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ENVIROMENTAL BASELINE SAMPLING REPORT

Parcel SS-86, Summit County, Utah

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1. INTRODUCTION

Geosyntec Consultants, Inc. (Geosyntec) was retained by Stoel Rives, LLP (Stoel Rives) on behalf of the Town of Hideout to conduct environmental baseline sampling within Parcel SS-86, which encompasses approximately 138 acres of undeveloped land within Summit County, Utah (Subject Property or Site). The sampling was conducted in accordance with Geosyntec's proposal to Stoel Rives dated 21 January 2021. The Site location is shown on **Figure 1** (Site Location Map). The general layout and features of the Site are shown in **Figure 2** (Site Layout Map).

The sampling was conducted to establish baseline environmental conditions within the Site relative to the presence of the Richardson Flat Tailings site (Richardson Flat), which is located immediately to the northwest of the Subject Property, and to assess conditions as part of the potential annexation of the Site by the Town of Hideout and the potential future development of the property.

1.1 Site Description and Background

The Site contains approximately 138 acres of undeveloped land located at roughly 40°40'30.2" N 111°26'32.6" W along Richardson Flat Road in Summit County, Utah. The Site is comprised of a discontinuous parcel, which is bisected from east to west by a historic Union Pacific railroad grade that has been converted into a hiking and biking trail (Rail Trail). The property containing the Rail Trail in not part of the Site and is located within a separate parcel that is owned by the State of Utah (See **Figure 1** – Site Layout Map).

An earthen embankment is present in the southeast portion of the Site. This feature crosses an ephemeral stream that drains topographically higher areas along the western, southern, and eastern margins of the Site. The embankment dates back to at least the 1930s and appears to have potentially been constructed as part of an old road embankment or railroad grade. It is also speculated that it may have been constructed as a water retention feature (CMT Engineering 2020). However, the exact purpose of this structure is unknown. Surrounding land use includes a mix of undeveloped, past industrial/historic mining, commercial, and residential land.

The Site is currently owned by Stichting Mayflower Mountain Fonds and is reportedly used for livestock grazing. In addition to livestock grazing, Site observations also indicate that the Subject Property has historically been trespassed and periodically used for ad-hoc recreational purposes such as hiking, off-road vehicle use and clay pigeon target shooting.

The Richardson Flat site is listed on the proposed National Priorities List (NPL) and consists of four operable units (OUs) which have been impacted by historic mining activities and/or wastes. OU1, which consists of the historical Richardson Flat tailings impoundment, is located immediately adjacent to the north/northwest of the Subject Property (it is noted that the Subject Property is not within the boundary of OU1). The tailings impoundment is owned by United Park City Mines (UPCM) and covers an area of approximately 160 acres (USEPA 2005). Aerial photographs suggest that the impoundment potentially received tailings from at least the late 1930s until approximately 1982. Over course of operation, the impoundment received approximately 450,000 tons of tailings (USEPA 2005).

OU2 and OU3 encompass approximately 2,000 acres of the Lower Silver Creek floodplain, which has been impacted by the discharge of mine tailings, and are located downstream of OU1 (the nearest OU2/OU3 boundary is approximately 1 mile west of the Site). OU4 is comprised of a surface water discharge to Lower Silver Creek known as the Prospector Drain, which is located approximately 2.5 miles west of the Site. The constituents of concern for the Richardson Flat site include aluminum, arsenic, cadmium, copper, lead, mercury, nickel, and zinc (USEPA 2021).

Investigation of OU1 began in the mid-1980's. Remediation of OU1 was completed in 2011 and involved stabilizing the existing tailings impoundment, diverting surface water, and consolidating, then capping, the mine tailings that were present within the impoundment. Capping of the impoundment has been completed except for select areas within OU1 that have a temporary 6-inch soil cover to facilitate potential further consolidation of wastes from OU2 and OU3. Groundwater investigations have shown that groundwater flows to the north-northwest within the boundary of OU1 and that the capped impoundment does not present a risk to offsite groundwater. Based on the most recent 5-year review for Richardson Flat (USEPA 2018), the remedy for OU1 is reported to be functioning well and is protective of human health and the environment; however, it is noted that institutional controls for the OU1 called for in the Record of Decision (ROD) have not yet been implemented (USEPA 2018). Future institutional controls would likely include formal land and groundwater use limitations for the Richardson Flat site. EPA is working with the responsible party for OU1 to develop an institutional control plan, which will address this issue (USEPA 2018). Investigation of the remaining OUs (OUs 2, 3, and 4) is ongoing and final remedial actions have not been determined.

2. SCOPE OF WORK

Baseline sampling activities were conducted by Geosyntec on 13 April 2021 and included the collection of surface soil, surface water, and groundwater samples from representative locations within the Site to establish baseline conditions. Sample locations were recorded in the field with a hand-held GPS and are shown on the attached **Figure 3 – Sample Location Map**. Detailed sampling information is provided in the following sections.

2.1 Surface Soil Sample Collection

Grab surface soil samples were collected from a total of 14 locations (samples SS-1 through SS-14), an average of approximately 1 sample per each 10 acres, to evaluate general surface soil conditions and potential metals impacts from wind-blown deposition of tailings from the Richardson Flat site. Samples were collected from approximately 0 to 3 inches below ground surface (bgs), to be representative of the uppermost surficial soil, using disposable plastic sampling scoops.

2.2 Groundwater Sample Collection

Shallow groundwater samples were collected from two locations (SB-01 and SB-02) near the northwest boundary of the Site. The groundwater samples were collected to assess general groundwater conditions on the downgradient edge of the property, immediately upgradient from the Richardson Flat site.

The groundwater samples were collected via temporary direct-push borings advanced in each location and extracted using a temporary 4-foot long, stainless-steel sampling screen and peristaltic pump equipped with disposable tubing to extract the groundwater from the boring and collect the samples. All downhole equipment (drill rods temporary sampling screens, etc.) were decontaminated between locations using a high-pressure sprayer.

At boring location SB-01, refusal was encountered on large rock and cobbles at depth of 30 inches bgs. However, shallow groundwater was detected at a depth of 20 inches bgs in the boring, and sufficient water was present to obtain a sample. At boring location SB-02, groundwater was detected at depth of approximately 2 feet bgs and the sample was obtained from 2 to 6 feet bgs. Soils observed in both locations consisted primarily of gravelly clay. Boring logs completed during the drilling are included in Appendix A.

2.3 Surface Water Sample Collection

Two surface water samples (SW-01 and SW-02) were collected from the small ephemeral drainage that emanates from the central portion of the Site and flows to the north-northwest to assess general surface water conditions. This drainage contains infrequent water, generally only in the spring from snowmelt or during high precipitation events. The Site does not contain any perennial surface water bodies.

Sample SW-01 was collected from a seep in the upper portion of the drainage. Sample SW-02 was collected from a small area of ponded water at the bottom of the drainage, near the offsite discharge point in the northwest corner of the Site. The ponded water in this area appears to form due to the presence of the Richards Flat Road, which forms an embankment across the drainage, backing up surface water that collects along the upstream side of the road. Surface water samples were collected from both locations by slowly submersing and directly filling the sample bottles from the ponded water in both locations by hand.

2.4 Laboratory Analysis

Upon collection, all samples were labeled and placed into laboratory-supplied sampling jars and stored in a cooler with wet ice for delivery to the analytical laboratory under chain-of-custody. All samples were submitted to Pace Analytical Laboratory (Pace), a Utah-certified environmental laboratory for the following analyses:

- Soil – Total RCRA metals plus aluminum antimony copper and zinc by EPA Methods 6010B and 7471A.
- Surface water and groundwater – Dissolved RCRA metals plus aluminum antimony copper and zinc by EPA Methods 6010B and 7470A.

All surface water and groundwater samples were filtered by the laboratory prior to analysis. The laboratory report prepared by Pace is included as Appendix B. The laboratory sample results are discussed in Section 3.0.

3. LABORATORY SAMPLE RESULTS

The following sections present a discussion of the laboratory sample results for the surface soil, groundwater, and surface water samples collected from the Site.

3.1 Surface Soil Sample Results

The surface soil sample results are summarized in Table 1. As a means of evaluating the surface soil data, the results were screened against the USEPA Regional Screening Levels (RSLs) for residential soil. The RSLs are risk-based screening criteria that are used by the USEPA to evaluate chemical concentrations for different media under the Superfund program. Concentrations below the RSL are protective of human health and generally indicate no further action or study is needed. The Utah Department of Environmental Quality (UDEQ) does not have established screening criteria for metals in soil and typically utilizes the RSLs as default screening criteria for sites managed under their regulatory programs.

As shown in Table 1, with the exception of arsenic, all of the analyzed metals concentrations are below the USEPA RSLs for residential soil and do not indicate potentially elevated metals concentrations that would pose a risk to human health are present in soil within the Site. As discussed further below, the arsenic concentrations observed in the surface soil samples are consistent with typical background levels for the surrounding area and western United States (U.S), which commonly exceed the USEPA RSLs due to naturally occurring concentrations of this element.

To evaluate the arsenic that was detected in the surface soil samples, arsenic concentrations were compared to background samples collected from the OU1 (RMC 2004) and OU2/OU3 (USEPA 2018) of the Richardson Flat site and typical background levels for the western U.S. soil (Shacklette, et al. 1984), as shown in Table 2[1]. Arsenic concentrations in the surface soil samples from the Site were observed to range from 5.50 mg/kg to 14.0 mg/kg. In comparison, background concentrations for arsenic for OU1 and OU2/OU3 as a whole ranged from 3.1 mg/kg to 17.5 mg/kg. Similarly, studies of background concentrations of arsenic in the western U.S. soils show arsenic concentrations ranging from 0.1 to 97 mg/kg.

Based on the above comparison, the observed arsenic concentrations are consistent with naturally occurring elemental concentrations of arsenic found in the surrounding area and western U.S. and do appear to be related to potential impacts from the Richardson Flat site. Further, the observed concentrations would not pose a greater risk of exposure to arsenic in comparison to surrounding native and undisturbed areas. Under the Superfund program, USEPA does not require cleanup actions to address background concentrations of metals or other constituents, as it is not feasible to reduce concentrations below naturally occurring levels.

[1] Background samples for OU1 and OU2/OU3 were collected from representative areas outside the boundaries of the OUs and are representative of natural background conditions, not background levels within the sites themselves.

3.2 Groundwater Sample Results

The groundwater sample results are summarized on Table 3. As a means of evaluating the groundwater sample data, the results were screened against the Utah Groundwater Quality Standards (UGWQSs) established under Utah Administrative Code (UAC) R317-6-2. In instances where established UGWQSs do not exist for certain parameters, the USEPA RSLs for tap water ingestion have been conservatively applied.

As shown in Table 3, low concentrations of arsenic, barium, chromium, nickel, and selenium were detected in one or both of the groundwater samples. Of the detected compounds, none of the reported concentrations exceeded the UGWQSs or USEPA RSLs. Based on the observed results, elevated metals concentrations were not detected in shallow groundwater near the northwestern (downgradient) edge of the Site and groundwater does not appear to be impacted by the Richardson Flat site. It is noted that groundwater flow is generally towards the north-northwest of the Site (RMEC 2004), and the Subject Property is located upgradient from the Richardson Flat property. Hence, it is unlikely that groundwater would be impacted in the future given the downgradient location of the Richardson Flat site relative to the Subject Property.

3.3 Surface Water Sample Results

The surface water sample results are summarized in Table 4. As a means of evaluating the surface water sample data, the results were screened against the Numeric Surface Water Criteria (NSWC) and Human Health Criteria (HHC) for surface waters established under UAC R317-2-14. The NSWC and HHC criteria were both conservatively based on Class 1C water (protected for domestic purposes with prior treatment) based on the designated use classification for the Silver Creek drainage by the UDEQ Division of Water Quality (DWQ). The DWQ classifies Silver Creek from the confluence of the Weber River to the headwaters of the drainage as being protected for domestic purposes (1C), infrequent recreational (2B), cold water game fish and aquatic species (3A), and agricultural uses (4). It is noted that the criteria for Class 1C water was conservatively used, as it is the most stringent criteria, but that surface water is not currently used for drinking water within the Site, and it is not anticipated that it will be used as part of any future development.

As shown in Table 4, the sample collected from location SW-01, which was collected from a seep in the central portion of the Site, showed detections for aluminum, barium, copper, and nickel, with all the concentrations falling below the relevant NSWC or HHC criteria. Sample SW-02, collected from the area of ponded water near the bottom drainage, showed detections for aluminum, antimony, arsenic, barium, and zinc. With the exception for antimony and arsenic, all of the reported detections were below the relevant NSWC or HHC criteria.

Antimony was detected in SW-02 at a reported concentration of 0.00762 mg/L, which slightly exceeds the HHC criteria for antimony of 0.0056 mg/L (there is no NSWC criteria for antimony). Arsenic was detected in this same sample at a concentration of 0.0178 mg/L, which slightly exceeds both the NSWC and HHC criteria for arsenic of 0.01 mg/L.

As part of the remedial investigation conducted for OU1 of the Richardson Flat site, select background surface water samples were collected to assess background surface water conditions (REMC 2004)[2]. Background concentrations of dissolved antimony were reported to range from < 0.005 to 0.01 mg/L. Background concentrations of arsenic were reported to range from < 0.005 to 0.008 mg/L. The reported antimony concentration detected in sample SW-02 is within the range of background concentrations of antimony detected as part of the OU1 remedial investigation. Arsenic was detected slightly above the OU1 background concentration range, but within the same order or magnitude (difference of less than 0.0098 mg/L). As noted in Section 2.1, elevated levels of naturally occurring arsenic are present in the Site and surrounding areas, which may be a contributing source to the observed arsenic concentrations.

Based on the above comparison, the observed detections of antimony and arsenic are likely representative of naturally occurring background levels of these metals. This is supported by the fact that the Site is located higher in elevation and hydrologically upgradient from Richardson Flat, and as such, surface water does not flow from the Richardson Flat site onto the Subject Property. Further, the observed surface water results are generally consistent with background concentrations that are reported for OU1 and evidence of potential impacts from the Richardson Flat site are not observed in other media (surface soil or groundwater data).

The NSWC and HHC criteria that were used to evaluate the surface water samples are very conservative and assume domestic surface water use or consumption. Surface water within the Site is limited in extent and is only intermittently present within the Subject Property and will not be used for drinking water purposes as part of any potential future development. While the Silver Creek drainage is designated for domestic use (Class 1 C), the criteria for aquatic wildlife and agricultural use are more directly applicable to the Site (there are no surface water criteria for recreational use). For comparison, the numeric surface water criteria for aquatic wildlife and agricultural use are 0.087 mg/L (acute exposure) and 0.1 mg/L, respectively, for arsenic (there is no standard for antimony), which are both higher than the observed arsenic concentrations that were detected in SW-02.

[2] Background samples collected upgradient of OU1.

4. QUALITY ASSURANCE QUALITY CONTROL

Quality assurance/quality control (QA/QC) samples that were collected and procedures that were performed in conjunction with this assessment are summarized and evaluated in the following sections. These evaluations did not identify significant data quality issues and demonstrate that the laboratory data are of sufficient quality for the intended use of evaluating baseline conditions within the Site.

4.1 Field Sampling Procedures

All samples were placed into clean, laboratory-supplied sample vials and stored on wet ice during transport to the laboratory. All samples were received by the laboratory properly labeled and in good condition. Temperatures at the time of delivery met the method-specified temperature. During sampling, chain-of-custody records were maintained as evidence of sample custody and control from the point of collection through laboratory analysis.

4.2 Laboratory Analytical Procedures

All samples were analyzed for the metals specified in Section 2.4 using EPA Methods 6010B and/or 7470A and 7471A in accordance with the analytical tests that were requested on the chain-of-custody. Based on a review of the laboratory reports, all sample holding times were met.

4.3 Field QA/QC Samples

QA/QC samples were collected in conjunction with the sampling activities for each media (surface soil, surface water, and groundwater) to verify the quality of the laboratory data. This included the collection of blind field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples. Field duplicates were collected at a frequency of 1 per 10 samples, and MS/MSD samples were collected at a frequency of 1 per 20 samples. Additionally, one equipment blank sample was also collected from the temporary stainless-steel sampling screen used to collect the groundwater samples. This was the only non-disposable sampling equipment used during the sampling; therefore, no other equipment blanks were collected.

4.3.1 Blind Duplicate Samples

Based on the total number of samples that were collected, two blind duplicate surface soil samples were collected (blind duplicate sample SS-44 collected at location SS-01 and blind duplicate sample SS-66 collected at location SS-06). One blind duplicate each was collected with the surface water and groundwater samples (blind duplicate surface water sample SW-12 collected from location SW-01, and blind duplicate groundwater sample SB-12 collected at location SB-12). All duplicate samples were given fabricate sample identifications and sample times so that the true location of the samples was not known to the laboratory. A summary of the blind duplicate and parent sample results is presented on Table 5.

As shown in Table 5, good reproducibility and precision was observed between the parent and duplicate sample results with the relative percent difference (RPD) for detected parameters falling

below 20 percent, where applicable. An RPD of 20 percent was as used as a general guideline for evaluating the overall accuracy and precision of the laboratory data in accordance with general guidelines presented in National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA 2017).

4.3.2 MS/MSD Samples

Project-specific MS/MSD samples were collected with the surface soil, surface water, and groundwater samples that were collected with the project.

The surface soil MS/MSD was collected at sample location SS-06. All recoveries for the MS/MSD performed on SS-06 were within the laboratory control limits, except for antimony and lead. Antimony showed a low recovery in both the MS and MSD samples. Lead was within the laboratory control limit for the MS sample, but showed a slightly high recovery in the MSD sample. The above results indicate that antimony may be biased low and lead may be biased high in the results from SS-06. The recoveries outside of the laboratory control limits for antimony and lead were attributed to potential matrix interference in the sample and were qualified by the laboratory. The serial dilution performed on aluminum also indicated potential matrix interference for this parameter and was qualified. The laboratory qualifications are included the surface soil sample summary table (Table 1).

The surface water MS/MSD was collected at location SW-02, and the groundwater MS/MSD was collected at location SB-02. Both MS and MSD samples at these locations were within the laboratory control limits for all parameters. The serial dilution performed for barium in the sample from SW-02 indicating a potential matrix interference for this parameter and was qualified by the laboratory.

4.3.3 Equipment Blank

An equipment blank sample (GW-EB) was collected from the stainless-steel sampling screen used to collect the groundwater samples from locations SB-01 and SB-02. No other non-disposable sampling equipment was used.

With the exception of trace levels of aluminum and barium, all parameters were non-detect in the equipment blank sample. A review of the groundwater sample results shows that aluminum was not detected in any of the associated groundwater samples. Barium was detected in the groundwater samples, but the observed concentrations were several orders of magnitude higher than the observed concentrations in the equipment blank, indicating that the observed detections were associated with concentrations of barium in groundwater and not a result of potential cross-contamination from the sampling equipment. Based on the above results, the decontamination procedures that were used during the field sampling were effective at reducing potential cross-contamination and the data do not appear to be significantly affected by potential cross-contamination.

4.4 Laboratory QA/AC Samples

Internal laboratory QC sample (Method Blanks and Laboratory Control Samples) summaries were reviewed for all samples analyzed during the project. The following presents a discussion of these results and any associated qualification of the data by the laboratory.

4.4.1 Method Blanks

All laboratory method blank sample results were below the laboratory method detection limit, with the exception for a trace detections (below the reporting limit) of barium in the Method Blank associated with sample SW-02 and arsenic in the Method Blank associated with samples SB-01, SB-02, and SB-12 (duplicate sample of SB-02). The observed detections of barium and arsenic may indicate potential laboratory cross-contamination for these parameters in these samples. The detected results of barium and arsenic in the above samples have been qualified by laboratory. The associated laboratory qualifications are included the analytical summary tables.

4.4.2 Laboratory Control Samples

All laboratory control sample (LCS) results were within laboratory specified control limits, and no qualification of the data was required.

4.5 QA/QC Summary

The field and laboratory QA/QC samples did not identify and significant data quality issues and none of the data are rejected.

5. FINDINGS AND CONCLUSIONS

Baseline sample results do not show evidence of impact to the Subject Property from the Richardson Flat site. Concentrations of arsenic in soil and arsenic and antimony in one of the surface water samples were detected above relevant screening criteria; however, these concentrations appear to be related to naturally occurring concentrations of these constituents and not related to impacts from the Richardson Flat site. All other metals concentrations in the environmental baseline samples that were collected were below relevant screening criteria.

6. REFERENCES

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TABLES

FIGURES

APPENDIX A
Boring Logs

APPENDIX B
Laboratory Analytical Report