APPENDIX 4

Data Gaps Report

APPLIED INTELLECT

Data Gap Report

Historic Bluebird and Blackjack Mines

Engineering Evaluation/Cost Analysis

Umatilla and Wallowa-Whitman National Forest, Oregon

December 8, 2020

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1. INTRODUCTION AND BACKGROUND

This Data Gaps Report has been prepared in response to data inadequacies identified during the preliminary draft Engineering Evaluation/Cost Analysis (EE/CA) that is being prepared for the United States Department of Agriculture - Forest Service (USFS) Region 6 at the Bluebird and Blackjack Mines (the Sites) located in Grant County, Oregon. Applied Intellect, LLC (AI) was contracted by the USFS (Contract No. 12046W18D0009; Task Order: 12046W19F0009) to conduct this EE/CA under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The EE/CA identifies and evaluates potential removal action technologies and alternatives for the cleanup of mine wastes remaining at the Sites. This document fulfills the requirements of CERCLA (42 USC 9601 et seq., 1980), under the Superfund Accelerated Cleanup Model (SACM) and the National Contingency Plan (NCP, 40 CFR 300.415). The EE/CA is being prepared in accordance with U.S. Environmental Protection Agency (EPA) guidance for conducting non-time-critical removal actions under CERCLA (EPA, 1993).

The historic Bluebird and Blackjack Mines are located on public lands administered by the Umatilla and Wallowa-Whitman National Forests approximately three miles southwest of the town of Granite, Oregon (Figure 1). Mining in this area began in the 1860s with the discovery of placer deposits in the gravels of Granite Creek, and in tributaries including Clear Creek. Placer mining was followed by lode mining as the gold was traced back to its sources. Mining claims at the Sites have dated back to 1898 and had been intermittently worked up to 1950s. Considerable work has been conducted by the U.S. Department of Agriculture Forest Service (USFS) at the Sites since the 1990s.

Environmental sampling at and around the Bluebird and Blackjack Mines was initiated by the USFS in 1980. Most detailed environmental studies began around 2003 and have continued since then. Site Inspections (SIs) and EE/CAs have been conducted at both mines. However, in 2019 the USFS requested that AI complete a review of all environmental reports and data from both sites and initiate a new combined EE/CA for both locations.

1.1 2019 EE/CA

AI initiated field studies for both sites to ensure that all information necessary to complete the new EE/CA was available. At the conclusion of the resulting Preliminary Draft EE/CA new alternatives for remediating both sites were identified as was the need for a comprehensive Human Health Risk Assessment (HHRA). These are listed as follows:

1. The new alternative was the potential for designing and constructing a new wetland for Blackjack Mine discharge treatment on the west side of Clear Creek;
2. Disposing of densified sludge from both sites at the Baker City Municipal Landfill;
3. Replacing the existing low-gradient pipeline at the Blackjack Mine with one at a steeper gradient;
4. Complete an HHRA to supplement the current Ecorisk Assessment; and develop a more accurate volume for existing sludge at settlement basins for both mines.

Item 4 was addressed during the Preliminary Draft EE/CA. However, following completion of that document AI determined that there were significant data gaps remaining before items 1 through 3 could be addressed.

AI proposed and was awarded a contract to complete this data gap assessment in 2020.

1.2 2020 Data Gap Investigation

The data gap proposal consisted of the following items:

1. Determine if the sludge could be disposed of in the Baker City Municipal Landfill rather than in an on-site repository;
2. Investigate possible sites west of Clear Creek for use as a wetland treatment location;
3. Prospect a potential replacement route for the Blackjack Mine discharge pipeline; and
4. Complete additional sampling needed at both sites to complete an HHRA.

The above items are discussed in detail in Section 2.0 through 3.0.

2. FIELD PROCEDURE

This section describes in detail the procedures used to complete the insufficient data (data gap) required to improve the 2019 EE/CA on behalf of the USFS. These include:

- Determining the applicability of Geotube filtering devices for condensing the sludge in the Bluebird and Blackjack Mines settling ponds for disposal in either an on-site repository or the Baker City Municipal Landfill;
- Evaluating the applicability of a location on the west side of Clear Creek for use as an alternative location to the current settlement basin on the east side of Clear Creek;
- Surveying elevations for a replacement pipeline route to the east side of Clear Creek that would result in an improved discharge gradient; and
- Additional soil sampling at the Bluebird and Blackjack Mines locations for use in a Human Health Risk Assessment of both locations.

Field work was initiated on May 28, 2020 and completed on June 19, 2020.

Each of the above four items is discussed in detail in Sections 2.1 through 2.4.

2.1 Geotube Demonstration

Sludge from the discharges at both mines exhibit low solids percentages ranging from 8.8 to 17.5 %, Table 3, EECA (AI, 2019). The average % solids was 11.8 %, and the sludge was very fluid. This kind of waste is very difficult to manage, transport, and dispose of. At some point the sludge will fill the settlement basins at both the Blackjack and Bluebird Mines and/or develop potential for significant discharge to Clear Creek, most notably from the Blackjack settlement ponds. In the

future the sludge will ultimately require removal and disposal at an appropriate location and facility. The primary choices are:

1. Disposal in an engineered on-site repository; or
2. Transport to and disposal at the Baker City Municipal Landfill.

Alternative 1 was evaluated by Cascade Earth Sciences in 2013 and 2015. The approach was to use vactor trucks to remove the sludge, transport the sludge to a nearby engineered repository, and densify the sludge in Geotubes at the repository location. This approach had a variety of issues including the cost to transport large amounts of water with the sludge, discharge of this water at the repository site, and construction and maintenance cost of the repository. The proposed repository location in a USFS rock quarry would also delete a material source for road maintenance.

Alternative 2 would require dewatering of sludge on-site in Geotubes with reject water returning to the source ponds. Landfill disposal would require that condensed sludge within the Geotubes would not fail the toxicity characteristic leaching procedure (TCLP) (EPA Method 1311) test for Resource Conservation and Recovery Act (RCRA) Hazardous Waste as well as pass the "paint filter" test, EPA Method 9095B. Material that fails TCLP criteria must be disposed of in a RCRA Subtitle C hazardous waste landfill, of which the Baker City Landfill is not one. The "paint filter" test determines if the waste will release free liquid, which would not be permitted in the Baker City Landfill. The concept for full-scale sludge removal is that the settlement ponds would use a suction pump or other device to pump sludge under controlled pressure into a Geotube within a dump truck bed lined with a disposable high-density polyethylene (HDPE) liner to prevent accidental discharge during transport and to permit discharge of reject water from the Geotube through a valve attached to the liner. When full, the Geotube would be transported to the Baker City Landfill , and the Geotube and liner would be dumped directly into the landfill. The major advantage of this approach is that an on-site repository with the attendant risks and long-term maintenance would not be constructed. The uncertainties are:

1. Would the condensed sludge pass the paint filter test?
2. Would the condensed sludge still pass the paint filter test after a 60-mile trip to the landfill?

AI proposed to evaluate the uncertainties by conducting a small-scale pilot test that consisted of filling two small (7 ft x 4 ft) Geotubes in the bed of a lined dump truck. Because the pH of the Bluebird and Blackjack sludge are significantly different, a separate Geotube was used for each material. Both Geotubes consisted of Tencate GT50D fabric as identified during the initial EE/CA sampling in 2019 to be the optimal material. A technician from WaterSolve LLC, Caledonia, Michigan, an experienced Geotube consultant oversaw the operation in support of AI. A flocculant, Solve 137, was injected into the sludge to enhance dewatering. The locations of sludge removal at Bluebird and Blackjack are illustrated by the red dots on Figure 2. A schematic of the procedure is provided in Figure 3. Heavy equipment (truck and excavator) were provided by Justus Excavation & Trucking LLC of Haines, Oregon.

Procedural details and results are discussed in Section 3.1.

2.2 Alternative Blackjack Treatment Pond Site Evaluation

During preparation of the draft EE/CA it was recommended that a new wetlands treatment system be considered on the west side of Clear Creek. This has several advantages over the existing system on the east side of Clear Creek including:

1. The existing system is adjacent to the county road and illustrates a visual impact by the orange precipitate; a wetland on the west side would be largely out-of-sight;
2. The existing system incorporated a borrow ditch as a convenience, but is difficult to maintain; a wetland on the west side would be specifically designed for effective maintenance;
3. The existing wetlands is long, narrow, and shallow with a direct connection to Clear Creek; a west side wetlands could be designed to be deeper and much shorter without a direct connection to Clear Creek; and
4. The existing wetlands requires a long pipeline from the Blackjack adit which goes under Clear Creek and has a flat gradient in the Clear Creek valley; a west side would use a much shorter pipeline with a much steeper gradient.

The disadvantages of a west side wetlands include:

1. Additional construction for the wetlands, pipeline, and roads would disturb additional USFS land;
2. Access road operation and maintenance (O&M) would be entirely supported by the USFS; the existing system utilizes a county road; and
3. Multiple crossing of Clear Creek would be required for construction and O&M; none is required at the current existing system.

The largest single unknown relative to the application of a west side wetlands is the infiltration rate of the existing terrain at the proposed location of the new wetlands as illustrated in Figure 4. The existing wetlands – although directly connected to Clear Creek - is approximately 2,500 feet long, whereas the proposed west side wetlands would be terrain-limited to approximately 400 feet in length. Without adequate subsurface infiltration part of the water would require surface discharge, and this discharge water must meet regulatory criteria prior to discharge. The surface area may be inadequate, or the design may be complicated with attendant O&M costs.

There also may not be adequate gradient to transport lower Blackjack Adit discharge to a new west side wetlands. If not, a small secondary infiltration basin may be required for the lower adit. This will increase construction and O&M costs.

To determine the infiltration rate at the proposed new wetlands location AI located four tests pits in which infiltration test would be performed. The depth of the pits would be determined by the profile encountered. Tests would be performed using double ring infiltrometers. However,

double ring infiltrometers are difficult to use and inaccurate in rocky soil. An alternative method planned is to simply partially fill the pits with water and measure the infiltration directly. Samples were also obtained of the anticipated depth of the wetland to perform infiltration calculations based on percentage of fines. These tests were performed by Strata Geotech, Spokane, Washington.

The locations of the four selected test pits is illustrated in Figure 4. The results of infiltration tests are discussed in Section 3.2.

2.3 Lower Blackjack Pipeline Survey

No actual surveys by a licensed surveyor exist of the lower Blackjack pipeline. An un-surveyed as-built drawing by CES in 2008 indicates that the pipeline is completely flat from a point on the east side of Clear Creek to the original outfall at a point in the borrow ditch just past the county road, a distance of approximately 400 feet. This pipeline layout creates a natural deposition point for precipitates to block flow, resulting in a possible overflow to Clear Creek. An option for improving this as identified in the draft EECA is to extend the pipeline a greater distance down the valley before passing under the county road to a point in the borrow ditch that is lower in elevation than the existing outfall.

To complete this survey a potential outfall was identified, the pipeline was exposed in an excavated pit west of Clear Creek, and the points were surveyed. The results are discussed in detail in Section 3.4. Figure 4 illustrates the surveyed elevations and a possible pipeline route.

2.4 Risk Assessment Sampling

Results from the screening level human health risk assessment presented in the draft EE/CA indicated that waste rock/soil for the Blackjack Mine slightly exceeded manganese and cobalt standards and waste rock/soil for the Bluebird Mine slightly exceeded the arsenic standard. Based on these results, it was determined that a quantitative human health risk assessment should be performed to further evaluate site-specific exposures and risks based on human receptors identified by USFS (e.g., workers and recreators). Additionally, it was determined that the quantitative human health risk assessment should evaluate a sub-250 µm fraction of soil that is the most likely to adhere to human hands and represent an exposure pathway.

In support of the quantitative human health risk assessment, AI collected additional soil samples as part of the Data Gap Investigation at locations near the previously evaluated waste piles. Specifically, five sampling areas (SAs) were identified at each mine site as shown in Figures 5 and 6. The SAs were selected to target areas outside of previously investigated waste rock piles that would be accessible to the public and USFS workers. Sampling procedures are described in more detail in Section 3.4, and analytical results in comparison to generic screening levels are shown in Tables 1 and 2. The site-specific results of the quantitative human health risk assessment will be presented in the final EE/CA document.

3. FIELD RESULTS

The results of the Data Gap Investigation presented in Section 2 are discussed in Sections 3.1 through 3.4:

- Geotube Evaluation;
- Alternative Blackjack treatment Pond Location Evaluation;
- Lower Blackjack Pipeline Survey; and
- Risk Assessment Sampling.

Field notes are provided in Attachment 1.

3.1 Geotube Demonstration

The Geotube demonstration was initiated on Sunday June 14, 2020 by mobilizing an excavator, a dump truck, an 8-ft-diamter mixing tank, and trash pumps to the Bluebird Mine settling pond. (See red dot on Figure 2). A level area for access was constructed along the county road just north of the Bluebird pipeline outfall, and the truck liner was installed with discharge control valve. On June 15, support from WaterSolve arrived to complete the polymer injection pump system installation and calibrate the injection rate. The procedure is illustrated in Figure 3. Initially sludge was pumped directly from the pond. However, this proved extremely difficult and the intake screen plugged constantly with vegetation debris. A mixing/surge tank proved to be far more efficient at managing the vegetation problem. The method that worked most efficiently and is shown on Figure 3 consisted of the following sequence:

1. Sludge and debris were scooped from the pond with the excavator bucket and deposited in the mixing tank;
2. Sludge was pumped from the tank through a screened intake and directed to the rear Geotube in the truck bed;
3. An appropriate mixture of make-up water and flocculant was injected in the pump discharge line. The makeup water was pumped directly from Clear Creek by a separate pump. Flocculation effect was monitored through a sample port, visually inspected, and the injection rate modified as needed;
4. The Geotube was monitored visually to ensure that excessive pressure, which could rupture the Geotube, was not developing, and pumping rates were adjusted accordingly; and
5. The discharge water from the Geotube was trapped in the double bed liner and discharged by pipeline back to the pond.

The upper photograph on Figure 3 shows the setup in the field; the lower photograph shows the Geotube as it is being filled. Other photographs illustrating the field procedures are shown in Photos 1 through 12.

At 12:30 PM on June 16th the Geotube sludge level was at ¾ of the maximum tube height, which is considered full. The Geotube was capped and the entire system relocated to the Blackjack settlement pond (See red dot, Figure 2). Total operational time to fill the Geotube was eight hours including adjustments to improve system operation. By 1:00 PM the system was operational at the Blackjack ponds. At Blackjack, the same procedures were followed with the following two exceptions:

1. The Blackjack sludge was largely weed-free; the mixing tank was not needed or used; and
2. The pH of the discharge is circumneutral, and a small pit was excavated in the sludge as a makeup water source. This could not be done at Bluebird because of the highly acidic pH of the pond water, which can decrease flocculation efficiency of the polyacrylamide flocculant that was used.

The Geotube was completely filled by 4:00 PM on June 17th. Total operational time was approximately 8 hours. The Geotubes were allowed to drain from the truck until the afternoon of Saturday June 21st when they were transported to Haines, Oregon to be delivered to the landfill on Monday June 23rd. Photo 17 illustrates the excellent sludge densification from both sites.

The Geotubes were opened and sampled on Saturday June 21st. Samples from both tubes easily passed the paint filter test (See Photos 13-15), and the material was disposed of at the Baker City Landfill (Receipt provided in Attachment 2). A core sample of each tube was obtained and sent to WaterSolve to determine % moisture. Results were as follows:

- Bluebird Sludge - 21.9% Dry Weight Solids;
- Blackjack Sludge - 24.7% Dry Weight Solids; and
- Average - 23.3% Dry Weight Solids.

The lower % solids of Bluebird relative to Blackjack may be attributable to the acidic pH of the ponds. This represents an average concentration factor of 23.3%/11.8% = ~2.

The WaterSolve analytical report is provided in Attachment 3.

The Blackjack sludge also had more of a yellow tint. This may indicate a different secondary mineral composition (See Photo 17).

3.2 Alternative Blackjack Treatment Pond Site Evaluation

The concept for the alternate wetlands location on the west side of Clear Creek is to construct a passive wetland for treatment with the idea that the treated water would ultimately infiltrate most of the time without discharging by overflow to Clear Creek. (Note: An emergency overflow would be incorporated into the design). The workplan required application of the standard double ring infiltrometer test, ASTM D3385-18. Four test pit locations were selected in the area of the proposed new wetlands for sampling and infiltration testing to determine the infiltration

rate of the subsoil as needed for treatment system design. Test pit locations are shown in Figure 4. Test pits BLK-TP1, 2, and 3 are within the surface area of the proposed wetlands; BLK-TP4 is located downhill from the lower Blackjack Adit. This area would be the location of a small lower adit infiltration basin if there was not adequate gradient from the lower adit to a constructed wetlands for a pipeline.

On June 19, 2020 pits TP1, 2, and 3 were excavated initially with the intention of completing infiltrometer tests. Photo 16 shows the alterative wetlands site, an old county road. The soil profile of all three pits indicated that an infiltrometer style test was not applicable as the subsurface was very rocky and there was an abundant clay matrix. The clay rich profile also indicated the infiltration rate may be low. The field crew decided to use a simple percolation test to determine infiltration. This would consist of filling each pit to a depth of one foot with water and measuring the amount of time needed for the depth to decrease to six inches. Water to fill the pits was pumped from Clear Creek. A five-gallon bucket of sample was obtained from each pit for particle size distribution and infiltration calculation based on fine percentage by Strata Geotech. Gradation Analyses/Curves were determined by ASTM D6913; Hydraulic Conductivity (k) was determined based on fines content by Spokane 200 Method, Spokane Regional Stormwater Manual. Curves and k calculations are provided in Attachment 4. Pit logs are as follows:

- BLK-TP1 – Surface to 5 ft (total depth [TD]) was entirely silty and sandy coarse, rounded gravel. Measured fines are 9.1%. This location would not hold water at all despite an estimated 150 gpm pumping rate. (See Photo 19.) Calculated k = 0.01 cm/sec.
- BLK-TP2 – Surface to 2 ft was clayey coarse gravel. 2 ft to 4 ft (TD) was a tight, very fine white clayey, sandy material locally called “volcanic ash.” Measured fines are 57%. Measured infiltrations was 2 inches in 1.02 hours (1.96 in/hr; 0.00054 in/sec; 0.0014 cm/sec) at 1.0 ft head. Calculated k = 0.00032 cm/sec. Photo 18 illustrated the “ash” layer and ponded water in BLK-TP2.
- BLK-TP3 – Surface to 5 ft (TD) was entirely clayey, silty coarse gravel with ~40% 3 inches to 14 inches cobbles and boulders. Measured fines are 9.5%. Measured infiltration was 6.25 inches in 40 minutes (0.156 in/min.; 0.0026 in/sec; 0.0066 cm/sec.) Calculated k = 0.009 cm/sec.

BLK-TP4 was excavated at the end of the day on June 19. The location immediately below the lower Blackjack Adit could be a location for a small infiltration basin to serve the lower adit discharge, and it is necessary to know if the location will allow full infiltration of the discharge flow.

- BLK-TP4 – Surface to 5 ft (TD) was entirely in typical mine waste from the adit. (See Photo 20.)There was also abundant ferric oxyhydroxides. The static water level was at 4 ft depth; the water may have been derived as leakage around the dams in the lower adit. If so, the location may already be consuming the very limited adit discharge. Measured fines are 11%. An additional foot of water was pumped to the pit to measure infiltration.

Measured infiltration was 3 inches in 45 minutes (0.0667 in/min; 0.00111 in/sec; 0.00282 cm/sec). Calculated k = 0.007 cm/sec.

Samples were also obtained at two distinct depths in each pit to determine if there were any soils that exceeded any criteria. The material in BLK-TP1 through TP3 should be natural soil, whereas that in TP4 is mine waste. The results are provided in Table 3. Arsenic exceeds EPA Industrial regional screening levels (RSLs) in most samples. However, the RSL is very low, and this is a highly mineralized region; therefore, it is not surprising that the criteria is exceeded naturally. No samples exceeded the more realistic Bureau of Land Management (BLM) Recreational screening criteria.

The preceding information will be addressed more extensively in the EE/CA where it will be used determine the size of the wetlands footprint required to infiltrate the full site discharge. Also, the extremely high infiltration at TP1 indicates this location could become an "injection" point for overflow.

3.3 Lower Blackjack Pipeline Survey

The pipeline on the west side of Clear Creek was exposed at the location (TOP OF PIPE, ELEV 4613.51) on Figure 4. On Saturday June 20, 2020 Jeffrey Hsu of Bagett-Griffith & Blackman, LaGrande, Oregon completed an elevation survey of the site which included:

- Points along the exposed existing pipeline (including the pit on the west side of Clear Creek, see Photo 21);
- A probable outfall of a replacement pipeline that would provide improved gradient; and
- The locations and elevations of the four test pits.

The full original survey map is provided in Attachment 5. The existing pipeline exhibits a drop of 1.18 ft over the 400 ft length between the exposed pipe in the pit and the point 4612.33 for a gradient of 0.003 ft/ft The total gradient at the existing outflow is a drop of 2.38 ft along the full length of 613 ft for a gradient of 0 0039 ft/ft The proposed new route would yield a drop of 2.5 ft along a length of 800 ft for a gradient of 0.0031 ft/ft. There is thus no apparent advantage to relocating the pipeline.

There is also a drop of 7 ft between TP4 and TP3. The lower adit pipeline intake is approximately 5 ft higher than TP4 for a total drop of 12 ft to TP3. TP3 is the probable maximum elevation of the proposed wetlands. Gravity flow of lower adit discharge to the wetlands by pipeline is thus probably viable, although maintenance may be high.

The above information will be addressed in more detail in the EECA.

3.4 Risk Assessment Sampling

Soil sample collection for the quantitative human health risk assessment took place within five SAs at each mine site (see Figures 5 and 6). These SAs were selected to represent areas near waste rock piles that would be accessible to the public and USFS workers. At each SA, a composite soil sample consisting of 10-20 sub-composites was collected with a clean, stainless steel spoon. The spoon was sprayed with an Alconox® solution wash and distilled water rinse between collection of composite samples. Sub-composite samples were equal in volume and collected from equally-spaced intervals in a grid pattern to a depth of approximately 0-6" below ground surface (bgs).

Composite samples were homogenized in the field, placed in labelled zip-lock bags, and submitted according to standard chain-of-custody protocols to a commercial laboratory (SVL Analytical, Kellogg, Idaho) to be dried and passed through a 60-mesh (250 µm) screen. The SVL report is provided in Attachment 6. The sub-250 µm fraction of each sample was then submitted via standard chain-of-custody protocols to a second commercial laboratory (Pace Analytical) for analysis of total analyte list (TAL) metals by EPA Method 6010. The Pace analytical reports are provided in Attachment 7.

Analytical results from this sampling effort in comparison to generic screening levels are shown in Tables 1 and 2. The site-specific results of the quantitative human health risk assessment will be presented in the final EE/CA document.

TABLES

Table 1. Bluebird Mine Soil Sample Results for Quantitative Human Health Risk Assessment in Comparison to Generic Screening Levels

Analyte	CAS No.	Generic Screening Levels		BB-SS-SA1					BB-SS-SA2					BB-SS-SA3				
		BLM Recreational RSL[1] (mg/kg)	EPA Industrial RSL[2] (mg/kg)	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF
Aluminum	7429-90-5	1000000	1100000	25800		8.44	<0.1	<0.1	24800		8.41	<0.1	<0.1	24600		8.40	<0.1	<0.1
Antimony	7440-36-0	782	470	2.03	J	0.515	<0.1	<0.1	0.953	J	0.513	<0.1	<0.1	0.865	J	0.512	<0.1	<0.1
Arsenic	7440-38-2	30.6	3	19.8		0.474	0.65	**6.6**	27.6		0.472	0.9	**9.2**	15.7		0.471	0.51	**5.2**
Barium	7440-39-3	390000	220000	126		0.247	<0.1	<0.1	178		0.246	<0.1	<0.1	131		0.246	<0.1	<0.1
Beryllium	7440-41-7	3910	2300	0.416		0.0824	<0.1	<0.1	0.397		0.0821	<0.1	<0.1	0.397		0.0820	<0.1	<0.1
Cadmium	7440-43-9	1780	980	0.681		0.0834	<0.1	<0.1	0.535		0.0831	<0.1	<0.1	0.570		0.0830	<0.1	<0.1
Chromium	7440-47-3	1000000	1800000[3]	144		0.257	<0.1	<0.1	93.8		0.257	<0.1	<0.1	143		0.256	<0.1	<0.1
Cobalt	7440-48-4	586	350	31.1		0.237	<0.1	<0.1	20.4		0.236	<0.1	<0.1	29.4		0.236	<0.1	<0.1
Copper	7440-50-8	78200	47000	79.9		0.521	<0.1	<0.1	45.1		0.519	<0.1	<0.1	50.5		0.519	<0.1	<0.1
Iron	7439-89-6	1000000	820000	51200		25.7	<0.1	<0.1	29000		5.13	<0.1	<0.1	37100		5.12	<0.1	<0.1
Lead	7439-92-1	800	800	16.7		0.214	<0.1	<0.1	8.94		0.213	<0.1	<0.1	5.91		0.213	<0.1	<0.1
Manganese	7439-96-5	46700	26000	1190		1.26	<0.1	<0.1	1040		1.25	<0.1	<0.1	1010		1.25	<0.1	<0.1
Mercury	7439-97-6	271	46	0.397	T8	0.0185	<0.1	<0.1	0.466	T8	0.0185	<0.1	<0.1	0.237	T8	0.0184	<0.1	<0.1
Nickel	7440-02-0	39000	22000	191		0.505	<0.1	<0.1	121		0.503	<0.1	<0.1	191		0.502	<0.1	<0.1
Selenium	7782-49-2	9780	5800	1.09	J	0.635	<0.1	<0.1	<0.633		0.633	<0.1*	<0.1*	<0.632		0.632	<0.1*	<0.1*
Silver	7440-22-4	9780	5800	<0.235		0.235	<0.1*	<0.1*	0.866	J	0.234	<0.1	<0.1	<0.234		0.234	<0.1*	<0.1*
Thallium	7440-28-0	19.6	12	0.582	J	0.365	<0.1	<0.1	0.520	J	0.363	<0.1	<0.1	0.403	J	0.363	<0.1	<0.1
Vanadium	7440-62-2	9850	5800	79.9		0.708	<0.1	<0.1	55.3		0.705	<0.1	<0.1	75.1		0.704	<0.1	<0.1
Zinc	7440-66-6	587000	350000	103		0.967	<0.1	<0.1	95.8		0.964	<0.1	<0.1	83.2		0.962	<0.1	<0.1

Table 1. Bluebird Mine Soil Sample Results for Quantitative Human Health Risk Assessment in Comparison to Generic Screening Levels (continued)

Analyte	CAS No.	Generic Screening Levels		BB-SS-SA4					BB-SS-SA5					BB-SS-SA5-DUP				
		BLM Recreational RSL[1] (mg/kg)	EPA Industrial RSL[2] (mg/kg)	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF
Aluminum	7429-90-5	1000000	1100000	24000		8.42	<0.1	<0.1	22400		8.35	<0.1	<0.1	21800		8.36	<0.1	<0.1
Antimony	7440-36-0	782	470	2.04	J	0.513	<0.1	<0.1	2.83		0.509	<0.1	<0.1	3.00		0.510	<0.1	<0.1
Arsenic	7440-38-2	30.6	3	33.2		0.472	**1.1**	**11**	64.4		0.468	**2.1**	**21**	54.0		0.469	**1.8**	**18**
Barium	7440-39-3	390000	220000	137		0.246	<0.1	<0.1	172		0.244	<0.1	<0.1	167		0.245	<0.1	<0.1
Beryllium	7440-41-7	3910	2300	0.390		0.0821	<0.1	<0.1	0.378		0.0814	<0.1	<0.1	0.357		0.0816	<0.1	<0.1
Cadmium	7440-43-9	1780	980	0.840		0.0831	<0.1	<0.1	0.713		0.0825	<0.1	<0.1	0.642		0.0826	<0.1	<0.1
Chromium	7440-47-3	1000000	1800000[3]	142		0.257	<0.1	<0.1	122		0.254	<0.1	<0.1	125		0.255	<0.1	<0.1
Cobalt	7440-48-4	586	350	32.3		0.236	<0.1	<0.1	39.7		0.234	<0.1	0.11	36.5		0.234	<0.1	0.1
Copper	7440-50-8	78200	47000	54.5		0.519	<0.1	<0.1	71.8		0.515	<0.1	<0.1	65.4		0.516	<0.1	<0.1
Iron	7439-89-6	1000000	820000	35800		5.13	<0.1	<0.1	39800		5.09	<0.1	<0.1	37500		5.10	<0.1	<0.1
Lead	7439-92-1	800	800	8.31		0.214	<0.1	<0.1	8.77		0.212	<0.1	<0.1	5.89		0.212	<0.1	<0.1
Manganese	7439-96-5	46700	26000	1220		1.25	<0.1	<0.1	2300		1.24	<0.1	<0.1	2010		1.24	<0.1	<0.1
Mercury	7439-97-6	271	46	0.228	T8	0.0185	<0.1	<0.1	0.341	T8	0.0183	<0.1	<0.1	0.236		0.0183	<0.1	<0.1
Nickel	7440-02-0	39000	22000	214		0.503	<0.1	<0.1	241		0.499	<0.1	<0.1	232		0.499	<0.1	<0.1
Selenium	7782-49-2	9780	5800	1.37	J	0.633	<0.1	<0.1	2.30		0.628	<0.1	<0.1	1.51	J	0.629	<0.1	<0.1
Silver	7440-22-4	9780	5800	0.540	J	0.234	<0.1	<0.1	0.733	J	0.232	<0.1	<0.1	0.926	J	0.232	<0.1	<0.1
Thallium	7440-28-0	19.6	12	<0.363		0.363	<0.1*	<0.1*	<0.360		0.360	<0.1*	<0.1*	0.394	J	0.361	<0.1	<0.1
Vanadium	7440-62-2	9850	5800	70.3		0.705	<0.1	<0.1	71.4		0.699	<0.1	<0.1	69.5		0.700	<0.1	<0.1
Zinc	7440-66-6	587000	350000	102		0.964	<0.1	<0.1	110		0.956	<0.1	<0.1	103		0.957	<0.1	<0.1

Values in **red** indicate EF > 1
* Analyte not present above MDL; value calculated from MDL
[1] Cox, 2017. BLM Technical Memorandum: Screening Assessment Approaches for Metals in Soil at BLM HazMat/AML Sites. United States Bureau of Land Management. September.
[2] USEPA 2020. Regional Screening Levels (RSLs) – Generic Tables. Last updated May 2020.
[3] Chromium SL is for Cr(III)
BLM – Bureau of Land Management
CAS – Chemical Abstracts Service
EF – Exceedance Factor
EPA – United States Environmental Protection Agency
J – The identification of the analyte is acceptable; the reported value is an estimate.
MDL – Laboratory Method Detection Limit
mg/kg – Milligrams per kilogram
NA - Not applicable
NE – Not established
SL – Screening Level

Table 2. Blackjack Mine Soil Sample Results for Quantitative Human Health Risk Assessment in Comparison to Generic Screening Levels

Analyte	CAS No.	Generic Screening Levels		BJ-SS-SA1					BJ-SS-SA2					BJ-SS-SA3				
		BLM Recreational RSL[1] (mg/kg)	EPA Industrial RSL[2] (mg/kg)	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF
Aluminum	7429-90-5	1000000	1100000	18000		8.32	<0.1	<0.1	14700		8.20	<0.1	<0.1	21700		8.39	<0.1	<0.1
Antimony	7440-36-0	782	470	1.69	J	0.507	<0.1	<0.1	2.52		0.500	<0.1	<0.1	2.36		0.512	<0.1	<0.1
Arsenic	7440-38-2	30.6	3	6.10		0.466	0.2	**2**	5.04		0.460	0.16	**1.7**	52.2		0.471	**1.7**	**17**
Barium	7440-39-3	390000	220000	226		0.243	<0.1	<0.1	192		0.240	<0.1	<0.1	126		0.246	<0.1	<0.1
Beryllium	7440-41-7	3910	2300	0.426		0.0811	<0.1	<0.1	0.402		0.0800	<0.1	<0.1	0.327		0.0819	<0.1	<0.1
Cadmium	7440-43-9	1780	980	0.293	J	0.0821	<0.1	<0.1	0.578		0.0810	<0.1	<0.1	0.589		0.0829	<0.1	<0.1
Chromium	7440-47-3	1000000	1800000[3]	19.2		0.254	<0.1	<0.1	22.9		0.250	<0.1	<0.1	140		0.256	<0.1	<0.1
Cobalt	7440-48-4	586	350	27.4		0.233	<0.1	<0.1	29.9		0.230	<0.1	<0.1	28.1		0.235	<0.1	<0.1
Copper	7440-50-8	78200	47000	105		0.513	<0.1	<0.1	81.7		0.506	<0.1	<0.1	56.6		0.518	<0.1	<0.1
Iron	7439-89-6	1000000	820000	55200		25.4	<0.1	<0.1	38300		5.00	<0.1	<0.1	32800		5.12	<0.1	<0.1
Lead	7439-92-1	800	800	9.87		0.211	<0.1	<0.1	9.93		0.208	<0.1	<0.1	8.34		0.213	<0.1	<0.1
Manganese	7439-96-5	46700	26000	2360		1.24	<0.1	<0.1	3460		1.22	<0.1	0.13	843		0.251	<0.1	<0.1
Mercury	7439-97-6	271	46	0.166		0.0183	<0.1	<0.1	0.162	T8	0.0180	<0.1	<0.1	0.160		0.0184	<0.1	<0.1
Nickel	7440-02-0	39000	22000	81.3		0.497	<0.1	<0.1	95.9		0.490	<0.1	<0.1	202		0.502	<0.1	<0.1
Selenium	7782-49-2	9780	5800	2.10		0.626	<0.1	<0.1	2.40		0.617	<0.1	<0.1	1.17	J	0.632	<0.1	<0.1
Silver	7440-22-4	9780	5800	<0.231		0.231	<0.1*	<0.1*	0.291	J	0.228	<0.1	<0.1	0.750	J	0.233	<0.1	<0.1
Thallium	7440-28-0	19.6	12	<0.359		0.359	<0.1*	<0.1*	<0.354		0.354	<0.1*	<0.1*	0.838	J	0.362	<0.1	<0.1
Vanadium	7440-62-2	9850	5800	41.0		0.697	<0.1	<0.1	30.7		0.687	<0.1	<0.1	65.8		0.703	<0.1	<0.1
Zinc	7440-66-6	587000	350000	135		0.952	<0.1	<0.1	152		0.939	<0.1	<0.1	69.6		0.961	<0.1	<0.1

Table 2. Blackjack Mine Soil Sample Results for Quantitative Human Health Risk Assessment in Comparison to Generic Screening Levels (Continued)

Analyte	CAS No.	Generic Screening Levels		BJ-SS-SA4					BJ-SS-SA5					BJ-SS-SA5-DUP				
		BLM Recreational RSL[1] (mg/kg)	EPA Industrial RSL[2] (mg/kg)	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF
Aluminum	7429-90-5	1000000	1100000	20300		8.33	<0.1	<0.1	20900		8.32	<0.1	<0.1	20200		8.34	<0.1	<0.1
Antimony	7440-36-0	782	470	2.33		0.508	<0.1	<0.1	2.38		0.507	<0.1	<0.1	2.51		0.508	<0.1	<0.1
Arsenic	7440-38-2	30.6	3	46.9		0.467	**1.5**	**16**	44.9		0.466	**1.5**	**15**	45.4		0.468	**1.5**	**15**
Barium	7440-39-3	390000	220000	113		0.244	<0.1	<0.1	122		0.243	<0.1	<0.1	124		0.244	<0.1	<0.1
Beryllium	7440-41-7	3910	2300	0.300		0.0812	<0.1	<0.1	0.312		0.0811	<0.1	<0.1	0.323		0.0813	<0.1	<0.1
Cadmium	7440-43-9	1780	980	0.624		0.0822	<0.1	<0.1	0.561		0.0821	<0.1	<0.1	0.519		0.0824	<0.1	<0.1
Chromium	7440-47-3	1000000	1800000[3]	136		0.254	<0.1	<0.1	139		0.254	<0.1	<0.1	135		0.254	<0.1	<0.1
Cobalt	7440-48-4	586	350	28.8		0.234	<0.1	<0.1	29.9		0.233	<0.1	<0.1	30.1		0.234	<0.1	<0.1
Copper	7440-50-8	78200	47000	66.0		0.514	<0.1	<0.1	52.8		0.513	<0.1	<0.1	52.9		0.514	<0.1	<0.1
Iron	7439-89-6	1000000	820000	34300		5.08	<0.1	<0.1	35200		5.07	<0.1	<0.1	34700		5.08	<0.1	<0.1
Lead	7439-92-1	800	800	9.95		0.211	<0.1	<0.1	6.94		0.211	<0.1	<0.1	8.02		0.211	<0.1	<0.1
Manganese	7439-96-5	46700	26000	1070		1.24	<0.1	<0.1	979		1.24	<0.1	<0.1	976		1.24	<0.1	<0.1
Mercury	7439-97-6	271	46	0.112		0.0183	<0.1	<0.1	0.136		0.0183	<0.1	<0.1	0.0908		0.0183	<0.1	<0.1
Nickel	7440-02-0	39000	22000	197		0.498	<0.1	<0.1	211		0.497	<0.1	<0.1	208		0.498	<0.1	<0.1
Selenium	7782-49-2	9780	5800	1.15	J	0.627	<0.1	<0.1	1.37	J	0.626	<0.1	<0.1	0.704	J	0.627	<0.1	<0.1
Silver	7440-22-4	9780	5800	0.540	J	0.232	<0.1	<0.1	0.679	J	0.231	<0.1	<0.1	0.694	J	0.232	<0.1	<0.1
Thallium	7440-28-0	19.6	12	<0.359		0.359	<0.1*	<0.1*	0.511	J	0.359	<0.1	<0.1	<0.360		0.360	<0.1*	<0.1*
Vanadium	7440-62-2	9850	5800	66.3		0.698	<0.1	<0.1	67.5		0.697	<0.1	<0.1	65.9		0.699	<0.1	<0.1
Zinc	7440-66-6	587000	350000	74.0		0.953	<0.1	<0.1	72.7		0.952	<0.1	<0.1	70.9		0.955	<0.1	<0.1

Values in **red** indicate EF > 1
* Analyte not present above MDL; value calculated from MDL
[1] Cox, 2017. BLM Technical Memorandum: Screening Assessment Approaches for Metals in Soil at BLM HazMat/AML Sites. United States Bureau of Land Management. September.
[2] USEPA 2020. Regional Screening Levels (RSLs) – Generic Tables. Last updated May 2020.
[3] Chromium SL is for Cr(III)
BLM – Bureau of Land Management
CAS – Chemical Abstracts Service
EF – Exceedance Factor
EPA – United States Environmental Protection Agency
J – The identification of the analyte is acceptable; the reported value is an estimate.
MDL – Laboratory Method Detection Limit
mg/kg – Milligrams per kilogram
NA - Not applicable
NE – Not established
SL – Screening Level

Table 3. Blackjack Mine Test Pit Soil Results in Comparison with Generic Screening Levels

Analyte	CAS No.	Regulatory Screening Levels		BLK-TP1-2					BLK-TP1-5					BLK-TP2-2				
		BLM Recreational RSL[1] (mg/kg)	EPA Industrial RSL[2] (mg/kg)	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF
Aluminum	7429-90-5	1000000	1100000	12400	V	41.2	<0.1	<0.1	12000		42.0	<0.1	<0.1	9080		38.3	<0.1	<0.1
Antimony	7440-36-0	782	470	<1.73	J6	1.73	<0.1*	<0.1*	<1.77		1.77	<0.1*	<0.1*	<1.61		1.61	<0.1*	<0.1*
Arsenic	7440-38-2	30.6	3	4.71		0.472	0.15	**1.6**	4.94		0.482	0.16	**1.6**	2.83		0.440	<0.1	0.94
Barium	7440-39-3	390000	220000	177		1.40	<0.1	<0.1	159		1.43	<0.1	<0.1	105		1.30	<0.1	<0.1
Beryllium	7440-41-7	3910	2300	<0.823		0.823	<0.1*	<0.1*	<0.839		0.839	<0.1*	<0.1*	<0.766		0.766	<0.1*	<0.1*
Cadmium	7440-43-9	1780	980	<0.454		0.454	<0.1*	<0.1*	<0.464		0.464	<0.1*	<0.1*	<0.423		0.423	<0.1*	<0.1*
Chromium	7440-47-3	1000000	1800000	17.4		2.51	<0.1	<0.1	17.0		2.56	<0.1	<0.1	19.0		2.33	<0.1	<0.1
Cobalt	7440-48-4	586	350	9.56		0.560	<0.1	<0.1	9.47		0.571	<0.1	<0.1	7.94		0.521	<0.1	<0.1
Copper	7440-50-8	78200	47000	31.2		2.80	<0.1	<0.1	35.0		2.85	<0.1	<0.1	15.9		2.60	<0.1	<0.1
Iron	7439-89-6	1000000	820000	15300	J3 O1 V	43.1	<0.1	<0.1	17200		44.0	<0.1	<0.1	12100		40.1	<0.1	<0.1
Lead	7439-92-1	800	800	7.06		1.12	<0.1	<0.1	7.99		1.14	<0.1	<0.1	3.48		1.04	<0.1	<0.1
Manganese	7439-96-5	46700	26000	720	V	1.38	<0.1	<0.1	916		1.39	<0.1	<0.1	525		1.27	<0.1	<0.1
Mercury	7439-97-6	271	46	0.128		0.0201	<0.1	<0.1	0.140		0.0206	<0.1	<0.1	0.171		0.0187	<0.1	<0.1
Nickel	7440-02-0	39000	22000	29.6		1.35	<0.1	<0.1	28.9		1.37	<0.1	<0.1	19.2		1.25	<0.1	<0.1
Selenium	7782-49-2	9780	5800	<1.13		1.13	<0.1*	<0.1*	<1.15		1.15	<0.1*	<0.1*	<1.05		1.05	<0.1*	<0.1*
Silver	7440-22-4	9780	5800	<0.238		0.238	<0.1*	<0.1*	<0.243		0.243	<0.1*	<0.1*	<0.222		0.222	<0.1*	<0.1*
Thallium	7440-28-0	19.6	12	<0.912		0.912	<0.1*	<0.1*	<0.931		0.931	<0.1*	<0.1*	<0.849		0.849	<0.1*	<0.1*
Vanadium	7440-62-2	9850	5800	25.1		0.901	<0.1	<0.1	24.4		0.919	<0.1	<0.1	21.2		0.838	<0.1	<0.1
Zinc	7440-66-6	587000	350000	57.9		9.12	<0.1	<0.1	59.0		9.31	<0.1	<0.1	35.2		8.49	<0.1	<0.1

Table 3. Blackjack Mine Test Pit Soil Results in Comparison with Generic Screening Levels (continued)

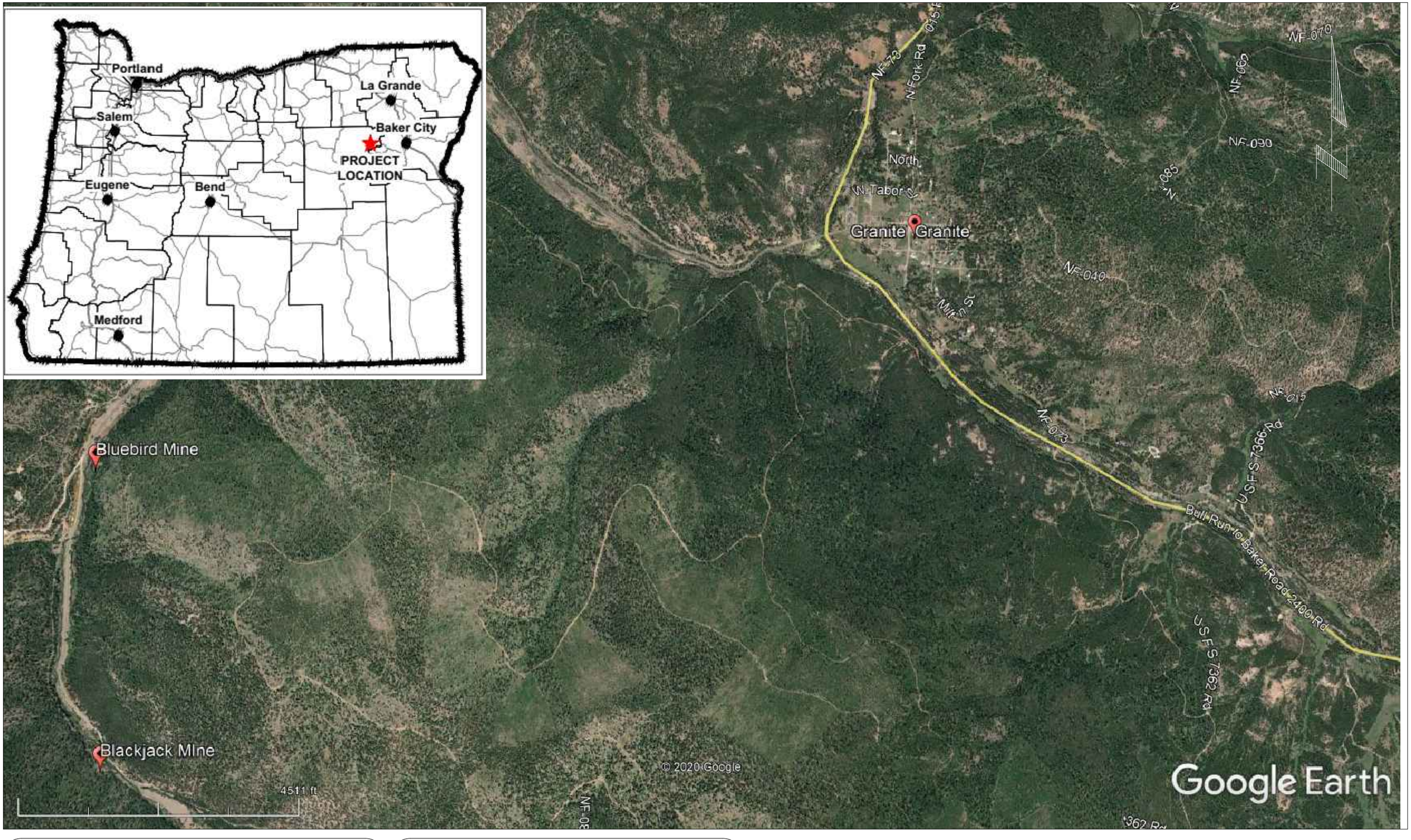
Analyte	CAS No.	Regulatory Screening Levels		BLK-TP2-4					BLK-TP3-2					BLK-TP3-5				
		BLM Recreational RSL[1] (mg/kg)	EPA Industrial RSL[2] (mg/kg)	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF
Aluminum	7429-90-5	1000000	1100000	4180		58.8	<0.1	<0.1	11800		45.4	<0.1	<0.1	8770		42.3	<0.1	<0.1
Antimony	7440-36-0	782	470	<2.48		2.48	<0.1*	<0.1*	<1.91		1.91	<0.1*	<0.1*	<1.78		1.78	<0.1*	<0.1*
Arsenic	7440-38-2	30.6	3	<0.674		0.674	<0.1*	0.22*	6.23		0.521	0.2	**2.1**	4.46		0.485	0.15	**1.5**
Barium	7440-39-3	390000	220000	47.5		2.00	<0.1	<0.1	130		1.54	<0.1	<0.1	94.3		1.44	<0.1	<0.1
Beryllium	7440-41-7	3910	2300	<1.17		1.17	<0.1*	<0.1*	<0.907		0.907	<0.1*	<0.1*	<0.845		0.845	<0.1*	<0.1*
Cadmium	7440-43-9	1780	980	<0.649		0.649	<0.1*	<0.1*	<0.501		0.501	<0.1*	<0.1*	<0.467		0.467	<0.1*	<0.1*
Chromium	7440-47-3	1000000	1800000	<3.58		3.58	<0.1*	<0.1*	19.5		2.76	<0.1	<0.1	12.9		2.57	<0.1	<0.1
Cobalt	7440-48-4	586	350	<0.799		0.799	<0.1*	<0.1*	10.6		0.617	<0.1	<0.1	10.9		0.575	<0.1	<0.1
Copper	7440-50-8	78200	47000	<3.99		3.99	<0.1*	<0.1*	41.8		3.08	<0.1	<0.1	78.3		2.87	<0.1	<0.1
Iron	7439-89-6	1000000	820000	1620		61.5	<0.1	<0.1	16300		47.5	<0.1	<0.1	12400		44.2	<0.1	<0.1
Lead	7439-92-1	800	800	<1.60		1.60	<0.1*	<0.1*	5.95		1.23	<0.1	<0.1	5.41		1.15	<0.1	<0.1
Manganese	7439-96-5	46700	26000	25.7		1.95	<0.1	<0.1	710		1.50	<0.1	<0.1	1060		1.40	<0.1	<0.1
Mercury	7439-97-6	271	46	<0.0288		0.0288	<0.1*	<0.1*	0.0780		0.0222	<0.1	<0.1	0.151		0.0207	<0.1	<0.1
Nickel	7440-02-0	39000	22000	<1.92		1.92	<0.1*	<0.1*	34.3		1.48	<0.1	<0.1	33.6		1.38	<0.1	<0.1
Selenium	7782-49-2	9780	5800	<1.61		1.61	<0.1*	<0.1*	<1.25		1.25	<0.1*	<0.1*	<1.16		1.16	<0.1*	<0.1*
Silver	7440-22-4	9780	5800	<0.340		0.340	<0.1*	<0.1*	<0.263		0.263	<0.1*	<0.1*	<0.245		0.245	<0.1*	<0.1*
Thallium	7440-28-0	19.6	12	<1.30		1.30	<0.1*	0.11*	<1.01		1.01	<0.1*	<0.1*	<0.936		0.936	<0.1*	<0.1*
Vanadium	7440-62-2	9850	5800	2.11	J	1.29	<0.1	<0.1	24.9		0.993	<0.1	<0.1	19.6		0.925	<0.1	<0.1
Zinc	7440-66-6	587000	350000	<13.0		13.0	<0.1*	<0.1*	59.4		10.1	<0.1	<0.1	41.7		9.36	<0.1	<0.1

Table 3. Blackjack Mine Test Pit Soil Results in Comparison with Generic Screening Levels (continued)

Analyte	CAS No.	Regulatory Screening Levels		BLK-TP4-1					BLK-TP4-3				
		BLM Recreational RSL[1] (mg/kg)	EPA Industrial RSL[2] (mg/kg)	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF	Result (mg/kg)	Flag	MDL (mg/kg)	BLM Recreational RSL EF	EPA Industrial RSL EF
Aluminum	7429-90-5	1000000	1100000	5450		48.6	<0.1	<0.1	8040		46.6	<0.1	<0.1
Antimony	7440-36-0	782	470	<2.05		2.05	<0.1*	<0.1*	<1.96		1.96	<0.1*	<0.1*
Arsenic	7440-38-2	30.6	3	7.05		0.558	0.23	**2.4**	2.77		0.535	<0.1	0.92
Barium	7440-39-3	390000	220000	116		1.65	<0.1	<0.1	88.4		1.58	<0.1	<0.1
Beryllium	7440-41-7	3910	2300	<0.972		0.972	<0.1*	<0.1*	<0.932		0.932	<0.1*	<0.1*
Cadmium	7440-43-9	1780	980	0.571	J	0.537	<0.1	<0.1	<0.515		0.515	<0.1*	<0.1*
Chromium	7440-47-3	1000000	1800000	12.0		2.96	<0.1	<0.1	7.30		2.84	<0.1	<0.1
Cobalt	7440-48-4	586	350	78.4		0.661	0.13	0.22	15.5		0.634	<0.1	<0.1
Copper	7440-50-8	78200	47000	134		3.30	<0.1	<0.1	43.4		3.17	<0.1	<0.1
Iron	7439-89-6	1000000	820000	53100		50.9	<0.1	<0.1	25300		48.8	<0.1	<0.1
Lead	7439-92-1	800	800	9.32		1.32	<0.1	<0.1	5.99		1.27	<0.1	<0.1
Manganese	7439-96-5	46700	26000	8020		3.24	0.17	0.31	1610		1.55	<0.1	<0.1
Mercury	7439-97-6	271	46	0.184		0.0238	<0.1	<0.1	0.180		0.0228	<0.1	<0.1
Nickel	7440-02-0	39000	22000	144		1.59	<0.1	<0.1	39.4		1.52	<0.1	<0.1
Selenium	7782-49-2	9780	5800	<1.34		1.34	<0.1*	<0.1*	<1.28		1.28	<0.1*	<0.1*
Silver	7440-22-4	9780	5800	<0.282		0.282	<0.1*	<0.1*	<0.270		0.270	<0.1*	<0.1*
Thallium	7440-28-0	19.6	12	2.11	J	1.08	0.11	0.18	<1.03		1.03	<0.1*	<0.1*
Vanadium	7440-62-2	9850	5800	15.8		1.06	<0.1	<0.1	12.5		1.02	<0.1	<0.1
Zinc	7440-66-6	587000	350000	307		10.8	<0.1	<0.1	118		10.3	<0.1	<0.1

[1] BLM Recreational Exposure Scenario from Cox (2017)
[2] USEPA Regional Screening Levels for Industrial Soil (USEPA, 2020)
Values in **red** indicate EF > 1
* Analyte not present above MDL; value calculated from MDL
BLM – Bureau of Land Management
CAS – Chemical Abstracts Service
EF – Exceedance Factor
EPA – United States Environmental Protection Agency
J – The identification of the analyte is acceptable; the reported value is an estimate.
J3 – The associated batch QC was outside the established quality control range for precision
J6 – The sample matrix interfered with the ability to make any accurate determination; spike value is low
MDL – Laboratory Method Detection Limit
mg/kg – Milligrams per kilogram
O1 – The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V – The sample concentration is too high to evaluate accurate spike recoveries

FIGURES



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No. 3			

		DATE
DESIGN:	B. LAMBETH	8/12/2020
DRAWN:	O.SALMON	8/12/2020
CHECKED:	-	-

PROJECT NAME
BLUEBIRD/BLACKJACK MINES

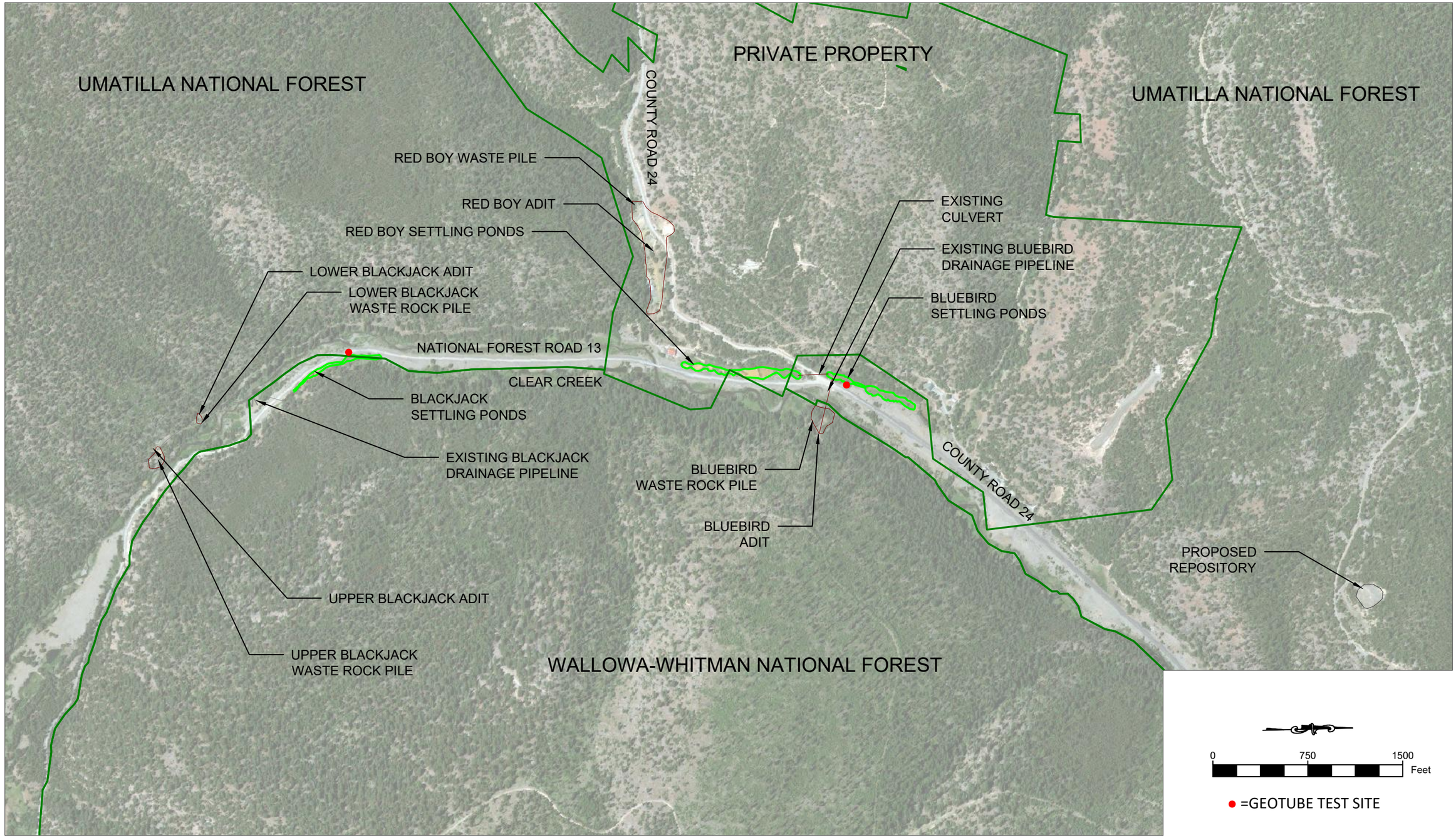
SECTION
SITE LOCATION MAP

REVISION DATE
11/6/2020

DRAFT

DRAWING NO.
FIG 1

SHEET
1 OF **6**



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No. 3			

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DRAWN:	A. BARENDT	11/15/2019 DATE
CHECKED:	P. HUNTER	11/15/2019 DATE

PROJECT NAME
BLUEBIRD/BLACKJACK DATA GAP REPORT

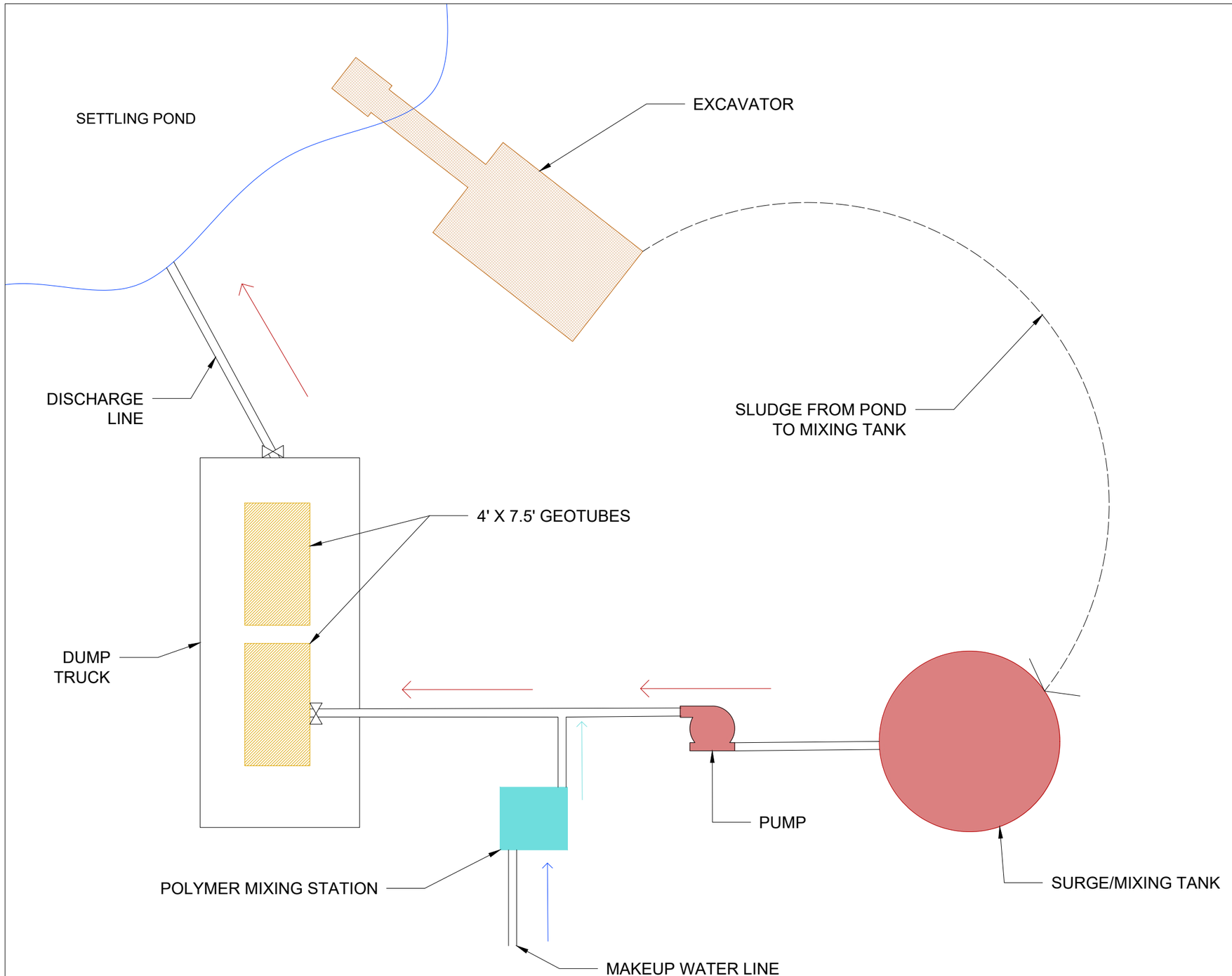
TITLE
SITE LAYOUT

REVISION DATE
11/6/2020

DRAFT

DRAWING NO.
FIG 2

SHEET **2** OF **6**



PUMPING OPERATIONS AND POLYMER MIXING AT BLUEBIRD SETTLING POND

GEOTUBE IN DUMP TRUCK AT BLUEBIRD SETTLING PONDS DURING PUMPING OPERATIONS

REVISIONS:

		DATE	INITIALS
No. 1			
No. 2			
No. 3			

DESIGN: B. LAMBETH 11/6/2020 DATE

DRAWN: O. SALMON 11/6/2020 DATE

CHECKED: - - DATE

PROJECT NAME
BLUEBIRD/BLACKJACK DATA GAP REPORT

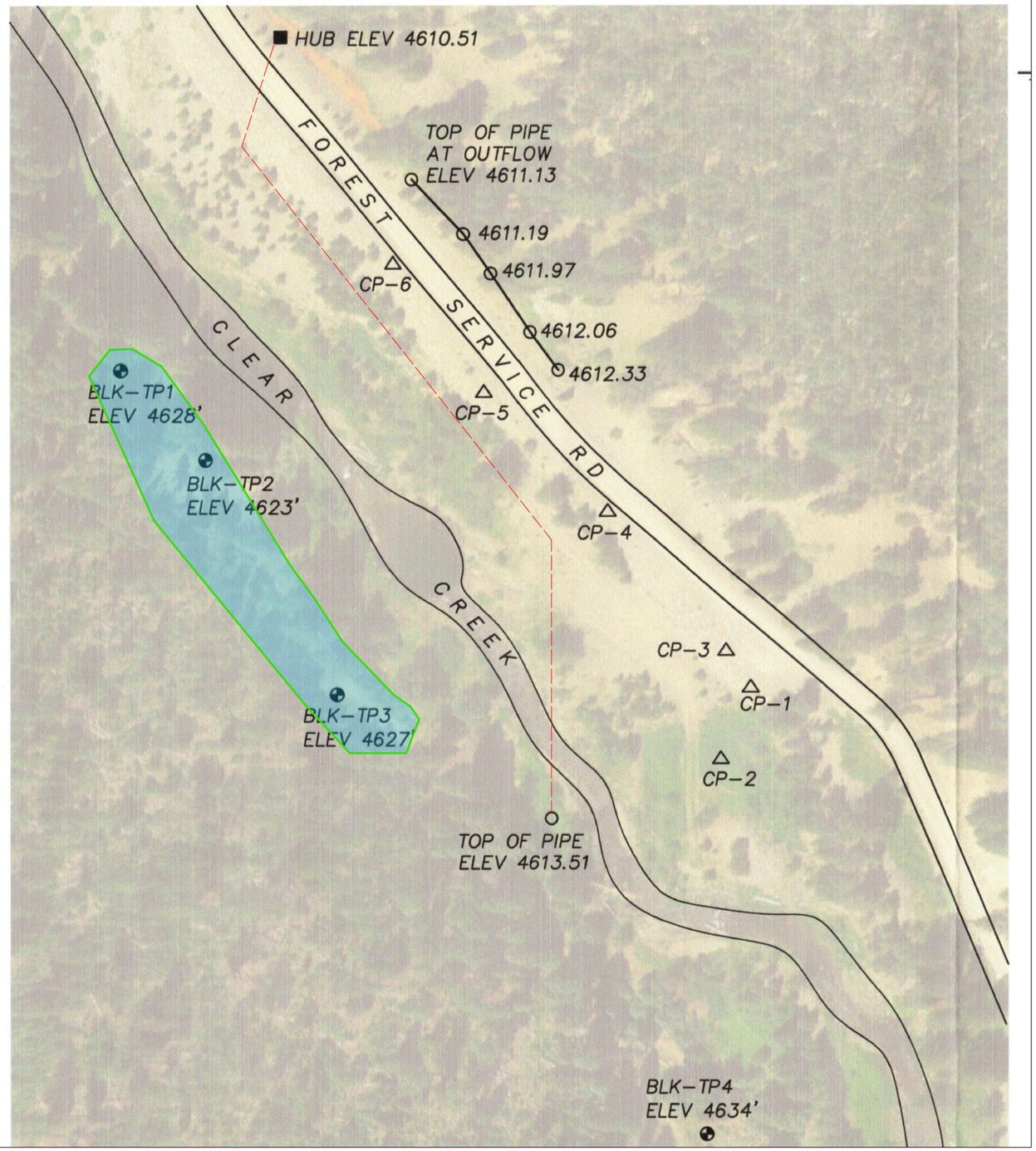
SECTION
GEOTUBE PUMPING SCHEMATIC

REVISION DATE
11/6/2020

DRAFT

DRAWING NO.
FIG 3

SHEET
3 OF **6**



LEGEND

○	SPOT ELEVATIONS ON TOP OF PIPE
⊕	TEST PITS
△	CONTROL POINT
■	HUB SET AT LOCATION OF PROPOSED OUTFLOW
- - - - - - - - - -	APPX. PROPOSED NEW PIPELINE ROUTE
▭	APPX. PROPOSED NEW WETLAND TREATMENT POND

Point No.	Northing	Easting	Elevation	Description
2	19944.65	29977.06	4617.52	Cotton Spindle
3	20028.64	29981.27	4621.78	Cotton Spindle
4	20136.80	29888.82	4620.21	Cotton Spindle
5	20229.57	29792.42	4620.61	Cotton Spindle
6	20329.35	29722.60	4620.25	1 1/2" Aluminum Cap
105	20395.43	29737.46	4611.13	Top of pipe at Outflow
107	19899.06	29845.58	4613.51	Top of Pipe on West side of Creek
116	20505.84	29635.53	4610.51	Hub at proposed Outflow

TEST PIT	NORTHING	EASTING	ELEVATION
BLK-TP1	20247.15	29511.33	4628
BLK-TP2	20177.49	29576.48	4623
BLK-TP3	19995.18	29678.36	4627
BLK-TP4	19653.53	29966.08	4634

NOTE: Fieldwork for this exhibit was performed June 20, 2020 and represent field conditions found at that time only. Elevation are based on an assumed datum,. Basis of bearings are based on Geodetic North taken at CP-1.

0 100 200 Feet

DESIGN: _____ DATE

DRAWN: _____ DATE

CHECKED: - _____ - DATE

PROJECT NAME
BLUEBIRD/BLACKJACK DATA GAP REPORT

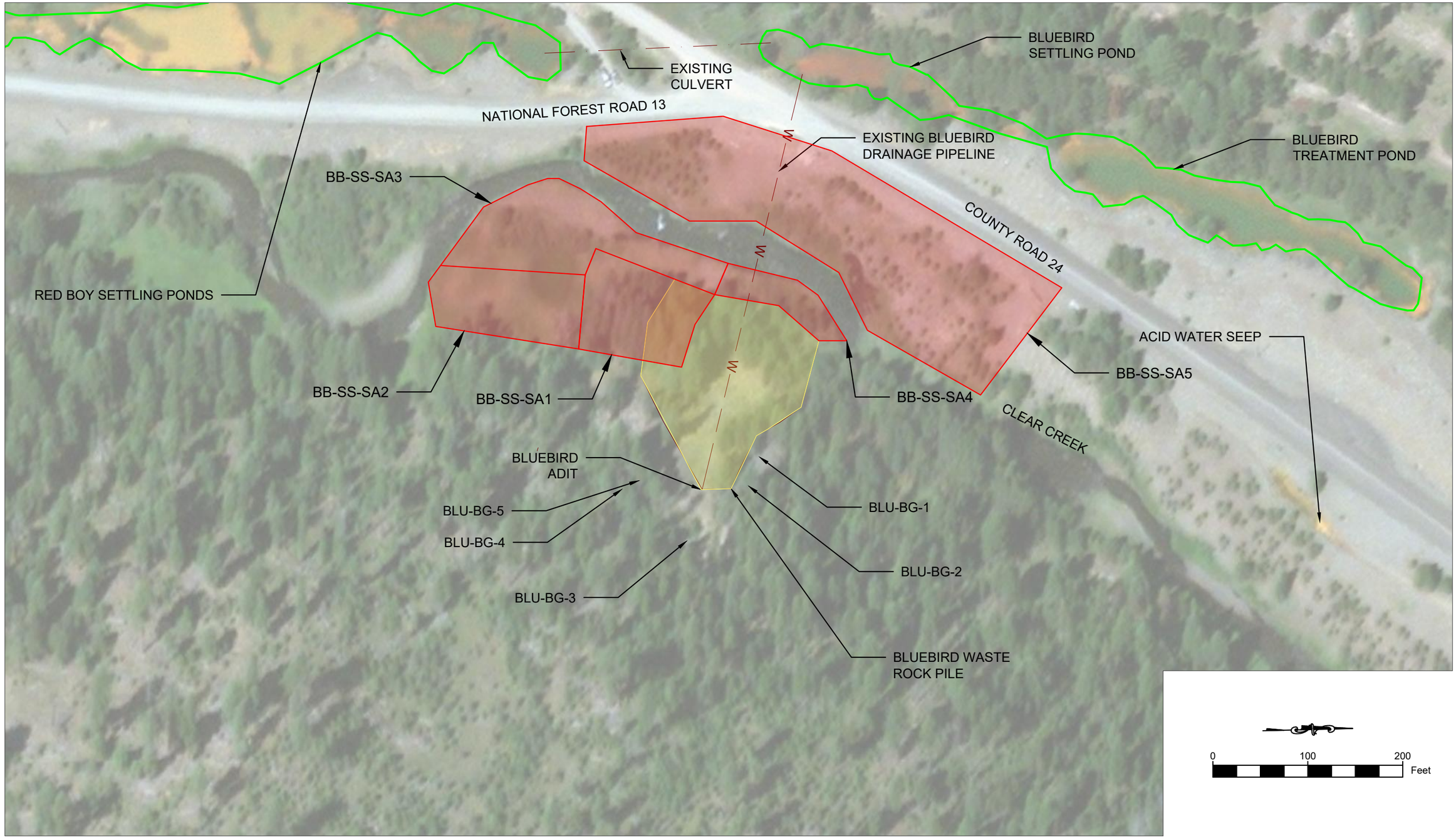
SECTION
BLACKJACK MINE TEST PITS AND LOWER PIPELINE SURVEY LOCATIONS

REVISION DATE
11/6/2020

DRAFT

DRAWING NO.
FIG 4

SHEET **4** OF **6**



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No. 2		DATE	INITIALS
No. 3		DATE	INITIALS

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DRAWN:	O. SALMON	10/6/2020 DATE
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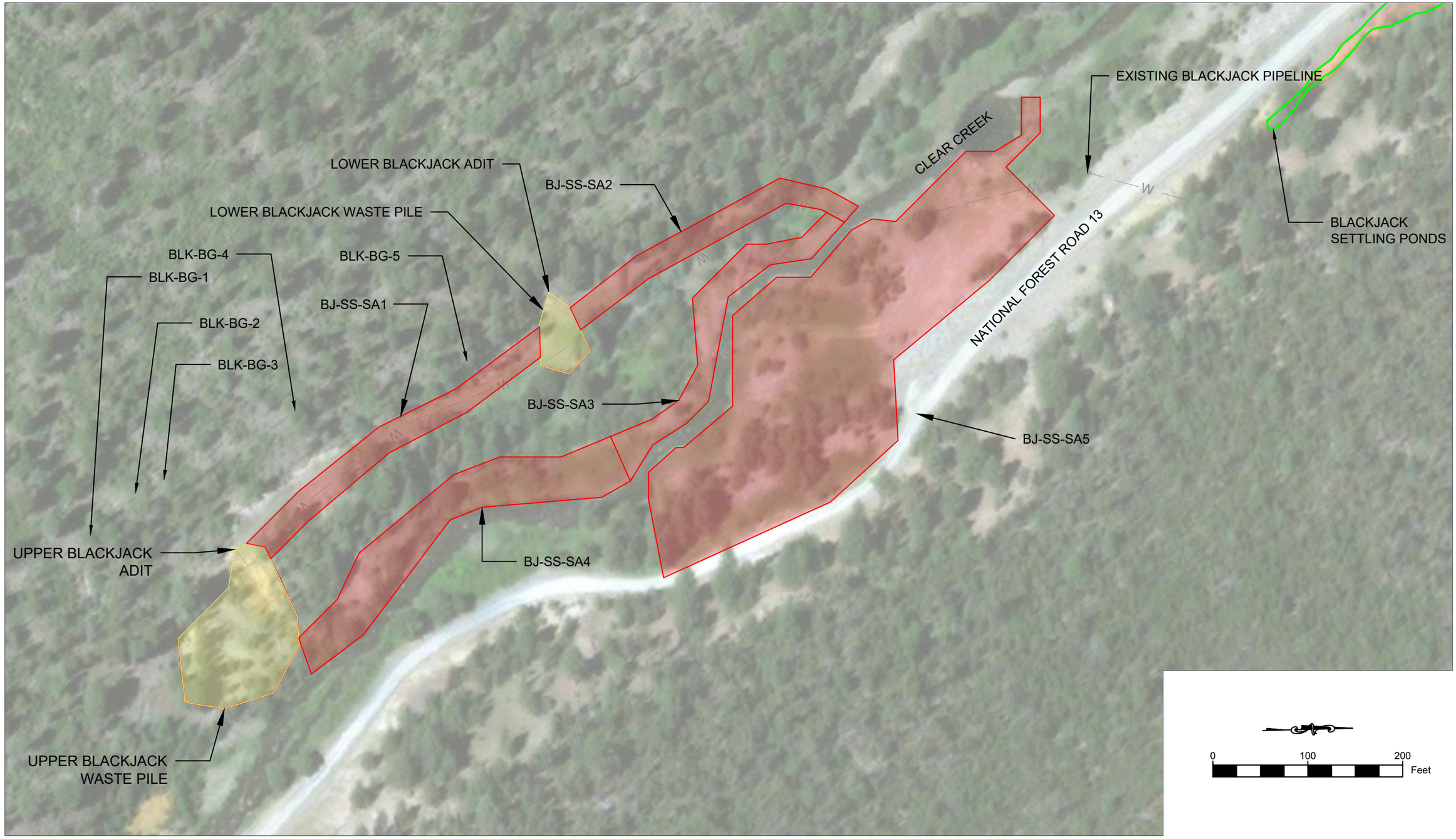
PROJECT NAME
BLUEBIRD/BLACKJACK DATA GAP REPORT

TITLE
BLUEBIRD ADDITIONAL SOIL SAMPLE LOCATIONS

REVISION DATE
11/6/2020
FINAL

DRAWING NO.
FIG 5

SHEET
5 OF **6**



REVISIONS:

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No. 2			
No. 3			

DESIGN:	P. HUNTER	11/15/2019 DATE
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CHECKED:		- DATE

PROJECT NAME
BLUEBIRD/BLACKJACK DATA GAP REPORT

TITLE
BLACKJACK ADDITIONAL SOIL SAMPLE LOCATIONS

REVISION DATE
11/6/2020

DRAFT

DRAWING NO.
FIG 6

SHEET
6 OF **6**

PHOTOGRAPHS

Photo 1. Setting up at Bluebird Pond

Photo 2. Setting up at Bluebird Pond

Photo 3. Operating at Bluebird Pond

Photo 4. Return drain line at Bluebird Pond

Photo 5. Testing flocculation

Photo 6. Mix tank

Photo 7. Operational at Bluebird Pond

Photo 8. Active Geotube filtering

Photo 9. Geotube filtering at high pressure

Photo 10. Bluebird Pond site reclaimed

Photo 11. Operating at Blackjack Pond

Photo 12. Active filtering at Blackjack Pond

Photo 13. Successful paint filter test (No water!)

Photo 14. Successful paint filter test (No water!)

Photo 15. Successful paint filter test (No water!)

Photo 17. Dewatered and densified sludge

Photo 16. Alternative wetland location

Photo 18. Infiltration test, BLK-TP2

Photo 19. Infiltration test, BLK-TP2

Photo 20. Natural water in BLK-TP4

Photo 21. Pit exposing pipeline

ATTACHMENT 1

Field Notes

6/16/20 BB/BJ

8:30 am arrive @ Bluebird
~ 3" solids in GT

Started pumping @ higher rate because polymer flow could be adjusted to 40% ~~flow~~

Bag @ capacity w/in 2 min, had to turn flow down @ 9/5

Polymer application inconsistent due to separation of sludge/water in stock tank. Greg recommends roll-off w/ mixers for full scale to keep solids % consistent in intake to ensure correct polymer addition

and very clear filtrate →

9:30 Gridded out BB-SS-SA5 w/ pin flags
The area is a dredge pile - coarse rocks

collected BB-SS-SA5 while geotubes finished filling.

Demob @ BB ~ 1 pm moved to BJ.
Decided to pump directly from pond, creating "sump" w/ excavator for mixing water.

chose area w/ less vegetation which seemed to be biggest problem @ BB

~~BB~~ 5:11 ~~started~~ stood on bucket in sludge for intake.

although less vegetation visible, intake filter clogged / bag filled after ~ 5-10 min.

2:30 soil sampling @ BJ SA-5

data longest

3:45 best run w/ GT
but needing to manually clean out intake the whole time

4:45 wait to drain
demob 5:30

6/17

Left start - Bob to Ontario for doctor appt @ ~ 9:45
I took geotube equip in Bob's truck to site
arrived ~ 10:30 am.

Bag was still water logged
Ran two runs to L
full w/ water @ 5 and polymer @ 40%

left to rest ~ 30 min in between runs.

After second run, took excavator across creek @ BJ and sampled either

↓ BJ-SS-SA1

side of road down started ~ 1:15 pm, end 2:35. ~~20~~ 24 samples between upper + lower adits

3:15 flagged BJ-SS-SA2 which is road from lower adit to creek, 2 samples either side of road, down ~~23~~ 13 samples total

Bob back ~ 2:30. He flagged 3 infiltration pit sites.

Bill needed location for pipeline to expose spot before it crosses creek. Called friend who had it available for tomorrow.

4pm One more round of pumping in GT. Demob and left site @ 5 pm

6

* Bob @ Doctor in Ontario

6/18

DLS @ site @ 8:30. Located pipeline from cleanouts across creek → creek crossing. Lost signal prior to lower adit.

I flagged BJ-SS-SA3 along creek while Justus crew excavated top of pipeline on mine side of creek.

9:45 start sampling BJ-SS-SA3. 15 subsamples from creek crossing/road to site along creek paralleled to lower adit.

Justus chainsawed out logs on the way to infiltration test pits.

Dug out furthest pit before lunch @ 12 pm

7

Then test pits closer to creek crossing after lunch.

1 sampled BJ-SS-SA4 after test pits - 12 samples between lower adit and stained upper adit outfall @ creek along the creek. Finished @ 2 pm Then crossed creek to wait for Bobs.

Called Bob @ 1:55 and then @ 2:45. Decided to call it a day only since he wouldn't make it up til close to 4.

Meeting held @ Sampler w/ Bob & and Justus @ 3:45 pm to plan next two days

6/19

@ site @ 11 am. Sampled duplicate BJ-SS-SAS-DUP. Included two subcomposites by "hot tubs" Also grabbed those subcomposites to add to original BJ-SS-SAS. 22 ~~###~~ plugs total.

Then GPS'ed stream crossing for pipeline and bounds of BT-SS-SAS sampling area.

sampled BB-SS-SAS-DUP from 12 - 12:45

3Bb and Parker → Creek @ 1:45 for infiltration tests

Bill and Olivia → Bluebird for inspection and HH soil samples across creek.

Creek crossing w/ chest waders on. Unlocked but gate and observed area behind dam completely full of sludge w/ ~ 4" freeboard. Thin river of water on top of sludge traveling to upper elbow (open) *on other side of dam and then to the pipeline. Bill closed ball valve and sludge/water rose to w/in 2" of top of dam w/in 2 min.

→ *top of elbow is under water/sludge.

Bill excercised valve several times. Pipe from plug had hole chewed through PVC coupler by packrats (presumed). Hole > 6 in Ø, located on portion of pipe between insulated box and Y with other pipeline. Inside the box, pressure valve had water flowing out the face of gauge.

and then trickling out corner of box. Bill closed valve immediately behind gauge- primary valve inside box was closed. Note: no flow. Thru pipe where already packrat hole was observed.

Oxygen was low @ concrete dam location Bill feeling it about 10 min after arrival, me about 12 min after arrival. Took break outside in between inspecting activities described above.

Bill opened

Cleanout immediately below adit. Flow was high thru pipeline w/ about 1-2" sludge accumulated on each side of pipeline.

Bill inspected cleanouts

@ road while I sampled BB-SS-SA1 - BB-SS-SA4.

17 subcomposites @ BB-SS-SA4
17 " " BB-S-SA3
13 " @ BB-SS-SA2
12 " @ BB-SS-SA1

Bounds D BB-SS-SA2 and BB-SS-SA1 not as high up the slope as proposed due to low probability of human exposure on steep, prickly vegetated slopes.

Finished soil sampling @ 5:30 and joined Bob + Parker @ BJ. They were finishing infiltration test @ lower adit pit. Bob and I collected metals and geotech samples there while Bill and Parker backfilled other 3 infiltration pits.

BJH

Carried everything back over creek & and de-waded ~ 7 pm.

6/20

9pke to Susan Griffin and Paul on 6/19 and conveyed the infeasibility of sieving HH soil samples to ~~[illegible]~~ <250 µm w/ out oven or shaker. After drying BB-SS-SA5 in thin layer on plastic in hotel room for 3 days, not completely dry. Took 7 hrs to sieve ~ 1/4 of 2 oz jar.

Paul gave go-ahead to pay $40/sample to Lab in Kellog that BJB knows to dry and sieve to < 250 µm. Sieved portion will then be mailed to Pace for TAL analysis.

* Soils were transfered from plastic sheets to zip lock bags (& labelled) for BJB to deliver to Kellog Lab.

Left Pace cooler w/ BJB for TCLP analysis if needed. I took 8 TAL metals samples from test pits in carry on bag.

Left Sumpter @ 8:30 am.

* Note: BB-SS-SA5 was re-homogenized w/ total/all size fractions for consistency. i.e. I recombined the portion I had sieved w/ coarse fraction into ziplocks left w/ BJB.

Total volume for most samples = 2 ziplock bags
~~BB-SS~~ BJ-SS-SA5-DUP was 3 bags.

5-28-19 (Th)

On site w/ O.C. @ 9:00 AM!

Off look @ Blackjack!

- Outfall <1 gpm.
- Cleanout A: Cap removed; rock in bottom; no bolts. Rock would have stopped cleaning both ways
- Cleanout B: Cap removed; no bolts; no rocks

Took photos

- Cleanout C: Fully sealed! Has ~2 gpm flow!
- RT lower adit not holding water
- LT lower adit running; ~3' water. Can hear flow, not plugged?
- Upper Adit Cleanouts: No water discharge. Plugged also. No water coming out. Pipe is plugged to dam. 1.5' water in adit.
- Robbed bolts to cover A&B caps!

Action plan

Get pressure element, water supply pump, gas! Return Tomorrow. Get later. For Saturday:

1) Work on removing rocks from element

2) Move gear motor unit, if there is time!

At hotel Bill reserved a pressure pump & reserved labor for Sunday

Note: Dam is 4' high! Need To open pipe & dam To lower level To 3-3.5' To work within dam. Need Two step ladders.

Clean external pipe first so things from upper pipe won't clog things!

~~30~~ 29
Aug 29, 2020 (Fri)

AT hotel waiting for Bill! He arrived @ 10:30 AM.

~~[illegible]~~ Paul Left message for Michael about opening road. Talked to Paul re: road. He is concerned about road env. liability. Justified!. Need permission, SWPPP, BMPs!

• Completed Timesheet & expenses!

~~[illegible]~~ for B.J. Michael Wilcox called @ 2:00 on road.

1) Permission To open road granted.
2) Use good BMPs + photo document.
3) Idea is To build a usable maintenance road.
4) Get before & after photos of Clear Creek (for Fe)!
5) USFS empl. will maybe be out Monday To view upper A&T plugging
6) Don't forget camera!

Arr. B.J. @

Bill had already started on road. Stopped him To discuss BMPs

- Get before + after shots,
- Construct an [illegible] grade, a [illegible]
- [illegible]

Note:

- OUTfall flow increased!
- Rock no longer [illegible].
- May have moved it when cleaning inlet!
- Pumped water though, but no [illegible] discharge!!

New schedule:

1) Finish road [illegible] + report upper [illegible]
2) Get power stuff To Upper Adit.
3) Design sweep w/ XTra cleanout To order Monday
4) Bill Takes Monday off!
5) "Super Flush" rock out(?)!
6) Order camera if needed!
7) Get USFS inspection of Tuesday AM.
8) Clean upper pipe Tuesday

No. 302

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www.RiteintheRain.com

"Rite in the Rain"
ALL-WEATHER WRITING PAPER

9) Add a new character on next trip!

No. 302

Aug 30 ~~2020~~ (Sat)

~~[illegible] 2" pump~~

Opened remainder of Upper Adit road. ~~[illegible]~~

Moved 2" pump to adit

Found [illegible] of 2500 psi hose inside adit.

Noted plugged cleanouts. SMAT appears to only be rodding, or using a small pump. No flow at outfall, no flow at adit cleanouts ∴ Plugged between dam & cleanouts No flow @ inlet.

6

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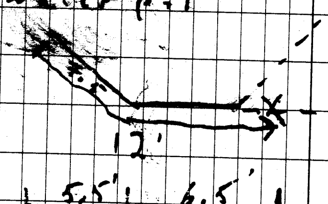
Aug 31, 2020 (Sun)

- Drained additional
- Reached lower pipe w/ hose!
- Flow improved
- Overflow stopped
- Water down to pipe-Top!
- Drainage working but marginal
- No overflow from lower elevations

June 1, 2020 (Mon)

- Took hi-press. cleaner to adit
- Worked lower pipes till clear. Some blockage from caving wall cake
- Worked adit pipe! Work 10' & flush em by removing cap.
- Very good flow. ½" air gap at inlet.
- Removed all gear
- Left hose outside. We will take inside next trip!
- "Pressure" at A & B! Rock blocks.
- Tried to excavate pipe to remove section. 2" pump couldn't do water pit



- Block may be in concrete cover of cleanouts!

- Will return w/ 4" pump on Tues.

- Cleanout discharge dropping!
  E.I. 40% @ cleanout & 60% at
  outfall!

- USFS arrived @ 2:00PM

June 2, 2020 Tues

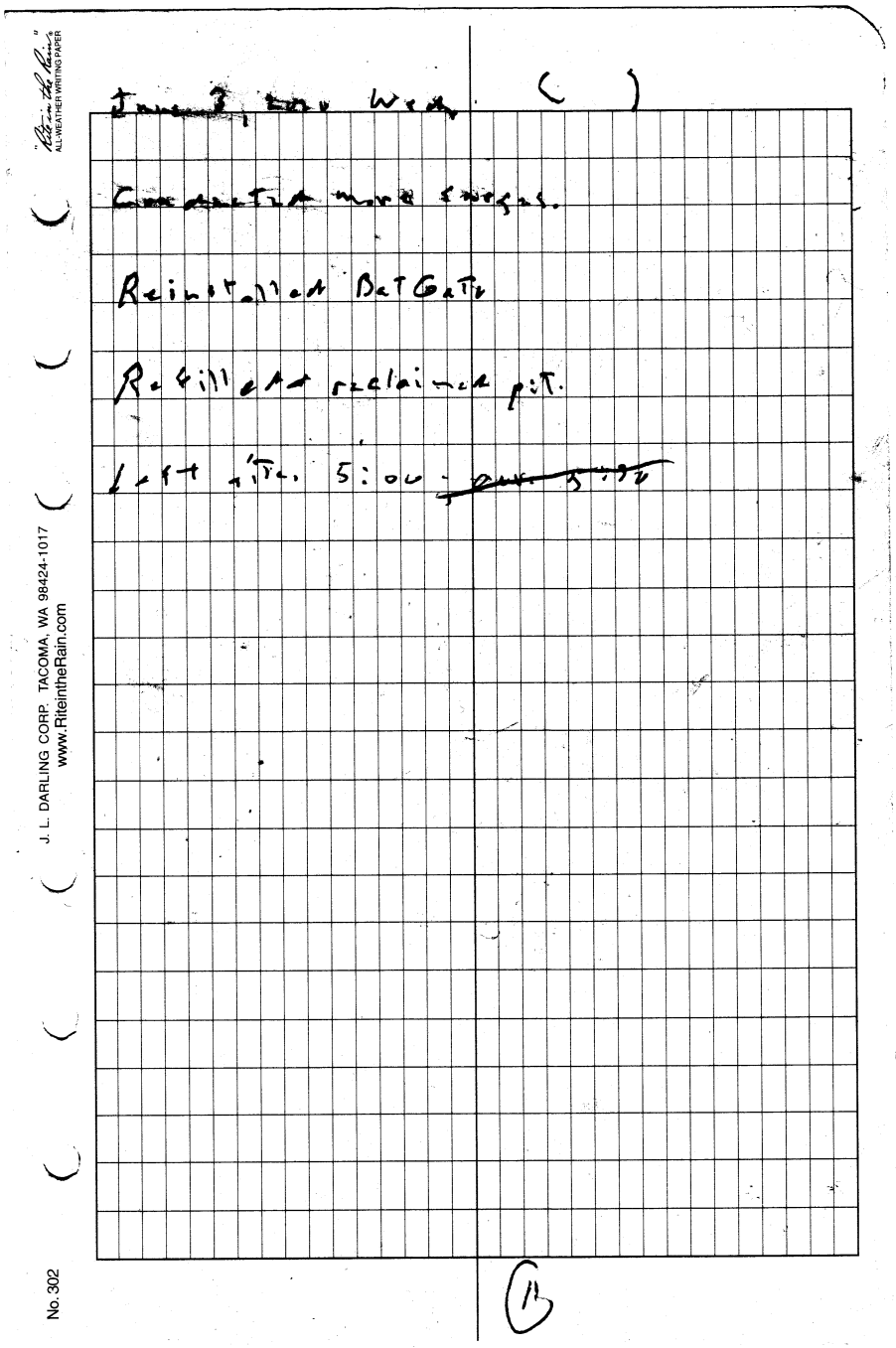
Returned w/4" pump

Dewatered pit, excavated & exposed pipe.

~~Decided To Try To~~ Ran pressure washer in pipe, did not get blocked. Is it going under a large rock or is it flooded? Decided To try flushing.

Went To Upper Aid. Capped intake to build head & opened. Repeated several Times. Used radios To comm w/Chris @ outfall. Small rocks came out. High surge flow.

Another discharges from cleanout 3. Slowly subsides. May be a result of slow flow due To flat pipe.



June 4, 1981 Thu

Bought 4 common-key padlocks in Baker. Returned to site & installed. Broke home.

June 13, 2020 Sat (8½ hrs)
Packed car 2 PM. Left for Sampler
at 5:00 PM. Arr. 12:30 AM

June 14, 2020 Sun (6 hrs)

Met Bill @ 9:00 AM at Market. Arr. BB @ [illegible]. Laid out BB layout

- Widened shoulder along pond
- Limbed Trees
- Constructed pad near outlet
- Constructed small pad near outfall
- Returned To Sumter @ 4:00

Olivia arr. @ 5:00 PM

TY

June 15, ~~[illegible]~~ (Mon) (8½)

- Bill arr. with load @ 9:00 AM
- Gregg Lebrier arr. @ 9:30 AM
- Toured site until everything was ready @ 12:00 PM
- Set up Tab & pump & went to work
  - Unable to pump fast, couldn't increase PAC feed
  - Weeds constantly plugged intake
  - Trough mix Tank ripped open
- Bag ~ ¼ full
- Left @ 6:00, Taking everything home!
- Arr Sumpter @ 9:00

June 16, 20[illegible] (Tue) (9½ hrs.)

- Depart Sumpter @ 8:30
- Hit [illegible] heavy sludge in Tank
- Tube full at 12:30!
- Reaming well.
- Sludge to Top at port,
- AT BJ @ 1:00 PM

Using different approach - No Tub. We set up supply water in a pit in up-stream sludge. Worked well.

Set large bucket in open sludge area (no veg.) & sucked up sludge for direct Tube disposal.

- By 3:00 Tube was ⅓ full.
- By 4:40 - couple of good runs, nearing full!

- Olivia completed BB west env. samples & BJ east
- Arr. Sumpter @ 6:00

(16)

June 17, [illegible] (Wed) (4½ hrs)

- Contacted [illegible]
- [illegible] site @ ~10:00
- Drove To Ontario, returned @ 1215
- Drove To site @ 1245
- Crew lined up to complete more sludge pumping in AM;
- Olivia complete BJ west end sample
- Located & flagged pits.
- Will bring [illegible] tomorrow.
  Did not want to search the trench in Clear Cr. bottom.
- Did not find pumps
- Departed for Sumpter @ 5:30; arr. at 6:00

June 18 2020 (Thu) (2 hrs)

To Ontario for shots

- Budgeting in PM
  BB shop in morning

June 19: 2020 (Fri) (10 hrs)

BL-TP 3 = filled w/ 1-ton, shop off, blew to 5" ST. = 1:52 PM.
Clayey-silty crs. gr., 40%
3"-10" in rounded boulders + cobbles. Very slow perc!
8'x5' hole matted. 5' deep avg. End = 2:36 PM Δ = 40 min.
Drop = 6.25"

BLK-TP2: All white-gray ash (?)
4' deep. Start @ 3:07 PM,
2' clayey coarse gravel on top!
End @ 4:10 Drop = 2.0"
Δ = 1:02 hrs.

BLK-TP1: Start @
silty, sandy coarse rounded gravel & cobble. ST. 6%, fines 0" ponding; possible inj. site!

(10)

BLK - TP 4

Start @ 5:48. All mine waste.
5' deep. ~1 ft standing water
Stop @ 6:35 ET = 47 min.
Drop = 3"

Arr. Sumpter @ 8:04

June 21, 2020; (Sat) - (hrs)

Met Hsu @ 8:30 AM. Showed him out fall survey marks, Tower pits
discussed products:
1) 11 x 17 map
2) Connect to earlier surveys - Bob
To make contacts. Get OR Lidar
+ USFS drone info to Hsu.

Returned to Sumpter @ Noon. Updated
Paul + Michael.
Re: Blackbird - Send pics + vids to
M + P. Talked about rat holes/storage
Tipping in pit. M wants quick
cleanup. I can't do this FOJ week
Provide M + K w/ options on
Mon for discussion and decision.

Talked To BC, Land Fill. No new TCLP needed. E-mail proof. Send [illegible] Filter Test To.

Sampler intermittent in rain. AV power To sampler lost @ 3:30 PM returned To night.

ATTACHMENT 2

Landfill Receipt

Baker Sanitary Service, Inc.

3048 Campbell St

Baker City, OR 97814

541-523-2626

6/23/2020 3:25:18 PM 56778

License #: YCTC873

Check Number: 3088

ITEMS	AMOUNT
Garbage In: 24340, Out: 21940, Net: 2400	68.40

Payment Type: Check

Total Amount Due: $68.40

Amount Tendered: $68.40

Change: $0.00

ATTACHMENT 3

WaterSolve, Inc. Density Reports

Total Solids Determination - Percent Dry Weight

Customer Name/Application BLACKJACK/BLUEBIRD

Date 7/23/20 Technician DCW Oven Temperature 105°C

Sample ID BLACKJACK Dish Number 5 Dilution 0

Dish (dry) = 0.553 g Dish, Sample (wet) = 31.374 g Dish, Sample (dry) = 7.306 g

Dish, sample (wet) – Dish (dry) = 30.821 (A) Dish, sample (dry) – Dish (dry) = 6.753 **(B)**

Total Solids B ÷ A x 100 = 21.9 % Dry Weight Solids

Sample ID BLUEBIRD Dish Number 6 Dilution 0

Dish (dry) = 0.561 g Dish, Sample (wet) = 44.525 g Dish, Sample (dry) = 11.431 g

Dish, sample (wet) – Dish (dry) = 43.964 (A) Dish, sample (dry) – Dish (dry) = 10.870 **(B)**

Total Solids B ÷ A x 100 = 24.7 % Dry Weight Solids

Sample ID _____ Dish Number _____ Dilution _____

Dish (dry) = _____ g Dish, Sample (wet) = _____ g Dish, Sample (dry) = _____ g

Dish, sample (wet) – Dish (dry) = _____ (A) Dish, sample (dry) – Dish (dry) = _____ **(B)**

Total Solids B ÷ A x 100 = _____ % Dry Weight Solids

Sample ID _____ Dish Number _____ Dilution _____

Dish (dry) = _____ g Dish, Sample (wet) = _____ g Dish, Sample (dry) = _____ g

Dish, sample (wet) – Dish (dry) = _____ (A) Dish, sample (dry) – Dish (dry) = _____ **(B)**

Total Solids B ÷ A x 100 = _____ % Dry Weight Solids

Sample ID _____ Dish Number _____ Dilution _____

Dish (dry) = _____ g Dish, Sample (wet) = _____ g Dish, Sample (dry) = _____ g

Dish, sample (wet) – Dish (dry) = _____ (A) Dish, sample (dry) – Dish (dry) = _____ **(B)**

Total Solids B ÷ A x 100 = _____ % Dry Weight Solids

ATTACHMENT 4

Strata Geotech Analyses

1	9/8/2020	BLACKJACK INFILTRATION	
SHEET NO.	DATE	PROJECT	FILE NO.

A. Use Spokane 200 Method from Spokane Regional Stormwater Manual to ESTIMATE Hydraulic Conductivity OF SITE SOILS.

B. Given: Samples Provided from Test Pits TP-1 to TP-4

C. LAB Results:

Sample Location	Depth, feet	% Fines (F)
TP-1	0.5 - 5.0	9.1%
TP-2	0.5 - 5.0	57%
TP-3	0.5 - 5.0	9.5%
TP-4	0.5 - 5.0	11.0%

D. Calculations

1. Calculate hydraulic Conductivity (k) using

$K = 0.6392\, F^{-1.8796}$ where F = % fines

$K_{TP-1} = 0.6392(9.1)^{-1.8796} \sim 0.01$ cm/sec ✓

$K_{TP-2} = 0.6392(57)^{-1.8796} \sim 0.00032$ cm/sec ✓

$K_{TP-3} = 0.6392(9.5)^{-1.8796} \sim 0.009$ cm/sec ✓

$K_{TP-4} = 0.6392(11)^{-1.8796} \sim 0.007$ cm/sec ✓

REVISIONS BY ____ DATE ____

BY SDA DATE 9/8/2020 FILE SP201024

CHECKED BY ____

STRATA
A PROFESSIONAL SERVICES CORPORATION
Integrity From the Ground Up

2	9/8/2022	Blackjack Infiltration	
SHEET NO.	DATE	PROJECT	FILE NO.

D 2. Now calculate the NORMALIZED outflow rate from a test PIT using $q_{ND} = 0.9242 K^{0.9646}$

where K = estimated hydraulic Conductivity

$(q_{ND})_{TP-1} = 0.9242 (0.01 \text{ cm/sec})^{0.9646} \sim 0.01$ cfs/ft head.

$(q_{ND})_{TP-2} = 0.9242 (0.0003 \text{ cm/sec})^{0.9646} \sim 0.0004$ cfs/ft head

$(q_{ND})_{TP-3} = 0.9242 (0.009)^{0.9646} \sim 0.01$ cfs/head

$(q_{ND})_{TP-4} = 0.9242 (0.007)^{0.9646} \sim 0.008$ cfs/head

E. Above q_{ND} values should be multiplied by estimated water depth (head) in infiltration pond

REVISIONS BY DATE

FILE SP2D1024

BY SDA DATE 9/8/2022

CHECKED BY

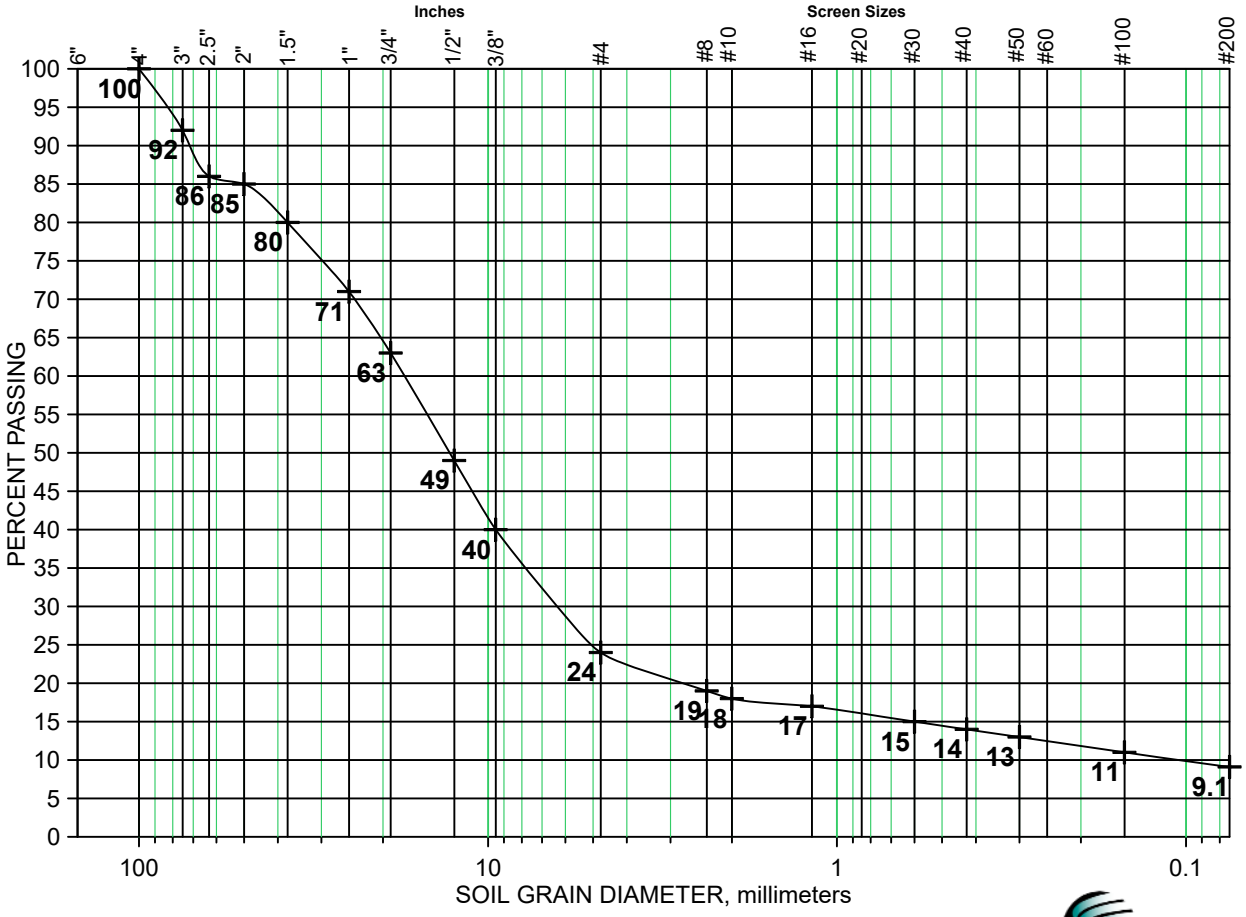
STRATA
A PROFESSIONAL SERVICES CORPORATION
Integrity From the Ground Up

GRADATION ANALYSIS

ASTM D6913

Project: Blackjack Infilitration Test Pits - Laboratory Testing
Client: Applied Intellect
File: SP20102A
Sample No.: SP2000316
Sample Location: Test Pit TP-1 from 6.0-inches to 5.0-feet BGS
Description: Poorly Graded GRAVEL with Silt, Sand, and Cobbles (GP-GM)
Date Received: July 20, 2020
(Client Provided Sample and Location)
Date Tested: July 25, 2020 By: P. Cameron

Cobbles	Gravel		Sand		
	Coarse	Fine	Coarse	Medium	Fine



Reviewed by:_____

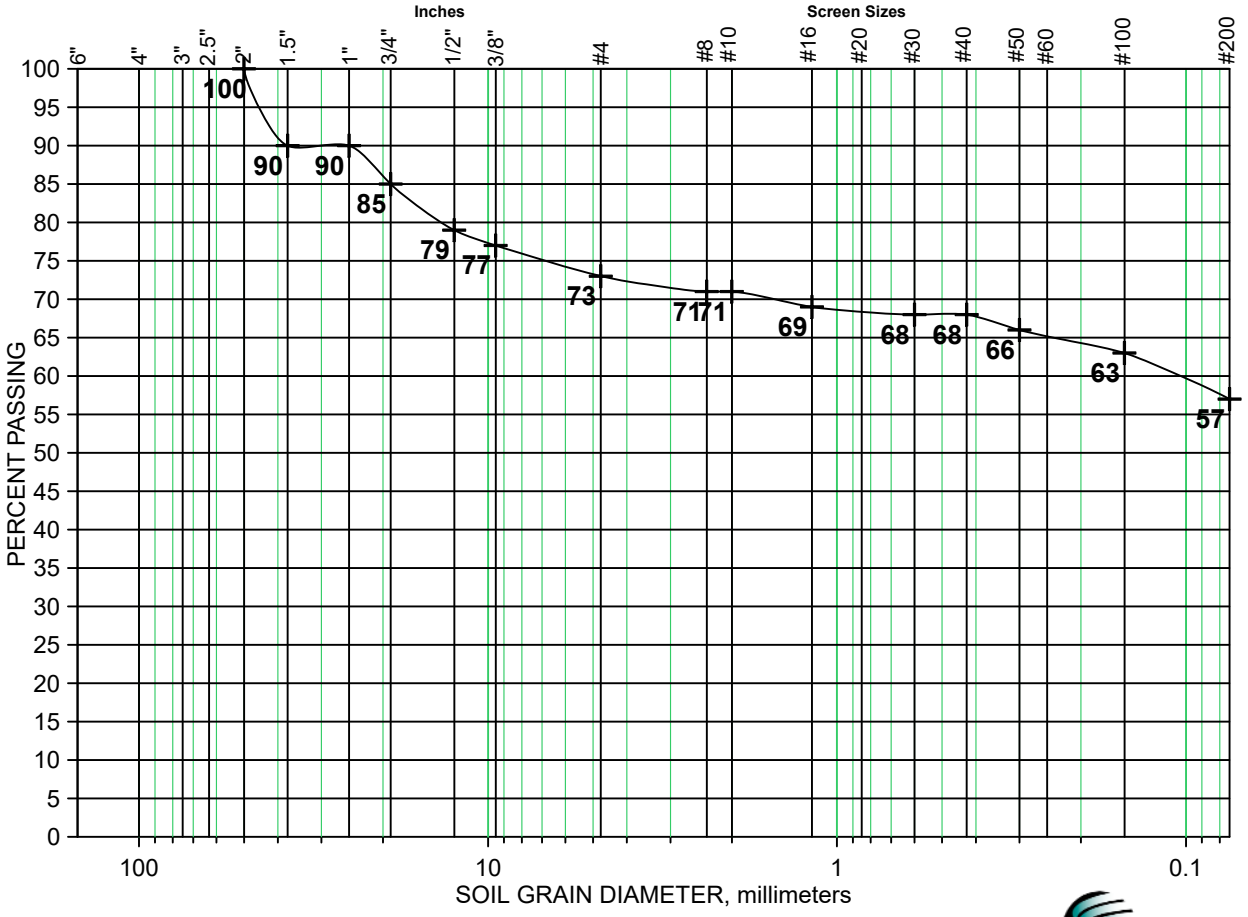
STRATA

GRADATION ANALYSIS

ASTM D6913

Project: Blackjack Infilitration Test Pits - Laboratory Testing
Client: Applied Intellect
File: SP20102A
Sample No.: SP2000317
Sample Location: Test Pit TP-2 from 6.0-inches to 5.0-feet BGS
Description: Gravelly SILT with Sand (ML)
Date Received: July 20, 2020
(Client Provided Sample and Location)
Date Tested: July 25, 2020 By: P. Cameron

Cobbles	Gravel		Sand		
	Coarse	Fine	Coarse	Medium	Fine



Reviewed by:_____

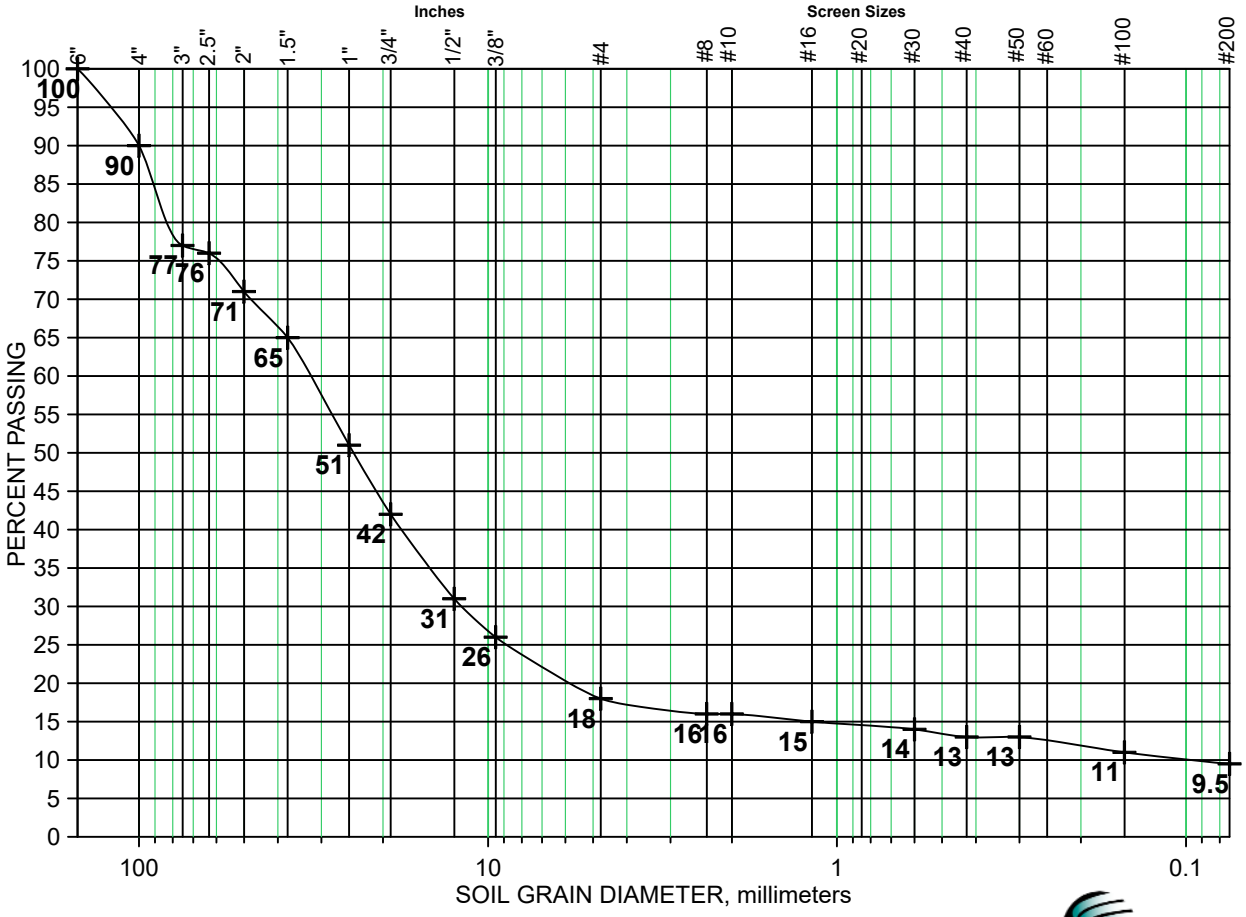
STRATA

GRADATION ANALYSIS

ASTM D6913

Project: Blackjack Infilitration Test Pits - Laboratory Testing
Client: Applied Intellect
File: SP20102A
Sample No.: SP2000318
Sample Location: Test Pit TP-3 from 6.0-inches to 5.0-feet BGS
Description: Silty GRAVEL with Cobbles (GM)
Date Received: July 20, 2020
(Client Provided Sample and Location)
Date Tested: July 25, 2020 By: P. Cameron

Cobbles	Gravel		Sand		
	Coarse	Fine	Coarse	Medium	Fine



Reviewed by:_____

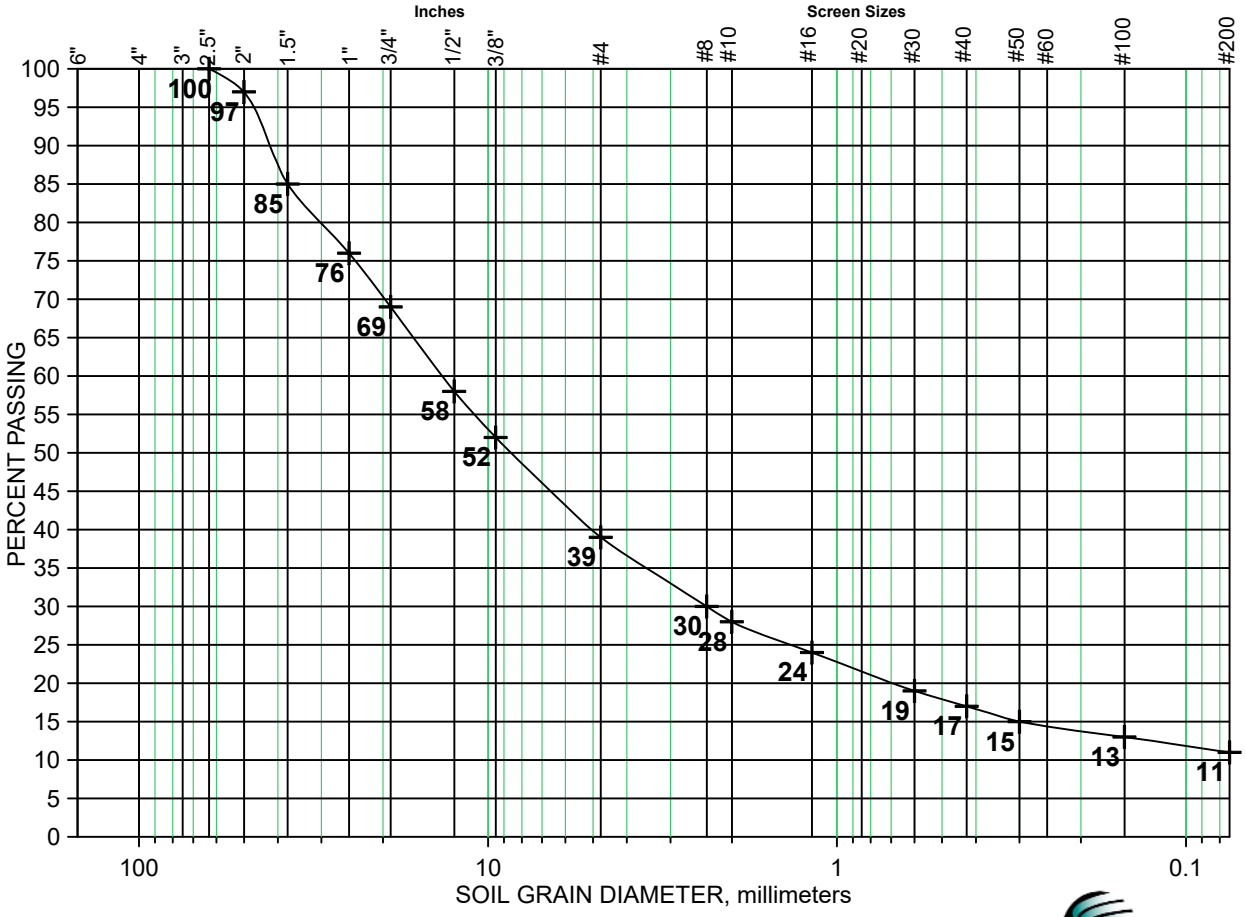
STRATA

GRADATION ANALYSIS

ASTM D6913

Project: Blackjack Infilitration Test Pits - Laboratory Testing
Client: Applied Intellect
File: SP20102A
Sample No.: SP2000319
Sample Location: Test Pit TP-4 from 6.0-inches to 5.0-feet BGS
Description: Poorly Graded GRAVEL with Silt and Sand (GP-GM)
Date Received: July 20, 2020
(Client Provided Sample and Location)
Date Tested: July 25, 2020 By: P. Cameron

Cobbles	Gravel		Sand		
	Coarse	Fine	Coarse	Medium	Fine



Reviewed by:_____

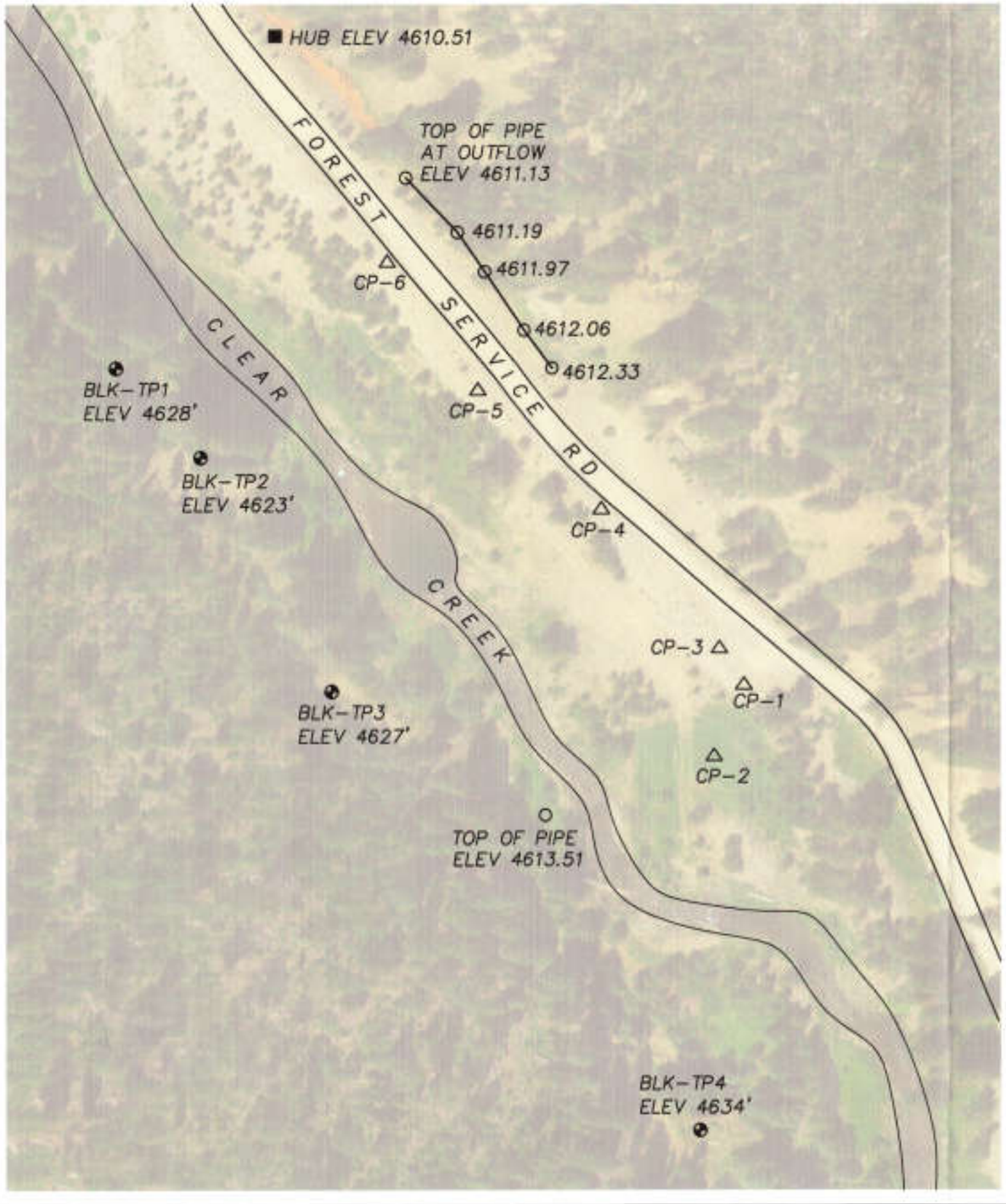
STRATA

ATTACHMENT 5

Hsu Survey

EXHIBIT FOR
BLACKJACK MINE RECLAMATION

Situated in Section 11, Township 9 South, Range 35 East of the Willamette Meridain



SCALE: 1"=100'

LEGEND

- ○ Spot elevations on top of pipe
- ◕ Test Pits
- △ Control Point
- ■ Hub set at location of proposed outflow

Point No.	Northing	Easting	Elevation	Description
2	19944.65	29977.06	4617.52	Cotton Spindle
3	20028.64	29981.27	4621.78	Cotton Spindle
4	20136.80	29888.82	4620.21	Cotton Spindle
5	20229.57	29792.42	4620.61	Cotton Spindle
6	20329.35	29722.60	4620.25	1 1/2" Aluminum Cap
105	20395.43	29737.46	4611.13	Top of pipe at Outflow
107	19899.06	29845.58	4613.51	Top of Pipe on West side of Creek
116	20505.84	29635.53	4610.51	Hub at proposed Outflow

TEST PIT	NORTHING	EASTING	ELEVATION
BLK-TP1	20247.15	29511.33	4628
BLK-TP2	20177.49	29576.48	4623
BLK-TP3	19995.18	29678.36	4627
BLK-TP4	19653.53	29966.08	4634

NOTE: Fieldwork for this exhibit was performed June 20, 2020 and represent field conditions found at that time only. Elevation are based on an assumed datum,. Basis of bearings are based on Geodetic North taken at CP-1.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JUNE 2, 2010
JEFFREY S. HSU
83571

Renewal Date: June 30, 2021

ATTACHMENT 6

SVL Laboratories Soil Sieve Reports

One Government Gulch - PO Box 929
Kellogg, ID 83837-0929
(208) 784-1258
www.svl.net

Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received	Notes
BB-SS-SA4	X0G0346-01	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA5	X0G0346-02	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA5	X0G0346-03	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA4	X0G0346-04	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA5 Dup	X0G0346-05	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA5	X0G0346-06	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA5 Dup	X0G0346-07	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA5 Dup 2	X0G0346-08	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA2	X0G0346-09	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA3	X0G0346-10	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA1	X0G0346-11	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA4	X0G0346-12	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA3	X0G0346-13	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA3	X0G0346-14	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA3	X0G0346-15	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA1	X0G0346-16	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA5 Dup 3	X0G0346-17	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA2	X0G0346-18	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA2	X0G0346-19	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BB-SS-SA4	X0G0346-20	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA2	X0G0346-21	Soil	16-Jul-20 00:00	OS	16-Jul-2020	
BJ-SS-SA1	X0G0346-22	Soil	16-Jul-20 00:00	OS	16-Jul-2020	

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.
Sample preparation is defined by the client as per their Data Quality Objectives.
This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.
Analyses were performed in accordance with SVL standard operating procedures and calibrations were performed and met SVL internal QC criteria.
The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.

One Government Gulch - PO Box 929
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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA4**
SVL Sample ID: **X0G0346-01 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	78.5	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA5**
SVL Sample ID: **X0G0346-02 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	96.6	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
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153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA5**
SVL Sample ID: **X0G0346-03 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	85.1	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA4**
SVL Sample ID: **X0G0346-04 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	83.3	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA5 Dup**
SVL Sample ID: **X0G0346-05 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	92.9	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA5**
SVL Sample ID: **X0G0346-06 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	83.8	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA5 Dup**
SVL Sample ID: **X0G0346-07 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	85.2	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA5 Dup 2**
SVL Sample ID: **X0G0346-08 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	85.0	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA2**
SVL Sample ID: **X0G0346-09 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	81.7	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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www.svl.net

Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA3**
SVL Sample ID: **X0G0346-10 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	76.7	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA1**
SVL Sample ID: **X0G0346-11 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	80.2	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA4**
SVL Sample ID: **X0G0346-12 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	86.6	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

One Government Gulch - PO Box 929
Kellogg, ID 83837-0929
(208) 784-1258
www.svl.net

Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA3**
SVL Sample ID: **X0G0346-13 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	83.7	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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(208) 784-1258
www.svl.net

Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA3**
SVL Sample ID: **X0G0346-14 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	82.7	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA3**
SVL Sample ID: **X0G0346-15 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	74.6	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA1**
SVL Sample ID: **X0G0346-16 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	85.6	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA5 Dup 3**
SVL Sample ID: **X0G0346-17 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	87.9	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA2**
SVL Sample ID: **X0G0346-18 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	80.7	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA2**
SVL Sample ID: **X0G0346-19 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	82.1	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
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Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BB-SS-SA4**
SVL Sample ID: **X0G0346-20 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	83.7	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA2**
SVL Sample ID: **X0G0346-21 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	90.0	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

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(208) 784-1258
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Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Client Sample ID: **BJ-SS-SA1**
SVL Sample ID: **X0G0346-22 (Soil)**

Sampled: 16-Jul-20 00:00
Received: 16-Jul-20
Sampled By: OS

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Sieve Procedures										
0.0098 in. (#60)	**Passing**	82.9	%				X030038	JLH	07/23/20 00:00	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

Connor Williams
Project Manager

One Government Gulch - PO Box 929
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(208) 784-1258
www.svl.net

Applied Intellect
153321 N Columbus St
Spokane, WA 99208

Project Name: Blackjack/Bluebird
Work Order: **X0G0346**
Reported: 27-Jul-20 10:10

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch and Source ID	Analyzed	Notes
Sieve Procedures									
0.0098 in. (#60)	Passing	%	92.9	85.2	8.6	20	X030038 - X0G0346-07	23-Jul-20	
0.0098 in. (#60)	Passing	%	92.9	92.9	0.0	20	X030038 - X0G0346-05	23-Jul-20	

Notes and Definitions

LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
0.30R>S	% recovery not applicable; spike level is less than 30% of the sample concentration
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable

Work Order: **X0G0346**
Applied Intellect

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

Temperature on Receipt:

Report to Company: Applied Intellect
Contact: Bob Lambeth
Address: 15321 N. Columbus St.
Spokane, WA 99208-8534
Phone Number: (509) 742-0294
FAX Number: (509) 467-4081
E-mail: bob.lambeth@ap-in.com

Invoice Sent To: Bob Lambeth
Contact: See left block
Address:
Phone Number:
FAX Number:
PO#:

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil, 4 = Sediment, 5 = Rock, 6 = Rinsate, 7 = Oil
8 = Waste, 9= Other:

Project Name: Bluebird-Blackjack Datagap

Sampler's Signature:

Indicate State of sample origination: Oregon

	Sample ID Please take care to distinguish between: 1 and I 2 and Z 5 and S Ø and O Thanks!	Collection: Date	Collection: Time	Collected by: (Init.)	Misc: Matrix Type (From Table 1)	Misc: No. of Containers	Preservative(s): Unpreserved	Preservative(s): HNO_3 Filtered	Preservative(s): HNO_3 Unfiltered	Preservative(s): HCl	Preservative(s): H_2SO_4	Preservative(s): NaOH	Preservative(s): Other (Specify)	Analyses Required	Rush Instructions (Days)	Comments
1	BB-55-5A4			OS	3	1	X									X
2	BB-55-5A5			OS	3	1	X									X
3	BJ-55-5A5~	5.2		OS	3	1	X									X
4	BJ-55-5A4			OS	3	1	X									X
5	BB-55-5A5dup			OS	3	1	X									X
6	BJ-55-5A5			OS	3	1	X									X
7	BJ-55-5A5-dup			OS	3	1	X									X
8	BJ-55-5A5-dup2			OS	3	1	X									X
9	BB-55-5A2			OS	3	1	X									X
10	BB-55-5A3			OS	3	1	X									X

Relinquished by:	[illegible]	Date: 7/16/20	Time:	Received by:	[signature]	Date: 7/16/2020	Time: 340
Relinquished by:		Date:	Time:	Received by:		Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL Work Order # XOG0346
Temperature on Receipt:

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil, 4 = Sediment, 5 = Rock, 6 = Rinsate, 7 = Oil
8 = Waste, 9= Other:

Report to Company: Applied Intellect
Contact: Bob Lambeth
Address: 15321 N. Columbus St.
Spokane, WA 99208-8534
Phone Number: (509) 742-0294
FAX Number: (509) 467-4081
E-mail: bob.lambeth@ap-in.com

Invoice Sent To: Bob Lambeth
Contact: See left block
Address:
Phone Number:
FAX Number:
PO#:

Project Name: Bluebird-Blackjack Datagap
Sampler's Signature:

Indicate State of sample origination: Oregon

	Sample ID (Please take care to distinguish between: 1 and I, 2 and Z, 5 and S, Ø and O. Thanks!)	Collection Date	Collection Time	Collected by: (Init.)	Misc. Matrix Type (From Table 1)	Misc. No. of Containers	Preservative(s) Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify)	Analyses Required	Rush Instructions (Days)	Comments
1	BB-55-SA1			OS	3	1	X									X
2	BJ-55-SA4			OS	3	1	X									X
3	BJ-55-SA3			OS	3	1	X									X
4	BJ-55-SA3			OS	3	1	X									X
5	BB-55-SA3			OS	3	1	X									X
6	BJ-55-SA1			OS	3	1	X									X
7	BJ-55-SA5 dup3			OS	3	1	X									X
8	BB-55-SA2			OS	3	1	X									X
9	BB-55-SA2			OS	3	1	X									X
10	BB-55-SA4			OS	3	1	X									X

Relinquished by:	Date: 7/16/20	Time:	Received by:	Date: 7/16/2020	Time: 1540
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 07/17

CHAIN OF CUSTODY RECORD

SVL Analytical, Inc. • One Government Gulch • Kellogg, ID 83837 • (208) 784-1258 • FAX: (208) 783-0891

FOR SVL USE ONLY
SVL Work Order #: X0G0346
Temperature on Receipt:

Table 1. -- Matrix Type
1 = Surface Water, 2 = Ground Water
3 = Soil, 4 = Sediment, 5 = Rock, 6 = Rinsate, 7 = Oil
8 = Waste, 9= Other:

Report to Company: Applied Intellect
Contact: Bob Lambeth
Address: 15321 N. Columbus St.
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Invoice Sent To: Bob Lambeth
Contact: See left block
Address:
Phone Number:
FAX Number:
PO#:

Project Name: Bluebird-Blackjack Datagap
Sampler's Signature:

Indicate State of sample origination: Oregon

Please take care to distinguish between:
1 and I
2 and Z
5 and S
Ø and O
Thanks!

	Sample ID	Collection: Date	Time	Collected by: (Init.)	Misc.: Matrix Type (From Table 1)	No. of Containers	Preservative(s): Unpreserved	HNO_3 Filtered	HNO_3 Unfiltered	HCl	H_2SO_4	NaOH	Other (Specify)	Analyses Required	Rush Instructions (Days)	Comments
1	BJ-SS-5A2			OS	3	1	X									X
2	BJ-SS-5A1			OS	3	1	X									X
3				OS	3	1	X									X
4				OS	3	1	X									X
5				OS	3	1	X									X
6				OS	3	1	X									X
7				OS	3	1	X									X
8				OS	3	1	X									X
9				OS	3	1	X									X
10				OS	3	1	X									X

Dry & screen; return -60 mesh portion to Bob Lambeth

Relinquished by:		Date: 7/16/20	Time:	Received by:		Date: 7/16/2020	Time: 340
Relinquished by:		Date:	Time:	Received by:		Date:	Time:

* Sample Reject: ☐ Return ☐ Dispose ☒ Store (30 Days)

White: LAB COPY Yellow: CUSTOMER COPY

SVL-COC 07/17

SAMPLE RECEIPT/CHAIN-OF-CUSTODY CHECKLIST

The following items were checked for completeness, correctness, and compliance to project specifications using the Chain-of-Custody (COC) and other supporting information.

Date of acceptance: 7-16-20 **By:** Michael Goddard

SVL Work No: X0G0346

Item	Description	V	NA	Comments
1	Client or project name	✓		Applied Intellect
2	Date and time of receipt at lab	✓		7-16-20/1540
3	Received by	✓		Crystal Seay
4	Temperature blank or cooler temperature		✓	Temp. — °C
5	Were the sample(s) received on ice		✓	
6	Custody tape/bottle seals		✓	
7	Shipper's air bill		✓	Walkin
8	Condition of samples upon receipt (leaking; bubbles in VOA vials)	✓		Good
9	Analysis requested for each sample	✓		
10	Sample matrix description	✓		
11	The correct preservative for the analysis requested		✓	
12	Did an SVL employee preserve sample(s) upon receipt		✓	
13	Additional Information		✓	

V- Verified **NA- Not Applicable**

Comments:

ATTACHMENT 7

Pace Analytical Laboratories Reports

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

September 08, 2020

Applied Intellect, LLC.- Boise, ID

Sample Delivery Group:	L1255995
Samples Received:	08/28/2020
Project Number:	
Description:	

Report To: Olivia Salmon
1670 E Monterey Drive
Boise, ID 83706

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

TABLE OF CONTENTS

BJ-SS-SA2 L1255995-01 Solid

Collected by: Olivia Salmon
Collected date/time: 07/16/20 00:00
Received date/time: 08/28/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1537503	1	09/04/20 18:20	09/04/20 18:55	KBC	Mt. Juliet, TN
Mercury by Method 7471A	WG1536401	1	09/01/20 18:01	09/02/20 09:56	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1536565	1	09/02/20 07:11	09/02/20 18:55	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1536565	5	09/02/20 07:11	09/02/20 23:14	CCE	Mt. Juliet, TN

BJ-SS-SA1 L1255995-02 Solid

Collected by: Olivia Salmon
Collected date/time: 07/16/20 00:00
Received date/time: 08/28/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1537503	1	09/04/20 18:20	09/04/20 18:55	KBC	Mt. Juliet, TN
Mercury by Method 7471A	WG1536401	1	09/01/20 18:01	09/02/20 09:13	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1536565	1	09/02/20 07:11	09/02/20 18:58	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1536565	5	09/02/20 07:11	09/02/20 23:16	CCE	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward

Chris Ward
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	98.2		1	09/04/2020 18:55	WG1537503

Mercury by Method 7471A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.162	T8	0.0180	0.0400	1	09/02/2020 09:56	WG1536401

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	14700		8.20	20.0	1	09/02/2020 18:55	WG1536565
Antimony	2.52		0.500	2.00	1	09/02/2020 18:55	WG1536565
Arsenic	5.04		0.460	2.00	1	09/02/2020 18:55	WG1536565
Barium	192		0.240	0.500	1	09/02/2020 18:55	WG1536565
Beryllium	0.402		0.0800	0.200	1	09/02/2020 18:55	WG1536565
Cadmium	0.578		0.0810	0.500	1	09/02/2020 18:55	WG1536565
Calcium	2340		30.0	100	1	09/02/2020 18:55	WG1536565
Chromium	22.9		0.250	1.00	1	09/02/2020 18:55	WG1536565
Cobalt	29.9		0.230	1.00	1	09/02/2020 18:55	WG1536565
Copper	81.7		0.506	2.00	1	09/02/2020 18:55	WG1536565
Iron	38300		5.00	10.0	1	09/02/2020 18:55	WG1536565
Lead	9.93		0.208	0.500	1	09/02/2020 18:55	WG1536565
Magnesium	2210		20.5	100	1	09/02/2020 18:55	WG1536565
Manganese	3460		1.22	5.00	5	09/02/2020 23:14	WG1536565
Nickel	95.9		0.490	2.00	1	09/02/2020 18:55	WG1536565
Potassium	1170		20.9	50.0	1	09/02/2020 18:55	WG1536565
Selenium	2.40		0.617	2.00	1	09/02/2020 18:55	WG1536565
Silver	0.291	J	0.228	1.00	1	09/02/2020 18:55	WG1536565
Sodium	424		33.2	100	1	09/02/2020 18:55	WG1536565
Thallium	U		0.354	2.00	1	09/02/2020 18:55	WG1536565
Vanadium	30.7		0.687	2.00	1	09/02/2020 18:55	WG1536565
Zinc	152		0.939	5.00	1	09/02/2020 18:55	WG1536565

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	98.5		1	09/04/2020 18:55	WG1537503

Mercury by Method 7471A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.132	T8	0.0180	0.0400	1	09/02/2020 09:13	WG1536401

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	18300		8.20	20.0	1	09/02/2020 18:58	WG1536565
Antimony	2.66		0.500	2.00	1	09/02/2020 18:58	WG1536565
Arsenic	6.44		0.460	2.00	1	09/02/2020 18:58	WG1536565
Barium	227		0.240	0.500	1	09/02/2020 18:58	WG1536565
Beryllium	0.418		0.0800	0.200	1	09/02/2020 18:58	WG1536565
Cadmium	0.340	J	0.0810	0.500	1	09/02/2020 18:58	WG1536565
Calcium	1490		30.0	100	1	09/02/2020 18:58	WG1536565
Chromium	21.0		0.250	1.00	1	09/02/2020 18:58	WG1536565
Cobalt	23.4		0.230	1.00	1	09/02/2020 18:58	WG1536565
Copper	100		0.506	2.00	1	09/02/2020 18:58	WG1536565
Iron	46800		25.0	50.0	5	09/02/2020 23:16	WG1536565
Lead	8.91		0.208	0.500	1	09/02/2020 18:58	WG1536565
Magnesium	2280		20.5	100	1	09/02/2020 18:58	WG1536565
Manganese	2010		1.22	5.00	5	09/02/2020 23:16	WG1536565
Nickel	68.2		0.490	2.00	1	09/02/2020 18:58	WG1536565
Potassium	1330		20.9	50.0	1	09/02/2020 18:58	WG1536565
Selenium	1.33	J	0.617	2.00	1	09/02/2020 18:58	WG1536565
Silver	U		0.228	1.00	1	09/02/2020 18:58	WG1536565
Sodium	209		33.2	100	1	09/02/2020 18:58	WG1536565
Thallium	U		0.354	2.00	1	09/02/2020 18:58	WG1536565
Vanadium	45.6		0.687	2.00	1	09/02/2020 18:58	WG1536565
Zinc	112		0.939	5.00	1	09/02/2020 18:58	WG1536565

Method Blank (MB)

(MB) R3567987-1 09/04/20 18:55

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00200			

L1256813-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1256813-01 09/04/20 18:55 • (DUP) R3567987-3 09/04/20 18:55

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	87.1	87.7	1	0.612		10

Laboratory Control Sample (LCS)

(LCS) R3567987-2 09/04/20 18:55

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3566504-1 09/02/20 09:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3566504-2 09/02/20 09:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.477	95.4	80.0-120	

L1255995-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1255995-02 09/02/20 09:13 • (MS) R3566504-3 09/02/20 09:20 • (MSD) R3566504-4 09/02/20 09:23

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.500	0.132	0.627	0.568	98.9	87.2	1	75.0-125			9.74	20

Method Blank (MB)

(MB) R3566802-1 09/02/20 18:10

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aluminum	U		8.20	20.0
Antimony	U		0.500	2.00
Arsenic	0.482	J	0.460	2.00
Barium	U		0.240	0.500
Beryllium	U		0.0800	0.200
Cadmium	U		0.0810	0.500
Calcium	U		30.0	100
Chromium	U		0.250	1.00
Cobalt	U		0.230	1.00
Copper	U		0.506	2.00
Iron	U		5.00	10.0
Lead	U		0.208	0.500
Magnesium	U		20.5	100
Manganese	U		0.245	1.00
Nickel	U		0.490	2.00
Potassium	U		20.9	50.0
Selenium	U		0.617	2.00
Silver	U		0.228	1.00
Sodium	U		33.2	100
Thallium	U		0.354	2.00
Vanadium	U		0.687	2.00
Zinc	U		0.939	5.00

Laboratory Control Sample (LCS)

(LCS) R3566802-2 09/02/20 18:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	1000	1010	101	80.0-120	
Antimony	100	98.5	98.5	80.0-120	
Arsenic	100	99.8	99.8	80.0-120	
Barium	100	102	102	80.0-120	
Beryllium	100	102	102	80.0-120	
Cadmium	100	98.6	98.6	80.0-120	
Calcium	1000	1010	101	80.0-120	
Chromium	100	99.9	99.9	80.0-120	
Cobalt	100	103	103	80.0-120	
Copper	100	98.0	98.0	80.0-120	
Iron	1000	994	99.4	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3566802-2 09/02/20 18:13

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Lead	100	99.1	99.1	80.0-120	
Magnesium	1000	1020	102	80.0-120	
Manganese	100	98.0	98.0	80.0-120	
Nickel	100	102	102	80.0-120	
Potassium	1000	963	96.3	80.0-120	
Selenium	100	102	102	80.0-120	
Silver	20.0	19.0	94.8	80.0-120	
Sodium	1000	997	99.7	80.0-120	
Thallium	100	98.3	98.3	80.0-120	
Vanadium	100	101	101	80.0-120	
Zinc	100	98.4	98.4	80.0-120	

L1255941-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1255941-03 09/02/20 18:16 • (MS) R3566802-5 09/02/20 18:24 • (MSD) R3566802-6 09/02/20 18:26

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	1000	1850	3780	3310	193	146	1	75.0-125	J5	J5	13.3	20
Antimony	100	0.775	84.0	88.9	83.3	88.1	1	75.0-125			5.57	20
Arsenic	100	U	96.2	97.0	96.2	97.0	1	75.0-125			0.792	20
Barium	100	15.5	116	114	101	98.8	1	75.0-125			1.54	20
Beryllium	100	0.197	97.6	99.4	97.4	99.2	1	75.0-125			1.80	20
Cadmium	100	U	94.2	95.4	94.2	95.4	1	75.0-125			1.24	20
Calcium	1000	593	1580	2250	99.2	166	1	75.0-125		J3 J5	34.7	20
Chromium	100	1.33	98.0	98.3	96.7	96.9	1	75.0-125			0.253	20
Cobalt	100	0.657	102	103	102	102	1	75.0-125			0.740	20
Copper	100	1.58	96.5	96.2	94.9	94.6	1	75.0-125			0.252	20
Iron	1000	3250	5440	4710	219	145	1	75.0-125	J5	J5	14.5	20
Lead	100	1.81	99.5	100	97.6	98.3	1	75.0-125			0.655	20
Magnesium	1000	291	1470	1360	118	106	1	75.0-125			8.06	20
Manganese	100	26.2	124	117	97.7	90.9	1	75.0-125			5.61	20
Nickel	100	1.12	101	102	100	101	1	75.0-125			0.868	20
Potassium	1000	440	1490	1410	105	96.8	1	75.0-125			5.45	20
Selenium	100	U	97.3	98.9	97.3	98.9	1	75.0-125			1.67	20
Silver	20.0	U	18.2	18.2	90.8	91.2	1	75.0-125			0.426	20
Sodium	1000	78.2	1030	1050	95.6	96.9	1	75.0-125			1.21	20
Thallium	100	U	94.6	96.6	94.6	96.6	1	75.0-125			2.07	20
Vanadium	100	4.06	102	103	97.9	98.9	1	75.0-125			0.912	20
Zinc	100	8.98	106	104	96.7	95.3	1	75.0-125			1.26	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
T8	Sample(s) received past/too close to holding time expiration.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

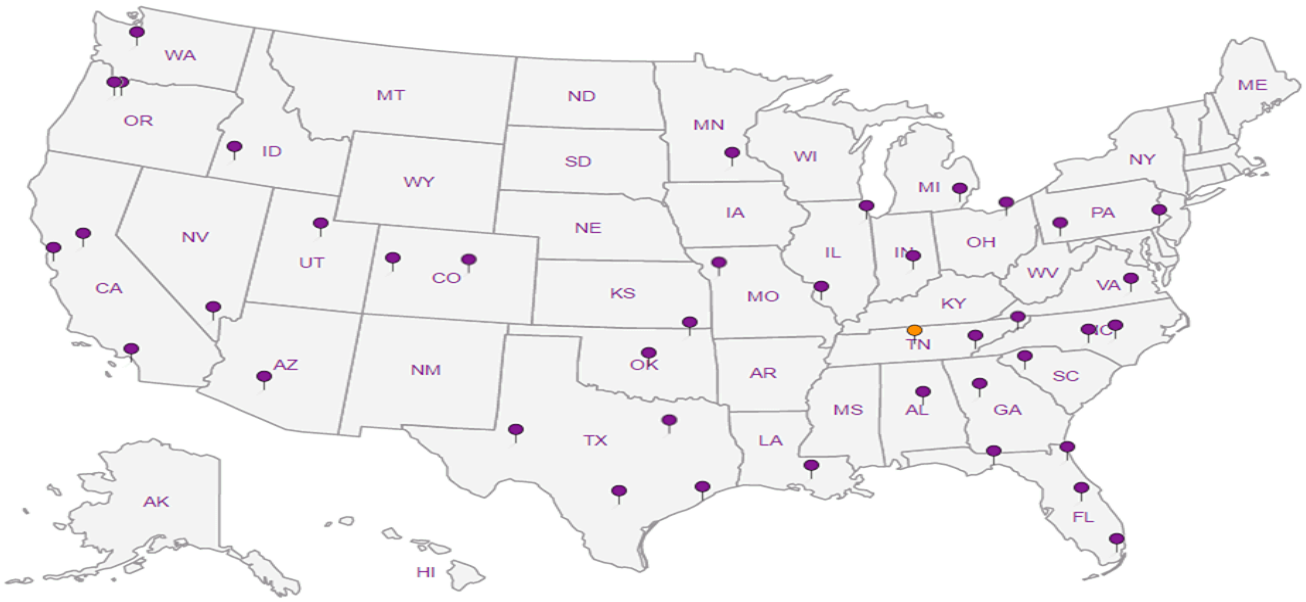
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Applied Intellect, LLC.- Boise, ID

1670 E Monterey Drive
Boise, ID 83706

Billing Information:
Accounts Payable- Ajit Louis
1827 Willow Oak Dr.
Wexford, PA 15090

Report to: Olivia Salmon

Email To: olivia.salmon@ap-in.com

Project Description:

City/State Collected:

Please Circle: PT MT CT ET

Phone: 208-953-7525

Client Project #

Lab Project # APPINTBID-SALMON

Collected by,(print): Olivia Salmon

Site/Facility ID #

P.O. #

Collected by (signature): RAV for O.S.

Immediately Packed on Ice N X Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Quote #

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	TAL Metals 250mlHDPE-HNO3	TAL Metals 2oz ~~Clr~~ NoPres Ziplock	TCLP RCRA 8 Metals 1L-Clr-NoPres	Remarks	Sample # (lab only)
BJ-SS-SA2	Comp.	SS		7/16/20		1		X	~~X~~		-01
BJ-SS-SA1	"	SS		7/16/20		1		X	~~X~~		-02
		~~GW~~		8/28		1	X				
		~~GW~~				1	X				
		~~GW~~				1	X				

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 1255999

F053

Acctnum: APPINTBID
Template: T168905
Prelogin: P778796
PM: 824 - Chris Ward
PB:

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Please hold samples until 11-30-20

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 7499998 0956

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N
RAD Screen <0.5 mR/hr:		Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
RAV 2 and FED	8-27-20	12:30P			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Amb	Bottles Received: 2
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 082820	Time: 0930

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 30, 2020

Applied Intellect, LLC.- Boise, ID

Sample Delivery Group:	L1232296
Samples Received:	06/23/2020
Project Number:	EN19.003
Description:	BB/BJ Data Gap Investigation

Report To: Olivia Salmon
1670 E Monterey Dr
Boise, ID 83706

Entire Report Reviewed By: Chris Ward

Chris Ward
Project Manager

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4 Cn
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6 Qc
7 Gl
8 Al
9 Sc

BLK-TP1-2 L1232296-01 Solid

Collected by: Bob L | Collected date/time: 06/19/20 16:19 | Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 21:40	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 11:34	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 19:14	LD	Mt. Juliet, TN

BLK-TP1-5 L1232296-02 Solid

Collected by: Bob L | Collected date/time: 06/19/20 16:20 | Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 21:47	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 11:57	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 19:31	LD	Mt. Juliet, TN

BLK-TP2-2 L1232296-03 Solid

Collected by: Bob L | Collected date/time: 06/19/20 15:00 | Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 21:50	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 13:48	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 15:45	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 19:34	LD	Mt. Juliet, TN

BLK-TP2-4 L1232296-04 Solid

Collected by: Bob L | Collected date/time: 06/19/20 15:03 | Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 21:52	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 13:52	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 15:48	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 19:38	LD	Mt. Juliet, TN

BLK-TP3-2 L1232296-05 Solid

Collected by: Bob L | Collected date/time: 06/19/20 14:00 | Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 21:55	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 13:55	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 15:52	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 19:55	LD	Mt. Juliet, TN

BLK-TP3-5 L1232296-06 Solid

Collected by: Bob L | Collected date/time: 06/19/20 14:20 | Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 21:32	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 13:58	LAT	Mt. Juliet, TN

BLK-TP3-5 L1232296-06 Solid

Collected by: Bob L
Collected date/time: 06/19/20 14:20
Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 15:55	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 19:58	LD	Mt. Juliet, TN

BLK-TP4-1 L1232296-07 Solid

Collected by: Bob L
Collected date/time: 06/19/20 18:30
Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 21:57	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	10	06/27/20 04:54	06/29/20 16:05	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 14:02	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 15:58	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 20:02	LD	Mt. Juliet, TN

BLK-TP4-3 L1232296-08 Solid

Collected by: Bob L
Collected date/time: 06/19/20 18:35
Received date/time: 06/23/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1499745	1	06/27/20 00:00	06/27/20 00:10	KDW	Mt. Juliet, TN
Mercury by Method 7471A	WG1499309	1	06/25/20 17:44	06/25/20 22:00	TCT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 14:05	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 16:02	LAT	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1499615	5	06/27/20 04:54	06/29/20 20:05	LD	Mt. Juliet, TN

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris Ward

Chris Ward
Project Manager

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	89.3		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.128		0.0201	0.0448	1	06/25/2020 21:40	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	12400	V	41.2	56.0	5	06/29/2020 11:34	WG1499615
Antimony	U	J6	1.73	3.36	5	06/29/2020 11:34	WG1499615
Arsenic	4.71		0.472	1.12	5	06/29/2020 11:34	WG1499615
Barium	177		1.40	2.80	5	06/29/2020 11:34	WG1499615
Beryllium	U		0.823	2.80	5	06/29/2020 11:34	WG1499615
Cadmium	U		0.454	1.12	5	06/29/2020 11:34	WG1499615
Calcium	1770		265	560	5	06/29/2020 11:34	WG1499615
Chromium	17.4		2.51	5.60	5	06/29/2020 11:34	WG1499615
Cobalt	9.56		0.560	1.12	5	06/29/2020 11:34	WG1499615
Copper	31.2		2.80	5.60	5	06/29/2020 11:34	WG1499615
Iron	15300	J3 O1 V	43.1	56.0	5	06/29/2020 11:34	WG1499615
Lead	7.06		1.12	2.24	5	06/29/2020 11:34	WG1499615
Magnesium	1950	J6	189	560	5	06/29/2020 11:34	WG1499615
Manganese	720	V	1.37	2.80	5	06/29/2020 11:34	WG1499615
Nickel	29.6		1.34	2.80	5	06/29/2020 19:14	WG1499615
Potassium	914		206	560	5	06/29/2020 11:34	WG1499615
Selenium	U		1.13	2.80	5	06/29/2020 11:34	WG1499615
Silver	U		0.238	0.560	5	06/29/2020 11:34	WG1499615
Sodium	432	J	340	560	5	06/29/2020 11:34	WG1499615
Thallium	U		0.912	2.24	5	06/29/2020 11:34	WG1499615
Vanadium	25.1		0.901	2.80	5	06/29/2020 11:34	WG1499615
Zinc	57.9		9.12	28.0	5	06/29/2020 11:34	WG1499615

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	87.6		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.140		0.0206	0.0457	1	06/25/2020 21:47	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	12000		42.0	57.1	5	06/29/2020 11:57	WG1499615
Antimony	U		1.77	3.43	5	06/29/2020 11:57	WG1499615
Arsenic	4.94		0.482	1.14	5	06/29/2020 11:57	WG1499615
Barium	159		1.43	2.85	5	06/29/2020 11:57	WG1499615
Beryllium	U		0.839	2.85	5	06/29/2020 11:57	WG1499615
Cadmium	U		0.464	1.14	5	06/29/2020 11:57	WG1499615
Calcium	1990		271	571	5	06/29/2020 11:57	WG1499615
Chromium	17.0		2.56	5.71	5	06/29/2020 11:57	WG1499615
Cobalt	9.47		0.571	1.14	5	06/29/2020 11:57	WG1499615
Copper	35.0		2.85	5.71	5	06/29/2020 11:57	WG1499615
Iron	17200		44.0	57.1	5	06/29/2020 11:57	WG1499615
Lead	7.99		1.14	2.28	5	06/29/2020 11:57	WG1499615
Magnesium	1810		193	571	5	06/29/2020 11:57	WG1499615
Manganese	916		1.39	2.85	5	06/29/2020 11:57	WG1499615
Nickel	28.9		1.37	2.85	5	06/29/2020 19:31	WG1499615
Potassium	1090		210	571	5	06/29/2020 11:57	WG1499615
Selenium	U		1.15	2.85	5	06/29/2020 11:57	WG1499615
Silver	U		0.243	0.571	5	06/29/2020 11:57	WG1499615
Sodium	499	J	347	571	5	06/29/2020 11:57	WG1499615
Thallium	U		0.931	2.28	5	06/29/2020 11:57	WG1499615
Vanadium	24.4		0.919	2.85	5	06/29/2020 11:57	WG1499615
Zinc	59.0		9.31	28.5	5	06/29/2020 11:57	WG1499615

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	96.0		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.171		0.0187	0.0417	1	06/25/2020 21:50	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	9080		38.3	52.1	5	06/29/2020 13:48	WG1499615
Antimony	U		1.61	3.12	5	06/29/2020 13:48	WG1499615
Arsenic	2.83		0.440	1.04	5	06/29/2020 13:48	WG1499615
Barium	105		1.30	2.60	5	06/29/2020 13:48	WG1499615
Beryllium	U		0.766	2.60	5	06/29/2020 15:45	WG1499615
Cadmium	U		0.423	1.04	5	06/29/2020 13:48	WG1499615
Calcium	2260		247	521	5	06/29/2020 13:48	WG1499615
Chromium	19.0		2.33	5.21	5	06/29/2020 13:48	WG1499615
Cobalt	7.94		0.521	1.04	5	06/29/2020 13:48	WG1499615
Copper	15.9		2.60	5.21	5	06/29/2020 13:48	WG1499615
Iron	12100		40.1	52.1	5	06/29/2020 13:48	WG1499615
Lead	3.48		1.04	2.08	5	06/29/2020 13:48	WG1499615
Magnesium	1670		176	521	5	06/29/2020 13:48	WG1499615
Manganese	525		1.27	2.60	5	06/29/2020 13:48	WG1499615
Nickel	19.2		1.25	2.60	5	06/29/2020 19:34	WG1499615
Potassium	919		192	521	5	06/29/2020 13:48	WG1499615
Selenium	U		1.05	2.60	5	06/29/2020 13:48	WG1499615
Silver	U		0.222	0.521	5	06/29/2020 13:48	WG1499615
Sodium	514	J	317	521	5	06/29/2020 13:48	WG1499615
Thallium	U		0.849	2.08	5	06/29/2020 13:48	WG1499615
Vanadium	21.2		0.838	2.60	5	06/29/2020 13:48	WG1499615
Zinc	35.2		8.49	26.0	5	06/29/2020 13:48	WG1499615

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	62.6		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	U		0.0288	0.0639	1	06/25/2020 21:52	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	4180		58.8	79.9	5	06/29/2020 13:52	WG1499615
Antimony	U		2.48	4.79	5	06/29/2020 13:52	WG1499615
Arsenic	U		0.674	1.60	5	06/29/2020 13:52	WG1499615
Barium	47.5		2.00	3.99	5	06/29/2020 13:52	WG1499615
Beryllium	U		1.17	3.99	5	06/29/2020 15:48	WG1499615
Cadmium	U		0.649	1.60	5	06/29/2020 13:52	WG1499615
Calcium	709	J	379	799	5	06/29/2020 13:52	WG1499615
Chromium	U		3.58	7.99	5	06/29/2020 13:52	WG1499615
Cobalt	U		0.799	1.60	5	06/29/2020 13:52	WG1499615
Copper	U		3.99	7.99	5	06/29/2020 13:52	WG1499615
Iron	1620		61.5	79.9	5	06/29/2020 13:52	WG1499615
Lead	U		1.60	3.19	5	06/29/2020 13:52	WG1499615
Magnesium	U		270	799	5	06/29/2020 13:52	WG1499615
Manganese	25.7		1.95	3.99	5	06/29/2020 13:52	WG1499615
Nickel	U		1.92	3.99	5	06/29/2020 19:38	WG1499615
Potassium	498	J	294	799	5	06/29/2020 13:52	WG1499615
Selenium	U		1.61	3.99	5	06/29/2020 13:52	WG1499615
Silver	U		0.340	0.799	5	06/29/2020 13:52	WG1499615
Sodium	820		486	799	5	06/29/2020 13:52	WG1499615
Thallium	U		1.30	3.19	5	06/29/2020 13:52	WG1499615
Vanadium	2.11	J	1.29	3.99	5	06/29/2020 13:52	WG1499615
Zinc	U		13.0	39.9	5	06/29/2020 13:52	WG1499615

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	81.1		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.0780		0.0222	0.0493	1	06/25/2020 21:55	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	11800		45.4	61.7	5	06/29/2020 13:55	WG1499615
Antimony	U		1.91	3.70	5	06/29/2020 13:55	WG1499615
Arsenic	6.23		0.521	1.23	5	06/29/2020 13:55	WG1499615
Barium	130		1.54	3.08	5	06/29/2020 13:55	WG1499615
Beryllium	U		0.907	3.08	5	06/29/2020 15:52	WG1499615
Cadmium	U		0.501	1.23	5	06/29/2020 13:55	WG1499615
Calcium	1740		292	617	5	06/29/2020 13:55	WG1499615
Chromium	19.5		2.76	6.17	5	06/29/2020 13:55	WG1499615
Cobalt	10.6		0.617	1.23	5	06/29/2020 13:55	WG1499615
Copper	41.8		3.08	6.17	5	06/29/2020 13:55	WG1499615
Iron	16300		47.5	61.7	5	06/29/2020 13:55	WG1499615
Lead	5.95		1.23	2.47	5	06/29/2020 13:55	WG1499615
Magnesium	2690		208	617	5	06/29/2020 13:55	WG1499615
Manganese	710		1.50	3.08	5	06/29/2020 13:55	WG1499615
Nickel	34.3		1.48	3.08	5	06/29/2020 19:55	WG1499615
Potassium	1300		227	617	5	06/29/2020 13:55	WG1499615
Selenium	U		1.25	3.08	5	06/29/2020 13:55	WG1499615
Silver	U		0.263	0.617	5	06/29/2020 13:55	WG1499615
Sodium	534	J	375	617	5	06/29/2020 13:55	WG1499615
Thallium	U		1.01	2.47	5	06/29/2020 13:55	WG1499615
Vanadium	24.9		0.993	3.08	5	06/29/2020 13:55	WG1499615
Zinc	59.4		10.1	30.8	5	06/29/2020 13:55	WG1499615

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	87.0		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.151		0.0207	0.0460	1	06/25/2020 21:32	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	8770		42.3	57.5	5	06/29/2020 13:58	WG1499615
Antimony	U		1.78	3.45	5	06/29/2020 13:58	WG1499615
Arsenic	4.46		0.485	1.15	5	06/29/2020 13:58	WG1499615
Barium	94.3		1.44	2.87	5	06/29/2020 13:58	WG1499615
Beryllium	U		0.845	2.87	5	06/29/2020 15:55	WG1499615
Cadmium	U		0.467	1.15	5	06/29/2020 13:58	WG1499615
Calcium	999		272	575	5	06/29/2020 13:58	WG1499615
Chromium	12.9		2.57	5.75	5	06/29/2020 13:58	WG1499615
Cobalt	10.9		0.575	1.15	5	06/29/2020 13:58	WG1499615
Copper	78.3		2.87	5.75	5	06/29/2020 13:58	WG1499615
Iron	12400		44.2	57.5	5	06/29/2020 13:58	WG1499615
Lead	5.41		1.15	2.30	5	06/29/2020 13:58	WG1499615
Magnesium	1060		194	575	5	06/29/2020 13:58	WG1499615
Manganese	1060		1.40	2.87	5	06/29/2020 13:58	WG1499615
Nickel	33.6		1.38	2.87	5	06/29/2020 19:58	WG1499615
Potassium	842		211	575	5	06/29/2020 13:58	WG1499615
Selenium	U		1.16	2.87	5	06/29/2020 13:58	WG1499615
Silver	U		0.245	0.575	5	06/29/2020 13:58	WG1499615
Sodium	U		349	575	5	06/29/2020 13:58	WG1499615
Thallium	U		0.936	2.30	5	06/29/2020 13:58	WG1499615
Vanadium	19.6		0.925	2.87	5	06/29/2020 13:58	WG1499615
Zinc	41.7		9.36	28.7	5	06/29/2020 13:58	WG1499615

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	75.7		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.184		0.0238	0.0529	1	06/25/2020 21:57	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	5450		48.6	66.1	5	06/29/2020 14:02	WG1499615
Antimony	U		2.05	3.97	5	06/29/2020 14:02	WG1499615
Arsenic	7.05		0.558	1.32	5	06/29/2020 14:02	WG1499615
Barium	116		1.65	3.30	5	06/29/2020 14:02	WG1499615
Beryllium	U		0.972	3.30	5	06/29/2020 15:58	WG1499615
Cadmium	0.571	J	0.537	1.32	5	06/29/2020 14:02	WG1499615
Calcium	473	J	313	661	5	06/29/2020 14:02	WG1499615
Chromium	12.0		2.96	6.61	5	06/29/2020 14:02	WG1499615
Cobalt	78.4		0.661	1.32	5	06/29/2020 14:02	WG1499615
Copper	134		3.30	6.61	5	06/29/2020 14:02	WG1499615
Iron	53100		50.9	66.1	5	06/29/2020 15:58	WG1499615
Lead	9.32		1.32	2.64	5	06/29/2020 14:02	WG1499615
Magnesium	487	J	223	661	5	06/29/2020 14:02	WG1499615
Manganese	8020		3.24	6.61	10	06/29/2020 16:05	WG1499615
Nickel	144		1.59	3.30	5	06/29/2020 20:02	WG1499615
Potassium	572	J	243	661	5	06/29/2020 14:02	WG1499615
Selenium	U		1.34	3.30	5	06/29/2020 14:02	WG1499615
Silver	U		0.282	0.661	5	06/29/2020 14:02	WG1499615
Sodium	U		402	661	5	06/29/2020 14:02	WG1499615
Thallium	2.11	J	1.08	2.64	5	06/29/2020 14:02	WG1499615
Vanadium	15.8		1.06	3.30	5	06/29/2020 14:02	WG1499615
Zinc	307		10.8	33.0	5	06/29/2020 14:02	WG1499615

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	78.9		1	06/27/2020 00:10	WG1499745

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Mercury	0.180		0.0228	0.0507	1	06/25/2020 22:00	WG1499309

Metals (ICPMS) by Method 6020

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg	mg/kg		date / time	
Aluminum	8040		46.6	63.4	5	06/29/2020 14:05	WG1499615
Antimony	U		1.96	3.80	5	06/29/2020 14:05	WG1499615
Arsenic	2.77		0.535	1.27	5	06/29/2020 14:05	WG1499615
Barium	88.4		1.58	3.17	5	06/29/2020 14:05	WG1499615
Beryllium	U		0.932	3.17	5	06/29/2020 16:02	WG1499615
Cadmium	U		0.515	1.27	5	06/29/2020 14:05	WG1499615
Calcium	618	J	300	634	5	06/29/2020 14:05	WG1499615
Chromium	7.30		2.84	6.34	5	06/29/2020 14:05	WG1499615
Cobalt	15.5		0.634	1.27	5	06/29/2020 14:05	WG1499615
Copper	43.4		3.17	6.34	5	06/29/2020 14:05	WG1499615
Iron	25300		48.8	63.4	5	06/29/2020 14:05	WG1499615
Lead	5.99		1.27	2.54	5	06/29/2020 14:05	WG1499615
Magnesium	512	J	214	634	5	06/29/2020 14:05	WG1499615
Manganese	1610		1.55	3.17	5	06/29/2020 14:05	WG1499615
Nickel	39.4		1.52	3.17	5	06/29/2020 20:05	WG1499615
Potassium	509	J	233	634	5	06/29/2020 14:05	WG1499615
Selenium	U		1.28	3.17	5	06/29/2020 14:05	WG1499615
Silver	U		0.270	0.634	5	06/29/2020 14:05	WG1499615
Sodium	386	J	385	634	5	06/29/2020 14:05	WG1499615
Thallium	U		1.03	2.54	5	06/29/2020 14:05	WG1499615
Vanadium	12.5		1.02	3.17	5	06/29/2020 14:05	WG1499615
Zinc	118		10.3	31.7	5	06/29/2020 14:05	WG1499615

Method Blank (MB)

(MB) R3543662-1 06/27/20 00:10

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.00100			

L1232296-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1232296-08 06/27/20 00:10 • (DUP) R3543662-3 06/27/20 00:10

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	78.9	75.9	1	3.84		10

Laboratory Control Sample (LCS)

(LCS) R3543662-2 06/27/20 00:10

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3543142-1 06/25/20 21:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Mercury	U		0.0180	0.0400

Laboratory Control Sample (LCS)

(LCS) R3543142-2 06/25/20 21:29

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.500	0.526	105	80.0-120	

L1232296-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1232296-06 06/25/20 21:32 • (MS) R3543142-3 06/25/20 21:34 • (MSD) R3543142-4 06/25/20 21:37

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.575	0.151	0.828	0.796	118	112	1	75.0-125			3.85	20

Method Blank (MB)

(MB) R3544344-1 06/29/20 11:27

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aluminum	U		36.8	50.0
Antimony	U		1.55	3.00
Arsenic	U		0.422	1.00
Barium	U		1.25	2.50
Beryllium	U		0.735	2.50
Cadmium	U		0.406	1.00
Calcium	U		237	500
Chromium	U		2.24	5.00
Cobalt	U		0.500	1.00
Copper	U		2.50	5.00
Iron	U		38.5	50.0
Lead	U		1.00	2.00
Magnesium	U		169	500
Manganese	U		1.23	2.50
Potassium	U		184	500
Selenium	U		1.01	2.50
Silver	U		0.213	0.500
Sodium	U		304	500
Thallium	U		0.815	2.00
Vanadium	U		0.805	2.50
Zinc	U		8.15	25.0

Method Blank (MB)

(MB) R3544471-1 06/29/20 19:07

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Nickel	U		1.21	2.50

Laboratory Control Sample (LCS)

(LCS) R3544344-2 06/29/20 11:31

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	1000	897	89.7	80.0-120	
Antimony	100	92.1	92.1	80.0-120	
Arsenic	100	92.9	92.9	80.0-120	
Barium	100	86.5	86.5	80.0-120	
Beryllium	100	81.9	81.9	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3544344-2 06/29/20 11:31

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Cadmium	100	95.9	95.9	80.0-120	
Calcium	1000	1040	104	80.0-120	
Chromium	100	92.8	92.8	80.0-120	
Cobalt	100	95.6	95.6	80.0-120	
Copper	100	86.5	86.5	80.0-120	
Iron	1000	952	95.2	80.0-120	
Lead	100	92.9	92.9	80.0-120	
Magnesium	1000	854	85.4	80.0-120	
Manganese	100	93.1	93.1	80.0-120	
Potassium	1000	921	92.1	80.0-120	
Selenium	100	93.9	93.9	80.0-120	
Silver	20.0	18.8	93.8	80.0-120	
Sodium	1000	1070	107	80.0-120	
Thallium	100	92.5	92.5	80.0-120	
Vanadium	100	89.0	89.0	80.0-120	
Zinc	100	92.7	92.7	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3544471-2 06/29/20 19:10

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCS Rec. %	Rec. Limits %	LCS Qualifier
Nickel	100	98.6	98.6	80.0-120	

L1232296-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1232296-01 06/29/20 11:34 • (MS) R3544344-5 06/29/20 11:44 • (MSD) R3544344-6 06/29/20 11:47

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	224	12400	15700	15900	294	316	5	75.0-125	V	V	1.60	20
Antimony	22.4	U	56.7	57.3	50.7	51.2	5	75.0-125	J6	J6	0.910	20
Arsenic	22.4	4.71	96.4	98.8	81.9	84.0	5	75.0-125			2.39	20
Barium	22.4	177	287	268	99.0	81.9	5	75.0-125			6.86	20
Beryllium	22.4	U	85.9	88.5	76.7	79.1	5	75.0-125			3.00	20
Cadmium	22.4	U	103	104	92.2	93.1	5	75.0-125			0.998	20
Calcium	224	1770	2720	2930	84.4	104	5	75.0-125			7.66	20
Chromium	22.4	17.4	107	110	79.7	82.9	5	75.0-125			3.31	20
Cobalt	22.4	9.56	103	108	83.9	88.3	5	75.0-125			4.62	20

L1232296-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1232296-01 06/29/20 11:34 • (MS) R3544344-5 06/29/20 11:44 • (MSD) R3544344-6 06/29/20 11:47

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Copper	22.4	31.2	122	130	81.0	88.2	5	75.0-125			6.35	20
Iron	224	15300	15700	21900	40.1	590	5	75.0-125	V	J3 V	32.8	20
Lead	22.4	7.06	103	107	85.3	89.7	5	75.0-125			4.69	20
Magnesium	224	1950	2590	2700	56.9	67.0	5	75.0-125	J6	J6	4.27	20
Manganese	22.4	720	936	1010	193	263	5	75.0-125	V	V	8.07	20
Potassium	224	914	1870	1840	85.4	82.8	5	75.0-125			1.58	20
Selenium	22.4	U	97.1	96.0	86.8	85.7	5	75.0-125			1.19	20
Silver	4.48	U	20.3	19.5	90.6	87.2	5	75.0-125			3.81	20
Sodium	224	432	1440	1390	90.1	85.2	5	75.0-125			3.91	20
Thallium	22.4	U	98.0	96.9	87.6	86.6	5	75.0-125			1.17	20
Vanadium	22.4	25.1	112	116	77.2	81.1	5	75.0-125			3.79	20
Zinc	22.4	57.9	156	175	87.3	105	5	75.0-125			11.7	20

L1232296-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1232296-01 06/29/20 19:14 • (MS) R3544471-5 06/29/20 19:24 • (MSD) R3544471-6 06/29/20 19:27

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Nickel	22.4	29.6	120	120	80.9	81.2	5	75.0-125			0.233	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

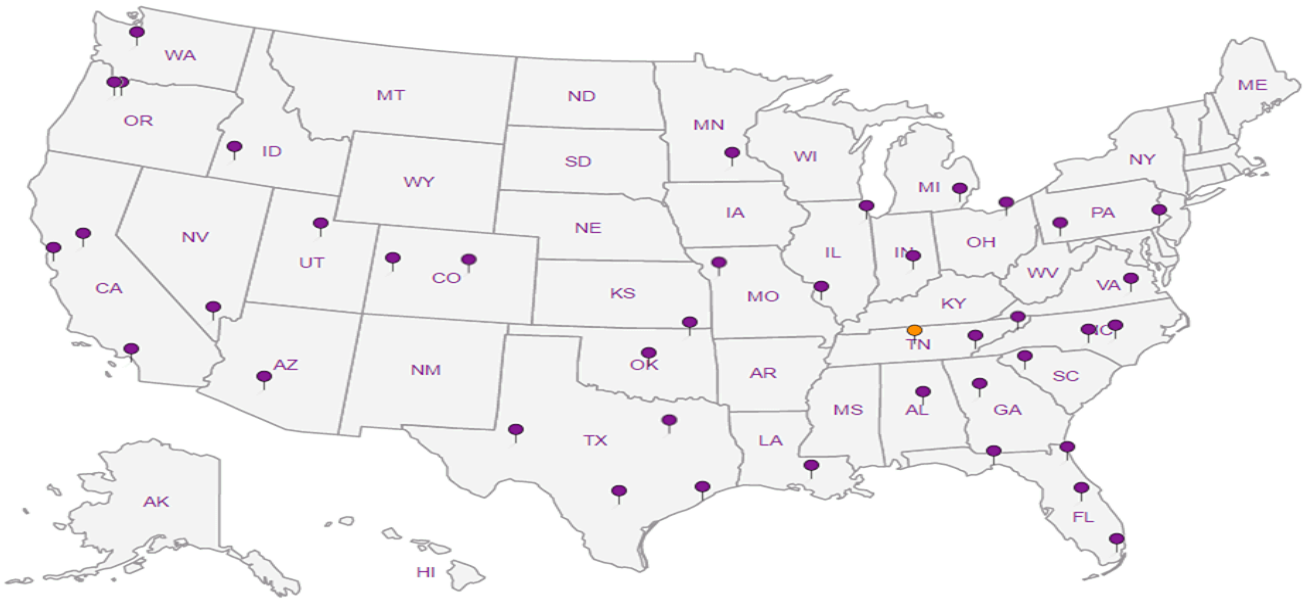
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Applied Intellect, LLC-BOISE
1670 E Monterey Drive
Boise, ID 83706

Billing Information:
Accounts Payable
c/o Ajit Louis
1827 Willow Oak Dr.
Wexford, PA 15090

Report to: Olivia Salmon

Email To: olivia.salmon@ap-in.com

Project Description: BB/BJ Data Gap Investigation

City/State Collected: Grant County OR

Please Circle: PT MT CT ET

Phone: 435-363-6690

Client Project # EN19.003

Lab Project #

Collected by (print): Bob Lambeth

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	TAL Metals 6020	Remarks	Sample # (lab only)
BLK-TP1-2	Grab	SS		6/A/2020	4:19	1	X		-01
BLK-TP1-5					4:20	1	X		-02
BLK-TP2-2					3:00	1	X		-03
BLK-TP2-4					3:03	1	X		-04
BLK-TP3-2					2:00	1	X		-05
BLK-TP3-5					2:20	1	X		-06
BLK-TP4-1					6:30	1	X		-07
BLK-TP4-3					6:35	1	X		-08

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1232294

Table # E229

Acctnum:

Template:

Prelogin:

PM:

PB:

Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 1790 3033 8170

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6/22/2020	13:30	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	6/22/20	1730	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Billy Ballard

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp 3PM3 °C Bottles Received: 8
1.7-2=1.5

If preservation required by Login: Date/Time

Date: 6/23/20 Time: 0845

Hold:

Condition: NCF / OK

Infiltration Calculations

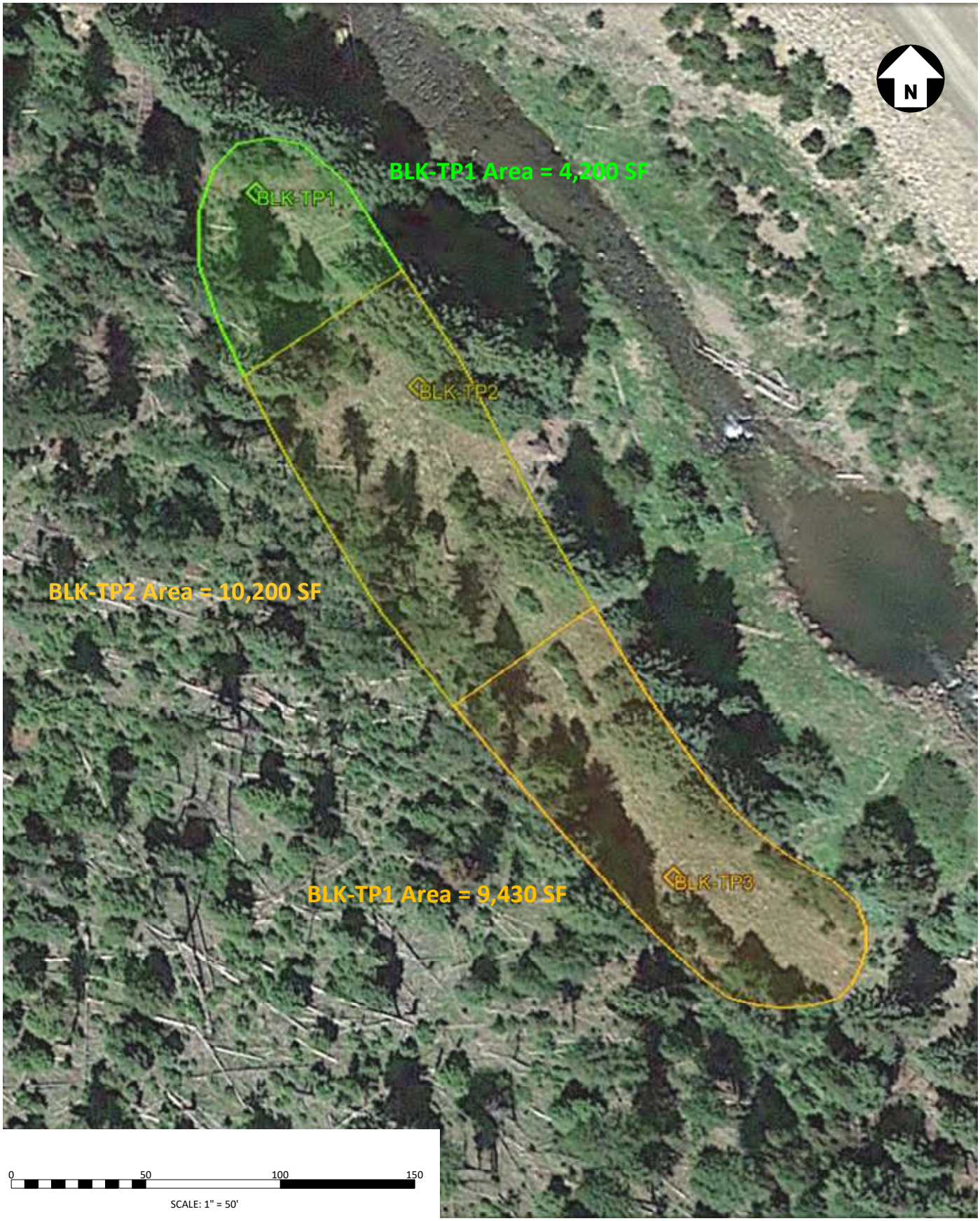


FIGURE LOG			
DESIGNED:	R.MISKINES	12/9/2020	
DRAWN:	R.MISKINES	12/9/2020	
CHECKED:	P.HUNTER	12/9/2020	
REVISIONS			
No. 1:	Draft	12/9/2020	RAM
No. 2:	Final	12/10/2020	RAM
No. 3:			

APPLIED INTELLECT

FIGURE NAME: TEST PIT REPRESENTATIVE AREAS INFILTRATION RATE ASSESSMENT

PROJECT NAME: BLUEBIRD/BLACKJACK EE/CA REPORT

FIGURE NUMBER: 1

TABLE 1 - Infiltration Test Analysis

Location	R_{NO} Normalized Outflow Rate [1] (cfs/ft head)	A_{TP} Test Pit Infiltration Area [2] (SF)	$R_{INFILTRATION}$ Unit Infiltration Rate [3] (fps/ft head)	A_R Representative Area [4] (SF)	D Assumed Depth (ft head)	$C_{INFILTRATION}$ Infiltration Capacity (GPM)
BLK-TP1	0.01	56.0	1.79E-04	4,200	2.0	673
BLK-TP2	0.0004	56.0	7.14E-06	10,200	2.0	65
BLK-TP3	0.01	56.0	1.79E-04	9,430	2.0	1,512
TOTAL				**23,830**		**2,250**

NOTES:

(1) ***Normalized Outflow Rate*** hand calculation (Data Gap Report, Attachment 3 - SDA, 9/28/2020)

(2) Wetted extent of each test pit measured approximately 8.0'L x 7.0'W.

(3) $R_{INFILTRATION} = R_{NO} / A_{TP}$

(4) See Appendix 4, Figure 1.

(5) $C_{INFILTRATION} = R_{INFILTRATION} * A_R * D * (7.4805 \text{ gallon/ft}^3 * 60 \text{ sec/min})$