YEAR-END REPORT

FOR THE 2021 FIELD SEASON

AT LEVIATHAN MINE

Alpine County, California

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Prepared by:
California Regional Water Quality Control Board, Lahontan Region
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Submitted to:
USEPA, Region IX
75 Hawthorne Street, SFD-7-2
San Francisco, CA 94105-3901

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1. INTRODUCTION

Leviathan Mine is a former sulfur mine that the State of California acquired in the early 1980s to address water quality problems caused by historical mining. Jurisdiction over Leviathan Mine rests with the State Water Resources Control Board, which, in turn, has delegated jurisdiction over cleanup work to the California Regional Water Quality Control Board, Lahontan Region (Water Board). On May 11, 2000, the United States Environmental Protection Agency (USEPA) placed Leviathan Mine on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List, thus making Leviathan Mine a federal Superfund site.

On July 19, 2000, pursuant to its authority under CERCLA, USEPA issued an Administrative Abatement Action (AAA) to the Water Board and directed the Water Board to implement certain pollution abatement and site monitoring activities at Leviathan Mine. With slight modifications, USEPA reissued the AAA in 2001, 2002, 2003, 2004, and 2005. In its 2005 AAA, instead of issuing the AAA every year, USEPA decided to allow its Remedial Project Manager to notify the Water Board of the necessity to continue the work for an additional year, for each year that the first phase of Non-Time Critical Removal Action (NTCRA) continues.

This Year-End Report for the 2021 Field Season at Leviathan Mine (Year-End Report) has been prepared by the Water Board for the USEPA to comply with Paragraph No. 50 of USEPA's July 14, 2005 AAA, which states:

> Within thirty (30) days after the LRWQCB [Water Board] concludes that the seasonal work on the NTCRA has been fully performed, the LRWQCB shall so notify EPA and shall schedule and conduct a pre-certification inspection to be attended by the LRWQCB and EPA. The pre-certification inspection shall be followed by a written report submitted within ninety (90) days of the inspection by the LRWQCB's Project Coordinator certifying that all work to date on the NTCRA has been completed in full satisfaction of the requirements of this Administrative Action.

USEPA and Water Board staff conducted the pre-certification inspection for the Leviathan Mine Site with the Water Board submission of an electronic mail providing a summary of the 2021 field season on December 9, 2021.

This Year-End Report constitutes the "written report" as referenced in Paragraph No. 50 of the AAA and contains year-end summaries of Water Board field activities performed in 2021. The activities required of the Water Board by the USEPA are described in Paragraph No. 37 of the AAA. These activities consist of:

1. Summer treatment of Acid Mine Drainage (AMD) captured year-round in a series of ponds;
2. Site maintenance of ponds, drainage and diversion channels, and gates and fences; and
3. Site monitoring of water quality, water quantity, and meteorological information.

Water Board staff conducted the above-listed activities in accordance with the *2021 Work Plan for Leviathan Mine, Alpine County, California* (Work Plan) prepared by the Water Board.

This Year-End Report describes the site activities performed by the Water Board in 2021, and is organized into the following sections:

- Background – provides a description of the site setting and history; collection and storage of AMD; and the treatment process;
- Pond Water Treatment and Sludge Removal – provides a description of AMD treatment and the removal and disposal of sludge in 2021;
- Surface Water Monitoring – provides a description of ongoing surface water flow monitoring in 2021; and
- Site Maintenance – provides a description of 2021 site maintenance activities.

Pond water treatment data are summarized in eight tables in Appendix A (A-1 through A-8). Laboratory reports and electronic data deliverables for pond water samples, United States Geological Survey (USGS) flow and stage data, and Pond Water Treatment Operator Logs are included as electronic files on the enclosed disc and are organized into Appendices B through D.

2. BACKGROUND

2.1 Site Setting and History

Leviathan Mine is located on the eastern slope of the Sierra Nevada Mountains in Alpine County, California (Figure 1). The mine is approximately six miles east of Markleeville, California and five miles west of Topaz Lake, Nevada. Based on the Final Title Search and Survey Report conducted by Science Applications International Corporation (SAIC) for the USEPA on January 31, 2000, the Leviathan Mine encompasses thirty-two patented mineral claims and a patented mill site. The majority of land disturbed by mining activities is on state-owned property, with the remainder of the disturbance located on property owned by the United States Department of Agriculture, Forest Service, Humboldt-Toiyabe National Forest (USFS). The USFS owns the majority of land surrounding the mine according to the above-mentioned SAIC report, with the exception of ten private parcels along the southern boundary of the mine site.

Leviathan and Aspen Creeks (Figure 2) flow across the mine site and join below the mine. Approximately 1.5 miles downstream of the confluence of Leviathan and Aspen Creeks, Leviathan Creek joins Mountaineer Creek. The combined flow of Leviathan and Mountaineer Creeks forms Bryant Creek. Approximately 3.5 miles downstream of the confluence of Leviathan and Mountaineer Creeks, Bryant Creek flows across the Nevada state line. Approximately 3.3 miles downstream of the Nevada state line, Bryant Creek joins the East Fork Carson River.

Historical mining activities at Leviathan Mine included underground and open pit extraction of sulfur-rich ore. These activities resulted in the exposure of naturally occurring sulfide minerals to air and water. This exposure triggered a series of chemical reactions that caused local groundwater to become acidic and metal-rich. The acidic groundwater discharges from an old mine tunnel as well as seeps at several locations within the Leviathan Mine site. When this AMD enters local surface water bodies, it adversely affects water quality, which, in turn, affects algae, insect, and fish growth, and damages the in-stream habitat through deposition of metal-rich precipitates.

The Water Board has implemented several projects to abate AMD from entering local surface water bodies. In 1985, the Water Board completed construction of a pollution abatement project at Leviathan Mine to address certain specific problem areas. This project included the construction of AMD storage and evaporation ponds, which are a major component of the Water Board's pond water collection and treatment activities.

2.2 AMD Collection and Storage

The 1985 pollution abatement project included construction of five lined evaporation ponds (Figure 3) to capture and evaporate AMD from remnant underground mine workings. The primary sources of AMD to the pond system are the Adit and the Pit Under-Drain (PUD).

The Adit is the location where acidic groundwater emanated from a remnant tunnel excavated during underground mining activities in the 1930s. The exact condition of the interior of the tunnel is unknown, but the tunnel is collapsed at its portal. The approximate location of the tunnel and other site features are shown in Figure 3. As part of the 1985 pollution abatement project, the Water Board's contractor installed an underground drain to collect acidic groundwater emanating from the Adit. The underground drain consists of a 12-inch-diameter perforated pipe in a bed of drain rock. The perforated pipe is connected to a non-perforated 12-inch pipe that carries the AMD to a concrete flow control structure. AMD from the Adit has a pH of less than 3.0 and typically has a discharge rate between nine (9) and 15 gallons per minute (gpm) with rates as high as approximately 67 gpm (based on flow data collected by USGS at 15-minute intervals from 1999 to present).

The Water Board's contractor installed the PUD during construction of the 1985 pollution abatement project to dewater saturated soils in the bottom of the open pit (Pit) prior to backfilling the Pit to its current elevation. The PUD consists of approximately 1,500 linear feet of 12-inch-diameter perforated pipe set in a bed of drain rock beneath the Pit bottom, buried in backfill material. The perforated pipes connect to a non-perforated 18-inch-diameter pipe that conveys the PUD discharge to the flow control structure. AMD from the PUD has a pH of less than 3.0 and typically has a flow rate between 0.1 and 4 gpm, with rates as high as approximately 67 gpm (based on flow data collected by USGS at 15-minute intervals from 1999 to present).

The five evaporation ponds (Ponds 1, 2 South, 2 North, 3, and 4; see Figure 3) cover a combined surface area of approximately 11.8 acres with a cumulative holding capacity of approximately 15.4 million gallons (based on a 2012 survey conducted by Atlantic Richfield Company [ARC]). AMD from the flow control structure is routed to the pond

system via underground PVC piping. AMD is directed to the pond system by gravity to any combination of Ponds 1, 2 South, and 2 North via a series of valves, as these ponds are interconnected and are at the same elevation. These three ponds are commonly referred to as the "upper ponds" and have a combined storage volume of approximately 14 million gallons. Pond 3 can receive overflow from the upper ponds by gravity via PVC overflow pipes. Overflow from Pond 3 flows in PVC piping and can be directed by gravity, via valves, to either Leviathan Creek or to Pond 4. Overflow from Pond 4 flows directly to Leviathan Creek via PVC piping. ARC is using Pond 4 for storage and treatment of other AMD sources. Since the spring of 2006, Pond 4 has been isolated from Pond 3 by a closed valve, and there has been no discharge from Pond 3 to Pond 4. Any discharges from Pond 3 are routed to Leviathan Creek. In 2021, Pond 3 did not receive overflow from any of the upper ponds, and there were no discharges from Pond 3 to Leviathan Creek.

2.3 Pond Water Treatment Processes

The Water Board treats AMD from the upper ponds and discharges the treated AMD during the summer (and spring, if needed) to renew pond storage capacity for the subsequent winter and spring months. The Water Board's treatment of AMD contained in the ponds is accomplished through lime neutralization. The neutralization of AMD by the addition of lime has long been accepted as an effective means to raise pH and remove metals in AMD. Lime (calcium hydroxide or $Ca[OH]_2$) is mixed into the AMD from the ponds; the addition of lime causes an increase in pH and the precipitation of dissolved constituents, including metals, contained in the AMD. The precipitated solids are settled out of solution, and the final products are: (1) a practically metal-free effluent with near neutral pH, and (2) a metal-rich waste sludge.

3. 2021 POND WATER TREATMENT AND SLUDGE REMOVAL

The 2021 AMD treatment and associated activities included sludge removal from the Pit Clarifier in late-June, and AMD treatment at the pond water treatment plant adjacent to Pond 1 (Plant) from late-June through mid-August.

3.1 Pit Clarifier Sludge Removal and Disposal

Approximately 336 tons of sludge generated during operations of the pond water treatment plant (Plant) in 2020 were removed from the Pit Clarifier by the Water Board's contractor AECOM Technical Services (AECOM), in late-June 2021. The sludge was sampled, analyzed, and characterized in the fall of 2020; the results from the fall 2020 sampling were reported in the Water Board's 2020 Year-End Report. The sludge was hauled to a Class I hazardous waste landfill in Beatty, Nevada for disposal. Hazardous waste manifests are available for review at the Water Board's office in South Lake Tahoe. The sand drainage layer in the bottom of the Pit Clarifier was evaluated; the sand layer was within the specified thickness, and replenishment was not necessary. Sludge removal and disposal activities are shown in Photo 1.

3.2 2021 Summer Pond Water Treatment Plant Operation

The Water Board assembled the Plant during the 1999 field season on the northeast corner of Pond 1 and tested the process at full-scale during the 1999 and 2000 field seasons. The Water Board has continued to operate the Plant during the summer months from 2001 through 2021. The typical Water Board field season at Leviathan Mine runs from mid-June through mid-October.

The Plant has also been referred to as the Pond 1 lime treatment plant, because it is located adjacent to Pond 1 and treats AMD stored in Ponds 1, 2 North, and 2 South using lime treatment technology. The Plant draws AMD from Pond 1 for treatment, thereby lowering the surface elevation of AMD stored in Pond 1. The lower level in Pond 1 causes AMD from Pond 2 North and Pond 2 South to flow by gravity to Pond 1. As the level of AMD drops near the end of the treatment season, portable transfer pumps are used to move water from Pond 2 North and Pond 2 South to Pond 1. The Plant conveys the treated AMD and suspended precipitated solids to the Pit Clarifier located in the bottom of the Pit. The Pit Clarifier has plan dimensions of approximately 150 feet by 150 feet, and includes a gravel/sand-covered perforated pipe underdrain and a 10-inch diameter PVC decanting device, known as the piccolo decant structure.

The Water Board contracted with AECOM for Plant operations for the 2021 field season. AMD treatment began in late-June, with the first treated AMD entering the Pit Clarifier on June 28, 2021. Discharge of treated AMD from the Pit Clarifier to Leviathan Creek began on July 1, 2021, and treatment ceased on August 13, 2021. Plant operations were not conducted from July 17, 2021 through August 8, 2021, due to a mandatory site evacuation caused by the Tamarack wildfire. AECOM chose to operate the Plant 24 hours per day, five days per week during treatment operations.

In 2021, AECOM used dry lime delivered to the site in 50-pound bags. AECOM mixed dry lime with Leviathan Creek water from upstream of the mine. AECOM used a two-point lime addition during most of the 2021 treatment season.

Figure 4 shows the Plant system layout and Figure 5 shows a simplified piping and instrumentation diagram of the Plant. AECOM pumped AMD from Pond 1 to a 10,000-gallon fiberglass tank (R-1). A pH probe installed in R-1 measured the pH in R-1 and controlled the amount of lime slurry added to R-1. The lime slurry raised the pH of the AMD from approximately 2.5 to an approximate range of 3.0 to 4.0, as measured in R-1. A mixer and compressed air were used in R-1 at all times to agitate, oxidize, and promote mixing. The AMD flowed by gravity from R-1 through a two-chambered combination flash/flocculation mix tank (FF-1). The fluid mixture flowed by gravity from FF-1 into a 10,000-gallon fiberglass reaction tank referred to as R-2. A mixer and compressed air were used in R-2 to further agitate, oxidize, and promote mixing. A pH probe in R-2 measured pH and metered the addition of lime slurry. The lime slurry raised the pH of the partially-treated AMD to an approximate range of 8.2 to 8.5, as measured in R-2. The fluid mixture then flowed by gravity through a second flash/flocculation mix tank (FF-2) in which compressed air and/or mixers were used to promote mixing.

The fluid mixture flowed by gravity from FF-2 into a clarifier tank (CL-2). A polyacrylamide polymer solution was injected into the fluid mixture at the bottom of CL-2 to promote flocculation and solids settling in the Pit Clarifier. Two 10-hp slurry pumps transferred the fluid mixture from the bottom of CL-2 to the Pit Clarifier, where solids settled out in near-quiescent conditions. During the 2021 treatment season, AECOM used a pH probe in FF-2 to control the slurry pumps and to prevent the transfer of treated AMD having a pH below 8.1 or above 8.7 to the Pit Clarifier. By means of this control system, treated AMD having a pH outside the range of 8.1-8.7 is automatically diverted back to Pond 1 for re-treatment. The pH probe, controller, and pump combination provided additional reliability as well as a final confirmation pH measurement.

A small portion of utility water is used to dilute the polyacrylamide polymer that is added into the fluid mixture at the bottom of CL-2. Typically, this utility water is collected from Leviathan Creek upstream of the disturbed portion of the site and is stored in two 15,000-gallon utility water tanks adjacent to the Plant. During some drier years, it has been periodically necessary to use treated AMD discharged from the Pit Clarifier as a source of utility water. In 2021, Water Board staff made minor repairs to the utility water capture and conveyance system thereby improving the efficiency of the system. Those repairs allowed the flow of Leviathan Creek in 2021 to supply an adequate volume of utility water for the entire treatment season. As such, treated AMD was not used at any time during the treatment season for utility water.

In 2021, treated AMD was discharged from the Pit Clarifier using the underdrain and piccolo decant structure. Treated AMD from the Pit Clarifier is routed through the Water Board's effluent weir box prior to discharging to Leviathan Creek. Treated AMD stage data and water quality control samples were collected at the 90-degree V-notch weir in the Water Board's effluent weir box. Stage data were recorded at 15-minute intervals using a data logger/pressure transducer system. The Water Board's stage data were used to calculate treated effluent discharge volumes from the Pit Clarifier.

Discharge of treated AMD from the Pit Clarifier to Leviathan Creek began on July 1, 2021. When AECOM staff evacuated the site on July 16, 2021, due to the Tamarack wildfire, the Plant was shut down. However treated AMD continued to be discharged from the Pit Clarifier as the accumulated sludge drained. When AECOM and Water Board staff were allowed to enter the site on August 2, 2021, flow of treated AMD from the Pit Clarifier was below five gpm. Prior to resuming Plant operations on August 9, 2021, Water Board staff closed the Pit Clarifier underdrain and piccolo decant structure. The underdrain and piccolo decant structure remained closed until August 11, 2021, when discharge of treated AMD from the Pit Clarifier to Leviathan Creek resumed. Discharge to Leviathan Creek then occurred continuously until all treated AMD was discharged from the Pit Clarifier. After the pond water was treated and the Plant was shut down on August 13, 2021, treated AMD continued to be discharged from the Pit Clarifier as the accumulated sludge drained. By September 8, 2021, approximately 2.9 million gallons of treated AMD had been discharged to Leviathan Creek and flows from the Pit Clarifier underdrain were well below five gpm. A summary of daily treated AMD volumes discharged to Leviathan Creek is presented in Table A-1 of Appendix A.

The 2021 Plant operation consumed 45.6 tons of high calcium hydrated lime (approximately 90 percent calcium hydroxide by weight), 94 gallons of liquid flocculent, 1,900 gallons of diesel fuel, and 195 gallons of gasoline. The Water Board's treatment effort in 2021, combined with natural evaporation, resulted in the upper pond system having the maximum available storage capacity of approximately 14 million gallons at the end of the treatment effort.

Sludge generated by the Plant in 2021 is contained in the Pit Clarifier to allow for further dewatering. Dewatering of the sludge over the winter will increase solids content and reduce both the volume and mass of the sludge. Water Board staff estimates that approximately 250 – 290 tons of sludge, generated during 2021 summer operations, will be disposed of in 2022.

3.3 Summer Pond Water Treatment Monitoring

Treatment process monitoring, sampling, and analysis were performed in accordance with the Water Board's April 2021 *Sampling and Analysis Plan for Leviathan Mine Site Pond Water Treatment* (PWT SAP). A summary of the monitoring parameters, locations, and frequencies for the 2021 Pond Water Treatment (PWT) monitoring program is presented in Table 1. Specific details of sample collection and handling are described in the PWT SAP. Effluent samples were collected and analyzed for comparison with USEPA Discharge Criteria; the USEPA Discharge Criteria are set forth in the September 25, 2008 Non-Time Critical Removal Action for the Leviathan Mine Site and are summarized in Table 2. In 2021, there were 62 minor deviations from the PWT SAP, as explained in Section 3.4.3, none of which were for effluent samples. Samples collected by AECOM staff were transferred under Chain of Custody for laboratory analysis by offsite laboratory, Microbac, of Marietta, Ohio.

To confirm the quality of treated AMD discharged to Leviathan Creek, AECOM collected grab samples of the treated AMD (effluent) twice weekly during the 2021 treatment season. AECOM collected effluent samples from the Water Board's effluent weir box located near the Pit Clarifier. As specified in the 2021 Work Plan, effluent sample collection stopped when the discharge of effluent dropped below five (5) gpm, which occurred on August 26, 2021. The first effluent sample was collected on July 1, 2021, and the last effluent sample was collected on August 23, 2021. To confirm the USEPA Discharge Criteria would be met, two pre-discharge samples were taken prior to discharging effluent to Leviathan Creek. These samples were collected by AECOM on June 29 and June 30, 2021 from the Pit Clarifier. Additionally, AECOM collected Plant influent samples from the line conveying pond water to the Plant weekly during the 2021 treatment season.

In summary, AECOM collected the following samples for analytical laboratory analysis as part of the 2021 PWT monitoring program:

- 10 effluent samples (2 per week)
- 2 effluent duplicate samples
- 2 pre-discharge samples
- 4 pre-treatment influent samples

- 2 field method blank samples

A portion of each grab sample was field filtered using a 0.45 micron filter, preserved with nitric acid, and submitted to the laboratory to be analyzed for the following dissolved metals/metalloids: aluminum (Al), arsenic (As), copper (Cu), chromium (Cr), cadmium (Cd), nickel (Ni), iron (Fe), lead (Pb), and zinc (Zn). An unfiltered portion of each grab sample was preserved with nitric acid and submitted to the laboratory for total recoverable selenium (Se) analysis. At least once per week, in addition to the above analyses, AECOM submitted to the laboratory samples of Plant influent and effluent for total dissolved solids (TDS), dissolved sulfate (SO_4), calcium (Ca), cobalt (Co), magnesium (Mg), manganese (Mn), antimony (Sb), barium (Ba), beryllium (Be), mercury (Hg), silver (Ag), thallium (Tl), and vanadium (V). During influent and effluent sample collection activities, AECOM monitored and recorded pH and temperature in the field on sampling record forms. Sample identification tracking forms and sampling record forms are available for review at the Water Board's office in South Lake Tahoe. Analytical and field monitoring results of Plant effluent and influent samples are summarized in Tables A-2 and A-3 of Appendix A, respectively. These tables include non-detect results for effluent and influent samples, in which case the lab qualifier of a U (The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.) is included in the Data Qualifier column and the method detection limit value is included in the table.

To provide real-time information on effluent quality and system operation, treatment plant operators measured the pH and temperature approximately every hour while the system was operating at four mid-process locations (R-1, R-2, FF-2, and influent to Pit Clarifier) and at one effluent location (effluent weir box). Operators used these data to check against in-system pH probes to modify lime additions, if necessary, and maintain effluent quality. Temperature and pH data collected by AECOM from R-1, R-2, FF-2, the Pit Clarifier, and the weir box are summarized in Table A-4 of Appendix A. Copies of AECOM's operator logs are available for review in the Water Board's office in South Lake Tahoe.

Sludge generated during the 2021 treatment effort, and contained in the Pit Clarifier, was sampled on October 14, 2021, for waste characterization and disposal purposes. AECOM collected three sludge samples from three different locations in the Pit Clarifier. At the time of sampling, the depth of accumulated sludge in the Pit Clarifier ranged from 16.5 to 30 inches.

Sludge samples were analyzed for comparisons with Total Threshold Limit Concentrations (TTLC) and Soluble Threshold Limit Concentrations (STLC) for California Code of Regulations Title 22 metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc), aluminum, and iron; and percent solids. Additionally, sludge samples were analyzed pursuant to the Toxicity Characteristic Leaching Procedure (TCLP) for disposal purposes. Analytical results for the sludge samples are summarized in Table A-5 of Appendix A. Table A-5 includes non-detect results for sludge samples, in which case the lab qualifier ND is included in the Data Qualifier column and the method detection limit value is included in the table.

3.4 Sampling Results from Summer Pond Water Treatment Monitoring

3.4.1 Monitoring Objectives

Specific objectives of the PWT monitoring program are:

- Identify the chemical characteristics of the Plant influent.
- Identify the chemical characteristics of the Plant effluent.
- Identify the chemical characteristics of solids generated in the treatment process.
- Monitor field pH at critical points within the treatment system and at the discharge point as a means to monitor and control treatment efficacy.
- Monitor the Plant's effectiveness in meeting USEPA Discharge Criteria.

3.4.2 Data Summary

Laboratory analytical results for effluent are summarized in Table A-2. These data are collected for comparison with the USEPA Daily Maximum Discharge Criteria, which are also included in Table A-2. All PWT effluent data met the USEPA Daily Maximum Discharge Criteria in 2021.

Table A-3 summarizes laboratory analytical results for Plant influent samples. Results are generally consistent with previous treatment seasons. Plant influent sample pH ranged from 2.39 to 2.48 and TDS ranged from 5,390 to 6,900 mg/L with an average of 6,232.5 mg/L. Results of pH and temperature for data collected by Plant operators are included in Table A-4. Measurements of pH taken by Plant operators show that the discharge of effluent to Leviathan Creek met USEPA Discharge Criteria, and that desired pH levels were achieved in the Plant throughout the treatment season.

A summary of daily discharge from the Pit Clarifier is included in Table A-1. A total of approximately 2.9 million gallons of effluent was discharged from the Pit Clarifier to Leviathan Creek in 2021. The 15-minute discharge stage data recorded by the data logger (which are the basis of discharge flow calculations) are available for review at the Water Board's office in South Lake Tahoe.

Results of the Pit Clarifier sludge characterization analyses are presented in Table A-5 for sludge generated during the 2021 treatment season. On October 14, 2021, AECOM collected three sludge samples from the Pit Clarifier to characterize sludge generated during the 2021 treatment season. These three sludge samples averaged 17.4 percent solids at the time of collection. With the exception of the STLC analysis for Nickel and TTLC analysis for arsenic, the sludge did not exceed any other STLC or TTLC limits. The total concentrations for nickel exceeded the STLC in two of the sludge samples. The arithmetic average nickel concentration for these two samples was 24.1 milligrams per liter (mg/L). The regulatory standard STLC for nickel is 20 mg/L. The total concentrations for arsenic exceeded the TTLC in two of the sludge samples. The arithmetic average arsenic concentration for these two samples was 591 milligrams per kilogram (mg/kg) on a dry-weight basis. The regulatory standard TTLC for arsenic is 500 mg/kg as measured on a wet-weight basis. Sludge sample results are reported on a dry-weight basis for this sampling effort because the percent solids at the time of

disposal is not known. Therefore, the dry-weight basis results constitute the most conservative evaluation of sludge quality. At the time of disposal in the late spring or early summer, the concentration of solids in the sludge has typically varied from about 25 to 55 percent. The average concentration of arsenic measured in the sludge would not exceed the TTLC on a wet-weight basis unless the sludge was approximately 85 percent or greater solids by weight. Therefore, it is possible the sludge could exceed the TTLC when it is disposed of in the late spring or early summer of 2022.

Copies of the laboratory's electronic data deliverable (EDD) files for Plant influent, effluent, and sludge samples are provided in Appendix B on compact disc. Appendix B also includes Portable Document Format (PDF) versions of the hard copy laboratory reports.

Sample name 2122PWT007 was not used during the 2021 field season. This sample name was inadvertently skipped in the sample naming sequence.

3.4.3 Data Quality Evaluation

AECOM and Water Board staff reviewed the quality of the PWT monitoring results. Sample collection, handling, preservation, and analysis were conducted as specified in the PWT SAP. Field quality control samples, including two field duplicate samples and two field method blank (FMB) samples, were collected. A Chain of Custody form was completed for each group of samples submitted to the analytical laboratories. Upon receipt of the laboratory report, Water Board staff reviewed the Chain of Custody to ensure that details such as the project name, sample ID numbers, sample dates, sample times, and requested parameters were properly reported. Water Board staff's data review also included an evaluation of sample holding times, an assessment of precision, an assessment of anomalous data, and a review of field duplicate sample and FMB results.

Data qualifiers from the laboratory, AECOM, and Water Board review are presented with the data in Tables A-2, A-3, and A-5. In 2021, Water Board staff assigned a data qualifier of "*" for data that did not meet the Water Board field duplicate assessment (relative percent difference) analysis. AECOM data qualifiers are summarized in Appendix C – AECOM 2021 Data Summary Report, Attachment 4.

AECOM submitted two field duplicate samples to the laboratory to measure the precision of the entire measurement system including sampling and analytical procedures in 2021. The relative percent difference (RPD) was calculated for each analyte in the primary and corresponding duplicate samples, as follows:

- If both the sample and duplicate values were equal to or greater than five times the RL, then the RPD was calculated by dividing the absolute value of the difference of the two measurements by the average of the two measurements and multiplying by 100. The RPD must be equal to or less than 25 percent to be within control limits.

- If either the sample or duplicate value was less than five times the RL, then the absolute value of the difference between the sample and duplicate values had to be equal to or less than the RL to be within control limits.

In 2021, the field duplicate samples were within the control limits for RPD for all analytes with one exception. For the sample/duplicate pair (sample 2122PWT004-EFF and duplicate 2122PWT006-EFF), the RPD for dissolved iron was 95 percent. Per the PWT SAP, the control limit of 25 percent is based on the analytical precision goals for the laboratory matrix spike duplicate samples.

Two FMB samples were collected and submitted for laboratory analysis of the same parameters as PWT effluent samples. The FMB sample is collected and processed in the same method as that of effluent samples, except using laboratory-supplied purified deionized water for the FMB. There were no positive detections in the FMB samples in 2021.

Staff were not permitted on-site during the mandatory evacuation for the Tamarack Fire. As such, effluent samples were not collected during the mandatory evacuation which is a deviation from the PWT SAP. Flow data from the pit clarifier during the evacuation indicates that three samples were not collected during the time effluent flow remained above 5 gpm. Operator logs and Water Board staff observations prior to the evacuation indicate successful treatment operations. Effluent that drained from the Pit Clarifier during evacuation likely had a chemical composition very similar to the effluent sample collected prior to evacuation on July 15, 2021.

There were sixty-two minor deviations from the PWT SAP that occurred in 2021. The first two deviations were for influent samples. Influent sample 2122PWT008-INF was a non-detect for total recoverable selenium, the reporting limit was 0.0200 mg/L; however, the SAP reporting limit is 0.004 mg/L. Influent sample 2122PWT014-INF was a non-detect for total recoverable selenium, the reporting limit was 0.0100 mg/L; however, the SAP reporting limit is 0.004 mg/L.

There were sixty minor deviations from the PWT SAP where sludge samples were analyzed at a reporting limit higher than specified in the PWT SAP. The moisture content in the collected sludge samples did not allow the laboratory to meet the specified reporting limits. Although the reporting limits were higher than specified in the PWT SAP, all of the reporting limits achieved by the laboratory were well below the sludge disposal regulatory criteria. For sample 2122PWT022-PC-A, the 20 minor deviations, where the reporting limits were higher than specified in the SAP, include: for TTLC – antimony, molybdenum, selenium, silver, and mercury, for STLC – antimony, lead and thallium, and for TCLP – antimony, arsenic, barium, copper, iron, lead, molybdenum, selenium, silver, thallium, vanadium, and mercury. For sample 2122PWT022-PC-B, the 20 minor deviations, where the reporting limits were higher than specified in the SAP, include: for TTLC – antimony, molybdenum, selenium, silver, and mercury, for STLC – antimony, lead and thallium, and for TCLP – antimony, arsenic, barium, copper, iron, lead, molybdenum, selenium, silver, thallium, vanadium, and mercury. For sample 2122PWT022-PC-C, the 20 minor deviations, where the reporting limits were higher than specified in the SAP, include: for TTLC – antimony, molybdenum, selenium, silver, and mercury, for STLC – antimony, lead and thallium, and for TCLP – antimony, arsenic, barium, copper, iron, lead, molybdenum, selenium, silver, thallium, vanadium, and mercury.

3.4.4 Database Format Discrepancies

Water Board staff did not format the laboratory-supplied EDDs in accordance with the template provided by ARC in their September 2006 Database Tech memo report (section B.6.3.1 of the 2010 PWT QAPP). ARC indicated in early January 2011 that they are trying to improve consistency across the Site-Wide Database; and therefore, the EDD templates are being refined. The laboratory used by the Water Board's contractor provides laboratory data in an EDD that will require changes by ARC prior to upload to the database. This information was submitted to ARC in a letter dated January 13, 2011, and the USEPA was also copied on this communication.

Water Board staff will continue to coordinate with subcontractors and laboratories during 2022 Pond Water Treatment activities to ensure that samples required by the Water Board's Work Plan are collected and analyzed in accordance with the PWT SAP. Water Board staff plan to discuss continued improvements with their contractor prior to the 2022 field season.

4. SURFACE WATER MONITORING

The Water Board continued its efforts through the 2021 water year to monitor surface water flow in the vicinity of Leviathan Mine. The Water Board also monitored the water surface elevation of Pond 1. Surface water flow and Pond 1 surface elevation data generated by Water Board monitoring activities are presented in the following section.

4.1 Flow and Stage Monitoring

Flow data are reported on the basis of water year. The 2021 water year began October 1, 2020 and ended September 30, 2021. Under contract to the Water Board, the USGS monitored water flows and pond water level stage at 14 locations during the 2021 water year. Flow monitoring locations, USGS station numbers, and equipment are identified in Table 3 and are shown on Figure 6. As shown in Table 3, 12 of the 14 stations have continuous stage records. One of the 14 stations (Station 16, Aspen Creek above the confluence of Aspen and Leviathan Creeks) is monitored manually, when conditions allow, only during USGS field visits, which occur approximately every six weeks, and one station (Station 24, Mountaineer Creek) is a calculated relationship derived by subtracting Station 23 (Leviathan Creek above the confluence of Mountaineer and Leviathan Creeks) from Station 25 (Bryant Creek below the confluence of Mountaineer and Leviathan Creeks). Tables D-1 through D-12 (Appendix D) provide the final data for the 2021 water year. Some flow and stage data may have been impacted by snow and/or ice and modified accordingly by the USGS.

Real-time provisional flow and stage recordings can be viewed on the web for the following eleven stations: Adit, PUD, Pond 1, Station 1, Station 15, Station 22, Station 23, Station 25, Pit Junction Box, Upper Tributary, and 4L Creek. The real-time data can be accessed through the USGS's website at: http://waterdata.usgs.gov/ca/nwis/current?type=flow. Published data reports can be searched by USGS station number at the USGS website: http://ca.water.usgs.gov/waterdata/.

5. SITE MAINTENANCE

The Water Board conducted routine and non-routine site maintenance work during the 2021 field season in accordance with the 2021 Work Plan.

5.1 Routine Maintenance

Routine maintenance activities performed in 2021 included repairing the perimeter fence, removing sediment from select storm water conveyances, replacing Best Management Practices (BMP's) for erosion control, maintaining pond liner cover material, and removing invasive weeds.

The perimeter fencing is barbed-wire and surrounds the majority of Leviathan Mine property. Water Board staff inspected the perimeter fence in early-August and noted that the Tamarack wildfire destroyed approximately 300-feet of the perimeter fence. The remainder of the fence required minor repairs in numerous locations around the site. Due to the more extensive repairs required by the Tamarack wildfire, Water Board staff requested that AECOM hire a fence subcontractor to rebuild the burned section of fence as well as make minor repairs to the remainder of the perimeter fence. AECOM's subcontractor repaired the perimeter fence in mid to late-October 2021. A portion of the Tamarack burn area can be seen in Photo 2 which shows the proximity of the burn to Leviathan Mine.

Water Board staff visually inspected storm water conveyances in the Pit and around the ponds for the presence of accumulated sediment. Water Board staff directed AECOM to remove accumulated sediment from storm water conveyance ditches in the Pond 1 area, along the Pit access road, in the Pit, and on the Pond 2 North and Pond 2 South berms. AECOM removed sediment from storm water conveyance ditches in mid-September 2021. Sediment removal activities can be seen in Photo 3.

Water Board staff noted that the BMP's along the Pit access road and in the Pond 1 area needed to be replaced. Water Board staff directed AECOM to remove the existing silt fence, remove sediment loading, and install new reinforced silt fence. AECOM replaced the silt fence in September 2021. Water Board staff also directed AECOM to remove existing fiber rolls near the confluence of Leviathan Creek and the Lower Tributary, remove sediment loading, and install new fiber rolls. AECOM replaced the fiber rolls in September 2021. Installation of new reinforced silt fence can be seen in Photo 4.

Water Board staff inspected the perimeters of Ponds 1, 2 North, 2 South, and 3 periodically throughout the field season and identified areas where the pond liners had become exposed due to erosion or displacement of the earthen liner cover. Water Board staff filled in minor rills in the Pond 1, Pond 2 North, Pond 2 South, and Pond 3 liner cover material on an as needed basis throughout the field season.

Periodically throughout the 2021 field season, Water Board staff inspected areas for the presence of the invasive plant, dyers woad (*Isatis tinctoria L.*). Dyers woad plants found by Water Board staff were removed using a small trowel to remove as much of the root as possible. Invasive plants were placed in sealed plastic bags for disposal. As in 2020, during the 2021 field season Water Board staff did not observe tall whitetop (*Lepidium latifolium*), as such the El Dorado County Department of Agriculture did not visit the site during the 2021 field season to spray for invasive plants.

5.2 Non-Routine Maintenance

5.2.1 Application of Epoxy Coating and Installation of Pipe Restraints on Pond 1 and 2 South Overflow Structures

During the 2020 field season, the overflow piping and associated concrete pedestals were replaced in Ponds 1 and 2 South. Due to the onset of colder weather conditions in the fall of 2020, the Water Board's contractor was unable to complete the application of a protective epoxy coating on the new concrete pedestals and the installation of pipe restraints on the overflow piping.

Upon completion of 2021 pond water treatment activities, AECOM carefully removed the pond liner cover material around each overflow structure exposing the entirety of each concrete pedestal. Once the concrete pedestals were exposed, AECOM applied an epoxy concrete primer followed by an epoxy coating and membrane sealant to the concrete. AECOM also installed pipe restraints to the overflow piping to provide additional stability. Once the concrete coating had sufficiently cured, the pond liner cover material was carefully replaced around each overflow structure.

5.2.2 Channel Under Drain (CUD) Pothole Activities

During the 2020 field season, the Water Board's contractor replaced the pipe assembly that conveys AMD from the downstream end of the CUD to a weir box on the bank of Leviathan Creek. With the pipe assembly removed, Water Board staff was able to inspect the interior of the CUD and noted that metal precipitates were obstructing a large portion of the pipe. Given the time of year (late-October 2020), and various concerns about the potential for an uncontrolled release of AMD that might occur if the obstruction was removed without further assessment of the conditions upstream of the partial obstruction, Water Board staff decided not to proceed with removal of the obstruction at that time. The new pipe assembly was installed just downstream of the partial obstruction in late-October 2020 and Water Board staff took no further field action to address the partial obstruction in 2020.

On June 23, 2021, Water Board staff submitted to USEPA an outline for proposed excavation activities (potholing) to locate and inspect the CUD. This outline proposed up to three potholes upstream from the CUD outlet to locate the CUD piping and collect information regarding construction of the CUD, and if possible, the flow of water into

and/or out of the CUD pipe in each of the excavations. On July 9, 2021, the USEPA provided their approval of the outline.

On September 21, 2021, AECOM used a tracked excavator to excavate a pothole (Pothole #1) on the west side of Leviathan Creek, approximately 280 feet upstream from the downstream end of the concrete channel. Excavation of the pothole began approximately 7 feet west of the concrete channel and extended 40 additional feet to the west. The pothole was completed to a depth of approximately 17 feet below ground surface. No evidence of the CUD, or gravel/filter fabric, was encountered at Pothole #1. After completion, Pothole #1 was backfilled and compacted to the existing ground surface elevation.

On September 22, 2021, AECOM used a tracked excavator to excavate a second pothole (Pothole #2) on the west side of Leviathan Creek, approximately 480 feet upstream from the downstream end of the concrete channel. At a depth of approximately 16.5 feet below ground surface, AECOM encountered white filter fabric and gravel. AECOM enlarged the excavation with benching to accommodate a trench box at the location where the fabric and gravel were found in Pothole #2. Once the trench box was in place, AECOM staff entered the excavation and used shovels and a hand probe to locate a PVC pipe at approximately 18.8 feet below ground surface. Due to the location of the pipe in relation to the trench box, it was necessary for AECOM to adjust the location of the trench box on September 23, 2021, and then continued exposing the pipe by hand. After AECOM finished exposing the pipe, the following observations were made: 1) manufacturer's writing observed on the pipe indicates that it is 12-inch, type PSM SDR 35 PVC sewer pipe, 2) the pipe was perforated with holes spaced approximately six inches apart along the bottom third of the pipe, 3) the holes perforating the pipe were approximately one-half inch in diameter, 4) by using a stethoscope flow was heard inside the pipe, 5) cloudy water from the excavation was observed flowing into the perforations, and 6) by gently using a cotton swab it was observed that all perforations in the excavation area (six) were unobstructed.

In addition to the observations listed above, Water Board staff observed cloudy water discharging at the CUD weir box downstream from the excavation which further confirmed that the pipe encountered in the excavation is part of the CUD. After collecting photographs, measurements, and all pertinent information from the excavation, AECOM re-wrapped the pipe with gravel and filter fabric and backfilled the excavation. Because water from the excavation was observed entering the perforations, Water Board staff were confident that there was not a backup of water inside the pipe. CUD pothole activities can be seen in Photos 5 and 6.

5.2.3 Channel Under Drain Cleanout

Given the low flow rate of the CUD during the fall of 2021, and based on information obtained during the CUD pothole project indicating there was not a backup of water in the CUD pipe, Water Board staff determined that it was an opportune time to remove metal precipitates from the CUD pipe. Water Board staff submitted a work plan for cleaning out the CUD to the USEPA on October 12, 2021. On October 29, 2021, ARC ended capture of the CUD, at which time CUD flows returned to Leviathan Creek. On

November 2, 2021, the USEPA provided their approval of the work plan. Metal precipitates obstructing the CUD pipe in November 2021 can be seen in Photo 7.

On November 3, 2021, AECOM began mobilizing equipment to the site for the CUD cleanout activities. On November 4, 2021, AECOM removed the discharge line that conveys AMD from the downstream end of the CUD to a weir box on the bank of Leviathan Creek and began installing a PVC manifold structure to the CUD stub-out at the end of the Leviathan Creek concrete channel. This manifold was secured to the concrete channel and would allow AECOM to advance a jetting tool into the CUD pipe to remove metal precipitates, while at the same time capturing the CUD flow and all dislodged metal precipitates and water introduced to the pipe by the jetting tool. AECOM plumbed the manifold to a pump which would convey water from the cleanout operation to two 2,000-gallon tanks staged west of ARC's HDS building. Solids would be allowed to settle out in the first tank, while the water (CUD flow and jetting water) would flow to the second tank. Once the tanks reached operating capacity, water would be pumped from the second tank to Pond 4.

On November 5, 2021, AECOM successfully advanced a jetting tool approximately 300 feet up the CUD pipe as measured from the stub-out at the downstream end of the concrete channel. Slow advancement of the jetting tool from 0-10 feet up the pipe indicated that this part of the pipe was mostly blocked with metal precipitates, advancement of the jetting tool from 10-50 feet up the pipe indicated occasional buildup of metal precipitates, and easy advancement of the jetting tool from approximately 50-300 feet up the pipe indicated minimal metal precipitate buildup in this section. Due to time constraints and incoming inclement weather, CUD cleanout activities were terminated at 300 feet upstream from the CUD stub-out.

While cleanout activities were underway, AECOM and Water Board staff monitored the flow of water and dislodged metal precipitates from the cleanout manifold. AECOM staff successfully pumped flow from the manifold to the two settling tanks where solids were allowed to settle before pumping the water to Pond 4.

Once the jetting tool was removed from the CUD pipe, water from the cleanout manifold continued to be pumped to the settling tanks until Water Board staff determined that flow from the CUD pipe was sufficiently clear. Once flow from the CUD was sufficiently clear, flow from the CUD was returned to Leviathan Creek. CUD cleanout activities can be seen in Photos 8 through 10. The CUD pipe following cleanout activities can be seen in Photo 11. AECOM staff then reinstalled the outlet pipe to convey AMD from the CUD flow to the weir box which then discharges to Leviathan Creek.

Water Board staff intended to perform a video inspection of the CUD pipe following cleanout activities. Due to the cleanout being completed very late in the field season, and the onset of winter weather, staff were unable to locate a contractor with availability to perform a video inspection. Provided field conditions allow, Water Board staff intend to have a video inspection of the CUD pipe performed during the 2022 field season, if CUD and stream flow conditions permit.

5.2.4 Concrete Channel Inspection and Coring

Water Board staff coordinated with the California Department of General Services to inspect the concrete channel that conveys Leviathan Creek through the mine site. Interactive Resources and Haynes Engineering sounded the concrete channel walls to locate any areas of delamination and collected concrete cores at a number of locations. Five concrete cores were tested for compressive strength and three cores were sent for petrographic analysis. As determined in previous studies, the inspection and testing of the concrete channel determined that the main source of concrete deterioration is the freeze thaw cycle. The results of the inspection and testing will be used to create repair plans for the concrete channel.

5.2.5 Pond Water Treatment Plant Improvement Project Design

After reviewing the 2019 tank inspection report prepared by Interactive Resources, Water Board staff determined that it is necessary to make certain improvements to the Pond Water Treatment Plant. The proposed improvements will include the removal of legacy pond water treatment components, construction of new foundations, improved tank access, and the addition of a new lime mixing system.

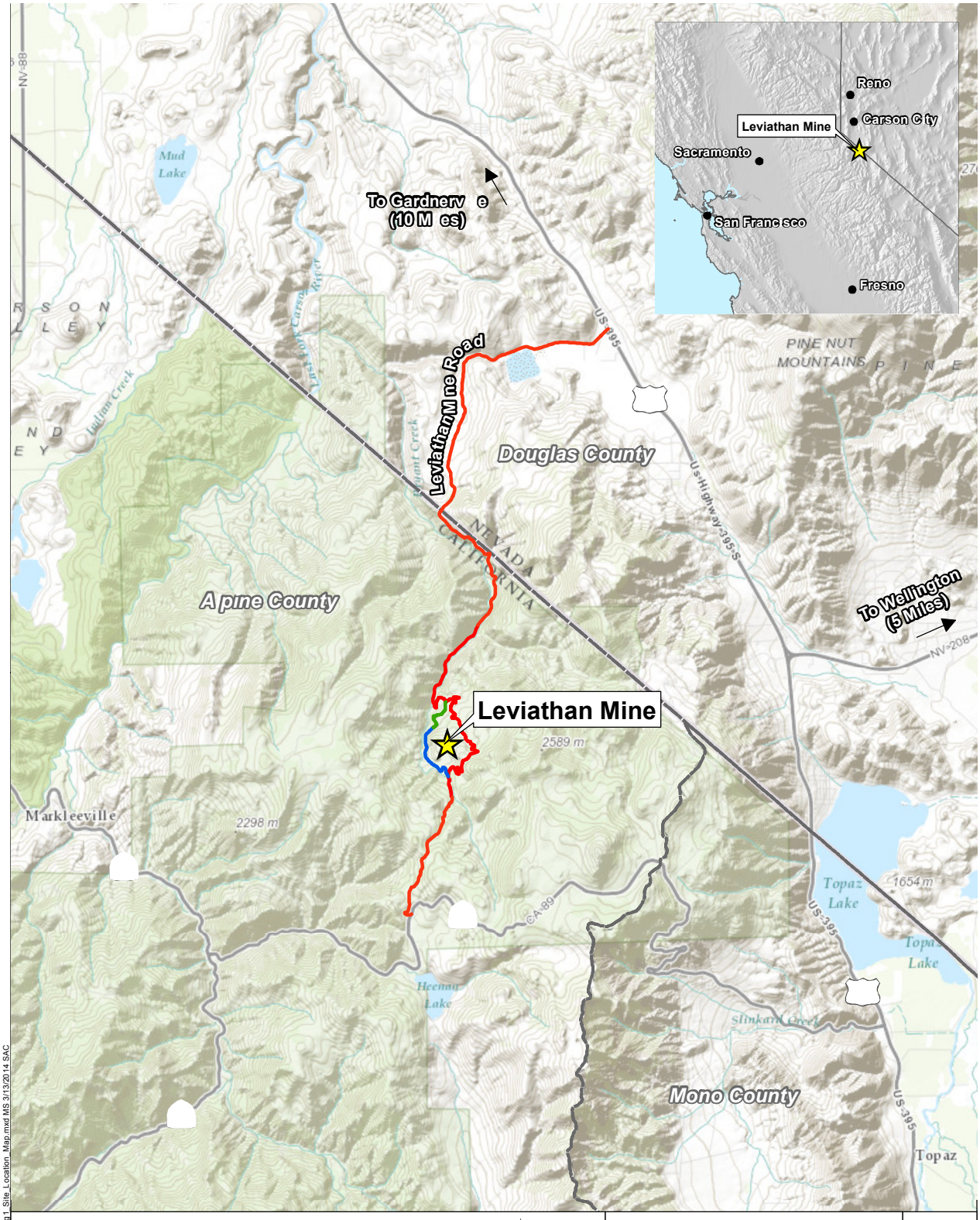
Water Board staff have begun the design process for improvements to the Pond Water Treatment Plant with the California Department of General Services and BKF Engineers. A survey and geotechnical evaluation of the Pond Water Treatment Plant area were completed during the fall of 2021 and 30% plans were submitted in December of 2021. The geotechnical evaluation included the installation of four borings up to 20 feet in depth, logging of subsurface conditions, collection and laboratory analysis of representative bulk and relatively undisturbed soil samples.

Final plans for improvements to the Pond Water Treatment Plant are expected in the Spring of 2022. The Water Board and the California Department of General Services may advertise the project for construction bids and hold a bid walk in late summer of 2022. Award of a construction contract may occur as early as the fall of 2022, potentially allowing construction to start in the fall of 2022.

5.2.6 Pond 3 Access Improvements

During the fall of 2020 the Water Board's contractor, JC Chang, prepared plans and specifications for improvements in the Pond 3 area. In mid-October 2021, the Department of General Services conducted a bid walk for the proposed project. The project will improve access to the pond 3 area and provide a concrete pad where equipment will be staged during future spring treatment efforts. Construction of the project will be completed during the 2022 field season.

FIGURES



Leviathan Mine Site Location Map

Figure 1

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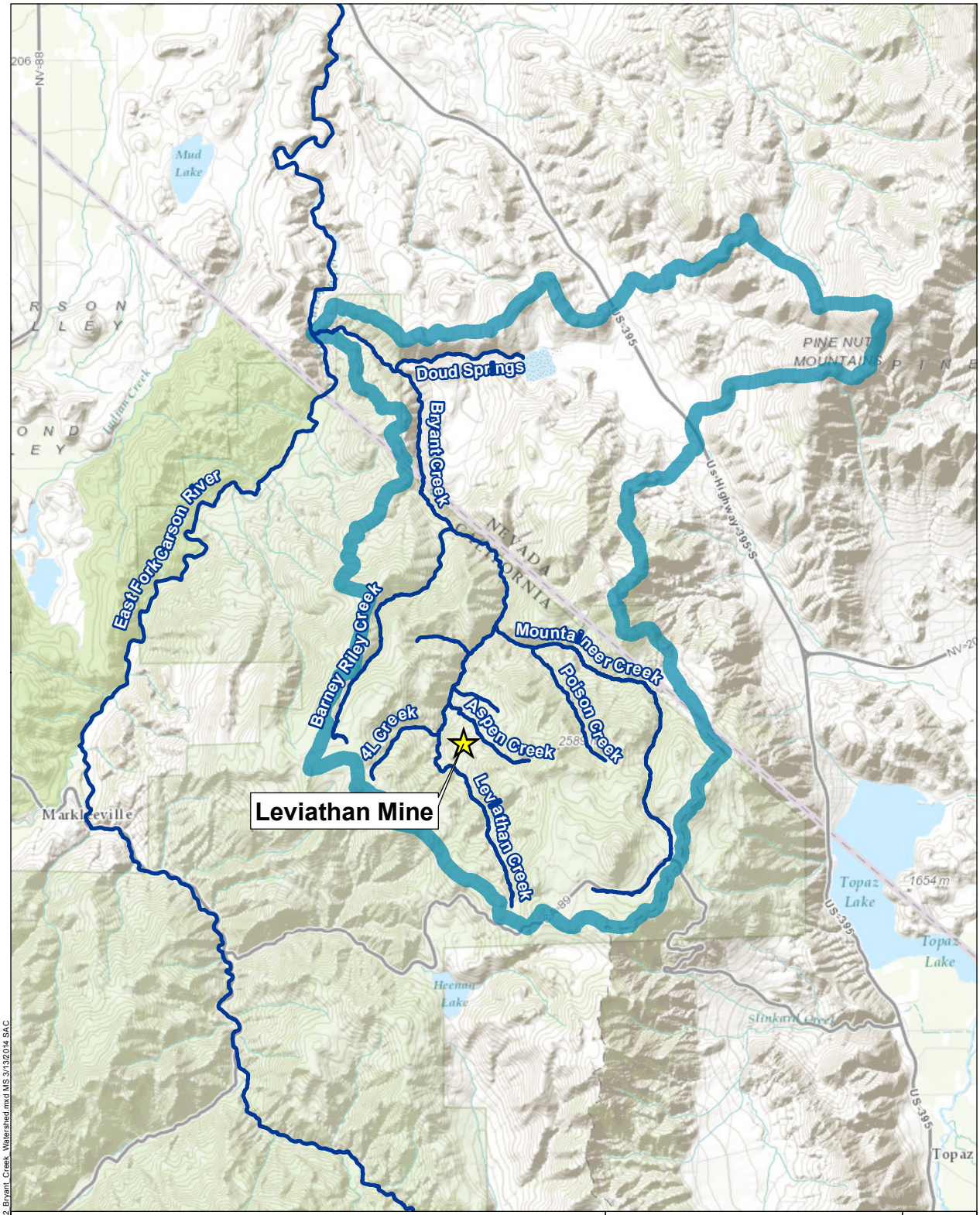

Bryant Creek Watershed
River/Creek
National Forest

N

0 1 2

Miles

Bryant Creek Watershed

Figure 2

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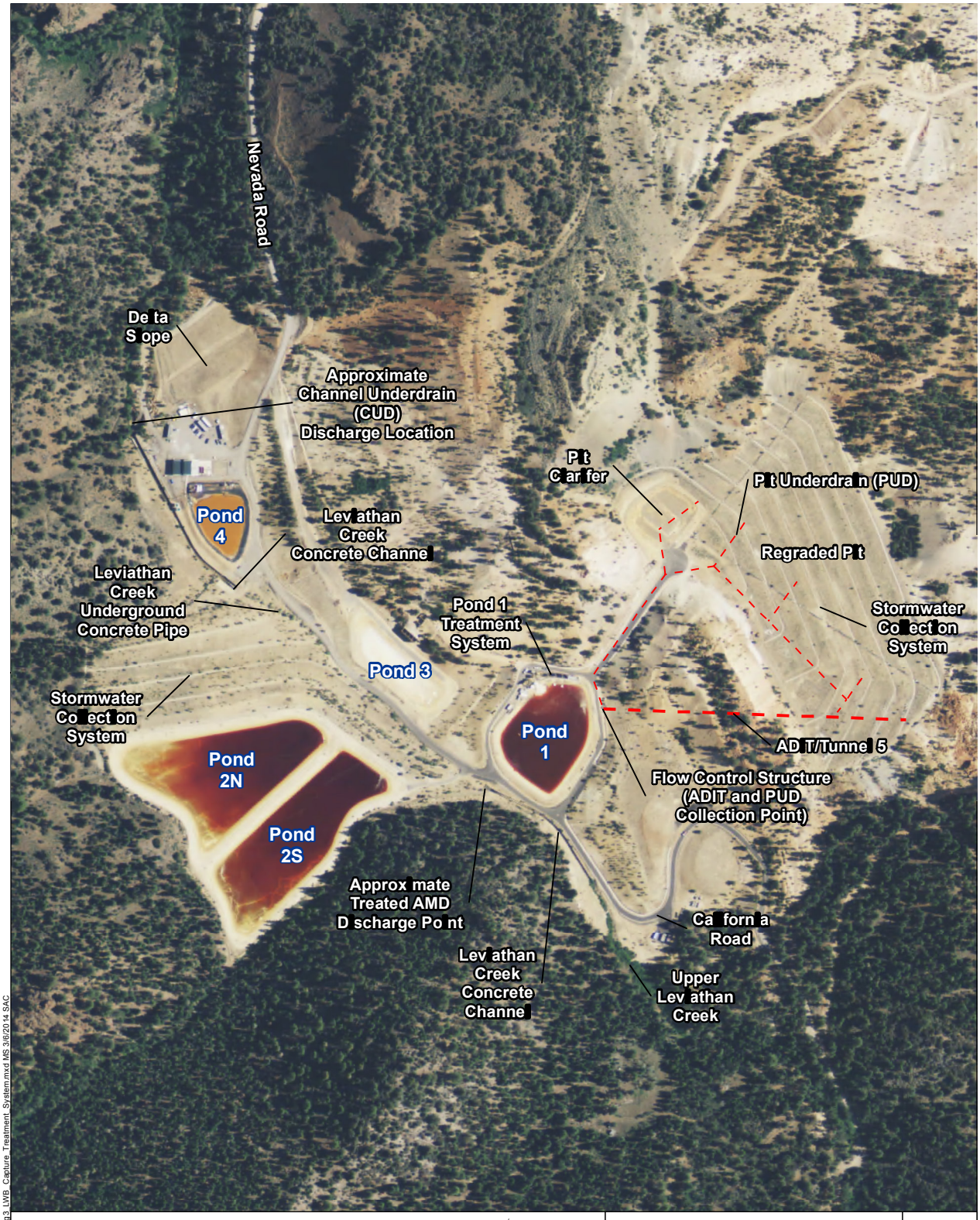

Lahontan Water Board AMD Capture and Treatment System

Figure 3

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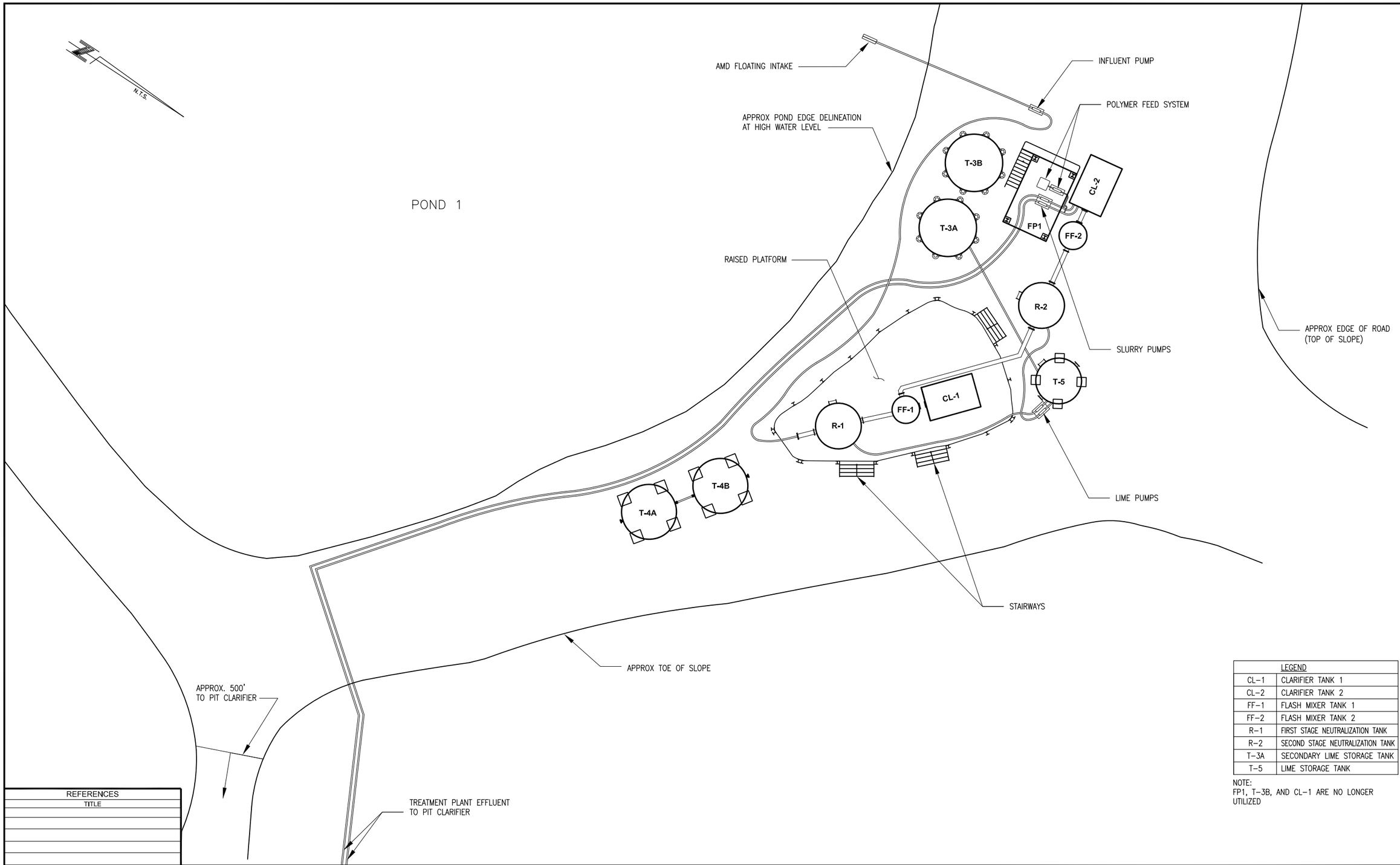


LEGEND	
CL-1	CLARIFIER TANK 1
CL-2	CLARIFIER TANK 2
FF-1	FLASH MIXER TANK 1
FF-2	FLASH MIXER TANK 2
R-1	FIRST STAGE NEUTRALIZATION TANK
R-2	SECOND STAGE NEUTRALIZATION TANK
T-3A	SECONDARY LIME STORAGE TANK
T-5	LIME STORAGE TANK

NOTE:
FP1, T-3B, AND CL-1 ARE NO LONGER UTILIZED

REFERENCES

TITLE

GRAPHIC SCALE
SCALE IN FEET
10 0 10 20

REVISIONS				REVISIONS			
NO.	BY.	DATE	DESCRIPTION	NO.	BY.	DATE	DESCRIPTION

DRAWING SCALE	AS NOTED
	DATE
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	

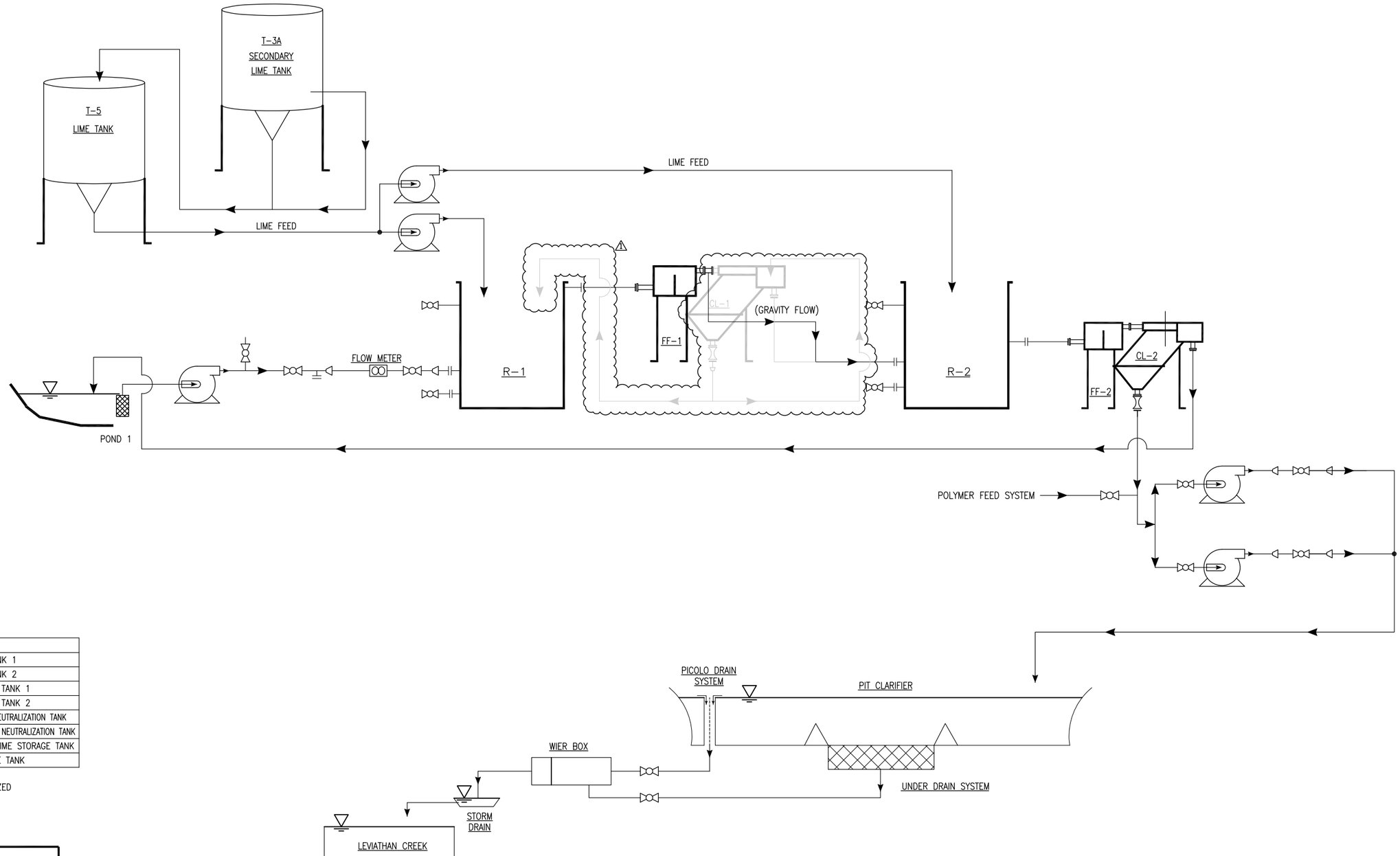
California Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

LEVIATHAN MINE POND WATER TREATMENT SYSTEM

SYSTEM LAYOUT

JOB NO.
PROJECT
SHEET NO.

Figure 4



LEGEND	
CL-1	CLARIFIER TANK 1
CL-2	CLARIFIER TANK 2
FF-1	FLASH MIXER TANK 1
FF-2	FLASH MIXER TANK 2
R-1	FIRST STAGE NEUTRALIZATION TANK
R-2	SECOND STAGE NEUTRALIZATION TANK
T-3A	SECONDARY LIME STORAGE TANK
T-5	LIME STORAGE TANK

NOTE:
CL-1 IS NO LONGER UTILIZED

REFERENCES
TITLE

DRAWING SCALE AS NOTED

REVISIONS

NO.	BY.	DATE	DESCRIPTION
1	DRL	03/2013	2011/2012 SYSTEM UPGRADES

REVISIONS

NO.	BY.	DATE	DESCRIPTION

DRAWING SCALE AS NOTED	
	DATE
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	

California Water Boards
State Water Resources Control Board
Regional Water Quality Control Boards

LEVIATHAN MINE POND WATER TREATMENT SYSTEM

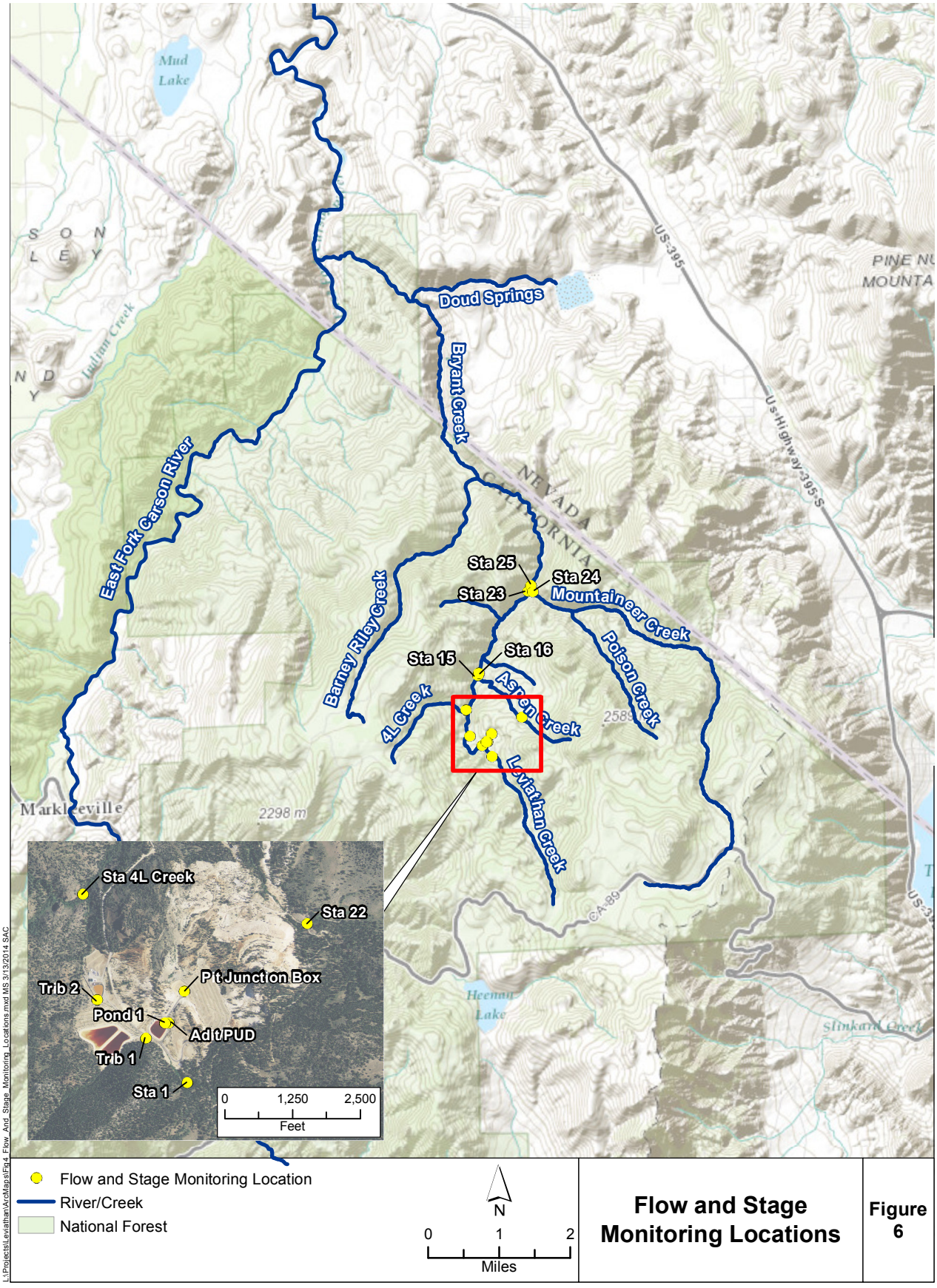
SIMPLIFIED PIPING & INSTRUMENTATION DIAGRAM

JOB NO.

PROJECT

SHEET NO.

Figure 5



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Flow and Stage Monitoring Locations

Figure 6

TABLES

TABLE 1
2021 SUMMER POND WATER TREATMENT MONITORING PROGRAM
LEVIATHAN MINE, ALPINE COUNTY, CALIFORNIA

SAMPLE LOCATION	LOCATION DESCRIPTION	ANALYSES	SCHEDULE	SAMPLER
Influent	Sampling port prior to lime addition	EPA-Required Discharge Criteria[1] with Additional Analytes[2]	weekly	Contractor
Mid Process	Various	pH, Temperature (field)	several times per day, as needed	Contractor
Effluent	Weir Box	pH, Temperature (field)	several times per day, as needed	Contractor
		EPA-Required Discharge Criteria	twice per week[5]	Contractor
		EPA-Required Discharge Criteria with Additional Analytes	weekly	Contractor
Duplicate Samples	Effluent samples at weir box	EPA-Required Discharge Criteria	minimum of 10%	Contractor
Field Method Blank	Collected at Weir Box using laboratory-supplied inorganic blank water	EPA-Required Discharge Criteria	minimum of 10%	Contractor
Sludge	Pit Clarifier	CAM-17[3] metals plus Al and Fe (for comparison with STLC and TTLC)[4]	three composite samples collected once per year after treatment	Contractor

Notes:
1. Dissolved As, Al, Cd, Cr, Cu, Fe, Pb, Ni, Zn (off-site laboratory); total recoverable Se (off-site laboratory); pH (field); temperature (field)
2. Dissolved Ca, Co, Mg, Mn, sulfate, TDS (off-site laboratory analysis)
3. Refers to 22 CCR 66261.24(a)(2)(A); CAM-17 metals: Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Hg, Mo, Ni, Se, Ag, Tl, V, Zn (off-site lab analysis)
4. STLC is the Soluble Threshold Limit Concentration and TTLC is the Total Threshold Limit Concentration.
5. Effluent samples were collected twice per week until discharge from the Pit Clarifier dropped below 5 gallons per minute.

TABLE 2
USEPA DISCHARGE CRITERIA
LEVIATHAN MINE, ALPINE COUNTY, CALIFORNIA

WATER QUALITY PARAMETER	MAXIMUM [2]	AVERAGE [4]
pH	Between 6.0 – 9.0 SU [1]	
Arsenic (dissolved)	0.34 mg/l	0.15 mg/l [3]
Aluminum (dissolved)	4.0 mg/l	2.0 mg/l [3]
Cadmium (dissolved)	0.009 mg/l	0.004 mg/l [3]
Chromium (dissolved)	0.97 mg/l	0.31 mg/l [3]
Copper (dissolved)	0.026 mg/l	0.016 mg/l [3]
Iron (dissolved)	2.0 mg/l	1.0 mg/l [3]
Lead (dissolved)	0.136 mg/l	0.005 mg/l [3]
Nickel (dissolved)	0.84 mg/l	0.094 mg/l [3]
Selenium (Total Recoverable)	Not Promulgated	0.005 mg/l [3]
Zinc (dissolved)	0.21 mg/l	0.21 mg/l [3]

Notes:
1: pH measurement based on 24-hour (single day) average discharge.
2: Concentrations based on daily grab samples, each grab sample field-filtered and acid fixed promptly after collection.
3: Concentrations based on four daily grab samples, each grab sample field-filtered and acid fixed promplty after collection.
4: If the concentration detected by the contract laboratory is less than the detection limit, 1/2 the detection limit shall be used in calculating the Average concentration.

TABLE 3
2021 FLOW AND STAGE MONITORING LOCATIONS
LEVIATHAN MINE, ALPINE COUNTY, CALIFORNIA

Station ID (USGS Number)	Station Description	Equipment	Installation of Gaging Station
Continuous Stage Measurement and Calculated Flow			
Station 1 (10308783)	Leviathan Creek above the mine	Continuous flow recorder and appurtenances, solar power supply.	October 1998
Pit Under Drain (PUD) (10308785)	Drainage from shallow ground water collection pipes in pit, diverted into evaporation ponds	Continuous flow recorder and appurtenances, solar power supply, telemetry (real time provisional data available).	October 1999
Adit (10308784)	Drainage from tunnel #5 diverted into evaporation ponds	Continuous flow recorder and appurtenances, solar power supply, telemetry (real time provisional data available).	October 1999
4L Creek (103087889)	4L Creek just above confluence with Leviathan Creek	Continuous flow recorder and appurtenances, solar power supply.	October 2003
Station 15 (10308789)	Leviathan Creek, above the confluence of Leviathan and Aspen creeks	Continuous flow recorder and appurtenances, solar power supply, telemetry (real time provisional data available).	October 1998
Station 22 (103087891)	Aspen Creek above mine	Continuous flow recorder and appurtenances, solar power supply.	October 2003
Station 23 (10308792)	Leviathan Creek above the confluence of Leviathan and Mountaineer creeks	Continuous flow recorder and appurtenances, solar power supply	November 1999
Station 25 (10308794)	Bryant Creek below the confluence of Leviathan and Mountaineer creeks	Continuous flow recorder and appurtenances, solar power supply, telemetry (real time provisional data available).	October 1998
Pit Junction Box (103087855)	Storm water collection vault in open pit	Continuous flow recorder and appurtenances, solar power supply.	October 2009
Unnamed Trib 2 (103087865)	Ephemeral tributary north of Pond 2 North (Commonly referred to as the Lower Tributary)	Continuous flow recorder and appurtenances, solar power supply.	November 2009
Unnamed Trib 1 (103087835)	Ephemeral tributary south of Pond 2 South (Commonly referred to as the Upper Tributary)	Continuous flow recorder and appurtenances, solar power supply.	November 2009
Continuous Stage Measurement			
Pond 1 Stage (103087853)	Water level in Pond 1	Continuous stage recorder and appurtenances, solar power supply, telemetry (real time provisional data available).	October 1999
Other Flow Data			
Station 16 (103087898)	Aspen Creek, above the confluence of Leviathan and Aspen creeks	Hand-held flow meters. Monthly flow measurements to establish relationship with STA 15.	not applicable
Station 24	Mountaineer Creek above the confluence of Leviathan and Mountaineer creeks	None. Flow calculated by difference on a monthly basis: (STA 25 – STA 23 = STA 24).	not applicable

PHOTOS

Photo 1 – June 23, 2021, Sludge stockpile and disposal activities at the pit clarifier

Photo 2 – August 2, 2021, Approximate area of a portion of the Tamarack Fire burn area as seen from the pit rim

Photo 3 – September 13, 2021, Removal of sediment from stormwater ditches with mini excavator and conveyance structures with vacuum trailer

Photo 4 – September 29, 2021, Installation of new reinforced silt fence near Pond 1

Photo 5 – September 22, 2021, CUD pothole activities at Pothole # 2

Photo 6 – September 23, 2021, The CUD pipe at the bottom of Pothole # 2

Photo 7 – November 3, 2021, Metal precipitates at the downstream end of the CUD pipe

Photo 8 – November 5, 2021, Installation of the jetting manifold on the CUD (prior to jetting)

Photo 9 – November 5, 2021, Jetting activities at the CUD

Photo 10 – November 5, 2021, Jetting and pumping activities at the CUD

Photo 11 – November 5, 2021, CUD pipe after removal of metal precipitates (prior to reinstallation of the outlet pipe to weir box)

Photo 1 – June 23, 2021, Sludge stockpile and disposal activities at the pit clarifier

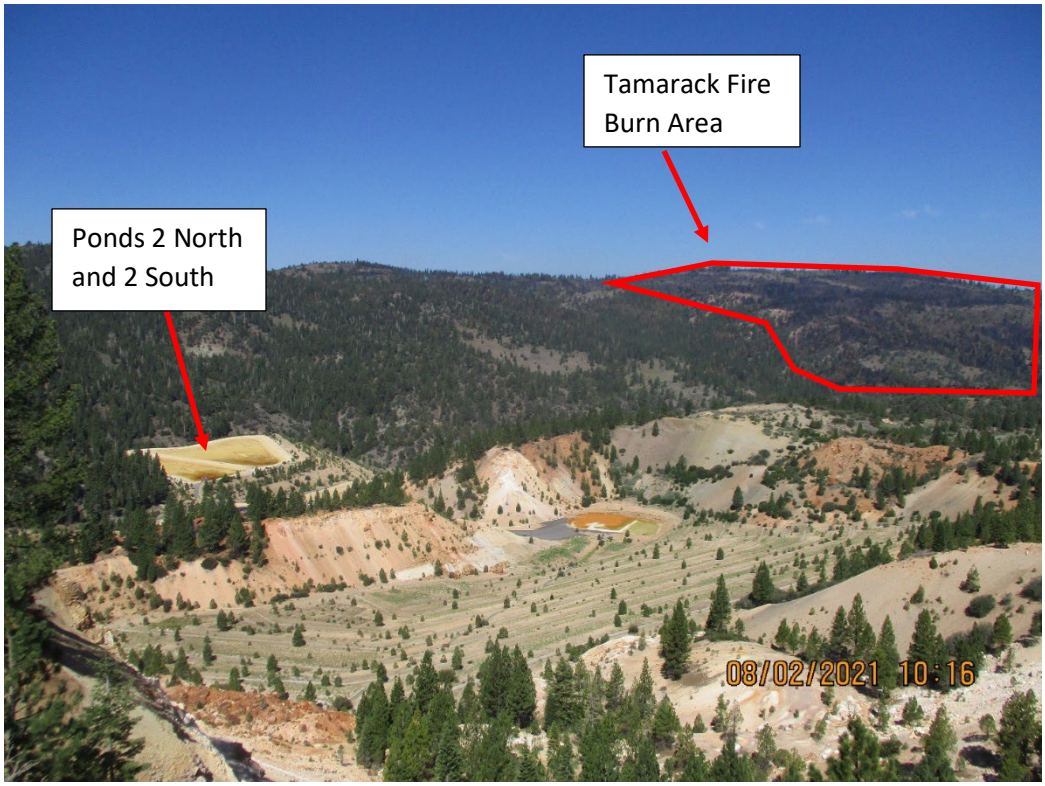

Photo 2 – August 2, 2021, Approximate area of a portion of the Tamarack Fire burn area as seen from the pit rim

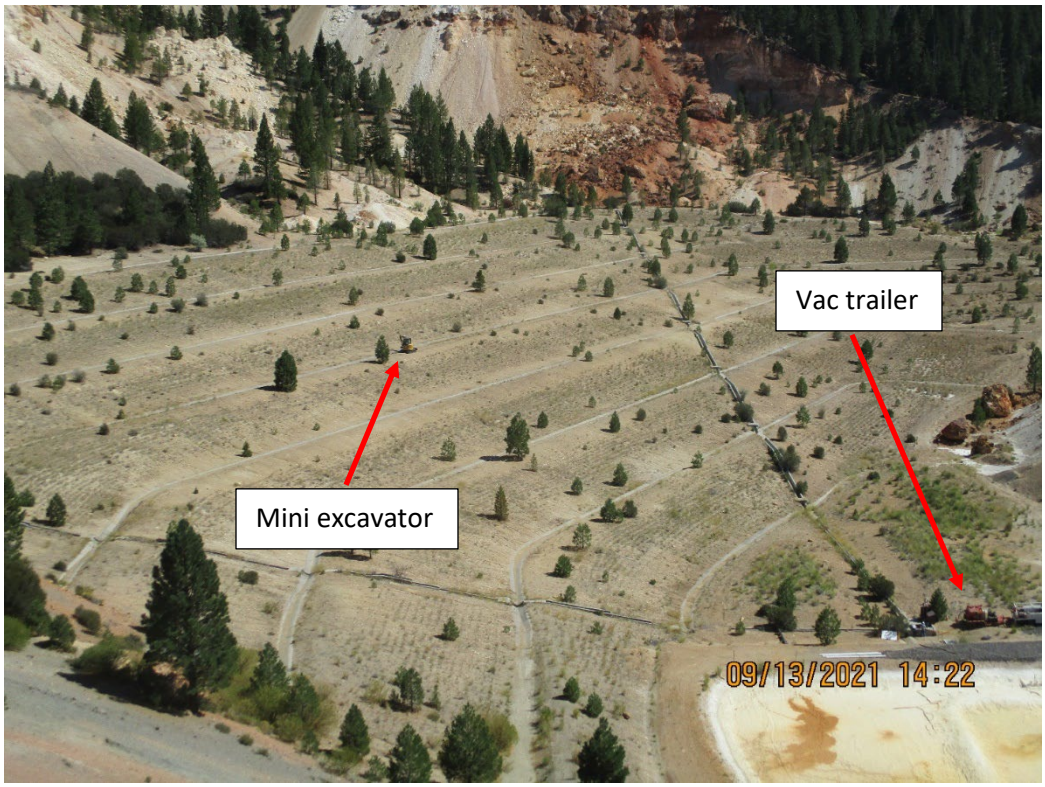

Photo 3 – September 13, 2021, Removal of sediment from stormwater ditches with mini excavator and conveyance structures with vacuum trailer

Photo 4 – September 29, 2021, Installation of new reinforced silt fence near Pond 1

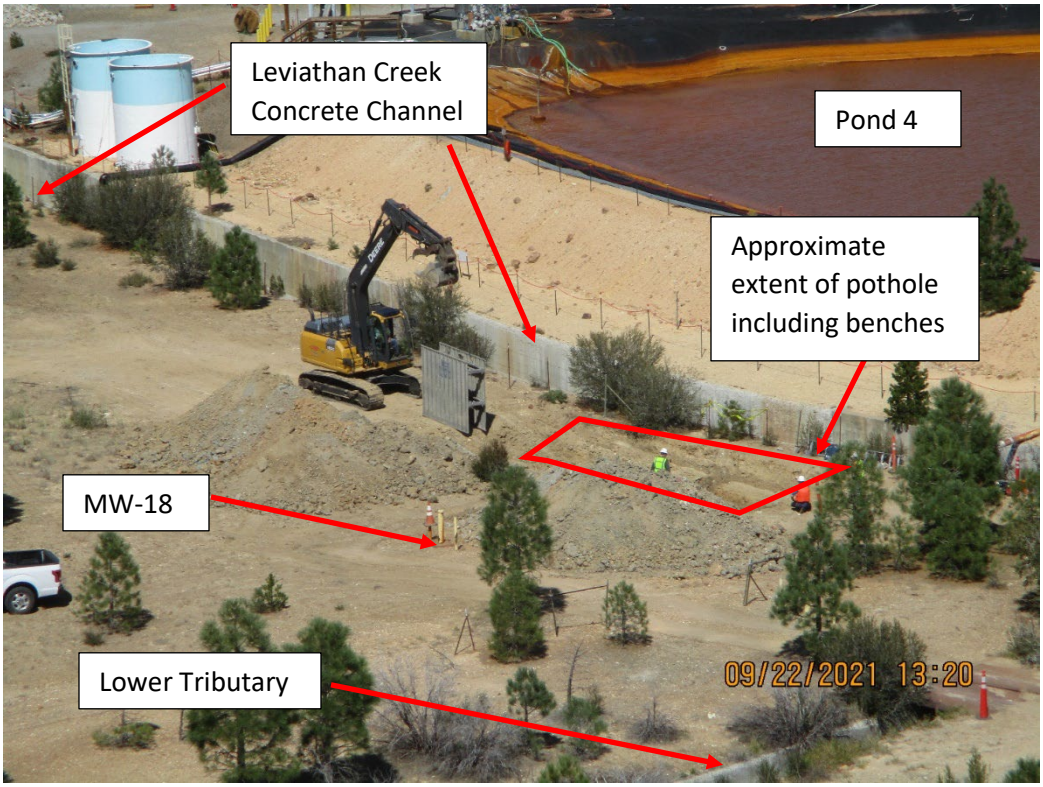

Photo 5 – September 22, 2021, CUD pothole activities at the Pothole # 2 location

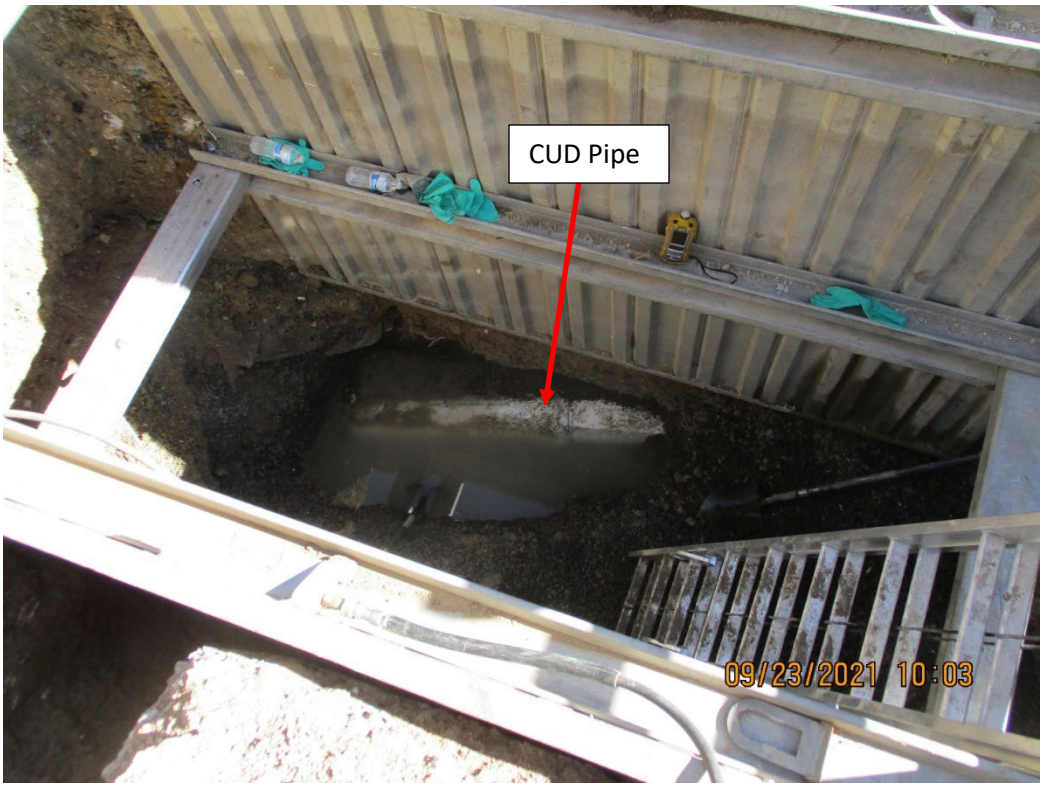

Photo 6 – September 23, 2021, The CUD pipe at the bottom of Pothole #2

Photo 7 – November 3, 2021, Metal precipitates at the downstream end of the CUD pipe

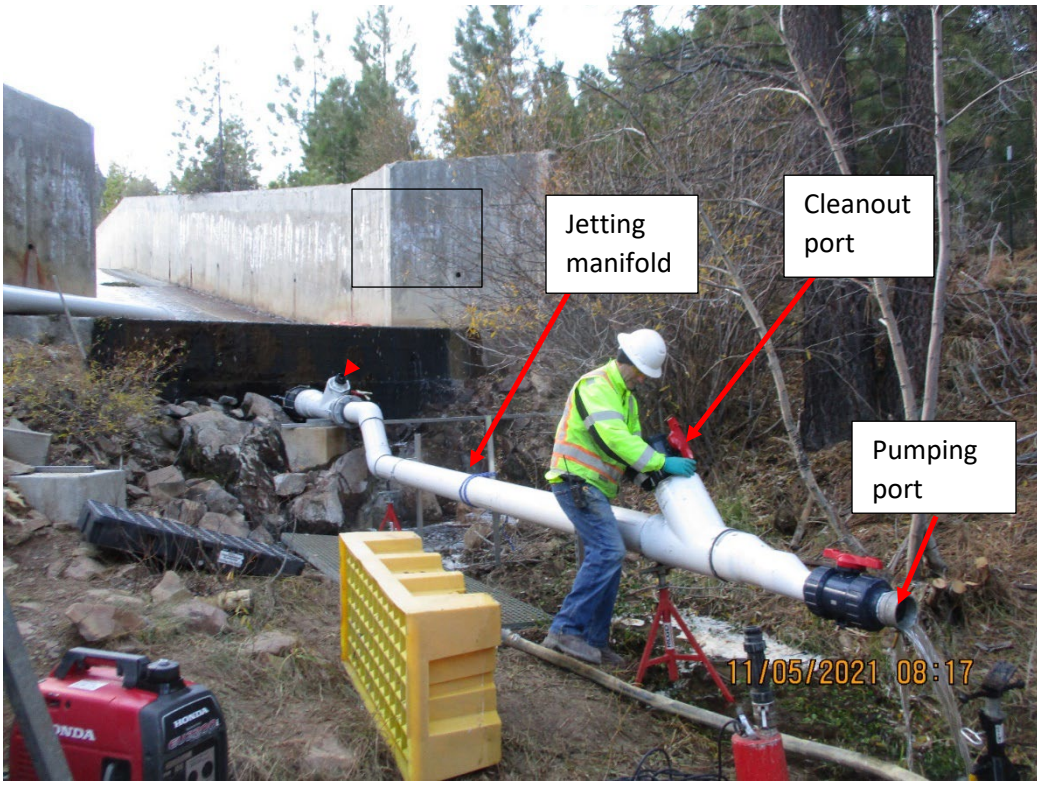

Photo 8 – November 5, 2021, Installation of the jetting manifold on the CUD (prior to jetting)

Photo 9 – November 5, 2021, Jetting activities at the CUD

Photo 10 – November 5, 2021, Jetting and pumping activities at the CUD

Photo 11 – November 5, 2021, CUD pipe after removal of metal precipitates (prior to reinstallation of the outlet pipe to weir box)

Appendices B through D (on compact disc)

Appendix B – 2021 Pond Water Treatment Data

Laboratory Reports (PDF format)

Analytical Laboratory Electronic Data Deliverable Files (Microsoft Excel format)

Appendix C – AECOM: Leviathan Mine Pond Water Treatment, 2021 Data Summary Report

Attachment 4 – Data Quality Summary (PDF format)

Appendix D – 2021 Water Year USGS Flow and Stage Annual Data Reports

Annual Water Data Reports for 12 Stations (Microsoft Excel format)

APPENDICES

Appendix A - Data Summary for 2021 Pond Water Treatment

Table A-1
2021 Pond Water Treatment
Daily Discharge Summary

Date	Volume Discharged (Gallons)	Cumulative Discharge (Gallons)
7/1/2021	41,665	41,665
7/2/2021	163,495	205,160
7/3/2021	40,990	246,150
7/4/2021	40,990	287,140
7/5/2021	36,679	323,819
7/6/2021	67,027	390,846
7/7/2021	173,906	564,752
7/8/2021	163,495	728,247
7/9/2021	134,543	862,790
7/10/2021	73,173	935,963
7/11/2021	67,027	1,002,990
7/12/2021	79,645	1,082,635
7/13/2021	117,092	1,199,727
7/14/2021	117,092	1,316,819
7/15/2021	184,705	1,501,524
7/16/2021	207,485	1,709,009
7/17/2021	101,074	1,810,083
7/18/2021	73,173	1,883,256
7/19/2021	55,691	1,938,947
7/20/2021	40,990	1,979,937
7/21/2021	32,652	2,012,589
7/22/2021	28,902	2,041,491
7/23/2021	22,209	2,063,700
7/24/2021	19,252	2,082,952
7/25/2021	14,079	2,097,031
7/26/2021	11,849	2,108,880
7/27/2021	9,845	2,118,725
7/28/2021	8,060	2,126,785
7/29/2021	6,484	2,133,269
7/30/2021	6,484	2,139,753
7/31/2021	8,060	2,147,813
8/1/2021	6,484	2,154,297
8/2/2021	5,109	2,159,406
8/3/2021	3,926	2,163,332
8/4/2021	2,925	2,166,257
8/5/2021	2,095	2,168,352
8/6/2021	1,425	2,169,777
8/7/2021	5,109	2,174,886
8/8/2021	3,926	2,178,812
8/9/2021	1,265	2,180,077
8/10/2021	0	2,180,077
8/11/2021	24,889	2,204,966
8/12/2021	93,590	2,298,556

Table A-1
2021 Pond Water Treatment
Daily Discharge Summary

Date	Volume Discharged (Gallons)	Cumulative Discharge (Gallons)
8/13/2021	173,906	2,472,462
8/14/2021	61,202	2,533,664
8/15/2021	55,691	2,589,355
8/16/2021	45,591	2,634,946
8/17/2021	36,679	2,671,625
8/18/2021	28,902	2,700,527
8/19/2021	25,424	2,725,951
8/20/2021	22,209	2,748,160
8/21/2021	19,252	2,767,412
8/22/2021	16,545	2,783,957
8/23/2021	14,079	2,798,036
8/24/2021	11,849	2,809,885
8/25/2021	9,845	2,819,730
8/26/2021	8,060	2,827,790
8/27/2021	8,060	2,835,850
8/28/2021	6,484	2,842,334
8/29/2021	6,484	2,848,818
8/30/2021	6,484	2,855,302
8/31/2021	5,109	2,860,411
9/1/2021	5,109	2,865,520
9/2/2021	3,926	2,869,446
9/3/2021	3,926	2,873,372
9/4/2021	2,925	2,876,297
9/5/2021	3,926	2,880,223
9/6/2021	2,925	2,883,148
9/7/2021	2,925	2,886,073
9/8/2021	2,095	2,888,168

Table A-2
2021 Pond Water Treatment Effluent Field and Analytical Results

Sample ID	Sample Description	Sample Type	Sample Date	pH	TEMP (°F)	Aluminum			Antimony			Arsenic			Barium			Beryllium		
USEPA Daily Maximum Discharge Criteria				6.0-9.0		4						0.34								
USEPA 4-Day Average Discharge Criteria				NP		2						0.15								
				Result	Result	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT001-PC	Pre-Discharge	N	6/29/2021	8.21	66.2	0.629			0.00168	J	J+	0.00734		J	0.0222			0.000100	U	
2122PWT002-PC	Pre-Discharge	N	6/30/2021	8.23	64.7	0.933			0.00100	U		0.00756			0.0207			0.000100	U	
2122PWT004-EFF	PWT Effluent	N	7/1/2021	6.30	63.7	0.0800	U		0.00124	J	U	0.00499			0.0222			0.000100	U	
2122PWT005-FMB	Field Method Blank	FMB	7/1/2021	N/A	N/A	0.0800	U		0.00100	U		0.00160	U		0.00150	U		0.000100	U	
2122PWT006-EFF	Duplicate	FD	7/1/2021	6.30	63.7	0.0800	U		0.00100	U		0.00400			0.0208			0.000100	U	
2122PWT009-EFF	PWT Effluent	N	7/7/2021	6.73	70.2	0.157	J	J	0.00100	U		0.00561		J	0.0215			0.000100	U	
2122PWT010-EFF	PWT Effluent	N	7/8/2021	6.32	70.9	0.0800	U		0.00173	J	U	0.00493		J	0.0204		J	0.000100	U	UJ
2122PWT012-EFF	PWT Effluent	N	7/13/2021	6.38	71.1	0.228			0.00100	U	UJ	0.00447		J	0.0218		J	0.000100	U	UJ
2122PWT013-EFF	PWT Effluent	N	7/15/2021	7.34	71.0	0.454			0.00197	J	U	0.00610			0.0216			0.000100	U	
2122PWT015-EFF	PWT Effluent	N	8/11/2021	6.51	61.3	0.0800	U		0.00100	U		0.00480			0.0197			0.000100	U	
2122PWT016-EFF	PWT Effluent	N	8/12/2021	6.48	65.6	0.0800	U		0.00146	J	U	0.00414			0.0200			0.000100	U	
2122PWT017-EFF	PWT Effluent	N	8/17/2021	6.64	66.4	0.0800	U		0.00100	U		0.00423			0.0188			0.000100	U	
2122PWT018-EFF	PWT Effluent	N	8/19/2021	6.74	66.9	0.0800	U		0.00100	U		0.00353			0.0167			0.000100	U,Q7	
2122PWT019-EFF	PWT Effluent	N	8/23/2021	6.55	67.2	0.0800	U		0.00102	J	U	0.00242	J	J	0.0163			0.000100	U	
2122PWT020-EFF	Duplicate	FD	8/23/2021	6.55	67.2	0.0800	U		0.00100	U		0.00241	J		0.0170			0.000100	U	
2122PWT021-FMB	Field Method Blank	FMB	8/23/2021	N/A	N/A	0.0800	U		0.00100	U		0.00160	U		0.00150	U		0.000100	U	

Sample ID	Cadmium			Calcium			Chromium			Cobalt			Copper			Iron			Lead		
USEPA Daily Maximum Discharge Criteria	0.0009			NP			0.97			NP			0.026			2			0.136		
USEPA 4-Day Average Discharge Criteria	0.004			NP			0.31			NP			0.016			1			0.005		
	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT001-PC	0.000300	U		1020	D3		0.00350	U		0.00797			0.00720		J	0.0400	U		0.000500	U	
2122PWT002-PC	0.000300	U		1230	D3		0.00350	U		0.0106			0.00920			0.0400	U		0.000500	U	
2122PWT004-EFF	0.000300	U		674	D3		0.00350	U		0.00134			0.00599		J	0.113		*	0.000500	U	
2122PWT005-FMB	0.000300	U		0.200	U		0.00350	U		0.000500	U		0.00100	U		0.0400	U		0.000500	U	
2122PWT006-EFF	0.000300	U		667	D3		0.00350	U		0.00107			0.00618		J	0.0400	U		0.000500	U	
2122PWT009-EFF	0.000300	U		710	D3		0.00350	U		0.00129			0.00694			0.244			0.000500	U	
2122PWT010-EFF	0.000300	U	UJ	695	D3		0.00350	U	UJ	0.00108		J	0.00169	J	J	0.0400	U		0.000500	U	UJ
2122PWT012-EFF	0.000300	U	UJ	639	D3		0.00350	U	UJ	0.00148		J	0.00363		J	0.296			0.000500	U	UJ
2122PWT013-EFF	0.000300	U		819	D3	J	0.00350	U		0.00512			0.00233			0.0400	U		0.000500	U	
2122PWT015-EFF	0.000300	U		628	D3		0.00350	U		0.00132			0.00239			0.0400	U		0.000500	U	
2122PWT016-EFF	0.000300	U		611	D3		0.00350	U		0.00133			0.00231			0.0400	U		0.000500	U	
2122PWT017-EFF	0.000300	U		589	D3		0.00350	U		0.00147			0.00250			0.0400	U		0.000500	U	
2122PWT018-EFF	0.000300	U		565	D3		0.00350	U		0.00154			0.00220			0.0400	U		0.000500	U	
2122PWT019-EFF	0.000300	U		518	D3		0.00350	U		0.00137			0.00324			0.0400	U		0.000500	U	
2122PWT020-EFF	0.000300	U		554	D3		0.00350	U		0.00136			0.00352			0.0400	U		0.000500	U	
2122PWT021-FMB	0.000300	U		0.200	U		0.00350	U		0.000500	U		0.00100	U		0.0400	U		0.000500	U	

Sample ID	Magnesium			Manganese			Mercury			Nickel			Selenium			Silver		
USEPA Daily Maximum Discharge Criteria	NP			NP						0.84			NP					
USEPA 4-Day Average Discharge Criteria	NP			NP						0.094			0.005					
	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT001-PC	42.4			0.366	D3		0.000100	U		0.0570			0.00262			0.000500	U	
2122PWT002-PC	37.0			0.411	D3		0.000100	U		0.0842			0.00120			0.000911	J, M5, Q2, Q7	J+
2122PWT004-EFF	86.7			0.0115			0.000100	U		0.0284			0.00253		J	0.000500	U	
2122PWT005-FMB	0.200	U		0.00200	U		0.000100	U		0.00200	U		0.000500	U		0.000500	U	
2122PWT006-EFF	87.4			0.0101			0.000100	U		0.0281			0.00273			0.000500	U	
2122PWT009-EFF	37.3			0.0550			0.000100	U,Q7		0.0323			0.00178			0.000500	U	
2122PWT010-EFF	35.7			0.0609		J	0.000100	U,Q7		0.0213		J	0.00226			0.000500	U	UJ
2122PWT012-EFF	34.3			0.106		J	0.000100	U		0.0197		J	0.00213		J	0.000500	U	UJ
2122PWT013-EFF	30.7			0.276			0.000100	U		0.0427			0.000500	U		0.000500	U	
2122PWT015-EFF	49.2			0.0138			0.000100	U		0.0273			0.00267			0.000500	U	
2122PWT016-EFF	43.6			0.0399		J	0.000100	U		0.0261			0.00207			0.000500	U	
2122PWT017-EFF	40.1			0.112			0.000100	U		0.0225			0.00170			0.000500	U	
2122PWT018-EFF	41.4			0.122			0.000100	U		0.0248			0.00242			0.000500	U	
2122PWT019-EFF	40.1			0.109			0.000100	U		0.0258			0.00148			0.000500	U	
2122PWT020-EFF	43.1			0.115			0.000100	U		0.0271			0.00118			0.000500	U	
2122PWT021-FMB	0.200	U		0.00200	U		0.000100	U		0.00200	U		0.000500	U		0.000500	U	

Sample ID	Sulfate (as SO_4)			Thallium			Total Dissolved Solids			Vanadium			Zinc		
USEPA Daily Maximum Discharge Criteria							NP						0.21		
USEPA 4-Day Average Discharge Criteria							NP						0.21		
	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT001-PC	NA			0.0268	D1		NA			0.00400	U		0.0100	U	
2122PWT002-PC	NA			0.0334			NA			0.00400	U		0.0100	U	
2122PWT004-EFF	2030	D3		0.0315			3050			0.00400	U		0.0100	U	
2122PWT005-FMB	0.5	U		0.000100	U		20.0	U		0.00400	U		0.0100	U	
2122PWT006-EFF	2010	D3		0.0291			3010			0.00400	U		0.0100	U	
2122PWT009-EFF	1790	D3		0.0323			2570			0.00400	U		0.0100	U	
2122PWT010-EFF	NA			0.0305		J	NA			0.00400	U		0.0100	U	
2122PWT012-EFF	1810	D3		0.0302		J	2420			0.00400	U		0.0100	U	
2122PWT013-EFF	NA			0.0223		J+	NA			0.00400	U		0.0100	U	
2122PWT015-EFF	1690	D3		0.0256		J+	2720			0.00400	U		0.0100	U	
2122PWT016-EFF	NA			0.0276		J+	NA			0.00400	U		0.0100	U	
2122PWT017-EFF	1550	D3		0.0273			2390			0.00400	U		0.0100	U	
2122PWT018-EFF	NA			0.0244			NA			0.00400	U		0.0100	U	
2122PWT019-EFF	1560	D3		0.0229			2380			0.00400	U		0.0100	U	
2122PWT020-EFF	1530	D3		0.0235			2290			0.00400	U		0.0100	U	
2122PWT021-FMB	0.5	U		0.000100	U		20.0	U		0.00400	U		0.0100	U	

Notes:

All values reported in milligrams per liter (mg/L) except pH which are in Standard Units and temperature which are in the units specified above.
All parameters are dissolved except Selenium which is total recoverable.
FMB = field method blank sample
FD = field duplicate sample
N = normal field sample
NA = Not applicable
NP = Not promulgated

Data Qualifiers (DQ) from the Laboratory:

D1 = Dilution was performed due to matrix interference.
D3 = Dilution was performed due to high target analyte concentration.
U = The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
M5 = Post digestion spike is outside of acceptance limits.
Q2 = LCS recovery is above acceptance criteria. There is no impact on the reported value.
Q7 = CCV recovery is above the acceptance limits. However there is no impact on the reported value.

EPA Qualifiers (EQ) from an additional QA/QC:

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample with a potential for high bias.
U = The analyte was detected above the reported method detection limit; however, the detection is attributed to external contamination.
UJ = The analyte was analyzed for but was not detected above the reported method detection limit. There is a potential for false negative result at the stated method detection limit
* = Failed Relative Percent Difference assessment

Table A-3

2021 Pond Water Treatment Influent Field and Analytical Results

Sample ID	Sample Description	Sample Type	Sample Date	pH	TEMP (◦F)	Aluminum			Antimony			Arsenic			Barium		
				Result	Result	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT003-INF	PWT Influent	N	7/1/2021	2.42	60.5	351			0.00179	J	U	3.87	D3		0.00504		
2122PWT008-INF	PWT Influent	N	7/7/2021	2.48	63.0	396			0.00100	U		4.34	D3		0.00258	J	J
2122PWT011-INF	PWT Influent	N	7/13/2021	2.39	66.0	422			0.00100	U	UJ	4.11	D3	J	0.00357		J
2122PWT014-INF	PWT Influent	N	8/11/2021	2.40	57.0	415			0.00100	U		4.67	D3		0.00196	J	J

Sample ID	Beryllium			Cadmium			Calcium			Chromium			Cobalt			Copper		
	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT003-INF	0.0140	D1	J-	0.0350			265			0.842	D3		2.47	D3		1.54	D3	
2122PWT008-INF	0.0139	D1	J-	0.0390			225			1.11	D3		2.77	D3		1.72	D3	
2122PWT011-INF	0.0135	D3	J	0.0473	D3	J	227			1.02	D3	J	2.58	D3	J	1.58	D3	J
2122PWT014-INF	0.0128	D1		0.0354			242			1.13	D3		2.75	D3		1.50	D3	

Sample ID	Iron			Lead			Magnesium			Manganese			Mercury			Nickel		
	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT003-INF	349			0.000728	J	J	56.1			12.0	D3		0.000100	U		6.60	D3	
2122PWT008-INF	439			0.000504	J	J	58.4			13.1	D3		0.000100	U,Q7		7.28	D3	
2122PWT011-INF	502	D3		0.000500	U	UJ	60.6			12.8	D3	J	0.000100	U		6.77	D3	J
2122PWT014-INF	475	D3		0.000500	U		61.1			13.4	D3		0.000100	U		7.08	D3	

Sample ID	Selenium			Silver			Sulfate (as SO_4)			Thallium			Total Dissolved Solids			Vanadium			Zinc		
	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ	Result	DQ	EQ
2122PWT003-INF	0.00134			0.000500	U	UJ	4440	D3		0.0541			5950			0.109			1.35		
2122PWT008-INF	0.0100	U,D1		0.000500	U		4640	D3		0.0381			5390			0.152			1.58		
2122PWT011-INF	0.000500	U	UJ	0.000500	U	UJ	5190	D3		0.0244		J	6690			0.194			1.71		
2122PWT014-INF	0.00500	U,D1	UJ	0.000500	U		4910	D3		0.0688			6900			0.160			1.79		

Notes:
All values reported in milligrams per liter (mg/L) except pH which are in Standard Units and temperature which are in the units specified above.
All parameters are dissolved except Selenium which is total recoverable.
N = normal field sample

Data Qualifiers (DQ) from the Laboratory:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
D1 = Dilution was performed due to matrix interference.
D3 = Dilution was performed due to high target analyte concentration.
U = The analyte was analyzed for but was not detected above the reported quantitation limit. The quantitation limit has been adjusted for any dilution or concentration of the sample.
Q7 = CCV recovery is above the acceptance limits. However there is no impact on the reported value.

EPA Qualifiers (EQ) from an additional QA/QC:
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J- = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample with a potential for low bias.
U = The analyte was detected above the reported method detection limit; however, the detection is attributed to external contamination.
UJ = The analyte was analyzed for but was not detected above the reported method detection limit. There is a potential for false negative result at the stated method detection limit

Table A-4
Summary of 2021
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 pH set point	R-1 pH	R-1 temp °F	R-2 pH set point	R-2 pH	R-2 temp °F	FF-2 pH	Pit Clarifier pH	Pit Clarifier temp °F	Discharge Weir pH	Discharge Weir temp °F
06/28/21	7:30	OFFLINE											
06/28/21	8:30												
06/28/21	9:30												
06/28/21	10:30												
06/28/21	11:30												
06/28/21	12:30												
06/28/21	13:30												
06/28/21	14:30												
06/28/21	15:30												
06/28/21	16:30	PRESTART											
06/28/21	17:30	NA	8.00	3.86	67.7	8.35	8.23	70.2	8.46	8.24	70.3	NA	NA
06/28/21	18:30	NA	8.00	3.93	68.7	8.35	8.41	72.1	8.42	8.29	72.3	NA	NA
06/28/21	19:30	NA	8.20	3.90	68.7	8.35	8.50	74.0	8.44	8.30	73.1	NA	NA
06/28/21	20:30	NA	8.20	3.88	68.7	8.35	8.55	73.7	8.44	8.31	73.0	NA	NA
06/28/21	21:30	NA	8.20	3.87	68.2	8.35	8.57	73.0	8.42	8.34	72.6	NA	NA
06/28/21	22:30	NA	8.20	3.88	67.0	8.35	8.50	73.3	8.42	8.37	72.0	NA	NA
06/28/21	23:30	NA	8.20	3.89	66.3	8.35	8.47	72.3	8.42	8.38	70.3	NA	NA
06/29/21	0:30	NA	8.20	3.90	65.3	8.35	8.53	71.4	8.41	8.37	69.4	NA	NA
06/29/21	1:30	NA	8.20	3.92	63.9	8.35	8.39	69.7	8.41	8.38	68.3	NA	NA
06/29/21	2:30	NA	8.20	3.92	63.0	8.33	8.32	69.0	8.37	8.39	67.0	NA	NA
06/29/21	3:30	NA	8.20	3.79	61.5	8.31	8.17	67.6	8.36	8.35	65.8	NA	NA
06/29/21	4:30	NA	8.20	3.56	60.3	8.31	8.24	67.1	8.34	8.33	64.8	NA	NA
06/29/21	5:30	NA	8.20	3.44	59.6	8.31	8.43	65.4	8.32	8.31	64.3	NA	NA
06/29/21	6:30	NA	8.20	3.52	58.4	8.31	8.60	64.9	8.32	8.26	63.8	NA	NA
06/29/21	7:30	NA	8.20	3.57	58.9	8.31	8.57	63.7	8.34	8.17	66.7	NA	NA
06/29/21	8:30	NA	8.20	3.58	57.5	8.31	8.48	64.1	8.32	8.21	64.1	NA	NA
06/29/21	9:30	NA	8.20	3.60	58.2	8.31	8.51	63.3	8.30	8.33	65.1	NA	NA
06/29/21	10:30	NA	8.20	3.62	59.9	8.31	8.20	64.2	8.33	8.09	65.3	NA	NA
06/29/21	11:30	NA	8.20	3.64	61.8	8.31	8.20	66.4	8.35	8.10	64.4	NA	NA
06/29/21	12:30	NA	8.20	3.61	63.4	8.31	8.28	67.1	8.35	8.09	66.6	NA	NA
06/29/21	13:30	NA	8.20	3.64	64.1	8.31	8.38	68.0	8.30	8.21	66.2	NA	NA
06/29/21	14:30	NA	8.20	3.60	64.9	8.31	8.29	70.6	8.24	8.18	66.7	NA	NA
06/29/21	15:30	NA	8.20	3.56	64.9	8.31	8.44	70.6	8.27	8.14	69.9	NA	NA
06/29/21	16:30	NA	8.20	3.58	65.1	8.31	8.24	70.4	8.22	8.14	69.9	NA	NA
06/29/21	17:30	NA	8.20	3.50	65.6	8.31	8.33	68.7	8.24	8.13	70.2	NA	NA
06/29/21	18:30	NA	8.20	3.49	65.6	8.31	8.31	69.5	8.28	8.20	68.7	NA	NA
06/29/21	19:30	NA	8.20	3.47	64.9	8.31	8.33	70.4	8.29	8.21	68.3	NA	NA
06/29/21	20:30	NA	8.20	3.49	64.1	8.31	8.17	70.2	8.27	8.23	67.8	NA	NA
06/29/21	21:30	NA	8.20	3.50	63.7	8.31	8.29	68.9	8.25	8.24	67.6	NA	NA
06/29/21	22:30	NA	8.20	3.52	63.0	8.31	8.46	68.7	8.29	8.25	67.5	NA	NA
06/29/21	23:30	NA	8.20	3.51	62.0	8.31	8.42	68.0	8.27	8.26	66.3	NA	NA
06/30/21	0:30	NA	8.20	3.52	61.1	8.31	8.39	67.1	8.29	8.28	65.6	NA	NA
06/30/21	1:30	NA	8.20	3.50	60.6	8.31	8.36	65.6	8.26	8.26	63.7	NA	NA
06/30/21	2:30	NA	8.20	3.48	59.6	8.31	8.41	64.7	8.26	8.26	62.0	NA	NA
06/30/21	3:30	NA	8.20	3.50	58.2	8.31	8.54	64.5	8.26	8.25	62.0	NA	NA
06/30/21	4:30	NA	8.20	3.51	58.0	8.31	8.59	64.0	8.27	8.25	62.4	NA	NA
06/30/21	5:30	NA	8.20	3.48	57.2	8.31	8.38	63.3	8.27	8.25	61.7	NA	NA
06/30/21	6:30	NA	8.20	3.50	56.3	8.31	8.19	62.1	8.24	8.24	61.1	NA	NA
06/30/21	7:30	NA	8.20	3.52	55.6	8.31	8.33	61.1	8.24	8.15	60.8	NA	NA
06/30/21	8:30	NA	8.20	3.54	55.6	8.33	8.38	61.8	8.23	8.29	61.9	NA	NA
06/30/21	9:30	NA	8.20	3.56	56.1	8.33	8.18	60.7	8.23	8.30	61.9	NA	NA
06/30/21	10:30	NA	8.20	3.60	57.2	8.33	8.42	59.7	8.26	8.31	62.7	NA	NA
06/30/21	11:30	NA	8.20	3.59	59.2	8.33	8.23	63.7	8.27	8.23	64.7	NA	NA
06/30/21	12:30	NA	8.20	3.59	60.1	8.33	8.29	65.2	8.25	8.31	65.3	NA	NA
06/30/21	13:30	NA	8.20	3.57	62.7	8.33	8.47	66.1	8.29	8.33	66.5	NA	NA
06/30/21	14:30	NA	8.20	3.56	63.9	8.33	8.44	68.3	8.27	8.35	67.3	NA	NA
06/30/21	15:30	NA	8.20	3.54	64.1	8.33	8.23	69.0	8.28	8.28	66.8	NA	NA
06/30/21	16:30	NA	8.20	3.56	64.1	8.33	8.47	69.0	8.33	8.32	67.0	NA	NA
06/30/21	17:30	NA	8.20	3.56	63.7	8.33	8.39	69.1	8.34	8.39	67.1	NA	NA
06/30/21	18:30	NA	8.20	3.63	62.5	8.33	8.24	68.0	8.20	8.28	66.4	NA	NA
06/30/21	19:30	NA	8.20	3.69	61.3	8.33	8.56	67.1	8.35	8.34	65.6	NA	NA
06/30/21	20:30	NA	8.20	3.67	60.6	8.33	8.59	66.1	8.34	8.34	64.3	NA	NA
06/30/21	21:30	NA	8.20	3.67	59.9	8.33	8.23	65.4	8.35	8.39	63.7	NA	NA
06/30/21	22:30	NA	8.20	3.69	58.2	8.33	8.30	64.7	8.34	8.46	63.3	NA	NA
06/30/21	23:30	NA	8.20	3.49	57.5	8.30	8.38	63.3	8.49	8.40	62.8	NA	NA
07/01/21	0:30	NA	8.20	3.52	57.2	8.30	8.43	62.3	8.51	8.38	62.0	NA	NA
07/01/21	1:30	NA	8.20	3.50	56.8	8.30	8.26	62.1	8.43	8.37	61.8	NA	NA
07/01/21	2:30	NA	8.20	3.49	56.3	8.30	8.23	61.6	8.37	8.35	60.6	NA	NA
07/01/21	3:30	NA	8.20	3.47	55.6	8.30	8.19	60.7	8.40	8.33	60.1	NA	NA
07/01/21	4:30	NA	8.20	3.57	54.9	8.30	8.45	59.7	8.39	8.33	59.0	NA	NA
07/01/21	5:30	NA	8.20	3.46	54.2	8.30	8.42	59.0	8.37	8.34	58.3	NA	NA
07/01/21	6:30	NA	8.20	3.47	53.7	8.30	8.40	57.3	8.39	8.34	58.1	NA	NA
07/01/21	7:30	NA	8.20	3.46	53.2	8.30	8.36	59.5	8.41	8.24	56.6	NA	NA
07/01/21	8:30	NA	8.20	3.48	52.5	8.30	8.49	56.8	8.37	8.18	57.7	NA	NA

Table A-4
Summary of 2021
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 pH set point	R-1 pH	R-1 temp °F	R-2 pH set point	R-2 pH	R-2 temp °F	FF-2 pH	Pit Clarifier pH	Pit Clarifier temp °F	Discharge Weir pH	Discharge Weir temp °F
07/01/21	9:30	NA	8.20	3.50	53.9	8.30	8.42	58.5	8.30	8.32	59.8	NA	NA
07/01/21	10:30	NA	8.20	3.53	56.1	8.30	8.21	59.9	8.31	8.15	60.6	6.51	61.8
07/01/21	11:30	NA	8.20	3.49	57.2	8.30	8.37	62.3	8.32	8.14	61.8	6.51	61.8
07/01/21	12:30	NA	8.20	3.52	60.8	8.30	8.25	62.3	8.33	8.14	63.8	6.30	63.7
07/01/21	13:30	NA	8.20	3.47	64.1	8.30	8.37	65.6	8.31	8.14	66.3	6.58	64.5
07/01/21	14:30	NA	8.20	3.42	65.3	8.30	8.21	69.8	8.37	8.18	69.2	6.51	66.1
07/01/21	15:30	NA	8.20	3.43	68.0	8.30	8.04	71.6	8.33	8.17	70.7	6.51	66.9
07/01/21	16:30	NA	8.20	3.44	68.7	8.30	8.10	71.8	8.27	HEAVY RAIN/HAIL			
07/01/21	17:30	NA	8.20	3.47	67.7	8.30	8.11	73.5	8.39	8.21	71.3	6.55	67.0
07/01/21	18:30	NA	8.20	3.48	68.0	8.30	8.46	73.0	8.43	8.26	71.7	6.52	65.3
07/01/21	19:30	NA	8.20	3.50	67.0	8.30	8.62	71.6	8.34	8.24	71.0	6.98	65.9
07/01/21	20:30	NA	8.20	3.57	66.3	8.30	8.14	70.6	8.36	8.22	70.1	7.06	66.0
07/01/21	21:30	NA	8.20	3.66	65.3	8.30	8.37	70.9	8.38	8.20	69.5	6.90	66.0
07/01/21	22:30	NA	8.20	3.65	63.4	8.30	8.08	69.2	8.43	8.22	68.3	6.86	66.2
07/01/21	23:30	NA	8.20	3.64	62.5	8.30	8.26	68.3	8.37	8.19	67.1	6.74	66.0
07/02/21	0:30	NA	8.20	3.65	61.3	8.30	8.17	67.3	8.39	8.20	65.9	6.66	65.7
07/02/21	1:30	NA	8.20	3.64	59.6	8.30	8.38	65.4	8.37	8.17	64.3	6.74	65.3
07/02/21	2:30	NA	8.20	3.65	58.4	8.30	8.31	64.2	8.36	8.18	63.0	6.70	65.0
07/02/21	3:30	NA	8.20	3.66	57.5	8.30	8.33	63.3	8.35	8.16	61.9	6.65	65.0
07/02/21	4:30	NA	8.20	3.67	56.3	8.30	8.56	62.8	8.35	8.14	61.2	6.61	64.9
07/02/21	5:30	NA	8.20	3.67	55.6	8.30	8.07	61.4	8.30	8.12	60.3	6.60	64.3
07/02/21	6:30	NA	8.20	3.70	54.6	8.30	8.32	60.4	8.29	8.10	58.9	6.59	63.8
07/02/21	7:30	NA	8.20	3.72	53.7	8.30	8.50	59.5	8.31	8.15	59.5	6.46	61.5
07/02/21	8:30	NA	8.20	3.71	53.7	8.30	8.47	58.3	8.31	8.08	59.8	6.53	64.1
07/02/21	9:30	NA	8.20	3.68	54.1	8.30	8.23	61.1	8.29	8.11	60.3	6.52	64.3
07/02/21	10:30	NA	8.20	3.57	57.5	8.30	8.43	61.1	8.29	8.12	62.5	6.35	66.1
07/02/21	11:30	NA	8.20	3.54	59.9	8.30	8.17	64.0	8.32	8.14	64.6	6.39	65.4
07/02/21	12:30	NA	8.20	3.41	62.7	8.30	8.33	65.6	8.33	8.11	63.7	6.34	66.9
07/02/21	13:30	NA	8.20	3.37	65.3	8.30	8.53	68.3	8.32	8.13	64.1	6.33	68.1
07/02/21	14:30	SHUTDOWN FOR WEEKEND											
07/02/21	15:30												
07/02/21	16:30												
07/02/21	17:30												
07/02/21	18:30												
07/06/21	7:30	PRESTART											
07/06/21	8:30												
07/06/21	9:30	NA	8.20	2.97	59.4	8.30	8.37	67.1	8.32	8.11	64.5	7.07	72.1
07/06/21	10:30	NA	8.20	3.08	61.2	8.30	8.15	66.4	8.29	8.10	66.6	6.48	70.6
07/06/21	11:30	NA	8.20	3.12	61.3	8.30	8.32	67.2	8.31	8.08	67.2	7.25	71.1
07/06/21	12:30	NA	8.20	3.12	63.4	8.30	8.12	67.1	8.32	8.07	67.5	6.56	73.1
07/06/21	13:30	NA	8.20	3.07	65.8	8.30	8.16	69.0	8.33	8.05	67.7	6.66	72.8
07/06/21	14:30	NA	8.20	3.08	69.1	8.30	8.32	71.8	8.35	8.10	68.0	6.46	72.5
07/06/21	15:30	NA	8.20	3.09	70.6	8.30	8.15	73.7	8.36	8.11	73.3	6.57	76.2
07/06/21	16:30	NA	8.20	3.08	72.7	8.30	8.44	77.1	8.37	8.11	70.7	6.50	76.8
07/06/21	17:30	NA	8.20	3.06	74.4	8.30	8.03	78.5	8.38	8.13	71.1	6.48	77.1
07/06/21	18:30	NA	8.20	3.06	74.9	8.30	8.19	79.9	8.15	8.12	70.7	6.46	75.8
07/06/21	19:30	NA	8.20	3.05	74.9	8.35	8.49	79.9	8.23	8.37	77.9	6.65	75.4
07/06/21	20:30	NA	8.20	3.06	74.6	8.35	8.31	78.5	8.22	8.38	77.7	6.63	75.0
07/06/21	21:30	NA	8.20	3.00	73.0	8.35	8.40	79.0	8.23	8.37	77.2	6.61	74.5
07/06/21	22:30	NA	8.20	3.00	71.5	8.35	8.24	77.8	8.25	8.37	76.9	6.60	74.1
07/06/21	23:30	NA	8.20	3.01	70.1	8.35	8.36	76.4	8.24	8.38	74.8	6.69	73.5
07/07/21	0:30	NA	8.20	3.00	68.9	8.35	8.30	75.2	8.23	8.38	73.2	6.75	72.2
07/07/21	1:30	NA	8.20	3.03	67.2	8.35	8.46	73.5	8.21	8.38	72.6	6.76	71.6
07/07/21	2:30	NA	8.20	3.01	65.6	8.35	8.34	72.1	8.23	8.39	71.9	6.71	71.0
07/07/21	3:30	NA	8.20	3.01	64.1	8.35	8.49	70.9	8.24	8.34	69.5	6.74	70.4
07/07/21	4:30	NA	8.20	3.00	63.0	8.35	8.27	69.5	8.26	8.36	68.3	6.73	69.8
07/07/21	5:30	NA	8.20	3.02	61.1	8.35	8.24	67.8	8.25	8.30	67.9	6.69	69.0
07/07/21	6:30	NA	8.20	3.02	59.9	8.35	8.25	67.1	8.17	8.26	55.2	6.67	68.4
07/07/21	7:30	NA	8.20	3.05	58.4	8.35	8.46	64.2	8.14	8.34	64.1	6.55	66.1
07/07/21	8:30	NA	8.20	3.09	58.4	8.40	8.41	63.7	8.19	8.16	62.9	6.70	68.3
07/07/21	9:30	NA	8.20	3.02	59.4	8.45	8.46	64.2	8.22	8.25	64.5	6.76	69.5
07/07/21	10:30	NA	8.20	3.03	60.6	8.45	8.42	68.3	8.24	8.30	65.6	6.68	70.1
07/07/21	11:30	NA	8.20	3.05	62.7	8.45	8.35	67.8	8.26	8.32	66.5	6.73	70.2
07/07/21	12:30	NA	8.20	3.01	64.9	8.45	8.30	69.9	8.29	8.39	69.1	6.74	70.4
07/07/21	13:30	NA	8.20	3.07	69.1	8.45	8.29	72.5	8.32	8.40	72.2	6.63	72.0
07/07/21	14:30	NA	8.20	3.12	70.6	8.42	8.26	74.0	8.31	8.39	73.1	6.66	72.8
07/07/21	15:30	NA	8.20	3.10	72.0	8.42	8.27	76.1	8.31	8.37	74.0	6.70	74.7
07/07/21	16:30	NA	8.20	3.12	73.2	8.42	8.25	77.1	8.32	8.36	74.4	6.61	75.5
07/07/21	17:30	NA	8.20	3.08	74.4	8.42	8.20	79.4	8.33	8.29	77.3	6.71	76.7
07/07/21	18:30	NA	8.20	3.06	74.2	8.40	8.31	80.4	8.23	8.30	76.4	6.77	76.5
07/07/21	19:30	NA	8.20	3.04	74.1	8.40	8.23	80.4	8.20	8.32	78.3	6.76	74.2
07/07/21	20:30	NA	8.20	3.02	73.4	8.40	8.36	79.2	8.19	8.34	78.0	6.78	73.9
07/07/21	21:30	NA	8.20	3.02	71.8	8.40	8.31	78.7	8.20	8.35	76.9	6.80	73.0
07/07/21	22:30	NA	8.20	3.04	70.3	8.40	8.48	77.1	8.23	8.33	75.5	6.86	72.5

Table A-4
Summary of 2021
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 pH set point	R-1 pH	R-1 temp °F	R-2 pH set point	R-2 pH	R-2 temp °F	FF-2 pH	Pit Clarifier pH	Pit Clarifier temp °F	Discharge Weir pH	Discharge Weir temp °F
07/07/21	23:30	NA	8.20	3.01	68.7	8.40	8.62	75.4	8.19	8.32	73.9	6.82	71.6
07/08/21	0:30	NA	8.20	3.01	68.0	8.40	8.20	74.9	8.15	8.34	72.8	6.80	71.0
07/08/21	1:30	NA	8.20	3.00	66.5	8.40	8.32	73.0	8.17	8.28	71.6	6.87	70.6
07/08/21	2:30	NA	8.20	3.02	65.3	8.40	8.56	70.9	8.20	8.33	70.4	6.92	70.3
07/08/21	3:30	NA	8.20	3.04	64.1	8.40	8.44	70.2	8.15	8.34	69.6	6.85	69.8
07/08/21	4:30	NA	8.20	3.02	63.2	8.40	8.46	69.7	8.19	8.35	68.1	6.76	69.3
07/08/21	5:30	NA	8.20	3.03	61.3	8.40	8.48	67.8	8.15	8.33	67.7	6.80	68.7
07/08/21	6:30	NA	8.20	3.08	60.6	8.40	8.45	66.6	8.14	8.27	65.7	6.89	68.4
07/08/21	7:30	NA	8.20	3.02	59.6	8.45	8.33	63.7	8.20	8.31	65.5	6.78	65.9
07/08/21	8:30	NA	8.20	3.04	60.1	8.45	8.46	64.9	8.19	8.29	65.8	6.76	68.6
07/08/21	9:30	NA	8.20	3.03	60.1	8.45	8.44	65.4	8.13	8.32	65.4	6.53	70.3
07/08/21	10:30	NA	8.20	3.02	62.0	8.45	8.58	66.6	8.16	8.13	65.5	6.39	70.7
07/08/21	11:30	NA	8.20	3.03	64.1	8.50	8.51	68.0	8.24	8.16	66.6	6.48	77.1
07/08/21	12:30	NA	8.20	3.04	65.1	8.50	8.29	69.0	8.27	8.22	70.4	6.32	70.9
07/08/21	13:30	NA	8.20	3.05	69.4	8.50	8.35	73.5	8.25	8.20	72.3	6.20	71.5
07/08/21	14:30	NA	8.20	3.06	70.1	8.50	8.61	74.7	8.30	8.21	74.1	6.25	72.2
07/08/21	15:30	NA	8.20	3.10	73.0	8.50	8.55	75.5	8.28	8.21	75.4	6.29	73.5
07/08/21	16:30	NA	8.20	3.05	73.9	8.50	8.58	76.8	8.31	8.19	75.9	6.27	73.8
07/08/21	17:30	NA	8.20	3.06	74.9	8.50	8.42	79.2	8.30	8.24	78.2	6.20	76.7
07/08/21	18:30	NA	8.20	3.05	74.1	8.50	8.32	80.4	8.32	8.27	77.6	6.23	77.1
07/08/21	19:30	NA	8.20	3.05	74.9	8.50	8.49	80.9	8.44	8.38	78.8	6.39	74.9
07/08/21	20:30	NA	8.20	3.04	74.4	8.47	8.30	79.7	8.41	8.37	78.4	6.36	74.6
07/08/21	21:30	NA	8.20	3.07	73.2	8.45	8.36	78.7	8.38	8.37	77.7	6.41	73.8
07/08/21	22:30	NA	8.20	3.06	72.0	8.45	8.33	78.5	8.40	8.36	75.1	6.38	73.0
07/08/21	23:30	NA	8.20	3.03	70.8	8.45	8.60	77.3	8.39	8.35	75.5	6.42	72.8
07/09/21	0:30	NA	8.20	3.04	69.6	8.45	8.47	75.9	8.39	8.33	74.3	6.46	72.5
07/09/21	1:30	NA	8.20	3.01	68.9	8.42	8.43	74.5	8.38	8.37	73.6	6.44	71.6
07/09/21	2:30	NA	8.20	3.02	68.0	8.42	8.27	74.0	8.37	8.36	72.3	6.47	71.0
07/09/21	3:30	NA	8.20	3.03	67.0	8.42	8.42	72.8	8.40	8.34	71.4	6.41	70.9
07/09/21	4:30	NA	8.20	3.01	65.3	8.42	8.45	71.6	8.42	8.33	70.8	6.43	70.8
07/09/21	5:30	NA	8.20	3.04	64.6	8.40	8.25	69.9	8.39	8.33	69.7	6.49	70.2
07/09/21	6:30	NA	8.20	3.04	63.7	8.40	8.20	69.5	8.32	8.32	68.6	6.53	69.9
07/09/21	7:30	NA	8.20	3.03	62.7	8.40	8.42	67.3	8.31	8.25	68.6	6.29	68.5
07/09/21	8:30	NA	8.20	3.03	62.5	8.40	8.39	68.0	8.29	8.22	68.6	6.32	70.5
07/09/21	9:30	NA	8.20	3.05	63.2	8.40	8.40	68.5	8.29	8.20	68.9	6.27	71.3
07/09/21	10:30	NA	8.20	3.06	64.1	8.40	8.22	71.4	8.31	8.23	69.3	6.28	71.5
07/09/21	11:30	NA	8.20	3.07	65.8	8.40	8.60	72.4	8.30	8.21	70.1	6.30	72.5
07/09/21	12:30	NA	8.20	3.04	66.8	8.40	8.43	69.7	8.33	8.26	72.1	6.24	71.9
07/09/21	13:30	NA	8.20	3.03	68.2	8.40	8.46	72.1	8.36	8.19	73.4	6.20	73.2
07/09/21	14:30	SHUTDOWN FOR WEEKEND											
07/09/21	15:30												
07/09/21	16:30												
07/09/21	17:30												
07/09/21	18:30												
07/12/21	7:30	PRESTART											
07/12/21	8:30												
07/12/21	9:30	NA	8.20	2.93	64.1	8.40	8.36	70.9	8.30	8.13	71.1	6.88	71.6
07/12/21	10:30	NA	8.20	2.99	64.1	8.40	8.27	70.2	8.24	8.09	72.4	6.35	71.4
07/12/21	11:30	NA	8.20	3.02	65.1	8.40	8.44	70.4	8.28	8.10	71.9	6.41	71.6
07/12/21	12:30	NA	8.20	3.01	66.3	8.40	8.46	70.2	8.31	8.05	70.9	6.55	72.7
07/12/21	13:30	NA	8.20	3.01	68.9	8.50	8.41	73.5	8.25	8.11	71.8	6.44	72.8
07/12/21	14:30	NA	8.20	2.96	69.9	8.60	8.43	73.7	8.30	8.22	74.6	6.40	73.9
07/12/21	15:30	NA	8.20	3.09	72.0	8.60	8.60	76.6	8.31	8.21	75.8	6.33	74.8
07/12/21	16:30	NA	8.20	3.00	73.0	8.60	8.67	77.5	8.34	8.23	77.0	6.38	75.5
07/12/21	17:30	NA	8.20	2.99	74.1	8.60	8.78	78.5	8.32	8.21	78.1	6.28	76.5
07/12/21	18:30	NA	8.20	2.98	74.1	8.60	8.70	81.1	8.38	8.20	78.2	6.36	77.8
07/12/21	19:30	NA	8.20	3.02	73.9	8.55	8.42	80.6	8.41	8.32	78.4	6.48	76.8
07/12/21	20:30	NA	8.20	3.04	73.7	8.55	8.41	79.7	8.44	8.34	78.2	6.51	76.4
07/12/21	21:30	NA	8.20	3.05	72.7	8.55	8.66	78.7	8.42	8.35	77.5	6.49	76.0
07/12/21	22:30	NA	8.20	3.04	71.5	8.50	8.44	77.8	8.37	8.32	76.0	6.48	75.5
07/12/21	23:30	NA	8.20	3.05	71.0	8.50	8.59	77.3	8.35	8.31	74.7	6.50	74.9
07/13/21	0:30	NA	8.20	3.06	69.9	8.50	8.52	75.6	8.35	8.30	73.6	6.52	74.4
07/13/21	1:30	NA	8.20	3.06	68.4	8.50	8.53	74.9	8.36	8.32	72.8	6.53	73.9
07/13/21	2:30	NA	8.20	3.07	67.7	8.50	8.45	74.0	8.37	8.30	72.0	6.49	73.3
07/13/21	3:30	NA	8.20	3.04	66.5	8.50	8.52	73.0	8.38	8.30	71.5	6.50	72.6
07/13/21	4:30	NA	8.20	3.05	65.3	8.50	8.27	71.8	8.41	8.28	70.7	6.48	72.2
07/13/21	5:30	NA	8.20	3.03	64.6	8.50	8.33	70.6	8.35	8.25	69.5	6.51	71.9
07/13/21	6:30	NA	8.20	3.06	64.1	8.50	8.78	69.9	8.34	8.22	68.3	6.54	71.6
07/13/21	7:30	NA	8.20	3.02	63.2	8.50	8.37	69.2	8.34	8.18	68.6	6.36	70.8
07/13/21	8:30	NA	8.20	3.08	63.0	8.50	8.49	68.7	8.33	8.20	68.8	6.42	71.0
07/13/21	9:30	NA	8.20	3.09	63.9	8.50	8.31	69.7	8.34	8.23	69.1	6.48	70.5
07/13/21	10:30	NA	8.20	3.08	64.6	8.50	8.55	69.9	8.31	8.23	69.9	6.45	70.8
07/13/21	11:30	NA	8.20	3.09	65.6	8.50	8.53	68.0	8.38	8.28	70.2	6.38	71.1
07/13/21	12:30	NA	8.20	3.11	66.5	8.50	8.41	71.4	8.38	8.23	72.2	6.24	71.5

Table A-4
Summary of 2021
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 pH set point	R-1 pH	R-1 temp °F	R-2 pH set point	R-2 pH	R-2 temp °F	FF-2 pH	Pit Clarifier pH	Pit Clarifier temp °F	Discharge Weir pH	Discharge Weir temp °F
07/13/21	13:30	NA	8.20	3.09	68.2	8.50	8.30	72.1	8.39	8.26	73.5	6.31	72.0
07/13/21	14:30	NA	8.20	3.06	70.1	8.50	8.47	74.6	8.41	8.25	75.2	6.30	72.9
07/13/21	15:30	NA	8.20	3.05	71.8	8.50	8.41	76.4	8.42	8.28	75.5	6.28	73.1
07/13/21	16:30	NA	8.20	3.06	73.0	8.50	8.46	77.1	8.44	8.33	76.8	6.47	74.3
07/13/21	17:30	NA	8.20	3.05	73.4	8.50	8.35	78.3	8.36	8.29	77.5	6.41	75.0
07/13/21	18:30	NA	8.20	3.05	73.7	8.50	8.49	78.3	8.44	8.33	77.7	6.36	75.7
07/13/21	19:30	NA	8.20	3.05	73.2	8.45	8.36	79.0	8.40	8.35	77.4	6.67	75.3
07/13/21	20:30	NA	8.20	3.04	72.5	8.45	8.29	79.0	8.41	8.36	77.2	6.71	75.3
07/13/21	21:30	NA	8.20	3.05	71.5	8.42	8.57	77.8	8.41	8.39	76.8	6.74	74.5
07/13/21	22:30	NA	8.20	3.03	70.8	8.42	8.36	77.1	8.42	8.42	76.2	6.75	74.0
07/13/21	23:30	NA	8.20	3.04	70.1	8.40	8.40	76.1	8.40	8.38	75.3	6.78	73.6
07/14/21	0:30	NA	8.20	3.01	68.9	8.40	8.19	75.2	8.39	8.39	74.5	6.79	73.1
07/14/21	1:30	NA	8.20	3.04	68.2	8.40	8.48	74.2	8.38	8.41	73.2	6.83	72.8
07/14/21	2:30	NA	8.20	3.00	67.2	8.40	8.32	73.3	8.40	8.44	72.5	6.85	72.5
07/14/21	3:30	NA	8.20	3.04	66.1	8.35	8.41	72.1	8.34	8.39	71.4	6.79	72.1
07/14/21	4:30	NA	8.20	3.03	65.3	8.35	8.49	71.4	8.34	8.34	70.5	6.74	71.5
07/14/21	5:30	NA	8.20	3.03	64.6	8.35	8.34	70.9	8.30	8.31	69.4	6.81	71.1
07/14/21	6:30	NA	8.20	3.04	63.9	8.35	8.21	69.9	8.32	8.28	68.6	6.79	70.7
07/14/21	7:30	NA	8.20	3.03	62.7	8.35	8.24	69.0	8.29	8.29	68.5	6.64	70.3
07/14/21	8:30	NA	8.20	3.06	62.5	8.40	8.52	68.5	8.24	8.28	69.0	6.59	70.9
07/14/21	9:30	NA	8.20	3.05	62.5	8.40	8.54	68.3	8.24	8.21	69.0	6.66	70.9
07/14/21	10:30	NA	8.20	3.06	63.7	8.40	8.42	69.0	8.27	8.25	69.3	6.60	71.3
07/14/21	11:30	NA	8.20	3.05	65.3	8.40	8.33	69.9	8.27	8.20	70.5	6.57	70.9
07/14/21	12:30	NA	8.20	3.06	66.3	8.40	8.25	70.6	8.28	8.22	71.7	6.56	71.3
07/14/21	13:30	NA	8.20	3.04	68.0	8.40	8.26	72.3	8.31	8.41	72.8	6.76	71.9
07/14/21	14:30	NA	8.20	3.05	68.9	8.40	8.56	73.5	8.29	8.37	74.4	6.41	73.2
07/14/21	15:30	NA	8.20	3.03	70.8	8.40	8.35	79.9	8.29	8.35	75.4	6.48	73.4
07/14/21	16:30	NA	8.20	3.04	72.7	8.40	8.39	76.6	8.32	8.42	76.3	6.77	74.1
07/14/21	17:30	NA	8.20	3.05	72.7	8.40	8.50	77.5	8.34	8.44	76.9	6.70	75.0
07/14/21	18:30	NA	8.20	3.05	72.7	8.40	8.59	78.0	8.21	8.25	77.2	7.02	75.4
07/14/21	19:30	NA	8.20	3.06	72.0	8.40	8.16	78.0	8.23	8.24	76.7	7.34	74.9
07/14/21	20:30	NA	8.20	-	-	8.40	8.47	77.5	8.21	8.23	76.3	7.31	74.8
07/14/21	21:30	NA	8.20	3.05	71.0	8.40	8.62	76.8	8.23	8.26	75.6	7.36	74.2
07/14/21	22:30	NA	8.20	3.09	70.1	8.40	8.52	76.1	8.23	8.30	74.3	7.41	73.8
07/14/21	23:30	NA	8.20	3.06	69.1	8.40	8.39	75.4	8.23	8.32	73.7	7.42	73.3
07/15/21	0:30	NA	8.20	3.04	67.7	8.40	8.41	74.0	8.22	8.29	72.4	7.39	72.9
07/15/21	1:30	NA	8.20	3.05	67.0	8.40	8.20	73.0	8.23	8.28	71.6	7.42	72.4
07/15/21	2:30	NA	8.20	3.04	66.5	8.40	8.52	72.3	8.24	8.26	70.8	7.44	71.9
07/15/21	3:30	NA	8.20	3.05	65.8	8.40	8.46	71.6	8.23	8.29	70.1	7.48	71.5
07/15/21	4:30	NA	8.20	3.03	64.9	8.40	8.36	70.9	8.25	8.27	69.5	7.46	71.1
07/15/21	5:30	NA	8.20	3.06	64.1	8.45	8.51	70.2	8.20	8.27	68.4	7.49	70.6
07/15/21	6:30	NA	8.20	3.05	63.4	8.45	8.21	69.2	8.25	8.31	67.9	7.51	70.0
07/15/21	7:30	NA	8.20	3.06	62.5	8.45	8.26	68.3	8.25	8.32	67.4	7.35	66.0
07/15/21	8:30	NA	8.20	3.07	62.2	8.45	8.54	68.0	8.22	8.31	68.9	7.54	69.3
07/15/21	9:30	NA	8.20	3.08	62.5	8.45	8.28	68.3	8.22	8.23	68.0	7.41	69.8
07/15/21	10:30	NA	8.20	3.08	63.4	8.45	8.64	68.7	8.29	8.29	68.5	7.41	70.3
07/15/21	11:30	NA	8.20	3.06	64.4	8.45	8.41	69.2	8.31	8.25	69.2	7.34	71.0
07/15/21	12:30	NA	8.20	3.07	65.6	8.45	8.49	70.2	8.37	8.33	70.5	7.28	71.4
07/15/21	13:30	NA	8.20	3.06	66.3	8.45	8.40	70.9	8.24	8.34	71.3	7.35	71.9
07/15/21	14:30	NA	8.20	3.06	67.7	8.45	8.55	72.1	8.26	8.21	72.1	7.30	72.9
07/15/21	15:30	NA	8.20	3.03	69.1	8.45	8.40	73.5	8.27	8.27	73.1	7.32	73.0
07/15/21	16:30	NA	8.20	3.04	70.3	8.45	8.35	72.7	8.30	8.31	75.1	7.36	74.9
07/15/21	17:30	NA	8.20	3.05	71.3	8.45	8.52	75.6	8.28	8.30	75.1	7.28	74.0
07/15/21	18:30	NA	8.20	3.05	71.0	8.45	8.44	76.1	8.45	8.45	76.2	7.28	74.1
07/15/21	19:30	NA	8.20	3.01	70.8	8.45	8.33	76.1	8.34	8.35	75.6	7.53	73.8
07/15/21	20:30	NA	8.20	3.02	70.3	8.45	8.54	75.9	8.33	8.31	75.1	7.37	73.2
07/15/21	21:30	NA	8.20	3.04	69.4	8.45	8.51	75.4	8.34	8.32	74.0	7.52	72.6
07/15/21	22:30	NA	8.20	3.03	68.4	8.45	8.42	74.5	8.33	8.33	73.1	7.47	72.0
07/15/21	23:30	NA	8.20	3.05	67.2	8.45	8.47	73.3	8.33	8.36	72.3	7.51	71.4
07/16/21	0:30	NA	8.20	3.03	66.5	8.45	8.26	72.5	8.32	8.32	71.5	7.49	70.9
07/16/21	1:30	NA	8.20	3.04	65.3	8.45	8.55	71.4	8.34	8.30	70.4	7.55	70.0
07/16/21	2:30	NA	8.20	3.04	64.6	8.45	8.57	70.6	8.31	8.29	69.2	7.51	69.6
07/16/21	3:30	NA	8.20	3.05	63.4	8.45	8.49	69.5	8.33	8.28	68.4	7.53	69.4
07/16/21	4:30	NA	8.20	3.06	62.5	8.45	8.27	68.5	8.32	8.33	67.3	7.57	69.3
07/16/21	5:30	NA	8.20	3.07	61.5	8.45	8.61	68.0	8.31	8.30	66.2	7.54	68.5
07/16/21	6:30	NA	8.20	3.04	60.6	8.45	8.36	67.1	8.29	8.25	65.1	7.55	67.2
07/16/21	7:30	NA	8.20	3.08	58.7	8.45	8.42	65.2	8.27	8.25	64.7	7.53	67.0
07/16/21	8:30	NA	8.20	3.06	58.4	8.45	8.46	64.5	8.19	8.20	63.8	7.48	66.8
07/16/21	9:30	NA	8.20	3.09	58.7	8.45	8.51	64.2	8.22	8.06	63.5	7.66	67.2
07/16/21	10:30	NA	8.20	3.10	59.6	8.45	8.43	64.7	8.23	8.15	65.0	7.37	67.5
07/16/21	11:30	NA	8.20	3.09	60.3	8.45	8.63	65.4	8.26	8.18	65.8	7.29	68.3
07/16/21	12:30	NA	8.20	3.09	61.5	8.45	8.47	66.4	8.27	8.22	69.9	7.25	69.0
07/16/21	13:30	NA	8.20	3.09	63.7	8.45	8.24	68.0	8.31	8.21	68.2	7.66	69.4
07/16/21	14:30	NA	8.20	3.08	64.6	8.45	8.35	69.0	8.33	8.23	69.4	7.31	70.4

Table A-4
Summary of 2021
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 pH set point	R-1 pH	R-1 temp °F	R-2 pH set point	R-2 pH	R-2 temp °F	FF-2 pH	Pit Clarifier pH	Pit Clarifier temp °F	Discharge Weir pH	Discharge Weir temp °F
07/16/21	15:30	NA	8.20	3.09	65.6	8.45	8.65	70.4	8.29	8.20	70.3	7.23	71.2
07/16/21	16:30	NA	8.20	3.07	67.7	8.45	8.47	71.8	8.29	8.21	71.6	7.22	71.9
07/16/21	17:30	NA	8.20	3.08	68.2	8.45	8.51	72.8	8.30	8.23	71.5	7.30	72.3
07/16/21	18:30	NA	8.20	3.06	68.7	8.45	8.56	73.3	8.47	8.35	72.8	7.22	70.1
07/16/21	19:30	NA	8.20	3.06	68.4	8.40	8.32	73.7	8.42	8.35	72.7	7.37	71.8
07/16/21	20:30	NA	8.20	3.07	68.0	8.35	8.48	73.5	8.41	8.33	72.3	7.37	71.4
07/16/21	21:30	SHUTDOWN FOR FIRE											
07/16/21	22:30												
07/16/21	23:30												
07/16/21	0:30												
07/16/21	1:30												
07/16/21	2:30												
07/16/21	3:30												
07/16/21	4:30												
07/16/21	5:30												
07/16/21	6:30												
08/09/21	7:30	PRESTART											
08/09/21	8:30												
08/09/21	9:30												
08/09/21	10:30	NA	8.20	3.05	57.7	8.35	8.41	64.0	8.21	7.85	63.2	NA	NA
08/09/21	11:30	NA	8.20	3.10	59.2	8.35	8.47	64.0	8.23	7.87	65.0	NA	NA
08/09/21	12:30	NA	8.20	3.25	60.8	8.35	8.27	65.2	8.29	7.96	64.9	NA	NA
08/09/21	13:30	NA	8.20	3.36	62.7	8.35	8.18	66.8	8.30	7.95	67.8	NA	NA
08/09/21	14:30	NA	8.20	3.62	62.7	8.35	8.41	67.6	8.34	8.17	68.5	NA	NA
08/09/21	15:30	NA	8.20	3.60	63.9	8.35	8.27	68.7	8.36	8.19	69.7	NA	NA
08/09/21	16:30	NA	8.20	3.80	64.9	8.35	8.51	69.2	8.40	8.23	70.2	NA	NA
08/09/21	17:30	NA	8.20	3.61	65.3	8.35	8.37	70.9	8.37	8.18	71.0	NA	NA
08/09/21	18:30	NA	8.20	3.52	65.6	8.35	8.62	70.6	8.37	8.18	71.2	NA	NA
08/09/21	19:30	NA	8.20	3.48	65.8	8.35	8.46	70.6	8.34	8.29	72.5	NA	NA
08/09/21	20:30	NA	8.20	3.47	66.1	8.35	8.44	71.4	8.33	8.26	71.6	NA	NA
08/09/21	21:30	NA	8.20	3.47	66.1	8.35	8.42	71.3	8.35	8.32	70.7	NA	NA
08/09/21	22:30	NA	8.20	3.48	65.8	8.35	8.37	71.4	8.33	8.35	69.9	NA	NA
08/09/21	23:30	NA	8.20	3.47	65.6	8.35	8.16	70.4	8.35	8.36	69.4	NA	NA
08/10/21	0:30	NA	8.20	3.49	64.9	8.35	8.42	70.6	8.35	8.37	69.0	NA	NA
08/10/21	1:30	NA	8.20	3.49	64.1	8.35	8.53	69.7	8.35	8.34	68.1	NA	NA
08/10/21	2:30	NA	8.20	3.46	62.5	8.35	8.44	68.7	8.34	8.32	67.3	NA	NA
08/10/21	3:30	NA	8.20	3.44	61.8	8.35	8.44	67.6	8.36	8.34	66.4	NA	NA
08/10/21	4:30	NA	8.20	3.49	60.6	8.35	8.31	66.8	8.36	8.33	65.5	NA	NA
08/10/21	5:30	NA	8.20	3.50	59.9	8.35	8.53	64.9	8.32	8.35	64.6	NA	NA
08/10/21	6:30	NA	8.20	3.50	59.2	8.35	8.11	64.7	8.34	8.36	63.7	NA	NA
08/10/21	7:30	NA	8.20	3.55	58.4	8.35	8.20	64.5	8.35	8.31	63.1	NA	NA
08/10/21	8:30	NA	8.20	3.60	57.5	8.35	8.27	63.0	8.36	8.33	63.3	NA	NA
08/10/21	9:30	NA	8.20	3.67	58.0	8.35	8.22	63.7	8.40	8.33	63.6	NA	NA
08/10/21	10:30	NA	8.20	3.49	58.2	8.35	8.57	63.5	8.32	8.30	64.0	NA	NA
08/10/21	11:30	NA	8.20	3.42	59.9	8.35	8.54	64.2	8.34	8.22	65.3	NA	NA
08/10/21	12:30	OFFLINE											
08/10/21	13:30												
08/10/21	14:30	NA	8.20	4.04	64.6	8.35	8.34	66.1	8.45	8.18	68.0	NA	NA
08/10/21	15:30	NA	8.20	3.39	67.0	8.35	8.52	70.4	8.40	8.21	71.0	NA	NA
08/10/21	16:30	NA	8.20	3.21	68.0	8.35	8.44	71.4	8.38	8.22	72.0	NA	NA
08/10/21	17:30	NA	8.20	3.14	68.7	8.35	8.23	72.8	8.38	8.23	72.5	NA	NA
08/10/21	18:30	GENERATOR ISSUES											
08/10/21	19:30	NA	8.20	3.12	68.7	8.35	8.15	74.2	8.36	8.27	73.0	NA	NA
08/10/21	20:30	NA	8.20	3.10	68.0	8.35	8.21	74.0	8.36	8.25	73.1	NA	NA
08/10/21	21:30	NA	8.20	3.08	67.5	8.35	8.28	73.3	8.37	8.29	72.4	NA	NA
08/10/21	22:30	NA	8.20	3.10	66.5	8.35	8.30	72.8	8.39	8.31	71.3	NA	NA
08/10/21	23:30	NA	8.20	3.09	65.6	8.35	8.34	71.6	8.38	8.33	70.5	NA	NA
08/11/21	0:30	NA	8.20	3.16	64.1	8.35	8.55	70.4	8.38	8.34	69.3	NA	NA
08/11/21	1:30	NA	8.20	3.09	63.2	8.35	8.16	69.5	8.39	8.35	67.9	NA	NA
08/11/21	2:30	NA	8.20	3.09	61.8	8.35	8.36	68.5	8.39	8.33	66.8	NA	NA
08/11/21	3:30	NA	8.20	3.10	60.8	8.35	8.24	67.3	8.31	8.31	65.9	NA	NA
08/11/21	4:30	NA	8.20	3.12	59.6	8.35	8.14	65.9	8.32	8.30	65.0	NA	NA
08/11/21	5:30	NA	8.20	3.11	58.4	8.35	8.64	64.7	8.31	8.29	64.2	NA	NA
08/11/21	6:30	NA	8.20	3.12	57.7	8.35	8.47	64.0	8.31	8.27	63.5	NA	NA
08/11/21	7:30	NA	8.20	3.11	57.7	8.35	8.44	63.0	8.33	8.29	61.9	NA	NA
08/11/21	8:30	NA	8.20	3.13	56.3	8.35	8.36	62.1	8.33	8.28	62.2	NA	NA
08/11/21	9:30	NA	8.20	3.11	56.5	8.35	8.43	62.1	8.27	8.23	62.4	6.65	59.2
08/11/21	10:30	NA	8.20	3.12	56.8	8.35	8.54	62.3	8.27	8.20	63.1	6.51	61.3
08/11/21	11:30	NA	8.20	3.10	58.4	8.35	8.39	63.5	8.26	8.28	64.1	6.46	62.8
08/11/21	12:30	NA	8.20	3.10	60.3	8.35	8.20	65.2	8.28	8.26	65.6	6.43	63.8
08/11/21	13:30	NA	8.20	3.13	63.9	8.35	8.29	67.9	8.30	8.25	67.7	6.44	64.7
08/11/21	14:30	NA	8.20	3.14	66.1	8.35	8.51	69.7	8.31	8.27	70.0	6.41	65.4
08/11/21	15:30	NA	8.20	3.13	67.2	8.35	8.41	71.6	8.33	8.28	71.2	6.39	66.0
08/11/21	16:30	NA	8.20	3.14	68.4	8.35	8.46	72.1	8.36	8.30	71.5	6.39	66.4

Table A-4
Summary of 2021
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 pH set point	R-1 pH	R-1 temp °F	R-2 pH set point	R-2 pH	R-2 temp °F	FF-2 pH	Pit Clarifier pH	Pit Clarifier temp °F	Discharge Weir pH	Discharge Weir temp °F
08/11/21	17:30	NA	8.20	3.13	68.9	8.35	8.23	72.5	8.34	8.24	72.7	6.41	67.1
08/11/21	18:30	NA	8.20	3.13	69.4	8.35	8.36	73.3	8.33	8.26	73.0	6.38	67.2
08/11/21	19:30	NA	8.20	3.13	68.9	8.35	8.57	74.5	8.29	8.16	73.1	6.53	68.9
08/11/21	20:30	NA	8.20	3.14	68.7	8.35	8.62	74.9	8.28	8.18	73.3	6.58	69.9
08/11/21	21:30	NA	8.20	3.11	68.0	8.35	8.13	73.7	8.31	8.20	72.2	6.55	68.7
08/11/21	22:30	NA	8.20	3.12	67.0	8.35	8.27	73.0	8.29	8.21	70.9	6.51	67.4
08/11/21	23:30	NA	8.20	3.12	66.8	8.35	8.47	72.1	8.30	8.19	70.0	6.50	67.3
08/12/21	0:30	NA	8.20	3.17	64.6	8.35	8.16	70.9	8.28	8.20	69.2	6.53	67.4
08/12/21	1:30	NA	8.20	3.13	63.0	8.35	8.32	69.2	8.27	8.17	68.3	6.48	67.3
08/12/21	2:30	NA	8.20	3.14	61.5	8.35	8.66	68.3	8.29	8.18	67.1	6.44	67.0
08/12/21	3:30	NA	8.20	3.14	60.3	8.35	8.41	66.6	8.31	8.17	66.0	6.50	66.8
08/12/21	4:30	NA	8.20	3.13	59.2	8.35	8.17	65.2	8.24	8.19	64.7	6.48	66.6
08/12/21	5:30	NA	8.20	3.15	58.0	8.35	8.51	64.5	8.22	8.16	64.4	6.55	66.1
08/12/21	6:30	NA	8.20	3.16	57.2	8.35	8.22	63.7	8.26	8.14	64.2	6.53	66.0
08/12/21	7:30	NA	8.20	3.16	56.1	8.35	8.55	62.3	8.24	8.15	61.8	6.53	65.1
08/12/21	8:30	NA	8.20	3.17	56.1	8.35	8.58	61.6	8.19	8.14	62.0	6.48	65.6
08/12/21	9:30	NA	8.20	3.17	55.6	8.35	8.32	61.1	8.17	8.16	61.9	6.62	65.8
08/12/21	10:30	NA	8.20	3.16	57.0	8.40	8.44	61.6	8.26	8.19	62.3	6.47	65.8
08/12/21	11:30	NA	8.20	3.17	58.2	8.40	8.50	62.6	8.26	8.20	63.4	6.48	66.1
08/12/21	12:30	NA	8.20	3.16	60.1	8.40	8.36	64.0	8.30	8.23	64.5	6.54	67.0
08/12/21	13:30	NA	8.20	3.17	61.5	8.40	8.40	65.6	8.33	8.23	65.4	6.50	67.8
08/12/21	14:30	NA	8.20	3.15	63.4	8.40	8.22	66.1	8.34	8.13	67.9	6.66	67.8
08/12/21	15:30	NA	8.20	3.15	65.6	8.40	8.36	71.4	8.36	8.25	68.2	6.65	67.1
08/12/21	16:30	NA	8.20	3.14	66.3	8.40	8.57	71.6	8.39	8.26	68.0	6.75	67.0
08/12/21	17:30	NA	8.20	3.14	66.8	8.40	8.29	72.3	8.40	8.20	71.2	6.63	67.4
08/12/21	18:30	NA	8.20	3.13	67.2	8.40	8.23	72.1	8.42	8.23	71.5	6.58	68.0
08/12/21	19:30	NA	8.20	3.14	67.0	8.40	8.50	72.3	8.42	8.22	71.4	7.46	67.3
08/12/21	20:30	NA	8.20	3.14	66.3	8.35	8.17	71.6	8.37	8.23	71.2	7.48	67.4
08/12/21	21:30	NA	8.20	3.19	65.1	8.35	8.49	70.9	8.39	8.24	70.0	7.50	67.4
08/12/21	22:30	NA	8.20	3.16	63.2	8.35	8.28	69.9	8.41	8.26	68.8	7.48	67.3
08/12/21	23:30	NA	8.20	3.18	61.5	8.35	8.26	68.3	8.43	8.25	67.5	7.46	67.0
08/13/21	0:30	NA	8.20	3.15	59.6	8.35	8.17	66.4	8.40	8.24	66.7	7.51	66.7
08/13/21	1:30	NA	8.20	3.17	58.2	8.35	8.19	64.7	8.39	8.23	65.5	7.47	66.4
08/13/21	2:30	NA	8.20	3.18	57.0	8.35	8.41	63.5	8.40	8.20	63.4	7.48	66.0
08/13/21	3:30	NA	8.20	3.20	55.6	8.35	8.54	62.1	8.35	8.18	62.1	7.50	65.9
08/13/21	4:30	NA	8.20	3.18	54.6	8.35	8.28	61.4	8.31	8.16	60.8	7.49	65.3
08/13/21	5:30	NA	8.20	3.17	53.2	8.35	8.21	59.7	8.33	8.15	59.9	7.48	64.9
08/13/21	6:30	NA	8.20	3.19	52.3	8.35	8.30	58.7	8.32	8.13	58.8	7.47	64.6
08/13/21	7:30	NA	8.20	3.18	51.1	8.35	8.43	57.6	8.32	8.17	57.9	7.47	64.4
08/13/21	8:30	NA	8.20	3.20	51.3	8.35	8.54	57.1	8.21	8.28	58.0	6.59	64.5
08/13/21	9:30	NA	8.20	3.17	52.3	8.35	8.14	56.4	8.23	8.20	58.4	6.78	64.8
08/13/21	10:30	NA	8.20	3.19	54.2	8.35	8.39	58.7	8.26	8.18	59.4	6.56	65.2
	11:30	SHUT DOWN - END OF OPERATIONS											

NA = Not applicable
- = Data not collected

Table A-5
2021 Pond Water Treatment Sludge Analytical Results

Regulatory Criteria	Date	Percent Solids	Aluminum			Antimony			Arsenic			Barium			Beryllium			Cadmium			Chromium			Cobalt			Copper			Iron			Lead			Mercury			Molybdenum			Nickel			Selenium			Silver			Thallium			Vanadium			Zinc		
TTLC (mg/kg)		NP	NP			500			500			10000			75			100			2500			8000			2500			NP			1000			20			3500			2000			100			500			700			2400			5000		
STLC (mg/L)		NP	NP			15			5			100			0.75			1			5			80			25			NP			5			0.2			350			20			1			5			7			24			250		
Sample ID and Testing Procedure		**Percent Solids**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**	**Result**	**DQ**	**EQ**
2122PWT022-PC-A (0 - 16.5")	10/14/2021	18.8																																																							
TTLC (mg/kg dry)			43300			9.77	ND		400			4.89			1.32			6.93			111			250			151			50700	D1		2.19	J	J	0.0532	ND		5.86	ND		666			9.77	ND,D1,Q7		4.89	ND,D1		9.77	ND		20.5			122		
STLC (mg/L)			498			0.500	ND		0.623			0.112		U	0.0406			0.0100	ND		2.66			7.64			2.10			478			0.100	ND		0.00100	ND		0.0500	ND		19.8			0.175	ND		0.0500	ND		1.00	ND		0.165			3.12		
TCLP (mg/L)			14.5			0.500	ND		0.100	ND		0.0500	ND		0.0100	ND		0.0100	ND		0.0250	ND		1.09			0.0500	ND		1.00	ND		0.100	ND		0.00100	ND,M5		0.0500	ND		4.02			0.175	ND		0.0500	ND		1.00	ND		0.0500	ND		0.234		
2122PWT022-PC-B (0 - 22")	10/14/2021	16.1																																																							
TTLC (mg/kg dry)			69200			10.4	ND		582			12.9			2.17			10.9			162			401			239			87200	D1		2.34	J	J	0.0596	ND,M5		6.24	ND		1070			10.4	ND,D1,Q7		5.20	ND,D1		10.4	ND		30.1			195		
STLC (mg/L)			598			0.500	ND		0.604			0.118		U	0.0486			0.0100	ND		2.86			9.19			2.32			607			0.100	ND		0.00100	ND		0.0500	ND		23.5			0.175	ND		0.0500	ND		1.00	ND		0.180			3.51		
TCLP (mg/L)			18.2			0.500	ND		0.100	ND		0.0500	ND		0.0100	ND		0.0100	ND		0.0250	ND		1.04			0.0500	ND		1.00	ND		0.100	ND		0.00100	ND		0.0500	ND		3.82			0.175	ND		0.0500	ND		1.00	ND		0.0500	ND		0.219		
2122PWT022-PC-C (0 - 30")	10/14/2021	17.3																																																						
TTLC (mg/kg dry)			78900			10.5	ND		599			7.31			2.49			11.9			163			459			270			89900	D1		2.33	J	J	0.0563	ND		6.3	ND		1220			10.5	ND,D1,Q7		5.25	ND,D1		10.5	ND		29.6			222		
STLC (mg/L)			628			0.500	ND		0.475			0.135		U	0.0495			0.0100	ND		2.58			9.58			2.57			552			0.100	ND		0.00100	ND		0.0500	ND		24.7			0.175	ND		0.0500	ND		1.00	ND		0.178			3.61		
TCLP (mg/L)			11.2			0.500	ND		0.100	ND		0.0500	ND		0.0100	ND		0.0209			0.0250	ND		0.982			0.0500	ND		1.00	ND		0.100	ND		0.00100	ND		0.0500	ND		4.29			0.175	ND		0.0500	ND		1.00	ND		0.0500	ND		0.232		

Notes:

Sludge samples represent a homogenized section through the entire sludge blanket thickenss.
TTLC - Total Threshold Limit Concentration
STLC - Soluble Threshold Limit Concentration
TCLP - Toxicity Characteristic Leaching Procedure
NP - Not Promulgated

Data Qualifiers (DQ) from the Laboratory:

ND = Not detected at or above adjusted sample detection limit
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
D1 = Dilution was performed due to matrix interference.
Q7 = CCV recovery is above the acceptance limits. However there is no impact on the reported value.
M5 = Post digestion spike is outside of acceptance limits.

EPA Qualifiers (EQ) from an additional QA/QC:

J = Estimated concentration; the analyte was detected between the RL and DL and/or one or more quality control parameters were not met
U = The analyte was detected above the reported method detection limit; however, the detection is attributed to external contamination.

Appendices B through D (on compact disc)

Appendix B – 2021 Pond Water Treatment Data

Laboratory Reports (PDF format)

Analytical Laboratory Electronic Data Deliverable Files (Microsoft Excel format)

Appendix C – AECOM: Leviathan Mine Pond Water Treatment, 2021 Data Summary Report

Attachment 4 – Data Quality Summary (PDF format)

Appendix D – 2021 Water Year USGS Flow and Stage Annual Data Reports

Annual Water Data Reports for 12 Stations (Microsoft Excel format)