liter

Data Qualifiers:

J = The analyte was detected. The associated result is estimated.
 J+ = The analyte was detected. The associated result is estimated with high bias.
 J- = The analyte was detected. The associated result is estimated low bias.
 U = The analyte was analyzed for but not detected. The value provided is the method detection limit.
 UJ = The analyte was analyzed for but not detected. The associated reporting limit is estimated.

Table 2-4. Groundwater Baseline Analytical Data - Fall 2021

Analyte	Station ID	Units	MW40	MW42	MW43	MW44	MW45	MW46	MW47	MW49	MW50	MW51	MW52	MW53	
	Geographic Area		Surface Mined Area			Vicinity of the Proposed Repository									
	Sample ID		0921MW40GW	0821MW42GW	0821MW43GW	0921MW44GW	0921MW45GW	0821MW46GW	0821MW47GW	0821MW49GW	0821MW50GW	0821MW51GW	0821MW52GW	0821MW53GW	
	Method														
Metals															
Aluminum	Metals (ICP)	6020B	µg/L	29.00 J	1400.00	11.00 J	61.00	42.00	70.00	12.00 J	64.00	97.00	67.00	2400.00	74.00
Antimony	Metals (ICP/MS)	6020B	µg/L	5.90	240.00 J	10.00	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	13.00	0.80 U	3.30	0.80 U
Arsenic	Metals (ICP/MS)	6020B	µg/L	420.00	800.00	330.00	0.80 J	1.00	0.29 J	1.00	1.30	520.00	6.80	30.00	0.37 J
Barium	Metals (ICP/MS)	6020B	µg/L	120.00	150.00	100.00	26.00	0.77 J	2.40	1.20	2.80	270.00	30.00	79.00	130.00
Beryllium	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.15 J	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Cadmium	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.04 U	0.04 J	0.40 U	0.40 U	0.18 J	0.40 U
Calcium	Metals (ICP)	6010D	µg/L	38000.00	36000.00	21000.00	33000.00	17000.00	15000.00	15000.00	11000.00	62000.00	20000.00	17000.00	17000.00
Chromium	Metals (ICP/MS)	6020B	µg/L	0.80 U	3.30	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	8.00 U	0.80 U	6.60	0.53 J
Cobalt	Metals (ICP/MS)	6020B	µg/L	28.00	3.80	31.00	2.40	0.40 U	0.40 U	0.40 U	0.18 J	3.90	2.80	42.00	0.34 J
Copper	Metals (ICP/MS)	6020B	µg/L	2.00 U	4.00	0.71 J	1.30 J	0.60 J	2.00 U	2.00 U	0.76 J	0.70 J	16.00	5.90	ND
Iron	Metals (ICP)	6020B	µg/L	1300.00	2900.00	2500.00	850.00	57.00 J	71.00 J	27.00 J	56.00 J	2600.00	1100.00	2300.00	100.00
Lead	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.90	0.40 U	0.09 J	0.17 J	0.40 U	0.40 U	0.05 J	0.40 U	0.40 U	1.00	0.07 J
Magnesium	Metals (ICP)	6010D	µg/L	39000.00	27000.00	15000.00	28000.00	15000.00	15000.00	16000.00	7700.00	51000.00	17000.00	11000.00	9500.00
Manganese	Metals (ICP/MS)	6020B	µg/L	290.00	510.00	2300.00	650.00	2.00 U	2.30 J+	6.80	230.00	1000.00	340.00	2000.00	88.00
Nickel	Metals (ICP/MS)	6020B	µg/L	91.00	18.00	90.00	2.40 J	0.45 J	0.88 J	0.30 J	2.80 J	9.70	1.90 J	25.00	0.75 J
Potassium	Metals (ICP)	6010D	µg/L	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	240.00 J
Selenium	Metals (ICP/MS)	6020B	µg/L	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	ND
Silver	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.04 J+	0.05 J+	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	1.10	ND
Sodium	Metals (ICP)	6010D	µg/L	1700.00	3400.00	3200.00	2100.00	1200.00	1400.00	1900.00	1500.00	2300.00	2100.00	2800.00	1900.00
Thallium	Metals (ICP/MS)	6020B	µg/L	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U
Vanadium	Metals (ICP/MS)	6020B	µg/L	4.00 U	4.80	4.00 U	4.00 U	4.00 U	4.00 U	4.00 U	4.00 U	0.49 J	4.00 U	6.70	ND
Zinc	Metals (ICP/MS)	6020B	µg/L	3.10 J+	14.00 J+	3.90 J+	5.90 J+	3.10 J+	7.00 U	7.00 U	7.00 U	7.00 U	7.00 U	23.00 J+	7.00 U
Mercury	Metals (ICP/MS)	7470A	µg/L	0.30 U	1.20	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.48	0.30 U	0.33	0.30 U
Total Low Level Mercury															
Mercury	Total Mercury	EPA 1631E	ng/L	25.20	1380.00	14.10	2.02 J+	10.70 J+	13.70	12.90	41.70	524.00	7.48	460.00	72.00
Dissolved Low Level Mercury															
Mercury	Dissolved Mercury	EPA 1631E	ng/L	3.18 U	353.00	3.18 U	3.18 U	4.43 J+	3.18 U	3.18 U	7.27 J+	192.00	2.72 J+	46.70	20.60
Field Water Quality Parameters															
Temperature	Field Measurement	Deg C		6.51	9.04	6.22	4.79	2.94	3.93	5.41	5.11	4.37	4.57	5.71	4.33
pH	Field Measurement	pH Units		7.38	6.71	5.93	6.7	4.76	6.63	6.82	5.50	6.46	4.13	6.71	6
Conductivity	Field Measurement	µS/cm		236	0.669	0.227	226	116	118	135	78	407	141	117	106
Turbidity	Field Measurement	NTU		8.79	72.08	6.69	3.12	2.16	1.87	1.66	2.62	9.6	9.51	40.02	6.42
Dissolved Oxygen	Field Measurement	mg/L		2.83	2.04	1.82	0.8	8.34	6.49	5.45	5.79	2.23	5.12	9.95	6.46
Oxidation-Reduction Potential	Field Measurement	mV		-8.5	75.3	-31.7	-36.2	54.3	148.7	179.1	12	-51.2	69.1	172.6	-5.1

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Table 2-4. Groundwater Baseline Analytical Data - Fall 2021

Analyte	Station ID	Units	MW54	MW55	MW56	MW57	MW58	MW59	Duplicate of MW47	Duplicate of MW27	Duplicate of MW33		
	Geographic Area		Vicinity of the Proposed Repository						Vicinity of the Pre-1955 MPA				
	Sample ID		0821MW54GW	0821MW55GW	0921MW56GW	0921MW57GW	0821MW58GW	0921MW59GW	0821MW97GW	0821MW98GW	0821MW99GW		
	Method												
Metals													
Aluminum	Metals (ICP)	6020B	µg/L	14.00 J	19.00 J	49.00	23.00 J	560.00	3100.00	6.80 J	8.00 J	180.00	
Antimony	Metals (ICP/MS)	6020B	µg/L	0.80 U	3.50	0.80 U	0.80 U	0.80 U	1.20	0.80 U	8.00	400.00 J	
Arsenic	Metals (ICP/MS)	6020B	µg/L	55.00	160.00 J	0.80 J	0.72 J	3.30	77.00	1.00 U	30.00	25.00	
Barium	Metals (ICP/MS)	6020B	µg/L	120.00	190.00	40.00	4.80	110.00	380.00	0.72 J	32.00	30.00	
Beryllium	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.14 J	0.40 U	0.40 U	0.40 U	
Cadmium	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.06 J	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	
Calcium	Metals (ICP)	6010D	µg/L	37000.00	19000.00	37000.00	7900.00	25000.00	50000.00	15000.00	76000.00	15000.00	
Chromium	Metals (ICP/MS)	6020B	µg/L	0.80 U	0.80 U	0.80 U	0.80 U	1.80	8.10	0.80 U	0.90 J	0.80 U	
Cobalt	Metals (ICP/MS)	6020B	µg/L	1.00	3.00	1.20	0.05 J	0.55	2.20	0.40 U	3.10	0.13 J	
Copper	Metals (ICP/MS)	6020B	µg/L	2.00 U	0.60 J	0.82 J	2.00 U	1.50 J	7.00	2.00 U	0.66 J	1.00 J	
Iron	Metals (ICP)	6020B	µg/L	2600.00	61000.00	88.00 J	31.00 J	2500.00	3200.00	21.00 J	88.00 J	230.00	
Lead	Metals (ICP/MS)	6020B	µg/L	0.40 U	0.09 J	0.08 J	0.40 U	0.40 U	1.20	0.40 U	0.40 UJ	0.40 UJ	
Magnesium	Metals (ICP)	6010D	µg/L	35000.00	9400.00	28000.00	3900.00	19000.00	47000.00	16000.00	45000.00	11000.00	
Manganese	Metals (ICP/MS)	6020B	µg/L	310.00	1500.00	540.00	2.10	100.00	420.00	5.40	1700.00	9.40	
Nickel	Metals (ICP/MS)	6020B	µg/L	4.90	4.40	4.50	1.50 J	3.20	7.50	0.23 J	28.00	1.20 J	
Potassium	Metals (ICP)	6010D	µg/L	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	3300.00 U	
Selenium	Metals (ICP/MS)	6020B	µg/L	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	8.00 U	
Silver	Metals (ICP/MS)	6020B	µg/L	0.03 J+	0.40 U	0.40 U	0.40 U	0.03 J+	0.04 J+	0.40 U	0.40 U	0.40 U	
Sodium	Metals (ICP)	6010D	µg/L	1800.00	3000.00	1300.00	2300.00	1.50	1800.00	1900.00	14000.00	14.00	4100.00
Thallium	Metals (ICP/MS)	6020B	µg/L	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	
Vanadium	Metals (ICP/MS)	6020B	µg/L	4.00 U	0.89 J	4.00 U	4.00 U	2.00 J	9.90	4.00 U	4.00 U	0.65 J	
Zinc	Metals (ICP/MS)	6020B	µg/L	7.00 U	7.00 U	7.00 U	7.00 U	7.00 U	9.10 J+	7.00 U	11.00 J+	1.70 J+	
Mercury	Metals (ICP/MS)	7470A	µg/L	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	0.23 J	0.30 U	0.30 U	0.30 UJ	
Total Low Level Mercury													
Mercury	Total Mercury	EPA 1631E	ng/L	13.60	67.10	16.70	34.30	61.60	281.00	11.90	721.00	90.60	
Dissolved Low Level Mercury													
Mercury	Dissolved Mercury	EPA 1631E	ng/L	1.14 J+	43.40 J+	2.33 J+	14.80	6.07	34.80	1.63	673.00	7.47	
Field Water Quality Parameters													
Temperature	Field Measurement	Deg C		4.01	5.24	4.35	3.43	7.79	7.92	5.41	5.5	6.6	
pH	Field Measurement	pH Units		6.45	6.21	6.37	5.91	6.72	7.47	6.82	5.14	6.55	
Conductivity	Field Measurement	µS/cm		279	228	230	37	195	266	135	444	119	
Turbidity	Field Measurement	NTU		9.63	14.98	4.89	2.31	15.88	69.18	1.66	1.44	8.33	
Dissolved Oxygen	Field Measurement	mg/L		1.81	0.44	3.88	9.9	0.46	1.17	5.45	0.8	5.24	
Oxidation-Reduction Potential	Field Measurement	mV		-53.4	-36.4	-23.1	46.7	-41.7	-131.8	179.1	-30.1	222	

Acronyms and Abbreviations

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 Deg C = Degrees Celsius.
 EPA = United States Environmental Protection Agency
 GC/MS = Gas Chromatography/Mass Spectrometry
 ICP/MS = Inductively coupled plasma/mass spectrometry
 mg/L = milligrams per liter
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Data Qualifiers:

J = The analyte was detected. The associated result is estimated.
 J+ = The analyte was detected. The associated result is estimated with high bias.
 J- = The analyte was detected. The associated result is estimated low bias.
 U = The analyte was analyzed for but not detected. The value provided is the method detection limit.
 UJ = The analyte was analyzed for but not detected. The associated reporting limit is estimated.

Table 2-5. Surface Water Baseline Analytical Data - Spring 2021

Sample Location	RD05	RD06	RD08	RD08	RD10	RD15								
Sample ID	0621RD15SW*	0621RD06SW	0621RD08SW	0621RD99SW	0621RD10SW	0621RD05SW*								
Laboratory Sample ID	580-103791-5	580-103791-2	580-103791-3	580-103791-6	580-103791-4	580-103791-1								
Sampling Date	6/10/2021	6/10/2021	6/10/2021	6/10/2021	6/10/2021	6/10/2021								
Matrix	WS	WS	WS	WS	WS	WS								
Analyte	Method	Units												
General Chemistry														
Total Dissolved Solids	160.1	mg/L	100	J	30	J	10	UJ	57	J	97	J	10	UJ
Total Suspended Solids	160.2	mg/L	2	UJ	2	UJ	2	UJ	19	J	2.8	J	2	UJ
Chloride	300.0	mg/L	1.5	UJ	1.5	UJ	1.5	UJ	1.5	UJ	1.5	UJ	1.5	UJ
Fluoride	300.0	mg/L	0.37	J	0.11	J	0.15	J	0.1	J	0.14	J	0.099	J
Sulfate	300.0	mg/L	31	J	10	J	11	J	10	J	9	J	8.8	J
Alkalinity	310.1	mg/L	240	J	72	J	75	J	73	J	66	J	64	J
Bicarbonate Alkalinity as CaCO3	310.1	mg/L	240	J	72	J	75	J	73	J	66	J	64	J
Carbonate Alkalinity as CaCO3	310.1	mg/L	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Nitrate Nitrite as N	353.2	mg/L	0.16	J	0.17	J	0.18	J	0.14	J	0.15	J	0.18	J
Metals														
Aluminum	6020B	mg/L	0.04	U	0.04	U	0.04	U	0.04	U	0.052	J+	0.044	J+
Antimony	6020B	mg/L	0.057		0.13	J	0.15	J	0.15	J	0.0016		0.030	
Arsenic	6020B	mg/L	1.3	J	0.073		0.070		0.072		0.00098	J	0.011	
Barium	6020B	mg/L	0.10		0.027		0.027		0.028		0.022		0.022	
Beryllium	6020B	mg/L	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Cadmium	6020B	mg/L	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Calcium	6020B	mg/L	41	J	18	J	18	J	18	J	17	J	16	J
Chromium	6020B	mg/L	0.00027	J	0.0003	J	0.00072	J	0.00045	J	0.00031	J	0.00034	J
Cobalt	6020B	mg/L	0.0045		0.00021	J	0.00018	J	0.00018	J	0.000059	J	0.000056	J
Copper	6020B	mg/L	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U	0.002	U
Iron	6020B	mg/L	2.8		0.19		0.16		0.14		0.12		0.13	
Lead	6020B	mg/L	0.000076	J	0.0004	U	0.000076	J	0.0004	U	0.0004	U	0.000055	J
Magnesium	6020B	mg/L	41	J	11	J	11	J	11	J	8.4	J	8.2	J
Manganese	6020B	mg/L	0.30		0.027		0.023		0.023		0.012		0.015	
Nickel	6020B	mg/L	0.017		0.003	U	0.003	U	0.003	U	0.003	U	0.003	U
Potassium	6020B	mg/L	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Selenium	6020B	mg/L	0.008	U	0.008	U	0.008	U	0.008	U	0.008	U	0.008	U
Silver	6020B	mg/L	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U	0.0004	U
Sodium	6020B	mg/L	11	J	10	UJ	10	U	10	UJ	10	UJ	10	UJ
Thallium	6020B	mg/L	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
Vanadium	6020B	mg/L	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U	0.004	U
Zinc	6020B	mg/L	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U	0.007	U
Mercury	7470A	mg/L	0.0003	U	0.0003	U	0.0003	U	0.0003	U	0.0003	U	0.0003	U
Low Level Mercury Analysis														
Mercury	EPA 1631E	ng/L	56.6		85.8	J+	61.7		62.9		2.63		75.7	J+
Field Water Quality Parameters														
Temperature	Field Measurement	Deg C	3.51		4.67		4.73		4.73		4.23		4.67	
pH	Field Measurement	pH Units	6.56		7.06		6.89		6.89		7.44		7.6	
Conductivity	Field Measurement	µS/cm	291		97		99		99		82		86	
Turbidity	Field Measurement	NTU	8.83		1.4		2.06		2.06		1.1		1.74	
Dissolved Oxygen	Field Measurement	mg/L	2.38		11.67		12.32		12.32		11.68		11.89	
Oxidation-Reduction Potential	Field Measurement	mV	79.6		95.2		160.1		160.1		111.1		57.8	

Notes

Bold font indicates a detection

- = not applicable

* = Sample collection locations for RD15 and RD05 (Seep) were misidentified during Spring 2021 field collection. The correct sample location has been listed in the tables to allow for proper comparison over time.

Acronyms and Abbreviations

- µS/cm = microsiemens per centimeter
- ID = Identifier
- mg/L = milligrams per liter
- mV = millivolts
- ng/L = nanograms per liter
- NTU = nephelometric turbidity unit
- WG = groundwater
- WQ = field quality control sample
- WS = surface water

Qualifiers

- U = not detected at the limit of quantitation
- J = estimated
- J+ = estimated, high bias
- J- = estimated, low bias
- UJ = not detected, estimated

Table 2-6. Surface Water Baseline Analytical Data - Fall 2021

Sample Location			RD05	RD06	RD08	RD10	RD15	RD15
Sample ID			0921RD05SW	0921RD06SW	0921RD08SW	0921RD10SW	0921RD15SW	0921RD99SW
Laboratory Sample ID			580-105705-16	580-105705-14	580-105705-15	580-105705-17	580-105705-42	580-105705-43
Sampling Date			9/3/2021	9/3/2021	9/3/2021	9/3/2021	9/3/2021	9/3/2021
Matrix			WS	WS	WS	WS	WS	WS
Analyte	Method	Units						
General Chemistry								
Total Dissolved Solids	160.1	mg/L	260	100	120	93	87	88
Total Suspended Solids	160.2	mg/L	2	U 2	U 2	U 2	U 2	U
Chloride	300.0	mg/L	1.3	J 1.1	J 1.1	J 0.97	J 0.97	J 0.97
Fluoride	300.0	mg/L	0.11	J 0.058	J 0.057	J 0.055	J 0.056	J 0.057
Sulfate	300.0	mg/L	35	J 12	J 12	J 9.6	J 9.9	J 9.9
Alkalinity	310.1	mg/L	240	80	J 85	J 76	J 73	J 74
Bicarbonate Alkalinity as Ca	310.1	mg/L	240	80	J 85	J 76	J 73	J 74
Carbonate Alkalinity as Ca	310.1	mg/L	5	U 5	UJ 5	U 5	UJ 5	UJ
Nitrate Nitrite as N	353.2	mg/L	0.15	UJ 0.13	J- 0.12	J- 0.13	J- 0.14	J- 0.12
Metals								
Calcium	6010D	mg/L	35	17	18	17	17	17
Magnesium	6010D	mg/L	37	10	11	9.0	9.1	9.3
Potassium	6010D	mg/L	3.3	U 3.3	U 3.3	U 3.3	U 3.3	U
Sodium	6010D	mg/L	11	2.3	2.4	1.6	1.8	1.8
Aluminum	6020B	mg/L	0.04	U 0.046	0.048	0.031	J 0.061	J 0.066
Antimony	6020B	mg/L	0.022	0.11	J 0.13	J 0.0014	J+ 0.027	0.028
Arsenic	6020B	mg/L	0.83	0.057	0.061	0.0012	0.01	J 0.011
Barium	6020B	mg/L	0.095	0.030	0.030	0.025	0.027	0.029
Beryllium	6020B	mg/L	0.0004	U 0.0004	U 0.0004	U 0.0004	U 0.0004	UJ 0.0004
Cadmium	6020B	mg/L	0.0004	U 0.0004	U 0.0004	U 0.0004	U 0.0004	U 0.0004
Chromium	6020B	mg/L	0.0002	J 0.00033	J 0.00035	J 0.00029	J 0.00033	J+ 0.00051
Cobalt	6020B	mg/L	0.0039	0.0002	J 0.00015	J 0.000062	J 0.000064	J 0.000072
Copper	6020B	mg/L	0.002	U 0.002	U 0.00085	J 0.002	U 0.00067	J 0.00065
Iron	6020B	mg/L	2.0	0.26	0.23	0.16	0.23	0.27
Lead	6020B	mg/L	0.00082	0.0004	U 0.000051	J 0.0004	U 0.000062	J 0.0004
Manganese	6020B	mg/L	0.29	0.032	0.028	0.023	0.027	J 0.024
Nickel	6020B	mg/L	0.015	0.00084	J 0.00082	J 0.00025	J 0.00028	J+ 0.00036
Selenium	6020B	mg/L	0.008	U 0.008	U 0.008	U 0.008	U 0.008	UJ 0.008
Silver	6020B	mg/L	0.0004	U 0.0004	U 0.0004	U 0.0004	U 0.0004	U 0.0004
Thallium	6020B	mg/L	0.001	U 0.001	U 0.001	U 0.001	U 0.001	UJ 0.001
Vanadium	6020B	mg/L	0.004	U 0.004	U 0.004	U 0.004	U 0.00046	J 0.00046
Zinc	6020B	mg/L	0.0015	J+ 0.007	U 0.0023	J+ 0.007	U 0.007	U 0.007
Mercury	7470A	mg/L	0.0003	U 0.00027	J 0.00026	J 0.0003	U 0.0003	U 0.0003
Low Level Mercury Analysis								
Mercury	EPA 1631E	ng/L	47.9	236	311	5.22	71.3	80.9
Field Water Quality Parameters								
Temperature	Field Measurement	Deg C	4.09	6.89	6.90	6.90	7.01	7.01
pH	Field Measurement	pH Units	6.71	6.54	4.96	7.90	7.68	7.68
Conductivity	Field Measurement	µS/cm	269	92	109	97	94	94
Turbidity	Field Measurement	NTU	2.76	0.45	0.63	0.46	0.37	0.37
Dissolved Oxygen	Field Measurement	mg/L	4.16	13.5	13.46	11.95	12.80	12.80
Oxidation-Reduction Potential	Field Measurement	mV	12.7	151.7	247.3	-87.5	-29.7	-29.7

Notes

Bold font indicates a detection
- = not applicable

Acronyms and Abbreviations

µS/cm = microsiemens per centimeter
ID = Identifier
mg/L = milligrams per liter
mV = millivolts
ng/L = nanograms per liter
NTU = nephelometric turbidity unit
WG = groundwater
WQ = field quality control sample
WS = surface water

Qualifiers

U = not detected at the limit of quantitation
J = estimated
J+ = estimated, high bias
J- = estimated, low bias
UJ = not detected, estimated

ATTACHMENT 1. FIELD DOCUMENTATION

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ATTACHMENT 1.1 TAILGATE SAFETY FIELD FORMS

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Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: RED DEVIL MINE		
Contract Number: B006-007	Task Order: MONITORING SPRING	
Project Location: RED DEVIL, AK	Date: 6/1/2021	Time: 1200
PM: JOHN CONSOLETTI	SSHO: Colleen Rust	
SUXOS:		

WEATHER

	AM	PM
TEMPERATURE	58° / 43°	
WIND	LIGHT WIND	
HUMIDITY	—	
COMMENTS	MOSTLY CLOUDY	

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
MOB TO RED DEVIL LODGE, FIELD OFFICE SET UP, CALIBRATIONS, CHARGING.

Hazards Related to Task: (check all that apply)

<input checked="" type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input checked="" type="checkbox"/> Chemicals	<input type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input checked="" type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
GOOD HOUSE KEEPING, LOCAL RESIDENTS, AIR/ATV TRAFFIC, BEAR, MOOSE, ROAD CONDITIONS

SIGNATURES

Personnel Name	Organization	Personnel's Signature
Colleen Rust	SUNDANCE	
George Berner	Sundance	
JUDSON PARSON	SUNDANCE	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: RED DEVIL MINE		
Contract Number: BU06-007	Task Order: SPRING MONITORING	
Project Location: RED DEVIL, AK	Date: 6/3/2021	Time: 0715
PM: JOHN CONSOLETTI	SSHO: Colleen Rost	
SUXOS: NA		

WEATHER

	AM	PM
TEMPERATURE	39°	62°
WIND	light wind	" "
HUMIDITY	NA	NA
COMMENTS	Cloudy	Cloudy

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
SITE WALK, ROAD/TRAIL ACCESS, ATU SAFETY AND MWE ADIT SAFETY

Hazards Related to Task: (check all that apply)

<input checked="" type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input checked="" type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations ATU
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
RADIO, SAT PHONE, SPOT/FOREXCH CHECK ONSITE

SIGNATURES

Personnel Name	Organization	Personnel's Signature
Colleen Rost	SUNDANCE	
George Garner	Sundance	
Judson Parson	SUNDANCE	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: VED DEVIL MINE		
Contract Number: BV06-007	Task Order: SPRING MONITORING	
Project Location: VED DEVIL, AK	Date: 6/4/2021	Time: 0618
PM: JOHN CONSOQUETTI	SSHO: Colleen Rust	
SUXOS: NA		

WEATHER

	AM	PM
TEMPERATURE	43°	64°
WIND	LIGHT	LIGHT
HUMIDITY	30% showers	30% showers
COMMENTS	FOG	PARTLY CLOUDY

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
BASED ON APPROVED WORK PLAN, WILL COMPLETE SITE GW LEVELS

Hazards Related to Task: (check all that apply)

<input checked="" type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations ATU
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input type="checkbox"/> Weather (rain/snow/wind)
<input checked="" type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife BEAR, WOLF
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
SLIPS, TRIPS & FALLS, ATU OPERATION, WALKING THE SITE

SIGNATURES

Personnel Name	Organization	Personnel's Signature
Colleen Rust	SUNDANCE	
George Garner	Sundance	
JUDSON PARSON	SUNDANCE	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: RED DEVIL MINE		
Contract Number: BV06-007	Task Order: SRLW6 SAMPLING	
Project Location: RED DEVIL, AK	Date: 6/5/2021	Time: 0629
PM: JOHN CONSOLETTI	SSHO: Colleen Rust	
SUXOS: NR		

WEATHER

	AM	PM
TEMPERATURE	39°	56°
WIND	LIGHT	LIGHT
HUMIDITY	—	—
COMMENTS	Cloudy	Cloudy

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
SAMPLE GW MONITORING WELLS ON EAST SIDE OF RED DEVIL CREEK

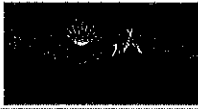
Hazards Related to Task: (check all that apply)

<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input checked="" type="checkbox"/> Chemicals Ca Solution	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations ATV
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife wolf, bear, moose
<input type="checkbox"/> Explosives	<input checked="" type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
BURIED DEBRIS AT MINE, PROPER TRAILER USE INCLUDING TIE DOWNS OF GEAR

SIGNATURES

Personnel Name	Organization	Personnel's Signature
Colleen Rust	SUNDANCE	
George Garner	Sundance	
JUDSON PARSON	SUNDANCE	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: *Red Devil Monitoring*

Contract Number: *B006-007* Task Order: *SPRING SAMPLING*

Project Location: *Red Devil AK* Date: *6/6/21* Time: *0630*

PM: *John Consoletti* SSHO: *Colleen Rust*

SUXOS:

WEATHER

	AM	PM
TEMPERATURE	<i>31°</i>	<i>60s</i>
WIND	<i>calm</i>	<i>light</i>
HUMIDITY	<i>low</i>	<i>low</i>
COMMENTS	<i>clear</i>	

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used: *Groundwater sampling, ATV use,*

Hazards Related to Task: (check all that apply)

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> Biological Hazards | <input type="checkbox"/> Extreme Weather (heat/cold) | <input checked="" type="checkbox"/> Sun Exposure |
| <input type="checkbox"/> Chemicals | <input type="checkbox"/> Pinch | <input checked="" type="checkbox"/> Vehicle Operations |
| <input type="checkbox"/> Contaminant Exposure | <input type="checkbox"/> Radiation | <input type="checkbox"/> Weather (rain/snow/wind) |
| <input checked="" type="checkbox"/> Dehydration | <input checked="" type="checkbox"/> Slip/Trip/Fall | <input checked="" type="checkbox"/> Wildlife |
| <input type="checkbox"/> Explosives | <input type="checkbox"/> Spills | <input type="checkbox"/> Other: |

Additional Safety Topics or Discussions: *wildlife, poisonous plants, battery usage.*

SIGNATURES

Personnel Name	Organization	Personnel's Signature
<i>George Garner</i>	<i>Sundance</i>	<i>[Signature]</i>
<i>JUDSON PARSON</i>	<i>SUNDANCE</i>	<i>[Signature]</i>
<i>Colleen Rust</i>	<i>SUNDANCE</i>	<i>[Signature]</i>



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: <i>Red Devil Monitoring</i>		
Contract Number: <i>BUC6-007</i>	Task Order: <i>SPRING SAMPLING</i>	
Project Location: <i>Red Devil, AK</i>	Date: <i>6/7/2021</i>	Time: <i>0630</i>
PM: <i>John Consoletti</i>	SSHO: <i>Judd Parson</i>	
SUXOS: <i>NA</i>		

WEATHER

	AM	PM
TEMPERATURE	<i>40s</i>	<i>60</i>
WIND	<i>light</i>	<i>light</i>
PRECIPITATION	<i>light rain</i>	<i>light rain</i>
COMMENTS	<i>Cloudy</i>	<i>Cloudy</i>

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used: *Groundwater sampling, ATV use, WILDLIFE*

Hazards Related to Task (check all that apply):

<input type="checkbox"/> Spills	<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Wildlife
<input checked="" type="checkbox"/> Slip/trip/fall	<input type="checkbox"/> Sun exposure	<input type="checkbox"/> Explosives
<input type="checkbox"/> Pinch	<input type="checkbox"/> Extreme weather (heat/cold)	<input type="checkbox"/> Chemicals
<input checked="" type="checkbox"/> Weather (<i>rain</i> , wind, snow)	<input type="checkbox"/> Radiation	<input type="checkbox"/> Contaminant exposure
<input checked="" type="checkbox"/> Vehicle operation <i>ATVs</i>	<input type="checkbox"/> Biological hazards	<input type="checkbox"/> Other _____

Additional Safety Topics or Discussions:
RADIO CHECK INS, SAMPLING IN RAIN

SIGNATURES

Personnel Name	Organization	Personnel's Signature
<i>George Garner</i>	<i>Sundance</i>	<i>[Signature]</i>
<i>JUDSON PARSON</i>	<i>SUNDANCE</i>	<i>[Signature]</i>
<i>Colleen Plust</i>	<i>SUNDANCE</i>	<i>[Signature]</i>



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION		
Project Name:	RED DEVIL MINE	
Contract Number:	BU06-007	Task Order: SPRING SAMPLING
Project Location:	RED DEVIL, AK	Date: 6/18/2021 Time: 0700
PM:	JOHN CONSOLETTI	SSHO: Colleen Rust
SUXOS:	NA	

WEATHER		
	AM	PM
TEMPERATURE	45°	55°
WIND	LIGHT	LIGHT
HUMIDITY	70% RAIN	70% RAIN
COMMENTS	PARTLY CLOUDY	CLOUDY

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
 ATU USE AND GROUNDWATER SAMPLING, CALIBRATION

Hazards Related to Task: (check all that apply)

<input checked="" type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input checked="" type="checkbox"/> Chemicals	<input type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations ATUs
<input checked="" type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
 MONITORING WELL TO WELL LOGISTICS WITH ATUs AND TRAILER.

SIGNATURES

Personnel Name	Organization	Personnel's Signature
Colleen Rust	SUNDANCE	
George Garner	Sundance	
JUDD PARSON	SUNDANCE	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: RED DEVIL MINE		
Contract Number: BV06007	Task Order: SPRING SAMPLING	
Project Location: RED DEVIL, AK	Date: 6/19/2021	Time: 0700
PM: JOHN CONSOLETTI	SSHO: Colleen Rust	
SUXOS: MA		

WEATHER

	AM	PM
TEMPERATURE	45°	50°
WIND	LIGHT	LIGHT
HUMIDITY	10% to 70% RAW	10% to 70% RAW
COMMENTS	CLOUDY RAW	CLOUDY RAIN

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
ATU USE, STREAM GAUGING

Hazards Related to Task: (check all that apply)

<input checked="" type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations ATUs
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Weather (rain /snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
DISCUSSED CHANGE IN ACTIVITIES TO COMPLETE STREAM GAUGING AND PARAMETERS

SIGNATURES

Personnel Name	Organization	Personnel's Signature
Colleen Rust	SUNDANCE	
George Garner	Sundance	
JUDSON PARSON	SUNDANCE	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION		
Project Name: RED DEVIL MINE		
Contract Number: B006-007	Task Order: SPRW6 SAMPLING	
Project Location: RED DEVIL	Date: 6/10/2021	Time: 0630
PM: JOHN CONSOLETTI	SSHO: Colleen Rust	
SUXOS: NA		

WEATHER		
	AM	PM
TEMPERATURE	45s	50s
WIND	LIGHT	LIGHT
HUMIDITY	CLOUDY	CLOUDY LIGHT RAIN
COMMENTS		

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
SURFACE WATER SAMPLING STARTING FROM THE CONFLUENCE OF THE RED DEVIL CREEK AND KUSKOSHUM RIVER.

Hazards Related to Task: (check all that apply)

<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations ATVS
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Weather (rain /snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:

SIGNATURES

Personnel Name	Organization	Personnel's Signature
George Garner	Sundance	
JUDD PARSON	SUNDANCE	
Colleen Rust	SUNDANCE	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: RED DEVIL		
Contract Number: BU06-007	Task Order:	
Project Location: RED DEVIL, AK	Date: 8-28-21	Time: 0730
PM: COLLEEN RUST	SSHO: GEORGE GARNER	
SUXOS:		

WEATHER		
	AM	PM
TEMPERATURE	37° F	55° F
WIND	5-10 mph	5 mph
HUMIDITY	50%	40%
COMMENTS	FROST	

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
 - MONITORING WELL NETWORK SURVEY
 - BRUSH CLEARING

Hazards Related to Task: (check all that apply)

<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input checked="" type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
 - ANIMAL ENCOUNTERS
 - ATV OPS

SIGNATURES

Personnel Name	Organization	Personnel's Signature
JUDSON PARSON	SUNDANCE	
Riley Wittler	Sundance	
George Garner	Sundance	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: Red Devil		
Contract Number: BU06-007	Task Order:	
Project Location: Red Devil, AK	Date: 8/29/2021	Time: 0730
PM: Colleen Rust	SSHO: George Garner	
SUXOS:		

WEATHER

	AM	PM
TEMPERATURE	46°	55°
WIND	low	low
HUMIDITY	high	high
COMMENTS	Rain	

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
sampling groundwater wells, ATV use

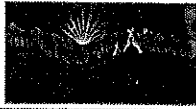
Hazards Related to Task: (check all that apply)

<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Weather (rain/snow/wind)
<input checked="" type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input checked="" type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:

SIGNATURES

Personnel Name	Organization	Personnel's Signature
Riley Wither	Sundance	
JUDY PARSON	SUNDANCE	
George Garner	Sundance	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION

Project Name: <i>Red devil</i>		
Contract Number: <i>BU06-007</i>	Task Order:	
Project Location: <i>Red Devil, AK</i>	Date: <i>08/30/2021</i>	Time: <i>0745</i>
PM: <i>Colleen Rust</i>	SSHO: <i>George Garner</i>	
SUXOS:		

WEATHER

	AM	PM
TEMPERATURE	<i>48° F</i>	<i>61° F</i>
WIND	<i>None</i>	<i>Low</i>
HUMIDITY	<i>100%</i>	<i>high</i>
COMMENTS		

ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY

Activities to be Performed & Equipment Used:
Groundwater monitoring, bladder pump retrieval, ATV op.

Hazards Related to Task: (check all that apply)

<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input type="checkbox"/> Weather (rain/snow/wind)
<input checked="" type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:

Additional Safety Topics or Discussions:
groundwater monitoring safety.

SIGNATURES

Personnel Name	Organization	Personnel's Signature
<i>Riley Witter</i>	<i>Sundance</i>	<i>Riley Witter</i>
<i>Judd Parson</i>	<i>SUNDANCE</i>	<i>Judd Parson</i>
<i>George Garner</i>	<i>Sundance</i>	<i>George Garner</i>



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION		
Project Name: RED DEVIL		
Contract Number:	Task Order:	
Project Location: RED DEVIL, AK	Date: 8-31-21	Time: 0700
PM:	SSHO:	
SUXOS:		
WEATHER		
	AM	PM
TEMPERATURE	46° F	62° F
WIND	2 mph	2 mph
HUMIDITY	96 %	90 %
COMMENTS		
ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY		
Activities to be Performed & Equipment Used: GROUNDWATER SAMPLING ATV OPS		
Hazards Related to Task: (check all that apply)		
<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input checked="" type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:
Additional Safety Topics or Discussions: BEAR COUNTERMEASURES AND PLAN		
SIGNATURES		
Personnel Name	Organization	Personnel's Signature
Judd Parson	SUNDANCE	
Riley Wither	Sundance	
George Garner	Sundance	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION		
Project Name: RED DEVIL		
Contract Number:	Task Order:	
Project Location:	Date: 9-2-21	Time: 0700
PM:	SSHO:	
SUXOS:		
WEATHER		
	AM	PM
TEMPERATURE	42° F	59° F
WIND	2 mph	4 mph
HUMIDITY	94%	89%
COMMENTS		
ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY		
Activities to be Performed & Equipment Used: GROUNDWATER SAMPLING ATV USE		
Hazards Related to Task: (check all that apply)		
<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input checked="" type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input checked="" type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:
Additional Safety Topics or Discussions: REDUCED VISIBILITY FROM FOG		
SIGNATURES		
Personnel Name	Organization	Personnel's Signature
JUDD PARSON	SUNDANCE	
George Garner	Sundance	
Riley Witter	Sundance	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION		
Project Name: BLM RED DEVIL MINE MONITORING		
Contract Number: BUOG-007	Task Order:	
Project Location: RED DEVIL, AK	Date: 4-2-21	Time: 0730
PM:	SSHO:	
SUXOS:		
WEATHER		
	AM	PM
TEMPERATURE	50°	60°
WIND	3 mph	5mph
HUMIDITY	93%	94%
COMMENTS		RAINY
ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY		
Activities to be Performed & Equipment Used: MONITORING WELL MAINTENANCE ATU OPS		
Hazards Related to Task: (check all that apply)		
<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input checked="" type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:
Additional Safety Topics or Discussions: LOADING ATUS + LIFTING TECHNIQUE		
SIGNATURES		
Personnel Name	Organization	Personnel's Signature
Judd PARSON	SUNDANCE	
Riley Wither	Sundance	
George Garner	Sundance	



Tailgate Safety Meeting & Job Safety Analysis

PROJECT & PERSONNEL INFORMATION		
Project Name: RED DEVIL SEASONAL MONITORING		
Contract Number: BU06-007	Task Order:	
Project Location: RED DEVIL, AK	Date: 9-3-21	Time: 0730
PM:	SSHO:	
SUXOS:		
WEATHER		
	AM	PM
TEMPERATURE	49°F	56°F
WIND	5 mph	7 mph
HUMIDITY	98%	90%
COMMENTS	RAIN	RAIN
ACTIVITIES, HAZARDS, EQUIPMENT & SAFETY		
Activities to be Performed & Equipment Used: SURFACE WATER SAMPLING + STREAM GAUGING		
Hazards Related to Task: (check all that apply)		
<input type="checkbox"/> Biological Hazards	<input type="checkbox"/> Extreme Weather (heat/cold)	<input type="checkbox"/> Sun Exposure
<input type="checkbox"/> Chemicals	<input checked="" type="checkbox"/> Pinch	<input checked="" type="checkbox"/> Vehicle Operations
<input checked="" type="checkbox"/> Contaminant Exposure	<input type="checkbox"/> Radiation	<input type="checkbox"/> Weather (rain/snow/wind)
<input type="checkbox"/> Dehydration	<input checked="" type="checkbox"/> Slip/Trip/Fall	<input checked="" type="checkbox"/> Wildlife
<input type="checkbox"/> Explosives	<input type="checkbox"/> Spills	<input type="checkbox"/> Other:
Additional Safety Topics or Discussions: SWIFT WATER SAFETY		
SIGNATURES		
Personnel Name	Organization	Personnel's Signature
Judd Parson	SUNDANCE	
Riley Witter	Sundance	
George Garner	Sundance	

ATTACHMENT 1.2 MONITORING WELL INTEGRITY CHECKLISTS

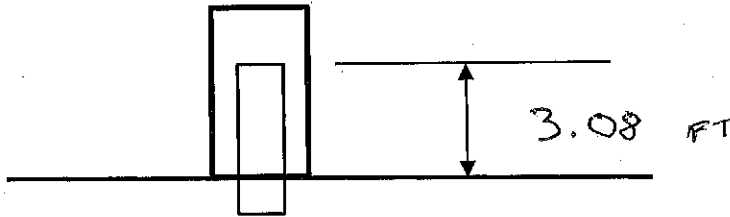
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Monitoring Well Integrity Checklist

Well ID: MW01 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0745 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.29 FT



3. Is the well lid/vault secure? LOCK CVT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040304

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040305
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLED

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples? _____

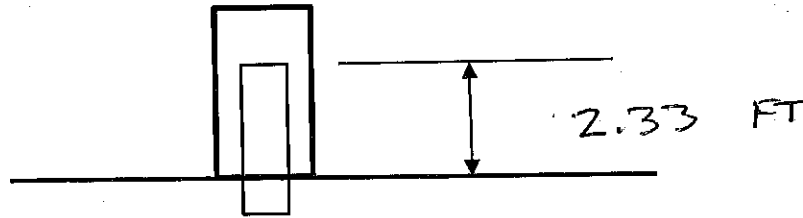
Comments:

Monitoring Well Integrity Checklist

Well ID: MW03 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0950 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.91 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040336

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040337
5. Transducer present? Condition? NO

During Groundwater Sampling ~~NOT SAMPLING~~

1. Is well operational? 2
2. Dedicated pump present? Condition? 2
3. Were there any issues in collecting samples?

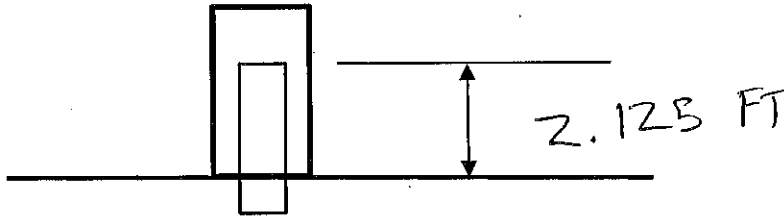
Comments:

Monitoring Well Integrity Checklist

Well ID: MW04 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1127 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.83 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040359

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040360
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?

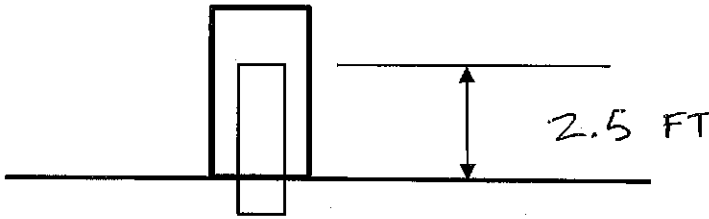
Comments:

Monitoring Well Integrity Checklist

Well ID: MW06 Inspector's name: George Garner
 Date: 6-4-21
 Time: 1155 Inspector's signature: [Signature]

Before Opening Monitoring Well:

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040372

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040372
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? No
3. Were there any issues in collecting samples?
NONE

Comments:

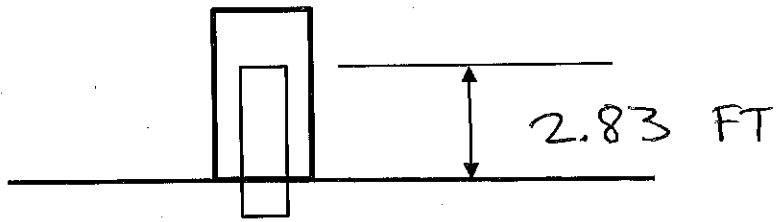
Empty tubing was in well at initial inspection. Heavy algal/Fe-oxides on tubing. Removed and replaced with clean tube.

Monitoring Well Integrity Checklist

Well ID: MW07 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0911 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.25 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040325

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040326
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples? _____

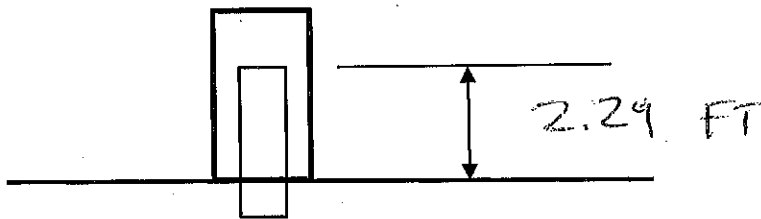
Comments:

Monitoring Well Integrity Checklist

Well ID: MW08 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0900 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.125 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040323

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040324
5. Transducer present? Condition? NO

During Groundwater Sampling ~~NOT SAMPLING~~

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples? _____

Comments:

Monitoring Well Integrity Checklist

Well ID: MW09

Inspector's name: Colleen Rust

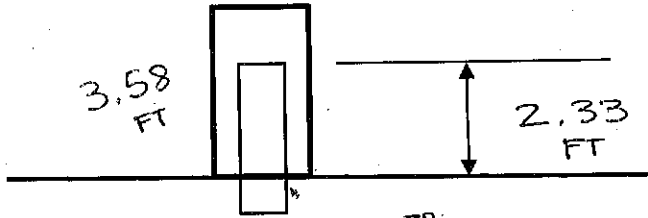
Date: 6-4-21 / 6/5/21

Time: 0820 / 1105

Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface NA



3. Is the well lid/vault secure? YES JP LOCK CUT, CLOSED W/ ZIP TIE
4. Is well clearly labeled? NO JP YES
5. Photographs of well closed P6040315

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040316
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? TUBES WERE BENT, STRAIGHTED AND ZIP TIED
3. Were there any issues in collecting samples?

~~THE~~ PUMPED TOO FAST AT 0.4 L/M ALLOWED TO RECHARGE

PUMPED AT 0.04 L/M TO ALLOW RECHARGE

Comments:

NONE.

Monitoring Well Integrity Checklist

Well ID: MW10

Inspector's name: JUDSON PARSON

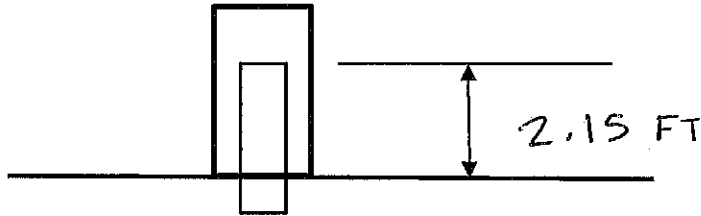
Date: 6-4-21

Time: 0807

Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, FROST JACKED
2. Frost jacking measures: Stick up height from ground surface 2.96 FT



3. Is the well lid/vault secure? YES LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040310

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040314 To P6040311
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, REPLACED DISCHARGE TUBING
3. Were there any issues in collecting samples?
AFTER TUBING WAS REPLACED, NO

Comments:

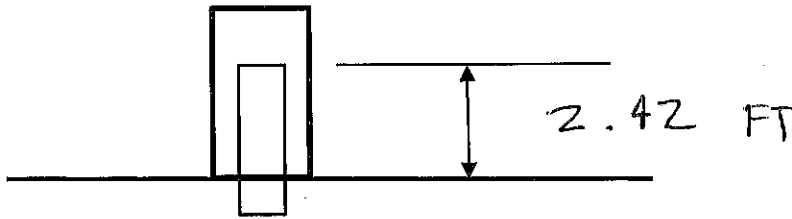
NONE

Monitoring Well Integrity Checklist

Well ID: MW11 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0756 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040309

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040308 TO P6040307
5. Transducer present? Condition? NO

During Groundwater Sampling ~~NOT SAMPLING~~

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples? [Signature]

Comments:

Monitoring Well Integrity Checklist

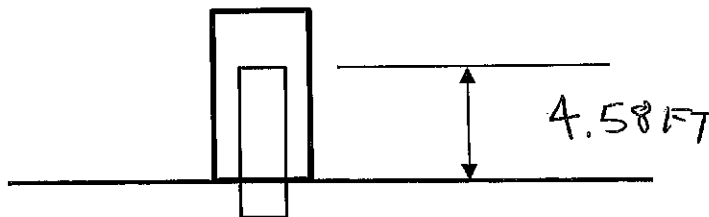
Well ID: MW 12 Inspector's name: JUDSON PARSON

Date: 6-9-21

Time: 0925 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.83 FT



3. Is the well lid/vault secure? NO
4. Is well clearly labeled? YES
5. Photographs of well closed NA

After removing lid before sampling well

1. Is gasket worn or damaged? YES
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040330 + P6040329
5. Transducer present? Condition? NO

During Groundwater Sampling ~~NOT SAMPLING~~

1. Is well operational? NO
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?
[Signature]

Comments:

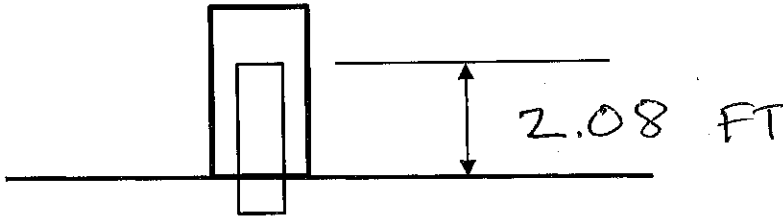
PVC JACKED OUT OF STEEL CASING, PVC COLLAPSED.
UNSAMPLEABLE, UNMEASUREABLE.

Monitoring Well Integrity Checklist

Well ID: MW13 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0920 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.83 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040327

After removing lid before sampling well

1. Is gasket worn or damaged? ~~NO~~ CAP TP NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040328
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples? _____

Comments:

Monitoring Well Integrity Checklist

Well ID: MW16

Inspector's name: Colleen Rust

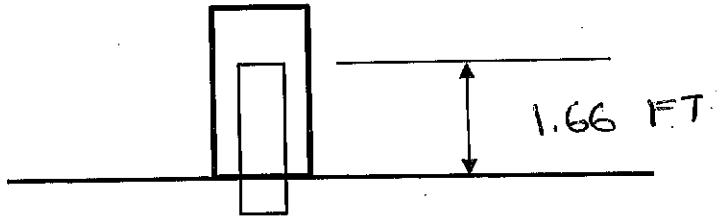
Date: 6-4-21 / 6/15/21

Time: 0945 / 1340

Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040334

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040335
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? NO, DEDICATED TUBING, REPLACED TUBING
3. Were there any issues in collecting samples?

TURBIDITY STABLE AT 38 NTUS, WITH ALGAE THAT WAS ON ORIGINAL TUBING.

Comments:

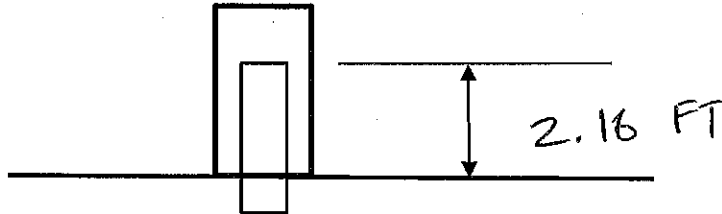
MOVING FORWARD WILL REPLACE TUBING TO THE SAME MEASURED LENGTH

Monitoring Well Integrity Checklist

Well ID: MW17 Inspector's name: Colleen Rust
 Date: 6-4-21 / 6-5-21
 Time: 0938 / 1230 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? FROST JACKED
2. Frost jacking measures: Stick up height from ground surface 3.25 FT



3. Is the well lid/vault secure? LOCK OUT
4. Is well clearly labeled? YES
5. Photographs of well closed: P6040332

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040333
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? No pump, dedicated tubing
3. Were there any issues in collecting samples?
NONE

Comments:

MOVING FORWARD WILL REPLACE TUBING AND REPLACE WITH SAME LENGTH

Monitoring Well Integrity Checklist

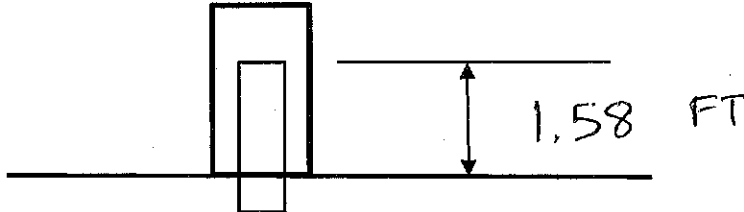
Well ID: MW18 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1022 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.75 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040347

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO, TOO MUCH SAND, REMOVED SOME
3. Any odors? NO
4. Photographs of well with lid off P6040348
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [initials]
2. Dedicated pump present? Condition? [initials]
3. Were there any issues in collecting samples?

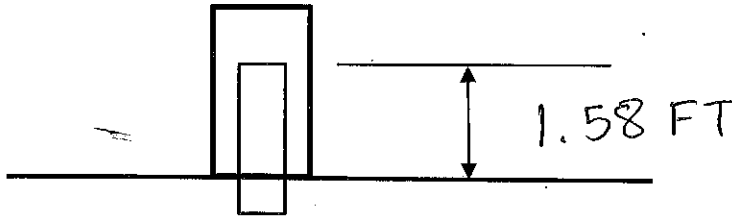
Comments:

Monitoring Well Integrity Checklist

Well ID: MW19 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1030 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.41 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040349

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040350
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

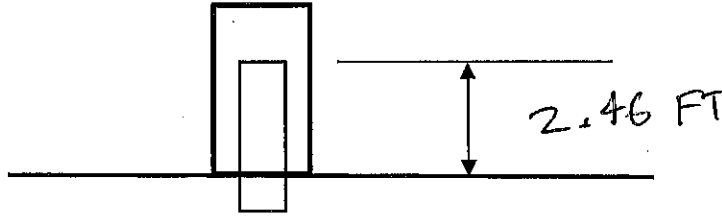
Well ID: MW20 Inspector's name: JADSON PARSON

Date: 6-4-21

Time: 0956 Inspector's signature: ~~YES~~ JP [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.125 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040338

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040339
5. Transducer present? Condition? NO

During Groundwater Sampling ~~NOT SAMPLING~~

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?
[Signature]

Comments:

Monitoring Well Integrity Checklist

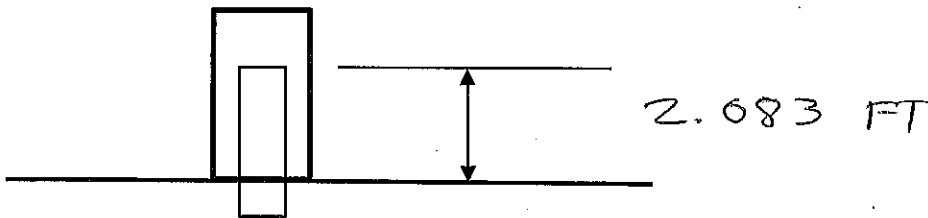
Well ID: MWZ1 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1005 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? FROST JACKED
2. Frost jacking measures: Stick up height from ground surface 2.91 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040340

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040341
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?

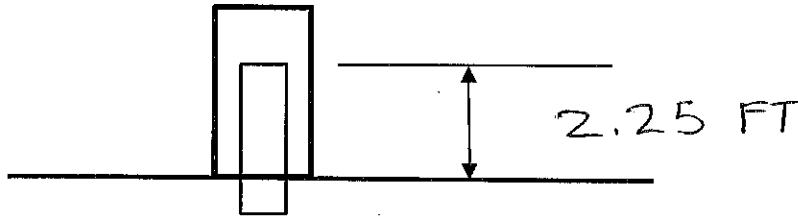
Comments:

Monitoring Well Integrity Checklist

Well ID: MW22 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1012 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed R6040342

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off R6040343
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

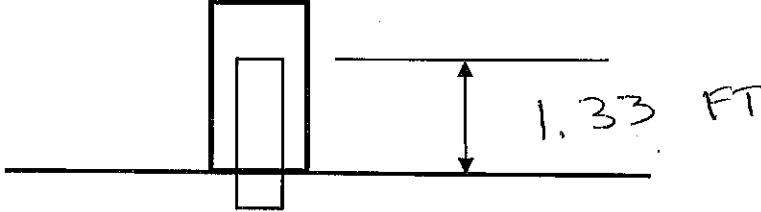
Comments:

Monitoring Well Integrity Checklist

Well ID: MW23 Inspector's name: JUDSON PARSON
Date: 6-4-21
Time: 1200 Inspector's signature: [Signature]

Before Opening Monitoring Well

- 1. Is well cement pad or stickup in good condition? YES
- 2. Frost jacking measures: Stick up height from ground surface 2.5 FT



- 3. Is the well lid/vault secure? LOCK CUT
- 4. Is well clearly labeled? YES
- 5. Photographs of well closed P6040373

After removing lid before sampling well

- 1. Is gasket worn or damaged? NO
- 2. Is vault flooded? NO
- 3. Any odors? NO
- 4. Photographs of well with lid off P6040374
- 5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

- 1. Is well operational? [Signature]
- 2. Dedicated pump present? Condition? [Signature]
- 3. Were there any issues in collecting samples?
[Signature]

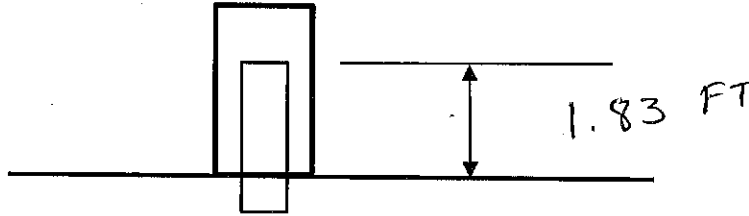
Comments:

Monitoring Well Integrity Checklist

Well ID: MW24 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1151 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040369

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6046370
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

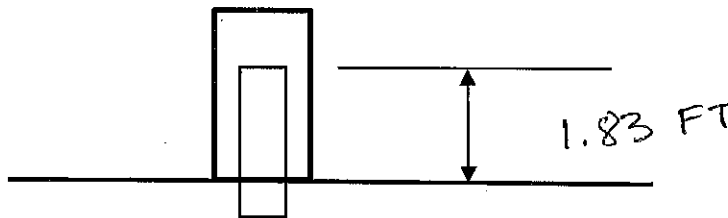
Comments: _____

Monitoring Well Integrity Checklist

Well ID: MW25 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1145 Inspector's signature: *[Signature]*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040367

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040368
5. Transducer present? Condition? NO

During Groundwater Sampling ~~NOT SAMPLING~~

1. Is well operational? *[Signature]*
2. Dedicated pump present? Condition? *[Signature]*
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

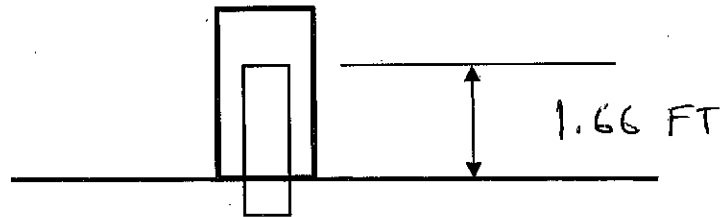
Well ID: MW26 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1140 Inspector's signature: *[Signature]*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6640365

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6640366
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD. REPLACED DISCHARGE TUBING
3. Were there any issues in collecting samples?
NO

Comments:
NEW DISCHARGE TUBING

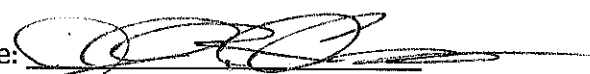
Monitoring Well Integrity Checklist

Well ID: MW27

Inspector's name: JUDSON PARSON

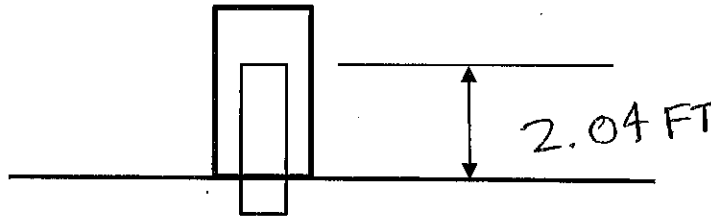
Date: 6-4-21

Time: 1135

Inspector's signature: 

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040363

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040364
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition
3. Were there any issues in collecting samples?
No issues

Comments:

NONE

Monitoring Well Integrity Checklist

Well ID: MW28

Inspector's name: JUDSON PARSON

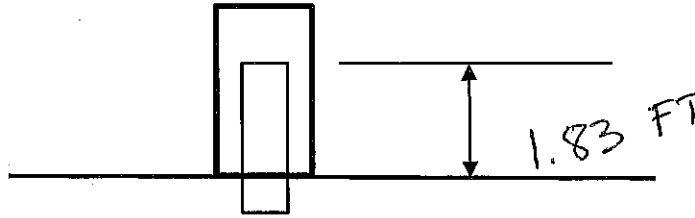
Date: 6-4-21

Time: 1132

Inspector's signature: 

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed 16040361

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 16040362
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, in good condition
3. Were there any issues in collecting samples?
Persistent turbidity but well was functional

Comments:

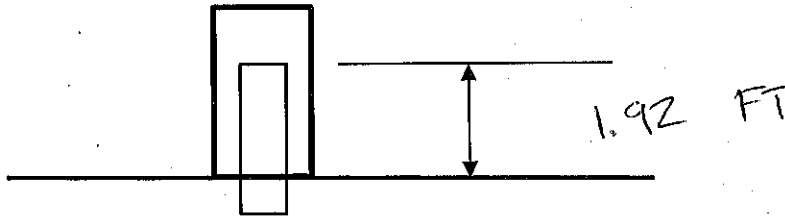
NONE

Monitoring Well Integrity Checklist

Well ID: MW29 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1621 Inspector's signature: *[Signature]*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, FROST JACKED
2. Frost jacking measures: Stick up height from ground surface 2.92 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed PG0A0416

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off PG0A0417
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? No
2. Dedicated pump present? Condition? Yes, air line missing, pump lodged in well.
3. Were there any issues in collecting samples?
Yes unable to sample due to tubing and pump lodged in well.

Comments:

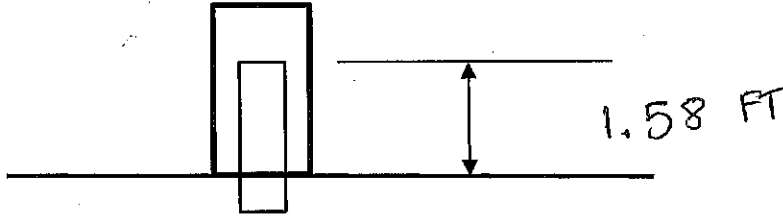
SEE FIELD NOTES

Monitoring Well Integrity Checklist

Well ID: MW30 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1627 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.33 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040418

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040419
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

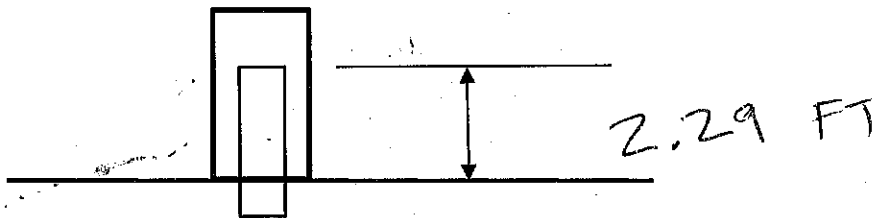
Comments:

Monitoring Well Integrity Checklist

Well ID: MW31 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1542 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.58 FT



3. Is the well lid/vault secure? LOOK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040408

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040409
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples? _____

Comments:

Monitoring Well Integrity Checklist

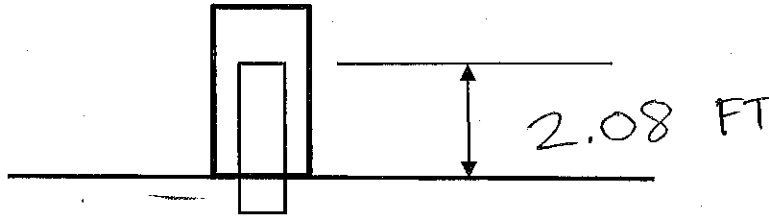
Well ID: MW32 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1040 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.58 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed 16040351

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 16040352
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

Well ID: MW33

Inspector's name: JUDSON PARSON

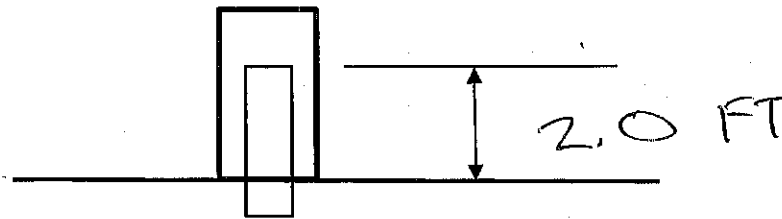
Date: 6-4-21

Time: 1647

Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.42 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040422

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040423
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? NO, PERI
3. Were there any issues in collecting samples?
NO

Comments:

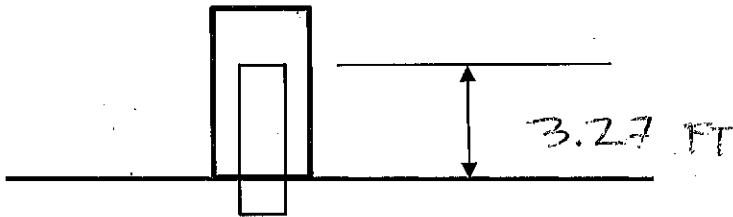
NONE

Monitoring Well Integrity Checklist

Well ID: JP MW34 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0932 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.81 FT



3. Is the well lid/vault secure? YES JP LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040317

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040318
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples? [Signature]

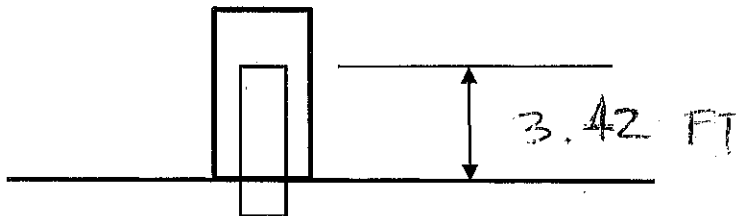
Comments:

Monitoring Well Integrity Checklist

Well ID: MW35 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 0840 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.875 FT



3. Is the well lid/vault secure? LOCK CVT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040319

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040320
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLED

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?
[Signature]

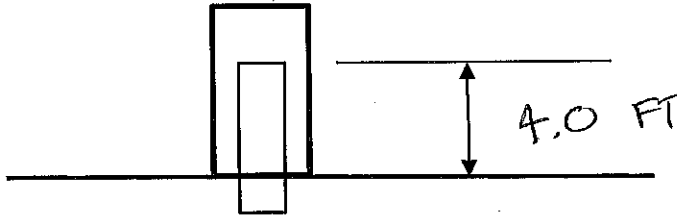
Comments:

Monitoring Well Integrity Checklist

Well ID: MW36 Inspector's name: JUDEON PARSON
 Date: 6-4-21
 Time: 0847 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, FROST JACKED
2. Frost jacking measures: Stick up height from ground surface 4.0 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040321

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040322
5. Transducer present? Condition? NO

During Groundwater Sampling ~~NOT SAMPLING~~

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

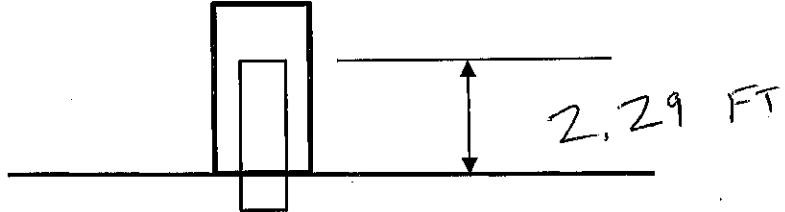
WELL IS SACKED INSIDE OF CASING

Monitoring Well Integrity Checklist

Well ID: NW-39 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1440 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040394

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040395
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples? _____

Comments:

Monitoring Well Integrity Checklist

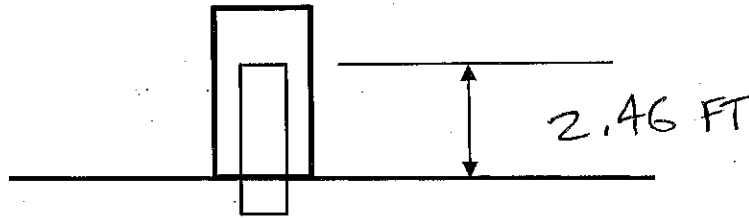
Well ID: MW40 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1428 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.33 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040392

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040393
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD CONDITION
3. Were there any issues in collecting samples?
NO

Comments:

NONE

Monitoring Well Integrity Checklist

Well ID: MW 42

Inspector's name: JUDSON PARSON

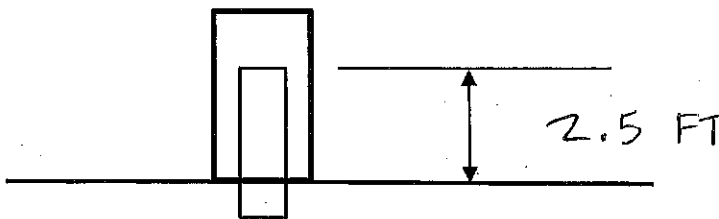
Date: 6-4-21

Time: 1106

Inspector's signature: 

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.70 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040353

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040354
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? NO
2. Dedicated pump present? Condition? YES, LODGED IN WELL WITH TUBING
3. Were there any issues in collecting samples?
YES, SEE FIELD NOTES.

Comments:

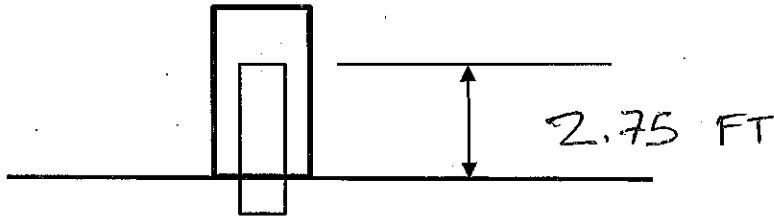
COULD NOT SAMPLE

Monitoring Well Integrity Checklist

Well ID: MW43 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1118 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.91 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040355

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? YES
3. Any odors? NO
4. Photographs of well with lid off P6040358 to P6040356
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

None

Monitoring Well Integrity Checklist

Well ID: MW 44

Inspector's name: JUDSON PARSON

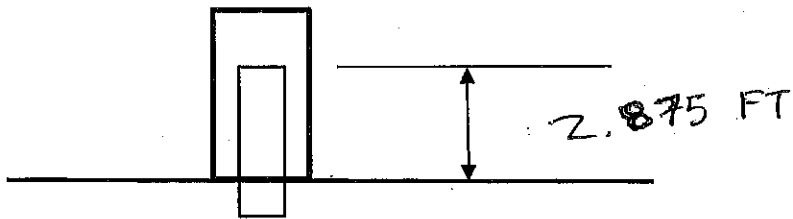
Date: 6-4-21

Time: 1600

Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.21 FT



3. Is the well lid/vault secure? YES, LOCK CDT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040412

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040413
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD CONDITION
3. Were there any issues in collecting samples?
NO


Comments:

NONE.

Monitoring Well Integrity Checklist

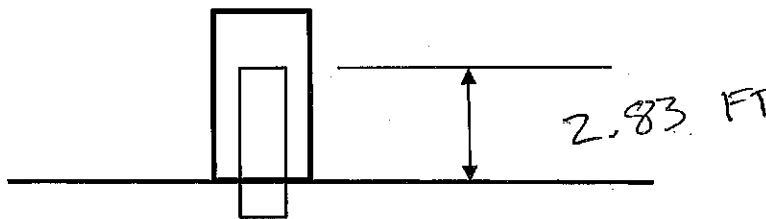
Well ID: MW45 Inspector's name: JUDSON PARSON

Date: 6-1-21

Time: 1334 Inspector's signature: 

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.91 FT.



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040385

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040386
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes seems in good condition
3. Were there any issues in collecting samples?
High amount of bubbles in return line. Questionable DO readings

Comments:

NONE

Monitoring Well Integrity Checklist

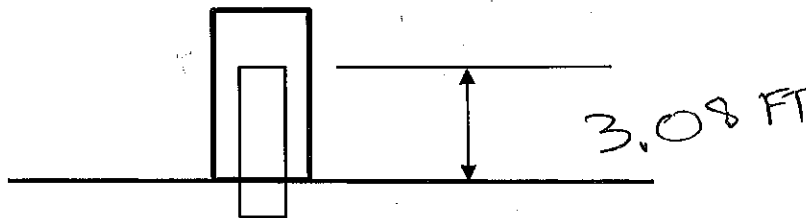
Well ID: MW46 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1326 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.54 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6046383

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040384
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD WORKING ORDER
3. Were there any issues in collecting samples?
NO

Comments:

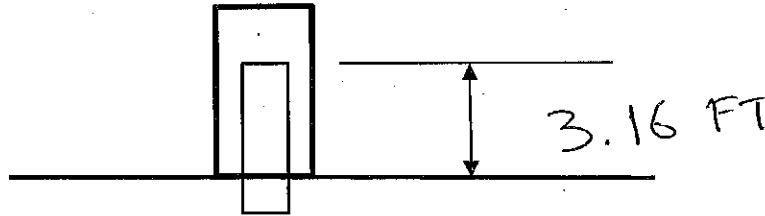
NONE

Monitoring Well Integrity Checklist

Well ID: MW47 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1313 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.42 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040381

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040382
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Good shape and Yes bladder pump
3. Were there any issues in collecting samples?
Lots of air in the water return. Possible leak in bladder.

Comments:

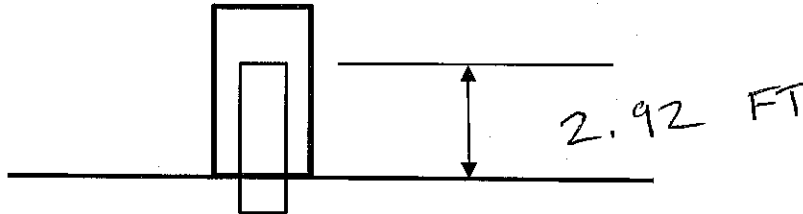
NONE

Monitoring Well Integrity Checklist

Well ID: MW48 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1611 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.25 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed PG040414

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off PG040415
5. Transducer present? Condition? NO

During Groundwater Sampling NOT SAMPLING

1. Is well operational? [Signature]
2. Dedicated pump present? Condition? [Signature]
3. Were there any issues in collecting samples?
[Signature]

Comments:

Monitoring Well Integrity Checklist

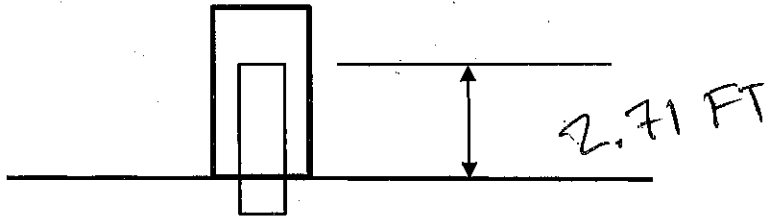
Well ID: MW 49 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1635 Inspector's signature: *J. Parson*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.33 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040420

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040421
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes good condition
3. Were there any issues in collecting samples?
No.

Comments:

NONE

Monitoring Well Integrity Checklist

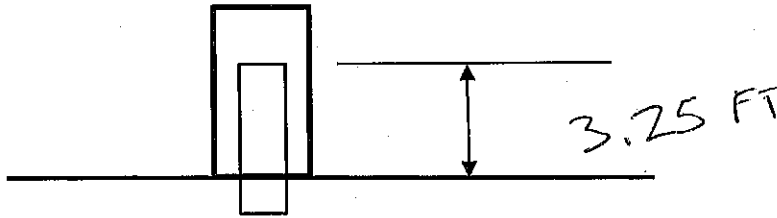
Well ID: MW50 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1514 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.54 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040402

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040403
5. Transducer present? Condition? YES, GOOD

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES
3. Were there any issues in collecting samples?
NO

Comments:

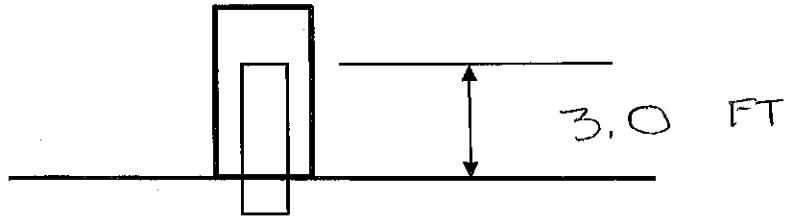
NONE.

Monitoring Well Integrity Checklist

Well ID: MWS1 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1453 Inspector's signature: *[Signature]*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.29 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040348

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040349
5. Transducer present? Condition? YES, GOOD

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

NONE

Monitoring Well Integrity Checklist

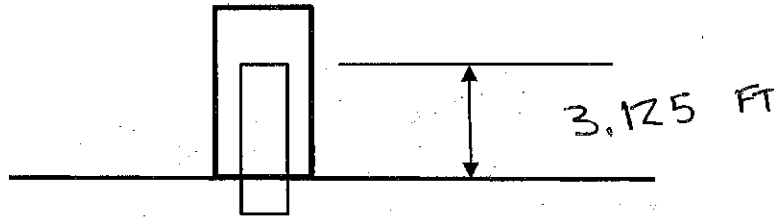
Well ID: MW52 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1306 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.42 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040379

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040380
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, WATER FLOWS BACK DURING RECHARGE CYCLE.
3. Were there any issues in collecting samples?
NO.

Comments:

NONE

Monitoring Well Integrity Checklist

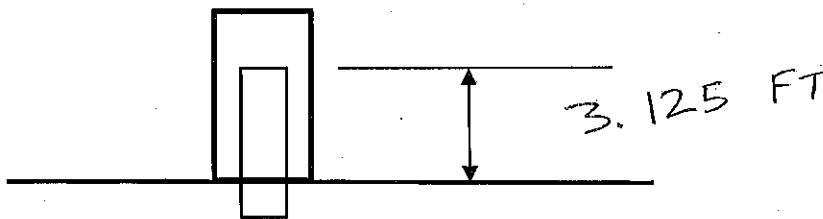
Well ID: MW53 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1532 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.5 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed PG040406

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off PG040407
5. Transducer present? Condition? YES, GOOD

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES
3. Were there any issues in collecting samples?
NO

Comments:

NONE

Monitoring Well Integrity Checklist

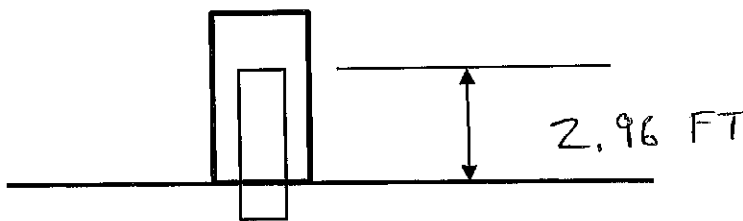
Well ID: MW54 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1504 Inspector's signature: *J. Parson*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.54 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040400

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040401
5. Transducer present? Condition? YES, GOOD

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

NONE

Monitoring Well Integrity Checklist

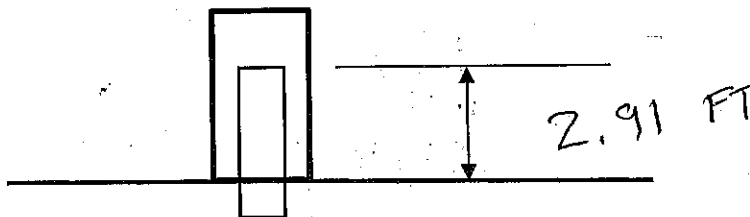
Well ID: MWS5 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1257 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.5 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6046377

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040378
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? NO, PERI PUMP
3. Were there any issues in collecting samples?
NO

Comments:

NONE

Monitoring Well Integrity Checklist

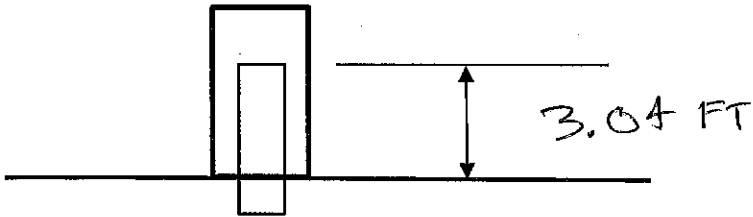
Well ID: MW56 Inspector's name: JUDSON PARSON

Date: 6-4-21 / 6-5-21

Time: 1341 / 35:35 @ 1455 Inspector's signature: *J. Parson*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.42 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040387

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040388
5. Transducer present? Condition? YES, GOOD SHAPE, DOWNLOADED 6-5-21

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:
NONE

Monitoring Well Integrity Checklist

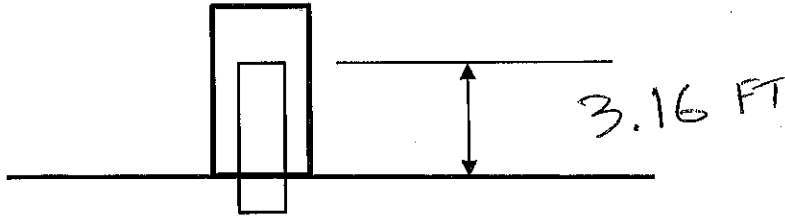
Well ID: MW 57 Inspector's name: JUDSON PARSON

Date: 6-4-21

Time: 1551 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.29 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040410

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040411
5. Transducer present? Condition? YES, GOOD, DOWNLOADED 6-8-21

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

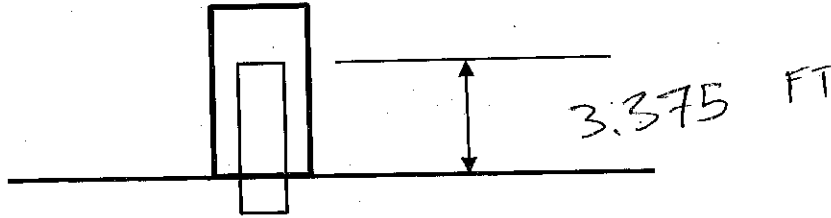
NONE

Monitoring Well Integrity Checklist

Well ID: MW 58 Inspector's name: JUDSON PARSON
 Date: 6-4-21
 Time: 1523 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.66 FT



3. Is the well lid/vault secure? LOCK CVT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040404

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040405
5. Transducer present? Condition? YES, GOOD

During Groundwater Sampling

1. Is well operational? NO, WILL REPLACE BLADDER IN FALL 2021
2. Dedicated pump present? Condition? YES, DID NOT WORK
3. Were there any issues in collecting samples?
YES, HAD TO BAIL FOR SAMPLE

Comments:

NEED TO REPLACE BLADDER IN PUMP, SPRING SAMPLE
COLLECTED BY BAILER

Monitoring Well Integrity Checklist

Well ID: ^{MW} 59

Inspector's name: JUDSON PARSON

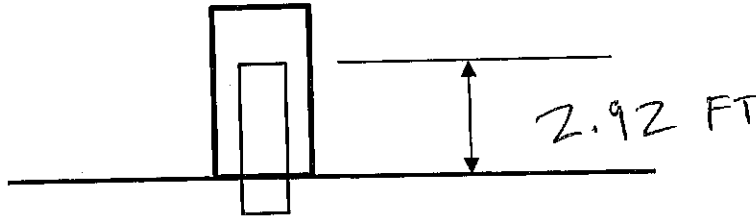
Date: 6-4-21

Time: 1444

Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.16 FT



3. Is the well lid/vault secure? LOCK CUT
4. Is well clearly labeled? YES
5. Photographs of well closed P6040396

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off P6040397
5. Transducer present? Condition? NO. WAS IN MW-39 ABOVE WATER

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD CONDITION
3. Were there any issues in collecting samples?
NO

Comments:

1. TRANSducer BASED ON SOW WAS SUPPOSE TO BE IN MW-59 HOWEVER A TRANSducer WAS IN MW-39 ABOVE WATER MEASURING BARAMETRIC PRESSURE NOT WATER LEVELS

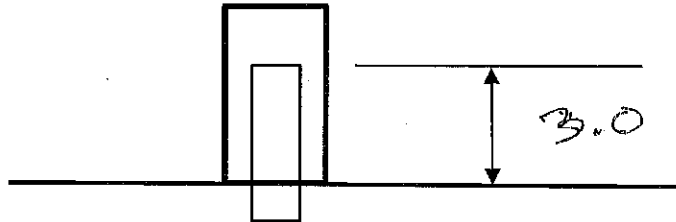
2. WATER TUBE WAS BENT HAD TO PULL PUMP, WATER TUBE WAS TOO LONG, ZIP TIES, FIXED AND LOWERED TO SAMPLE.

Monitoring Well Integrity Checklist

Well ID: MW01 Inspector's name: JUDD PARSONS
 Date: 3-25-21
 Time: 0919 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.25



20.11
DTW

3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES, PRINTED LABEL
5. Photographs of well closed 114, 115

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off _____
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

Well ID: MW03

Inspector's name: JUDD PARSON

Date: 8-28-21

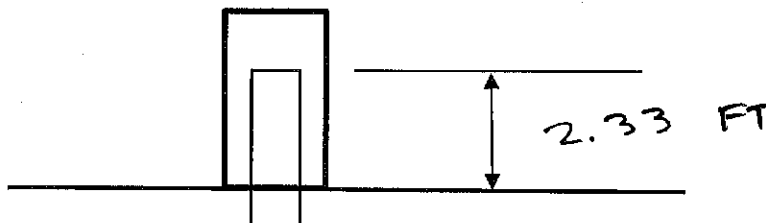
Time: 1105

Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT

20.82 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 200

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 201
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

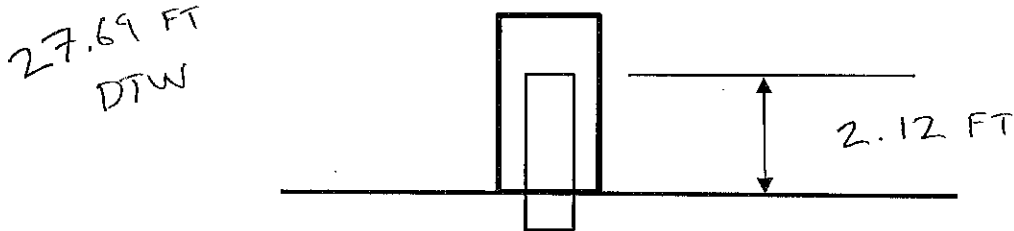
Comments:

Monitoring Well Integrity Checklist

Well ID: MW04 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1250 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.83 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 228

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 229
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

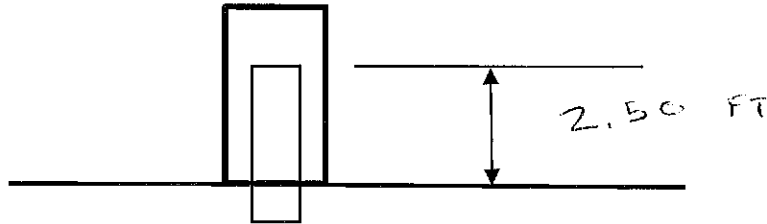
Monitoring Well Integrity Checklist

Well ID: MW06 Inspector's name: JUD PARSON
 Date: 8-28-21
 Time: 1155 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT

19.02 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 216

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 217
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? NO
3. Were there any issues in collecting samples?
NO

Comments:

Monitoring Well Integrity Checklist

Well ID: MW-07

Inspector's name: JUDD PARSON

Date: 8-28-21

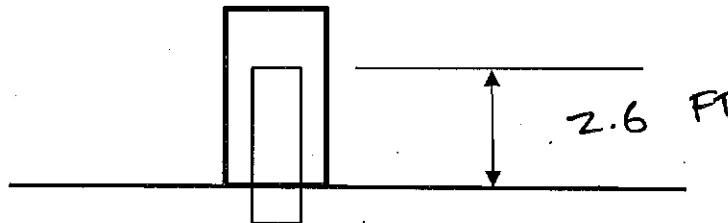
Time: 1032

Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT

20.93 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 190

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 191
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

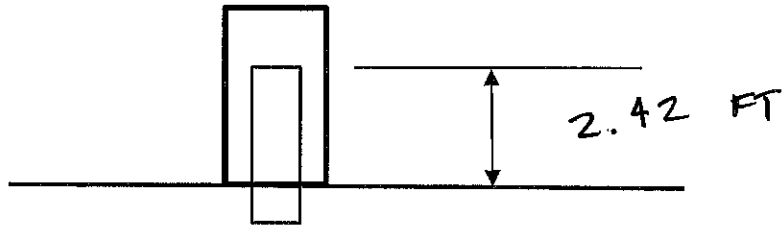
Monitoring Well Integrity Checklist

Well ID: MW-08 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1025 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.25 FT

14.27 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 189

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 189
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

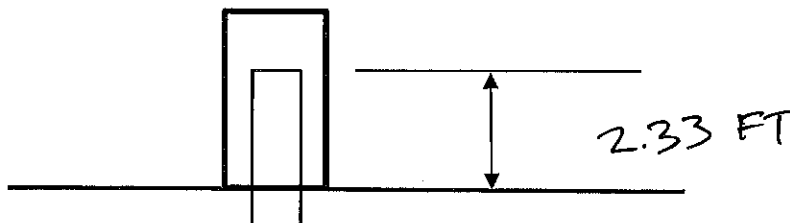
Monitoring Well Integrity Checklist

Well ID: MW09 Inspector's name: JUPD PARSON
 Date: 8-28-21
 Time: 0949 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.59 FT

*25.37 FT
DTW*



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 180

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 181
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, KINKED TUBING → FIXED
3. Were there any issues in collecting samples?
NO

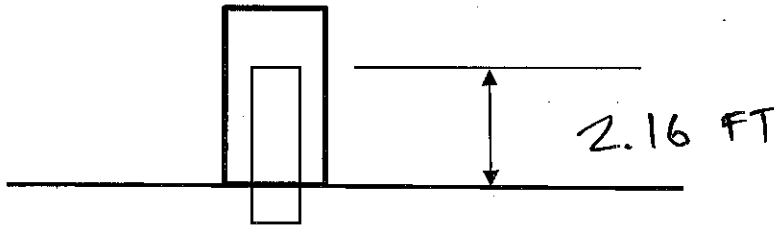
Comments:

Monitoring Well Integrity Checklist

Well ID: MW10 Inspector's name: JUPP PARSON
 Date: 8-28-21
 Time: 0943 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT



3. Is the well lid/vault secure? YES
4. Is well clearly labeled? YES
5. Photographs of well closed 178, 179 RW

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 179
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

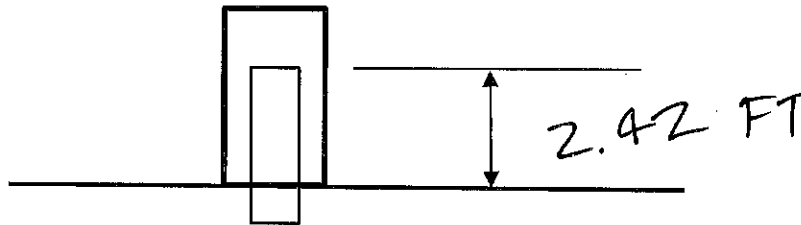
Monitoring Well Integrity Checklist

Well ID: MW11 Inspector's name: JUDD PARSON
 Date: 9-28-21
 Time: 0938 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.0 FT

23.55 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 176, 177

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off _____
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples? _____

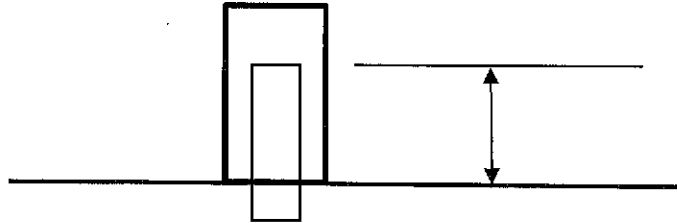
Comments:

Monitoring Well Integrity Checklist

Well ID: MW12 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1044 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, CASING IS JACKED
2. Frost jacking measures: Stick up height from ground surface _____



3. Is the well lid/vault secure? YES
4. Is well clearly labeled? YES
5. Photographs of well closed 194

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 195
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

CASING JACKED OUT OF STICK-UP. CASING IS COLLAPSED.
UNSAMPLEABLE.

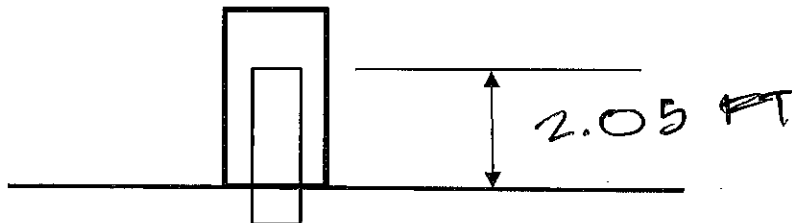
Monitoring Well Integrity Checklist

Well ID: MW-13 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1037 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.80 FT

DRY
31.72 FT
TO BOTTOM



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 192

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 193
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

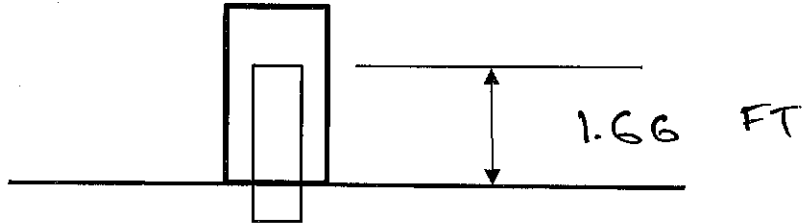
Monitoring Well Integrity Checklist

Well ID: MW-16 Inspector's name: JUDD PARSON
 Date: HOT JP 8-28-21
 Time: 1101 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT

13.49 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 198

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 199
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? NO
3. Were there any issues in collecting samples?
NO

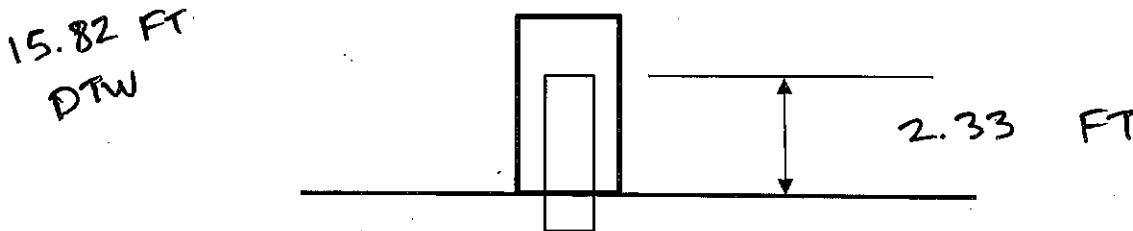
Comments:

Monitoring Well Integrity Checklist

Well ID: MW-17 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1058 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, JACKED 6 INCHES
2. Frost jacking measures: Stick up height from ground surface 3.33 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 196

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 197
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? NO
3. Were there any issues in collecting samples?
NO

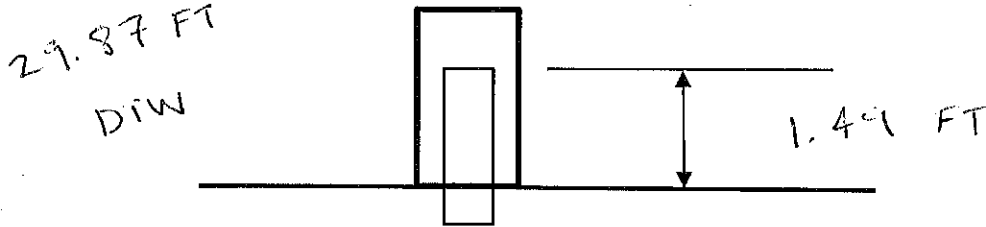
Comments:

Monitoring Well Integrity Checklist

Well ID: MW-18 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1118 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 204

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 205
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

2021
 8/28/21
 JPP

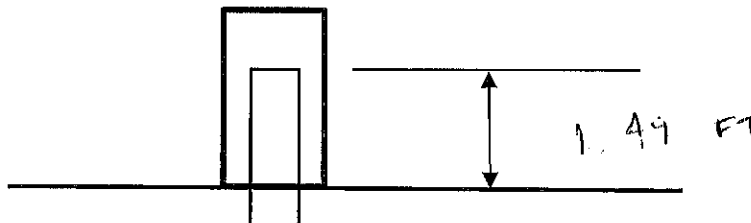
Monitoring Well Integrity Checklist

Well ID: MW 19 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1124 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.33 FT

21.81 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 206

After removing lid before sampling well

1. Is gasket worn or damaged? _____
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 207
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

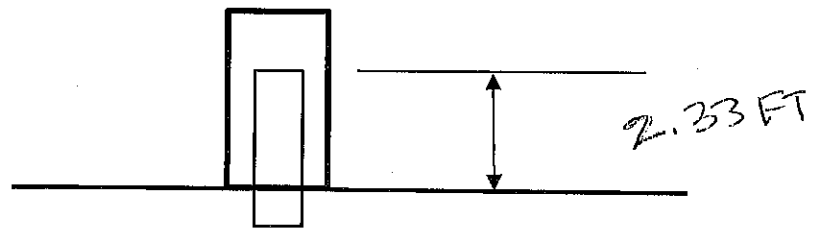
Monitoring Well Integrity Checklist

Well ID: MW 20 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1109 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.08 FT

*7.67 FT
DTW*



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 202

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 203
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

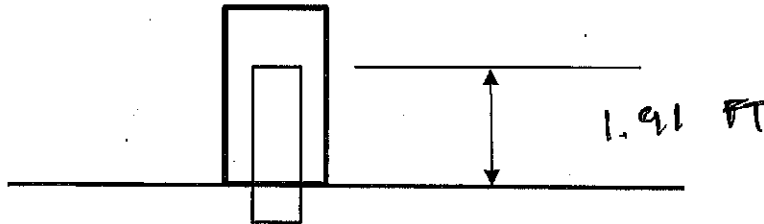
Monitoring Well Integrity Checklist

Well ID: MW 21 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1140 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, CEMENT IS JACKED.
2. Frost jacking measures: Stick up height from ground surface 2.75 FT

8.96 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 212

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 213
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

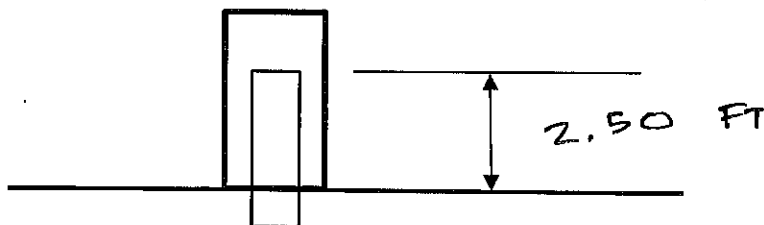
Monitoring Well Integrity Checklist

Well ID: MW 22 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1137 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.25 FT

9.97 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 210

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 211
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

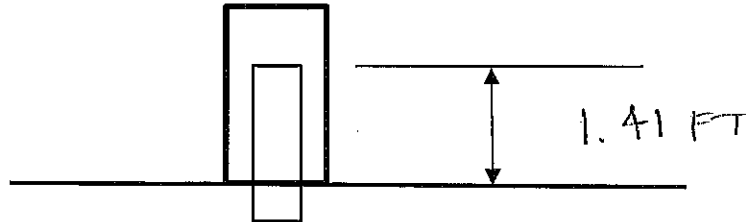
Monitoring Well Integrity Checklist

Well ID: MW-23 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1151 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.58 FT

16.38 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 214

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 215
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

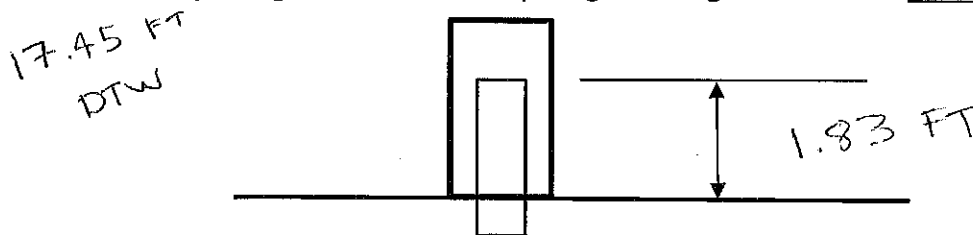
Comments:

Monitoring Well Integrity Checklist

Well ID: MW 24 Inspector's name: JODD PARSON
 Date: 8-28-21
 Time: 1158 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 218

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 219
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

Well ID: MW25 Inspector's name: JUDD PARSON

Date: 8-28-21

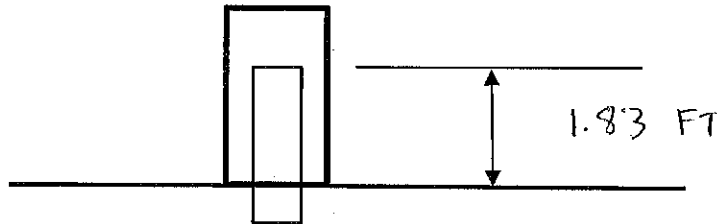
Time: 1239 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES

2. Frost jacking measures: Stick up height from ground surface 3.0 FT

32.26 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK

4. Is well clearly labeled? YES

5. Photographs of well closed 222

After removing lid before sampling well

1. Is gasket worn or damaged? NO

2. Is vault flooded? NO

3. Any odors? NO

4. Photographs of well with lid off 223

5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____

2. Dedicated pump present? Condition? _____

3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

Well ID: MW26

Inspector's name: JUDD PARSON

Date: 8-28-21

Time: 1234

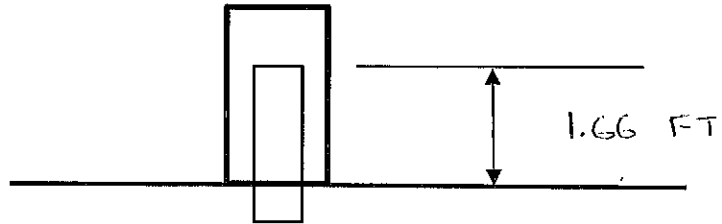
Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES

2. Frost jacking measures: Stick up height from ground surface 2.66 FT

36.15 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK

4. Is well clearly labeled? YES

5. Photographs of well closed 220

After removing lid before sampling well

1. Is gasket worn or damaged? NO

2. Is vault flooded? NO

3. Any odors? NO

4. Photographs of well with lid off 221

5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES

2. Dedicated pump present? Condition? YES, APPEARS TO BE FINE BUT WONT WORK

3. Were there any issues in collecting samples?
USED MINI RENTAL BLADDER PUMP

Comments:

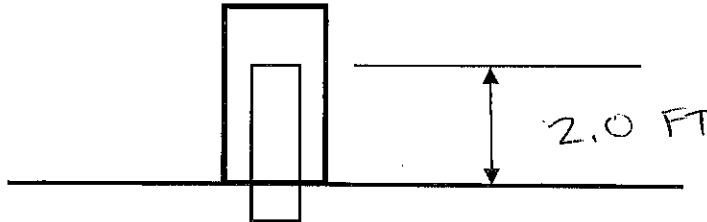
Monitoring Well Integrity Checklist

Well ID: MW27 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1243 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.66 FT

30.92 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 22A

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 225
5. Transducer present? Condition? NO

During Groundwater Sampling

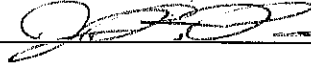
1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition.
3. Were there any issues in collecting samples?
No.

Comments:

Monitoring Well Integrity Checklist

Well ID: MW28 Inspector's name: JUDD PARSON

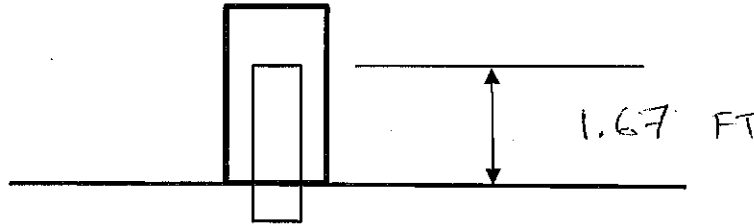
Date: 8-28-21

Time: 1246 Inspector's signature: 

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.50 FT

29.51 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 226

After removing lid before sampling well

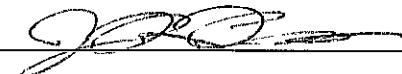
1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? ~~NO~~ NO
4. Photographs of well with lid off 227
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD. BLADDER IS WORN
3. Were there any issues in collecting samples?
NO

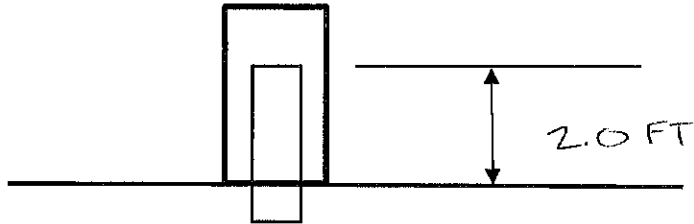
Comments:

Monitoring Well Integrity Checklist

Well ID: MW 29 Inspector's name: J PARSON
 Date: 8-28-21
 Time: 1615 Inspector's signature: 

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, JACKED
2. Frost jacking measures: Stick up height from ground surface 3.0 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 268

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 269
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
LOTS OF SILT IN WELL, VERY HIGH TURBIDITY

Comments:

PUMP STILL STUCK, PTW NOT MEASURABLE, STUCK
@ 263 FT BLOC

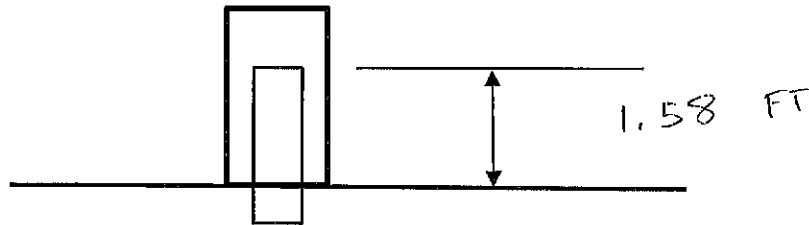
Monitoring Well Integrity Checklist

Well ID: MW30 Inspector's name: J PARSON
 Date: 8-28-21
 Time: 1621 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.33 FT

54.19 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 270

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 271
5. Transducer present? Condition? ~~NO~~ JP NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

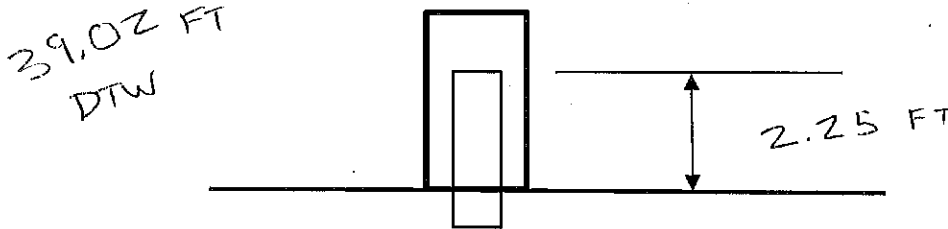
Well ID: MW 31 Inspector's name: J PARSON

Date: 8-28-21

Time: 1509 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.58 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 252

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 253
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

Well ID: MW 32

Inspector's name: JP Judd PARSON

Date: 8-28-21

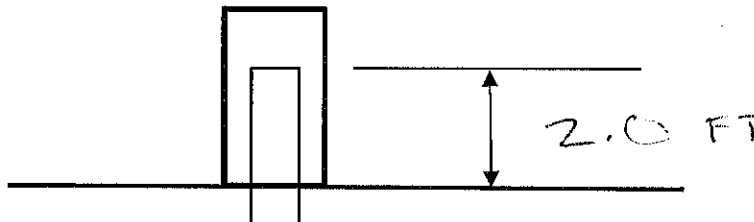
Time: 1131

Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.50 FT

19.28 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 208

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 209
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

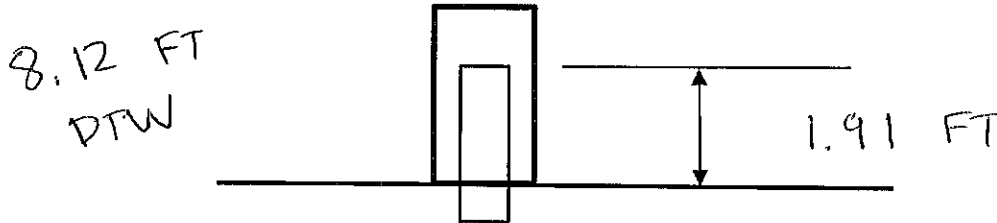
Comments:

Monitoring Well Integrity Checklist

Well ID: MW33 Inspector's name: J PARSON
 Date: 8-28-21
 Time: 1653 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.33 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 276

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 277
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? NO
3. Were there any issues in collecting samples?
NO

Comments:

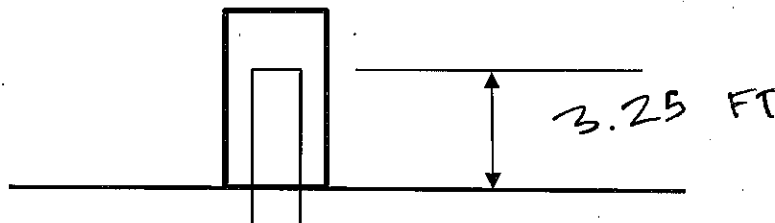
Monitoring Well Integrity Checklist

Well ID: MW-34 Inspector's name: JDD PARSON
 Date: 8-28-21
 Time: 0955 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.75 FT

34.59 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 192

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 183
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

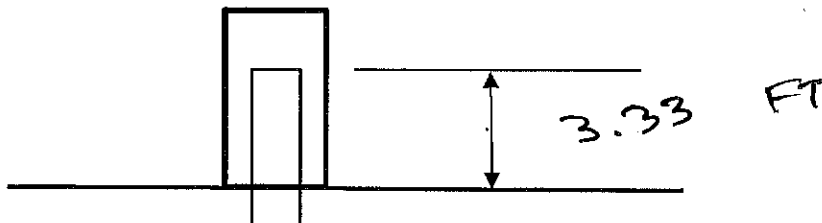
Monitoring Well Integrity Checklist

Well ID: MW-35 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 0959 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.83 FT

39.18 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 184

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 185
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

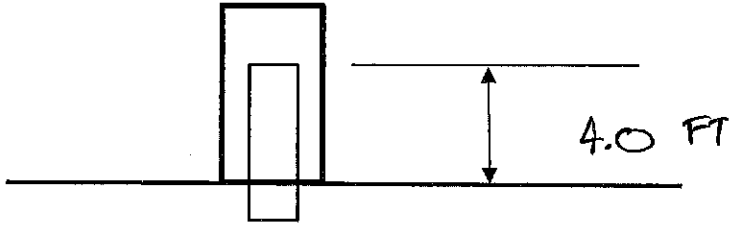
Monitoring Well Integrity Checklist

Well ID: MW-36 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1002 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, CASINGS IS FROST JACKED
2. Frost jacking measures: Stick up height from ground surface 4.0 FT

*16.39 FT
DTW*



3. Is the well lid/vault secure? YES
4. Is well clearly labeled? YES
5. Photographs of well closed 186

After removing lid before sampling well

1. Is gasket worn or damaged? NO.
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 187
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

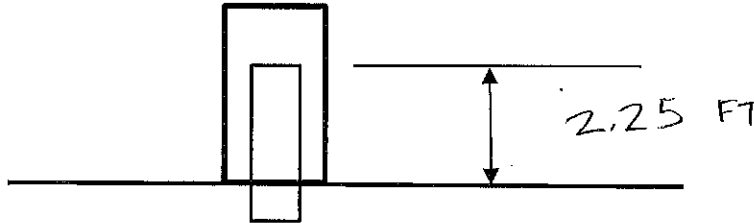
Monitoring Well Integrity Checklist

Well ID: MW39 Inspector's name: J PARSON
 Date: 8-28-21
 Time: 1535 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES^{JP} NO, JACKED
2. Frost jacking measures: Stick up height from ground surface 3.0 FT

84.79 FT
BTOC
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 256

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 257
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

Well ID: MW40 Inspector's name: J PARSON

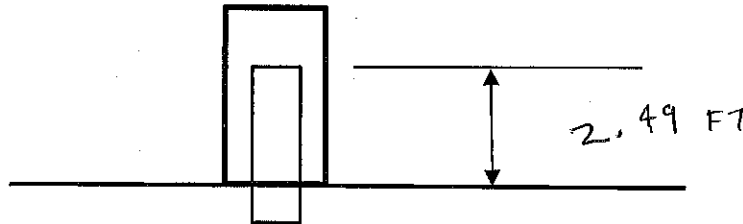
Date: 8-28-21

Time: 1545 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES, JACKED
2. Frost jacking measures: Stick up height from ground surface 3.33 FT

128.91 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 260

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 261
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

LEAKY AIR FITTINGS, STILL PROVIDES ENOUGH PRESSURE TO PUMP.

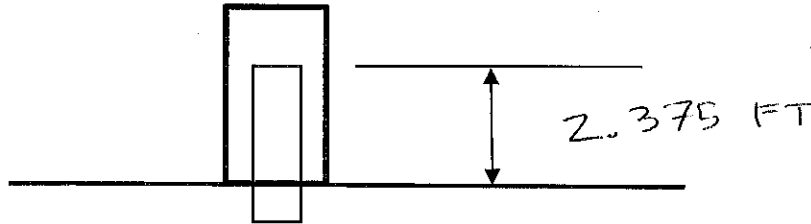
Monitoring Well Integrity Checklist

Well ID: MW 42 Inspector's name: J PARSON
 Date: 8-28-21
 Time: 1631 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.58 FT

128.68 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 272

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 273
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?

Comments:

85 FT BTOC TO STUCK PUMP, UNABLE TO MEASURE DTW
8-30-21. GOT PUMP UNSTUCK AND TO SURFACE. REPLACED
ALL TUBING AND ROPE AND REPLACED AT 134 FT
BTOC.

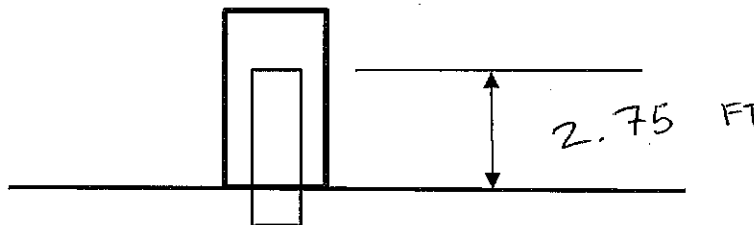
Monitoring Well Integrity Checklist

Well ID: MW43 Inspector's name: J PARSON
 Date: 8-28-21
 Time: 1638 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.875 FT

90.14 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 274

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 275
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition.
3. Were there any issues in collecting samples?
No

Comments:

Monitoring Well Integrity Checklist

Well ID: MW44 Inspector's name: J PARSON

Date: 8-28-21

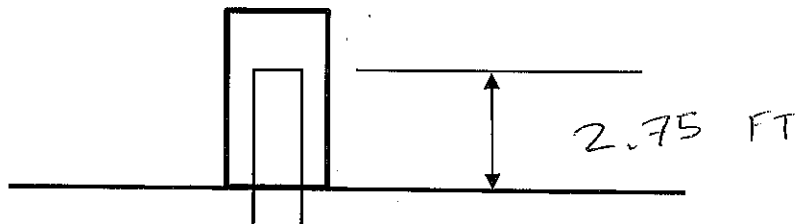
Time: 1556 Inspector's signature: *[Signature]*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES

2. Frost jacking measures: Stick up height from ground surface 3.16 FT

*35.42 FT
DTW*



3. Is the well lid/vault secure? YES, NEW LOCK

4. Is well clearly labeled? YES

5. Photographs of well closed 262

After removing lid before sampling well

1. Is gasket worn or damaged? NO

2. Is vault flooded? NO

3. Any odors? NO

4. Photographs of well with lid off 263

5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes

2. Dedicated pump present? Condition? Yes, good condition

3. Were there any issues in collecting samples?
No issues

Comments:

Monitoring Well Integrity Checklist

Well ID: MW 45

Inspector's name: JUDD PARSON

Date: 8-28-21

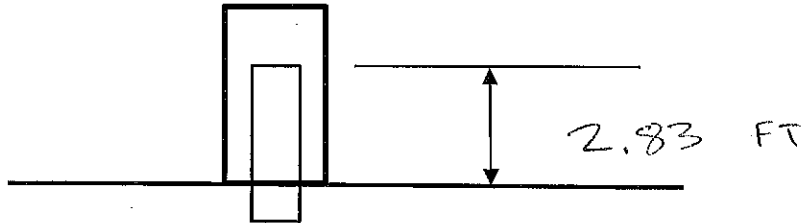
Time: 1340

Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 2.875 FT

46.72 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 238

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 239
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition
3. Were there any issues in collecting samples?
No issues

Comments:

Monitoring Well Integrity Checklist

Well ID: MW 46 Inspector's name: JUDD PARSON

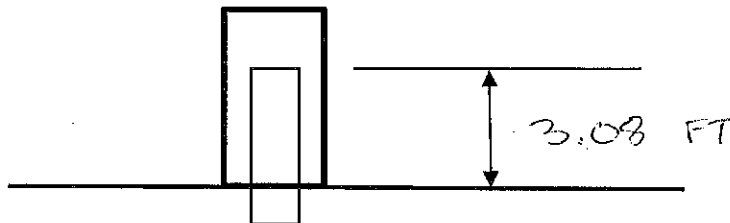
Date: 8-28-21

Time: 1332 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.5 FT

35.63 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 236

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 237
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition
3. Were there any issues in collecting samples?
No issues

Comments:

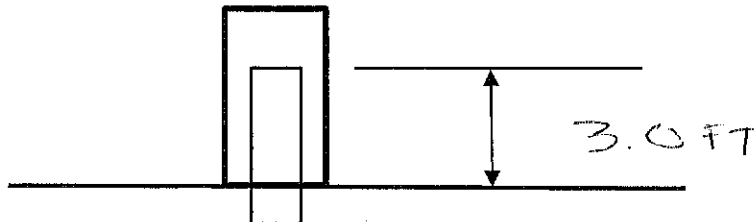
Monitoring Well Integrity Checklist

Well ID: MW47 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1325 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.25 FT

*39.06 FT
DTW*



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 234

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 235
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition
3. Were there any issues in collecting samples?
No issues

Comments:

Duplicate sample collected from this well.

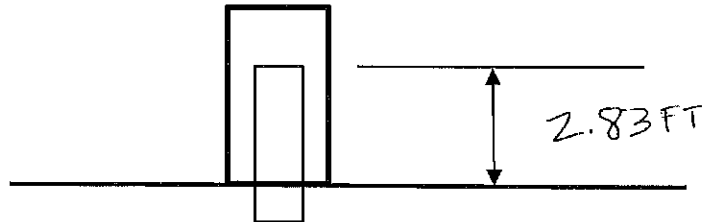
Monitoring Well Integrity Checklist

Well ID: MW48 Inspector's name: J PARSON
 Date: 8/28/2021
 Time: 1602 Inspector's signature: _____

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.16 FT

20.19 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 264

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 265
5. Transducer present? Condition? NO

During Groundwater Sampling

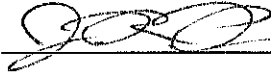
1. Is well operational? _____
2. Dedicated pump present? Condition? _____
3. Were there any issues in collecting samples?

Comments:

Monitoring Well Integrity Checklist

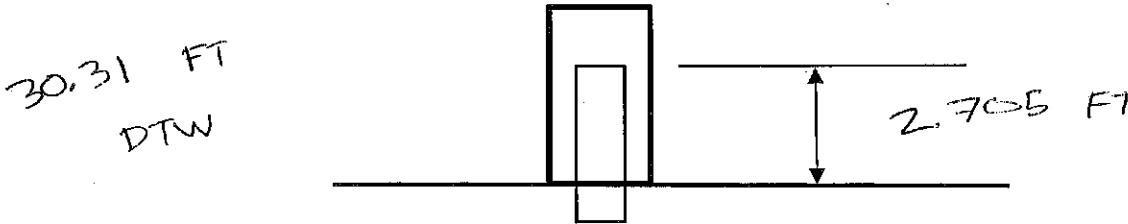
Well ID: MW 49 Inspector's name: J PARSON

Date: 8-28-21

Time: 1610 Inspector's signature: 

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.33 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 266

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 267
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition
3. Were there any issues in collecting samples?
No issues

Comments:

Monitoring Well Integrity Checklist

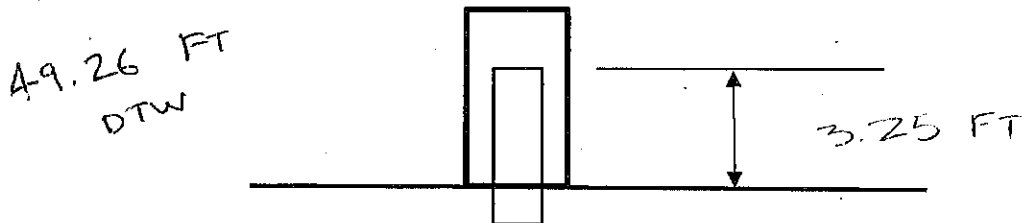
Well ID: NW50 Inspector's name: JUDD PARSON

Date: 8-28-21

Time: 1430 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.5 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 246

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 247
5. Transducer present? Condition? YES, GOOD. DOWNLOADED

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

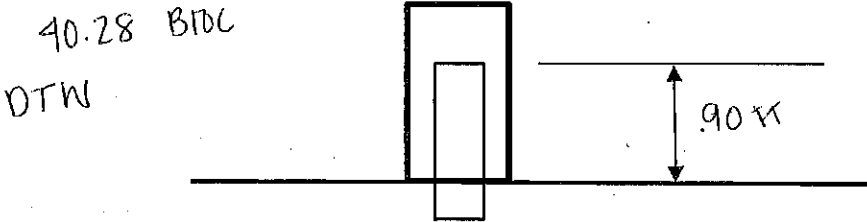
Comments:

Monitoring Well Integrity Checklist

Well ID: MW51 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1403 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? yes
2. Frost jacking measures: Stick up height from ground surface 3. 4.2 ft



3. Is the well lid/vault secure? yes
4. Is well clearly labeled? yes
5. Photographs of well closed 242

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 243
5. Transducer present? Condition? YES, excellent condition

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

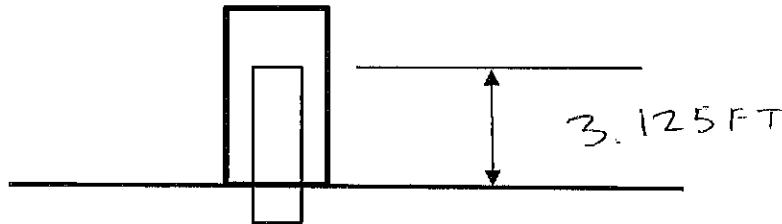
Monitoring Well Integrity Checklist

Well ID: MW 52 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1317 Inspector's signature: *J. Parson*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.41 FT

34.17 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 232

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 233
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes,
2. Dedicated pump present? Condition? Yes, pump is in good condition.
3. Were there any issues in collecting samples?
Yes, leaking couplings caused air into ~~to~~ leaks into water line.

Comments:

well will need new fittings on water return line and a new water return barb fitting assembly.

Monitoring Well Integrity Checklist

Well ID: MW53 Inspector's name: J PARSON

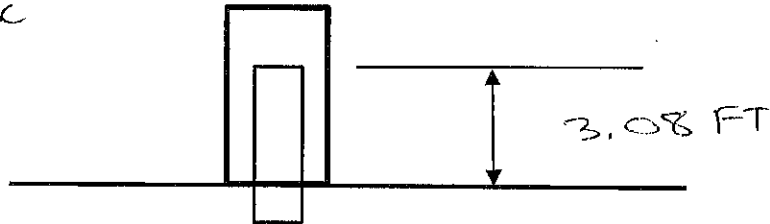
Date: 9-28-21

Time: 1456 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.50 FT

34.08 FT BTCL
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 250

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 251
5. Transducer present? Condition? YES, GOOD. DOWNLOADED.

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD.
3. Were there any issues in collecting samples?
NO!

Comments:

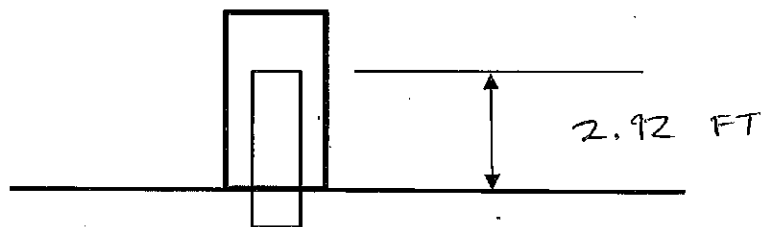
Monitoring Well Integrity Checklist

Well ID: MW 54 Inspector's name: JUDD PARSON
 Date: 8-28-21
 Time: 1417 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.5 FT

30.52 FT
PTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 244

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 245
5. Transducer present? Condition? YES, GOOD. DOWNLOADED

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

Monitoring Well Integrity Checklist

Well ID: MW55 Inspector's name: JUDD PARSON

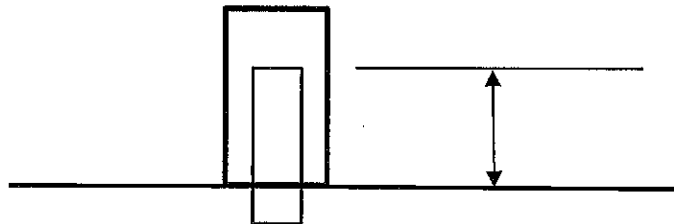
Date: 5-28-21

Time: 1310 Inspector's signature: *[Signature]*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.5 FT

14.08 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 230

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 231
5. Transducer present? Condition? NO

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? No.
3. Were there any issues in collecting samples?
No.

Comments:

Brown / orange film and debris prevalent during sampling and purging.

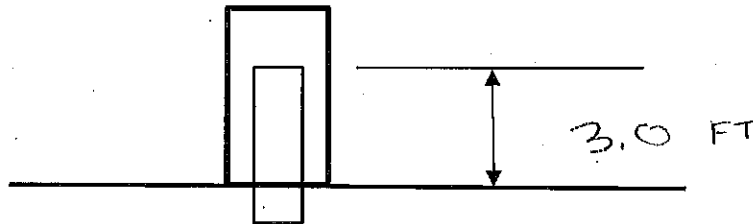
Monitoring Well Integrity Checklist

Well ID: MW 56 Inspector's name: JUDD PARSON
 Date: 9-28-21
 Time: 1346 Inspector's signature: *Judd Parson*

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.41 FT

*37.93 FT DTW
BTOC*



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 240

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 241
5. Transducer present? Condition? YES, GOOD. DOWNLOADED

During Groundwater Sampling

1. Is well operational? Yes
2. Dedicated pump present? Condition? Yes, good condition
3. Were there any issues in collecting samples?
No issues

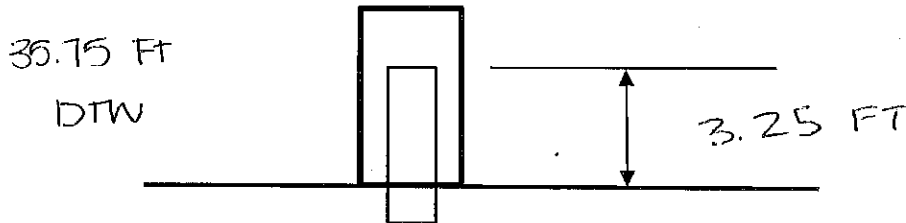
Comments:

Monitoring Well Integrity Checklist

Well ID: MW57 Inspector's name: J PARSON
 Date: 8-28-21
 Time: 1517 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.33 FT



3. Is the well lid/vault secure? YES
4. Is well clearly labeled? YES
5. Photographs of well closed 25A

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 255
5. Transducer present? Condition? yes / good

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

Monitoring Well Integrity Checklist

Well ID: MW58 Inspector's name: J PARSON

Date: 8-28-21

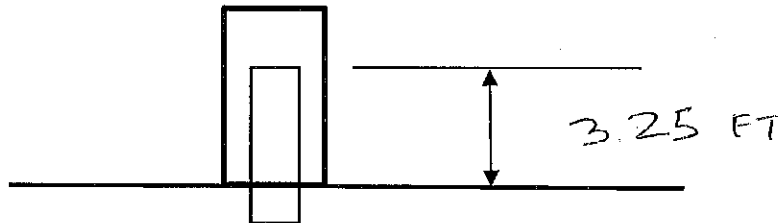
Time: 1443 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES

2. Frost jacking measures: Stick up height from ground surface 3.5 FT

31.76 FT
DTW



3. Is the well lid/vault secure? YES, NEW LOCK

4. Is well clearly labeled? YES

5. Photographs of well closed 248

After removing lid before sampling well

1. Is gasket worn or damaged? NO

2. Is vault flooded? NO

3. Any odors? NO

4. Photographs of well with lid off 249

5. Transducer present? Condition? YES, GOOD. DOWNLOADED

During Groundwater Sampling

1. Is well operational? YES

2. Dedicated pump present? Condition? YES, NEEDS NEW BLADDER

3. Were there any issues in collecting samples?

Comments:

BALL VALVE ON BOTTOM OF PUMP WAS CLOGGED, REPLACED
ALL TUBING AFTER FINDING MULTIPLE LEAKS IN TUBING AND
FITTINGS

Monitoring Well Integrity Checklist

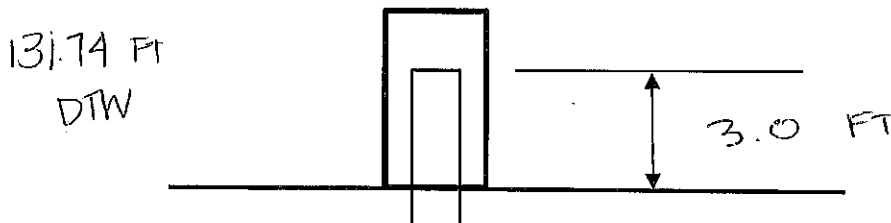
Well ID: MW59 Inspector's name: J PARSON

Date: 8-28-21

Time: 1528 Inspector's signature: [Signature]

Before Opening Monitoring Well

1. Is well cement pad or stickup in good condition? YES
2. Frost jacking measures: Stick up height from ground surface 3.25 FT



3. Is the well lid/vault secure? YES, NEW LOCK
4. Is well clearly labeled? YES
5. Photographs of well closed 258

After removing lid before sampling well

1. Is gasket worn or damaged? NO
2. Is vault flooded? NO
3. Any odors? NO
4. Photographs of well with lid off 259
5. Transducer present? Condition? YES

During Groundwater Sampling

1. Is well operational? YES
2. Dedicated pump present? Condition? YES, GOOD
3. Were there any issues in collecting samples?
NO

Comments:

NEEDS NEW AIR FITTINGS

ATTACHMENT 1.3 FIELD NOTEBOOKS

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CONTENTS

PAGE	REFERENCE	DATE

Location ANCHORAGE / RED DEVIL Date 6/21/2021
 Project / Client RED DEVIL MINE BLM

0630 DROPPED OFF RENTAL CAR AND CHECKED OUT OF HOTEL.

0715 AT ALASKA AIR TRANSIT TO WEIGH BAGGAGE AND PEOPLE

0800 BOARDED PLANE

0823 TOOK OFF FROM ANCHORAGE

0956 LANDED IN RED DEVIL ALASKA

1000 MET UP WITH DONNA VANDERPOOL AND RUBY TO UNLOAD GEAR AND BRIVE TO DEVIL ~~HOUSE~~ LODGE

1000-1400 SET UP FIELD OFFICE, ORGANIZE, CALIBRATION OF EQUIPMENT, WALK THROUGH OF ATUS w/ TRAILER, TWO GENERATORS, LODGE HAS WIFI, INTERNET, COOLER, FREEZER, WATER, LAUNDRY, ELECTRICITY, 3 SEPARATE BEDROOMS, 2 BATHROOMS
 1400 END OF MOB DAY

COL

Location: RED DEVIL Date: 6/3/2021
 Project / Client: SPRING MONITORING BLM

WEATHER: 39°/62° light wind, cloudy
 TEAM: COLLEEN RUST, GEORGE GARBER,
 JUDD PARSON

TASKS: RED DEVIL MINE SITE
 WALK TO ACCESS STREAM LOCATIONS,
 MONITORING WELL LOCATIONS, TRAIL/ROAD
 ACCESS, WILL FLAG LOCATIONS

0715 HEALTH & SAFETY MEETING TO
 DISCUSS DAY TASKS PRIMARILY
 WILDLIFE, ROAD/TRAIL ACCESS, MINE
 ADIT SAFETY, ATU SAFETY

0715-0745 PACK UP OF SUPPLIES

0800 LEFT FOR THE SITE ON
 ATUS

0815-1000 AT FIRST GATE, 2 SETS OF
 BLM KEYS DID NOT WORK ON THE
 CHAIN LINK FENCE AND YELLOW ROAD GATE
 → CONDUCTED SITE ORIENTATION AND
 WALKED TO ALL MONITORING WELL
 AND SURFACE WATER LOCATIONS

Location: RED DEVIL Date: 6/3
 Project / Client: SPRING MONITORING BLM

1000-1645 SITE WALK
 → NONE OF THE GATE OR MW
 LOCKS WORKED ON THE BLM KEYS
 → FRESH BEAR & WOLF TRACKS
 IN AREA
 → CREEK WAS FLOWING CLEAR
 → NO ACTIVE BEAVER SIGN
 IN LAKE UPSTREAM, LOOKED
 AT SAMPLING LOCATIONS BASED
 ON CURRENT STREAM CHANNELS
 → CLEARED TRAILS TO WELL SITES
 AND LOCATED WELLS BY TRACKS
 → VERIFIED LOCATIONS WITH
 TRIMBLE AND ADDED SURVEY AND
 MAJOR FEATURES TO INCLUDE
 TRAILS, ROADS, SURVEY MARKERS,
 STOCKPILES, CONCRETE FEATURES FOR
 UPDATED FIGURES

1645 LEFT SITE AND CLOSED GATES

CR

Location RED DEVIL Date 6/4/2021
 Project / Client SPRING MONITORING - BLM

WEATHER: 43°/64°, 30% RAIN CHANCE,
 MORNING FOG, LIGHT WINDS

TEAM: GEORGE GARNER, JUDG PARSON,
 COLLEEN RUST

TASKS: GROUNDWATER ELEVATION MEASUREMENTS
 OF THE ENTIRE SITE, DOWNLOAD
 TRANSDUCERS, WELL SURVEYS

0618 HEALTH + SAFETY MEETING,
 ATU USE, SLIPS, TRIPS, FALLS,
 WILDLIFE, BUDDY SYSTEM, ATU TRIGGER
 SYSTEM

0630-0730 MOB TO SITE, STARTING
 ON THE EAST SIDE WELLS

0745 → STARTED WELLS GW LEVELS

1215 → LUNCH BREAK

1245 → HEAD TO WELLS

1343-1420 → AT MW-56 to download
 transducer, program did not work will
 pull transducer to get ADMIN PERMISSION

1420 → HEAD TO MORE WELLS

1605 LEFT SITE FOR THE DAY

CR

Location RED DEVIL Date 6/4/2021
 Project / Client SPRING SAMPLING - BLM

PHOTO #	DIRECTION	DESCRIPTION
START AT 304 for notes will start at #1		
1 745	NA	MW-1 closed (304)
2 745 746	NA	MW-1 open
3 800	NA	MW-11 closed
4 801	NA	MW-11 open
5 804	EAST	MW-11 set up
6 809	EAST	MW-11 ZIP TIE/LABEL
7 810	NA	(310) MW-10 closed
311/813	NA	MW-10 open
312/816	NA	Bladder Pump
313/816	NA	Bladder Pump
314/817	NA	Bladder Pump
315/824	NA	MW-09 closed
316/824	NA	MW-09 open
317/836	NA	MW-34 closed
318/838	NA	MW-34 open
319/844	NA	MW-35 closed
320/844	NA	MW-35 open
321/850	NA	MW-36 closed
322/851	NA	MW-36 open, PROTECT SACKED
323/906	NA	MW-08 closed
324/907	NA	MW-08 open
325/916	NA	MW-7 closed
326/917	NA	MW-7 open

Rite in the Rain

Location RED DEVIL Date 6/14/2021
 Project / Client SPRING SAMPLING - BLM

TIME	PHOTO #/	DIRECTION	DESCRIPTION
	327 / 922	NA	MW-13 closed
	328 / 923	NA	MW-13 open
	329 / 929	NA	MW-12 open frost jacked
	330 / 929	NA	MW-12 open Frost jacked
	331 / 941	EAST	2 ATUs AND TRAILER set up
	332 / 942	N SOUTH	MW-17 closed
	333 / 943	NA	MW-17 open
	334 / 945	SOUTH	MW-16 closed
	335 / 945	NA	MW-16 open
	336 / 953	WEST	MW-03 closed
	337 / 953	NA	MW-03 open
	338 / 957	NA	MW-20 closed *check
	339 / 1000	NA	MW-20 open GPS POINT
	340 / 1010	NA	MW-21 closed & check
	341 / 1010	NA	MW-21 open GPS POINT
	342 / 1017	NA	MW-22 open
	343 / 1017	NA	MW-22 closed
	344 / 1022	NA	BIRD'S NEST
	345 / 1022	NA	" "
	346 / 1022	NA	" "
	347 / 1025	NA	MW-18 closed
	348 / 1025	NA	MW-18 open
	349 / 1034	NA	MW-19 closed
	350 / 1034	NA	MW-19 open

Location RED DEVIL Date 6/14/2021
 Project / Client SPRING SAMPLING - BLM

TIME	PHOTO #/	DIRECTION	DESCRIPTION
	351 / 1044	NA	MW-32 closed
	352 / 1044	NA	MW-32 open
	353 / 1110	NA	MW-42 closed
	354 / 1110	NA	MW-42 open
	355 / 1118	NA	MW-43 closed
	356 / 1118	NA	MW-43 open
	357 / 1122	NA	MW-43 ATU NEAR WELL
	358 / 1123	NA	" "
	359 / 1130	NA	MW-4 closed
	360 / 1132	NA	MW-4 open
	361 / 1136	NA	MW-28 closed
	362 / 1136	NA	MW-28 open
	363 / 1136	NA	MW-27 closed
	364 / 1136	NA	MW-27 open
	365 / 1141	NA	MW-26 closed
	366 / 1142	NA	MW-26 open
	367 / 1146	NA	MW-25 closed
	368 / 1147	NA	MW-25 open
	369 / 1154	NA	MW-24 closed
	370 / 1154	NA	MW-24 open
	371 / 1158	NA	MW-6 closed
	372 / 1158	NA	MW-6 open
	373 / 1202	NA	MW-23 closed
	374 / 1202	NA	MW-23 open

Location Red Devil Date 6/4/2021
 Project / Client SPRING SAMPLING - BLM

Photo# / TIME	DIRECTION	DESCRIPTION
375 / 1233	NA	BUTTERFLY
376 / 1233	NA	" "
377 / 1252	NA	MW-55 closed
378 / 1252	NA	MW-55 open
379 / 1310	NA	MW-52 closed
380 / 1310	NA	MW-52 open
381 / 1316	NA	MW-47 closed
382 / 1317	NA	MW-47 open
383 / 1330	NA	MW-46 closed
384 / 1330	NA	MW-46 open
385 / 1336	NA	MW-45 closed
386 / 1336	NA	MW-45 open
387 / 1343	NA	MW-56 closed
388 / 1343	NA	MW-56 open
389 / 1345	NA	MW-56 LEVELLOGGER
390 / 1346	NA	MW-56 LEVELLOGGER
391 / 1349	NA	MW-56 LEVELLOGGER
392 / 1431	NA	MW-40 closed
393 / 1431	NA	MW-40 open
394 / 1441	NA	MW-39 closed
395 / 1441	NA	MW-39 open
396 / 1442	NA	MW-59 closed
397 / 1442	NA	MW-59 open

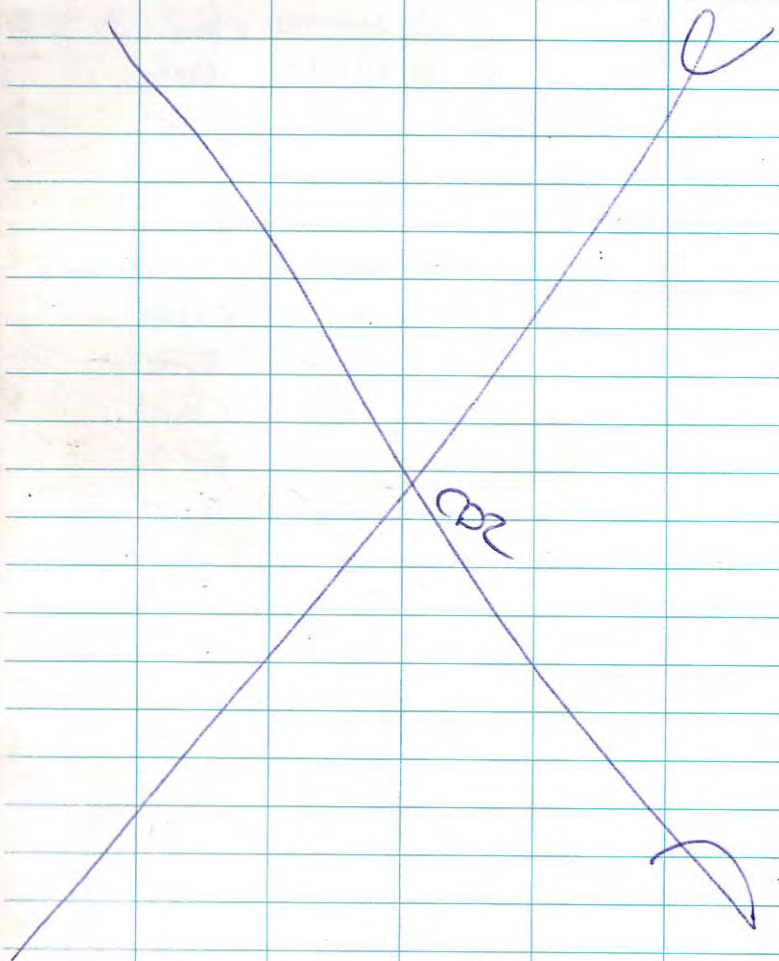
Location Red Devil Date 6/4/2021
 Project / Client SPRING SAMPLING - BLM

Photo# / TIME	DIRECTION	DESCRIPTION
398 / 1457	NA	MW-51 closed
399 / 1458	NA	MW-51 open
400 / 1508	NA	MW-54 closed
401 / 1509	NA	MW-54 open
402 / 1518	NA	MW-50 closed
403 / 1518	NA	MW-50 open
404 / 1526	NA	MW-58 closed
405 / 1526	NA	MW-58 open
406 / 1533	NA	MW-53 closed
407 / 1534	NA	MW-53 open
408 / 1547	NA	MW-31 closed
409 / 1547	NA	MW-31 open
410 / 1555	NA	MW-57 closed
411 / 1555	NA	MW-57 open
412 / 1605	NA	MW-44 closed
413 / 1605	NA	MW-44 open
414 / 1615	NA	MW-48 closed
415 / 1616	NA	MW-48 open
416 / 1625	NA	MW-29 closed
417 / 1625	NA	MW-29 open
418 / 1630	NA	MW-30 closed
419 / 1630	NA	MW-30 open
420 / 1639	NA	MW-49 closed
421 / 1639	NA	MW-49 open

Rite in the Rain

Location RED DEVIL Date 6/4/2021Project / Client SPRING SAMPLING - BLM

Photo # / TIME	DIRECTION	Description
422 / 1651	NA	MW-33 closed
423 / 1651	NA	MW-33 open

Location RED DEVIL Date 6/15/2021Project / Client SPRING MONITORING - BLM

WEATHER: 39°/56° cloudy
 TEAM: JUDG PARSON, GORGE GARNER,
 Colleen Rust

TASKS: SAMPLE MWs ON EASTERN SIDE
 OF RED DEVIL CREEK including
 MW09, MW10, MW16, + MW17.

629 HEALTH + SAFETY MEETING
 TO DISCUSS FIELD ACTIVITIES
 INCLUDING BURIED DEBRIS, PROPER
 TRAILER USE AND TIE DOWNS OF GEAR.

630 TROUBLE SHOOTING WATER LEVEL
 TRANSDUCER, WILL NEED ADMIN SUPPORT
 IN THE EVENING AFTER FIELD DAY

730 PACKUP OF ALL GEAR ON ATVs AND
 TRAILER

0800 CREATED 3 TRIP BLANKS TO GO
 WITH SAMPLES FOR THE DURATION OF TRIP

0621TB01 @ 6/15/21 @ 0800
 0621TB02 @ 6/15/21 @ 0800
 0621TB03 @ 6/15/21 @ 0800

Location RED DEVIL Date 6/5/21
 Project / Client SPRING MONITORING - BLM

830 HEAD TO SITE, SLOWLY W/ CAR
 900 ARRIVED AT SITE TO SET UP
 ON MW9 + MW10, bladder pumps

900-1100 Looked at MW09 + MW10
 TO DETERMINE PROCESS FOR BLADDER
 PUMPS, DETAILS BELOW

MW10 - EXTRA WATER VALVE WAS
 LEAKING PRESSURE, REMOVED TUBING
 AND REPLACED, KEPT HARDWEAR IN WELL
 PHOTOS: #430, 431, 432,

MW09 - AIR HOSE BEAT AT BLADDER
 PUMP UNBEAT ADDED ZIP TIES AND
 LOWERED BACK IN WELL TO SAMPLE
 PHOTOS: #428, 429

MONITORING WELLS COMPLETED

+ MW10 MS/MSD + SAMPLE
 + MW17 DUP + SAMPLE
 + MW16 SAMPLE
 + MW09 SAMPLE
 + MW26 SAMPLE
 + MW06 SAMPLE

Location RED DEVIL Date 6/5/2021
 Project / Client SPRING MONITORING - BLM

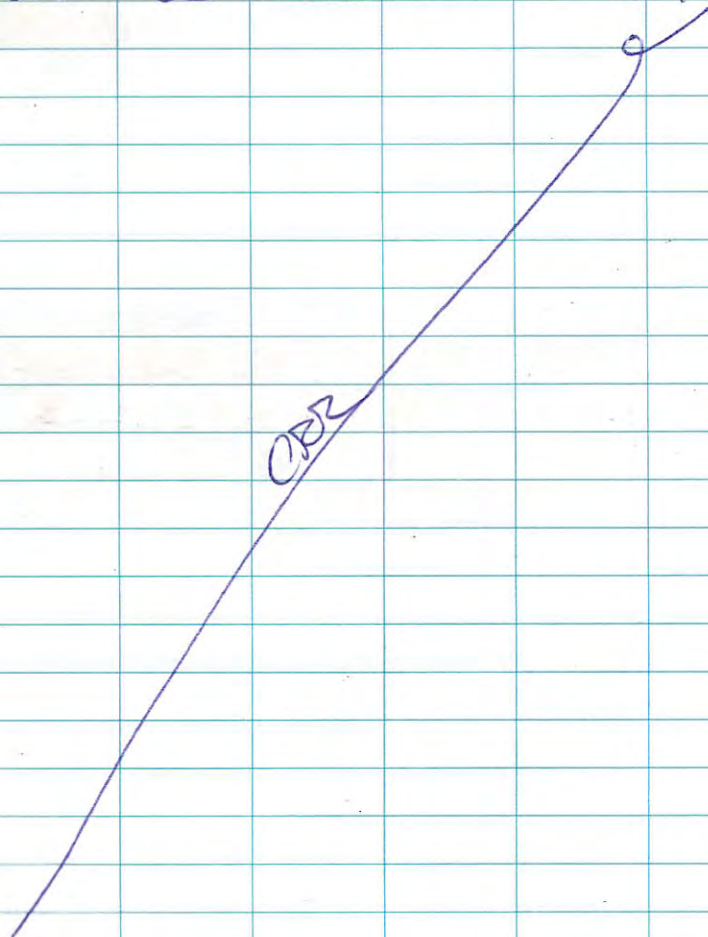
PHOTO# / TIME	DIRECTION	DESCRIPTION
424 745	SOUTH	RED DEVIL LODGE
425 746	NORTH	RED DEVIL LODGE
426 923	NA	MW-1 GEOTECH BLADDER PUMP
427 923	NA	MW-1 " "
428 923	NA	MW-09 Bent tube
429 1010	NA	MW-09 Bladder Pump
430 1016	NA	MW-10 LINE
431 1016	NA	MW-10 Fittings
432 1017	NA	MW-10 LEAKING VALVE
433 1423	WEST	MW-16 + MW-17
434 1423	WEST	" " RED CREEK
435 1755	NORTH	MW-06 SAMPLING
436 1755	NORTH	MW-06 " "

MW-06 REPLACED PERI TUBING
 MW-26 REPLACED DISCHARGE WATER TUBING
 TO BEAT UNUSABLE, ~1 foot FREE PRODUCT,
 SAMPLES BELOW AT LOW FLOW NOT TO MIX
 MW-17 USED ORIGINAL TUBING AND KEPT
 MW-16 REPLACED PERI TUBING
 * MW-6 + MW-16 HAD LARGE AMOUNTS
 OF ORANGE/BROWN ALGAE GROWING ON TUBING
 AFFECTED TURBIDITY MEASUREMENTS

Location RED DEVIL Date 6/15/2021
 Project / Client SPRING SAMPLING - BLM

1100-1810 SAMPLED 6 MONITORING
 WELLS

1815 LEFT SITE FOR THE DAY



Location RED DEVIL Date 6/16/2021
 Project / Client SPRING SAMPLING - BLM

WEATHER: 31°/60s clear sunny
 TEAM: GEORGE GARNER, JUDY PARKIN,
 COLLEEN RUST

TASKS: COLLECT SAMPLE WELLS
 MW42, MW43, MW27, MW28

0630 HEALTH & SAFETY MEETING
 DISCUSSED BATTERY USAGE, ATVs,
 WILDLIFE, POISONOUS PLANTS LIKE
 DEVIL'S CLUB

★ CALIBRATED EQUIPMENT IN THE EVENING
 OF 6/15/2021 AT THE LODGE, PACKED
 SAMPLES ON ICE IN THE FIELD AND
 AT THE LODGE WAITING TRANSPORT.

0630-0730 LOAD UP ATVs AND TRAILER
 WITH SUPPLIES AND GEAR

0740 HEAD TO SITE

0800 ARRIVE AT SITE

0810 ARRIVE AT MW-42^W BUDDER PUMP

0820 HOOKED UP TUBING FOR AIR ~~FOR~~ ^{FOR} WATER,
 NO PRESSURE OR WATER. POLLED PUMP
 AND FOUND WATER TUBE BENT AND

Location RED DEVIL Date 6/16/2021
 Project / Client SPRING SAMPLING - BLM

PHOTO # / TIME	DIRECTION	DESCRIPTION
437 845	NA MW-42	Bent WATER TUBE
438 845		Bladder Pump Geotech
439 849		REATTACHED TUBING ^{ADDED} 2 TIES
440 849		Geotech #10101
441 852		90° connection of water tube
442 852		Air Tube Splice
443 852		Water connection
444 853		MW-42 TOP GEAR
445 855	↓ ↓	MW-42 Location
446 1405	↓	MW-29 Bladder Pump cord and water tube
447 1405	↓	MW-29 missing AIR TUBE
448 1713	↓	TWO WATER LEVELS FOR 2 EQUIPMENT BANKS

(★)

WHEN PUMP WAS PULLED ALL CONNECTIONS WERE CHECKED WITH AT DEPTH PRESSURE AT GROUND LEVEL TO CHECK FOR LEAKS AND STRENGTH OF FITTINGS.

Location RED DEVIL Date 6/16/2021
 Project / Client SPRING SAMPLING - BLM

BLOCKING WATER FROM PASSING. COULD HEAR LEAKING AIR ON A SPLICE ON THE AIR TUBE, ATTEMPTED TO FIX AND LOWER PUMP BACK IN WELLS. PUT PRESSURE ON SYSTEM AND AIR TUBE CAME UNDONE. ATTEMPTED TO PULL PUMP ONCE MORE AND THE AIR TUBE GOT LODGED BETWEEN THE BLADDER PUMP AND WELL CASING. SPENT OVER ~~1~~ 2 HOURS TRYING TO PULL PUMP WITH NYLON LINE AND ATTACHED WATER TUBE. WAS UNABLE TO REMOVE LODGED PUMP AND TUBING. (★)

PHOTOS: 437 TO 445.

1000-1200 GEORGE + JUDY ATTEMPTED TO REMOVE PUMP
 1000 PULLED UP FROM MW-42 AND MOVED TO MW-28 TO SAMPLE
 1010-1300 PUMPED, TOOK PARAMETERS AND SAMPLED MW-28 W/ BLADDER PUMP.
 1300-1330 LUNCH BREAK
 1330-1410 SET UP ON MW-29 W/ BLADDER PUMP. FOUND NYLON STRING FOR BLADDER PUMP AND WATER TUBE. NO AIR TUBE PRESENT IN TOC.

Rite in the Rain

Location Red Devil Date 6/6/2021
 Project / Client Spring Sampling - BLM

ATTEMPTED TO PULL PUMP BUT THE PUMP AND LIKELY TUBING IS STUCK BETWEEN THE PUMP AND MONITORING WELL CASING. ATTEMPTED ~~TO~~ PLACE A BAIUER IN MONITORING WELL 29 BUT BAIUER GOT STUCK BEFORE IT GOT TO WATER. ONLY ~TOP 5 FEET FREE OF SPACE FOR STANDARD BAIUER.

TD (ft. bToc) \Rightarrow 71.52^{ft} From work plan
 TD (ft. bToc) Top of Pump \Rightarrow 62.71 ft
 DTW (ft. bToc) \Rightarrow 59.25

ATTEMPTED TO FISH OUT TUBING WITH LONG METAL WIRE WITH NO LOCK. TOO DEEP TO USE A PERI PUMP, COULD NOT SAMPLE.

1420 SET UP ON MW-49 W/ GEORGE.
 1430 MOVED OVER TO MW-56 W/ SUDD;
 HELPED SET UP TO TAKE PARAMETERS
 1600 FINISHED UP AT MW-56 REPLACED WATER LEVEL TRANSDUCER.
 1615 LEFT THE SITE FOR THE DAY
 1630 BACK AT LODGE TO DO

Location Red Devil Date 6/6/2021
 Project / Client Spring Sampling - BLM

EQUIPMENT BANKS (2)

#1 WATER LEVEL - DIPPER T2
 VIN # WLM0747

0621 EB 01 @ 1710

\rightarrow WASHED WITH ALCONOX SOAP AND RINSED WITH

#2 WATER LEVEL - SCHWIST
 VIN # 294991

0621 EB 02 @ 1715

1730 END OF DAY

OPR

RED DEVIL

6/17/21

SPRING SAMPLING - BLM

PHOTO #	TIME	DIRECTION	DESCRIPTION
449	911	West	Bladder Set upon MW-52
450	911	West	" "
451	912	West	Checking Flow Rate MW52
452	912	West	" "
453	1013 1013	NA	ATU SET UP BEFORE MESSING
454	1448	MW-58 NA	MW-58 BROKEN BLADDER PUP.
455	1448		" "
456	1449		" "
457	1449		Geotech Bladder #0062
458	1449		" "
459	1450		BLADDER PUMP FUD
460	1450		" "
461	1450		" "
462	1450	↓	" "

COP

RED DEVIL

6/17/2021

SPRING SAMPLING - BLM

WEATHER: 40s to 60s with ~10%
chance of rain, clear up in pm
TEAM: Colleen Rust, GEORGE GARNER,
JASON PARSON

TASKS: GW SAMPLES WELLS
MW55, MW52, MW47, MW46

0630 HEALTH + SAFETY MEETING
TO DISCUSS TASKS FOR THE DAY
TO INCLUDE GW SAMPLING AND
ATU + TRAILER USE.

0630-0730 PACK UP OF GEAR +
SUPPLIES

0730 LEFT FOR SITE

0745 ARRIVE AT SITE (A) NOTE
REPLACED GATE LOCKS WITH
MASTER LOCK COMMERCIAL GRADE
#2008 KEY ON CHAIN LINK
AND YELLOW ROAD GATE. ADDED
#2008 KEY TO BLM KEY SETS
WITH BLUE TAGS LABELED RED DEVIL

0800-0830 CALLED IN ON ALL COMMUNICATIONS
SAT PHONE, SPOT, ENRATCH, RADIOS FOR A

RED DEVIL

6/17/2021

SPRING SAMPLING - BLM

SAFETY CHECK. BETTER SAT COVERAGE
ON TOP OF HILL.

0845 SET UP ON MW-52 AND ~~MW-47~~
BLADDER PUMP WELLS

0845-0950 HELPED JUDD ON MW-52,
SAMPLED AND CLEANED UP

1000 HEADED TO GEORGE TO HELP
ON MW-47

1000-1020 SAMPLED MW-47 AND PACKED
UP TO HEAD BACK TO JUDD ON
MW-46

1020 AT MW-46 TO HELP JUDD
TAKE PARAMETERS AND SAMPLE

1020-1115 SAMPLED AND CLEANED UP
TO MOVE TO MW-44

1125 HEADED OVER TO GEORGE AT
MW-45 TO SAMPLE

1140 FINISHED UP ON MW-45

1145 HEADED OVER TO JUDD ON
MW-44 TO HELP

1300 FINISHING UP ON MW-44 w/ JUDD

1310 HEADING TO MW-53

1320 AT MW-53, GEORGE NEEDED
HELP PULLING THE PUMP FROM MW-53

RED DEVIL

6/17/2021

SPRING SAMPLING - BLM

1330-1350 HELPED PULL PUMP FROM
MW-58 AND DISMANTLE. APPARENTLY
THE BLADDER MEMBRANE IS FLATTENED
AND WILL NOT RECHARGE WITH
WATER WITH AIR PRESSURE. GEORGE
WILL USE A BAILER TO SAMPLE. CREW
WILL PURCHASE A NEW BLADDER FOR
FALL 2021.

1355-1510 MEASURED PARAMETERS
AND SAMPLED MW-53

1510 HEADED TO MW-50 TO SET UP

1530 SET UP ON MW-50 TO TAKE
PARAMETERS AND SAMPLE

1530-1650 MEASURED AND SAMPLED
MW-50

1720 MOVED TO MW-51 TO SET UP

1735-1900 MEASURED AND SAMPLED
MW-51

1915 PACKED UP FROM MW-51

1930 LEFT SITE FOR THE DAY

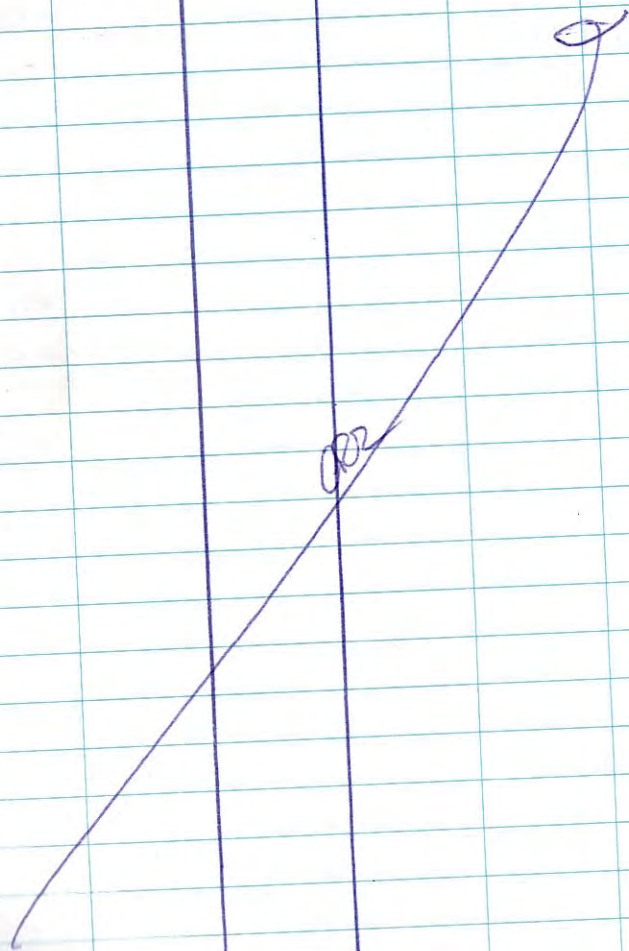
1945 BACK AT LODGE

2000 END OF DAY

CER

Location RED DEVIL Date 6/8/2021
 Project / Client SPRING SAMPLING - BLM

PHOTO #	TIME	DIRECTION	DESCRIPTION
463	1041	WEST	DOWNLOADING MW-39 TRANSDUCER
464	1314	NA	MW-59 Bladder Pump
465	1315	NA	MW-59 #0077 Bladder Pump



Location RED DEVIL Date 6/8/2021
 Project / Client SPRING SAMPLING - BLM

WEATHER: 45°/50° UP TO 70% CHANCE
 OF RAIN, CLOUDY
 TEAM: GEORGE GARNER, JOON PARSON,
 COLLEEN RUST
 TASKS: TO SAMPLE MW-55, MW-59,
 MW-40, MW-33, AND MW-57
 LAST MONITORING WELLS, 2 PERI, AND
 COLLECT DUP, MS/MSD

0730 HEALTH + SAFETY MEETING TO
 DISCUSS ACTIVITIES, ATV TRAVEL, WILDLIFE

0730-830 PACKED GEAR + SUPPLIES, AND
 CALIBRATED EQUIPMENT

830 LEFT LODGE FOR SITE

850 AT SITE, GEORGE TO SET UP
 ON MW-55, JOON AND COLLEEN SET UP
 ON MW-57 w/ BLADDER PUMP

930-1020 MEASURE AND SAMPLE MW-57

1025 JOON + COLLEEN TO SET UP ON
 MW-59

→ NO TRANSDUCER IN MW-59, WAS IN
 MW-39 ABOVE WATER MEASURING ATMOSPHERIC
 PRESSURE ONLY. REMOVED AND DOWNLOADED

Location RED DEVIL Date 6/18/2021
 Project / Client SPRING SAMPLING - BLM

→ TOOK TRANSDUCER FROM MW-39 TO REPROGRAM TO BE PLACED IN MW-59 BELOW WATER. DOWNLOADED MW-39 DATA AND DELETED DATA TO SET UP AS MW-59.

→ MW-59 WATER TUBING WAS BENT, POURED PUMP AND TROUBLE SHOOT AND FIXED w/ ZIP TIES, WATER TUBE IS ~6 INCHES TOO LONG. TOOK AWHILE TO CHARGE LINE TO START TAKING MEASUREMENTS.

1030-1230 TROUBLE SHOOTING

1230-1330 LUNCH

1330-1530 MEASURING AND SAMPLING MW-59

1530 MOVED OVER TO HELP FINISH SAMPLING ON MW-40.

1640 FINISHED UP ON MW-40.
 1700 PACK UP SUPPLIES AND HEADED TO LODGE.

1730 RETURNS TO LODGE, END OF DAY

CBZ

Location RED DEVIL Date 6/19/2021
 Project / Client SPRING SAMPLING - BLM

WEATHER: 45/50° RAINY

TEAM: Colleen Rust, GEORGE GARBER, JUDY PARSON

TASKS: STREAM GAUGING AND PARAMETERS

0730 HEALTH + SAFETY MEETING
 CHANGE IN ACTIVITIES

0730-0830 SET UP FOR STREAM GAUGING AND ORGANIZATION OF PAPERWORK

0900 LEFT THE LODGE

0930 ARRIVED AT SITE TO A STREAM MEASUREMENTS STARTING AT THE CONFLUENCE OF RED DEVIL CREEK AND THE KUSKUMIN RIVER AND MOVING UP STREAM

1000 SW08 STREAM GAUGING

1100 SW06 STREAM GAUGING

1120 SW15 SOOP MEASUREMENTS 1/2" BAND

~~1120~~ SW05 STREAM GAUGING, LOCATION

1130 MARKED WITH A STAKE

1150 SW10 STREAM GAUGING

1200 WALKED AROUND STOCKPILES

Location RED DEVIL Date 6/19/2021
 Project / Client SPRING SAMPLING - BLM

PHOTO #	TIME	DIRECTION	DESCRIPTION
466	951	N	SW08 at confluence
467	952	E ^{Flow}	of RD Creek and
468	953	E ^{Flow}	KUSKUMIN RIVER
469	1101	S	SW06 stream
470	1101	S	gaging in RD
471	1102	S	Creek
472	1120	NA	SEEP Measurement
473	1120	NA	1 L for Second
474	1123	NA	SW15 (seep) ^{Creek}
475	1123	S ^{Flow}	Seep on right side bank of RD
476	1127		SW15 Depth Measurements
477	1131		DEPTH MEASUREMENTS
478	1131		Lucky up stream
479	1132		Flow measurements
480	1133		SW15 Flow
481	1149		old Beaver Dam
482	1149		" "
483	1149		SW10 near old dam
484	1150		SW10 measurements
485	1152		SW10 Flow measurements
486	1152		SW10 Flow measurements
487	1155		SW10 " "
488	1155		SW10 " "

Location RED DEVIL Date 6/19/2021
 Project / Client SPRING SAMPLING - BLM

PHOTO #	TIME	DIRECTION	DESCRIPTION
489	1205	NORTH	STOCK PILES
490	1206	N	" "
491	1206	N	MINOR EROSION
492	1207	WEST	EROSION TUNED CREEK
493	1207	N	Stock Piles
494	1207	N	" "
495	1230	NA	LUNCH BREAK

Location RED DEVIL Date 6/9/2021
 Project / Client SPRING SAMPLING - BLM

1230-1300 LUNCH BREAK NEAR RIVER
 1315 GPS TRACKED TRAILS AND
 ROADS FOR FIGURES, WILL DROP
 TRANSDUCER IN MW-59.

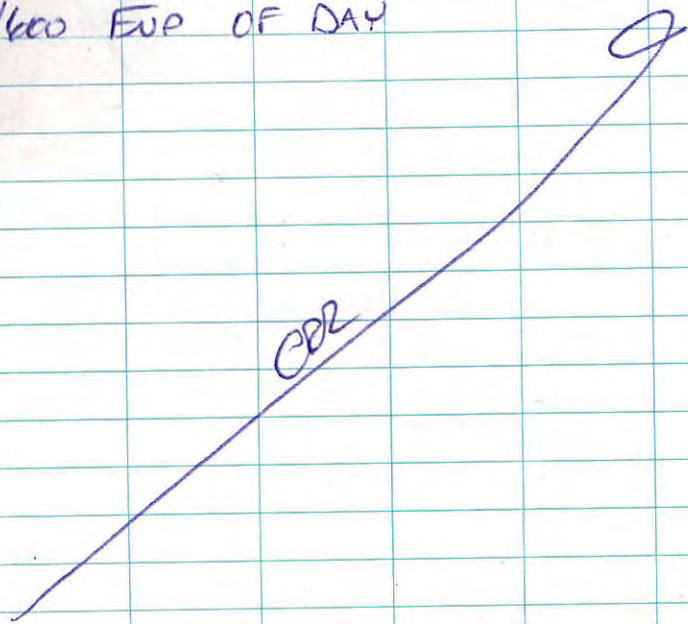
1430 FINISHED UP TRACKING ROADS

1445 LEFT SITE

1500 BACK AT LODGE.

1500-1600 CREATED COL, EDITED
 IN STREAM GAUGING DATA,
 DOWNLOADED PICTURES, CALIBRATED
 YSI_s FOR STREAM SAMPLES TOMORROW.

1600 END OF DAY



Location RED DEVIL Date 6/10/2021
 Project / Client SPRING SAMPLING - BLM

WEATHER: 45/50° RAINY CLOUDY
 TEAM: COLLEEN RUST, GEORGE GARNER,
 JUDD PARSON
 TASKS: SURFACE WATER SAMPLING

0630 HEALTH + SAFETY MEETING,
 CHANGE IN ACTIVITY SURFACE WATER
 SAMPLING AND LAST DAY OF FIELDWORK.

0630-0800 PACK UP OF GEAR AND
 SUPPLIES

0815 LEAVE LODGE FOR SITE

0830 AT SITE SETTING UP
 ON SW08 AT THE CONfluence OF
 RED DEVIL CREEK AND THE KUSKAWUM
 RIVER

0845 SAMPLED SW08

0930 PACKING UP TO HEAD TO SW06

0945 SAMPLED SW06

1000 SAMPLED SW15 (see p)

1015 SAMPLED SW05

1030 SAMPLED SW10

1050-1115 PACK UP ALL REMAINING
 GEAR ON SITE

1130 LEAVE SITE FOR LODGE

Location RED DEVIL Date 6/10/2021
 Project / Client SPRING SAMPLING - BLM

PHOTO #	TIME	DIRECTION	DESCRIPTION
158	743		SW08 Looking up River
159	744		" "
160	812		" "
161	812		" "
162	844		SW06 Looking up creek
163	844		" "
164	906		SW15 seep
165	907		" "
166	913		SW05
167	913		" "

* NOT NEW CAMERA AND TIMES ARE OFF
 1 HOUR SHOULD START AT #158 @ 843

168	935		SW10 upstream
169	935		" "
170	935		MOSQUITOS
171	936		SW10 Bottle fill
172	936		SW10 Creek input

CEL

Location RED DEVIL Date 6/10/2021
 Project / Client SPRING SAMPLING - BLM

1200-1230 LUNCH AT LODGE
 1230-1330 SAMPLE CHECK AND COC
 1350 GOT A CALL FROM ALASKA
 TRANSIT FOR AN EARLY PICK UP
 DUE TO WEATHER ROLLING IN,
 SCHEDULED A PICK UP AT 1630.
 1350-1630 PACKED UP LODGE, GEAR,
 SUPPLIES AND HEADED TO AIRSTRIP
 1700 ALASKA AIR TRANSIT ONSITE
 1700-1930 FLIGHT TO ANCHORAGE
 1930-2030 DROPPED OFF SAMPLES
 AND GEAR AT WAREHOUSE, WILL
 SHIP TOMORROW
 2030 END OF DAY

CEL

Location RED DEVIL Date 6/11/2021
 Project / Client SPRING SAMPLING - BUM

WEATHER: 65° SUNNY

TEAM: GERGE GARNER, JOJO PARSIN,
 COLUEN RUST

TASKS: SAMPLE COL, SHIPPING,
 CLEAN UP

800 MET AT WAREHOUSE

800 HEALTH & SAFETY Meeting

800-1330 CLEAN UP, SAMPLE

COL AND PACKING ON ICE

1345 DROP OFF OF SAMPLES AT
 FEDEX FOR SATURDAY DELIVERY

1400 END OF DAY

OPZ

Location _____ Date _____

Project / Client _____



Location Red Devil, AK

Date 02 June 2021³

Project / Client Red Devil - BLM

- 0800 Leave ANC via charter flight from Alaska Air Transit.
- 1000 Arrive at Red Devil. Unload equipment and go to Vanderpool Lodge.
- 1300 Calibrate and prep equipment for use.
- 1500 Complete field prep and ATV prep.

[A large diagonal line is drawn across the grid, with a signature and date written over it.]
Hy
02 June 2021

Location Red Devil AK Date 03 June 2021Project / Client BLM

- 0715 Safety brief
 0800 Proceed to site for site walk / orientation.
 1000 BLM provided keys do not work on any locks found. Proceed on site walk to locate and flag all wells.
 1645 Complete site walk and proceed back to townsite.
 1700 Arrive back in town, complete work for the day.

high
 3 June 2021

Location Red Devil AK Date 4 June 2021Project / Client BLM

- 0620 Conduct Safety brief. Prep for field work. Will collect all water levels and well inspections. Will attempt to collect all transducer data.
 0705 Leave for Mine to collect water level data.
 0725 Arrive at mine to begin field work.
 0742 Check MW-1. Water level at 25.97 ft below TOC. Casing 2.5" below outer casing. Outer casing 39.5". 37" stick up.
 0755 Check MW-11. Water level = 21.86' BTOC. Well in good conditions.
 0808 Check MW-10. Well last jacked. Outer casing and concrete pad raised several inches. Bladder pump present. Depth to water = 54.61' BTOC (top of pump)
 0820 Check MW-09. Bladder pump installed. Depth to water = 25.43 ft BTOC. Top of pump = 32.07 ft BTOC
 0835 Check MW-34. Depth to water: 58.13 ft BTOC

Location Red Devil AK Date 4 June 2001Project / Client BLM / Red Devil Monitoring
40s Fog

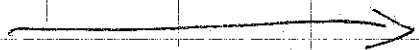
0842	Check MW35.		
	Water depth: 35.42	ft	BTOC.
0849	Check MW36. Well first jacked		
	Water depth: 15.74	ft	BTOC
0904	Check MW08.		
	Water depth: 15.59	ft	BTOC.
0915	Check MW07.		
	Water depth: 20.35	ft	BTOC.
0920	Check MW13.		
	Water depth: 28.50	ft	BTOC.
0925	Check MW12: Well broken. Casing first jacked out of outer casing, PVC collapsed due to suction.		
0940	Check MW17. Concrete case jacked up ~4" Water depth: 13.07	ft	BTOC
0945	Check MW16.		
	Water depth: 11.90	ft	BTOC.
0950	Check MW03.		
	Water depth: 18.84	ft	BTOC
0958	Check MW20		
	Water depth: 7.01	ft	BTOC
1008	Check MW21.		
	Water depth: 8.48	ft	BTOC.
	→		

Location Red Devil AK Date 4 June 2001⁷Project / Client BLM Red Devil Monitoring
40s Fog

1013	Check MW20.		
	Depth to water: 8.55	ft	BTOC
1023	Check MW18.		
	Depth to water: 27.55	ft	BTOC.
1032	Check MW19.		
	Depth to water: 17.30	ft	BTOC.
1041	Check MW32.		
	Depth to water: 18.51	ft	BTOC.
1108	Check MW42.		
	Depth to water: 127.20	ft	BTOC
1118	Check MW43.		
	Depth to water: 88.62	ft	BTOC
1129	Check MW04.		
	Depth to water: 26.03	ft	BTOC
1133	Check MW28:		
	Depth to water: 27.95	ft	BTOC
1140	Check MW27:		
	Depth to water: 29.48	ft	BTOC
1143	Check MW26:		
	Depth to water: 34.35	ft	BTOC
1147	Check MW25:		
	Depth to water: 31.66	ft	BTOC.
1156	Check MW24:		
	Depth to water: 16.16	ft	BTOC

Location Red Devil AK Date 4 June 2021Project / Client BLM / Red Devil Monitoring
50% Partly Cloudy

1158	Check MW06, Depth to water: 17.38 ft. BTOC
1203	Check MW23, Depth to water: 15.49 ft. BTOC
1300	Check MW55, Depth to water: 12.80 ft. BTOC
1308	Check MW52, Depth to water: 38.66 ft. BTOC
1314	Check MW47, Depth to water: 36.62 ft. BTOC
1327	Check MW46, Depth to water: 33.58 ft. BTOC
1335	Check MW45, Depth to water: 43.91 ft. BTOC
1343	Check MW56, Depth to water: 34.80 ft. BTOC Transducer Livelogger 3001 FGS/MDS
1420	Troubleshooting transducer download, Issues communicating with datalogger. Removed datalogger to attempt trouble shooting with internet.
1429	Check MW40, Depth to water: 127.99 ft. BTOC

Location Red Devil AK Date 4 June 2021Project / Client BLM / Red Devil Monitoring
50% Partly Cloudy

1440	Check MW39, Depth to water: 84.81 ft. BTOC
1446	Check MW59, Depth to water: 132.66 ft. BTOC
1455	Check MW51, Depth to water: 38.45 ft. BTOC
1505	Check MW54, Depth to water: 29.43 ft. BTOC
1515	Check MW50, Depth to water: 47.31 ft. BTOC
1525	Check MW58, Depth to water: 30.48 ft. BTOC
1535	Check MW53, Depth to water: 30.43 ft. BTOC
1545	Check MW31, Depth to water: 38.56 ft. BTOC
1553	Check MW57, Depth to water: 32.22 ft. BTOC
1602	Check MW44, Depth to water: 33.80 ft. BTOC
1613	Check MW48, Depth to water: 19.51 ft. BTOC
1622	Check MW29, Depth to water: 58.50 ft. BTOC

Location Red Devil AK Date 4 June 2021Project / Client BLM / Red Devil Monitoring50s Cloudy / Light Rain

1630 Check MW30.
Depth to water: 53.66 # BTOC

1636 Check MW49.
Depth to water: 29.72 # BTOC

1649 Check MW33.
Depth to water: 6.13 # BTOC.

1655 Complete water level measurements.
Return to townsite.

[Handwritten signature]
4 June 2021

Location Red Devil AK Date 5 June 2021Project / Client BLM / Red Devil Monitoring

0630 Conduct safety brief.

0645 Continue troubleshooting Levellogger software for data download.

0700 Continue packing equipment on ATV trailer.

0800 Collect trip blanks to accompany samples.
Sample ID: 0621TB01, 0621TB02, and 0621TB03 at 0800.

0825 Leave for site.

0855 Arrive at site to begin sampling.

0900 Setup on MW09 and MW10.
MW10 has a leaky valve/tube splitter that is preventing sampling and purging. Replaced tubing and we were able to make it functional.

MW09 setup and purged. Will draw down at 0.4 l/min to unsampleable levels, paused purging to allow for recharge and sampling at a later time.

1000 Sample collected at MW10 →

Location Red Devil AK Date 5 June 21Project / Client BLM / Red Devil Monitoring

- 1230 Move to MW17 and MW16 site for Peristaltic pump sampling.
- 1510 Complete sampling at MW16 and MW17 area. Return to MW09 area to sample ~~area~~ (Collect). Judd is sampling / purging at MW26.
- 1625 Complete sampling at MW09 and MW26. Set up on MW6 to sample with a peristaltic pump.
- 1658 Begin purging MW6.
- 1800 Collect sample @ MW6.
Sample ID: 0621 MW06GW
- 1815 Pack up and leave site for the day.

by h
05 June 2021

Location Red Devil AK Date 6 June 21Project / Client BLM Red Devil30s Clear sunny

- 0630 Safety brief.
- 0700 Load ATVs
- 0740 Leave for Mine.
- 0800 Arrive at Mine. Set up on MW-27 and MW-28 area with one team. Team 2 moves to set up on MW 4 and MW 4
- 0818 Begin purging MW 27.
- 0900 Complete purging. Sample MW27 and collect duplicate. (
- | | |
|------------------------|------|
| Sample ID: 0621 MW27GW | 0905 |
| Dup: 0621 MW98GW | 0900 |
- 0940 Go to assist other team with wedged tubing at MW42.
- 1000 Attempt to dislodge pump wedged in MW42 after air line blowout fitting.
- 1200 Unable to dislodge pump. Move to MW43.
- 1315 Move to MW29 to attempt sampling. Judd continues on MW43.
- 1330 MW29 has only one tube to bladder pump. Air line is not visible but pump is wedged in well. Top of pump is roughly even with →

14 ~~0~~ Location Red Devil AK Date 6/6/21

Project / Client BLM / Red Devil AK Monitoring
65 Sunny light wind.

1330 Cont'd
The top of the well screen. Possibly broken at the top of well screen and wedged pump.

1400 Attempted to sample with a bailer at MW 29. Bailer will not reach water due to existing pump hose stuck in the well.

1425 Move to MW 49 to attempt sampling.

1440 Begin pumping MW 49. 10 sec recharge, 5 sec discharge @ 30 psi is making 0.125 L/min with near zero drawdown.

1445 Other team moves to MW 56 to return transducer and sample.

1500 Continue purging MW 49. Water quality parameters are stabilizing.

1525 Collect sample 0621 MW 49 GW at 1525.

1545 Complete sampling at MW 49.

1615 Leave site for the day.

~~6/6/21~~
2021

Location Red Devil, AK Date 6/7/2021 15

Project / Client BLM / Red Devil AK Monitoring

0630 Safety Brief

0700 Pack equipment and load ATVs.

0730 Leave for mine site.

0755 Arrive at mine site.

0815 Move to upper well locations. Set up on MW 52 and MW 47.

0912 Begin purging @ MW 47

0930 Issues with air in water return line. Possible crack or hole in bladder. Pump is making/pumping good volume. Dissolved O₂ will be questionable for this well.

0956 All parameters stabilized.

1000 Collect GW sample 0621 MW 47 GW (1000) and duplicate 0621 MW 47 GW (1010).

1020 Complete sampling at MW 47. Move to next well.

1035 Set up on MW 45.

1135 Collect sample @ 1135 from MW 45. 0621 MW 45 GW. Questionable DO reading due to air in return line.

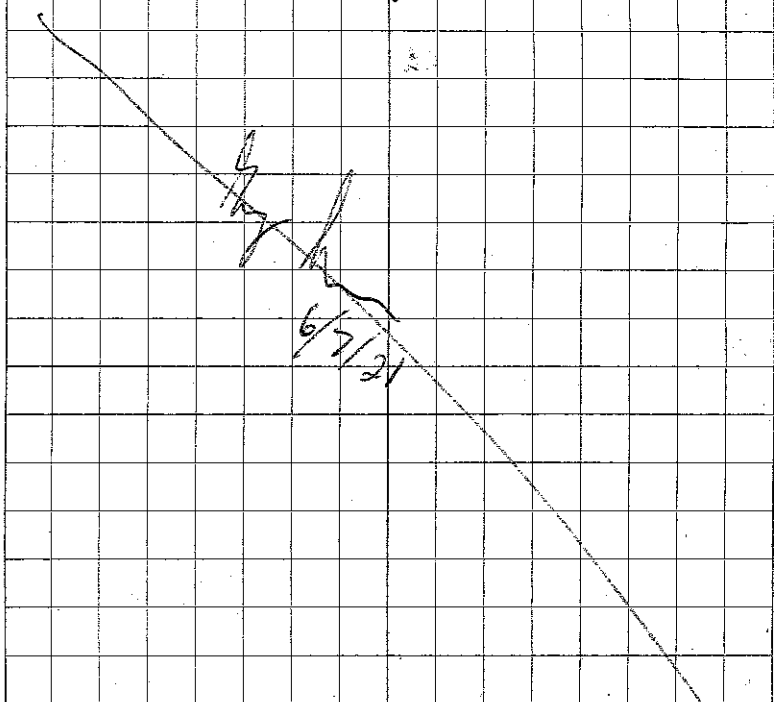
1215 Move and set up on MW 58.

Location Red Devil AK Date 6/7/21Project / Client Red Devil Monitoring / BLM
50s Cloudy

- 1228 Begin purging MW58 with bladder pump.
- 1235 Very little water being produced despite air pressure in line. Pull pump to check tubing is in good condition.
- 1245 Tubing is in good condition with no visible kinks. Retry pumping.
- 1300 Still no water return. Pull pump to examine pump internals.
- 1330 Pump bladder has creased and folds up within the pump housing. Bladder is unable to reinflate with the current water pressure downhole. We will replace the bladder during Fall sampling.
- 1400 We will attempt to sample with a bailer.
- 1700 Sample collected at MW58. 100 L removed (6 well volumes).
- 1725 Move to next well location.
- 1735 Set up on MW54.
- 1745 Begin purging MW 54.

Location Red Devil AK Date 6/7/21Project / Client Red Devil Monitoring / BLM
50s Rainy

- 1800 Continue purging. Abundant red-orange algae in water.
- 1845 Collect sample @ MW54.
0621 MW54GW.
- 1905 Complete sampling.
- 1915 Move downhill to gear storage location.
- 1930 Leave site.
- 2000 Arrive at lodge.



Location Red Devil AK Date 6/8/21Project / Client Red Devil Monitoring / BLM40s Cloudy

- 0700 Conduct safety brief. Calibrate all equipment.
- 0830 Leave for Mine site.
- 0900 Arrive at Mine Pack equipment.
- 0915 Move to MW55 for sampling.
- 0930 Set up on well, MW55.
- 0945 Peristaltic Pump is not functioning. Return to equipment area to change pumps.
- 1015 Begin purging with new pump.
- 1120 Collect sample 0621 MW55GW and MS/MSD volume.
- 1155 Complete sampling at MW55.
- 1230 Move to MW33 for sampling.
- 1420 Complete sampling at MW33. 0621 MW33GW collected @ 1403.
- 1500 Set up on MW40.
- 1625 Collect sample at MW40. 0621 MW40GW @ 1625.
- 1640 Complete sampling at MW40.
- 1700 Pack equipment for return to lodge.
- 1730 Return to lodge.

~~MS to~~ 6/8/21

Location Red Devil AK Date 6/8/21Project / Client Red Devil Monitoring / BLM40s Rain

- 0730 Safety brief.
- 0800 Calibrated equipment.
- 0900 Leave for Mine site.
- 0930 Arrive at Mine.
- 0935 Begin stream flow measurements. See page 100 for measurements.
- 1200 Complete stream flow measurements. Take GPS tracks of all trails. Return transducer to MW59.
- 1445 Leave site for the day.

[Signature]
6/10/2021

Location Red Devil AK Date 6/10/21Project / Client Red Devil Monitoring / BLM50 cloudy

- 0630 Safety brief. Prep bottles for sampling.
- 0759 Leave for site.
- 0833 Arrive on site. Will start at River and work upstream for sampling.
- 0930 Complete sampling at SW08
- 0935 Move to sample at SW06.
- 1050 Complete all surface water sampling.
- 1130 Return to lodge for sample prep.
- 1200 Arrive at lodge.
- 1230 Receive notice that the charter flight needs to pick us up early, ETA 3 pm.
- 1500 Leave Red Devil via charter flight.

[Signature]
6/10/21

Location Red Devil

Date 08/28/2021

Project / Client BLM Red Devil

- 0745 Conduct Safety Brief. Discuss wildlife, brush clearing and ATV use.
- 0800 Pack atv for trip to mine.
- 0815 Leave for mine
- 0900 Arrive at mine site to begin water level survey. Park at covered tailing/waste rock area. Note some ropes on larger covered stockpile have been cut and sand bags moved.
- 0905 Begin GW Depth Survey. Set up 128 for survey measurements.
- 1700 Complete GW Survey.
- 1705 Leave site.

~~by h~~

45° Rain

0730	safety brief. Pack equipment for field.
0810	Leave for mine.
0840	Arrive at mine to begin setup.
0900	Set up on MW10. for one team.
0920	Set up on MW16.
1045	Collect sample at MW16. ID # 0821 MW16GW.
1100	Set up on MW17.
1215	Collect sample at MW17. ID # 0821 MW17GW
1315	Set up on MW33.
1410	collected sample at MW33. ID # 0821 MW33GW and duplicate ID # 0821 MW99GW @ 1415.
1445	Complete MW33 sampling and move to MW06.
1500	Begin set up on MW06.
1515	Begin purging MW06.
1555	Collect sample at MW06. ID # 0821 MW06GW.
1620	Move to MW28 to assist team.
1700	Move all thread and connectors to MW42 location.

Location Red Devil

Date 8/29/2021

Project / Client BLM Red Devil Mine Monitoring

55 Cloudy

1730 Move back to MW 28 area to assist with loadout upon sample completion.

1748 Return to town.

1815 Complete field work for the day.

[Handwritten signature]

~~8/29/2021~~

Location Red DevilDate 8/30/2021Project / Client BLM Red Devil Mine

48° Cloudy GB, JP, RW

- | | |
|------|--|
| 0730 | Safety brief and go over plans for the day, prep field equipment for sampling. |
| 0800 | Begin loadout of field equipment. |
| 0820 | Leave for mine site |
| 0840 | Arrive at mine. Set up on MW26 and MW27. |
| 0915 | Begin purging MW27. |
| 1010 | Collect sample at MW27, Optimum flow @ 12 seconds recharge, 3 sec discharge, 4 cpm @ ~22 psi. made 0.125 L/min, Sample ID# 0821 MW27GW and Duplicate ID# 0821 MW98GW @ 1020 Extra volume collected at this location. |
| 1045 | Complete sampling at MW27. Pack up and move to MW43. |
| 1120 | Begin set up on MW43. |
| 1145 | Begin purging MW43, Judd + George move to MW42 to try pump retrieval with all-thread, hook, and couplers. |
| 1330 | Well retrieval successful. Pump removed and tubing replaced. Set at 134 ft btoe. |

Location Red Devil

Date 8/30/2021 ²⁷

Project / Client BLM Red Devil Mine

59° Cloudy

- 1340 Begin setup for sampling at MW42.
- 1350 Begin purging MW42. Sudd and
- 1420 George move to MW29 to attempt pump retrieval.
- 1500 Pump retrieval successful using all-thread and hook. Pump removed and tubing and rope replaced.
- 1535 Pump set at 66 ft. Total well depth at 71.1 ft btoe. Water at MW29 was at 61.40 ft btoe.
- 1600 Complete well repair at MW29. Move back to MW42.
- 1630 Unable to get turbidity below 70 ntu. Collect sample ~~0821~~⁰⁸²¹ MW42 @ W. All other parameters are stable.
- 1710 Complete sampling of MW42.
- 1715 Return to cabin.
- 1745 Return to cabin and unpack gear.
- 1815 Collected equipment blanks.
- 1815 0821 EBO1 - Small Bladder Pump SN 092
- 1820 0821 EBO2 - Solinst 102 WLM
- 1825 0821 EBO3 - Solinst 101 WLM (Rental)
- 1835 Complete field work for the day

Rite in the Rain


Location Red DevilDate 8/31/2021Project / Client Red Devil Mine - BLM48° cloudy JP, GG, RW

0730	Safety brief.
0755	Pack up trailer and ATVs
0830	Arrive at Mine.
0845	Begin set up on MW55. Other teams at MW51.
0925	Begin purge MW55 after replacing tubing. TD = 23.93 ft and water at 14.19. Tubing set at 19 ft btoe and marked tube with orange tape (toe).
1020	Collect sample and NS/MSD volume at MW55. Turbidity would not get below ~15. Fe-oxides/hydroxides precipitating out in flow cell.
1110	Complete sampling at MW55. Move locations.
1130	Set up on MW52.
1140	Issue with water line connectors letting air in. Causing backflow. Will attempt to fix connector.
1155	Unable to fix connector. Water line pulled loose from pump.
1205	Repaired water line. Will need new male coupler in 1/4" for pump. Current male coupler on water line is 3/8" or 1/2".

Location Red Devil Date 8/31/2021 29

Project / Client Red Devil Mine BEM

55° Muggy, buggy,

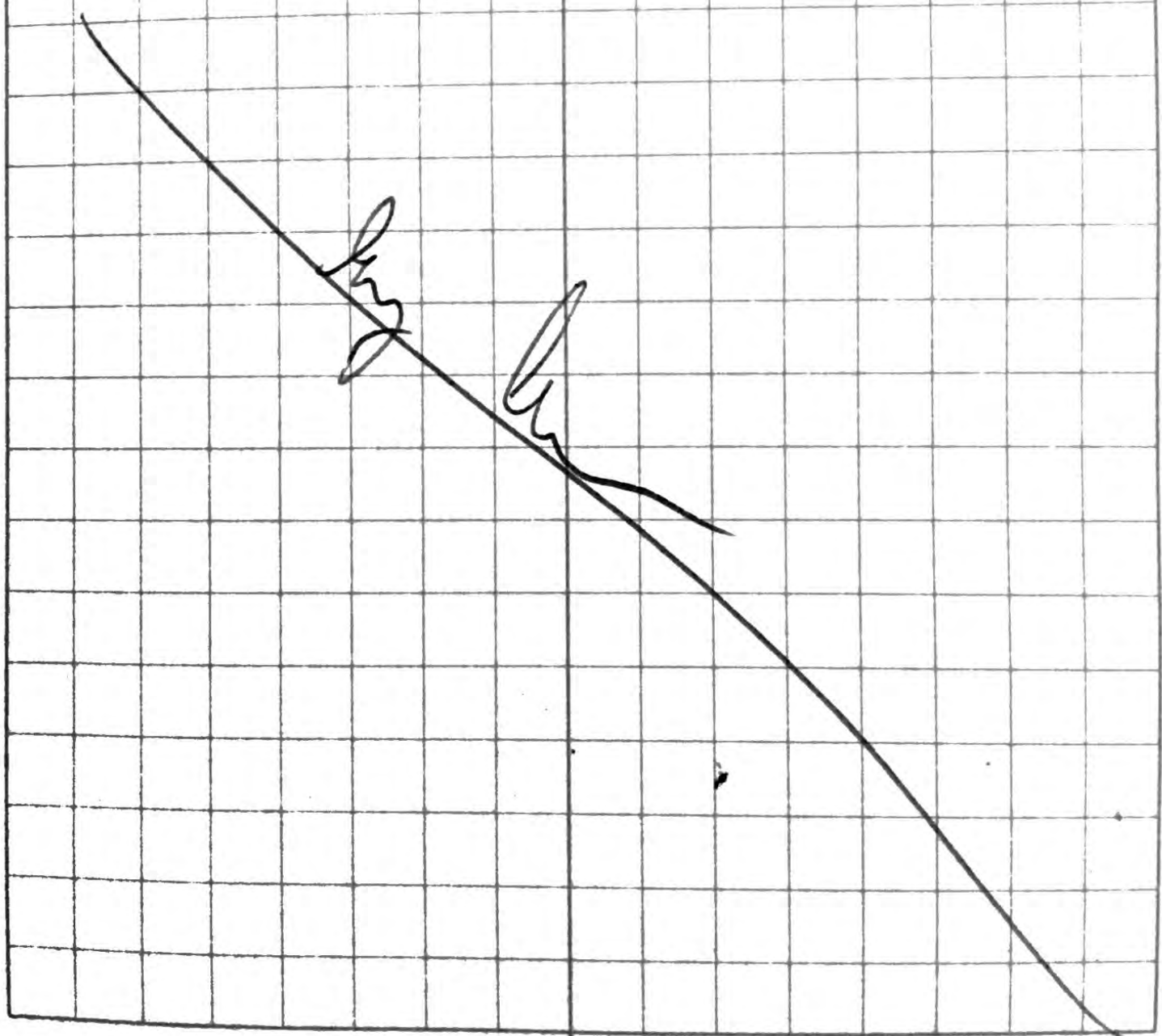
- 1205 Cont'd
Poor connection due to oversized outlet
barb and poorly fitted silicone tubing.
Will need to replace all lines and
tubing in Spring.
- 1230 Begin purging again
- 1305 Collect sample 0821 MW 52 GW.
- 1325 Complete sampling. Move to MW 47.
- 1355 Set up on MW 47.
- 1410 Begin purging MW 47.
- 1430 Collect sample and duplicate at MW 47.
ID: 0821 MW 47 GW @ 1430
Dup: 0821 MW 97 GW @ 1440
- 1515 Move to next well, MW 46.
- 1535 Set up on MW 46.
- 1545 Begin purging MW 46.
- 1615 Collect sample @ 1615
ID# 0821 MW 46 GW
- 1645 Complete pack up at MW 46. Go to meet
other team @ MW 58.
- 1715 Leave site for the day.
- 1742 Arrive at lodge.
- 

Location Red DevilDate 9/1/2021Project / Client Red Devil Mine - BLM50° Fog, JP, OG, RW

- | | |
|------|--|
| 0748 | Safety brief and prep. |
| 0810 | Leave for mine site. |
| 0840 | Arrive at Mine, One team on MW57 and one on MW45. |
| 0845 | Begin set up and purging of MW45. |
| 0930 | Collect sample at MW45.
ID # 0921 MW45GW. |
| 0945 | Complete sampling and pack for move to MW 56. |
| 1005 | Setup on MW56. Begin purging. |
| 1040 | Collect sample at MW56.
ID # 0921 MW56GW |
| 1055 | Pack up and move to MW44. |
| 1130 | Set up on MW44 after meeting with team at MW59. |
| 1230 | Collected sample at MW44.
ID# 0921 MW44GW |
| 1245 | Pack up for move to MW49. |
| 1300 | Move to MW49 for setup. |
| 1310 | MW49 tubing has shifted down into well. Will use all thread and hook to pull it out. |
| 1340 | Tubing retrieved. |

Location Red Devil Date 7/1/2021 31
Project / Client Red Devil Mine Monitoring - BLM
60° Cloudy, humid

- 1345 Set up on hole and begin purging
1430 Collect sample ID 0921 MW49GW
at MW49 @ 1430,
1455 Complete sampling at MW49, Move
to MW29.
1635 Collect sample @ MW29.
ID# 0921 MW29GW
1705 Leave site for the day.
1745 Arrive at cabin.



Rite in the Rain.

Location Red DevilDate 9/2/2021Project / Client Red Devil Monitoring - BLM40s Cloudy - Rain

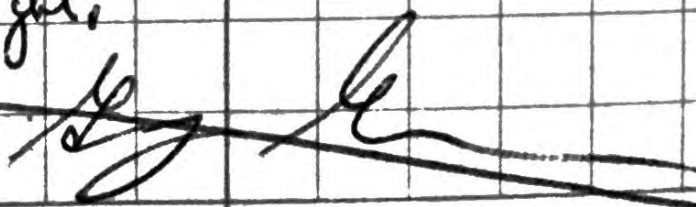
- | | |
|------|--|
| 0730 | Safety brief and plan for the day. |
| 0830 | Arrive at mine |
| 0845 | Perform maintenance on MW-50. |
| 0915 | Replacing hose connection and take photos. |
| 1100 | Return to cabin for sample prep. |

g h

Location Red Devil Date 9/3/2021 33
Project / Client Red Devil Monitoring - BLM

4/05 Rain

0730	Safety brief
0800	Leave for mine.
0830	Arrive at mine.
0900	Collect stream measurements.
0915	Collect sample # 0921 RD08 SW and MS/MSD.
0935	Complete sample collection at RD08 surface water points.
1000	Collect 0921 RD06 SW @
1015	Measure SEEP flow using 1L bottle. Flow = 0.7 L/S
1030	Collect 0921 RD05 SW @ 1030
1040	Collect stream flow readings at SW15
1055	Collect sample 0921 RD15 SW
1100	Collect duplicate 0921 RD99 SW at SW15.
1125	Collect surface water measurements at RD10 SW site.
1135	Collect 0921 RD10 SW @ 1135.
1200	Complete all sampling at RDM. Pack up equipment and return to cabin for sample QC and prep for flight.



Location RED DEVIL Date 6/11/2021Project / Client SPRING SAMPLING - BUMWEATHER: 65° SUNNYTEAM: GERGE GARNER, JOJO PARSON,
COLLEEN RUSTTASKS: SAMPLE COC, SHIPPING,
CLEAN UP800 MET AT WAREHOUSE800 HEALTH + SAFETY Meeting800-1330 CLEAN UP, SAMPLE
COC AND PACKING ON ICE1345 DROP OFF OF SAMPLES AT
FEDEX FOR SATURDAY DELIVERY1400 END OF DAY

CPL

Location Red DevilDate 8/25/2021 37Project / Client Fall Sampling - BUMweather: 37° clearTeam: Diky Witter, judi parson
George GarnerTASKS: well surveys

Photo #	Time	direction	description
start at 174 #174 →	0917	South	MW-01 closed
175	0924	South	MW-01 open
176	0935	East	MW-11 closed
177	0938	East	MW-11 open
178	0944	W	MW-10 closed
179	0944	W	MW-10 open
180	0949	NW	MW-09 closed
181	0949	NW	MW-09 open
182	0954	E	MW-34 closed
183	0958	E	MW-34 open
184	0959	W	MW-35 closed
185	0959	W W	MW-35 open
186	1003	N	MW-36 closed
187	1003	N	MW-36 open
188	1025	NE	MW-08 closed
189	1025	NE	MW-08 open

Rite in the Rain

Location Red Devil

Date 08/28/2021

Project / Client Fall sampling - BLM

Photo	Time	direction	descriptions
0900: arrive at mine & start survey			
190	1033	W	MW-07 closed
191	1033	W	MW-07 open
192	1034	N	MW-13 closed
193	1034	N	MW-13 open
194	1044		MW-12 frost jacketed
195	1044		MW-12 frost jacketed
196	1100	N	MW-17 closed
197	1106	N	MW-17 open
198	1100	N	MW-16 closed
199	1106	N	MW-16 open
200	1106	NW	MW-3 closed
201	1106	NW	MW-3 open
202	1109	W	MW-26 closed
203	1109	W	MW-20 open
204	1119	N	MW-18 closed
205	1119	N	MW-18 open
206	1125	N	MW-19 closed
207	1125	N	MW-19 open
208	1132	N	MW-32 closed
209	1132	N	MW-32 open

Red devil

Date 8/28/2021³⁹

Project / Client Fall sampling - BLM

Photo	time	direction	description
210	1138	S	MW-22 closed
211	1138	S	MW-22 open
212	1140	S	MW-21 closed
213	1140	S	MW-21 open
214	1151	W	MW-23 closed
215	1151	W	MW-23 open
216	1156	N	MW-6 closed
217	1156	N	MW-6 open
218	1159	NE	MW-24 closed
219	1159	NE	MW-24 open
220	1235	NW	MW-26 closed
221	1235	NW	MW-26 open
222	1239	NE	MW-25 closed
223	1239	NE	MW-25 open
224	1243	N	MW-27 closed
225	1243	N	MW-27 open
226	1244	W	MW-28 closed
227	1244	W	MW-28 open
228	1250	NE	MW-4 closed
229	1250	NE	MW-4 open
230	1311	E	MW-55 closed
231	1311	E	MW-55 open

Location Red devil

Date 08/28/2021

Project / Client Fall sampling - BUM

Photo	time	direction	description
222	1319	WW	MW-52 closed
223	1319	NW	MW-52 open
234	1325	N	MW-47 closed
235	1325	N	MW-47 open
236	1332	E	MW-46 closed
237	1332	E	MW-46 open
238	1341	NW	MW-45 sp closed
239	1341	NW	MW-45 open
240	1347	NE	MW-56 closed
241	1347	NE	MW-56 open
242	1400	N	MW-51 closed
243 44 ^{mw}	1400	N	MW-51 open
244	1418	SE	MW-54 closed
245	1418	SE	MW-54 open
246	1430	E	MW-50 closed
247	1430	E	MW-50 open
248	1444	SE	MW-58 closed
249	1444	SE	MW-58 open
250	1457	SW	MW-53 closed
251	1457	SW	MW-53 open
252	1509	E	MW-31 closed
253	1509	E	MW-31 open
254	1517	E	MW-57 closed
255	1517	E	MW-57 open

Red devil

Date 08/28/2021 41

Project / Client Fall sampling - BUM

Photo	time	direction	description
256	1529	W	MW-39 closed
257	1529	W	MW-39 open
258	1529	N	MW-59 closed
259	1529	N	MW-59 open
260	1545	W	MW-40 open closed
261	1545	W	MW-40 open
262	1556	SW	MW-44 closed
263	1556	SW	MW-44 open
264	1603	N	MW-48 closed
265	1603	N	MW-48 open
266	1609	W	MW-49 closed
267	1609	W	MW-49 open
268	1615	NW	MW-29 closed
269	1615	NW	MW-29 open
270	1621	S	MW-30 closed
271	1621	S	MW-30 open
272	1632	W	MW-42 closed
273	1632	W	MW-42 open
274	1639	W	MW-43 closed
275	1639	W	MW-43 open
276	1653	E	MW-33 closed
277	1653	E	MW-33 open

Revs
Rite in the Rain

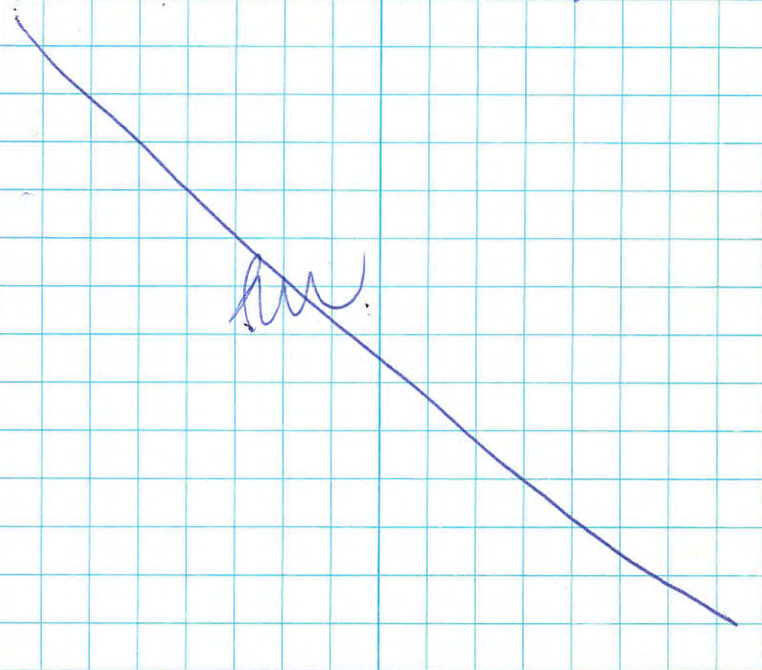
Location Red devil Date 08/29/2021Project / Client Fall sampling - BLM

- 0900: arrive at mine setup on
MW-10, MW-17, MW-16.
- 0910: Judd goes to lodge to grab paperwork.
- 0900: Start on MW-10
- 1045: Sample MW-10
- 1115: move to MW-09 & start
- 1215: Sample MW-09
- 1223: finish at MW-09
- 1225: break for lunch
- 1301: setup at MW-26
- 1415: Collapsed bladder pump at MW-26
tried to massage bladder x2 and
still no success. Pulled full pump
and have decided to bail well.
- 1442: Just kidding decided to move
to other well and use small
rented bladder pump another
day after deconing.
- 1452: move from MW-26 to MW-28
- 1500: Start on MW-28
- 1634: MW-28 same problems as MW-26
bladder collapsed water not pumping
been trying to trouble shoot for 1.5 hours

Location Red devil Date 08/29/2021⁴³Project / Client Fall sampling - BLMblack
calculator

Photo	time	direction	description
278	1313	N	all thread tube grabber MW-26
279	1313	S	" "
280	1441		MW-26 bladder pump
281	1441		MW-26 bladder pump

- 1700: MW-28 magically starts working
start parameter readings.
- 1730: Sample MW-28
- 1934: leave MW-28 for lodge



Location Red devil Date 08/30/2021
 Project / Client Fall Sampling - BLM

- 0800: leave lodge for mine
 0845: set up on MW-26.
 0930: decide to use rental pump
 Since dedicated pump is still not working.
 0945: rental pump works & start purging
 1100: sample MW-26
 1124: pack up MW-26 & head to MW-43
 1225: sample MW-43

Photo	time	direction	description
278	0947	N/A	rental pump set up.
279	1307	N/A	MW-42 pulled out.

- 1300: move to MW-42 to assist with pulling MW-42 pump out.
 1342: successfully drop new pump into MW-42
 1330: start on MW-42
 1350: start purging.
 1430: sample MW-42.
 1100: leave MW-42 for lodge.

th

Location Red devil Date 08/31/2021 45
 Project / Client Fall sampling - BLM

- 0845: start on MW-51.
 1005: sample MW-51.
 1016: finish at MW-51 & go to MW-54
 1025: start on MW-54
 1110: sample MW-54
 1130: leave MW-54 for MW-50
~~1135: arrive at MW-50~~ PW
 1130: start on MW-50
 1255: sample MW-50
 1305: leave MW-50 for MW-53.

Photo	time	direction	description
280	1154	N/A	MW-50 Setup
281	1401	N/A	MW-58 Setup
1			

- 1310: arrive at MW-53 & eat lunch.
 1325: start on MW-53
 1400: sample MW-53
 1410: leave MW-53 for MW-58
 1425: start MW-58, pull tubing & replace. don't have to bail! pump working.
 1440: sample MW-58

Location Red devil

Date 09/01/2021

Project / Client Fall Sampling - BLM

0830: Start on MW-57
 0905: Sample MW-57
 0915: Finish MW-57 & move to MW-59
 0925: Start MW-59
 0945: Replace tubing due to air leakage
 1330: Sample MW-59
 1350: Finish MW-59 & head to MW-46

Photo	time	direction	description
282	0848	N/A	MW-57 setup
283	1042	N/A	MW-59 pulled tubing
284	1042	N/A	MW-59 setup w/new tubing
285	1411	N/A	MW-40 setup

1400: Start on MW-40
 1430: Sample MW-40
 1441: Finish MW-40 & go to MW-29.
 1500: Start on MW-29.
 1635: Sample MW-29.
 1655: Leave MW-29 for lodge.

Location Red devil

Date 09/02/2021 47

Project / Client Fall Sampling - BLM

0846: arrive at MW-52 for maintenance
 1120: arrive back at lodge

Photo	time	direction	description
286	0848	N/A	MW-52 weird connection
287	0857	" "	MW-52 PVC TOP
288	0857	" "	MW-52 new connection
289	0923		Stock piles
290	0923		Stock piles
291	0924		erosion control
292	0925		NOT working erosion control
293	0925		" "
294	0925		Cut ropes on stock piles
295	0925		erosion control
296	0925		Cut ropes on stock piles
297	0925		erosion control
298	0926		Creek - Red devil
299	0927		Creek - Red devil
300	0928		Red devil creek
301	0928		" "
302	0928		" "
303	0929		" "
304	0930		erosion control

Location Red bevil Date 09/02/2021
 Project / Client Fall sampling - BUM

Photo	time	direction	description	
305	0930	N/A	erosion control	
306	0931		Red bevil creek	
307	0933		"	"
308	08 0934		"	"
309	0935		"	"
310	0935		"	"
311	0935		"	"
312	0935		"	"
313	1011		Red bevil creek ^{by} bridge	
314	1011		"	"
315	1011		"	"
316	1012		"	"
317	1012		"	"
318	1012		"	"

11:45: Start going through paper work
 and samples & prep for surface
 water samples tomorrow.

PR

Location Red bevil Date 09/03/2021
 Project / Client Fall sampling - BUM

Photo	time	direction	description	
0842: arrive at mine				
0850: start gauging stream 08				
319	0857	N/A	stream 08	
320	0857		"	"
321	0858		"	"
322	0902		"	"
323	0949	SW	Stream spot 06	
324	0952	NE	"	"
325	1033	N/A	RD 05 SW STEEP	
326	1034		"	"
327	1034		"	"
328	1034		"	"
329	1034		"	"
330	1044		RD 05 SW not steep	
331	1128		RD	
332	1129		"	"

1230: arrive back at lodge to finish
 going through paperwork & check
 samples. Also to get prepped
 for tomorrow's departure.

RU

ATTACHMENT 1.4 GROUNDWATER SAMPLING FORMS

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Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW06
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/15/2021	Samplers:	GG-15P
Time Start:	1658	Checked By:	Colleen Rust
Time Finish:	1910		

Well & Purge Information

TD (ft. bTOC):	26.05	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	17.44	ft		
Water Column:	8.61	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	5.21	L	Water Column x L/ft	
Three Well Volumes:	15.63	L	Liters in Well x 3	
Sample Depth:	23.0	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	1413103510
Water Level Meter:	Dipper TQ	Serial No.:	WLM0747
Turbidity Meter:	Micro TPW	Serial No.:	2020007702
Pump Type:	Alexis Peristaltic	Serial No.:	90048

Purge Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL Metals	1	Nitric		HDPE	
Low Level Hg Total	1	NONE	16.31	DB Glass	
Dissolved Lk Hg	1	NONE	16.31	DB Glass	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW06</u>	Sample ID: <u>0621MW06 GW</u>	Sample Time: <u>1800</u>
Date: <u>6-5-21</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>
Notes: <u>original tubing in well removed due to Fe-oxide staining</u>		

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1658	START PURGING									
1712	1.4	5.91	233	0.33	6.77	8.5	23.73	17.44	0.10	
1717	1.9	5.79	231	0.33	6.78	17.7	23.55	17.44	0.125	
1722	2.5	5.25	228	0.31	6.79	17.1	13.65	17.44	0.15	
1727	3.25	4.95	226	0.29	6.80	27.4	10.02	17.44	0.15	
1732	4.00	4.85	225	0.23	6.80	35.0	8.22	17.44	0.15	
1734	4.3	4.89	225	0.23	6.80	41.2	10.08	17.44	0.15	
1740	5.2	4.93	225	2.31	6.79	26.8	10.55	17.44	0.15	
1745	5.95	4.73	224	1.36	6.79	23.7	8.70	17.44	0.15	
1750	6.70	4.76	222	1.41	6.80	24.6	9.87	17.44	0.15	
										Sampled @ 1800

Sampled?: Yes No

Initial of Sampler: [Signature]



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri Bladder
Transducer: Yes/No
Sample Team: CR/GG/JP

Sample Location: MW 06
Sample ID: 0621MW 06GW
Date: 6-5-21
Time: 1800
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>[Signature]</i>
Total LL Mercury	8 oz	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<i>[Signature]</i>
Dissolved LL Mercury	8 oz	glass	filtered	None	4°C	48 hours/14 days ⁺	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time. 3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14 days.

Logged By: JUDSON PARSON

Reviewed By: Colleen Rust

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW-09
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/5/2021	Samplers:	6615P/CR
Time Start:	1107	Checked By:	JUDD PARSON
Time Finish:	1645		

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):
DTW (ft. bTOC):	ft	
Water Column:	ft	TD-DTW=Water Column
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table
Liters In Well:	L	Water Column x L/ft
Three Well Volumes:	L	Liters In Well x 3
Sample Depth:	ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556MPS ^{CR}	Serial No.:	11F102278
Water Level Meter:	Solinst Model 102	Serial No.:	294991
Turbidity Meter:	MICRO TPW	Serial No.:	202008376
Pump Type:	BLADDER GEOTECH	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge 100mL per pulse (0.4 L/min)

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL METALS	1 250mL Nitric	NITRIC		plastic	
TOTAL LL MERCURY	1 802	NONE		glass	
Diss. LL MERCURY	1 802	NONE		glass	
<div style="position: absolute; top: 0; left: 0; width: 100%; height: 100%; border: 1px solid black; opacity: 0.5; pointer-events: none;"> CER </div>					

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW-09</u>	Sample ID: <u>0621MW096W</u>	Sample Time: <u>1625</u>
Date: <u>6/5/2021</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes: SAMPLE ONLY

Purging and *Stabilization Data										
Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1120		3.65	195	1.99	6.58	128.7	8.75	30.4	0.4 1/2 min	Clear
1135		3.94	210	0.93	6.70	143.3	5.71	31.7	0.4 1/2 min	
1140		4.26	210	0.78	6.76	126.3	5.30	30.5	0.2 1/4 min	Lowered rate to keep water level steady
1145		4.31	212	0.75	6.78	119.9	5.20	31.9	0.2	
1150		4.57	205	0.93	6.83	90.0	7.55	32.01	0.14	lowered rate to keep water level steady
1155		4.81	195	0.92	6.85	63.2	10.82	32.17	0.1	lowered rate to keep water level steady will allow to stabilize
→ STOPPED BLADDER PUMP TO RECHARGE AND STABILIZE										
<i>TRIP</i>										
1540	7.91	200	2.07	6.95	10.6	21.95	30.11	0.06	Lowest rate possible for bladder pump + head	
1545	7.68	198	1.79	6.95	11.9	19.61	31.27	0.06	12 RECHARGE 3 DISCHARGE	
1550	7.61	193	1.02	6.96	-1.2	18.42	31.36	0.06	* IN DIRECT SUN SHADED 1/2 BUT LIKELY HIGH TEMP.	
1555	8.02	191	1.05	6.95	-4.7	17.38	31.36	0.04	LOWERED RATE BY 12 RECHARGE 3 DISCHARGE	
1600	8.38	191	1.10	6.95	-6.6	15.57	31.36	0.04	STABLE WATER LEVEL	
1605	8.84	193	1.35	6.94	1.8	14.27	31.52	0.04		
1610	8.87	193	1.59	6.93	12.0	11.96	31.52	0.04		
1612	8.81	193	2.02	6.93	19.6	10.82	31.52	0.04		
1614	8.81	194	2.24	6.93	23.4	10.23	31.52	0.04		
1616	8.80	195	2.40	6.93	26.5	9.91	31.62	0.04		
1618	8.67	197	2.70	6.94	30.5	9.36	31.69	0.04		
1620	8.61	198	2.79	6.94	31.5	8.36	31.69	0.04		
1625	<u>SAMPLED</u>									

Sampled?: Yes No

Initial of Sampler: CHW/TP



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri (Bladder)
Transducer: Yes / (No)
Sample Team: CR/GG/JP

Sample Location: MW-09
Sample ID: 0621MW 09 GW
Date: 6/15/2021
Time: 1625
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL <u>X</u>	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<u>CR</u>
Total LL Mercury	8 oz <u>X</u>	glass	unfiltered	None	4°C	48 hours/14 days*	<u>CR</u>
Dissolved LL Mercury	8 oz <u>X</u>	glass	filtered	None	4°C	48 hours/14 days*	<u>CR</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: Colleen Rust

Reviewed By: JUDD PARSON

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW10
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-5-21	Samplers:	JUDSON PARSON
Time Start:	1100	Checked By:	Colleen Rust
Time Finish:	1230		

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	27.50		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	14B103510
Water Level Meter:	HERON DIPPER TZ	Serial No.:	WLM0747
Turbidity Meter:	HF SCI MICRO TPW	Serial No.:	202007902
Pump Type:	BLADDER PUMP	Serial No.:	

Purge Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 7.5 Seconds Refill 7.5 Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 7.5 Seconds Refill 7.5 Seconds Discharge

Sample Collection Information

Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL METALS	3	NITRIC		250 ml	✓
TOTAL LL MERCURY	3	NONE		8oz	✓
DISSOLVED LL Hg	3	NONE		8oz	✓

CDZ

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <i>MW10</i>	Sample ID: <i>0621MW10GW</i>	Sample Time: <i>1200</i>
Date: <i>6-8-21</i>	Dup. Sample ID:	Dup. Sample Time:

Notes: *65 psi, CPM4, 7.5, 7.5*

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp $\pm 3\%$ °C, min $\pm 0.2^\circ\text{C}$	Spec. Cond. ($\mu\text{S/cm}$) $\pm 3\%$	DO (mg/L) $\pm 10\%$	pH ± 0.1	ORP (mV) $\pm 10\text{ mV}$	Turbidity (NTU) $\pm 10\%$	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1100	START PURGING									
1107	0.7	5.84	262	2.24	6.15	86.3	31.65	28.1	0.1	
1110	1.0	5.51	235	1.68	6.34	74.4	21.75	28.1	0.1	
1115	1.5	5.30	208	0.74	6.73	39.2	12.83	28.1	0.1	
1120	2.0	5.19	198	0.57	6.97	0.8	6.61	29.2	0.1	
1125	2.5	5.16	194	0.41	7.04	-3.5	4.65	29.6	0.1	
1130	3.0	5.12	194	0.34	7.08	-68.1	3.29	29.7	0.1	
1135	3.5	5.34	195	0.30	7.18	-117.0	3.04	29.8	0.1	
1140	4.0	5.17	195	0.31	7.20	-94.8	3.34	29.88	0.1	
1145	4.5	5.15	194	0.30	7.26	-232.8	2.49	29.91	0.1	
1150	5.0	5.12	193	0.31	7.32	-244.0	1.95	29.98	0.1	

Sampled?: Yes No

Initial of Sampler: *JAP*



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR/GG/JP

Sample Location: MW 10
Sample ID: 0621MW10 GW
Date: 6-5-21
Time: 1200
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X3	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>[Signature]</i>
Total LL Mercury	8 oz X3	glass	unfiltered	None	4°C	48 hours/14 days*	<i>[Signature]</i>
Dissolved LL Mercury	8 oz X3	glass	filtered	None	4°C	48 hours/14 days*	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

9 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

MS/MSD

Logged By: Judson Parson

Reviewed By: Colleen Rust

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site: BLM Red Devil Mine Well ID.: MW10
 Contract No.: 140L6321C0001 Project No.: BU06-007
 Date: 6/15/2021 Samplers: GG/CR
 Time Start: 1335
 Time Finish: 1510 Checked By: JUDD PARSON

Well & Purge Information

TD (ft. bTOC): _____ ft Screened Interval (ft.): _____
 DTW (ft. bTOC): 15.28 ft
 Water Column: _____ ft TD-DTW=Water Column
 Liter/Foot: _____ L/ft See ***Well Volume Calculation*** table
 Liters in Well: _____ L Water Column x L/ft
 Three Well Volumes: _____ L Liters in Well x 3
 Sample Depth: _____ ft Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
<u>2"</u>	<u>0.605</u>
4"	2.47

Field Equipment

Multiparameter Water Quality Meter: YSI 556 MPS Serial No.: 11F102278
 Water Level Meter: Solinst Serial No.: 29491
 Turbidity Meter: MICR TPW Serial No.: 202008376
 Pump Type: PERI PUMP Serial No.: 90048

Purge Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information

Parameter	# Containers (fill in for each well)	Preservative	MS/MSD? :		
			Method	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
TAL METALS	1 250ML UNFILTERED	NITRIC			
TOTAL LL MERCURY	1 30Z UNFILTERED	NONE			
Diss LL Hg	1 30Z FILTERED	NONE			

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW16</u>	Sample ID: <u>0621MW16GW</u>	Sample Time: <u>1455</u>
Date: <u>6/15/2021</u>	Dup. Sample ID: <u>NONE</u>	Dup. Sample Time: <u>NONE</u>

Notes: SAMPLE ONLY

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1340		6.23	347	5.41	6.39	90.3	67.65	15.28	0.14	PREVIOUS TUBE HAD A LOT OF ALGAE GROWTH, RED/ORANGE
1350		6.15	346	2.13	6.43	86.9	74.06	15.32	0.11	
1400		6.15	335	2.52	6.43	80.9	59.05	15.50	0.11	Slowed down to allow for less algae particulates still cloudy with algae
1410		6.34	341	1.91	6.42	82.4	54.99	15.50	0.11	
1420		6.28	346	1.60	6.41	78.6	42.36	15.61	0.11	
1430		6.28	348	1.42	6.42	76.9	41.83	15.60	0.11	
1440		6.38	354	1.19	6.42	74.4	39.75	15.60	0.11	
1450		6.39	356	1.20	6.41	76.1 38.34	38.34	15.61	0.11	TURBIDITY STABLE AT 38, STILL HAS ALGAE WILL SAMPLE
1455	SAMPLED									SAMPLED
<div style="position: relative; height: 100px;"> CSC </div>										

Sampled?: Yes No

Initial of Sampler: CSC



Groundwater Sample Collection Log

Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: GW
 Pump Type: Perj/ Bladder
 Transducer: Yes (No)
 Sample Team: CR/GG/JP

Sample Location: MW 16
 Sample ID: 0621MW/16GW
 Date: 10/5/2021
 Time: 1455
 COC #: _____
 Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL <u>X 1</u>	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<u>CR</u>
Total LL Mercury	8 oz <u>X 1</u>	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<u>CR</u>
Dissolved LL Mercury	8 oz <u>X 1</u>	glass	filtered	None	4°C	48 hours/14 days ⁺	<u>CR</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY, TURBIDITY STABLE AT 38 WITH ALGAE PRESENT

Logged By: Colleen Rust

Reviewed By: JDD PARSON



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site: BLM Red Devil Mine **Well ID.:** MW17
Contract No.: 140L6321C0001 **Project No.:** BU06-007
Date: 6/15/2021 **Samplers:** COLE CRISP
Time Start: 1230
Time Finish: 1320 **Checked By:** JUDD PARSON

Well & Purge Information

TD (ft. bTOC): _____ **ft** **Screened Interval (ft.):** _____
DTW (ft. bTOC): 13.86 **ft**
Water Column: _____ **ft** **TD-DTW=Water Column**
Liter/Foot: _____ **L/ft** **See ***Well Volume Calculation*** table**
Liters in Well: _____ **L** **Water Column x L/ft**
Three Well Volumes: _____ **L** **Liters In Well x 3**
Sample Depth: _____ **ft** **Depth of Pump Intake**

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
<u>2"</u>	<u>0.605</u>
4"	2.47

Field Equipment

Multiparameter Water Quality Meter: YSI 556MPS **Serial No.:** 11F102278
Water Level Meter: Solinst Model 102 **Serial No.:** 294991
Turbidity Meter: MICRO TRU **Serial No.:** 202008376
Pump Type: PERI Pump **Serial No.:** 90048

Purge Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information

MS/MSD? : Yes No

Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL Metals	2 unfiltered	NITRIC		250ML Plastic	
TOTAL LL Hg	2 unfiltered	NONE		2oz glass	
Diss LL Hg	2 filtered	NONE		2oz glass	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW17	Sample ID: 06021 MW 17GW	Sample Time: 1305
Date: 6/15/2021	Dup. Sample ID: 06021 MW 99GW @ 0800 6/15/2021	Dup. Sample Time: 0800
Notes: DUPLICATE ON PERI		

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1235		6.92	127	11.99	7.26	175.4	1.75	13.89	0.14	L/min
1240		6.78	126	9.21	7.25	175.5	1.34	13.89	0.14	Stable water level
1245		6.90	127	8.72	7.24	174.5	1.34	13.89	0.14	
1250		6.91	127	8.64	7.23	174.7	1.51	13.90	0.14	
1255		6.85	128	8.66	7.22	176.1	2.13	13.90	0.14	
1300		6.89	128	8.54	7.22	177.5	1.47	13.90	0.14	clear none turbid
1305	SAMPLED		WITH DUP		06021 MW 99GW		6/15/2021 @ 0800			
<div style="position: relative; width: 100%; height: 100%;"> CP </div>										

Sampled? : Yes No

Initial of Sampler: CP



Groundwater Sample Collection Log

DOP/SAMPLE

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri/ Bladder
Transducer: Yes ~~No~~
Sample Team: CR/GG/JP

Sample Location: MW 17
Sample ID: 0621MW 17GW
Date: 6/15/21
Time: 1305
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL <i>X2</i>	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>CR</i>
Total LL Mercury	8 oz <i>X2</i>	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<i>CR</i>
Dissolved LL Mercury	8 oz <i>X2</i>	glass	filtered	None	4°C	48 hours/14 days ⁺	<i>CR</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

6 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

DUPLICATE: 0621MW 99GW 6/15/21 @ 0800

Logged By: *CR*

Reviewed By: *JUDD PARSON*

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW26
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-5-21	Samplers:	JUDSON PARSON
Time Start:	1352	Checked By:	Colleen Rust
Time Finish:	1635		

Well & Purge Information

TD (ft. bTOC):	34.58	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	59.81	ft		
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	14B103510
Water Level Meter:	HERON DITTER T2	Serial No.:	WLMO747
Turbidity Meter:	HFSCI MICRO TPW	Serial No.:	20280790Z
Pump Type:	BLADDER PUMP	Serial No.:	

Purge Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 12.5 Seconds Refill 2.5 Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 12.5 Seconds Refill 2.5 Seconds Discharge 30 psi 4 CRM

Sample Collection Information

MS/MSD? : Yes No

Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL METALS	1	NITRIC		250 ml	
TOTAL LL MERCURY	1	NONE		80Z	
DISSOLVED LL MERCURY	1	NONE		80Z	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW26</u>	Sample ID: <u>0621MW26GW</u>	Sample Time: <u>1615</u>
Date: <u>6-5-21</u>	Dup. Sample ID:	Dup. Sample Time:

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1505	0.5	6.62	419	3.59	6.66	29.1	59.81	35.20	0.1	
1510	1.0	6.42	414	2.08	6.66	-34.0	56.40	35.33	0.1	
1515	1.5	5.91	408	1.24	6.66	-27.8	75.24	35.59	0.1	
1520	2.0	5.88	402	1.52	6.65	-21.7	86.53	35.72	0.1	
1525	2.5	6.47	407	1.69	6.65	-18.3	80.87	35.82	0.05	
1530	2.75	7.05	412	1.82	6.64	-16.0	69.63	35.84	0.05	
1535	3.00	7.79	419	2.59	6.63	-9.1	54.46	35.85	0.05	
1540	3.25	7.98	421	2.94	6.63	-3.7	45.61	35.86	0.05	
1545	3.50	8.09	421	3.23	6.63	1.9	29.82	35.90	0.05	
1550	3.75	8.15	421	3.35	6.64	0.2	31.39	35.92	0.05	
1555	4.0	8.11	421	3.41	6.64	-1.7	21.04	35.95	0.05	
1600	4.25	8.11	421	3.46	6.64	-6.7	13.90	35.97	0.05	
1605	4.50	8.10	422	3.45	6.64	-9.1	12.04	35.99	0.05	
1610	4.75	8.09	423	3.49	6.64	-11.5	9.09	36.02	0.05	

Sampled?: Yes No

Initial of Sampler: JRS



Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR/GC/JP

Groundwater Sample Collection Log

Sample Location: MW 26
Sample ID: 0621MW26 GW
Date: 6-5-21
Time: 1615
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL <u>X1</u>	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<u>JP</u>
Total LL Mercury	8 oz <u>X1</u>	glass	unfiltered	None	4°C	48 hours/14 days*	<u>JP</u>
Dissolved LL Mercury	8 oz <u>X1</u>	glass	filtered	None	4°C	48 hours/14 days*	<u>JP</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: JUDSON PARSON

Reviewed By: Colleen Rust

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 27
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/6/2021	Samplers:	GG/CFR
Time Start:	0815	Checked By:	Colleen Rust
Time Finish:	0930		

Well & Purge Information			
TD (ft. bTOC):	ft	Screened Interval (ft.):	ft
DTW (ft. bTOC):	30.64		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment	
Multiparameter Water Quality Meter:	Y51 556
Serial No.:	11 F102278
Water Level Meter:	Dipper T2
Serial No.:	WLM 0747
Turbidity Meter:	Micro TPW
Serial No.:	2020 08376
Pump Type:	N/A

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 9.0
 Seconds Refill 6.0
 Seconds Discharge 4 cpm

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 9.0
 Seconds Refill 6.0
 Seconds Discharge 4 cpm

Sample Collection Information				MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note	
TAA Metals	2	Nitric		HDPE/Plastic		
U. Hg. Total	2	None		DB Glass		
LL Hg. Dissolved	2	None		DB Glass		
<div style="position: relative; width: 100%; height: 100%;"> OR </div>						

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW27</u>	Sample ID: <u>0621MW27GW</u>	Sample Time: <u>0905</u>
Date: <u>6/6/21</u>	Dup. Sample ID: <u>0621MW98GW</u>	Dup. Sample Time: <u>0900</u>

Notes: DUPLICATE

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>0818</u>	<u>START PURGING</u>									
<u>0826</u>	<u>0.6</u>	<u>5.10</u>	<u>421</u>	<u>4.05</u>	<u>6.03</u>	<u>238.1</u>	<u>7.21</u>	<u>30.70</u>	<u>0.075</u>	<u>Clear</u>
<u>0830</u>	<u>0.9</u>	<u>4.99</u>	<u>410</u>	<u>2.52</u>	<u>6.18</u>	<u>225.9</u>	<u>4.03</u>	<u>3.72</u>	<u>0.075</u>	
<u>0837</u>	<u>1.425</u>	<u>4.86</u>	<u>402</u>	<u>1.77</u>	<u>6.24</u>	<u>211.1</u>	<u>3.75</u>	<u>30.74</u>	<u>0.075</u>	
<u>0840</u>	<u>1.65</u>	<u>4.81</u>	<u>401</u>	<u>1.63</u>	<u>6.24</u>	<u>209.3</u>	<u>3.23</u>	<u>30.80</u>	<u>0.075</u>	
<u>0845</u>	<u>2.03</u>	<u>4.82</u>	<u>399</u>	<u>1.50</u>	<u>6.24</u>	<u>210.1</u>	<u>2.67</u>	<u>30.80</u>	<u>0.075</u>	
<u>0850</u>	<u>2.4</u>	<u>4.82</u>	<u>399</u>	<u>1.47</u>	<u>6.24</u>	<u>199.9</u>	<u>2.14</u>	<u>30.80</u>	<u>0.075</u>	
<u>0855</u>	<u>2.78</u>	<u>4.90</u>	<u>401</u>	<u>1.43</u>	<u>6.24</u>	<u>202.3</u>	<u>1.78</u>	<u>30.80</u>	<u>0.075</u>	
<u>0900</u>	<u>4</u>	<u>4.91</u>	<u>402</u>	<u>1.44</u>	<u>6.25</u>	<u>202.2</u>	<u>1.71</u>	<u>30.80</u>	<u>0.075</u>	<u>Clear</u>
<u>0905</u>	<u>SAMPLED</u>									
<u>0900</u>	<u>DUPLICATE</u>									
<u>CO2</u>										

Sampled?: Yes No

Initial of Sampler: NR



Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri Bladder
Transducer: Yes ~~No~~
Sample Team: CR/GG/JP

Groundwater Sample Collection Log

Sample Location: MW 27
Sample ID: 0621MW27GW
Date: 6/6/2021
Time: 0905
COC #:
Trip Blank ID: LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X2	plastic	unfiltered	Nitric	ambient	180 days/28 days *	GG/CFR
Total LL Mercury	8 oz X2	glass	unfiltered	None	4°C	48 hours/14 days ⁺	GG/CFR
Dissolved LL Mercury	8 oz X2	glass	filtered	None	4°C	48 hours/14 days ⁺	GG/CFR

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

6 BOTTLES

⁺ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Duplicate: 0621MW98GW 6/10/2021 @ 0900

Logged By: Colleen Rust

Reviewed By: Judd Parson

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW28
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/6/21	Samplers:	CPZ
Time Start:	1010		
Time Finish:	1300	Checked By:	JUDD PARSON

Well & Purge Information			
TD (ft. bTOC):	28.52	ft	Screened Interval (ft.):
DTW (ft. bTOC):		ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556	Serial No.:	11F102278
Water Level Meter:	DIPPER TA	Serial No.:	WLM0747
Turbidity Meter:	MICRO TPN	Serial No.:	202008396
Pump Type:	BLADDER PUMP GEOTECH	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 14 Seconds Refill 1 Seconds Discharge 0.01 L/min

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 14 Seconds Refill 1 Seconds Discharge 0.01 L/min

Sample Collection Information					MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note		
TAL Metals	1 x 250mL	Nitric		plastic			
Total LL Hg	1 x 202	NONE		glass			
Diss. LL Hg	1 x 202	NONE	Filtered	glass			
CPZ							

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW28</u>	Sample ID: <u>0621MW28GW</u>	Sample Time: <u>1230</u>
Date: <u>6/6/2021</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes: SAMPLE ONLY

Purging and *Stabilization Data										
Time (24 hrs)	Volume Removed (L)	Temp $\pm 3\% \text{ } ^\circ\text{C}$, min $\pm 0.2\text{ } ^\circ\text{C}$	Spec. Cond. ($\mu\text{S}/\text{cm}$) $\pm 3\%$	DO (mg/L) $\pm 10\%$	pH ± 0.1	ORP (mV) $\pm 10 \text{ mV}$	Turbidity (NTU) $\pm 10\%$	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1035	4.77	227	1.73	6.85	113.3	20.25	28.52	0.25	0.25	0.25 L/min
1040	4.81	219	0.44	6.88	82.7	19.94	28.52	0.25		
1045	4.71	218	0.37	6.79	77.1	16.84	28.52	0.25		
1050	4.75	216	0.30	6.90	69.9	19.82	28.52	0.25		
1055	5.01	216	0.27	6.91	63.0	18.36	28.52	0.09	4m ³	Lowered to 9.0/6.0 60 feet, to drop turbidity
1100	5.08	217	0.25	6.93	63.1	19.73	28.52	0.09		
1105	5.45	220	0.32	6.94	61.8	17.61	28.52	0.09		Clearing up
1110	5.57	221	0.34	6.94	60.1	18.46	28.52	0.09		Household Alarms 17 to 19 NTUS
1115	5.58	221	0.37	6.95	59.4	19.30	28.52	0.09		Temp warming up in sun
1120	5.60	222	0.38	6.95	58.0	20.13	28.52	0.09		Can't lower flow rate anymore with required pressure
1125	5.79	222	0.37	6.96	58.5	32.67	28.52	0.085		Lowered cycles to 13/2
1130	5.79	222	0.37	6.96	58.5	33.67	28.52	0.025		
1140	5.79	233	0.57	6.96	57.0	35.79	28.52	0.025		Lowered cycles to 14/1 lowest cycle setting possible
1150	7.83	235	0.62	6.96	57.0	35.96	28.52	0.025	0.01	
1200	10.00	250	0.96	6.98	61.6	32.04	28.52	0.025	0.01	psi in shade but still rising temp.
1215	10.30	252	0.98	6.97	62.2	30.36	28.52	0.025	0.01	PARAMETERS STABLE, TURBIDITY @ ~30 NTUS
1230	<u>SAMPLED</u>									

Sampled?: Yes No

Initial of Sampler: CP



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri Bladder
Transducer: Yes/No
Sample Team: CR/GG/JP

Sample Location: MW 28
Sample ID: 0621MW 28 GW
Date: 6/6/2021
Time: 1230
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X 1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	CR
Total LL Mercury	8 oz X 1	glass	unfiltered	None	4°C	48 hours/14 days*	CR
Dissolved LL Mercury	8 oz X 1	glass	filtered	None	4°C	48 hours/14 days*	CR

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE

Logged By: Colleen Rust

Reviewed By: JUDD PARSON



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 23
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/8/21	Samplers:	CB
Time Start:	1300		
Time Finish:	1420	Checked By:	CRP

Well & Purge Information

TD (ft. bTOC):	24.28	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	6.49	ft		
Water Column:	17.79	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	10.76	L	Water Column x L/ft	
Three Well Volumes:	32.3	L	Liters in Well x 3	
Sample Depth:	20	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MRS	Serial No.:	14 B103510
Water Level Meter:	dipper-T2	Serial No.:	WLM 0747
Turbidity Meter:	MicroTPW	Serial No.:	2020 07902
Pump Type:	Alexis Peristaltic	Serial No.:	90048

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information

Parameter	# Containers (fill in for each well)	Preservative	MS/MSD? :		Note
			Method	Container Type	
TAL Metals	1	Nitric		PASTIC	
LL Hg Dissolved	1	None		DB Glass	
LL Hg Total	1	None		DB Glass	



Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: GW
 Pump Type: Peri / Bladder
 Transducer: Yes / ~~No~~
 Sample Team: CR/GG/JP

Groundwater Sample Collection Log

Sample Location: MW 33
 Sample ID: 0621MW33 GW
 Date: 6/8/21
 Time: 1403
 COC #: _____
 Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	GH
Total LL Mercury	8 oz X1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	GH
Dissolved LL Mercury	8 oz X1	glass	filtered	None	4°C	48 hours/14 days ⁺	GH

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: GG

Reviewed By: CR

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW40
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/8/2021	Samplers:	BO/SPICK
Time Start:	1500		
Time Finish:	1640	Checked By:	CRZ

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	ft		135.65 To Pump
Water Column:	ft	TD-DTW=Water Column	6
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters In Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	VSI 55G MPS	Serial No.:	14 B10 3510
Water Level Meter:	Solinst 102M	Serial No.:	294991
Turbidity Meter:	Micro TPW	Serial No.:	2020 07902
Pump Type:	Bladder	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 35 Seconds Refill 25 Seconds Discharge 1 cpm @ 65psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL Metals	1	Nitric		Plastic	
Total L _l Hg	1	None		DB Glass Bor	
Dissolved L _l Hg	1	None		DB Glass Bor	



Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri Bladder
Transducer: Yes No
Sample Team: CR/GG/JP

Groundwater Sample Collection Log

Sample Location: MW 40
Sample ID: 0621MW40 GW
Date: 6/18/2021
Time: 1625
COC #:
Trip Blank ID: LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	CR
Total LL Mercury	8 oz X1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	CR
Dissolved LL Mercury	8 oz X1	glass	filtered	None	4°C	48 hours/14 days ⁺	CR

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: Colleen

Reviewed By: CR

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 43
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-6-21	Samplers:	JUDD PARSON GEORGE GARNER
Time Start:	1200	Checked By:	Colleen Rust
Time Finish:	1420		

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	_____
DTW (ft. bTOC):	88.85		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	14 B103510
Water Level Meter:	SOLIST 102	Serial No.:	294991
Turbidity Meter:	HF 511 MICRO TPW	Serial No.:	202007902
Pump Type:	GEOTECH BLADDER PUMP	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10.0 Seconds Refill 5.0 Seconds Discharge ~80 psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL METALS	1	NITRIC		250 ml	
TOTAL LL MERCURY	1	NONE		8 OZ GLASS	
DISSOLVED LL MERCURY	1	NONE		8 OZ GLASS	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW43</u>	Sample ID: <u>0621 MW43 GW</u>	Sample Time: <u>1400</u>
Date: <u>6-6-21</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes: SAMPLE

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) ± 3%	DO (mg/L) ± 10%	pH ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>1212</u>	<u>START PURGING</u>									
<u>1300</u>	<u>0.1</u>	<u>8.28</u>	<u>176</u>	<u>8.07</u>	<u>6.29</u>	<u>172.1</u>	<u>11.27</u>	<u>88.8</u>	<u>0.1</u>	
<u>1305</u>	<u>0.6</u>	<u>7.56</u>	<u>155</u>	<u>5.03</u>	<u>6.32</u>	<u>117.2</u>	<u>12.73</u>	<u>88.89</u>	<u>0.1</u>	
<u>1310</u>	<u>1.1</u>	<u>6.93</u>	<u>149</u>	<u>3.69</u>	<u>6.37</u>	<u>113.9</u>	<u>17.76</u>	<u>88.90</u>	<u>0.1</u>	
<u>1315</u>	<u>1.6</u>	<u>6.43</u>	<u>144</u>	<u>3.02</u>	<u>6.40</u>	<u>95.8</u>	<u>24.32</u>	<u>88.90</u>	<u>0.1</u>	
<u>1320</u>	<u>2.1</u>	<u>6.42</u>	<u>142</u>	<u>2.71</u>	<u>6.43</u>	<u>91.3</u>	<u>26.15</u>	<u>88.90</u>	<u>0.1</u>	
<u>1325</u>	<u>2.6</u>	<u>6.25</u>	<u>142</u>	<u>2.66</u>	<u>6.44</u>	<u>88.0</u>	<u>24.48</u>	<u>88.90</u>	<u>0.1</u>	
<u>1330</u>	<u>3.1</u>	<u>6.08</u>	<u>142</u>	<u>2.67</u>	<u>6.47</u>	<u>88.7</u>	<u>22.41</u>	<u>88.90</u>	<u>0.1</u>	
<u>1335</u>	<u>3.6</u>	<u>6.08</u>	<u>143</u>	<u>2.54</u>	<u>6.48</u>	<u>86.7</u>	<u>19.60</u>	<u>88.90</u>	<u>0.1</u>	
<u>1340</u>	<u>4.1</u>	<u>6.06</u>	<u>143</u>	<u>2.46</u>	<u>6.49</u>	<u>88.2</u>	<u>13.76</u>	<u>88.89</u>	<u>0.1</u>	
<u>1345</u>	<u>4.6</u>	<u>6.14</u>	<u>143</u>	<u>2.43</u>	<u>6.50</u>	<u>86.7</u>	<u>10.87</u>	<u>88.91</u>	<u>0.1</u>	
<u>1350</u>	<u>5.1</u>	<u>6.20</u>	<u>144</u>	<u>2.41</u>	<u>6.51</u>	<u>83.3</u>	<u>6.59</u>	<u>88.90</u>	<u>0.1</u>	<u>Clear</u>
<u>1400</u>	<u>SAMPLED</u>									

Sampled?: Yes No

Initial of Sampler: JOR



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR / GG/JP

Sample Location: MW 43
Sample ID: 0621MW43 GW
Date: 6-6-21
Time: 1400
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<u>JP</u>
Total LL Mercury	8 oz	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<u>JP</u>
Dissolved LL Mercury	8 oz	glass	filtered	None	4°C	48 hours/14 days ⁺	<u>JP</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: JUDD PARSON

Reviewed By: Colleen Rust



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW44
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-7-21	Samplers:	J. PARSON
Time Start:	1120		
Time Finish:	1255	Checked By:	CR

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	34.14		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	59.7	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	11F102278
Water Level Meter:	HERON DIPPER T2	Serial No.:	WLM0747
Turbidity Meter:	HF SCI MICRO TPW	Serial No.:	202008376
Pump Type:	GEOTECH BUDDER	Serial No.:	NA

Purge Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 0.1 L/min

Sampling Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge +CPM ~35 psi

Sample Collection Information

Parameter	# Containers (fill in for each well)	Preservative	MS/MSD? :		Note
			Method	Container Type	
TAL METALS	1 250ML	NITRIC		Plastic	
TOTAL LL Hg	1 80Z	NONE		Glass	
DISS LL Hg	1 80Z	NONE	FILTERED	Glass	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW44	Sample ID: 0621MW44 GW	Sample Time: 1245
Date: 6-7-21	Dup. Sample ID: N/A	Dup. Sample Time: N/A

Notes: N/A

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1145	START PURGING									
1150	0.5	4.23	258	4.10	6.28	179.4	82.24	34.29	0.1	
1155	1.0	3.82	224	1.20	6.68	116.7	70.80	34.20	0.1	
1200	1.5	3.67	221	0.83	6.77	100.1	65.34	34.27	0.1	
1205	2.0	3.71	218	0.60	6.86	85.3	35.47	34.29	0.1	
1210	2.5	3.60	217	0.52	6.90	82.5	37.68	34.29	0.1	
1215	3.0	3.51	216	0.72	6.92	78.5	21.55	34.29	0.1	
1220	3.5	3.47	216	0.72	6.92	73.3	21.24	34.29	0.1	
1225	4.0	3.43	216	0.71	6.93	70.6	13.85	34.29	0.1	
1230	4.5	3.40	216	0.71	6.95	66.1	9.44	34.30	0.1	
1235	5.0	3.42	216	0.68	6.96	62.6	8.92	34.29	0.1	
1240	5.5	3.44	216	0.68	6.97	64.2	8.41	34.30	0.1	
1245	SAMPLED									

Sampled?: Yes No

Initial of Sampler: JORO



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri (Bladder)
Transducer: Yes (No)
Sample Team: CR/GG/JP

Sample Location: MW44
Sample ID: 0621MW44-GW
Date: 6-7-21
Time: 1245
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X 1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>[Signature]</i>
Total LL Mercury	8 oz X 1	glass	unfiltered	None	4°C	48 hours/14 days*	<i>[Signature]</i>
Dissolved LL Mercury	8 oz X 1	glass	filtered	None	4°C	48 hours/14 days*	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time. 3 BOTTLE

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: JUDD PARSON

Reviewed By: CR



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW45
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/7/21	Samplers:	GG
Time Start:	1040		
Time Finish:	1145	Checked By:	OPR

Well & Purge Information

TD (ft. bTOC):		ft	Screened Interval (ft.):	
DTW (ft. bTOC):	44.4	ft		66.82 top of pump
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:	~65	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	14B103510
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	MicroTRW	Serial No.:	202007902
Pump Type:	Bladder	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 8 Seconds Refill 7 Seconds Discharge @ ~37 psi @ 4 cpm

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 8 Seconds Refill 7 Seconds Discharge @ ~37 psi @ 4 cpm

Sample Collection Information			MS/MSD? :		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note	
TAL Metals	1	Nitric		Plastic		
LL Total Hg	1	NONE		DB Glass		
LL Dissolved Hg	1	NONE		DB Glass		
<i>OPR</i>						

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW45	Sample ID: 0621MW45GW	Sample Time: 1135
Date: 6/7/21	Dup. Sample ID: NA	Dup. Sample Time: NA

Notes: **Unable to remove/eliminate excess air in water return, Dissolved O₂ readings are questionable due to excess air in return line.**

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1050	START PURGING									Varied flow to get best results 8/7 and 37 psi Sample @ 1135
1105	3.90	109	10.27	6.77	196.3	6.79	44.53	0.10		
1110	3.65	106	10.04	6.74	196.6	7.00 7.75	44.53	0.10		
1115	3.51	105	9.79	6.76	197.0	7.45	44.53	0.10		
1120	3.42	105	9.59	6.75	197.5	6.09	44.53	0.10		
1125	3.47	105	9.01	6.76	196.7	4.63	44.53	0.10		
1130	3.55	105	8.91	6.77	196.1	4.23	44.53	0.10		

Sampled? : Yes No

Initial of Sampler: GG



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW ~~?~~
Pump Type: Peri ~~(Bladder)~~
Transducer: Yes ~~(No)~~
Sample Team: CR/GC/JP

Sample Location: MW 45
Sample ID: 0621MW45GW
Date: 6/7/21
Time: 1135
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	GH
Total LL Mercury	8 oz X1	glass	unfiltered	None	4°C	48 hours/14 days*	GH
Dissolved LL Mercury	8 oz X1	glass	filtered	None	4°C	48 hours/14 days*	GH

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: GL

Reviewed By: CE

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	<u>BLM Red Devil Mine</u>	Well ID.:	<u>MW 46</u>
Contract No.:	<u>140L6321C0001</u>	Project No.:	<u>BU06-007</u>
Date:	<u>6-7-21</u>	Samplers:	<u>J. PARSON</u>
Time Start:	<u>1005</u>		
Time Finish:	<u>1100</u>	Checked By:	<u>CR</u>

Well & Purge Information

TD (ft. bTOC):	<u>33.82</u>	ft	Screened Interval (ft.):	
DTW (ft. bTOC):		ft		
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:	<u>0.605</u>	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:	<u>47.50</u>	ft	Depth of Pump Intake	

Well Diameter	L/ft
5/8"	0.06
<u>2"</u>	<u>0.605</u>
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	<u>YSI 556 MPS</u>	Serial No.:	<u>11F102278</u>
Water Level Meter:	<u>HERON PIPPER T2</u>	Serial No.:	<u>WLM0747</u>
Turbidity Meter:	<u>HF SCI MICRO TPAW</u>	Serial No.:	<u>202008376</u>
Pump Type:	<u>BLADDER</u>	Serial No.:	<u>NA</u>

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge 4 CPM ~ 25 PSI

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL METALS	1	NITRIC		250ML PLASTIC	
TOTAL LL MERCURY	1	NONE		8 OZ GLASS	
DISSOLVED LL MERCURY	1	NONE		8 OZ GLASS	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW 46	Sample ID: 0621MW46GW	Sample Time: 1105
Date: 6-7-21	Dup. Sample ID: NA	Dup. Sample Time: NA

Notes: **AIR BUBBLES W WATER LINE FROM 3RD LINE CONNECTED TO WATER LINE**

Purging and *Stabilization Data										
Time (24 hrs)	Volume Removed (L)	Temp $\pm 3\% \text{ } ^\circ\text{C}$, min $\pm 0.2\text{ } ^\circ\text{C}$	Spec. Cond. ($\mu\text{S}/\text{cm}$) $\pm 3\%$	DO (mg/L) $\pm 10\%$	pH ± 0.1	ORP (mV) $\pm 10 \text{ mV}$	Turbidity (NTU) $\pm 10\%$	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1015	START PURGING									
1020	0.5	4.15	148	10.66	5.56	204.9	98.98	33.85	0.1	
1025	1.0	3.86	111	8.75	6.22	193.8	77.46	33.8	0.1	
1030	1.5	3.73	99	8.44	6.35	188.8	51.84	33.86	0.1	
1035	2.0	3.80	96	8.38	6.40	187.3	29.65	33.85	0.1	
1040	2.5	3.72	95	8.37	6.46	187.7	20.43	33.86	0.1	
1045	3.0	3.66	94	8.38	6.48	188.9	13.42	33.87	0.1	
1050	3.5	3.58	92	8.26	6.51	190.7	13.41	33.87	0.1	
1055	4.0	3.49	92	8.24	6.52	192.4	9.82	33.8	0.1	
1100	4.5	3.47	92	8.24	6.54	194.6	6.90	33.8	0.1	
1105	SAMPLED									

Sampled?: Yes No

Initial of Sampler: **JORD**



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR/GG/JP

Sample Location: MW 46
Sample ID: 0621MW46 GW
Date: 6-7-21
Time: 1105
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<u>JP</u>
Total LL Mercury	8 oz X1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<u>JP</u>
Dissolved LL Mercury	8 oz X1	glass	filtered	None	4°C	48 hours/14 days ⁺	

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: JUDD PARSON

Reviewed By: CR

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW47
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/7/21	Samplers:	GG
Time Start:	0855	Checked By:	<i>Colleen Ross</i>
Time Finish:	1020		

Well & Purge Information

TD (ft. bTOC):	57.47 ⁰⁴	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	37.03	ft	Top of Pump:	57.31
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	VSI 556 MPS	Serial No.:	M B103510
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	Micro TPW	Serial No.:	2020 07902
Pump Type:	Bladder	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 9 Seconds Refill 6 Seconds Discharge @ 33 psi = 0.125 L/min

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 9 Seconds Refill 6 Seconds Discharge @ 33 psi = 0.125 L/min

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL Metals	2	Nitric		Plastic	
LL Hg Total	2	None		DB Glass	
LL Hg Dissolved	2	None		DB Glass	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW47</u>	Sample ID: <u>0621 MW47 GW</u>	Sample Time: <u>1000</u>
Date: <u>6/7/21</u>	Dup. Sample ID: <u>0621 MW97 GW</u>	Dup. Sample Time: <u>1010</u>
Notes: <u>unable to get air out of water return line. Possible hole in teflon bladder.</u>		

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>0912</u>										<u>START PURGING</u>
										<u>adjusted regulator to get best flow</u>
<u>0936</u>		<u>3.52</u>	<u>100</u>	<u>9.01</u>	<u>6.65</u>	<u>197.1</u>	<u>2.64</u>	<u>37.03</u>	<u>0.125</u>	<u>bubbles in water return line</u>
<u>0941</u>		<u>3.51</u>	<u>99</u>	<u>8.99</u>	<u>6.66</u>	<u>197.4</u>	<u>2.43</u>	<u>37.03</u>	<u>0.125</u>	
<u>0946</u>		<u>3.51</u>	<u>100</u>	<u>9.00</u>	<u>6.67</u>	<u>197.7</u>	<u>2.21</u>	<u>37.03</u>	<u>0.125</u>	
<u>0951</u>		<u>3.43</u>	<u>99</u>	<u>8.92</u>	<u>6.71</u>	<u>198.4</u>	<u>1.30</u>	<u>37.03</u>	<u>0.125</u>	
<u>0956</u>		<u>3.42</u>	<u>99</u>	<u>8.93</u>	<u>6.73</u>	<u>199.1</u>	<u>1.31</u>	<u>37.03</u>	<u>0.125</u>	
										<u>Collect sample @ 1000 and duplicate @ 1010</u>

Sampled?: Yes No

Initial of Sampler: GEORGE GARNER



Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri ~~Bladder~~
Transducer: Yes ~~NO~~
Sample Team: CR/GG/JP

Groundwater Sample Collection Log

Sample Location: MW47
Sample ID: 0621MW47GW
Date: 6/7/21
Time: 1000
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X2	plastic	unfiltered	Nitric	ambient	180 days/28 days *	JS
Total LL Mercury	8 oz X2	glass	unfiltered	None	4°C	48 hours/14 days*	JS
Dissolved LL Mercury	8 oz X2	glass	filtered	None	4°C	48 hours/14 days*	JS

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Duplicate 0621 MW 47 GW @ 1010

6 BOTTLES

Logged By: GG

Reviewed By: Colleen Rust

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW49
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/6/2021	Samplers:	GG
Time Start:	1440	Checked By:	Colleen Rust
Time Finish:			

Well & Purge Information

TD (ft. bTOC):	63.75 (from report) ft	Screened Interval (ft.):	
DTW (ft. bTOC):	30.04 ft		
Water Column:	33.71 ft	TD-DTW=Water Column	
Liter/Foot:	0.605 L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	20.4 L	Water Column x L/ft	
Three Well Volumes:	61.2 L	Liters in Well x 3	
Sample Depth:		Depth of Pump Intake	

top of pump = 51.15 ft

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MP3	Serial No.:	11 F102278
Water Level Meter:	clipper-T2	Serial No.:	WLM 0747
Turbidity Meter:	Micro TPW	Serial No.:	202008376
Pump Type:	GEOTECH BUNNOR	Serial No.:	NA

Purge Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge @ 30 psi and 4 gpm

Sampling Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge @ 30 psi and 4 gpm

Sample Collection Information

MS/MSD? : Yes No

Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL Metals	1	Nitric		Plastic	
LL Hg Total	1			DB Glass	
LL Hg Dissolved	1			DB Glass	filtered

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW 59</u>	Sample ID: <u>0621 MW 49 RW</u>	Sample Time: <u>1525</u>
Date: <u>6/6/2021</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes: SAMPLE

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>1440</u>	START PURGING									
1440							NA		0.125	
<u>1455</u>	<u>1.875</u>	<u>6.27</u>	<u>75</u>	<u>5.60</u>	<u>6.16</u>	<u>129.7</u>	<u>3.85</u>	<u>30.04</u>	<u>0.125</u>	
<u>1500</u>	<u>2.5</u>	<u>6.22</u>	<u>73</u>	<u>5.66</u>	<u>6.15</u>	<u>133.3</u>	<u>4.54</u>	<u>30.04</u>	<u>0.125</u>	
<u>1505</u>	<u>3.125</u>	<u>6.06</u>	<u>72</u>	<u>5.72</u>	<u>6.12</u>	<u>140.4</u>	<u>2.98</u>	<u>30.04</u>	<u>0.125</u>	
<u>1510</u>	<u>3.75</u>	<u>5.95</u>	<u>71</u>	<u>5.70</u>	<u>6.12</u>	<u>141.9</u>	<u>3.69</u>	<u>30.04</u>	<u>0.125</u>	
<u>1515</u>	<u>4.375</u>	<u>5.91</u>	<u>71</u>	<u>5.69</u>	<u>6.11</u>	<u>144.9</u>	<u>3.93</u>	<u>30.04</u>	<u>0.125</u>	
<u>1520</u>	<u>5</u>	<u>6.04</u>	<u>71</u>	<u>5.65</u>	<u>6.10</u>	<u>147.3</u>	<u>2.57</u>	<u>30.04</u>	<u>0.125</u>	
										<u>Sampled at 1525. (3 bottles)</u>

ODS

Sampled?: Yes No

Initial of Sampler: NA



Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri ~~Bladder~~
Transducer: Yes / ~~No~~
Sample Team: CR/GG/JP

Groundwater Sample Collection Log

Sample Location: MW 49
Sample ID: 0621MW GW
Date: 6/6/21
Time: 15 25
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	plastic	unfiltered	Nitric	ambient	180 days/28 days *	GG
Total LL Mercury	8 oz	glass	unfiltered	None	4°C	48 hours/14 days ⁺	GG
Dissolved LL Mercury	8 oz	glass	filtered	None	4°C	48 hours/14 days ⁺	GG

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: GG

Reviewed By: Colleen Rust



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW-50
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/17/2021	Samplers:	CR
Time Start:	1530		
Time Finish:	1650	Checked By:	JODD PARSON

Well & Purge Information

TD (ft. bTOC):	21.42 TOP OF PUMP	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	47.66 @ 1531	ft		
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI	Serial No.:	11F102278
Water Level Meter:	DIPPER 2	Serial No.:	WLM0747
Turbidity Meter:	MICRO TRW	Serial No.:	202008376
Pump Type:	GREEN BUDDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 50 to 60 psi

Sample Collection Information

Parameter	# Containers (fill in for each well)	Preservative	Method	MS/MSD? :	
				Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
TAL METALS	1 250ML	NONE			
TOTAL LL Hg	1 202	NONE			
Diss. LL Hg	1 202	NONE			

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW-50</u>	Sample ID: <u>0621MWS0 GW</u>	Sample Time: <u>1650</u>
Date: <u>6/7/2001</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes: AIR BOBBLES IN WATER LINE

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1545	0.00	5.37	388	4.26	6.69	105.2	55.36	47.92	0.075	gal/min
1550	0.075	5.24	387	4.13	6.70	98.0	49.48	47.92	0.075	AIR BOBBLES IN WATER LINE
1555		4.96	384	3.77	6.72	88.3	63.94	47.95	0.10	INCREASED CYCLES TO 10/5 ~ 50psi
1600		4.93	384	3.54	6.72	85.6	60.94	49.00	0.050	DECREASED CYCLES 12/3 ~ 50psi
1605		5.44	390	4.31	6.75	82.3	56.79	48.00	0.050	
1610		5.71	393	4.44	6.75	81.4	42.90	48.02	0.050	Algae Brown/RED FLOATING IN WATER
1615		5.62	391	4.50	6.76	79.9	31.95	48.05	0.050	NOTE SUN CAME OUT and temp is rising in shade
1620		5.53	390	4.43	6.77	79.1	35.51	48.10	0.050	
1625		5.67	389	4.51	6.77	78.2	31.50	48.11	0.050	
1630		5.44	389	4.52	6.77	78.3	25.82	48.12	0.050	WILL PUMP AN HOUR AND SAMPLE, NTUS around 30 ^{to see} NTUS Turbidity
1635		5.40	389	4.65	6.77	78.2	23.11	48.12	0.050	STILL MORE BROWN/RED ALGAE IN WATER
1640		5.50	391	4.78	6.77	78.0	22.92	48.14	0.050	
1645							20.51			
1650	SAMPLED									

Sampled?: Yes No

Initial of Sampler: CR



Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: GW
 Pump Type: Peri / bladder
 Transducer: Yes / No
 Sample Team: CR/GG/JP

DOWNLOADED
 6/17/2021

Groundwater Sample Collection Log

Sample Location: MW 50
 Sample ID: 0621MW 50 GW
 Date: 6/17/21
 Time: 1650
 COC #: _____
 Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL <u>X1</u>	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<u>CR</u>
Total LL Mercury	8 oz <u>X1</u>	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<u>CR</u>
Dissolved LL Mercury	8 oz <u>X1</u>	glass	filtered	None	4°C	48 hours/14 days ⁺	<u>CR</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By:

Colleen Rust

Reviewed By:

JUDD PARSON



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW51
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-7-21	Samplers:	C. RUST J. PARSON
Time Start:	1730	Checked By:	CR
Time Finish:	1900		

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):
DTW (ft. bTOC):	38.95	
Water Column:	ft	TD-DTW=Water Column
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table
Liters in Well:	L	Water Column x L/ft
Three Well Volumes:	L	Liters in Well x 3
Sample Depth:	66.05	ft Depth of Pump Intake

Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI	Serial No.:	11F102278
Water Level Meter:	DIPPER 2	Serial No.:	WLM0747
Turbidity Meter:	MICRO TFW	Serial No.:	202008376
Pump Type:	COEDTECH BLOWER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge ~0.15 L/min

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge ~0.15 L/min

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL METALS	1 250ML	NITRIC		Plastic	
TOTAL LL Hg	1 8oz	NONE		glass	
DISS. LL Hg	1 8oz	NONE		glass	



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri Bladder
Transducer: Yes / No
Sample Team: CR/GG/JP

Sample Location: MW 51
Sample ID: 0621MW51 GW
Date: 6-7-21
Time: 1950
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

DOWNLOADED
6/7/2021

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>[Signature]</i>
Total LL Mercury	8 oz X1	glass	unfiltered	None	4°C	48 hours/14 days*	<i>[Signature]</i>
Dissolved LL Mercury	8 oz X1	glass	filtered	None	4°C	48 hours/14 days*	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time. 3 BOTTLES
 + According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: J. JOD PARSON

Reviewed By: CDZ

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW52
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-7-21	Samplers:	J. PARSON
Time Start:	0845		C. RUST
Time Finish:	0945	Checked By:	CR

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	31.07		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	45.70	ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	11F102278
Water Level Meter:	HERON DIPPER T2	Serial No.:	WLM 0747
Turbidity Meter:	HF SCI MICRO TPW	Serial No.:	202008376
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 11 Seconds Refill
 4 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 11 Seconds Refill
 4 Seconds Discharge
4 cpm ~ 30 psi

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL METALS	1	NITRIC		250 ml PLASTIC	✓
TOTAL LL MERCURY	1	NONE		802 GLASS	✓
DISSOLVED LL MERCURY	1	NONE		802 GLASS	✓



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR/GG/IP

Sample Location: MW 52
Sample ID: 0621MW52 GW
Date: 6-7-21
Time: 0940
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL x 1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<u>CR</u>
Total LL Mercury	8 oz x 1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<u>CR</u>
Dissolved LL Mercury	8 oz x 1	glass	filtered	None	4°C	48 hours/14 days ⁺	<u>CR</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: JUDD PARSON

Reviewed By: CR

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW-53
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	1355	Samplers:	PTG CR
Time Start:	6/7/2021	Checked By:	JUDD PARSON
Time Finish:	1500		

Well & Purge Information			
TD (ft. bTOC):	49.9 top of pump	ft	Screened Interval (ft.):
DTW (ft. bTOC):	30.92 1355	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI	Serial No.:	11F102278
Water Level Meter:	DOUBLE DIPPER	Serial No.:	WLM0747
Turbidity Meter:	MICR TPW	Serial No.:	202008376
Pump Type:	GEOTECH BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 13 Seconds Refill 2 Seconds Discharge 0.054/min

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 13 Seconds Refill 2 Seconds Discharge 0.054/min

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note			
TAL METALS	1	NITRIC		250ML				
TOTAL LC Hg	1	NONE		80Z				
DISS. LC Hg	1	NONE	FILTERED	80Z				

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW-53	Sample ID: 0621MW53GW	Sample Time: 1435
Date: 6/7/2021	Dup. Sample ID: NA	Dup. Sample Time: NA
Notes:		

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1355	START PURGING									
1400	0.05	5.13	124	8.27	6.2	185.6	13.40	31.10	0.05 L/min	Clear
1405	0.25	4.96	114	8.19	6.25	185.3	12.72	31.12	0.05	no air bubbles in water line
1410	0.50	4.82	102	8.10	6.36	182.2	10.85	31.15	0.05	
1415	0.75	4.73	97	7.95	6.40	183.5	9.65	31.17	0.05	
1420	1.00	4.66	95	7.76	6.43	185.9	8.87	31.17	0.05	
1425	1.25	4.69	95	7.67	6.45	189.2	7.99	31.17	0.05	
1430	1.50	4.64	95	7.57	6.48	194.6	7.02	31.19	0.05	
1435	SAMPLED									
	<i>(Diagonal line)</i>									
	<i>(Diagonal line)</i>									
	<i>(Diagonal line)</i>									
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	<i>(Diagonal line)</i>									

Sampled?: Yes No

Initial of Sampler: [Signature]



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes/ No *DOWNLOADED 6/7/2021*
Sample Team: CR/GG/JP

Sample Location: MW 53
Sample ID: 0621MW53 GW
Date: 6/7/2021
Time: 1435
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>CR</i>
Total LL Mercury	8 oz	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<i>CR</i>
Dissolved LL Mercury	8 oz	glass	filtered	None	4°C	48 hours/14 days ⁺	<i>CR</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: *Colleen Rust*

Reviewed By: *JUDY PARSON*

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW54
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/7/21	Samplers:	CG
Time Start:	1735	Checked By:	Colleen Ross
Time Finish:	1905		

Well & Purge Information			
TD (ft. bTOC):	ft	Screened Interval (ft.):	ft
DTW (ft. bTOC):	29.65	Top of Pump =	39.85
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	1413103510
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	MicroTPW	Serial No.:	202007902
Pump Type:	Bladder Pump	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge 30 psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge 30 psi

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL Metals	1	Nitric		Plastic 250mL	
LL Mg Total	1	None		DB Glass	
LL Mg Dissolved	1	None		DB Glass	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW54</u>	Sample ID: <u>0621 MW54CW</u>	Sample Time: <u>1845</u>
Date: <u>6/7/21</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>
Notes: <u>Pumped for first 30 min to remove algae from pump.</u>		

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>1745</u>										<u>START PURGING</u>
<u>1815</u>		<u>4.77</u>	<u>245</u>	<u>3.24</u>	<u>6.98</u>	<u>37.2</u>	<u>45.42</u>	<u>29.70</u>	<u>0.075</u>	<u>Reddish orange algae is abundant even at 0.075 L/min</u>
<u>1820</u>		<u>4.35</u>	<u>243</u>	<u>3.70</u>	<u>6.97</u>	<u>34.7</u>	<u>33.21</u>	<u>29.70</u>	<u>0.075</u>	
<u>1825</u>		<u>4.40</u>	<u>243</u>	<u>3.10</u>	<u>6.99</u>	<u>31.4</u>	<u>24.73</u>	<u>29.70</u>	<u>0.075</u>	
<u>1830</u>		<u>4.29</u>	<u>242</u>	<u>3.06</u>	<u>7.00</u>	<u>29.3</u>	<u>17.20</u>	<u>29.70</u>	<u>0.075</u>	
<u>1835</u>		<u>4.27</u>	<u>242</u>	<u>3.03</u>	<u>7.00</u>	<u>28.6</u>	<u>16.85</u>	<u>29.70</u>	<u>0.075</u>	
<u>1834</u>		<u>4.23</u>	<u>242</u>	<u>3.01</u>	<u>7.01</u>	<u>27.1</u>	<u>15.69</u>	<u>29.70</u>	<u>0.075</u>	
<u>1837</u>		<u>4.20</u>	<u>242</u>	<u>2.99</u>	<u>7.02</u>	<u>26.4</u>	<u>10.47</u>	<u>29.70</u>	<u>0.075</u>	
<u>1840</u>		<u>4.18</u>	<u>242</u>	<u>2.92</u>	<u>7.02</u>	<u>25.6</u>	<u>9.94</u>	<u>29.70</u>	<u>0.075</u>	
<u>1843</u>		<u>4.17</u>	<u>243</u>	<u>2.93</u>	<u>7.03</u>	<u>25.1</u>	<u>9.04</u>	<u>29.70</u>	<u>0.075</u>	
										<u>Sample @ 1845</u>

Sampled?: Yes No

Initial of Sampler: EA



Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR/GG/JP

DOWNLOADED
 6/7/21

Groundwater Sample Collection Log

Sample Location: MW 54
Sample ID: 0621MW54 GW
Date: 6/2/21
Time: 1845
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL x 1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	HL
Total LL Mercury	8 oz x 1	glass	unfiltered	None	4°C	48 hours/14 days*	HL
Dissolved LL Mercury	8 oz x 1	glass	filtered	None	4°C	48 hours/14 days*	HL

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: HL

Reviewed By: CR

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW55
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/8/21	Samplers:	GG
Time Start:	0930	Checked By:	CDR
Time Finish:	1155		

Well & Purge Information			
TD (ft. bTOC):	24.09	ft	Screened Interval (ft.):
DTW (ft. bTOC):	13.06	ft	
Water Column:	11.03	ft	TD-DTW=Water Column
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table
Liters in Well:	6.67	L	Water Column x L/ft
Three Well Volumes:	20.02	L	Liters in Well x 3
Sample Depth:	20	ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556MPS	Serial No.:	14B10 3510
Water Level Meter:	Solinst 102M	Serial No.:	294 991
Turbidity Meter:	MicroTRU	Serial No.:	2020 07902
Pump Type:	Alexis Peristaltic	Serial No.:	34243 90048

Purge Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information			MS/MSD? :	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAL Metals	2 at 3	Nitric		Plastic 250mL	
Total Hg 2L	2 at 3	NONE		DB Glass 8oz	
Dissolved Lb Hg	2 at 3	NONE		DB Glass 8oz	
<div style="position: relative; width: 100%; height: 100%;"> CDR </div>					

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW 55</u>	Sample ID: <u>0621 MW55 GW</u>	Sample Time: <u>1120</u>
Date: <u>6/8/21</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>
Notes: <u>red-orange algae in well.</u> <u>MS/MSD</u>		

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp $\pm 3\%$ °C, min $\pm 0.2^\circ\text{C}$	Spec. Cond. ($\mu\text{S}/\text{cm}$) $\pm 3\%$	DO (mg/L) $\pm 10\%$	pH ± 0.1	ORP (mV) $\pm 10\text{ mV}$	Turbidity (NTU) $\pm 10\%$	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>1015</u>	<u>START PURGING</u>									
<u>1020</u>	<u>0.625</u>	<u>5.09</u>	<u>233</u>	<u>1.01</u>	<u>5.49</u>	<u>103.1</u>	<u>130.9</u>	<u>13.23</u>	<u>0.125</u>	
<u>1025</u>	<u>1.25</u>	<u>4.42</u>	<u>101</u>	<u>1.41</u>	<u>5.85</u>	<u>75.3</u>	<u>109.2</u>	<u>13.23</u>	<u>0.125</u>	<u>Drained flow thru cell of algae to get more accurate reading.</u>
<u>1030</u>	<u>1.875</u>	<u>4.35</u>	<u>186</u>	<u>1.04</u>	<u>5.91</u>	<u>71.7</u>	<u>100.6</u>	<u>13.23</u>	<u>0.125</u>	
<u>1033</u>	<u>2.5</u>	<u>4.41</u>	<u>184</u>	<u>0.63</u>	<u>5.95</u>	<u>72.4</u>	<u>93.05</u>	<u>13.23</u>	<u>0.125</u>	
<u>1038</u>	<u>2.875</u>	<u>4.49</u>	<u>179</u>	<u>0.32</u>	<u>6.00</u>	<u>66.4</u>	<u>84.65</u>	<u>13.23</u>	<u>0.125</u>	
<u>1043</u>	<u>3.5</u>	<u>4.49</u>	<u>173</u>	<u>0.30</u>	<u>6.04</u>	<u>59.4</u>	<u>68.50</u>	<u>13.23</u>	<u>0.125</u>	
<u>1048</u>	<u>4.125</u>	<u>4.47</u>	<u>167</u>	<u>0.31</u>	<u>6.06</u>	<u>61.9</u>	<u>54.72</u>	<u>13.23</u>	<u>0.125</u>	
<u>1053</u>	<u>4.75</u>	<u>4.58</u>	<u>162</u>	<u>0.45</u>	<u>6.10</u>	<u>60.7</u>	<u>44.63</u>	<u>13.23</u>	<u>0.125</u>	
<u>1058</u>	<u>5.375</u>	<u>4.53</u>	<u>159</u>	<u>0.46</u>	<u>6.13</u>	<u>61.0</u>	<u>46.63</u>	<u>13.23</u>	<u>0.125</u>	
<u>1103</u>	<u>6.00</u>	<u>4.37</u>	<u>154</u>	<u>0.47</u>	<u>6.16</u>	<u>65.0</u>	<u>39.06</u>	<u>13.23</u>	<u>0.125</u>	
<u>1106</u>	<u>6.375</u>	<u>4.40</u>	<u>153</u>	<u>0.46</u>	<u>6.17</u>	<u>68.1</u>	<u>36.30</u>	<u>13.23</u>	<u>0.125</u>	
<u>1109</u>	<u>6.75</u>	<u>4.46</u>	<u>152</u>	<u>0.45</u>	<u>6.18</u>	<u>69.4</u>	<u>33.96</u>	<u>13.23</u>	<u>0.125</u>	
<u>1112</u>	<u>7.125</u>	<u>4.42</u>	<u>152</u>	<u>0.51</u>	<u>6.19</u>	<u>71.7</u>	<u>27.40</u>	<u>13.23</u>	<u>0.125</u>	
<u>1115</u>	<u>7.5</u>	<u>4.47</u>	<u>151</u>	<u>0.54</u>	<u>6.20</u>	<u>72.8</u>	<u>29.21</u>	<u>13.23</u>	<u>0.125</u>	
<u>1118</u>	<u>7.875</u>	<u>4.50</u>	<u>150</u>	<u>0.54</u>	<u>6.21</u>	<u>74.5</u>	<u>26.79</u>	<u>13.23</u>	<u>0.125</u>	
										<u>Sample @ 1120 MS/MSD</u>
<u>OK</u>										

Sampled?: Yes No

Initial of Sampler: AS



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Per / Bladder
Transducer: Yes / ~~No~~
Sample Team: CR/GG/JP

Sample Location: MW55
Sample ID: 0621MW55 GW
Date: 6/8/21
Time: 1130
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL x 3	plastic	unfiltered	Nitric	ambient	180 days/28 days *	GH
Total LL Mercury	8 oz x 3	glass	unfiltered	None	4°C	48 hours/14 days*	GH
Dissolved LL Mercury	8 oz x 3	glass	filtered	None	4°C	48 hours/14 days*	GH

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

9 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

MS/MSD AND SAMPLE

Logged By: GH

Reviewed By: CR



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW56
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-6-21	Samplers:	J. PARSON C. RUST
Time Start:	1440	Checked By:	COLLEEN RUST
Time Finish:	1547		

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	35.07		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	65.56	Depth of Pump Intake	

Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	14B103510
Water Level Meter:	SOLINST102	Serial No.:	294991
Turbidity Meter:	HF SCI MICRO TPW	Serial No.:	202007902
Pump Type:	GEO TECH BLADDER PUMP	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge @ ~40 psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TAM METALS	1	NITRIC		250ML	
TOTAL LL MERCURY	1	NONE		8oz GLASS	
DISSOLVED LL MERCURY	1	NONE		8oz GLASS	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW56	Sample ID: 06Z1MW56 GW	Sample Time: 1540
Date: 6-6-21	Dup. Sample ID:	Dup. Sample Time:

Notes: **LOTS OF AIR IN WATER LINE FROM 3RD HOSE CONNECTED TO WATER LINE.**

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1450	START PURGING									
1455	0.5	6.88	146	34.57	6.76	173.6	54.21	35.35	0.1	Clear
1500	1.0	6.24	267	9.41	6.87	128.0	31.09	35.42	0.1	
1505	1.5	5.36	261	4.61	6.73	123.1	22.69	35.47	0.1	
1510	2.0	4.94	260	4.89	6.72	125.7	14.90	35.46	0.1	
1515	2.5	4.77	263	3.62	6.72	130.6	13.81	35.47	0.1	
1520	3.0	4.67	266	3.74	6.72	133.7	10.38	35.53	0.1	
1525	3.5	4.60	269	3.42	6.72	136.9	7.92	35.55	0.1	
1530	4.0	4.67	272	3.66	6.73	137.3	7.29	35.60	0.1	
1535	4.5	4.57	273	3.27	6.73	138.9	8.35	35.57	0.1	Clear
1540	SAMPLED									

Sampled?: Yes No

Initial of Sampler: **SOJ**



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CRYGG/IP

Sample Location: MW56
Sample ID: 0621MW56 GW
Date: 6-8-21
Time: 1540
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

DOWNLOADED
 6-5-21
 REPLACES 6-6-21

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>[Signature]</i>
Total LL Mercury	8 oz	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<i>[Signature]</i>
Dissolved LL Mercury	8 oz	glass	filtered	None	4°C	48 hours/14 days ⁺	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time. 3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: JUDD PARSON

Reviewed By: *[Signature]*



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	NAW57
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-8-21	Samplers:	J. PARSON L. RUST
Time Start:	0925	Checked By:	CPR
Time Finish:	1028		

Well & Purge Information

TD (ft. bTOC):	48.10 Top of Pump ft	Screened Interval (ft.):	
DTW (ft. bTOC):	32.88 @ 930 ft		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	11F102278
Water Level Meter:	HERON DIPPER TZ	Serial No.:	WLM0747
Turbidity Meter:	HF SCIENTIFIC MICRO TPW	Serial No.:	202008376
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 4 cpm ~ 28 psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge

Sample Collection Information			MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note
TOTAL METALS	1	NITRIC		250 ml PLASTIC	✓
TOTAL LIQUID MERCURY	1	NONE		8 OZ GLASS	✓
DISSOLVED LIQUID MERCURY	1	NONE		8 OZ GLASS	✓
<div style="position: relative; width: 100%; height: 100%;"> CPR </div>					

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW57 Sample ID: 0621MW57GW Sample Time: 1015
 Date: 6-8-21 Dup. Sample ID: NA Dup. Sample Time: NA
 Notes: NA

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) ± 3%	DO (mg/L) ± 10%	pH ± 0.1	ORP (mV) ± 10 mV	Turbidity (NTU) ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
0930	START PURGING									
0940	0.5	4.96	112	14.85	4.53	279.0	6.35	32.88	0.1	
0945	1.0	4.60	70	11.25	5.18	264.8	6.27	32.96	0.1	
0950	1.5	4.46	56	10.94	5.47	264.9	5.19	32.95	0.1	
0955	2.0	4.30	50	10.73	5.63	267.8	5.01	32.97	0.1	
1000	2.5	4.22	48	10.72	5.76	263.4	5.04	32.96	0.1	
1005	3.0	4.20	46	10.60	5.84	254.7	7.45	32.96	0.1	
1010	3.5	4.17	45	10.66	5.89	248.0	8.21	32.98	0.1	
1015	SAMPLED									

Sampled?: Yes No

Initial of Sampler: JRP



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR/GG/JP

Sample Location: MW 57
Sample ID: 0621MW57 GW
Date: 6-8-21
Time: 1015
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

DOWNLOADED
6-8-21

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>[Signature]</i>
Total LL Mercury	8 oz X1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<i>[Signature]</i>
Dissolved LL Mercury	8 oz X1	glass	filtered	None	4°C	48 hours/14 days ⁺	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: Judd Parson

Reviewed By: CR

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MWSEB
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6/2/21	Samplers:	GG
Time Start:	1200	Checked By:	CR
Time Finish:			

Well & Purge Information

TD (ft. bTOC):	60.70	ft	top of pump = 47.46	Screened Interval (ft.):	
DTW (ft. bTOC):	30.69	ft			
Water Column:	30.01	ft		TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft		See ***Well Volume Calculation*** table	
Liters in Well:	18	L		Water Column x L/ft	
Three Well Volumes:	54	L		Liters in Well x 3	
Sample Depth:	~ 49	ft		Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	141310 3510
Water Level Meter:	Solinst 102	Serial No.:	294921
Turbidity Meter:	Micro TPW	Serial No.:	202007902
Pump Type:	Bladder	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: Bailer

Bladder Pump :
 Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: Bailer

Bladder Pump :
 Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information

Parameter	# Containers (fill in for each well)	Preservative	MS/MSD? :		Note
			Method	Container Type	
JAL Metals	1	Nitric		Plastic	
LL Total Hg	1	None		DB Glass	
LL Dissolved Hg	1	None		DB Glass	

CR

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MWS8 Sample ID: 0621MWS8G-W Sample Time: 1700
 Date: 6/7/21 Dup. Sample ID: NA Dup. Sample Time: NA

Notes: SAMPLED WITH BAUER

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1528										
1500	1 L	4.13	130	5.44	6.40	190.5	200.4	30.67	NA	
1515	10 L	3.75	151	2.25	6.83	96.2	71.81	30.69	NA	
1530	18 L	3.75	152	2.21	7.05	56.0	101.7	31	NA	
1535	27	3.80	152	2.30	7.07	53.2	138.2	31.0	NA	
1544	36	3.98	154	2.21	7.07	49.9	102.1	33.6	NA	
1554	45	3.84	155	2.18	7.11	48.3	144.4	34.2	NA	
1600	54	3.89	155	2.20	7.12	46.3	190.1	35.6	NA	
1605	63	3.80	156	2.17	7.16	46.8	188.7	36.6	NA	
1610	72	3.86	157	2.15	7.17	47.4	28.68	41.02	NA	
1625	81	3.97	154	2.19	7.24	48.2	77.93	38.22	NA	
1633	90	3.84	155	2.14	7.14	45.4	21.54	34.90	NA	
1640	99	3.82	154	2.21	7.18	49.5	9.16	35.13	NA	
1648	108	3.96	162	2.25	7.22	42.3	68.78	34.81	NA	
1700										SAMPLE 1, 6 WELLBORE VOLUMES REMOVED SAMPLED WITH BAUER NOT BLASSER

Sampled?: Yes No

Initial of Sampler: JSJ



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri-Bladder *Bailer*
Transducer: Yes/No
Sample Team: CR/GG/JP

Sample Location: MW *S8*
Sample ID: 0621MWS8 GW
Date: 6/7/21
Time: 1700
COC #:
Trip Blank ID: LL Mercury (only)

*DOWNLOADED
6/7/2021*

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL $\times 1$	plastic	unfiltered	Nitric	ambient	180 days/28 days *	<i>MM</i>
Total LL Mercury	8 oz $\times 1$	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<i>MM</i>
Dissolved LL Mercury	8 oz $\times 1$	glass	filtered	None	4°C	48 hours/14 days ⁺	<i>MM</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

3 BOTTLES

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: *MM*

Reviewed By: *CR*

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW59
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	6-8-21	Samplers:	J. PARSON C. RUST
Time Start:	1040 1350	Checked By:	CR
Time Finish:	1545		

Well & Purge Information			
TD (ft. bTOC):	151.20 Top of Pump	ft	Screened Interval (ft.):
DTW (ft. bTOC):	133.22	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:	151.20	ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI	Serial No.:	11F102278
Water Level Meter:	Solinat	Serial No.:	294991
Turbidity Meter:	Mico TPW	Serial No.:	202008376
Pump Type:	GEOTECH BLADDER	Serial No.:	NA

Purge Method:	★ CPMI 85 to 90 PSI		
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial	<input type="checkbox"/> Other:	
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>30</u> Seconds Refill <u>30</u> Seconds Discharge		

Sampling Method:	<input type="checkbox"/> Peristaltic Pump <input type="checkbox"/> Inertial <input type="checkbox"/> Other:		
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge		

Sample Collection Information				MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers (fill in for each well)	Preservative	Method	Container Type	Note	
TAL Metals	1 250mL	NITRIC		Plastic		
TOTAL LL Hg	1 250mL 80Z	NONE		Glass		
Diss LL Hg	1 80Z	NONE		Glass		

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW 59</u>	Sample ID: <u>0021 MW 59 GW</u>	Sample Time: <u>1505</u>
Date: <u>6</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes: NA

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1400	0.015	8.39	394	11.56	7.19	115.3	9.49	133.21	0.015	Lots of Bubbles in Line, Turbidity of Water in Line
1405		8.76	400	9.67	7.11	97.8	105.5	133.21	0.015	
1410		8.88	403	8.92	7.08	88.5	112.5	133.29	0.015	
1415		8.95	405	8.12	7.08	83.2	165.3	133.36	0.015	
1420		7.11	408	7.87	7.06	79.5	141.6	133.22	0.015	Sun came out, in shade but heating up
1425		7.18	410	7.22	7.05	73.3	129.7	133.22	0.015	Floating Red/Brown Algae
1430		9.16	410	6.97	7.05	69.8	141.3	133.24	0.015	
1435		9.26	411	6.39	7.04	65.1	134.1	133.24	0.015	
1440		9.27	412	6.40	7.05	64.1	129.4	133.24	0.015	Red Brown Algae in Water, Higher Turbidity
1445		9.51	413	6.43	7.03	58.5	125.8	133.24	0.015	
1450		9.52	414	6.47	7.03	56.9	112.5	133.24	0.015	Red Brown Algae
1455		9.75	417	6.45	7.02	54.5	127.5	133.24	0.015	" "
1500		9.85	418	5.97	7.03	53.8	112.2	133.24	0.015	" "
1505	SAMPLED									

Sampled?: Yes No

Initial of Sampler: COL



Groundwater Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: GW
Pump Type: Peri / Bladder
Transducer: Yes / No
Sample Team: CR/GG/JP

Sample Location: MW 59
Sample ID: 0621MW 59GW
Date: 6/18/2021
Time: 1505
COC #: _____
Trip Blank ID: _____ LL Mercury (only)

IN MW-39 NEXT
 TO MW-59
 DOWNWATER

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/ Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	CR
Total LL Mercury	8 oz X1	glass	unfiltered	None	4°C	48 hours/14 days*	CR
Dissolved LL Mercury	8 oz X1	glass	filtered	None	4°C	48 hours/14 days*	CR

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time. 3 BOTTLES
 + According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

SAMPLE ONLY

Logged By: Colleen

Reviewed By: CR

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW06
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8/29/2021	Samplers:	GG
Time Start:	1515	Checked By:	R. WITTLER
Time Finish:	No 20		

Well & Purge Information

TD (ft. bTOC):	26.17	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	19.00	ft		
Water Column:	7.14	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	4.32	L	Water Column x L/ft	
Three Well Volumes:	12.96	L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	106101486
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	Micro TPW	Serial No.:	201810324
Pump Type:	Alexis Peristaltic	Serial No.:	90048

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information

Parameter	# Containers	Filtered?	Preservative	MS/MSD? :		Initials
				Method	Container Type	
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	GG
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	GG
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	GG

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW06</u>	Sample ID: <u>0821 MW06GW</u>	Sample Time: <u>1555</u>
Date: <u>8/29/2021</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time:

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1520	START PURGING									
1530	1.0	6.16	272	2.80	6.39	75.5	36.90	19.03	0.1	
1535	1.5	5.84	255	0.92	6.60	57.2	16.30	19.03	0.1	
1540	2.0	5.74	245	0.68	6.67	55.4	13.43	19.03	0.1	
1544	2.4	5.62	242	0.62	6.70	54.5	9.51	19.03	0.1	
1548	2.8	5.58	241	0.62	6.72	49.2	7.30	19.03	0.1	
1552	3.2	5.54	240	0.58	6.74	47.8	9.58	19.03	0.1	
1555										Collect Sample 0821 MW06GW

Sampled? : Yes No

Initial of Sampler: NA

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MWO9
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-29-21	Samplers:	J PARSON
Time Start:	1115		R WITTLER
Time Finish:	1220	Checked By:	R Wittler

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	25.30		
Water Column:	27.71	TD-DTW=Water Column	
Liter/Foot:	0.605	See ***Well Volume Calculation*** table	
Liters in Well:		Water Column x L/ft	
Three Well Volumes:		Liters in Well x 3	
Sample Depth:		Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	09E100724
Water Level Meter:	SONST 101	Serial No.:	77297
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 13 Seconds Refill 2 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 13 Seconds Refill 2 Seconds Discharge @ 30 PSI

Sample Collection Information

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	MS/MSD? :	
						Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic		
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass		
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass		

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW09</u>	Sample ID: <u>0321MW09GW</u>	Sample Time: <u>1215</u>
Date: <u>8-29-21</u>	Dup. Sample ID:	Dup. Sample Time:

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>1135</u>	<u>START PURGING</u>									
<u>1140</u>	<u>1.0</u>	<u>5.76</u>	<u>166</u>	<u>1.70</u>	<u>6.75</u>	<u>3.6</u>	<u>21.44</u>	<u>25.30</u>	<u>0.2</u>	
<u>1145</u>	<u>2.0</u>	<u>5.53</u>	<u>162</u>	<u>0.80</u>	<u>6.53</u>	<u>4.2</u>	<u>20.90</u>	<u>26.15</u>	<u>0.2</u>	
<u>1148</u>	<u>2.6</u>	<u>5.47</u>	<u>161</u>	<u>0.72</u>	<u>6.46</u>	<u>4.0</u>	<u>23.21</u>	<u>26.15</u>	<u>0.2</u>	
<u>1151</u>	<u>3.2</u>	<u>5.58</u>	<u>160</u>	<u>0.74</u>	<u>6.40</u>	<u>2.6</u>	<u>24.10</u>	<u>26.20</u>	<u>0.2</u>	
<u>1154</u>	<u>3.8</u>	<u>5.52</u>	<u>161</u>	<u>0.75</u>	<u>6.39</u>	<u>0.3</u>	<u>21.21</u>	<u>26.25</u>	<u>0.2</u>	
<u>1157</u>	<u>4.4</u>	<u>5.46</u>	<u>162</u>	<u>0.91</u>	<u>6.35</u>	<u>-1.0</u>	<u>18.90</u>	<u>26.32</u>	<u>0.2</u>	
<u>1200</u>	<u>5.0</u>	<u>5.47</u>	<u>165</u>	<u>1.09</u>	<u>6.32</u>	<u>-3.7</u>	<u>13.37</u>	<u>26.65</u>	<u>0.2</u>	
<u>1203</u>	<u>5.6</u>	<u>5.42</u>	<u>167</u>	<u>1.17</u>	<u>6.31</u>	<u>-4.2</u>	<u>10.59</u>	<u>26.73</u>	<u>0.2</u>	
<u>1206</u>	<u>6.2</u>	<u>5.41</u>	<u>169</u>	<u>1.20</u>	<u>6.30</u>	<u>-5.2</u>	<u>10.51</u>	<u>26.80</u>	<u>0.2</u>	
<u>1209</u>	<u>6.8</u>	<u>5.46</u>	<u>171</u>	<u>1.20</u>	<u>6.33</u>	<u>-6.4</u>	<u>8.59</u>	<u>26.93</u>	<u>0.2</u>	

Sampled?: Yes No

Initial of Sampler: WAC



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW10
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-29-21	Samplers:	J PARSON
Time Start:	0900		R WITTLER
Time Finish:	1100	Checked By:	R. WITTLER

Well & Purge Information			
TD (ft. bTOG):	55.23 TO PUMP ft	Screened Interval (ft.):	
DTW (ft. bTOC):	30.10 ft		
Water Column:		TD-DTW=Water Column	
Liter/Foot:	0.605 L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		Water Column x L/ft	
Three Well Volumes:		Liters in Well x 3	
Sample Depth:		Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	09E100724
Water Level Meter:	SELINST 101	Serial No.:	77297
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 7.5 Seconds Refill 7.5 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 7.5 Seconds Refill 7.5 Seconds Discharge 30 psi

Sample Collection Information						MS/MSD? :	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type			Initials
TAL Metals	3	No	Nitric	6020B LL, 7470A	250 ml Plastic			<i>[Signature]</i>
Total LL Mercury	3	No	None	1631 LL Hg	8oz Amber Glass			<i>[Signature]</i>
Dissolved LL Mercury	3	Yes	None	1631 LL Hg	8oz Amber Glass			<i>[Signature]</i>

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW10	Sample ID: 0821MW10GW	Sample Time: 1045
Date: 8-29-21	Dup. Sample ID: —	Dup. Sample Time: —

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1000	START PURGING									
1015	1	6.64	270	4.25	4.96	169.8	3.45	31.0	0.2	
1020	2	5.76	208	0.84	3.40	242.6	1.05	31.72	0.2	
1023	2.6	5.45	193	0.60	3.32	232.5	0.78	31.90	0.2	
1026	3.2	5.33	187	0.49	3.51	217.7	0.71	32.23	0.2	
1029	3.8	5.32	185	0.42	3.80	196.4	0.98	32.30	0.2	
1032	4.4	5.26	183	0.39	4.07	179.3	2.53	31.30	0.2	
1035	5.0	5.20	182	0.36	4.41	159.1	1.71	31.44	0.2	
1038	5.6	5.20	182	0.32	4.48	155.1	1.57	31.60	0.2	
1041	6.2	5.19	182	0.30	4.49	153.5	1.43	31.54	0.2	

Sampled?: Yes No

Initial of Sampler:



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 16
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8/29/2021	Samplers:	GG/R
Time Start:	0945	Checked By:	R. WITMER
Time Finish:	1100		

Well & Purge Information			
TD (ft. bTOC):	24.12	ft	Screened Interval (ft.):
DTW (ft. bTOC):	13.54	ft	
Water Column:	10.58	ft	TD-DTW=Water Column
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table
Liters in Well:	6.4	L	Water Column x L/ft
Three Well Volumes:	19.2	L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556	Serial No.:	106101486
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	MicroTPW	Serial No.:	201810324
Pump Type:	Alexis Peristaltic	Serial No.:	1176570

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	HK		
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	HK		
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	HK		

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW16</u>	Sample ID: <u>0821 RD MW16</u> <u>0821 MW16 GW</u>	Sample Time: <u>1045</u>
Date: <u>8/29/2021</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>0945</u>	<u>START PURGING</u>									
<u>0952</u>	<u>1.4</u>	<u>6.79</u>	<u>541</u>	<u>3.87</u>	<u>6.05</u>	<u>-59.9</u>	<u>33.44</u>	<u>18.54</u>	<u>0.2</u>	
<u>0958</u>	<u>2.0</u>	<u>7.21</u>	<u>529</u>	<u>1.57</u>	<u>6.39</u>	<u>-0.5</u>	<u>29.96</u>	<u>14.56</u>	<u>0.1</u>	
<u>1003</u>	<u>2.5</u>	<u>7.25</u>	<u>529</u>	<u>1.32</u>	<u>6.41</u>	<u>16.9</u>	<u>27.66</u>	<u>14.56</u>	<u>0.1</u>	
<u>1007</u>	<u>2.9</u>	<u>7.32</u>	<u>528</u>	<u>1.09</u>	<u>6.44</u>	<u>55.0</u>	<u>25.43</u>	<u>14.56</u>	<u>0.1</u>	
<u>1011</u>	<u>3.3</u>	<u>7.41</u>	<u>528</u>	<u>0.99</u>	<u>6.44</u>	<u>59.0</u>	<u>21.50</u>	<u>14.56</u>	<u>0.1</u>	
<u>1015</u>	<u>3.7</u>	<u>7.54</u>	<u>528</u>	<u>0.89</u>	<u>6.44</u>	<u>61.8</u>	<u>16.65</u>	<u>14.56</u>	<u>0.1</u>	
<u>1018</u>	<u>4.0</u>	<u>7.67</u>	<u>529</u>	<u>0.88</u>	<u>6.45</u>	<u>62.4</u>	<u>16.32</u>	<u>14.56</u>	<u>0.1</u>	
<u>1021</u>	<u>4.3</u>	<u>7.73</u>	<u>530</u>	<u>0.85</u>	<u>6.46</u>	<u>64.6</u>	<u>14.86</u>	<u>14.56</u>	<u>0.1</u>	
<u>1024</u>	<u>4.6</u>	<u>7.82</u>	<u>534</u>	<u>0.77</u>	<u>6.47</u>	<u>66.3</u>	<u>10.81</u>	<u>14.56</u>	<u>0.1</u>	
<u>1028</u>	<u>5.0</u>	<u>7.86</u>	<u>541</u>	<u>0.70</u>	<u>6.46</u>	<u>56.3</u>	<u>15.12</u>	<u>14.56</u>	<u>0.1</u>	
<u>1031</u>	<u>5.3</u>	<u>7.81</u>	<u>542</u>	<u>0.73</u>	<u>6.47</u>	<u>53.3</u>	<u>15.04</u>	<u>14.56</u>	<u>0.1</u>	
<u>1034</u>	<u>5.6</u>	<u>7.69</u>	<u>540</u>	<u>0.74</u>	<u>6.48</u>	<u>50.7</u>	<u>21.77</u>	<u>14.56</u>	<u>0.1</u>	
<u>1037</u>	<u>5.9</u>	<u>7.68</u>	<u>540</u>	<u>0.65</u>	<u>6.49</u>	<u>48.5</u>	<u>7.76</u>	<u>14.56</u>	<u>0.1</u>	
<u>1040</u>	<u>6.2</u>	<u>7.70</u>	<u>541</u>	<u>0.68</u>	<u>6.49</u>	<u>48.2</u>	<u>6.50</u>	<u>14.56</u>	<u>0.1</u>	
<u>1043</u>	<u>6.5</u>	<u>7.71</u>	<u>542</u>	<u>0.73</u>	<u>6.49</u>	<u>46.8</u>	<u>6.21</u>	<u>14.56</u>	<u>0.1</u>	
<u>1045</u>										<u>Collect Sample 0821 MW16 GW</u>

Sampled? : Yes No

Initial of Sampler: GB



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW17
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8/29/2001	Samplers:	GG
Time Start:	1130	Checked By:	R. WITTLER
Time Finish:	1300		

Well & Purge Information

TD (ft. bTOC):	55.82	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	15.92	ft		
Water Column:	39.9	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	24.14	L	Water Column x L/ft	
Three Well Volumes:	72.4	L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	106101486
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	MicroTPW	Serial No.:	2018 10324
Pump Type:	Alexis Peristaltic	Serial No.:	90048

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information

Parameter	# Containers	Filtered?	Preservative	MS/MSD? :		Initials
				Yes <input type="checkbox"/>	No <input type="checkbox"/>	
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	GG
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	GG
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	GG

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <i>MW17</i>	Sample ID: <i>0821 MW17GW</i>	Sample Time: <i>1215</i>
Date: <i>8/29/2021</i>	Dup. Sample ID:	Dup. Sample Time:

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<i>1150</i>										START PURGING
<i>1200</i>	<i>1.0</i>	<i>7.29</i>	<i>160</i>	<i>8.38</i>	<i>7.33</i>	<i>135.5</i>	<i>2.45</i>	<i>15.92</i>	<i>0.1</i>	
<i>1203</i>	<i>1.3</i>	<i>7.28</i>	<i>160</i>	<i>7.91</i>	<i>7.32</i>	<i>141.1</i>	<i>2.21</i>	<i>15.92</i>	<i>0.1</i>	
<i>1206</i>	<i>1.6</i>	<i>7.23</i>	<i>160</i>	<i>7.88</i>	<i>7.23</i>	<i>146.3</i>	<i>1.86</i>	<i>15.92</i>	<i>0.1</i>	
<i>1209</i>	<i>1.9</i>	<i>7.24</i>	<i>160</i>	<i>7.81</i>	<i>7.34</i>	<i>150.4</i>	<i>2.50</i>	<i>15.92</i>	<i>0.1</i>	
<i>1212</i>	<i>2.2</i>	<i>7.22</i>	<i>159</i>	<i>7.83</i>	<i>7.34</i>	<i>156.0</i>	<i>1.11</i>	<i>15.92</i>	<i>0.1</i>	
<i>1215</i>										<i>Sample 0821 MW17GW</i>

Sampled? : Yes No

Initial of Sampler: *BA*



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW26
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-30-21	Samplers:	J PARSON R WITTLER
Time Start:	0845	Checked By:	R. WITTLER
Time Finish:			

Well & Purge Information			
TD (ft. bTOC):	TO PUMP 38.6	ft	Screened Interval (ft.):
DTW (ft. bTOC):	36.24	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	106101486
Water Level Meter:	SOLINST 101	Serial No.:	77262
Turbidity Meter:	HF MICRO TPW	Serial No.:	201810324
Pump Type:	TTT MINI BLADDER	Serial No.:	092

Purge Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>12</u> Seconds Refill <u>3</u> Seconds Discharge
Sampling Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>12</u> Seconds Refill <u>3</u> Seconds Discharge @ <u>25</u> psi

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic			
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass			
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass			

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW26</u>	Sample ID: <u>0821MW266W</u>	Sample Time: <u>1100</u>
Date: <u>8-30-21</u>	Dup. Sample ID:	Dup. Sample Time:

Notes:

Purging and *Stabilization Data										
Time (24 hrs)	Volume Removed (L)	Temp ±3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) ±3%	DO (mg/L) ±10%	pH ±0.1	ORP (mV) ±10 mV	Turbidity (NTU) ±10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>0945</u>	START PURGING									
<u>1025</u>	<u>1.6</u>	<u>9.54</u>	<u>819</u>	<u>4.46</u>	<u>6.52</u>	<u>0.3</u>	<u>38.64</u>	<u>36.24</u>	<u>0.04</u>	
<u>1028</u>	<u>1.72</u>	<u>9.52</u>	<u>818</u>	<u>4.34</u>	<u>6.51</u>	<u>1.6</u>	<u>37.45</u>	<u>36.25</u>	<u>0.04</u>	
<u>1031</u>	<u>1.84</u>	<u>9.47</u>	<u>814</u>	<u>4.72</u>	<u>6.51</u>	<u>0.9</u>	<u>34.72</u>	<u>36.25</u>	<u>0.04</u>	
<u>1034</u>	<u>1.96</u>	<u>9.48</u>	<u>814</u>	<u>4.78</u>	<u>6.51</u>	<u>0.4</u>	<u>34.10</u>	<u>36.25</u>	<u>0.04</u>	
<u>1037</u>	<u>2.08</u>	<u>9.50</u>	<u>814</u>	<u>4.93</u>	<u>6.51</u>	<u>0.2</u>	<u>28.64</u>	<u>36.24</u>	<u>0.04</u>	
<u>1040</u>	<u>2.20</u>	<u>9.58</u>	<u>817</u>	<u>4.82</u>	<u>6.50</u>	<u>0.1</u>	<u>26.16</u>	<u>36.24</u>	<u>0.04</u>	
<u>1043</u>	<u>2.32</u>	<u>9.56</u>	<u>819</u>	<u>4.91</u>	<u>6.52</u>	<u>-0.7</u>	<u>27.04</u>	<u>36.25</u>	<u>0.04</u>	
<u>1046</u>	<u>2.44</u>	<u>9.57</u>	<u>821</u>	<u>4.99</u>	<u>6.52</u>	<u>-1.8</u>	<u>27.20</u>	<u>36.25</u>	<u>0.04</u>	
<u>1049</u>	<u>2.56</u>	<u>9.54</u>	<u>824</u>	<u>4.96</u>	<u>6.52</u>	<u>-2.4</u>	<u>26.68</u>	<u>36.25</u>	<u>0.04</u>	
<u>1052</u>	<u>2.68</u>	<u>9.61</u>	<u>826</u>	<u>4.92</u>	<u>6.52</u>	<u>-3.9</u>	<u>27.24</u>	<u>36.25</u>	<u>0.04</u>	
<u>1055</u>	<u>2.80</u>	<u>9.69</u>	<u>829</u>	<u>5.00</u>	<u>6.52</u>	<u>-4.5</u>	<u>25.95</u>	<u>36.24</u>	<u>0.04</u>	

Sampled?: Yes No

Initial of Sampler: *[Signature]*

Client/Site:	BLM Red Devil Mine	Well ID.:	MW27
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8/30/2021	Samplers:	GG
Time Start:	0915	Checked By:	R. WITTLER
Time Finish:	1045		

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	_____
DTW (ft. bTOC):	30.92		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	09E 100 724
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	MicroTPW	Serial No.:	202007903
Pump Type:	Bladder	Serial No.:	MPSO -1365

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 7 cpm @ 22 psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 4 cpm @ 22 psi

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	3	No	Nitric	6020B LL, 7470A	250 ml Plastic	B/G		
Total LL Mercury	3	No	None	1631 LL Hg	8oz Amber Glass	B/G		
Dissolved LL Mercury	3	Yes	None	1631 LL Hg	8oz Amber Glass	B/G		

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW27	Sample ID: 0821 MW27 GW	Sample Time: 1010
Date: 8/30/2021	Dup. Sample ID: 0821 MW98 GW	Dup. Sample Time: 1020

Notes: Extra volume collected and duplicate.

Purging and Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp $\pm 3\% \text{ }^\circ\text{C}$, min $\pm 0.2\text{ }^\circ\text{C}$	Spec. Cond. ($\mu\text{S}/\text{cm}$) $\pm 3\%$	DO (mg/L) $\pm 10\%$	pH ± 0.1	ORP (mV) $\pm 10 \text{ mV}$	Turbidity (NTU) $\pm 10\%$	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
0915									0.15	
START PURGING										
0925	1.6	5.61	452	4.30	3.80	93.0	2.44	31.34	0.15	0.125
0932	2.1	5.60	448	1.166	4.22	55.7	3.86	31.34		0.125
0935	2.5	5.60	447	1.42	4.30	46.5	3.67	31.34		0.125
0940	3.0	5.57	445	1.09	4.53	24.4	2.39	31.34		0.125
0945	3.6	5.55	444	0.93	4.72	4.0	2.55	31.34		0.125
0950	4.2	5.53	444	0.92	4.91	-11.2	1.32	31.34		0.125
0955	4.8	5.52	444	0.85	5.04	-23.1	0.71	31.34		0.125
1000	5.4	5.52	444	0.84	5.10	-27.5	1.37	31.34		0.125
1005	6.0	5.50	444	0.80	5.14	-30.1	1.44	31.34		0.125
1010										Collect sample @ 1010

Sampled?: Yes No

Initial of Sampler: AB

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW28
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-29-21	Samplers:	J PARSON R WITTLER
Time Start:	1500	Checked By:	R. WITTLER
Time Finish:	1740		

Well & Purge Information			
TD (ft. bTOC):	TOP OF PUMP 58.02	ft	Screened Interval (ft.):
DTW (ft. bTOC):	29.51	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	09E100724
Water Level Meter:	SOLINST 101	Serial No.:	77297
Turbidity Meter:	HF MICRO TRW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>23</u> Seconds Refill <u>7</u> Seconds Discharge
Sampling Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>23</u> Seconds Refill <u>7</u> Seconds Discharge @ <u>40</u> PSI

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	JWP		
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	JWP		
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	JWP		

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW28</u>	Sample ID: <u>0821 MW28GW</u>	Sample Time: <u>1730</u>
Date: <u>8-29-31</u>	Dup. Sample ID:	Dup. Sample Time:

Notes: _____

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1650 1650 START PURGING										
1653	0.9	5.80	243	1.02	6.37	-7.2	84.4	29.7	10.3 0.3	
1656	1.8	5.54	241	0.73	6.07	-1.0	59.65	29.7	0.3	
1659	2.7	5.45	239	0.62	5.96	-1.1	57.64	29.9	0.3	
1702	3.6	5.30	238	0.52	5.89	-4.3	36.98	29.80	0.3	
1705	4.5	5.25	237	0.45	5.90	-8.3	32.95	29.82	0.3	
1708	5.4	5.23	237	0.44	5.97	-15.7	28.43	29.82	0.3	
1711	6.3	5.24	236	0.45	6.08	-24.1	22.52	29.83	0.3	
1714	7.2	5.24	236	0.45	6.16	-29.5	19.92	29.82	0.3	
1717	8.1	5.20	236	0.43	6.25	-36.1	15.42	29.80	0.3	
1720	9.0	5.20	236	0.41	6.32	-40.0	13.04	29.84	0.3	
1723	9.9	5.23	236	0.38	6.36	-42.5	13.38	29.82	0.3	
1725	1.5	5.23	236	0.37	6.36	-43.8	9.72	29.82	0.3	

Sampled?: Yes No

Initial of Sampler: QRO



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW29
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	9-2-21	Samplers:	J PARSON
Time Start:	1500		R WITTLER
Time Finish:	1655	Checked By:	R. WITTLER

Well & Purge Information			
TD (ft. bTOC):	To PUMP 68.90	ft	Screened Interval (ft.):
DTW (ft. bTOC):	64.00	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	106101486
Water Level Meter:	SOLINST 102	Serial No.:	294991
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 23 Seconds Refill
 7 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 23 Seconds Refill
 7 Seconds Discharge
 2 cpm @ 35 psi

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic			
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass			
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass			

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW29	Sample ID: 0921MW29GW	Sample Time: 1635
Date: 9-1-21	Dup. Sample ID: NA	Dup. Sample Time: NA

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1520	START PURGING									
1533	0.65	12.81	322	5.08	6.88	24.6	392.7	64.2	0.05	
1538	0.90	12.22	316	3.73	6.88	18.6	324.9	64.2	0.05	
1541	1.05	11.80	312	2.77	6.88	13.5	284.3	64.2	0.05	
1544	1.20	11.53	308	2.87	6.88	5.7	239.3	64.2	0.05	
1547	1.35	11.37	307	2.62	6.88	2.1	208.6	64.2	0.05	
1550	1.50	11.29	306	1.93	6.88	-2.4	172.3	64.2	0.05	
1553	1.65	11.41	306	1.58	6.88	-8.0	171.1	64.2	0.05	
1556	1.80	11.47	306	1.41	6.88	-6.5	186.4	64.1	0.05	
1559	1.95	11.36	306	1.35	6.89	-4.3	166.1	64.1	0.05	
1602	2.10	11.47	306	1.32	6.89	-3.9	193.9	64.2	0.05	
1605	2.25	11.37	306	1.31	6.90	-2.8	144.9	64.1	0.05	
1608	2.40	11.34	305	1.29	6.90	-1.6	135.5	64.2	0.05	
1611	2.55	11.46	306	1.30	6.90	-1.5	124.4	64.2	0.05	
1614	2.70	11.34	305	1.34	6.90	-1.7	115.2	64.2	0.05	
1617	2.85	11.29	305	1.36	6.90	1.3	108.6	64.2	0.05	
1620	3.0	11.38	305	1.34	6.90	2.3	113.2	64.2	0.05	
1623	3.15	11.34	304	1.38	6.90	3.2	105.7	64.2	0.05	
1626	3.30	11.38	305	1.31	6.91	4.9	104.8	64.2	0.05	
1629	3.45	11.37	304	1.32	6.91	6.2	105.2	64.2	0.05	

Sampled?: Yes No

Initial of Sampler: *J. [Signature]*

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 33
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8/29/2021	Samplers:	GC
Time Start:	1320	Checked By:	R. Witter
Time Finish:	1445		

Well & Purge Information

TD (ft. bTOC):	24.36	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	8.14	ft		
Water Column:	16.22	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	9.81	L	Water Column x L/ft	
Three Well Volumes:	29.44	L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	106101486
Water Level Meter:	Solinst 102	Serial No.:	294991
Turbidity Meter:	Micro TPW	Serial No.:	201810324
Pump Type:	Alexis Peristaltic	Serial No.:	90048

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information

Parameter	# Containers	Filtered?	Preservative	MS/MSD? :		Initials
				Method	Container Type	
TAL Metals	2	No	Nitric	6020B LL, 7470A	250 ml Plastic	HW
Total LL Mercury	2	No	None	1631 LL Hg	8oz Amber Glass	HW
Dissolved LL Mercury	2	Yes	None	1631 LL Hg	8oz Amber Glass	HW
Duplicate Collected						



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW40
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	9-1-21	Samplers:	J PARSON
Time Start:	1400		R WITTLER
Time Finish:	1445	Checked By:	R. WITNER

Well & Purge Information			
TD (ft. bTOC):	TO PUMP 135.30	ft	Screened Interval (ft.):
DTW (ft. bTOC):	129.0	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	106101486
Water Level Meter:	SEUNST 102	Serial No.:	294991
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>35</u> Seconds Refill <u>25</u> Seconds Discharge
Sampling Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input type="checkbox"/> Other: _____	
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>35</u> Seconds Refill <u>25</u> Seconds Discharge <u>1 cpm @ 65 psi</u>

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic			
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass			
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass			

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 42
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-30-31	Samplers:	J PARSON
Time Start:	1330		R WITTLER
Time Finish:		Checked By:	R. WITTLER

Well & Purge Information			
TD (ft. bTOC):	TO PUMP 134	ft	Screened Interval (ft.):
DTW (ft. bTOC):	128.68	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	106101486
Water Level Meter:	SOLINST 102	Serial No.:	294991
Turbidity Meter:	HF MICRO TPW	Serial No.:	201810324
Pump Type:	Bladder	Serial No.:	1010

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 45 Seconds Refill 15 Seconds Discharge PSI: 68 - JUST SHY OF 70

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 45 Seconds Refill 15 Seconds Discharge

Sample Collection Information					MS/MSD? :	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials	
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	JW	
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	JW	
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	RW	

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW-42	Sample ID: 0821MW42 0821MW42GW	Sample Time: 1630
Date: 8-30-2021	Dup. Sample ID: —	Dup. Sample Time: —

Notes: _____

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1616	.03	9.01	0.671	1.520	6.71	74.8	100.8	128.68	.03	
1619	.15	9.02	0.671	2.07	6.71	75.2	99.00	128.68	.03	
1622	0.21	9.03	0.669	2.02	6.71	75.1	87.43	128.68	.03	
1625	0.39	9.04	0.669	2.04	6.71	75.3	72.08	128.68	.03	

Sampled? : Yes No

Initial of Sampler: _____

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW-43
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	08-30-2021	Samplers:	Riley Wittler
Time Start:	1130	Checked By:	R. Wittler
Time Finish:	1245		

Well & Purge Information			
TD (ft. bTOC): ^{Pump}	109	ft	Screened Interval (ft.):
DTW (ft. bTOC):	90.06	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556	Serial No.:	09E 100734
Water Level Meter:	Solinst 102	Serial No.:	294 991
Turbidity Meter:	Micro	Serial No.:	302007903
Pump Type:	Bladder	Serial No.:	MP50-1365

Purge Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type			Initials
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic			RW
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass			RW
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass			RW

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW-43	Sample ID: 0821 MW43 GW	Sample Time: 1225
Date: 08-30-2021	Dup. Sample ID: —	Dup. Sample Time: —

Notes:

Purging and *Stabilization Data										
Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
START PURGING										
1145	.08	6.23	0.280	11.97	5.95	15.7	14.44	90.06	.08	
1150	.53	5.94	0.251	7.63	5.65	13.4	11.63	90.06	.08	
1155	0.88	5.68	0.236	5.05	5.58	6.1	7.79	90.06	.08	
1158	1.12	6.21	0.229	4.06	5.75	-10.3	8.51	90.06	.08	
1202	1.44	6.26	0.228	2.78	5.91	-23.2	7.75	90.06	.08	
1206	1.76	6.23	0.227	1.91	5.92	-26.0	7.72	90.06	.08	
1210	2.08	6.21	0.227	1.80	5.93	-30.0	6.70	90.16	.08	
1213	2.32	6.22	0.227	1.85	5.92	-30.7	7.01	90.06	.08	
1216	2.64	6.22	0.227	1.82	5.93	-31.7	6.69	90.06	.08	

Sampled?: Yes No

Initial of Sampler: _____

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW44
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	9/1/2021	Samplers:	GG
Time Start:	1130	Checked By:	R. WITTLER
Time Finish:	1245		

Well & Purge Information

TD (ft. bTOC):		ft	Screened Interval (ft.):	
DTW (ft. bTOC):	35.49	ft		
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	09E100724
Water Level Meter:	Solinst 101	Serial No.:	77262
Turbidity Meter:	MicroTPW	Serial No.:	201810324
Pump Type:	Bladder (Botech 18")	Serial No.:	unknown

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge ~35 psi 4cpm 0.1 L/min

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge ~35 psi 4cpm = 0.1 L/min

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	GG
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	GG
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	GG

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW45
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	9/1/2021	Samplers:	GB
Time Start:	0845	Checked By:	R. WITTLER
Time Finish:	0945		

Well & Purge Information

TD (ft. bTOC):	_____	ft	Screened Interval (ft.):	_____
DTW (ft. bTOC):	47.00	ft		
Water Column:	_____	ft	TD-DTW=Water Column	
Liter/Foot:	_____	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	_____	L	Water Column x L/ft	
Three Well Volumes:	_____	L	Liters in Well x 3	
Sample Depth:	_____	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	09E100724
Water Level Meter:	Solinst 101	Serial No.:	77262
Turbidity Meter:	MicroTPW	Serial No.:	2018 10324
Pump Type:	Bladder (Gastek 10")	Serial No.:	N/A

Purge Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at 9 Seconds Refill 6 Seconds Discharge ~37 psi @ 4Lpm = 0.2 L/min

Sampling Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at 9 Seconds Refill 6 Seconds Discharge ~37 psi @ 4Lpm = 0.2 L/min

Sample Collection Information

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	MS/MSD? :	
						Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic		Initials <u>HA</u>
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass		Initials <u>HA</u>
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass		Initials <u>HA</u>



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site: BLM Red Devil Mine Well ID.: MW 46
 Contract No.: 140L6321C0001 Project No.: BU06-007
 Date: 0/31/2021 Samplers: GG
 Time Start: 1538
 Time Finish: 1633 Checked By: R. WITTLER

Well & Purge Information

TD (ft. bTOC): _____ ft Screened Interval (ft.): _____
 DTW (ft. bTOC): 35.80 ft
 Water Column: _____ ft TD-DTW=Water Column
 Liter/Foot: _____ L/ft See ***Well Volume Calculation*** table
 Liters in Well: _____ L Water Column x L/ft
 Three Well Volumes: _____ L Liters in Well x 3
 Sample Depth: _____ ft Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter: YSI 556 Serial No.: 106101486
 Water Level Meter: Solinst 101 Serial No.: 77262
 Turbidity Meter: Micro TPW Serial No.: 201010324
 Pump Type: Bladder Serial No.: NA

Purge Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge 4cpm ~26psi

Sampling Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge 4cpm ~26psi

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials
TAL Metals	<u>1</u>	No	Nitric	6020B LL, 7470A	250 ml Plastic	<u>RH</u>
Total LL Mercury	<u>1</u>	No	None	1631 LL Hg	8oz Amber Glass	<u>RH</u>
Dissolved LL Mercury	<u>1</u>	Yes	None	1631 LL Hg	8oz Amber Glass	<u>RH</u>



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site: BLM Red Devil Mine Well ID.: NW42
 Contract No.: 140L6321C0001 Project No.: BU06-007
 Date: 8/31/2021 Samplers: GG
 Time Start: 1355
 Time Finish: 1515 Checked By: R. W. H. H. W.

Well & Purge Information

TD (ft. bTOC): Top of Pump = 57.31 ft Screened Interval (ft.): _____
 DTW (ft. bTOC): 39.03 ft
 Water Column: _____ ft TD-DTW=Water Column
 Liter/Foot: 0.605 L/ft See ***Well Volume Calculation*** table
 Liters in Well: _____ L Water Column x L/ft
 Three Well Volumes: _____ L Liters in Well x 3
 Sample Depth: _____ ft Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
<u>2"</u>	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter: YSI 556 Serial No.: 10 G 101486
 Water Level Meter: Solinst 101 Serial No.: 77362
 Turbidity Meter: MicroTPW Serial No.: 201810324
 Pump Type: Bladder Alexis Peristaltic Serial No.: NA 90048

Purge Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 9 Seconds Refill 6 Seconds Discharge @ 33-35 psi ~ 0.1 L/min

Sampling Method:

Peristaltic Pump Inertial Other: _____
 Bladder Pump : Optimum Flow Rate Set at 9 Seconds Refill 6 Seconds Discharge @ 33-35 psi ~ 0.1 L/min

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials
TAL Metals	<u>2</u>	No	Nitric	6020B LL, 7470A	250 ml Plastic	<u>GG</u>
Total LL Mercury	<u>2</u>	No	None	1631 LL Hg	8oz Amber Glass	<u>GG</u>
Dissolved LL Mercury	<u>2</u>	Yes	None	1631 LL Hg	8oz Amber Glass	<u>GG</u>

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 49
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	9/1/2021	Samplers:	GB
Time Start:	1300	Checked By:	R. WITTLER
Time Finish:			

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	30.45		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	09E100724
Water Level Meter:	Solinst 101	Serial No.:	77262
Turbidity Meter:	MicroTPW	Serial No.:	201810324
Pump Type:	Bladder (Geotech 10")	Serial No.:	unknown

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge ~30psi = 0.15 gpm

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10 Seconds Refill 5 Seconds Discharge ~30psi

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	AW
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	AW
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	AW

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW 49</u>	Sample ID: <u>0921 MW49GW</u>	Sample Time: <u>1430</u>
Date: <u>9/1/2021</u>	Dup. Sample ID:	Dup. Sample Time:

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1345	START PURGING									
1355	1.5	5.35	98	7.30	5.03	51.8	14.27	30.45	0.15	
1400	2.25	5.02	84	6.22	4.83	58.4	13.28	30.45	0.15	
1404	2.85	4.96	81	5.94	4.78	59.8	8.38	30.45	0.15	
1408	3.45	4.98	80	5.86	4.93	49.7	4.87	30.45	0.15	
1412	4.05	5.03	80	5.80	5.17	35.3	3.71	30.45	0.15	
1415	4.50	5.02	80	5.79	5.29	27.5	3.67	30.45	0.15	
1419	5.10	5.05	79	5.84	5.40	21.6	2.97	30.45	0.15	
1422	5.55	5.10	78	5.83	5.48	15.9	3.09	30.45	0.15	
1425	6.00	5.11	78	5.79	5.50	12.0	2.62	30.45	0.15	
1430										Collect sample @ 1430

Sampled? : Yes No

Initial of Sampler: YLB



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW50
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-31-21	Samplers:	J PARSON
Time Start:	1130		R WITTLER
Time Finish:	1305	Checked By:	R. WITTLER

Well & Purge Information			
TD (ft. bTOC):	82.00	ft	Screened Interval (ft.):
DTW (ft. bTOC):	49.20	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	09E100724
Water Level Meter:	SOLINST 102	Serial No.:	294991
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>17</u> Seconds Refill <u>3</u> Seconds Discharge
Sampling Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>17</u> Seconds Refill <u>3</u> Seconds Discharge ³ CPM @ ~45 psi

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	JSP		
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	JSP		
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	JSP		

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW50</u>	Sample ID: <u>0821MW50GW</u>	Sample Time: <u>1255</u>
Date: <u>8-31-21</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>1145</u>	<u>START PURGING</u>									
<u>1151</u>	<u>0.6</u>	<u>5.03</u>	<u>429</u>	<u>2.27</u>	<u>6.24</u>	<u>-40.8</u>	<u>76.28</u>	<u>49.25</u>	<u>0.10</u>	
<u>1156</u>	<u>1.1</u>	<u>4.89</u>	<u>424</u>	<u>2.16</u>	<u>6.28</u>	<u>-40.8</u>	<u>94.92</u>	<u>49.3</u>	<u>0.10</u>	
<u>1201</u>	<u>1.6</u>	<u>4.63</u>	<u>420</u>	<u>2.26</u>	<u>6.29</u>	<u>-40.2</u>	<u>84.40</u>	<u>49.3</u>	<u>0.10</u>	
<u>1206</u>	<u>2.1</u>	<u>4.52</u>	<u>418</u>	<u>2.31</u>	<u>6.31</u>	<u>-41.4</u>	<u>65.43</u>	<u>49.3</u>	<u>0.10</u>	
<u>1209</u>	<u>2.4</u>	<u>4.49</u>	<u>416</u>	<u>2.24</u>	<u>6.33</u>	<u>-43.3</u>	<u>48.71</u>	<u>49.3</u>	<u>0.10</u>	
<u>1212</u>	<u>2.7</u>	<u>4.46</u>	<u>415</u>	<u>2.22</u>	<u>6.36</u>	<u>-44.2</u>	<u>46.49</u>	<u>49.3</u>	<u>0.10</u>	
<u>1215</u>	<u>3.0</u>	<u>4.45</u>	<u>414</u>	<u>2.21</u>	<u>6.39</u>	<u>-45.9</u>	<u>41.72</u>	<u>49.3</u>	<u>0.10</u>	
<u>1218</u>	<u>3.3</u>	<u>4.51</u>	<u>415</u>	<u>2.24</u>	<u>6.41</u>	<u>-47.0</u>	<u>34.68</u>	<u>49.4</u>	<u>0.10</u>	
<u>1221</u>	<u>3.6</u>	<u>4.44</u>	<u>414</u>	<u>2.13</u>	<u>6.42</u>	<u>-48.5</u>	<u>75.32</u>	<u>49.3</u>	<u>0.10</u>	
<u>1224</u>	<u>3.9</u>	<u>4.39</u>	<u>412</u>	<u>2.11</u>	<u>6.41</u>	<u>-48.2</u>	<u>88.18</u>	<u>49.3</u>	<u>0.10</u>	
<u>1227</u>	<u>4.2</u>	<u>4.34</u>	<u>410</u>	<u>2.16</u>	<u>6.41</u>	<u>-48.2</u>	<u>59.13</u>	<u>49.3</u>	<u>0.10</u>	
<u>1230</u>	<u>4.5</u>	<u>4.33</u>	<u>410</u>	<u>2.17</u>	<u>6.41</u>	<u>-47.5</u>	<u>39.72</u>	<u>49.3</u>	<u>0.10</u>	
<u>1233</u>	<u>4.8</u>	<u>4.32</u>	<u>408</u>	<u>2.44</u>	<u>6.42</u>	<u>-48.0</u>	<u>28.31</u>	<u>49.3</u>	<u>0.10</u>	
<u>1236</u>	<u>5.1</u>	<u>4.35</u>	<u>408</u>	<u>2.27</u>	<u>6.41</u>	<u>-48.7</u>	<u>24.02</u>	<u>49.3</u>	<u>0.10</u>	
<u>1239</u>	<u>5.4</u>	<u>4.37</u>	<u>408</u>	<u>2.23</u>	<u>6.44</u>	<u>-49.7</u>	<u>20.19</u>	<u>49.3</u>	<u>0.10</u>	
<u>1242</u>	<u>5.7</u>	<u>4.38</u>	<u>408</u>	<u>2.30</u>	<u>6.45</u>	<u>-51.9</u>	<u>16.91</u>	<u>49.3</u>	<u>0.10</u>	
<u>1245</u>	<u>6.0</u>	<u>4.40</u>	<u>408</u>	<u>2.35</u>	<u>6.46</u>	<u>-52.3</u>	<u>15.46</u>	<u>49.3</u>	<u>0.10</u>	
<u>1248</u>	<u>6.3</u>	<u>4.37</u>	<u>407</u>	<u>2.20</u>	<u>6.45</u>	<u>-51.4</u>	<u>13.8</u>	<u>49.3</u>	<u>0.10</u>	
<u>1251</u>	<u>6.6</u>	<u>4.37</u>	<u>407</u>	<u>2.23</u>	<u>6.46</u>	<u>-51.2</u>	<u>9.60</u>	<u>49.3</u>	<u>0.10</u>	

Sampled?: Yes No

Initial of Sampler: JES

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 51
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-31-21	Samplers:	J PARSON
Time Start:	0845		R WITTLER
Time Finish:	1020	Checked By:	R. WITTLER

Well & Purge Information			
TD (ft. bTOC):	TO PUMP 66.3 ft	Screened Interval (ft.):	
DTW (ft. bTOC):	52.5 65.92 ft		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	09E100724
Water Level Meter:	SOLINST 102	Serial No.:	294991
Turbidity Meter:	HF MICRO T.P.W	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>12</u> Seconds Refill <u>3</u> Seconds Discharge
Sampling Method:	
<input type="checkbox"/> Peristaltic Pump	<input type="checkbox"/> Inertial
<input checked="" type="checkbox"/> Bladder Pump :	Optimum Flow Rate Set at <u>12</u> Seconds Refill <u>3</u> Seconds Discharge <u>4 CPM @ ~35 psi</u>

Sample Collection Information				MS/MSD? :		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials	
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	JPP	
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	JPP	
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	JPP	

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MWS2
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8/31/2021	Samplers:	GG
Time Start:	1130	Checked By:	R. W. H. T. H. E. R.
Time Finish:	1325		

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	34.30		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	45.70	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	106101486
Water Level Meter:	Solinst 101	Serial No.:	77262
Turbidity Meter:	Micro TPW	Serial No.:	2018 10324
Pump Type:	Bladder	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10.5 Seconds Refill 4.5 Seconds Discharge @ 30 psi 4cpm

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 10.5 Seconds Refill 4.5 Seconds Discharge @ 30 psi 4cpm

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	GG
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	GG
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	GG



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW53
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-31-21	Samplers:	J PARSON
Time Start:	1325		R WITTLER
Time Finish:	1410	Checked By:	R. Wittler

Well & Purge Information

TD (ft. bTOC):	TO PUMP 51.4	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	34.21	ft		
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	09E100724
Water Level Meter:	SOLINST 102	Serial No.:	29491
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007103
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 4 cpm @ N 30 psi

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	JEP		
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	JEP		
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	JEP		

Low-Flow Groundwater Sample & Stabilization Form

Well ID: <u>MW53</u>	Sample ID: <u>0821MW53GW</u>	Sample Time: <u>1400</u>
Date: <u>8-31-21</u>	Dup. Sample ID: <u>NA</u>	Dup. Sample Time: <u>NA</u>

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp ±3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) * ±3%	DO (mg/L) * ± 10%	pH * ± 0.1	ORP (mV) * ± 10 mV	Turbidity (NTU) * ± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
<u>1335</u>										<u>START PURGING</u>
<u>1340</u>	<u>0.75</u>	<u>4.83</u>	<u>136</u>	<u>8.40</u>	<u>5.66</u>	<u>6.5</u>	<u>10.26</u>	<u>34.21</u>	<u>0.15</u>	
<u>1345</u>	<u>1.50</u>	<u>4.46</u>	<u>102</u>	<u>7.27</u>	<u>5.77</u>	<u>6.3</u>	<u>8.57</u>	<u>34.21</u>	<u>0.15</u>	
<u>1348</u>	<u>1.95</u>	<u>4.41</u>	<u>99</u>	<u>6.97</u>	<u>5.83</u>	<u>3.1</u>	<u>8.41</u>	<u>34.21</u>	<u>0.15</u>	
<u>1351</u>	<u>2.40</u>	<u>4.39</u>	<u>101</u>	<u>6.87</u>	<u>5.86</u>	<u>0.3</u>	<u>5.54</u>	<u>34.21</u>	<u>0.15</u>	
<u>1354</u>	<u>2.85</u>	<u>4.35</u>	<u>103</u>	<u>6.71</u>	<u>5.93</u>	<u>-4.2</u>	<u>8.18</u>	<u>34.21</u>	<u>0.15</u>	
<u>1357</u>	<u>3.20</u>	<u>4.33</u>	<u>106</u>	<u>6.46</u>	<u>6.00</u>	<u>-5.1</u>	<u>6.42</u>	<u>34.21</u>	<u>0.15</u>	

Sampled? : Yes No

Initial of Sampler: JD



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW 54
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8-31-21	Samplers:	R WITTLER
Time Start:	1025		J PARSON
Time Finish:	1120	Checked By:	R. WITTLER

Well & Purge Information

TD (ft. bTOC):	TO PUMP 30.35 ^{ft} 39.55 ft	Screened Interval (ft.):	
DTW (ft. bTOC):	39.3 ^{ft} 30.35 ft		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	09E100724
Water Level Meter:	SOLINST 102	Serial No.:	294991
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 17.5 Seconds Refill 2.5 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 17.5 Seconds Refill 2.5 Seconds Discharge 3CPM @ ~28 psi.

Sample Collection Information						MS/MSD? :	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials		
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic			
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass			
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass			



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW55
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	8/31/2021	Samplers:	GG
Time Start:	0845	Checked By:	R. WITTLER
Time Finish:	1120		

Well & Purge Information

TD (ft. bTOC):	23.93	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	14.19	ft		
Water Column:	9.74	ft	TD-DTW=Water Column	
Liter/Foot:	0.605	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	5.9	L	Water Column x L/ft	
Three Well Volumes:	17.7	L	Liters in Well x 3	
Sample Depth:	19 ft	ft	Depth of Pump Intake	

Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556	Serial No.:	106101486
Water Level Meter:	Solinst 101	Serial No.:	77262
Turbidity Meter:	MicroTPW	Serial No.:	201810324
Pump Type:	Peristaltic Alexis	Serial No.:	90048

Purge Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sampling Method:

Peristaltic Pump Inertial Other: _____

Bladder Pump : Optimum Flow Rate Set at _____ Seconds Refill _____ Seconds Discharge

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials
TAL Metals	3	No	Nitric	6020B LL, 7470A	250 ml Plastic	GG
Total LL Mercury	3	No	None	1631 LL Hg	8oz Amber Glass	GG
Dissolved LL Mercury	3	Yes	None	1631 LL Hg	8oz Amber Glass	GG



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MU56
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	9/11/2021	Samplers:	GG
Time Start:	1005	Checked By:	R. WITTLER

Well & Purge Information

TD (ft. bTOC):	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	39.46		
Water Column:	ft	TD-DTW=Water Column	
Liter/Foot:	L/ft	See ***Well Volume Calculation*** table	
Liters in Well:	L	Water Column x L/ft	
Three Well Volumes:	L	Liters in Well x 3	
Sample Depth:	ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 550	Serial No.:	09E 100 724
Water Level Meter:	Solinst 101	Serial No.:	77262
Turbidity Meter:	MicroTPW	Serial No.:	2018 10324
Pump Type:	Bladder (Gastech 18")	Serial No.:	unknown

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 4 cpm @ 40 psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 4 cpm @ 40 psi = 0.1 L/min

Sample Collection Information MS/MSD? : Yes No

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	GG
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	GG
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	GG



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW57
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	JP 9-1-21	Samplers:	J PARSON
Time Start:	0830		R WITTLER
Time Finish:	0915	Checked By:	R. WITTLER

Well & Purge Information

TD (ft. bTOC):	TO PUMP 47.87	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	47.87 JP 42.55	ft		
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	106101486
Water Level Meter:	SOLINST 10Z	Serial No.:	294991
Turbidity Meter:	HF MICRO TPW	Serial No.:	202007903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

- Peristaltic Pump
 Inertial
 Other: _____
- Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge

Sampling Method:

- Peristaltic Pump
 Inertial
 Other: _____
- Bladder Pump : Optimum Flow Rate Set at 12 Seconds Refill 3 Seconds Discharge 4 CPM @ 28 psi

Sample Collection Information

Parameter	# Containers	Filtered?	Preservative	MS/MSD? :		Initials
				Method	Container Type	
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic	JP
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass	JP
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass	JP

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW57	Sample ID: 0921MW57GW	Sample Time: 0905
Date: 9-1-21	Dup. Sample ID: NA	Dup. Sample Time: NA

Notes:

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
0840	START PURGING									
0845	1.0	4.48	56	14.14	5.35	269.0	5.00	42.60	0.2	
0850	2.0	3.79	41	10.12	5.76	256.0	2.92	42.6	0.2	
0853	2.6	3.58	39	9.84	5.83	232.4	1.95	42.6	0.2	
0856	3.2	3.49	38	9.86	5.83	-13.5	2.07	42.6	0.2	
0859	3.8	3.46	37	9.87	5.89	46.1	1.46	42.6	0.2	
0902	4.4	3.43	37	9.90	5.91	46.7	2.31	42.6	0.2	

Sampled?: Yes No

Initial of Sampler: *JPR*

Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	<u>BLM Red Devil Mine</u>	Well ID.:	<u>MW 58</u>
Contract No.:	<u>140L6321C0001</u>	Project No.:	<u>BU06-007</u>
Date:	<u>8-31-21</u>	Samplers:	<u>J PARSON</u>
Time Start:	<u>1425</u>		<u>R WITTLER</u>
Time Finish:	<u>1650</u>	Checked By:	<u>R. WITTLER</u>

Well & Purge Information			
TD (ft. bTOC):	<u>47.12</u>	ft	Screened Interval (ft.):
DTW (ft. bTOC):	<u>31.77</u>	ft	
Water Column:		ft	TD-DTW=Water Column
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table
Liters in Well:		L	Water Column x L/ft
Three Well Volumes:		L	Liters in Well x 3
Sample Depth:		ft	Depth of Pump Intake

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment			
Multiparameter Water Quality Meter:	<u>YSI 556 MPS</u>	Serial No.:	<u>09E100724</u>
Water Level Meter:	<u>SOLINST 10Z</u>	Serial No.:	<u>294941</u>
Turbidity Meter:	<u>HF MICRO TPW</u>	Serial No.:	<u>202007903</u>
Pump Type:	<u>BLADDER</u>	Serial No.:	<u>NA</u>

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 26 Seconds Refill 4 Seconds Discharge

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 26 Seconds Refill 4 Seconds Discharge 2 CPM @ ~32 psi

Sample Collection Information						MS/MSD? :		
Parameter	# Containers	Filtered?	Preservative	Method	Container Type	Initials	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
TAL Metals	<u>1</u>	No	Nitric	6020B LL, 7470A	250 ml Plastic	<u>[Signature]</u>		
Total LL Mercury	<u>1</u>	No	None	1631 LL Hg	8oz Amber Glass	<u>[Signature]</u>		
Dissolved LL Mercury	<u>1</u>	Yes	None	1631 LL Hg	8oz Amber Glass	<u>[Signature]</u>		



Low-Flow Groundwater Sampling & Stabilization Form

Client/Site:	BLM Red Devil Mine	Well ID.:	MW59
Contract No.:	140L6321C0001	Project No.:	BU06-007
Date:	4-1-21	Samplers:	J PARSON
Time Start:	0925		R WITTLER
Time Finish:	1350	Checked By:	R. WITTLER

Well & Purge Information

TD (ft. bTOC):	To PUMP 151.30	ft	Screened Interval (ft.):	
DTW (ft. bTOC):	131.70	ft		
Water Column:		ft	TD-DTW=Water Column	
Liter/Foot:		L/ft	See ***Well Volume Calculation*** table	
Liters in Well:		L	Water Column x L/ft	
Three Well Volumes:		L	Liters in Well x 3	
Sample Depth:		ft	Depth of Pump Intake	

Well Volume Calculation	
Well Diameter	L/ft
5/8"	0.06
2"	0.605
4"	2.47

Field Equipment

Multiparameter Water Quality Meter:	YSI 556 MPS	Serial No.:	106101486
Water Level Meter:	SOLINST 102	Serial No.:	294991
Turbidity Meter:	HF MICRO TPW	Serial No.:	202607903
Pump Type:	BLADDER	Serial No.:	NA

Purge Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 40 Seconds Refill 20 Seconds Discharge 1 LPM @ N 70 psi

Sampling Method:

Peristaltic Pump
 Inertial
 Other: _____

Bladder Pump :
 Optimum Flow Rate Set at 40 Seconds Refill 20 Seconds Discharge

Sample Collection Information

Parameter	# Containers	Filtered?	Preservative	Method	Container Type	MS/MSD? :	
						Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
TAL Metals	1	No	Nitric	6020B LL, 7470A	250 ml Plastic		JEP
Total LL Mercury	1	No	None	1631 LL Hg	8oz Amber Glass		JEP
Dissolved LL Mercury	1	Yes	None	1631 LL Hg	8oz Amber Glass		JEP

Low-Flow Groundwater Sample & Stabilization Form

Well ID: MW59	Sample ID: 0921MW59GW	Sample Time: 1330
Date: 9-1-21	Dup. Sample ID: NA	Dup. Sample Time: NA

Notes: NEEDS NEW AIR FITTINGS, BAD FERRULES. (sp?)

Purging and *Stabilization Data

Time (24 hrs)	Volume Removed (L)	Temp *± 3% °C, min ± 0.2°C	Spec. Cond. (µS/cm) *± 3%	DO (mg/L) *± 10%	pH *± 0.1	ORP (mV) *± 10 mV	Turbidity (NTU) *± 10%	DTW (ft)	Flow Rate L/min	Color/Odor/Notes
1105	START PURGING									
1138	0.66	10.00	292	4.05	7.20	28.0	71.7	131.7	0.02	
1140	0.70	10.01	292	4.04	7.20	27.5	62.0	131.7	0.02	
1145	0.80	10.34	294	3.55	7.19	21.5	80.98	131.7	0.02	
1148	0.86	10.38	295	3.33	7.20	8.5	75.81	131.7	0.02	
1151	0.92	10.47	296	3.29	7.20	11.2	79.26	131.7	0.02	
1154	0.98	10.69	298	3.28	7.20	14.9	81.01	131.7	0.02	
1157	1.04	10.70	298	3.09	7.20	15.7	91.24	131.7	0.02	
1200	1.10	10.92	299	3.08	7.20	16.3	94.57	131.7	0.02	
1203	1.16	11.14	301	3.12	7.21	-0.5	84.14	131.7	0.02	
1206	1.22	11.36	303	3.01	7.22	-4.9	72.16	131.7	0.02	
1209	1.28	11.45	304	2.95	7.23	-7.4	76.19	131.7	0.02	
1212	1.34	11.61	305	2.84	7.26	-2.3	74.23	131.7	0.02	FIXING FAULTY AIR FITTINGS
1240	1.40	12.11	314	3.22	7.32	-26.8	113.00	131.7	0.05	
1243	1.55	8.64	292	3.94	7.33	-55.6	112.6	131.7	0.05	
1246	1.70	7.60	274	2.99	7.37	-73.2	146.2	131.7	0.05	
1249	1.85	7.34	270	2.64	7.38	-69.1	154.9	131.7	0.05	
1252	2.0	6.98	267	2.44	7.41	-66.4	148.9	131.7	0.05	
1255	2.15	6.94	266	2.31	7.44	-81.2	145.2	131.7	0.05	
1258	2.30	6.81	266	2.29	7.45	-72.7	136.1	131.7	0.05	
1301	2.45	7.0	266	2.30	7.44	-74.1	122.9	131.7	0.05	
1304	2.60	6.87	266	1.77	7.49	-105.2	124.4	131.7	0.05	
1307	2.75	6.76	265	1.52	7.50	-110.0	110.6	131.7	0.05	
1310	2.90	6.74	265	1.45	7.51	-108.0	103.5	131.7	0.05	
1313	3.05	6.74	264	1.35	7.52	-95.0	94.10	131.7	0.05	
1316	3.20	6.85	264	1.28	7.50	-101.2	97.48	131.7	0.05	
1319	3.35	6.89	265	1.23	7.49	-102.8	86.61	131.7	0.05	
1322	3.50	7.92	266	1.17	7.47	-131.8	69.18	131.7	0.05	

Sampled?: Yes No

Initial of Sampler: GRP

ATTACHMENT 1.5 SURFACE WATER SAMPLING FORMS

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Surface Water Sample Collection Log

Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: SW
 Pump Type: Peri
 Sample Team: CR/GG/JP

Sample Location: RD ~~155W~~ (555P) 055W ^{JP}
 Sample ID: 0621RD 15 SW
 Date: 6/10/2021
 Time: 1000
 COC #: _____
 Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL x 1	plastic	unfiltered	Nitric <u>Red</u>	ambient	180 days/28 days *	<u>CR</u>
Total LL Mercury	8 oz x 1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	<u>CR</u>
TSS and TDS **	1 L x 1	plastic	unfiltered	None	4°C	7 days	<u>CR</u>
Nitrate-Nitrite	250 mL x 1	plastic	unfiltered	Sulfuric <u>Yellow</u>	4°C	28 days	<u>CR</u>
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL x 1	plastic	unfiltered	None	4°C	28 days/14 days	<u>CR</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

5 BOTTLES

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 mL container.

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: Colleen Rust

Reviewed By: JUDD PARSON

TIME	TEMP °C	SPEC COND. µS/cm	DO mg/L	pH	ORP	TORB. NTUS	NOTES
<u>1000</u>	<u>3.51</u>	<u>291</u>	<u>2.38</u>	<u>6.56</u>	<u>79.6</u>	<u>8.83</u>	



Surface Water Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: SW
Pump Type: Peri
Sample Team: CR/GG/JP

Sample Location: RD 06SW
Sample ID: 0621RD 06 SW
Date: 6/10/2021
Time: 9:45
COC #:
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL x1	plastic	unfiltered	Nitric <i>RED</i>	ambient	180 days/28 days *	<i>CR</i>
Total LL Mercury	8 oz x1	glass	unfiltered	None	4°C	48 hours/14 days*	<i>CR</i>
TSS and TDS **	1 L x1	plastic	unfiltered	None	4°C	7 days	<i>CR</i>
Nitrate-Nitrite	250 mL x1	plastic	unfiltered	Sulfuric <i>Yellow</i>	4°C	28 days	<i>CR</i>
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL x1	plastic	unfiltered	None	4°C	28 days/14 days	<i>CR</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time. *5 BOTTLES*
 **The TSS and TDS are sampled together in a 1 L container.
 ***The Inorganic Ions and Alkalinity are sampled together in a 250 mL container.
 + According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: Colleen Rust

Reviewed By: Judd Parson

TIME	TEMP °C	SPEC. COND $\mu S/cm$	DO mg/L	pH	ORP	TURB. NTUs	NOTES
9:45	4.67	97	11.67	7.06	95.2	1.40	clear

SAMPLE DWP/MS/MSD



Surface Water
Sample Collection Log

Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: SW
 Pump Type: Peri
 Sample Team: CR/GG/JP

Sample Location: RD 086W
 Sample ID: 0621RD 08 SW
 Date: 6/10/2021
 Time: 7:45
 COC #: _____
 Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X4	plastic	unfiltered	Nitric <u>CS</u>	ambient	180 days/28 days*	<u>CR</u>
Total LL Mercury	8 oz X4	glass	unfiltered	None	4°C	48 hours/14 days*	<u>CR</u>
TSS and TDS **	1 L X4	plastic	unfiltered	None	4°C	7 days	<u>CR</u>
Nitrate-Nitrite	250 mL X4	plastic	unfiltered	Sulfuric <u>Yellow</u>	4°C	28 days	<u>CR</u>
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL X4	plastic	unfiltered	None	4°C	28 days/14 days	<u>CR</u>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time. DWP 0621RD099SW @ 0900
 **The TSS and TDS are sampled together in a 1 L container.
 ***The Inorganic Ions and Alkalinity are sampled together in a 250 mL container.
 + According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days. 20 Bottles

Logged By: Colleen Rust

Reviewed By: Judd Parson

TIME	TEMP °C	SEC. COND µS/cm	DO %mg/L	pH	ORP	TORB. NTUs	NOTES
<u>0845</u>	<u>4.73</u>	<u>99</u>	<u>12.32</u>	<u>6.89</u>	<u>160.1</u>	<u>2.06</u>	<u>CLEAR</u>



Surface Water Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: SW
Pump Type: Peri
Sample Team: CR/GG/JP

Sample Location: RD 10SW
Sample ID: 0621RD 10 SW
Date: 6/10/2021
Time: 1030
COC #:
Trip Blank ID: _____ LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X 1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	CR
Total LL Mercury	8 oz X 1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	CR
TSS and TDS **	1 L X 1	plastic	unfiltered	None	4°C	7 days	CR
Nitrate-Nitrite	250 mL X 1	plastic	unfiltered	Sulfuric	4°C	28 days	CR
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL X 1	plastic	unfiltered	None	4°C	28 days/14 days	CR

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

5 BOTTLES

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 mL container.

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: Colleen Rust

Reviewed By: JUDY PARSON

TIME	TEMP. °C	SPEC COND µS/cm	DO mg/L	PH	ORP	TDS NTUS	NOTES
1030	4.23	82	11.68	7.44	111.1	1.1	CLEAR



Surface Water Sample Collection Log

Project Name: Red Devil Mine
Project No.: BU06-007
Sample Type: SW
Pump Type: Peri
Sample Team: CR/GG/JP

Sample Location: RD ~~055N~~ 15SW^{JP}
Sample ID: 0621RD05SW
Date: 6/10/2021
Time: 1015
COC #:
Trip Blank ID: LL Mercury (only)

Methods (listed in prioritized order)	Sample Volume	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL X 1	plastic	unfiltered	Nitric	ambient	180 days/28 days *	CR
Total LL Mercury	8 oz X 1	glass	unfiltered	None	4°C	48 hours/14 days ⁺	CR
TSS and TDS **	1 L X 1	plastic	unfiltered	None	4°C	7 days	CR
Nitrate-Nitrite	250 mL X 1	plastic	unfiltered	Sulfuric	4°C	28 days	CR
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL X 1	plastic	unfiltered	None	4°C	28 days/14 days	CR

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time.

5 BOTTLES

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 mL container.

+ According to the laboratory project manager, if filtered in field and analyzed in original container, laboratory SOP indicates hold time of 14-days.

Logged By: Colleen Rost

Reviewed By: Judd Parson

TIME	TEMP °C	SPEC COND µS/cm	DO mg/L	pH	ORP	TURB. NTU ₂₅	NOTES
1015	4.67	86	11.89	7.60	57.8	1.74	Clear



Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: SW
 Pump Type: Peri
 Sample Team: CR/GG/JP

Surface Water
 Sample Collection Log

SEEP

Sample Location: RD 05
 Sample ID: 0921RD 05 SW
 Date: 9-3-21
 Time: 1030
 COC #: _____
 Trip Blank ID: _____

Methods (listed in prioritized order)	Sample Volume	Bottle Count	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	1	plastic	Unfiltered	Nitric	ambient	180 days/ 28 days*	[Signature]
Total LL Mercury	8 oz	1	glass	Unfiltered	None	4° C	48 hours/14 days	[Signature]
TSS and TDS**	1 L	1	plastic	Unfiltered	None	4° C	7 days	[Signature]
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL	1	plastic	Unfiltered	None	4° C	28 days/ 14 days	[Signature]
Nitrate-Nitrite	250 mL	1	plastic	Unfiltered	Sulfuric	4° C	28 days	[Signature]

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 ml container.

Logged By: JP

Reviewed By: R. WITTLER

Time	Temp °C	Spec Con μS/cm	DO mg/L	pH	ORP	Turb. NTU	Notes
<u>1030</u>	<u>4.09</u>	<u>269</u>	<u>4.16</u>	<u>10.71</u>	<u>12.7</u>	<u>2.16</u>	



Surface Water Sample Collection Log

Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: SW
 Pump Type: Peri
 Sample Team: CR/GG/JP

Sample Location: RD06
 Sample ID: 0921RD06SW
 Date: 9-3-21
 Time: 1000
 COC #: _____
 Trip Blank ID: _____

Methods (listed in prioritized order)	Sample Volume	Bottle Count	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	1	plastic	Unfiltered	Nitric	ambient	180 days/ 28 days*	<i>[Signature]</i>
Total LL Mercury	8 oz	1	glass	Unfiltered	None	4° C	48 hours/14 days	<i>[Signature]</i>
TSS and TDS**	1 L	1	plastic	Unfiltered	None	4° C	7 days	<i>[Signature]</i>
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL	1	plastic	Unfiltered	None	4° C	28 days/ 14 days	<i>[Signature]</i>
Nitrate-Nitrite	250 mL	1	plastic	Unfiltered	Sulfuric	4° C	28 days	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 ml container.

Logged By: JP

Reviewed By: R. Wittler

Time	Temp °C	Spec Con µS/cm	DO mg/L	pH	ORP	Turb. NTU	Notes
<u>0955</u>	<u>6.84</u>	<u>92</u>	<u>13.50</u>	<u>6.51</u>	<u>151.7</u>	<u>0.45</u>	



Surface Water Sample Collection Log

Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: SW
 Pump Type: Peri
 Sample Team: CR/GG/JP

Sample Location: RDO8
 Sample ID: 0921RDO8 SW
 Date: 9-3-21
 Time: 0915
 COC #: _____
 Trip Blank ID: _____

Methods (listed in prioritized order)	Sample Volume	Bottle Count	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	3	plastic	Unfiltered	Nitric	ambient	180 days/ 28 days*	<i>[Signature]</i>
Total LL Mercury	8 oz	3	glass	Unfiltered	None	4° C	48 hours/14 days	<i>[Signature]</i>
TSS and TDS**	1 L	3	plastic	Unfiltered	None	4° C	7 days	<i>[Signature]</i>
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL	3	plastic	Unfiltered	None	4° C	28 days/ 14 days	<i>[Signature]</i>
Nitrate-Nitrite	250 mL	3	plastic	Unfiltered	Sulfuric	4° C	28 days	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 ml container.

Logged By: JP

Reviewed By: R. W. H. H. H.

Time	Temp °C	Spec Con μS/cm	DO mg/L	pH	ORP	Turb. NTU	Notes
0910	6.90	109	13.46	4.96	247.3	0.2	



Surface Water Sample Collection Log

Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: SW
 Pump Type: Peri
 Sample Team: CR/GG/JP

Sample Location: RD 10
 Sample ID: 0921RD10SW
 Date: 09-3-21
 Time: 1135
 COC #: _____
 Trip Blank ID: _____

Methods (listed in prioritized order)	Sample Volume	Bottle Count	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	1	plastic	Unfiltered	Nitric	ambient	180 days/ 28 days*	<i>[Signature]</i>
Total LL Mercury	8 oz	1	glass	Unfiltered	None	4° C	48 hours/14 days	<i>[Signature]</i>
TSS and TDS**	1 L	1	plastic	Unfiltered	None	4° C	7 days	<i>[Signature]</i>
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL	1	plastic	Unfiltered	None	4° C	28 days/ 14 days	<i>[Signature]</i>
Nitrate-Nitrite	250 mL	1	plastic	Unfiltered	Sulfuric	4° C	28 days	<i>[Signature]</i>

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 ml container.

Logged By: JP

Reviewed By: R. Wither

Time	Temp °C	Spec Con µS/cm	DO mg/L	pH	ORP	Turb. NTU	Notes
1130	10.90	97	11.95	7.90	-81.5	0.46	



**Surface Water
Sample Collection Log**

0921RD99SW @ 1100

Project Name: Red Devil Mine
 Project No.: BU06-007
 Sample Type: SW
 Pump Type: Peri
 Sample Team: CR/GG/JP

Sample Location: RD 15
 Sample ID: 0921RD15 SW
 Date: 9-3-21
 Time: 1055
 COC #: _____
 Trip Blank ID: _____

Methods (listed in prioritized order)	Sample Volume	Bottle Count	Bottle Type	Filtered/Unfiltered	Preservative	Temperature	Hold Time	Initials
TAL Metals	250 mL	2	plastic	Unfiltered	Nitric	ambient	180 days/ 28 days*	JP
Total LL Mercury	8 oz	2	glass	Unfiltered	None	4° C	48 hours/14 days	JP
TSS and TDS**	1 L	2	plastic	Unfiltered	None	4° C	7 days	JP
Inorganic Ions (Cl, F, SO ₄) and Alkalinity***	250 mL	2	plastic	Unfiltered	None	4° C	28 days/ 14 days	JP
Nitrate-Nitrite	250 mL	2	plastic	Unfiltered	Sulfuric	4° C	28 days	JP

Comments: * The TAL Hg analyzed by EPA Method 7470A has a 28 day hold time

**The TSS and TDS are sampled together in a 1 L container.

***The Inorganic Ions and Alkalinity are sampled together in a 250 ml container.

Logged By: JP

Reviewed By: R. Wiltner

Time	Temp °C	Spec Con µS/cm	DO mg/L	pH	ORP	Turb. NTU	Notes
1050	7.01	94	12.80	7.64	-29.7	0.37	

ATTACHMENT 1.6 CALIBRATION LOGS

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Model: YSI 556 MPB

Serial Number: 14B103510

Date & Time & Temp	Calibration Information	Initial Calibration Readings	Final Calibration Readings
Date: 6-2-21 Time: 1245 Temp: 55°F	pH (4.0)	3.96	4.01
	pH (7.0)	7.00	7.00
	pH (10.0)	10.15	10.02
	Spec Cond (µS/cm)	1162	1165
	DO (mg/L)	9.18	9.67
	ORP (mV)	249.5	240.0
Date: 6-5-21 Time: 1921 Temp: 18.25°C	pH (4.0)	4.05	4.01
	pH (7.0)	6.98	7.00
	pH (10.0)	10.06	10.02
	Spec Cond (µS/cm)	1341	1241
	DO (mg/L)	9.31	9.16
	ORP (mV)	239.8	240.0
Date: 6-6-21 Time: 1725 Temp: 23.2	pH (4.0)	3.88	4.01
	pH (7.0)	6.80	7.00
	pH (10.0)	10.18	10.04
	Spec Cond (µS/cm)	1308	1275
	DO (mg/L)	8.71	8.97
	ORP (mV)	236.8	240.0
Date: 6-8-21 Time: 0740 Temp: 19°	pH (4.0)	4.08	4.01
	pH (7.0)	6.99	7.00
	pH (10.0)	10.06	10.07
	Spec Cond (µS/cm)	1182	1236
	DO (mg/L)	9.60	9.29
	ORP (mV)	241.5	240.0
Date: 6/9/21 Time: 1457 Temp: 19°	pH (4.0)	3.99	4.01
	pH (7.0)	7.03	7.00
	pH (10.0)	9.88	10.00
	Spec Cond (µS/cm)	1150	1234
	DO (mg/L)	9.46	9.15
	ORP (mV)	240.2	240.0
Date: Time: Temp:	pH (4.0)		
	pH (7.0)		
	pH (10.0)		
	Spec Cond (µS/cm)		
	DO (mg/L)		
	ORP (mV)		

Model: YSI 556

Serial Number: 11F102278

Date & Time & Temp	Calibration Information	Initial Calibration Readings	Final Calibration Readings
Date: <u>06/02/21</u> Time: <u>1246</u> Temp: <u>16° 15.7°C</u>	pH (4.0)	<u>3.97</u>	<u>4.01</u>
	pH (7.0)	<u>7.05</u>	<u>7.00</u>
	pH (10.0)	<u>10.01</u>	<u>10.01</u>
	Spec Cond (µS/cm)	<u>1243</u>	<u>1174</u>
	DO (mg/L)	<u>9.53</u>	<u>9.66</u>
	ORP (mV)	<u>244.4</u>	<u>240.0</u>
	Date: <u>6/5/21</u> Time: <u>1725</u> Temp: <u>19.40°C</u>	pH (4.0)	<u>4.01</u>
pH (7.0)		<u>6.89</u>	<u>7.00</u>
pH (10.0)		<u>10.25</u>	<u>10.05</u>
Spec Cond (µS/cm)		<u>1342</u>	<u>1266</u>
DO (mg/L) %		<u>112.0 %</u>	<u>99.8 %</u>
ORP (mV)		<u>237.2</u>	<u>240.0</u>
Date: <u>6-6-21</u> Time: <u>1725</u> Temp: <u>23.2°C</u>		pH (4.0)	<u>4.06</u>
	pH (7.0)	<u>6.95</u>	<u>7.00</u>
	pH (10.0)	<u>10.08</u>	<u>10.02</u>
	Spec Cond (µS/cm)	<u>1185</u>	<u>1256</u>
	DO (mg/L)	<u>8.47</u>	<u>9.05</u>
	ORP (mV)	<u>241.5</u>	<u>240.0</u>
	Date: <u>6/8/21</u> Time: <u>0731</u> Temp: <u>19°C</u>	pH (4.0)	<u>3.97</u>
pH (7.0)		<u>7.10</u>	<u>7.00</u>
pH (10.0)		<u>9.91</u>	<u>10.00</u>
Spec Cond (µS/cm)		<u>1125</u>	<u>1237</u>
DO (mg/L)		<u>9.08</u>	<u>9.28</u>
ORP (mV)		<u>241.5</u>	<u>240.0</u>
Date: <u>6/9/21</u> Time: <u>0830</u> Temp: <u>19°C</u>		pH (4.0)	<u>3.98</u>
	pH (7.0)	<u>7.04</u>	<u>7.00</u>
	pH (10.0)	<u>9.89</u>	<u>9.99</u>
	Spec Cond (µS/cm)	<u>1248</u>	<u>1233</u>
	DO (mg/L)	<u>239.6 9.18</u>	<u>9.24</u>
	ORP (mV)	<u>237.6</u>	<u>240.1</u>
	Date: Time: Temp:	pH (4.0)	
pH (7.0)			
pH (10.0)			
Spec Cond (µS/cm)			
DO (mg/L)			
ORP (mV)			

TURBIDITY CAL

RED DEVIL

JUNE 21

HF SCIENTIFIC MICRO TPI 20000

SN: 202008376

DATE	STANDARD	READING	OK?
6-2-21 1240	1000	1000	✓
	10.0	10	✓
	0.02	0.02	✓
6-5-21 1711	1000	1000	✓
	10.0	10	✓
	0.02	0.02	✓
6-6-21 1715	1000	1000	✓
	10.0	10.0	✓
	0.02	0.02	✓
6-8-21 0700	1000	1000	✓
	10	10	✓
	0.02	0.02	✓
6-9-21 0830	1000	1000	✓
	10	10	✓
	0.02	0.02	✓

de

TURBIDITY CAL

RED DEVIL

JUNE 21

HF SCIENTIFIC MICRO TPI 20000

SN: 202007902

DATE	STANDARD	READING	OK?
6-2-21 1240	1000	1000	✓
	10	10	✓
	0.02	0.02	✓
6-5/21 1917	1000	1000	✓
	10	10	✓
	0.02	0.02	✓
6-6-21 1715	1000	1000	✓
	10	10	✓
	0.02	0.02	✓
6-8-21 0700	1000	1000	✓
	10	10	✓
	0.02	0.02	✓
6-9-21 0830	1000	1000	✓
	10	10	✓
	0.02	0.02	✓

Model: Micro TPW

Serial Number: 201810324

Date & Time & Temp	Calibration Information	Initial Calibration Readings	Final Calibration Readings
Date: <u>08/27/2021</u> Time: <u>1210</u>	pH(4.0) <u>0.00</u>	<u>0.00</u> 1000	1000 <u>0.02</u>
	pH(7.0) <u>10.0</u>	<u>10.05</u>	10.0 <u>10.0</u>
	pH(10.0) <u>1000</u>	<u>982.6</u>	<u>1000</u>
Temp: <u>8-29-21</u> <u>1835</u>	Spec Cond (µS/cm) <u>0.02</u>	<u>0.02</u>	<u>0.02</u>
	DO (mg/L) <u>10.0</u>	<u>10</u>	<u>10</u>
	ORP (mV) <u>1000</u>	<u>1000</u>	<u>1000</u>
Date: <u>8-30-21</u> Time: <u>1800</u>	pH(4.0) <u>0.02</u>	<u>0.02</u>	<u>0.02</u>
	pH(7.0) <u>10.0</u>	<u>10.0</u>	<u>10.0</u>
	pH(10.0) <u>1000</u>	<u>1000</u>	<u>1000</u>
Temp: <u>8-31-21</u> <u>1752</u>	Spec Cond (µS/cm) <u>0.02</u>	<u>0.00</u>	<u>0.02</u>
	DO (mg/L) <u>10.0</u>	<u>9.06</u>	<u>10.0</u>
	ORP (mV) <u>1000</u>	<u>881.5</u>	<u>1000</u>
Date: <u>09-02-21</u> Time: <u>1257</u>	pH(4.0) <u>0.02</u>	<u>0.42</u>	<u>0.02</u>
	pH(7.0) <u>10.0</u>	<u>10.65</u>	<u>10.00</u>
	pH(10.0) <u>1000</u>	<u>926.6</u>	<u>1000</u>
Temp:	Spec Cond (µS/cm)		
	DO (mg/L)		
	ORP (mV)		
Date:	pH (4.0)		
	pH (7.0)		
	pH (10.0)		
Time:	Spec Cond (µS/cm)		
	DO (mg/L)		
	ORP (mV)		
Temp:	pH (4.0)		
	pH (7.0)		
	pH (10.0)		
Date:	Spec Cond (µS/cm)		
	DO (mg/L)		
	ORP (mV)		

MM

Model: Micro TPW
Serial Number: 2020 07903

Date & Time & Temp	Calibration Information	Initial Calibration Readings	Final Calibration Readings
Date: 08-27-2021 Time: 1306	pH(4.0) 0.02	0.04	0.02
	pH(7.0) 10.0	9.16	10.0
	pH(10.0) 1000	1000 ew 816.0	1000
Temp: 8-29-21 1835	Spec-Cond(µS/cm) 0.02	0.02	0.02
	DO(mg/L) 10.0	10	10
	ORP(mV) 1000	1000	1000
Date: 8-30-21 Time: 1800	pH(4.0) 0.02	0.02	0.02
	pH(7.0) 10.0	10.0	10.0
	pH(10.0) 1000	1000	1000
Temp: 8-31-21 1747	Spec-Cond(µS/cm) 0.02	0.02	0.02
	DO(mg/L) 10.0	9.83	10.0
	ORP(mV) 1000	967.1	1000
Date: Time: Temp:	pH(4.0) 0.02		
	pH(7.0) 10.0		
	pH(10.0) 1000		
Date: Time: Temp:	Spec-Cond(µS/cm) 0.02		
	DO(mg/L) 10.0		
	ORP(mV) 1000		
Date: Time: Temp:	pH(4.0) 0.02		
	pH(7.0) 10.0		
	pH(10.0) 1000		
Date: Time: Temp:	Spec-Cond(µS/cm) 0.02		
	DO(mg/L) 10.0		
	ORP(mV) 1000		
Date: Time: Temp:	pH(4.0)		
	pH(7.0)		
	pH(10.0)		
Date: Time: Temp:	Spec-Cond(µS/cm)		
	DO(mg/L)		
	ORP(mV)		
Date: Time: Temp:	pH(4.0)		
	pH(7.0)		
	pH(10.0)		
Date: Time: Temp:	Spec-Cond(µS/cm)		
	DO(mg/L)		
	ORP(mV)		

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September 2, 2021.



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Photograph 2-27. Red Devil Creek reworked section with gabions. September 2, 2021.



Photograph 2-28. Red Devil Creek reworked gabion section, looking upstream.
September 2, 2021.

ATTACHMENT 3. SUPPLEMENTAL DATA

(Provided on a CD)

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ATTACHMENT 4. ANALYTICAL LABORATORY REPORTS

(Provided on a CD)

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ATTACHMENT 5. DATA VALIDATION REPORTS

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ATTACHMENT 5.1 2021 SPRING DATA VALIDATION REPORT

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I. Project Information

File Name:	580-103791-1 DV Report.0_Metals_GenChem				
Analysis:	MT, WC				
SDG#:	580-103791-1	Reviewer:	KKOL	Rev Date:	8/23/2021
Matrix:	Surface Water Groundwater	2nd Rev:	HC CTD	2nd Rev Date:	9/22/2021
Validation Level:	Stage2B/Stage4	# Samples:	40	# RE/DL:	0

II. Secondary Review List

Narrative:	Form Is:
<input checked="" type="checkbox"/> Qualifications in text match Form Is	<input checked="" type="checkbox"/> "U" / "J" lab codes carried over
<input checked="" type="checkbox"/> Spell check	<input checked="" type="checkbox"/> Appropriate qual codes used
<input checked="" type="checkbox"/> Pagination, appropriate headers/footers	<input checked="" type="checkbox"/> Form I IDs match sample ID table
<input checked="" type="checkbox"/> Correct project site name/manager on cover and introduction pages	
Required Edits/Changes:	
Add comprehensive table of qualifiers	
Revision (include revision #, date and reason):	
Revision 0	
Validator Signature:	
Kathryn K. Okonzak-Lowry <small>Digitally signed by Kathryn K. Okonzak-Lowry Date: 2021.10.28 12:26:27 -06'00'</small>	
Review Signature:	
	

Data Validation Report

Red Devil Mine, Alaska

Sample Delivery Group

580-103791-1

Prepared for

Sundance Consulting, Inc.

8210 Louisiana Blvd NE

Suite C

Albuquerque, NM 87113

Attention:

Colleen Rust, PG

9/22/2021

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III. Acronyms and Abbreviations

°C	Celsius
%	Percent
%D	percent difference
CCAL	continuing calibration
CCB	continuing calibration blank
CCV	continuing calibration verification
COC	chain of custody
CLP	Contract Laboratory Program
DL	detection limit
EFGS	Eurofins Frontier Global Sciences
EPA	US Environmental Protection Agency
ER	equipment rinsate
FB	field blank
FD	field duplicate
GW	ground water
ICAL	initial calibration
ICB	initial calibration blank
ICV	initial calibration verification
IS	internal standard
J	estimated value
LCS	laboratory control sample
LL Hg	low level mercury
LOD	limit of detection
LOQ	limit of quantification
MB	method blank
MS	matrix spike
MSD	matrix spike duplicate
ND	nondetect
QAPP	Quality Assurance Program Plan
QC	quality control
QSM	Quality Systems Manual
R	Rejected
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
SDG	sample delivery group
TB	trip blank
TDS	total dissolved solids
TSS	total suspended solids
SW	surface water
U	not detected
UJ	not detected; associated value is an estimate

IV. Introduction

Project Name: Red Devil Mine

Sample Delivery Group: 580-103791-1

Client Project Manager: Colleen Rust

Matrix: Surface Water

QC Level: Stage 2B/Stage 4

No. of Samples: 40

Laboratory: Eurofins TestAmerica Seattle

Table 1 – Sample Summary

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
1	0621RD05SW	580-103791-1 1F00124-01	SW	6/10/2021	6020B, 7470A, 353.2, 300.0, 310.1, 160.1, 160.2 1631	Stage 2B
2	0621RD06SW	580-103791-2 1F00124-02	SW	6/10/2021	6020B, 7470A, 353.2, 300.0, 310.1, 160.1, 160.2 1631	Stage 2B
3	0621RD08SW	580-103791-3 1F00124-03	SW	6/10/2021	6020B, 7470A, 353.2, 300.0, 310.1, 160.1, 160.2 1631	Stage 4
4	0621RD10SW	580-103791-4	SW	6/10/2021	6020B, 7470A, 353.2, 300.0, 310.1, 160.1,	Stage 2B

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
		1F00124-04			160.2 1631	
5	0621RD15SW	580-103791-5	SW	6/10/2021	6020B, 7470A, 353.2, 300.0, 310.1, 160.1, 160.2 1631	Stage 2B
		1F00124-05			1631	
6	0621RD99SW	580-103791-6	SW	6/10/2021	6020B, 7470A, 353.2, 300.0, 310.1, 160.1, 160.2 1631	Stage 2B
		1F00124-06			1631	
7	0621EB1	580-103791-7	EB	6/06/2021	6020B, 7470A	Stage 2B
	0621EB1 TOTAL	1F00124-07			1631	
	0621EB1 DISS	1F00124-08				
8	0621EB2	580-103791-8	EB	6/06/2021	6020B, 7470A	Stage 2B
	0621EB2 TOTAL	1F00124-09			1631	
	0621EB2 DISS	1F00124-10				
9	0621MW99GW	580-103791-9	GW	6/05/2021	6020B, 7470A	Stage 2B
	0621MW99GW TOTAL	1F00124-11			1631	
	0621MW99GW DISS	1F00124-12				
10	0621MW98GW	580-103791-10	GW	6/06/2021	6020B, 7470A	Stage 2B
	0621MW98GW TOTAL	1F00124-13			1631	

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
	0621MW98GW DISS	1F00124-14				
11	0621MW97GW	580-103791-11	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW97GW TOTAL	1F00124-15			1631	
	0621MW97GW DISS	1F00124-16				
12	0621MW06GW	580-103791-12	GW	6/05/2021	6020B, 7470A	Stage 2B
	0621MW06GW TOTAL	1F00124-17			1631	
	0621MW06GW DISS	1F00124-18				
13	0621MW09GW	580-103791-13	GW	6/05/2021	6020B, 7470A	Stage 2B
	0621MW09GW TOTAL	1F00124-19			1631	
	0621MW09GW DISS	1F00124-20				
14	0621MW10GW	580-103791-14	GW	6/05/2021	6020B, 7470A	Stage 2B
	0621MW10GW TOTAL	1F00124-21			1631	
	0621MW10GW DISS	1F00124-22				
15	0621MW16GW	580-103791-15	GW	6/05/2021	6020B, 7470A	Stage 2B
	0621MW16GW TOTAL	1F00124-23 1F00124-24			1631	
	0621MW16GW DISS					
16	0621MW17GW	580-103791-16	GW	6/05/2021	6020B, 7470A	Stage 2B
	0621MW17GW	1F00124-25				

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
	TOTAL 0621MW17GW DISS	1F00124-26			1631	
17	0621MW26GW 0621MW26GW TOTAL 0621MW26GW DISS	580-103791-17 1F00124-27 1F00124-28	GW	6/05/2021	6020B, 7470A 1631	Stage 2B
18	0621MW27GW 0621MW27GW TOTAL 0621MW27GW DISS	580-103791-18 1F00124-29 1F00124-30	GW	6/06/2021	6020B, 7470A 1631	Stage 2B
19	0621MW28GW 0621MW28GW TOTAL 0621MW28GW DISS	580-103791-19 1F00124-31 1F00124-32	GW	6/06/2021	6020B, 7470A 1631	Stage 2B
20	0621MW33GW 0621MW33GW TOTAL 0621MW33GW DISS	580-103791-20 1F00124-33 1F00124-34	GW	6/08/2021	6020B, 7470A 1631	Stage 2B
21	0621MW40GW 0621MW40GW TOTAL 0621MW40GW DISS	580-103791-21 1F00124-35 1F00124-36	GW	6/08/2021	6020B, 7470A 1631	Stage 2B
22	0621MW43GW	580-103791-22	GW	6/06/2021	6020B, 7470A	Stage 2B

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
	0621MW43GW TOTAL	1F00124-37			1631	
	0621MW43GW DISS	1F00124-38				
23	0621MW44GW	580-103791-23	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW44GW TOTAL	1F00124-39			1631	
	0621MW44GW DISS	1F00124-40				
24	0621MW45GW	580-103791-24	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW45GW TOTAL	1F00124-59			1631	
	0621MW45GW DISS	1F00124-60				
25	0621MW46GW	580-103791-25	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW46GW TOTAL	1F00124-61			1631	
	0621MW46GW DISS	1F00124-62				
26	0621MW47GW	580-103791-26	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW47GW TOTAL	1F00124-63			1631	
	0621MW47GW DISS	1F00124-64				
27	0621MW49GW	580-103791-27	GW	6/06/2021	6020B, 7470A	Stage 2B
	0621MW49GW TOTAL	1F00124-65			1631	
	0621MW49GW DISS	1F00124-66				
28	0621MW50GW	580-103791-28	GW	6/07/2021	6020B,	Stage 2B

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
	0621MW50GW TOTAL	1F00124-67			7470A	
	0621MW50GW DISS	1F00124-68			1631	
29	0621MW51GW	580-103791-29	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW51GW TOTAL	1F00124-69			1631	
	0621MW51GW DISS	1F00124-70				
30	0621MW52GW	580-103791-30	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW52GW TOTAL	1F00124-71			1631	
	0621MW52GW DISS	1F00124-72				
31	0621MW53GW	580-103791-31	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW53GW TOTAL	1F00124-73			1631	
	0621MW53GW DISS	1F00124-74				
32	0621MW54GW	580-103791-32	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW54GW TOTAL	1F00124-75			1631	
	0621MW54GW DISS	1F00124-76				
33	0621MW55GW	580-103791-33	GW	6/08/2021	6020B, 7470A	Stage 4
	0621MW55GW TOTAL	1F00124-77			1631	
	0621MW55GW DISS	1F00124-78				

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
34	0621MW56GW	580-103791-34	GW	6/06/2021	6020B, 7470A	Stage 2B
	0621MW56GW TOTAL	1F00124-79			1631	
	0621MW56GW DISS	1F00124-80				
35	0621MW57GW	580-103791-35	GW	6/08/2021	6020B, 7470A	Stage 2B
	0621MW57GW TOTAL	1F00124-81			1631	
	0621MW57GW DISS	1F00124-82				
36	0621MW58GW	580-103791-36	GW	6/07/2021	6020B, 7470A	Stage 2B
	0621MW58GW TOTAL	1F00124-83			1631	
	0621MW58GW DISS	1F00124-84				
37	0621MW59GW	580-103791-37	GW	6/08/2021	6020B, 7470A	Stage 2B
	0621MW59GW TOTAL	1F00124-85			1631	
	0621MW59GW DISS	1F00124-86				
38	0621TB01	580-103791-38 1F00124-87	TB	6/05/2021	1631	Stage 2B
39	0621TB02	580-103791-39 1F00124-88	TB	6/05/2021	1631	Stage 2B
40	0621TB02	580-103791-40 1F00124-89	TB	6/05/2021	1631	Stage 2B

V. Sample Management

According to the case narrative, the sample receiving checklist and the chains-of-custody (COCs) provided by the laboratory for sample delivery group (SDG) 580-103791-1:

- The laboratory's Login Sample Receipt Checklist and the COCs noted all coolers were received within the temperature limits of $\leq 6^{\circ}\text{C}$ and $\geq 0^{\circ}\text{C}$, with the following exception: The samples from cooler #2 were received at the laboratory outside the recommended temperature criteria for the following analyses: 353.2 nitrate+nitrite, 300.0 anions, 310.1 alkalinity, 160.1 TSS and 160.2 TDS. The cooler temperature at receipt was 10.1° . Per the laboratory narrative, the following samples were impacted: 0621RD05SW (580-103791-1), 0621RD06SW (580-103791-2), 0621RD08SW (580-103791-3), 0621RD08SW (580-103791-3[DU]), 0621RD08SW (580-103791-3[MS]), 0621RD08SW (580-103791-3[MSD]), 0621RD10SW (580-103791-4), 0621RD15SW (580-103791-5) and 0621RD99SW (580-103791-6).
- The samples were received intact, and properly preserved, as applicable, with the cooler temperature exception listed above.
- The laboratory's Sample Receiving Checklist did not address the presence or absence of custody seals.
- The samples for low level mercury (LL Hg) by Method 1631 were subcontracted to Eurofins Frontier Global Sciences (EFGS). The samples were received intact at EFGS on 6/18/2021 under EFGS SDG 1F00124. Total and dissolved volumes were received at the lab for the ground water (GW) LL Hg samples. The dissolved sample volumes were field filtered. As noted in Table 1-Sample Summary of this DVR, the total and dissolved volumes for each GW Sample ID were given a distinct EFGS laboratory ID.
- Field and laboratory personnel signed and dated the COCs, with the following exception: The COCs shipped with the LL Hg samples were not all signed by EFGS. Only the first COC for the shipment was signed.

Table 2 – Data Qualifier Definitions

Qualifier	Definition
U	The analyte was analyzed for but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

VI. SW-846 Method 6020B AND 7470A—Metals and Mercury

K. Okonczak-Lowry of Oak Services reviewed the SDG August 6, 2021.

VI.1. Holding Times

Analytical holding times, 28 days for mercury and six months for the remaining metals, was met.

VI.2. Tuning and Calibration

All tuning criteria were met. Mass calibrations were ≤ 0.1 atomic mass unit (amu) from the true value. Resolution was < 0.9 amu full width at 10% peak height and all %RSDs were $\leq 5\%$.

A blank and five standards were used in the initial calibration. Correlation coefficients were ≥ 0.995 . The range of the ICP/MS calibration curves is low. The high standard for a number of trace analytes is 100 ppb. The high standard for Ca, Mg, Al, Na, K, Fe and Al is 2000 ppb. The lab reported results above the linear curve range and did not analyze a high linear range check standard. Sample detects reported above the high standard in the calibration curve are qualified as estimated, J.

Table 3 - Metals and Mercury Tuning and Calibration

Issue	Analyte	Qualifier	Affected Samples
Sample detects reported above the calibration curve linear range	Calcium	J	All sample detects
	Magnesium	J	All sample detects
	Sodium	J	All sample detects
	Potassium	J	All sample detects

Issue	Analyte	Qualifier	Affected Samples
	Antimony	J	580-103791-2 580-103791-3 580-103791-6 580-103791-15 580-103791-20
	Arsenic	J	580-103791-5 580-103791-15 580-103791-17 580-103791-21 580-103791-22 580-103791-28 580-103791-37
	Barium	J	580-103791-33 580-103791-13 580-103791-17 580-103791-21 580-103791-22 580-103791-28 580-103791-31 580-103791-32 580-103791-36 580-103791-37
	Iron	J	580-103791-33 580-103791-5 580-103791-12 580-103791-15 580-103791-17 580-103791-22 580-103791-28 580-103791-32 580-103791-36 580-103791-37

Issue	Analyte	Qualifier	Affected Samples
	Manganese	J	580-103791-33 580-103791-10 580-103791-12 580-103791-13 580-103791-14 580-103791-15 580-103791-17 580-103791-18 580-103791-19 580-103791-21 580-103791-22 580-103791-23 580-103791-28 580-103791-29 580-103791-30 580-103791-31 580-103791-32 580-103791-34 580-103791-36 580-103791-37

The MDL and RLs for major cations do not concur with the low range of the calibration curve. The MDL is above the calibration curve. The calibration check standards (ICVs and CCVs) were therefore reported as nondetect, ND, on the QC summary forms. Recoveries within control limits were verified in the raw data for a number of the ICV/CCV analyses. The Ca, Na, Mg and K ICV and CCV standards do not meet method requirements, and all sample results are qualified as estimated, J/UJ, respectively, for detects and nondetects. All reported ICV and CCV recoveries were within 90-110% and the low-level CCV recoveries were within 80-120%.

Table 4 - Metals and Mercury Calibration Check Standards

Calibration Check Standards	Analyte	Qualifier	Affected Samples
ICV/CCV Standards have a true value < the laboratory reported MDL	Calcium Magnesium Sodium Potassium	J/UJ	All samples

A blank and 5 non-zero standards were used for the CVAA calibration. The initial (ICV) and continuing calibration recoveries (CCV) were within 90-110%.

VI.3. Laboratory Quality Control Samples

VI.3.1. Calibration blanks and Method Blanks

No target analytes were reported in the method blanks (MB) or bracketing calibration blanks (ICB/CCB) of sufficient concentration to warrant qualification of site sample results except as noted in the table

below. For the positive blank concentrations, associated detected sample results that were below the reporting limit (RL) were qualified as nondetect (U) at the RL. Associated detected sample results that were greater than RL and <5× the blank concentration were qualified as estimated with high bias (J+) using professional judgement. For negative blank concentrations, associated detected sample results that were ≤5× the blank level were qualified as estimated with low bias (J-) using professional judgement. Associated nondetect results were qualified as estimated (UJ).

Table 5 - Metals and Mercury Calibration Blanks and Method Blanks

Analyte	Blank concentration	Qualified Samples
Thallium	0.111 J and 0.128 J µg/L (CCBs)	580-103791-37
Aluminum	0.0136 J mg/L (MB 580-360817/22-A)	580-103791-1, 580-103791-2, 580-103791-3, 580-103791-4, 580-103791-5, 580-103791-6, 580-103791-7, 580-103791-8, 580-103791-9, 580-103791-10, 580-103791-11, 580-103791-12, 580-103791-16, 580-103791-17, 580-103791-18
Nickel	0.000291 J mg/L (MB 580-360817/22-A)	580-103791-1, 580-103791-2, 580-103791-3, 580-103791-4, 580-103791-6, 580-103791-11, 580-103791-16
Zinc	0.00456 J mg/L (MB 580-360817/22-A)	580-103791-1, 580-103791-2, 580-103791-3, 580-103791-5, 580-103791-6, 580-103791-9, 580-103791-10, 580-103791-11, 580-103791-12, 580-103791-13, 5880-103791-15, 580-103791-16, 580-103791-17, 580-103791-18, 580-103791-19
Mercury	-0.182, -0.252 and -0.159 µg/L (6/23/21 CCBs)	580-103791-10, 580-103791-14, 580-103791-15, 580-103791-16

VI.3.2. Interference Check Samples

Interference Check Samples (ICSA/B): ICSAB recoveries were within the control limits of 80-120% or ±2× the reporting limit, whichever is greater. One or more interferences were present in several samples at concentrations comparable to those of the ICSAs. As noted in the table below, non-spiked analyte cadmium was present in the ICSAs at greater than MDL. For analytes with positive ICSA results, associated detected results which were <10× the ICSA concentration were qualified as estimated with high bias (J+). The ICS interferent levels were lower than the method standard at 10,000 µg/L; therefore, the samples were assessed based on interferences being present at ≥10,000 µg/L in the samples.

Table 6 - Metals and Mercury Interference Check Samples

Analyte	ICSA Concentration ICSA 580-361035/11	Qualified Samples
Cadmium	0.0480 µg/L	580-103791-10, 580-103791-13, 580-103791-15, 580-103791-18, 580-103791-29

VI.3.3. Laboratory Control Sample/Laboratory Control Sample Duplicate

Target analytes were recovered within the control limits of 70-130% recovery (%R), and the relative percent difference (RPDs) were $\leq 20\%$.

VI.3.4. Laboratory Duplicates

Laboratory duplicate analyses were performed on samples 580-103791-3, 580-103791-14 and 580-103791-33 for metals and Hg. A laboratory duplicate analysis was also performed on sample 580-103791-35 for Hg. Original and duplicate sample values $\geq 5\times$ the RL were within the control limit of 20% Relative Percent Difference (RPD). The control limit of $\pm RL$ was met when the sample or duplicate result was $< 5\times$ the RL.

VI.3.5. Matrix Spike/Matrix Spike Duplicate

MS/MSD analyses were performed on samples 580-103791-3, 580-103791-14 and 580-103791-33 for metals and Hg. An MS/MSD analysis was also performed on sample 580-103791-35 for Hg. MS recoveries were not assessed when the parent sample concentrations were more than $4\times$ the spike amount. Recoveries for all target analytes met control limits of 75-125%R, and the RPDs were $\leq 20\%$. For the ICP/MS analysis, the parent samples were analyzed undiluted, and the MS/MSD samples were analyzed at a $20\times$ dilution. Sample qualifications were not assigned.

VI.3.6. Post Digestion Spike

Post digestion spike analyses were performed, but not assessed, due to MS/MSD analyses meeting control limit criteria.

VI.3.7. Serial Dilution

Serial dilution analysis was performed on samples 580-103791-3, 580-103791-14 and 580-103791-33. Results were not assessed unless the parent sample concentration was $> 50\times$ the MDL. The control limit of $\leq 10\%$ difference (%D) of the original sample results was met for all target analytes.

VI.3.8. Internal Standards Performance

According to the raw data sample results, all ICPMS sample internal standard intensities were within the control limits of 60-125% of the calibration blank.

VI.3.9. Sample Result Verification

Sample results were verified for the Level 4 validation for samples 580-103791-3 and 580-103791-33. Sample result verification is not applicable for Level 2B validation samples. Detects below the RL were qualified as estimated (J). Nondetects are valid to the RL.

VI.4. Field QC Samples

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. The remaining detects were used to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

VI.4.1. Field Blanks and Equipment Blanks

Field blank samples were not identified in this SDG for these analyses.

Equipment blank samples 0621EB1 and 0621EB2 were collected and associated with the GW samples as listed in the table below:

Table 7 - Metals and Mercury Equipment Blank Association

Equipment Blanks		
Blank ID	0621EB01	0621EB02
Serial #	WLM0747	294991
Associated Samples	0621MW06GW	0621MW09GW
	0621MW10GW	0621MW16GW
	0621MW26GW	0621MW17GW
	0621MW27GW	0621MW40GW
	0621MW28GW	0621MW43GW
	0621MW33GW	0621MW45GW
	0621MW44GW	0621MW47GW
	0621MW46GW	0621MW54GW
	0621MW49GW	0621MW55GW
	0621MW50GW	0621MW56GW
	0621MW51GW	0621MW58GW
	0621MW52GW	0621MW59GW
	0621MW53GW	
0621MW57GW		

Antimony was detected in 0621EB1 at 0.00020 J mg/L. Chromium was detected in 0621EB2 at 0.00024 J mg/L.

For EB detects, associated detected sample results that were below the reporting limit (RL) were qualified as nondetect (U) at the RL. Associated detected sample results that were greater than RL and <5× the blank concentration were qualified as estimated with high bias (J+).

Table 8 - Metals and Mercury Equipment Blank Qualifiers

Analyte	EB Blank concentration (mg/L)	Qualified Samples
Antimony	0.00020 J	580-103791-23 580-103791-30 580-103791-25 580-103791-27 580-103791-31 580-103791-35
Chromium	0.00024 J	580-103791-26 580-103791-13 580-103791-15 580-103791-33

Analyte	EB Blank concentration (mg/L)	Qualified Samples
		580-103791-34 580-103791-32

VI.4.2. Field Duplicates

Samples 580-103791-3 and 580-103791-6, 580-103791-16 and 580-103791-9, 580-103791-18 and 580-103791-10 and 580-103791-26 and 580-103791-11 were identified as field duplicate pairs. The control limits of $\leq 30\%$ for all target analytes greater than $5 \times \text{RL}$ and $\pm \text{RL}$ for all results $< 5 \times \text{RL}$ were met except as noted in the table below. Associated results in the field duplicate pair were qualified as estimated (J).

Table 9 - Metals and Mercury Field Duplicates

Field duplicate samples	Analyte	RPD/ $\pm \text{RL}$
580-103791-9/580-103791-16	Chromium	$> \pm \text{RL}$
	Iron	$> \pm \text{RL}$
	Manganese	$> \pm \text{RL}$
580-103791-10/580-103791-18	Chromium	$> \pm \text{RL}$
	Copper	$> \pm \text{RL}$

VII. EPA Method 1631, Revision E - Total and Dissolved Mercury

K. Okonzak-Lowry of Oak Services reviewed the SDG on August 12, 2021

VII.1. Holding Times

Sample preservation and analytical holding times were met. The samples analyzed for dissolved mercury were filtered in the field. The water samples were preserved (oxidized with BrCl) in the sample bottles within 28 days of collection by laboratory personnel.

VII.2. Calibration

A blank and 5 non-zero standards were used for the cold vapor atomic fluorescence spectrometry calibration. Calibration criteria were met. ICV and CCV %Rs were within the laboratory control limits of 77-123%R.

VII.3. Quality Control Samples

VII.3.1. Calibration Blanks and Method Blanks

No mercury reported in the method blanks (MB) or bracketing calibration blanks (ICB/CCB) of sufficient concentration to warrant qualification of site sample results except as noted in the table below. For the positive blank concentrations, associated detected sample results that were below the reporting limit (RL) were qualified as nondetect (U) at the RL. Associated detected sample results that were greater than RL and $< 5 \times$ the blank concentration were qualified as estimated with high bias (J+). For negative blank concentrations, associated detected sample results that were $\leq 5 \times$ the blank level were qualified as estimated with low bias (J-). Associated nondetect results were qualified as estimated (UJ).

Table 10 - Method 1631 Calibration Blanks and Method Blanks

Analyte	Blank concentration (ng/L)	Qualified Samples
Mercury	CCBs (0.16 and 0.17) June 29, 2021	1F00124-01 (0621RD05SW) 1F00124-02 (0621RD06SW)
	CCBs (0.20, -0.103, 0.24) July 7, 2021	1F00124-08 (0621EB1 DISS) 1F00124-34 (0621MW33GW DISS) 1F00124-36 (0621MW40GW DISS) 1F00124-75 (0621MW54GW TOTAL)
	CCBs (0.156) July 1, 2021	1F00124-16 (0621MW97GW DISS)
	CCBs (0.56, 0.60) July 9, 2021	1F00124-76 (0621MW54GW DISS) 1F00124-80 (0621MW56GW DISS) 1F00124-82 (0621MW57GW DISS) 1F00124-84 (0621MW58GW DISS) 1F00124-85 (0621MW59GW TOTAL)

VII.3.2. Laboratory Control Sample/Laboratory Control Sample Duplicate

Target analytes were recovered within the laboratory control limits of 77-123% recovery, and the RPDs were ≤24% with the following exception. Batch F106468 LCSD F106468-BSD1 was above the control limits with 125%R. LCS F106468-BS1 (123%R) was within control limits, and the RPD was within control limits. The associated Sample 1F00124-14 (0621MW98GW DISS) detect was not reported for this batch. The sample was reanalyzed on 8/31/2021, and sample qualification was not required. Remaining recoveries and RPDs were within the laboratory established control limits.

VII.3.3. Matrix Spike/Matrix Spike Duplicate

MS/MSD analyses were performed on Samples 1F00124-03 (0621RD08SW), 1F00124-04 (0621RD10SW), 1F00124-21 (0621MW10GW TOTAL), 1F00124-22 (0621MW10GW DISS), 1F00124-33 (0621MW33GW TOTAL), 1F00124-63 (0621MW47GW TOTAL), 1F00124-77 (0621MW55GW TOTAL) and 1F00124-78 (0621MW55GW DISS) from this SDG. For Sample 1F00124-22 (0621MW10GW DISS), both the MS and MSD were recovered above the control limits at 176% and 174%, respectively. The Sample 0621MW10GW DISS mercury detect was qualified as estimated with a potential high bias (J+). For Sample 1F00124-77 (0621MW55GW TOTAL), the MS was recovered below the control limits at 61.2%. The Sample 0621MW55GW TOTAL mercury detect was qualified as estimated with a potential low bias (J-). Remaining recoveries and RPDs were within the laboratory established control limits of 71-125%R and 24% RPD.

VII.4. Field QC Samples

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. The remaining detects were used to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

VII.4.1. Field Blanks, Equipment Blanks, and Trip Blanks

Field blank samples were not identified in this SDG for these analyses.

Equipment blank samples 0621EB1 and 0621EB2 (total and dissolved) were collected and associated with the GW samples as listed in the table below:

Table 11 - Method 1631 Equipment Blank Association

Equipment Blanks		
Blank ID	0621EB01 TOTAL and 0621EB1 DISS	0621EB02 TOTAL and 0621EB02 DISS
Serial #	WLM0747	294991
Associated Samples	0621MW06GW	0621MW09GW
	0621MW10GW	0621MW16GW
	0621MW26GW	0621MW17GW
	0621MW27GW	0621MW40GW
	0621MW28GW	0621MW43GW
	0621MW33GW	0621MW45GW
	0621MW44GW	0621MW47GW
	0621MW46GW	0621MW54GW
	0621MW49GW	0621MW55GW
	0621MW50GW	0621MW56GW
	0621MW51GW	0621MW58GW
	0621MW52GW	0621MW59GW
	0621MW53GW	
	0621MW57GW	

Trip blank samples 0621TB01, 0621TB02 and 0621TB03 were shipped with the low level mercury samples. None of the field QC samples had mercury detects above the MDL. Sample qualifications were not required.

VII.4.2. Field Duplicates

Samples 580-103791-3 and 580-103791-6, 580-103791-16 and 580-103791-9, 580-103791-18 and 580-103791-10 and 580-103791-26 and 580-103791-11 were identified as field duplicate pairs. The control limits of $\leq 30\%$ for all target analytes greater than 5x RL and $\pm RL$ for all results $< 5x$ RL were met. Sample qualification was not required.

VII.5. Sample Result Verification and Reported Detection Limits

The laboratory analyzed for low level mercury by EPA Method 1631E. Total mercury was analyzed for six surface water (SW) samples. Total and dissolved mercury was analyzed for the groundwater (GW) samples.

Mercury quantification was verified for the Level 4 validation samples. Sample result verification is not applicable for Level 2B validation samples. Detects reported below the RL were qualified as estimated (J). Nondetects are valid to the RL. Multiple samples were analyzed at dilutions to bring detects within the calibration linear range due to the level of mercury found in the samples.

A revised laboratory data package was reported on 9/02/2021. Per the revised laboratory narrative, investigation of the originally reported LL Hg results identified analytical errors with samples 1F00124-13 (total) and 1F00124-14 (diss), (FD sample ID 580-103791-10). Reanalysis of these samples was performed (with confirmation at two different dilutions), and the results of the 20x dilutions analyzed on 8/31/2021 were reported in the revised data package.

VIII. Various EPA Methods - General Minerals

K. Okonzak-Lowry of Oak Services reviewed the SDG on August 20, 2021.

VIII.1. Holding Times

Analytical holding times, as listed below, were met.

Table 12 - General Minerals Analytical Method Holding Times

Analytical Method	Analysis Holding Time (days)
353.2 (NO3+NO2 as N)	28
300.0 (anions SO4, Cl-, F-)	28
310.1 (alkalinity)	14
Total Dissolved Solids (TDS)	7
Total Suspended Solids (TSS)	7

The samples from cooler #2 were received at the laboratory outside the recommended temperature criteria for the following analyses: 353.2 nitrate+nitrite, 300.0 anions, 310.1 alkalinity, 160.1 TSS and 160.2 TDS. The cooler temperature at receipt was 10.1°. The sample results for the general chemistry analyses are therefore qualified as estimated (J/UJ) for detects and nondetects, respectively.

VIII.2. Calibration

The correlation coefficients (r) were ≥0.995. ICV and CCV recoveries associated with reported sample results were within the laboratory control limits.

VIII.3. Quality Control Samples

VIII.3.1. Calibration Blanks and Method Blanks

No mercury reported in the method blanks (MB) or bracketing calibration blanks (ICB/CCB) of sufficient concentration to warrant qualification of site sample results except as noted in the table below. For the positive blank concentrations, associated detected sample results that were below the reporting limit (RL) were qualified as nondetect (U) at the RL.

Table 13 - General Minerals Calibration Blanks and Method Blanks

Analyte	Blank concentration (mg/L)	Qualified Samples
Chloride	CCBs (0.512 J, 0.840 J, 0.834 J)	580-103791-1, 580-103791-2, 580-103791-3, 580-103791-4, 580-103791-5 and 580-103791-6

VIII.3.2. Laboratory Control Samples

LCS and LCSD (as appropriate) recoveries and RPDs were within laboratory control limits.

VIII.3.3. Laboratory Duplicates

Laboratory duplicate analyses were performed on Samples 580-103791-3 and 580-103791-5 from this SDG. RPDs were within laboratory control limits.

VIII.3.4. Matrix Spike/Matrix Spike Duplicate

MS/MSD analyses were performed on Sample 580-103791-3 from this SDG. The spike recoveries and RPDs were within laboratory control limits.

VIII.4. Sample Result Verification

Result quantification was verified for the Level 4 validation sample. Sample result verification is not applicable for Level 2B validation samples. Detects reported below the RL were qualified as estimated (J). Nondetects are valid to the RL.

VIII.5. Field QC Samples

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. The remaining detects were used to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

VIII.5.1. Field Blanks and Equipment Blanks

Field blank or equipment blank samples were not analyzed for these surface water sample analyses.

VIII.5.2. Field Duplicates

Samples 580-103791-3 and 580-103791-6 were identified as the field duplicate pair. The control limits of $\leq 30\%$ for all target analytes greater than $5x$ RL and $\pm RL$ for all results $< 5x$ RL were met except as noted in the table below. Associated results in the field duplicate pair were qualified as estimated (U/J).

Table 14 - General Minerals Field Duplicates

Field duplicate samples	Analyte	RPD/ $\pm RL$
580-103791-3/580-103791-6	TDS	$\pm RL$
	TSS	$\pm RL$

IX. References

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ATTACHMENT 5.2 2021 FALL DATA VALIDATION REPORT

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I. Project Information

File Name:	580-105705-1 DV Report.0_Metals_GenChem				
Analysis:	MT, WC				
SDG#:	580-105705-1	Reviewer:	KKOL	Rev Date:	11/10/2021
Matrix:	Surface Water Groundwater	2nd Rev:	CTD	2nd Rev Date:	11/17/2021
Validation Level:	Stage2B/Stage4	# Samples:	43	# RE/DL:	0

II. Secondary Review List

Narrative:	Form Is:
Qualifications in text match Form Is	"U" / "J" lab codes carried over
Spell check	Appropriate qual codes used
Pagination, appropriate headers/footers	Form I IDs match sample ID table
Correct project site name/manager on cover and introduction pages	
Required Edits/Changes:	
Add comprehensive table of qualifiers	
Revision (include revision #, date and reason):	
Revision 0	
Validator Signature:	Kathryn K. Okonzak-Lowry  Digitally signed by Kathryn K. Okonzak-Lowry Date: 2021.11.18 07:14:27 -07'00'
Review Signature:	

Data Validation Report

Red Devil Mine, Alaska

Sample Delivery Group
580-105705-1

Prepared for
Sundance Consulting, Inc.
8210 Louisiana Blvd NE Suite C
Albuquerque, NM 87113
Attention:
Colleen Rust, PG

11/10/2021

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ACRONYMS AND ABBREVIATIONS

°C	Celsius
%	Percent
%D	percent difference
CCAL	continuing calibration
CCB	continuing calibration blank
CCV	continuing calibration verification
COC	chain of custody
CLP	Contract Laboratory Program
DL	detection limit
DISS	dissolved
EFGS	Eurofins Frontier Global Sciences
EPA	US Environmental Protection Agency
ER	equipment rinsate
FB	field blank
FD	field duplicate
GW	ground water
ICAL	initial calibration
ICB	initial calibration blank
ICV	initial calibration verification
IS	internal standard
J	estimated value
LCS	laboratory control sample
LL Hg	low level mercury
LOD	limit of detection
LOQ	limit of quantification
MB	method blank
MS	matrix spike
MSD	matrix spike duplicate
ND	nondetect
QAPP	Quality Assurance Program Plan
QC	quality control
QSM	Quality Systems Manual
R	Rejected
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
RSD	relative standard deviation
SDG	sample delivery group
TB	trip blank
TDS	total dissolved solids
TSS	total suspended solids
SW	surface water
U	not detected
UJ	not detected; associated value is an estimate

III. Introduction

Project Name: Red Devil Mine

Sample Delivery Group: 580-105705-1

Client Project Manager: Colleen Rust

Matrix: Surface Water

QC Level: Stage 2B/Stage 4

No. of Samples: 43

Laboratory: Eurofins TestAmerica Seattle

Table 1 - Sample Summary

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
1	0821MW51GW 0821MW51GW TOTAL 0821MW51GW DISS	580-105705-1 1100051-01 1100051-02	GW	8/31/2021	6020B, 6010D, 7470A 1631	Stage 2B
2	0821MW52GW 0821MW52GW TOTAL 8021MW52GW DISS	580-105705-2 1100051-03 1100051-04	GW	8/31/2021	6020B, 6010D, 7470A 1631	Stage 4
3	0821MW53GW 0821MW53GW TOTAL 0821MW53GW DISS	580-105705-3 1100051-05 1100051-06	GW	8/31/2021	6020B, 6010D, 7470A 1631	Stage 2B
4	0821MW54GW	580-105705-4	GW	8/31/2021	6020B, 6010D, 7470A	Stage 2B

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
5	0821MW54GW TOTAL 0821MW54GW DISS	1100051-07 1100051-08			1631	
	0821MW55GW 0821MW55GW TOTAL 0821MW55GW DISS	580-105705-5 1100051-09 1100051-10	GW	8/31/2021	6020B, 6010D, 7470A 1631	Stage 2B
6	0921MW56GW 0921MW56GW TOTAL 0921MW56GW DISS	580-105705-6 1100051-11 1100051-12	GW	9/01/2021	6020B, 6010D, 7470A 1631	Stage 2B
7	0921MW57GW 0921MW57GW TOTAL 0921MW57GW DISS	580-105705-7 1100051-13 1100051-14	GW	9/01/2021	6020B, 6010D, 7470A 1631	Stage 2B
8	0821MW58GW 0821MW58GW TOTAL 0821MW58GW DISS	580-105705-8 1100051-15 1100051-16	GW	9/01/2021	6020B, 6010D, 7470A 1631	Stage 2B
9	0921MW59GW 0921MW59GW TOTAL 0921MW59GW DISS	580-105705-9 1100051-17 1100051-18	GW	9/01/2021	6020B, 6010D, 7470A 1631	Stage 2B

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
10	0921TB03 0921TB03 TOTAL 0921TB03 DISS	580-105705-10 1100051-19 1100051-20	TB	8/28/2021	6020B, 6010D, 7470A 1631	Stage 2B
11	0821EB01 0821EB01 TOTAL	580-105705-11 1100051-21	EB	8/30/2021	6020B, 6010D, 7470A 1631	Stage 2B
12	0821EB02 0821EB02 TOTAL	580-105705-12 1100051-22	EB	8/30/2021	6020B, 6010D, 7470A 1631	Stage 2B
13	0821EB03 0821EB03 TOTAL	580-105705-13 1100051-23	EB	8/30/2021	6020B, 6010D, 7470A 1631	Stage 2B
14	0921RD06SW 0921RD06SW TOTAL	580-105705-14 1100051-24	SW	9/03/2021	6020B, 6010D, 7470A, 353.2, 300.0, 160.1, 160.2 1631	Stage 2B
15	0921RD08SW 0921RD08SW TOTAL	580-105705-15 1100051-25	SW	9/03/2021	6020B, 6010D, 7470A, 353.2, 300.0, 160.1, 160.2 1631	Stage 2B
16	0921RD05SW	580-105705-16	SW	9/03/2021	6020B, 6010D,	Stage 2B

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
	0921RD05SW TOTAL	1100051-26			7470A, 353.2, 300.0, 160.1, 160.2 1631	
17	0921RD10SW 0921RD10SW TOTAL	580-105705-17 1100051-27	SW	9/03/2021	6020B, 6010D, 7470A, 353.2, 300.0, 160.1, 160.2 1631	Stage 2B
18	0821MW33GW 0821MW33GW TOTAL 0821MW33GW DISS	580-105705-18 1100051-28 1100051-29	GW	8/29/2021	6020B, 6010D, 7470A 1631	Stage 2B
19	0821MW09GW 0821MW09GW TOTAL 0821MW09GW DISS	580-105705-19 1100051-30 1100051-31	GW	8/29/2021	6020B, 6010D, 7470A 1631	Stage 2B
20	0821MW10GW 0821MW10GW TOTAL 0821MW10GW DISS	580-105705-20 1100051-32 1100051-33	GW	8/29/2021	6020B, 6010D, 7470A 1631	Stage 2B
21	0821MW16GW 0821MW16GW TOTAL 0821MW16GW DISS	580-105705-21 1100051-34 1100051-35	GW	8/29/2021	6020B, 6010D, 7470A 1631	Stage 2B

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
22	0821MW17GW	580-105705-22	GW	8/29/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW17GW TOTAL	1100051-36			1631	
	0821MW17GW DISS	1100051-37				
23	0821MW99GW	580-105705-23	FD	8/29/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW99GW TOTAL	1100051-38			1631	
	0821MW99GW DISS	1100051-39				
24	0821MW26GW	580-105705-24	GW	8/30/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW26GW TOTAL	1100051-40			1631	
	0821MW26GW DISS	1100051-41				
25	0821MW27GW	580-105705-25	GW	8/30/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW27GW TOTAL	1100051-42			1631	
	0821MW27GW DISS	1100051-43				
26	0821MW98GW	580-105705-26	FD	8/30/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW98GW TOTAL	1100051-44			1631	
	0821MW98GW DISS	1100051-45				
27	0821MW28GW	580-105705-27	GW	8/29/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW28GW TOTAL	1100051-46			1631	
	0821MW28GW DISS	1100051-47				

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
28	0821TB01	580-105705-28	TB	8/28/2021	6020B, 6010D, 7470A	Stage 2B
	0821TB01 TOTAL	1100051-48			1631	
	0821TB01 DISS	1100051-49				
29	0921MW29GW	580-105705-29	GW	6/05/2021	6020B, 6010D, 7470A	Stage 2B
	0921MW29GW TOTAL	1100051-50			1631	
	0921MW29GW DISS	1100051-51				
30	0821MW06GW	580-105705-30	GW	8/29/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW06GW TOTAL	1100051-52			1631	
	0821MW06GW DISS	1100051-53				
31	0921MW40GW	580-105705-31	GW	9/01/2021	6020B, 6010D, 7470A	Stage 2B
	0921MW40GW TOTAL	1100051-54			1631	
	0921MW40GW DISS	1100051-55				
32	0821MW42GW	580-105705-32	GW	8/30/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW42GW TOTAL	1100051-56			1631	
	0821MW42GW DISS	1100051-57				
33	0821MW43GW	580-105705-33	GW	8/30/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW43GW TOTAL	1100051-58			1631	
	0821MW43GW DISS	1100051-59				

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
34	0921MW44GW	580-105705-34	GW	9/01/2021	6020B, 6010D, 7470A	Stage 2B
	0921MW44GW TOTAL	1100051-60			1631	
	0921MW44GW DISS	1100051-61				
35	0921MW45GW	580-105705-35	GW	9/01/2021	6020B, 6010D, 7470A	Stage 2B
	0921MW45GW TOTAL	1100051-62			1631	
	0921MW45GW DISS	1100051-63				
36	0821MW46GW	580-105705-36	GW	8/31/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW46GW TOTAL	1100051-64			1631	
	0821MW46GW DISS	1100051-65				
37	0821MW47GW	580-105705-37	GW	8/31/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW47GW TOTAL	1100051-66			1631	
	0821MW47GW DISS	1100051-67				
38	0821MW97GW	580-105705-38	FD	8/31/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW97GW TOTAL	1100051-68			1631	
	021MW97GW DISS	1100051-69				

Sample Count	Field Sample ID	Lab Sample ID	Matrix	Collection	Method	Validation Level
39	0821MW49GW	580-105705-39	GW	9/01/2021	6020B, 6010D, 7470A	Stage 2B
	0821MW49GW TOTAL	1100051-70			1631	
	0821MW49GW DISS	1100051-71				
40	0821MW50GW	580-105705-40	GW	8/31/2021	6020B, 6010D, 7470A	Stage 4
	0821MW50GW TOTAL	1100051-72			1631	
	0821MW50GW DISS	1100051-73				
42	0921RD15SW	580-105705-42	SW	9/03/2021	6020B, 6010D, 7470A, 353.2, 300.0, 160.1, 160.2	Stage 2B
	0921RD15SW TOTAL	1100051-76			1631	
43	0921RD99SW	580-105705-43	FD	9/03/2021	6020B, 6010D, 7470A, 353.2, 300.0, 160.1, 160.2	
	0921RD99SW TOTAL	1100051-77			1631	

IV. Sample Management

According to the case narrative, the sample receiving checklist and the chains-of-custody (COCs) provided by the laboratory for sample delivery group (SDG) 580-105705-1:

- The laboratory's Login Sample Receipt Checklist and the COCs noted all coolers were received within the temperature limits of $\leq 6^{\circ}\text{C}$ and $\geq 0^{\circ}\text{C}$, with the following exception: The cooler containing samples for metals analysis only was received at 18.9°C . The sample receipt temperature is acceptable for metals, and sample qualification was not required.
- The samples were received intact, and properly preserved, as applicable, with the cooler temperature exception listed above.
- The laboratory's Sample Receiving Checklist notes that the cooler's custody seal, if present, is intact.
- The samples for low level mercury (LL Hg) by Method 1631 were subcontracted to Eurofins Frontier Global Sciences (EFGS). The samples were received intact at EFGS on 9/10/2021 under EFGS SDG 1I00051. Total and dissolved volumes were received at the lab for the ground water (GW) LL Hg samples. The dissolved sample volumes were field filtered. As noted in Table 1-Sample Summary of this DVR, the total and dissolved volumes for each GW Sample ID were given a distinct EFGS laboratory ID.

Table 2 - Data Qualifier Definitions

Qualifier	Definition
U	The analyte was analyzed for but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

V. SW-846 Methods 6020B, 6010D, AND 7470A—Metals and Mercury

K. Okonzak-Lowry of Oak Services reviewed the SDG November 1, 2021.

V.1. Holding Times

Analytical holding times, 28 days for mercury and six months for the remaining metals, were met, with the exceptions listed below.

Method 7470A: The following samples were prepared outside of preparation holding time for 7470A on 9/27/2021 for the mercury analysis due to the analytical supervisor not recognizing the samples were going out of hold on Sunday, 9/26/2021: 0821MW33GW (580-105705-18), 0821MW09GW (580-105705-19), 0821MW10GW (580-105705-20), 0821MW16GW (580-105705-21), 0821MW17GW (580-105705-22), 0821MW99GW (580-105705-23), 0821MW28GW (580-105705-27) and 0821MW06GW (580-105705-30). The mercury results for the above samples were qualified as estimated (J and UJ) for detects and nondetects, respectively.

V.2. Tuning and Calibration

All 6020B ICP/MS tuning criteria were met. Mass calibrations were ≤ 0.1 atomic mass unit (amu) from the true value. Resolution was < 0.9 amu full width at 10% peak height and all %RSDs were $\leq 5\%$.

A blank and five standards were used in the initial calibration. Correlation coefficients were ≥ 0.995 . The range of the ICP/MS calibration curves is low. The high standard for a number of trace analytes is 100 ppb. The lab did analyze high linear range check standards. The linear range check standards were within 10% of the true value, with the exception of antimony, which was recovered at 87% for the 9/28/2021 analytical run. Sample detects reported above the high standard in the calibration curve for antimony were qualified as estimated, J.

Table 3 - Metals and Mercury Tuning and Calibration

Issue	Analyte	Qualifier	Affected Samples
Sample detects reported above the calibration curve linear range	Antimony	J	580-105705-14 580-105705-15 580-105705-18 580-105705-23 580-105705-32

All reported ICV and CCV recoveries were within 90-110% and the low-level CCV recoveries were within 80-120%.

A blank and 5 non-zero standards were used for the CVAA calibration. The initial (ICV) and continuing calibration recoveries (CCV) were within 90-110%.

V.3. Calibration blanks and Method Blanks

No target analytes were reported in the method blanks (MB) or bracketing calibration blanks (ICB/CCB) of sufficient concentration to warrant qualification of site sample results except as noted in the table below. For the positive blank concentrations, associated detected sample results that were below the reporting limit (RL) were qualified as nondetect (U) at the RL. Associated detected sample results that were greater than RL and <5× the blank concentration were qualified as estimated with high bias (J+) using professional judgement.

Table 4 - Metals and Mercury Calibration Blanks and Method Blanks

Analyte	Blank concentration	Qualified Samples
Zinc	0.00143 J mg/L (MB 580-368932/24-A)	580-105705-1, 580-105705-3, 580-105705-4, 580-105705-5, 580-105705-6, 580-105705-7, 580-105705-8, 580-105705-14, 580-105705-36, 580-105705-37, 580-105705-39, 580-105705-40, 580-105705-42, 580-105705-43
Antimony	0.199 J to 0.684 J µg/L (9/28/21 CCBs)	580-105705-1, 580-105705-3, 580-105705-4, 580-105705-6, 580-105705-7, 580-105705-8, 580-105705-17, 580-105705-20, 580-105705-29, 580-105705-34, 580-105705-35, 580-105705-36, 580-105705-37, 580-105705-39
Thallium	0.033 J, 0.039 J and 0.044 J µg/L (9/28/21 CCBs)	580-105705-2, 580-105705-9, 580-105705-16
Potassium	0.421 J mg/L (9/29/21 ICB)	All field samples

V.4. Interference Check Samples

Interference Check Samples (ICSA/B): ICSAB recoveries were within the control limits of 80-120% or $\pm 2\times$ the reporting limit, whichever is greater. One or more interferents were present in several samples at concentrations comparable to those of the ICSAs. As noted in the table below, non-spiked analytes zinc, silver, chromium and nickel were present in the ICSAs at greater than MDL. For analytes with positive ICSA results, associated detected results which were $<10\times$ the ICSA concentration were qualified as estimated with high bias (J+). The ICP/MS ICS interferent levels were at 10,000 $\mu\text{g/L}$; therefore, the samples were assessed based on interferents being present at $\geq 10,000 \mu\text{g/L}$ in the samples. The ICP samples did not have interferents at concentrations comparable to the ICP ICSA solution, and sample qualifications were not required.

Table 5 - Metals and Mercury Interference Check Samples

Analyte	ICSA Concentration ICSA 580-369106/11	Qualified Samples
Zinc	2.84 J $\mu\text{g/L}$	580-105705-2, 580-105705-9, 580-105705-15, 580-105705-16, 580-105705-18, 580-105705-19, 580-105705-21, 580-105705-23, 580-105705-24, 580-105705-25, 580-105705-26, 580-105705-27, 580-105705-29, 580-105705-30, 580-105705-31, 580-105705-32, 580-105705-33, 580-105705-34, 580-105705-35
Silver	0.051 J $\mu\text{g/L}$	580-105705-4, 580-105705-8, 580-105705-9, 580-105705-29, 580-105705-32, 580-105705-33
Chromium	0.184 J $\mu\text{g/L}$	580-105705-42, 580-105705-43
Nickel	0.138 J $\mu\text{g/L}$	580-105705-42, 580-105705-43

V.4.1. Laboratory Control Sample/Laboratory Control Sample Duplicate

Target analytes were recovered within the control limits of 70-130% recovery (%R), and the relative percent difference (RPDs) were $\leq 20\%$.

V.4.2. Laboratory Duplicates

Laboratory duplicate analyses were performed on samples 580-105705-5 and 580-105705-15 for metals and Hg. Original and duplicate sample values $\geq 5\times$ the RL were within the control limit of 20% Relative Percent Difference (RPD). The control limit of $\pm\text{RL}$ was met when the sample or duplicate result was $<5\times$ the RL. All results were within control limit criteria.

V.4.3. Matrix Spike/Matrix Spike Duplicate

MS/MSD analyses were performed on samples 580-105705-5, 580-105705-15 and 580-105705-20 for metals and Hg. MS recoveries were not assessed when the parent sample concentrations were more than $4\times$ the spike amount. Recoveries for all target analytes met control limits of 75-125%R, and the RPDs were $\leq 20\%$, with the exception of the 580-105705-5 MS recovery for iron (156%). The sample MSD and post digestion spike (PDS) recoveries were within control limits for iron, and sample qualification was not applied for the high MS recovery. For the ICP/MS analysis, the parent samples were analyzed

undiluted, and the MS/MSD samples were analyzed at a 20× dilution. Sample qualifications were not assigned.

V.4.4. Post Digestion Spike

The laboratory performed ICP/MS and ICP post digestion spike analyses for samples 580-105705-5 and 580-105705-15 for all reported analytes, and the recoveries were within control limit criteria.

V.4.5. Serial Dilution

Serial dilution analysis was performed on samples 580-105705-5 and 580-105705-15. Results were not assessed unless the parent sample concentration was >50× the MDL. The control limit of ≤10% difference (%D) of the original sample results was met for all target analytes with the exception of arsenic (11%D) for sample 580-105705-5. The parent sample detect for arsenic was qualified as estimated, J.

V.4.6. Internal Standards Performance

According to the raw data sample results, all ICPMS sample internal standard intensities were within the control limits of 60-125% of the calibration blank, except as noted in the table below. Associated sample nondetects are qualified as estimated, UJ, and detects are qualified as estimated, J.

Table 6 - Metals and Mercury Interference Check Samples

Sample	Internal Standard Percent Recovery	Qualified Analytes
580-105705-42	Li 126.7% Sc 127.3% Ho 131.8% Bi 129.1%	Al, As, Be, Cr, Co, Cu, Fe, Pb, M, Ni, Se, Tl and V
580-105705-43	Ho 128.2% Bi 125.5%	Pb and Tl

V.4.7. Sample Result Verification

Sample results were verified for the Level 4 validation for samples 580-105705-2, 580-105705-40 and 580-105705-42. Sample result verification is not applicable for Level 2B validation samples. Detects below the RL were qualified as estimated (J). Nondetects are valid to the RL.

V.4.8. Field QC Samples

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. The remaining detects were used to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

V.4.9. Field Blanks and Equipment Blanks

Field blank samples were not identified in this SDG for these analyses.

Equipment blank samples 0821EB01, 0821EB02 and 0821EB03 were collected and associated with the GW samples as listed in the table below:

Table 7 - Metals and Mercury Equipment Blank Association

Equipment Blanks			
Blank ID	0821EB01	0821EB02	0821EB03
Serial #	Rental: 092	294991	77297
Associated Samples	0821MW26GW	0821MW06GW	0821MW09GW
		0821MW16GW	0821MW10GW
		0821MW17GW	0821MW28GW
		0821MW27GW	0921MW44GW
		0821MW98GW	0921MW45GW
		0921MW29GW	0821MW46GW
		0821MW33GW	0821MW47GW
		0821MW99GW	0821MW97GW
		0921MW40GW	0921MW49GW
		0821MW42GW	0821MW52GW
		0821MW43GW	0821MW55GW
		0821MW50GW	0921MW56GW
		0821MW51GW	
		0821MW53GW	
		0821MW54GW	
		0921MW57GW	
		0821MW58GW	
	0921MW59GW		

Chromium was detected in 0821EB1 at 0.00022 J mg/L. Cadmium, chromium, lead and manganese were detected in 0821EB2 at 0.000075 J, 0.00022 J, 0.000065 J and 0.00084 J mg/L, respectively. Chromium and manganese were detected in 0821EB03 at 0.00018 J and 0.00056 J mg/L, respectively.

For EB detects, associated detected sample results that were below the reporting limit (RL) were qualified as nondetect (U) at the RL. Associated detected sample results that were greater than RL and <5× the blank concentration were qualified as estimated with high bias (J+).

Table 8 - Metals and Mercury Equipment Blank Qualifiers

Analyte	EB Blank concentration (mg/L)	Qualified Samples
Cadmium	0.000075 J (EB02)	580-105705-1, 580-105705-9, 580-105705-21, 580-105705-25, 580-105705-26, 580-105705-29
Chromium	0.00022 J (EB02)	580-105705-1, 580-105705-3, 580-105705-4, 580-105705-7, 580-105705-18, 580-105705-21, 580-105705-22, 580-105705-23, 580-105705-25, 580-105705-30, 580-105705-31, 580-105705-33, 580-105705-40
Lead	0.000065 J (EB02)	580-105705-1, 580-105705-3, 580-105705-8, 580-105705-21, 580-105705-22, 580-105705-23, 580-105705-26, 580-105705-30, 580-105705-31, 580-105705-33,

Analyte	EB Blank concentration (mg/L)	Qualified Samples
		580-105705-40
Manganese	0.00084 J (EB02)	580-105705-22
Chromium	0.00018 J (EB03)	580-105705-5, 580-105705-6, 580-105705-19, 580-105705-20, 580-105705-34, 580-105705-35, 580-105705-36, 580-105705-37, 580-105705-38, 580-105705-39
Chromium	0.00022 J (EB01)	580-105705-24

V.4.10. Field Duplicates

Samples 0821MW99GW and 0821MW33GW, 0821MW98GW and 0821MW27GW, 0821MW97GW and 0821MW47GW and 0921RD99SW and 0921RD15SW. The control limits of $\leq 30\%$ for all target analytes greater than 5x RL and $\pm RL$ for all results $< 5x RL$ were met except as noted in the table below. Associated results in the field duplicate pair were qualified as estimated (J) for detects and (U) for nondetects.

Table 9 - Metals and Mercury Field Duplicates

Field duplicate samples	Analyte	RPD/ $\pm RL$
0821MW33GW/0821MW99GW	Lead (0.00068/0.0004U mg/L)	$> \pm RL$
0821MW27GW/0821MW98GW	Chromium (0.0008 U/0.0009)	$> \pm RL$
	Lead (0.00051/0.0004 U)	$> \pm RL$

VI. EPA Method 1631, Revision E - Total and Dissolved Mercury

K. Okonczak-Lowry of Oak Services reviewed the SDG on November 6, 2021

VI.1. Holding Times

Sample preservation and analytical holding times were met. The samples analyzed for dissolved mercury were filtered in the field. The water samples were preserved (oxidized with BrCl) in the sample bottles within 28 days of collection by EFGS laboratory personnel on 9/10/2021.

VI.2. Calibration

A blank and 5 non-zero standards were used for the cold vapor atomic fluorescence spectrometry calibration. Calibration criteria were met. ICV and CCV %Rs were within the laboratory control limits of 77-123%R.

VI.3. Quality Control Samples

VI.3.1. Calibration Blanks and Method Blanks

No mercury reported in the method blanks (MB) or bracketing calibration blanks (ICB/CCB) of sufficient concentration to warrant qualification of site sample results except as noted in the table below. For the positive blank concentrations, associated detected sample results that were below the reporting limit (RL) were qualified as nondetect (U) at the RL. Associated detected sample results that were greater than RL

and <5× the blank concentration were qualified as estimated with high bias (J+).

Table 10 - Method 1631 Calibration Blanks and Method Blanks

Analyte	Blank concentration (ng/L)	Qualified Samples
Mercury	CCBs (0.12 J – 0.23 J) Run 1J04018 (Oct. 1, 2021)	1I00051-19 (0921TB03 TOTAL) 0.5 U 1I00051-20 (0921TB03 DISS) 0.54 J+ 1I00051-27 (0921RD10SW [10x]) 5.22 J+
	CCBs (0.08 J – 0.20 J) Run 1J06011 (Oct. 5, 2021)	1I00051-21 (0821EB01) 0.62 J+ 1I00051-48 (0821TB01 TOTAL) 0.5 U 1I00051-49 (0821TB01 DISS) 0.5 U 1I00051-62 (0921MW45GW TOTAL [10x]) 10.7 J+ 1I00051-74 (0921TB02 TOTAL) 0.68 J+
	CCBs (0.32 J – 0.26 J) Run 1I27021 (Sep. 24, 2021)	1I00051-22 (0821EB02) 0.72 J+
	MB F109433 (BLK4 0.38 J) Run 1J01002 (Sep. 30, 2021)	1I00051-23 (0821EB03) 0.5U

VI.3.2. Laboratory Control Sample/Laboratory Control Sample Duplicate

Target analytes were recovered within the laboratory control limits of 77-123% recovery, and the RPDs were ≤24%. Sample qualification was not required.

VI.3.3. Matrix Spike/Matrix Spike Duplicate

MS/MSD analyses were performed on Samples 1I00051-01 (0821MW51GW TOTAL), 1I00051-09 (0821MW55GW TOTAL), 1I00051-10 (0821MW55GW DISS), 1I00051-25 (0921RD08SW), 1I00051-32 (0821MW10GW TOTAL), 1I00051-33 (0821MW10GW DISS), 1I00051-47 (0821MW28GW DISS) and field QC sample 0821TB01 DISS from this SDG. For Sample 1I00051-10 (0821MW55GW DISS), both the MS and MSD were recovered above the control limits at 128%, each. The Sample 1I00051-10 DISS mercury detect was qualified as estimated with a potential high bias (J+). The remaining recoveries and RPDs were within the laboratory established control limits of 71-125%R and 24% RPD.

VI.4. Field QC Samples

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. The remaining detects were used to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

VI.4.1. Field Blanks, Equipment Blanks, and Trip Blanks

Field blank samples were not identified in this SDG for these analyses.

Equipment blank samples 0821EB01, 0821EB02 and 0821EB03 (total) were collected and associated with the GW samples as listed in the table below.

Table 11 - Method 1631 Equipment Blank Association

Equipment Blanks			
Blank ID	0821EB01	0821EB02	0821EB03
Serial #	Rental: 092	294991	77297
Associated Samples (Total and Dissolved)	0821MW26GW	0821MW06GW	0821MW09GW
		0821MW16GW	0821MW10GW
		0821MW17GW	0821MW28GW
		0821MW27GW	0921MW44GW
		0821MW98GW	0921MW45GW
		0921MW29GW	0821MW46GW
		0821MW33GW	0821MW47GW
		0821MW99GW	0821MW97GW
		0921MW40GW	0921MW49GW
		0821MW42GW	0821MW52GW
		0821MW43GW	0821MW55GW
		0821MW50GW	0921MW56GW
		0821MW51GW	
		0821MW53GW	
		0821MW54GW	
		0921MW57GW	
	0821MW58GW		
	0921MW59GW		

Table 12 - Method 1631 Equipment Blank Qualifications

Analyte	Equipment Blank concentration (ng/L)	Qualified Samples
Mercury	0821EB02 0.72 J+	1100051-02 (0821MW51GW DISS) 2.72 J+ 1100051-08 (0821MW54GW DISS) 1.14 J+

Trip blank samples 0921TB01, 0921TB02 and 0921TB03 (total and dissolved) were shipped with the low level mercury samples. Each trip blank was associated with the samples shipped in the same cooler.

Table 13 - Method 1631 Trip Blank Association

Trip Blanks			
Blank ID	0921TB01 (Total and Diss)	0921TB02 (Total and Diss)	0921TB03 (Total and Diss)
Cooler ID	Cooler 1	Cooler 2	Cooler 3
Associated Samples (Total and Dissolved)	0821MW33GW	0921MW29GW	0821MW51GW
	0821MW09GW	0821MW06GW	0821MW52GW
	0821MW10GW	0921MW40GW	0821MW53GW
	0821MW16GW	0821MW42GW	0821MW54GW
	0821MW17GW	0821MW43GW	0821MW55GW
	0821MW99GW	0921MW44GW	0921MW56GW

	0821MW26GW	0921MW45GW	0221MW57GW
	0821MW27GW	0821MW46GW	0821MW58GW
	0821MW98GW	0821MW47GW	0921MW59GW
	0821MW28GW	0821MW97GW	0821EB01
		0921MW49GW	0821EB02
		0821MW50GW	0821EB03
		0921RD15SW	0921RD06SW
		0921RD99SW	0921RD08SW
			0921RD05SW
			0921RD10SW

Sample qualifications for trip blank detects are listed in the table below.

Table 14 - Method 1631 Trip Blank Qualifications

Analyte	Blank concentration (ng/L)	Qualified Samples
Mercury	0921TB02 (total) 0.68 J+	1I00051-60 (0921MW44GW TOTAL) 2.02 J+
	0921TB02 (dissolved) 3.18	1I00051-53 (0821MW06GW DISS) 3.18 U 1I00052-55 (091MW40GW DISS) 3.18 U 1I00051-59 (0821MW43GW DISS) 3.18 U 1I00051-61 (0921MW44GW DISS) 3.18 U 1I0051-63 (0921MW45GW DISS) 4.43 J+ 1I00051-65 (0821MW46GW DISS) 3.18 U 1I00051-67 (0821MW47GW DISS) 3.18 U 1I00051-69 (0821MW97GW DISS) 3.18 U 1I00051-71 (0821MW49GW DISS) 7.27 J+
	0921TB03 (dissolved) 0.54 J+	1I00051-02 (0821MW51GW DISS) 2.72 J+ 1I00051-08 (0821MW54GW DISS) 1.14 J+ 1I00051-12 (0821MW56GW DISS) 2.33 J+

VI.4.2. Field Duplicates

Samples 0821MW99GW and 0821MW33GW, 0821MW98GW and 0821MW27GW, 0821MW97GW and 0821MW47GW (total and dissolved) and 0921RD99SW and 0921RD15SW (total) were identified as field duplicate pairs. The control limits of $\leq 30\%$ for all target analytes greater than 5x RL and $\pm RL$ for all results $< 5x RL$ were met. Sample qualification was not required.

VI.5. Sample Result Verification and Reported Detection Limits

The laboratory analyzed for low level mercury by EPA Method 1631E. Total mercury was analyzed for six surface water (SW) samples. Total and dissolved mercury was analyzed for the groundwater (GW) samples.

Mercury quantification was verified for the Level 4 validation samples. Sample result verification is not applicable for Level 2B validation samples. Detects reported below the RL were qualified as estimated (J). Nondetects are valid to the RL. Multiple samples were analyzed at dilutions to bring detects within the calibration linear range due to the level of mercury found in the samples.

VII. Various EPA Methods - General Minerals

K. Okonzak-Lowry of Oak Services reviewed the SDG on November 8, 2021.

VII.1. Holding Times

Analytical holding times, as listed below, were met.

Table 15 - General Minerals Analytical Method Holding Times

Analytical Method	Analysis Holding Time (days)
353.2 (NO ₃ +NO ₂ as N)	28
300.0 (anions SO ₄ , Cl ⁻ , F ⁻)	28
310.1 (alkalinity)	14
Total Dissolved Solids (TDS)	7
Total Suspended Solids (TSS)	7

The analytical holding times were met except as noted in the table below. Reported detects are qualified as estimated (J). Reported nondetects for carbonate alkalinity are qualified as estimated (UJ).

Table 16 - General Minerals Holding Time Qualifications

Analyte	Days to Analysis	Qualified Samples
Method 310.1 Alkalinity, Bicarbonate Alkalinity and Carbonate Alkalinity	18 Days	580-105705-14, 580-105705-15, 580-105705-42 and 580-105705- 43
Method 300.0 SO ₄ , Cl ⁻ and F ⁻	33 Days	580-105705-14, 580-105705-15, 580-105705-16, 580-105705-17, 580-105705-42 and 580-105705- 43

VII.2. Calibration

The correlation coefficients (r) were ≥ 0.995 . ICV and CCV recoveries associated with reported sample results were within the laboratory control limits.

VII.3. Quality Control Samples

VII.3.1. Calibration Blanks and Method Blanks

No reported detects in the method blanks (MB) or bracketing calibration blanks (ICB/CCB) were of sufficient concentration to warrant qualification of site sample results.

VII.3.2. Laboratory Control Samples

LCS and LCSD (as appropriate) recoveries and RPDs were within laboratory control limits.

VII.3.3. Laboratory Duplicates

Laboratory duplicate analyses were performed on Sample 580-105705-15 from this SDG. RPDs were within laboratory control limits.

VII.3.4. Matrix Spike/Matrix Spike Duplicate

MS/MSD analyses were performed on Sample 580-105705-15 from this SDG. The spike recoveries and RPDs were within laboratory control limits except for Method 353.2 nitrate + nitrite. The MS/MSD recoveries were 78% and 71%, respectively. It was determined that the surface water samples are of similar matrix; therefore, the nitrate + nitrite detects were qualified as estimated with a low bias (J-) for

samples 580-105705-15, 580-105705-14, 580-105705-42, 580-105705-43. The nitrate + nitrite nondetect for sample 580-105705-16 was qualified as estimated (UJ).

VII.4. Sample Result Verification

Result quantification was verified for the Level 4 validation sample 580-105705-42. Sample result verification is not applicable for Level 2B validation samples. Detects reported below the RL were qualified as estimated (J). Nondetects are valid to the RL.

VII.5. Field QC Samples

Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. The remaining detects were used to evaluate the associated site samples. Findings associated with field QC samples are summarized below.

VII.5.1.1. Field Blanks and Equipment Blanks

Field blank or equipment blank samples were not analyzed for these surface water sample analyses.

VII.5.1.2. Field Duplicates

Samples 580-105705-42 and 580-105705-43 were identified as the field duplicate pair. The control limits of $\leq 30\%$ for all target analytes greater than $5x$ RL and $\pm RL$ for all results $< 5x$ RL were met.

VIII. Data Qualification Summary

Table 17 - Data Qualification Summary Table

Sample	Analyte	Qualifier	Reason
580-105705-14 580-105705-15 580-105705-18 580-105705-23 580-105705-32	Antimony	J (detects)	Sample detects > calibration range
580-105705-1 580-105705-3 580-105705-4 580-105705-5 580-105705-6 580-105705-7 580-105705-8 580-105705-14 580-105705-36 580-105705-37 580-105705-39 580-105705-40 580-105705-42 580-105705-43	Zinc	U at RL (detects < RL) J+ (detects > RL)	Method Blank detect
580-105705-1 580-105705-3 580-105705-4 580-105705-6 580-105705-7 580-105705-8	Antimony	U at RL (detects < RL) J+ (detects > RL)	CCB detects

Sample	Analyte	Qualifier	Reason
580-105705-17 580-105705-20 580-105705-29 580-105705-34 580-105705-35 580-105705-36 580-105705-37 580-105705-39			
580-105705-2 580-105705-9 580-105705-16	Thallium	U at RL (detects < RL)	CCB detects
All Field Samples	Potassium	U at RL (detects < RL)	ICB detect
580-105705-2 580-105705-9 580-105705-15 580-105705-16 580-105705-18 580-105705-19 580-105705-21 580-105705-23 580-105705-24 580-105705-25 580-105705-26 580-105705-27 580-105705-29 580-105705-30 580-105705-31 580-105705-32 580-105705-33 580-105705-34 580-105705-35	Zinc	J+ (detects < 10x the ICSA detect)	ICSA detect > MDL
580-105705-4 580-105705-8 580-105705-9 580-105705-29 580-105705-32 580-105705-33	Silver	J+ (detects < 10x the ICSA detect)	ICSA detect > MDL
580-105705-42 580-105705-43	Chromium	J+ (detects < 10x the ICSA detect)	ICSA detect > MDL
580-105705-42 580-105705-43	Nickel	J+ (detects < 10x the ICSA detect)	ICSA detect > MDL
580-105705-42	Al, As, Be, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Tl and V	J (detects) UJ (nondetects)	Internal Standard recoveries

Sample	Analyte	Qualifier	Reason
580-105705-43	Pb and Tl	UJ (nondetects)	Internal Standard recoveries
580-105705-1 580-105705-9 580-105705-21 580-105705-25 580-105705-26 580-105705-29	Cadmium	U at RL (detects < RL)	EB02 detect
580-105705-1 580-105705-3 580-105705-4 580-105705-7 580-105705-18 580-105705-21, 580-105705-22 580-105705-23 580-105705-25 580-105705-30 580-105705-31 580-105705-33 580-105705-40 580-105705-5 580-105705-6 580-105705-19 580-105705-20 580-105705-34 580-105705-35 580-105705-36 580-105705-37 580-105705-38 580-105705-39 580-105705-24	Chromium	U at RL (detects < RL) J+ (detects > RL)	EB01, EB02 and EB03 detects
580-105705-1 580-105705-3 580-105705-8 580-105705-21 580-105705-22 580-105705-23 580-105705-26 580-105705-30 580-105705-31 580-105705-33 580-105705-40	Lead	U at RL (detects < RL)	EB02 detect
580-105705-22	Manganese	U at RL (detect < RL)	EB02 detect
580-105705-18 580-105705-23	Lead	J (detect) UJ (nondetect)	FD results $\geq \pm RL$

Sample	Analyte	Qualifier	Reason
580-105705-25 580-105705-26	Lead Chromium	J (detects) UJ (nondetects)	FD results >±RL
1100051-19 1100051-20 1100051-27 1100051-21 1100051-48 1100051-49 1100051-62 1100051-74 1100051-22	LL Mercury	U at RL (detects < RL) J+ (detects > RL)	Bracketing CCB detects
1100052-23	LL Mercury	U at RL (detect < RL)	MB detect
1100051-10	LL Mercury	J+ (detect)	MS/MSD high recovery
1100051-02 1100051-08	LL Mercury	J+ (detects)	EB02 detect
1100051-60 1100051-02 1100051-08 1100051-12	LL Mercury	J+ (detects)	TB02 (total) and TB03 (dissolved) detects > RL
1100051-53 1100052-55 1100051-59 1100051-61 1100051-63 1100051-65 1100051-67 1100051-69 1100051-71	LL Mercury	U (detects > RL and < the TB detect were qualified U at the level of the TB detect) J+ (detects > the TB detect)	TB02 (dissolved) detect > RL
580-105705-14 580-105705-15 580-105705-42 580-105705-43	Alkalinity (total, bicarbonate and carbonate)	J (detects) UJ (nondetects)	HT exceedance
580-105705-14 580-105705-15 580-105705-16 580-105705-17 580-105705-42 580-105705-43	SO4, Cl- and F-	J (detects)	HT exceedance
580-105705-14 580-105705-15 580-105705-16 580-105705-17 580-105705-42 580-105705-43	NO3 + NO2	J- (detects) UJ (nondetects)	Low MS/MSD %R

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