

YEAR-END REPORT FOR THE 2016 FIELD SEASON AT LEVIATHAN MINE

Alpine County, California

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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 subsequently reissued the AAA in 2001, 2002, 2003, 2004, and 2005. In its 2005 AAA, USEPA decided, instead of issuing the AAA every year, to allow its Remedial Project Manager to notify 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 2016 Field Season at Leviathan Mine (Year-End Report) has been prepared by the Water Board for the USEPA. This Year-End Report was prepared 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."

The pre-certification inspection for the Leviathan Mine Site was conducted onsite on October 6, 2016 and by conference call on October 25, 2016 by USEPA and Water Board personnel.

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 2016. 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 *2016 Work Plan for Leviathan Mine, Alpine County, California* (Work Plan) prepared by the Water Board.

This report describes the site activities performed in 2016, and is organized into the following sections:

- A background section that describes the site setting and history; collection and storage of AMD; and the treatment process;
- A sludge removal and pond water treatment section describing the removal and disposal of sludge and treatment of AMD in 2016;
- A site meteorological and surface water flow monitoring section; and
- A general site maintenance section.

Pond water treatment data are summarized in five tables in Appendix A (A-1 through A-5). Laboratory reports and electronic data deliverables for pond water samples, USGS flow and stage data, and Pond Water Treatment Operator Logs are included as electronic files on the enclosed disc and 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 9 and 15 gallons per minute (gpm) with rates as high as approximately 50 gpm (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 42 gpm (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 12.8 acres with a cumulative holding capacity of approximately 16.5 million gallons, based on an October 1998 survey conducted by ARCO Environmental Remediation, LLC. 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 called the "upper ponds" and have a combined 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 the Leviathan Creek or to Pond 4. Pond 4 overflows directly to the Leviathan Creek via PVC piping. Pond 4 is being utilized by Atlantic Richfield Company (ARC) 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 2016, Pond 3 received no overflow from any of the upper ponds, and there was no discharge from Pond 3 to Leviathan Creek or Pond 4.

2.3 Pond Water Treatment (PWT) 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. There was no need for spring treatment in 2016. 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 $\text{Ca}[\text{OH}]_2$), is mixed into the AMD from the pond system; 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.

The Water Board assembled the PWT plant (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 2016. The typical Water Board field season at Leviathan Mine runs from mid-June through mid-October.

The Plant, which has also been referred to as the Pond 1 lime treatment plant, because the treatment system is located adjacent to Pond 1, treats the AMD stored in the three upper ponds. 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.

3. 2016 POND WATER TREATMENT AND SLUDGE REMOVAL

The 2016 AMD treatment and associated activities included sludge removal from the Pit Clarifier in June and AMD treatment at the Plant in July and August. These activities are further discussed in the following sections.

3.1 Pit Clarifier Sludge Removal and Disposal

Approximately 163 tons of sludge generated during operation of the Plant in 2015 were removed from the Pit Clarifier by the Water Board's contractor, URS Corporation Americas (URS), in June 2016. The sludge was sampled, analyzed, and characterized in the fall of 2015; the results from the fall 2015 sampling were reported in the Water Board's 2015 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 following sludge removal; the sand layer was adequate and replenishment was not necessary.

3.2 2016 Summer Pond Water Treatment Plant Operation

The Water Board contracted with URS for Plant operations for the 2016 field season. AMD treatment began in early-July, with the first treated AMD entering the Pit Clarifier on July 5, 2016. Discharge of treated AMD from the Pit Clarifier to Leviathan Creek began on July 11, 2016, and treatment ceased on August 17, 2016. URS chose to operate the Plant 24 hours per day, Monday through Friday during most of the treatment season.

In 2016 URS used pre-mixed lime slurry delivered to the site in tanker trucks. URS used a two point lime addition during most of the 2016 treatment season.

Figure 4 shows the PWT system layout and Figure 5 shows a simplified piping and instrumentation diagram of the PWT Plant. URS 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 4.5, 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 was 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. In 2016, URS used a pH probe in FF-2 to control the mud 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 to Pond 1. 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. This year the flow in Leviathan Creek was insufficient to supply an adequate volume of utility water for the entire treatment season. As has been done in recent years, the Water Board began using treated AMD from the Water Board's effluent weir box as a source of utility water shortly after treatment began. Approximately 60 percent of the AMD was neutralized while using treated effluent as utility water. Based on laboratory analytical results of effluent samples and field observations, no negative impacts on treatment efficiency were observed while using treated effluent as utility water.

In 2016, treated AMD was discharged from the Pit Clarifier using both the underdrain and piccolo decant structure. 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. For 2016, the Water Board's stage data were used to calculate treated effluent discharge volumes. The V-notch weir was flow tested by USGS and Water Board staff at both high flows (approximately 240 gpm) and low flows (less than 50 gpm). The USGS developed a rating curve based on these data; the rating curve was used to convert the 15-minute stage readings into flow rates.

Discharge of treated AMD from the Pit Clarifier to Leviathan Creek began on July 11, 2016. Discharge to Leviathan Creek 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 17, 2016, treated AMD continued to be discharged from the Pit Clarifier as the accumulated sludge drained. By September 5, 2016, approximately 5.7 million gallons of treated AMD had been discharged to Leviathan Creek, and flows from the Pit Clarifier underdrain were well below 5 gpm. A summary of daily flow volumes discharged to Leviathan Creek is presented in Table A-1 of Appendix A.

The 2016 PWT Plant operation consumed approximately 62.07 standard tons of dry lime, 184 gallons of liquid flocculent, 4,120 gallons of diesel fuel, and 200 gallons of gasoline. The Water Board's treatment effort in 2016, 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 2016 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 485 - 570 tons of sludge will be disposed of in 2017.

3.3 Summer Pond Water Treatment Monitoring

Treatment process monitoring, sampling and analysis were performed in accordance with the Water Board's April 2016 *Sampling and Analysis Plan for Leviathan Mine Site Pond Water Treatment* (PWT SAP). A summary of the monitoring parameters, locations, and frequencies for the 2016 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 summarized in Table 2. In 2016, there were 14 minor deviations from the PWT SAP as explained in Section 3.4.3. Samples collected by URS staff were transferred under chain of custody for laboratory analysis by off-site laboratories, Microbac, of Marietta, Ohio, and Curtis and Tompkins, Ltd, Analytical Laboratories, of Berkeley, California.

To confirm the quality of treated AMD discharged to Leviathan Creek, the Water Board's contractor, URS, collected grab samples of the treated AMD (effluent) twice weekly during the 2016 treatment season. URS collected effluent samples from the Water Board's weir box located near the Pit Clarifier. As specified in the 2016 Work Plan, effluent sample collection stopped when the discharge of effluent dropped below 5 gpm, which occurred on August 30, 2016. The first effluent sample was collected on July 12, 2016, and the last effluent sample was collected on August 31, 2016. 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 URS staff on July 6 and 7, 2016 from the Pit Clarifier. Additionally, URS collected Plant influent samples from the line conveying pond water to the treatment plant twice weekly during the 2016 treatment season.

In summary, the Water Board's contractor collected the following samples for analytical laboratory analysis as part of the 2016 PWT monitoring program:

- 15 effluent samples (2 per week)
- 2 effluent duplicate samples
- 2 pre-discharge samples
- 11 pre-treatment influent samples (2 per week)
- 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, URS submitted to the laboratory samples of Plant influent and effluent for total dissolved solids (TDS), dissolved sulfate (SO₄), calcium (Ca), cobalt (Co), magnesium (Mg), and manganese (Mn). During influent and effluent sample collection activities, URS 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.

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 (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 URS 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 URS's operator logs are available for review in the Water Board's office in South Lake Tahoe.

Sludge generated during the 2016 treatment effort, and contained in the Pit Clarifier, was sampled on October 12, 2016, for waste characterization and disposal purposes. URS 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 to 32 inches.

Sludge samples were analyzed for comparisons with Total Threshold Limit Concentrations (TTLCs) and Soluble Threshold Limit Concentrations (STLCs) for California Code of Regulations Title 22 metals, aluminum, and iron; and percent solids. Additionally, sludge samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) for disposal purposes. Analytical results for the sludge samples are summarized in Table A-5 of Appendix A.

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 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 efficiency.
- 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. One sample, 1617PWT004-EFF, in 2016 exceeded the

Daily Maximum Discharge Criteria for zinc, however this result appears to be an anomaly because the result (1.40 mg/L) is higher than even the highest influent concentration of 1.25 mg/L. Water Board staff discussed this issue with laboratory personnel however the laboratory maintained that a dilution or sample mix-up did not occur. Of the 14 other effluent samples, only three detected zinc at 0.0624, 0.0614, and 0.0109 mg/L respectively, in the 11 other effluent samples zinc was not detected above the detection limit of 0.0100 mg/L. Water Board staff believe that the 1617PWT004-EFF zinc result is not accurate.

One sample, 1617PWT004-EFF, in 2016 individually exceeded the more stringent USEPA 4-day Average Discharge Criteria for lead, however this result also appears to be an anomaly because the result (0.00713 mg/L) is higher than even the highest influent lead concentration of 0.00135 mg/L. Water Board staff discussed this issue with the laboratory concurrently with the zinc discussion for the same sample. Laboratory personnel maintained that a dilution or sample mix-up did not occur. All of the 14 other effluent samples had a non-detect for lead. Water Board staff believe that the 1617PWT004-EFF lead result is not accurate.

Table A-3 summarizes laboratory analytical results for Plant influent samples. Results are fairly consistent with previous treatment seasons. Plant influent sample pH ranged from 1.95 to 2.79 and TDS ranged from 3,970 to 5,540 milligrams per liter (mg/L) with an average of 4,495 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 was within the 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 5.7 million gallons of effluent was discharged to Leviathan Creek in 2016. 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 2016 treatment season. On October 12, 2016, URS collected three sludge samples from the Pit Clarifier to characterize sludge generated during the 2016 treatment season. These three sludge samples averaged 13 percent solids. With the exception of the TTLC analysis for arsenic, the sludge did not exceed any other TTLC or STLC limits. The total concentrations for arsenic exceeded the TTLC in two of the three sludge samples. The arithmetic average arsenic concentration for these three samples was 503 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, and 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 99 percent or greater solids by weight; therefore, the sludge is not likely to exceed the TTLC when it is disposed of in the late spring or early summer of 2017.

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.

3.4.3 Data Quality Evaluation

URS 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 laboratory. 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, URS, and Water Board review are presented with the data in Tables A-2, A-3, and A-5. In 2016, Water Board staff assigned a data qualifier of “**” for data that did not meet our field duplicate assessment (relative percent difference), a data qualifier of “***” for data that did not meet our FMB analysis, and a data qualifier of “^” for anomalous results for effluent data in Table A-2. URS data qualifiers are summarized in Appendix D – URS 2016 Data Summary Report, Attachment 4.

URS submitted two field duplicate samples to the laboratory to measure the precision of the entire measurement system including sampling and analytical procedures in 2016. 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 Reporting Limit (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 in control limits.

In 2016, the field duplicate samples were within the control limits for RPD with two exceptions. The RPD for dissolved cobalt was 47 percent for the sample/duplicate pair (sample 1617PWT008-EFF and duplicate 1617PWT009-EFF). The RPD for dissolved

iron was 37 percent for the sample/duplicate pair (sample 1617PWT008-EFF and duplicate 1617PWT009-EFF). 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 four positive detections in the FMB, or sample 1617PWT010-FMB. These detections are discussed below and concentrations are compared with sample 1617PWT012-EFF, which was taken on the same day as the FMB sample. The first parameter detected in the FMB is dissolved calcium and does not have discharge criteria established by the USEPA at Leviathan Mine. The dissolved calcium sample concentration was detected in the FMB sample at 3.78 mg/L, whereas the concentration of dissolved calcium in the effluent sample in the same batch was 596 mg/L. The second parameter detected in the FMB is dissolved magnesium and does not have discharge criteria established by USEPA at Leviathan Mine. The dissolved magnesium concentration was detected in the FMB sample at 1.84 mg/L, whereas the dissolved magnesium concentration in the effluent sample analyzed in the same batch was 27.9 mg/L. The third parameter detected in the FMB sample is dissolved manganese, which also does not have discharge criteria established by the USEPA at Leviathan Mine. The dissolved manganese concentration in the FMB sample was 0.00425 mg/L, whereas the dissolved manganese concentration in the effluent sample analyzed in the same batch was 0.237 mg/L. The fourth parameter detected in the FMB was dissolved zinc, which has a USEPA discharge limit of 0.21 mg/L for both the daily maximum and four day average discharge criteria. The dissolved zinc concentration was detected at 0.0624 mg/L, whereas the dissolved zinc concentration in the effluent sample analyzed in the same batch was a non-detect at 0.0100 mg/L reporting limit.

The second FMB sample, sample 1617PWT014-FMB had 6 positive detections. These detections are discussed below and concentrations are compared with sample 1617PWT015-EFF, which was taken on the same day as the FMB sample. The first parameter detected in the FMB is dissolved calcium and does not have discharge criteria established by the USEPA at Leviathan Mine. The dissolved calcium sample concentration was detected in the FMB sample at 3.95 mg/L, whereas the concentration of dissolved calcium in the effluent sample in the same batch was 886 mg/L. The second parameter detected in the FMB is dissolved cobalt and does not have discharge criteria established by USEPA at Leviathan Mine. The dissolved cobalt concentration was detected in the FMB sample at 0.00122 mg/L, whereas the dissolved cobalt concentration in the effluent sample analyzed in the same batch was 0.00949 mg/L. The third parameter detected in the FMB is dissolved magnesium and does not have discharge criteria established by USEPA at Leviathan Mine. The dissolved magnesium concentration was detected in the FMB sample at 1.83 mg/L, whereas the dissolved magnesium concentration in the effluent sample analyzed in the same batch was 31.8 mg/L. The fourth parameter detected in the FMB sample is dissolved manganese, which does not have discharge criteria established by the USEPA at Leviathan Mine. The dissolved manganese concentration in the FMB sample was

0.00458 mg/L, whereas the dissolved manganese concentration in the effluent sample analyzed in the same batch was 0.589 mg/L. The fifth parameter detected in the FMB is total dissolved solids and does not have discharge criteria established by USEPA at Leviathan Mine. The total dissolved solids concentration was detected in the FMB sample at 72.0 mg/L, whereas the total dissolved solids concentration in the effluent sample analyzed in the same batch was 3380 mg/L. The sixth parameter detected in the FMB was dissolved zinc, which has a USEPA discharge limit of 0.21 mg/L for both the daily maximum and four day average discharge criteria. The dissolved zinc concentration was detected at 0.0614 mg/L, whereas the dissolved zinc concentration in the effluent sample analyzed in the same batch was a non-detect at 0.0100 mg/L reporting limit.

There were fourteen minor deviations from the PWT SAP that occurred this year. The first 5 deviations were for influent and effluent samples. For sample 1617PWT010-FMB, the reporting limit for total dissolved solids was not met by the laboratory. The PWT SAP specifies the maximum reporting limit at 10 mg/L for total dissolved solids, however this sample was a non-detect at a reporting limit of 20 mg/L. The plant influent sample 1617PWT019-INF was reanalyzed past hold time for total dissolved solids analysis. For this sample, sulfate and total dissolved solids were initially analyzed within hold time; however it appeared that the initial sample results were erroneous as the sulfate result exceeded the total dissolved solids result. The holding time for sulfate is 28 days. The holding time for total dissolved solids is 7 days. Water Board staff requested that sulfate and total dissolved solids samples be reanalyzed, at which time the holding time for the total dissolved solids sample had elapsed. For total dissolved solids, the sample was reanalyzed 7 days past the hold time. The sulfate and total dissolved solids results from the reanalysis are included in Table A-3. For samples 1617PWT030-EFF, 1617PWT031-EFF, and 1617PWT032-EFF, the reporting limit was not met by the laboratory for dissolved aluminum. The PWT SAP specifies the maximum reporting limit at 0.1 mg/L for dissolved aluminum, however all three samples were a non-detect at a reporting limit of 0.200 mg/L.

The last 9 minor deviations from the PWT SAP are for the sludge STLC samples. For the three sludge samples, the PWT SAP maximum reporting limits for antimony (10.0 mg/L), selenium (5.0 mg/L), and silver (1.0 mg/L) were not met, as is discussed further below. For sample 1617PWT033-PC-A, the results were non-detect for antimony, selenium, and silver, the reporting limits were 15 mg/L, 15 mg/L, and 2.1 mg/L, respectively. For sample 1617PWT034-PC-B, the results were non-detect for antimony, selenium, and silver, the reporting limits were 15 mg/L, 15 mg/L, and 1.9 mg/L, respectively. For sample 1617PWT035-PC-C, the results were non-detect for antimony, selenium, and silver, the reporting limits were 14 mg/L, 14 mg/L, and 1.7 mg/L, respectively.

The plant influent sample 1617PWT011-INF was reanalyzed past hold time for total dissolved solids analysis, however the original result is reported in Table A-3. For this sample, sulfate and total dissolved solids were initially analyzed within hold time; however it appeared that the initial sample results were erroneous as the sulfate result exceeded the total dissolved solids result. The holding time for sulfate is 28 days. The holding time for total dissolved solids is 7 days. Water Board staff requested that

sulfate and total dissolved solids samples be reanalyzed, at which time the holding time for the total dissolved solids sample had elapsed. For total dissolved solids, the sample was reanalyzed 8 days past the hold time. The sulfate results from the reanalysis are included in Table A-3. The total dissolved solids results from the original analysis are included in Table A-3 and the result from the reanalysis is included as a footnote in Table A-3.

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 minimal 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 the 2017 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.

4. METEOROLOGICAL AND SURFACE WATER MONITORING

In a letter dated March 28, 2011, the USEPA authorized the Water Board to discontinue surface water quality monitoring and meteorological monitoring responsibilities for the site. Although the Water Board was not required to monitor meteorological data at the site, it continued to do so through 2015. In early 2016 the Water Board's weather station became inoperable. As such, the Water Board has officially discontinued meteorological monitoring at Leviathan Mine as authorized by the USEPA. As required by the USEPA, the Water Board continued its efforts through the 2016 water year to monitor surface water flow in the vicinity of Leviathan Mine. The Water Board also monitored the level of Pond 1. The surface water flow 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 2016 water year began October 1, 2015 and ended September 30, 2016. Under contract to the Water Board, the United States Geological Survey (USGS) monitored water flows and pond water level stage at 15 locations during the 2016 water year. Flow monitoring locations, USGS station numbers, and equipment are detailed in Table 3 and shown on Figure 6. As shown in Table 3, 13 of the 15 stations have continuous stage records, one of the 15 stations (Station 16, Aspen Creek above the confluence of Aspen and Leviathan Creeks) is monitored manually 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 C-1 through C-13 (Appendix C) provide the final provisional data for the 2016 water year. The USGS typically publishes the data by the spring following the completion of the 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 six stations: Adit, PUD, Station 1, Station 15, Station 25, and Pond 1. 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 2016 field season in accordance with the 2016 Work Plan.

5.1 Routine Maintenance

Routine maintenance activities performed in 2016 included repairing the perimeter fence, removing sediment from storm water conveyances, installation and maintenance of Best Management Practices (BMP's), minor grading, and coordinating invasive plant control.

The perimeter fencing is barbed-wire and surrounds the majority of the site. In early-June 2016, Water Board staff inspected the perimeter fence and noted that minor repairs to the fence were required in a number of locations around the site. Water Board staff performed periodic fence repairs throughout the field season and completed fence repairs by mid-September.

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 URS to remove accumulated sediment from storm water conveyance ditches in the Pond 1 area, along the Pit access road, and above the Delta slope; and to perform maintenance or replacement of BMPs in the Pond 1 area and along the Pit access road. Sediment was removed from the storm water conveyance ditches in late-June 2016 and BMP maintenance was completed in late-August 2016.

Water Board staff also directed URS to perform minor grading around the southwest corner of Pond 2 South as well as to fill in minor rills in the Pond 2 North and Pond 2 South liner cover material. The grading was completed in late-June 2016 and the minor rills were filled in late-August 2016.

The El Dorado County, Department of Agriculture (EDCDA) visited Leviathan Mine on August 17, 2016, and spot applied an herbicide (Telar[®]) on invasive plants. This year,

as in 2002 through 2015, the EDCDA sprayed to eradicate tall whitetop (*Lepidium latifolium*) as well as dyers woad (*Isatis tinctoria L.*).

5.2 Non-Routine Maintenance

During the winter of 2016 Water Board personnel discovered a discrepancy between the Pond 1 stage as measured in the Flow Control Structure (FCS) and Pond 1 stage as actually measured in Pond 1. AMD from the FCS is routed to the pond system via underground PVC piping, historically the elevation of AMD in the FCS has been the same elevation as AMD contained in Pond 1 and has been where the Pond 1 AMD elevation has been measured.

The discrepancy between the two readings led Water Board personnel to believe that sediment, which was likely washed into the FCS in the late 1980's or early 1990's, was being redistributed in such a manner as to partially obstruct the AMD distribution line. Water Board staff directed URS to remove sediment and debris in the AMD distribution line from the FCS to Pond 1 and to remotely video the condition of the AMD distribution line. URS subcontracted with Underground Video Technology, Inc. (UVT) to perform this work in early-October. UVT successfully removed approximately a half cubic yard of sediment from the approximately 370 feet of AMD distribution line between the FCS and the outlet to Pond 1. UVT also successfully performed a video inspection of the majority of this section and confirmed that all of the sediment (except very minor amounts) was removed and that there are no obstructions between the FCS and Pond 1.

It will be unknown if sediment removal from the AMD distribution line will cause the Pond 1 AMD elevation measurement, as collected in the FCS, to return to its historical accuracy until more AMD accumulates in the Ponds.

6. OTHER ITEMS

6.1 Unauthorized Site Activity

On October 26, 2016 an AMEC Foster Wheeler employee (AMEC), performing RI/FS work for ARC, discovered an excavation containing a partially buried wooden box a short distance north of MW-40 on the Aspen Seep side of Leviathan Mine. Because the excavation and wooden box did not appear to be related to any ARC site work, AMEC notified Water Board personnel of the excavation/box on October 27, 2016. Water Board personnel confirmed that the excavation/box were not related to any Water Board work tasks. On October 31, 2016 Water Board personnel notified USEPA personnel of the unauthorized site activity via personal communication. On November 1, 2016, Water Board personnel conducted a site visit and confirmed that a wooden box approximately six feet, by six feet, by four feet in dimension had been constructed in an excavation north of MW-40 and had been partially covered with soil from the excavation. Water Board personnel made additional site visits on November 2, 2016 and again on November 5, 2016 with law enforcement personnel from the Alpine County Sheriff's office, California Highway Patrol, and the El Dorado County Sheriff's Office. Law enforcement personnel determined that the wooden box was empty and posed no threat to site personnel. It is unknown at this time who constructed the box or

what their intentions for the box were. During the 2017 field season the Water Board will coordinate with their pond water treatment contractor to remove and dispose of the box as well as fill in the excavation. Water Board personnel will keep the USEPA apprised if any new information becomes available.

6.2 Notifications Provided to Landowner

On November 4, 2016, AMEC personnel provided notification to Water Board personnel by electronic mail that on September 6, 2016, field crews encountered soil with what was described as resembling a “hydrocarbon” odor at 4.5 feet below ground surface in one boring at the original location of Hydrology Plot 2. Following the observation of a “hydrocarbon” odor, Hydrology Plot 2 was relocated. Water Board personnel forwarded the information provided by AMEC to the USEPA on November 7, 2016.

LIST OF FIGURES

Figure 1: Site Location Map

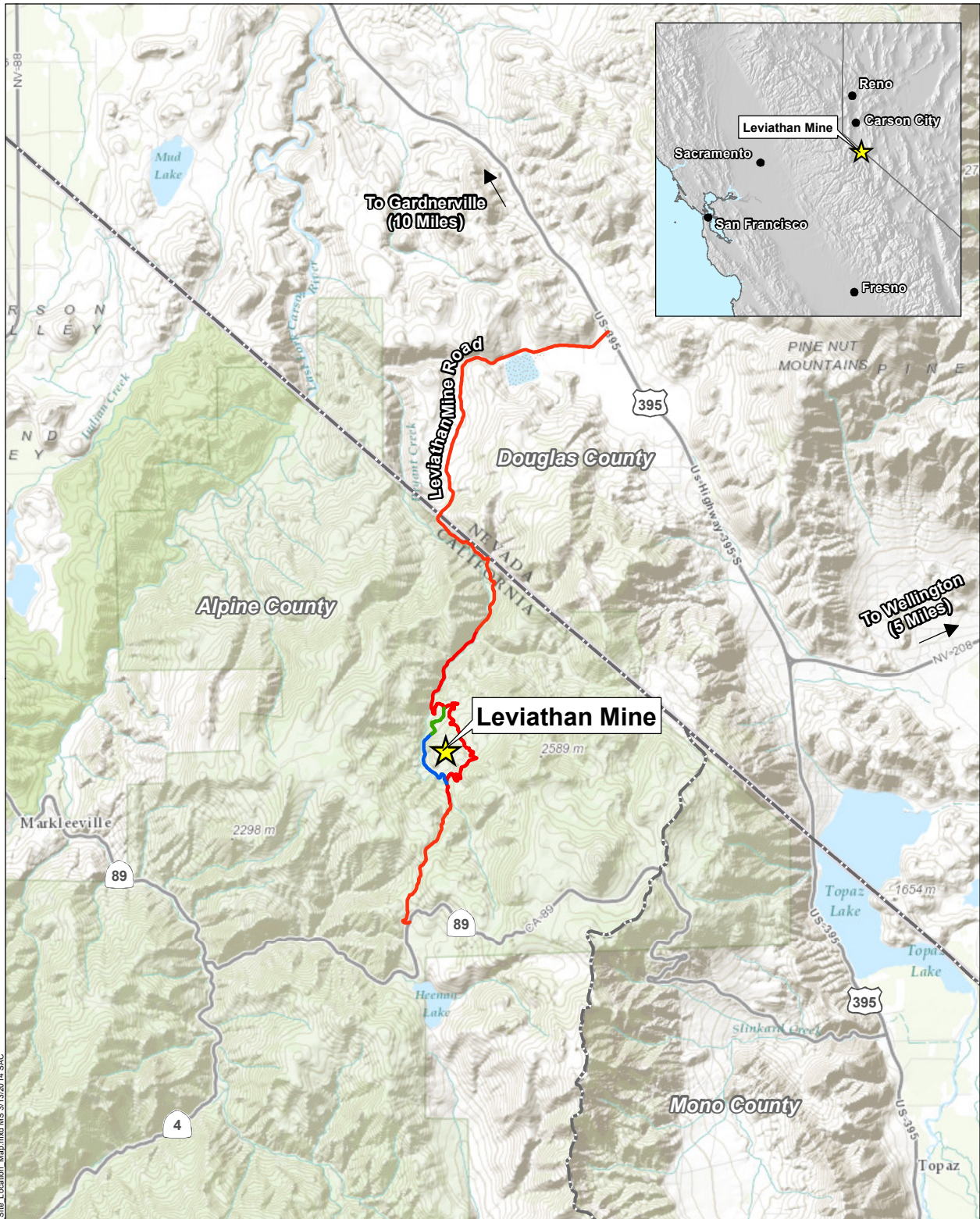
Figure 2: Bryant Creek Watershed

Figure 3: Lahontan Water Board AMD Capture and Treatment System

Figure 4: Pond Water Treatment System Layout

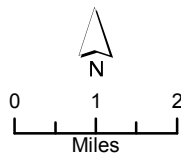
Figure 5: Pond Water Treatment Simplified Piping and Instrumentation Diagram

Figure 6: Flow and Stage Monitoring Locations



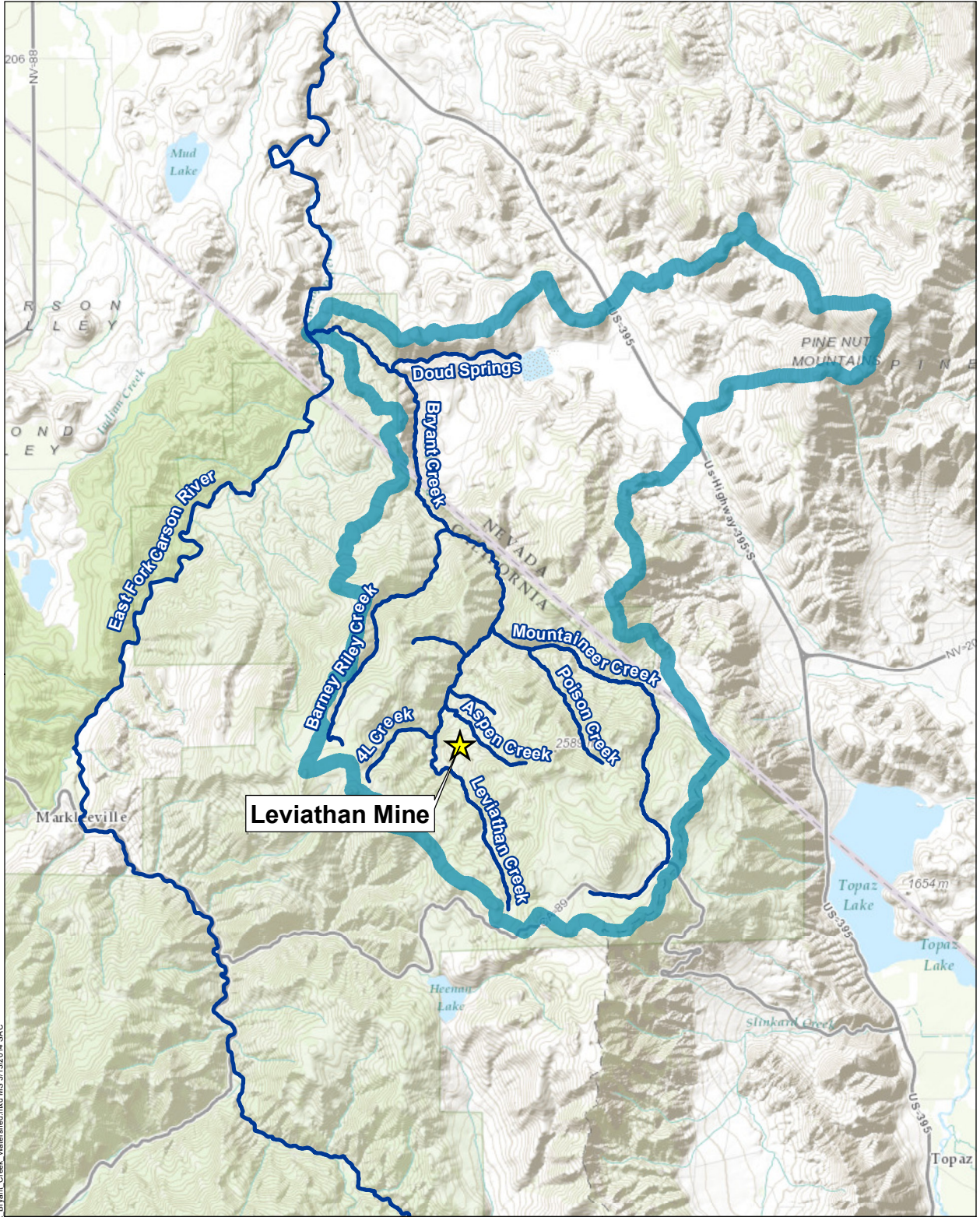
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- Forest Service Road 31348
- Leviathan Mine Access Road
- Leviathan Mine Road (Forest Service Road 31052)
- National Forest



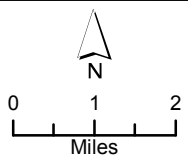
**Leviathan Mine
Site Location Map**

**Figure
1**



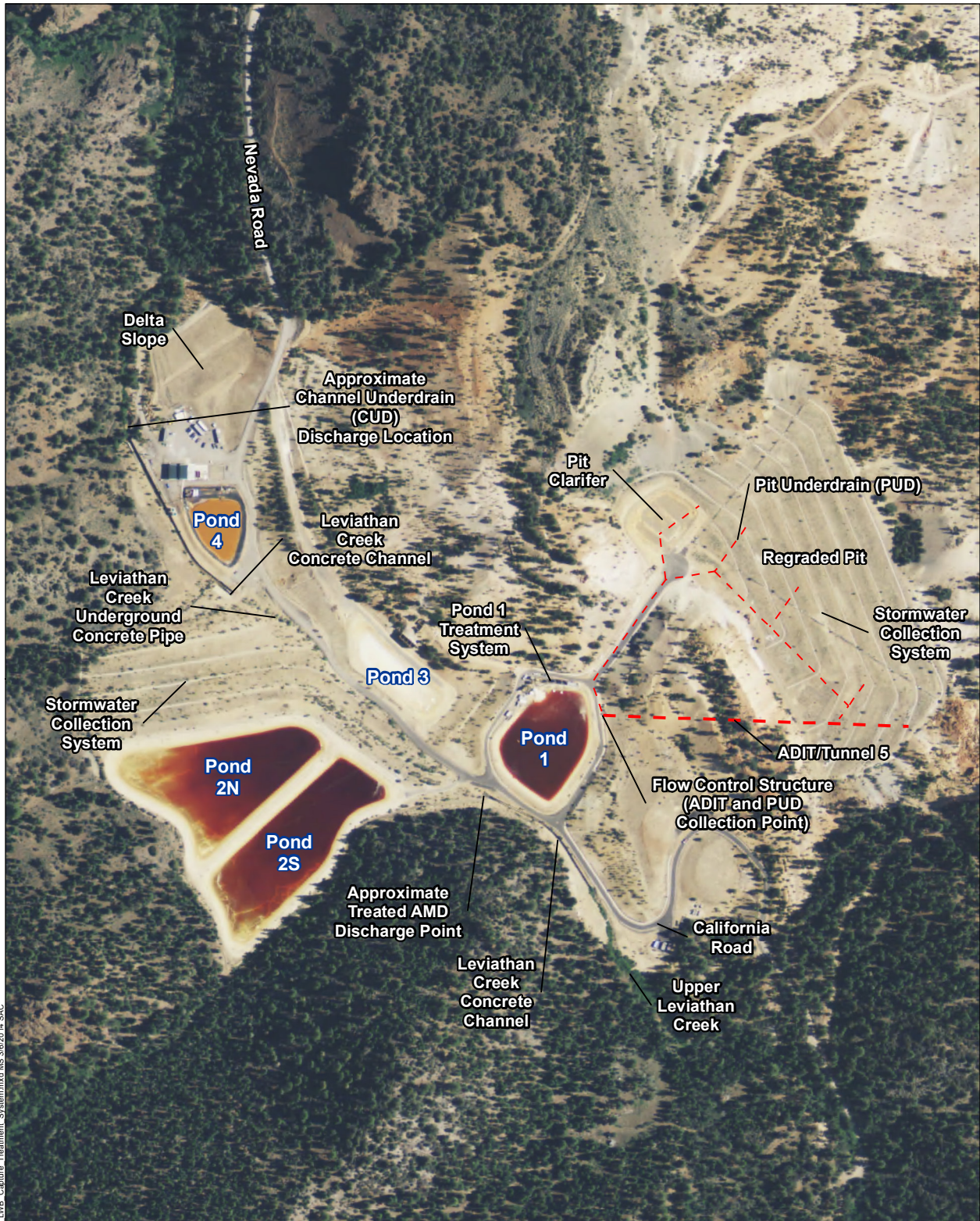
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- Bryant Creek Watershed
- River/Creek
- National Forest

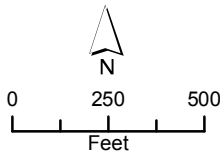


Bryant Creek Watershed

Figure 2



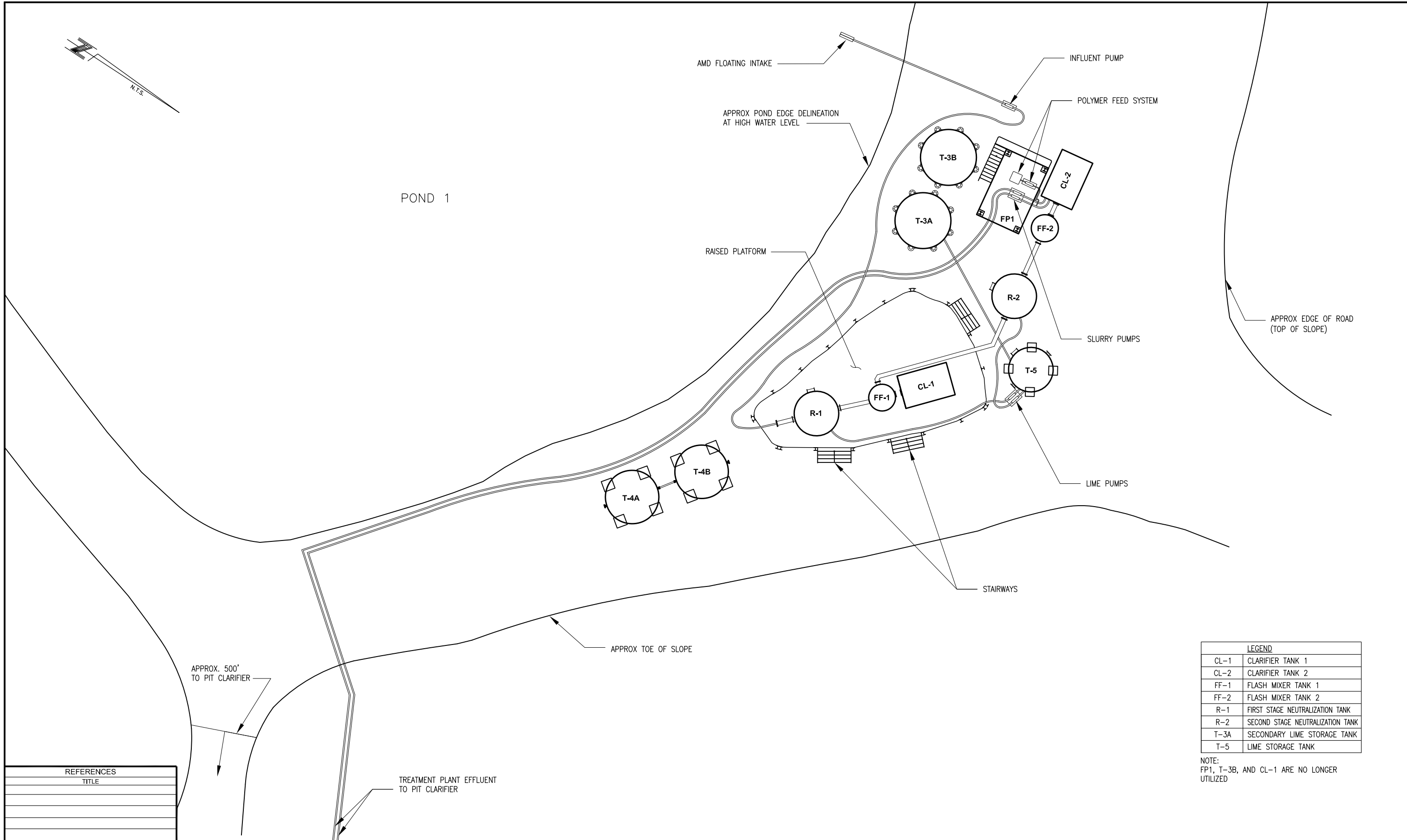
- - - ADIT/Tunnel 5
- . . . Pit Underdrain (PUD)



**Lahontan Water Board
AMD Capture
and Treatment System**

**Figure
3**

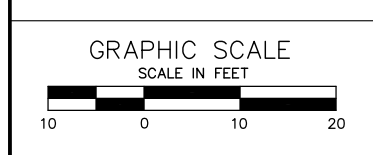
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LEGEND	
CL-1	CLARIFIER TANK 1
CL-2	CLARIFIER TANK 2
FF-1	FLASH MIXER TANK 1
FF-2	FLASH MIXER TANK 2
R-1	FIRST STAGE NEUTRALIZATION TANK
R-2	SECOND STAGE NEUTRALIZATION TANK
T-3A	SECONDARY LIME STORAGE TANK
T-5	LIME STORAGE TANK

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

REFERENCES
TITLE



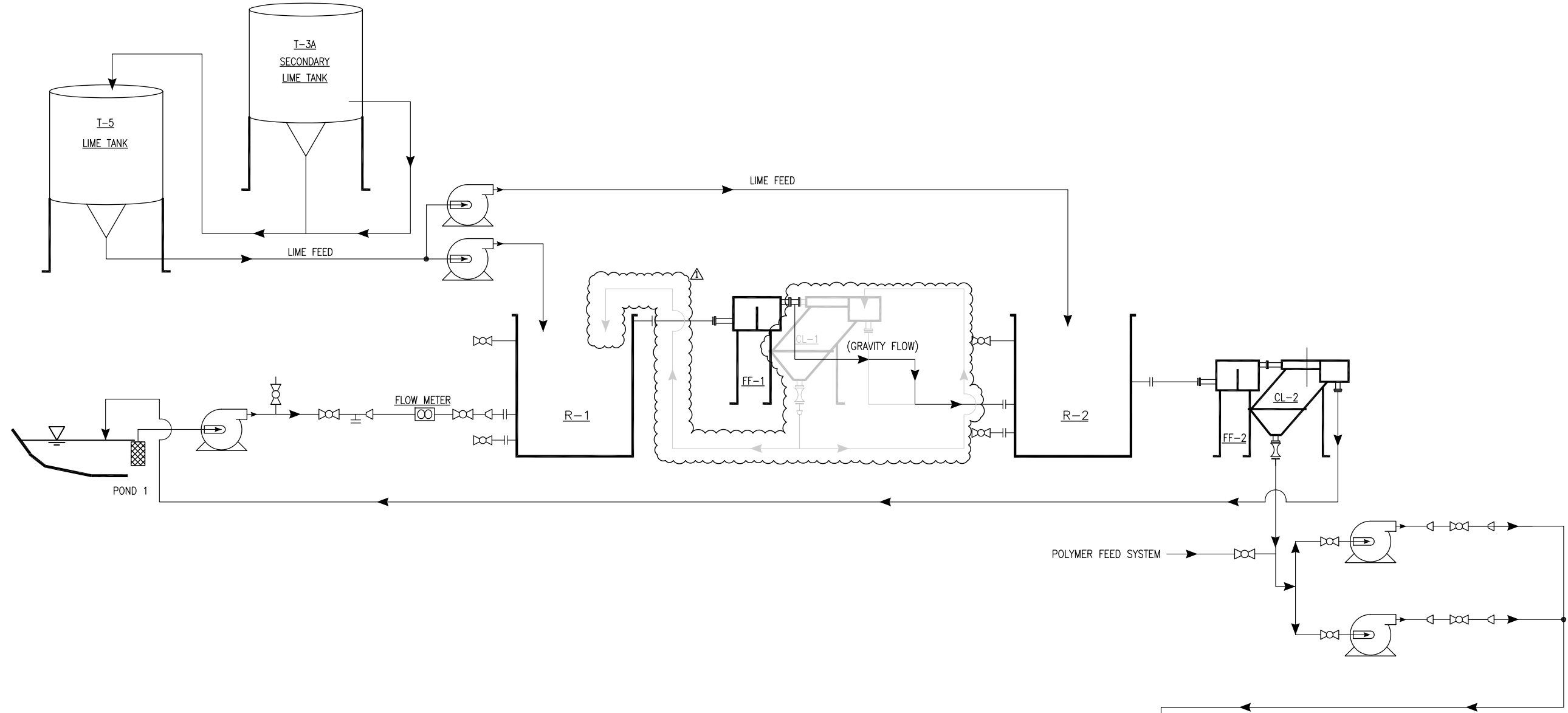
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DRAWING SCALE	AS NOTED	DATE
DESIGNED BY:		
DRAWN BY:		
CHECKED BY:		
APPROVED BY:		



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

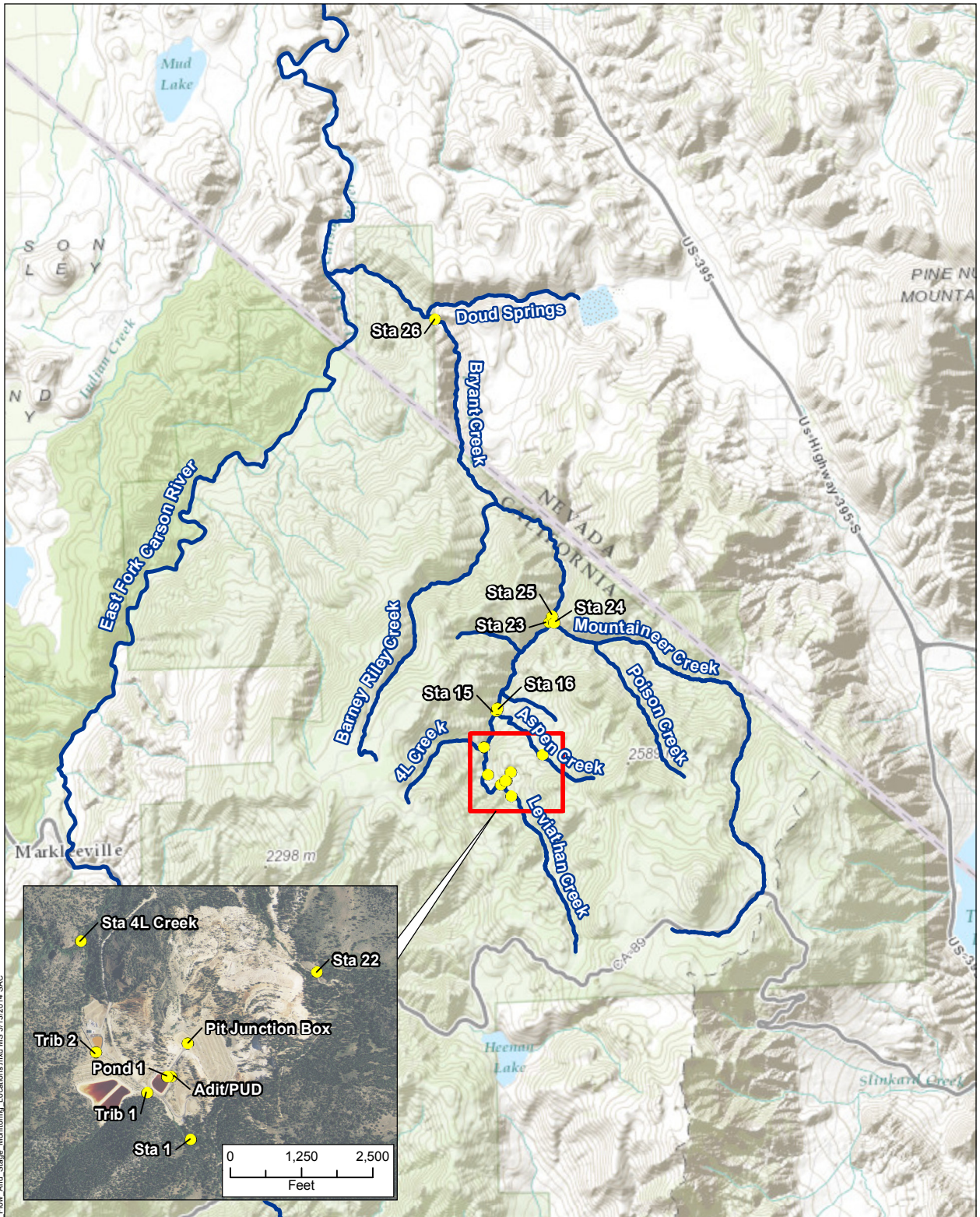
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△	DRL	03/2013	2011/2012 SYSTEM UPGRADES

NO.	BY.	DATE	REVISIONS DESCRIPTION
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DRAWING SCALE	AS NOTED	DATE
DESIGNED BY:		
DRAWN BY:		
CHECKED BY:		
APPROVED BY:		

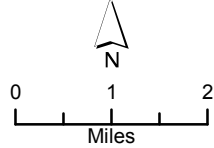


LEVIATHAN MINE POND WATER TREATMENT SYSTEM SIMPLIFIED PIPING & INSTRUMENTATION DIAGRAM	JOB NO.
	PROJECT
	SHEET NO.
	Figure 5



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- Flow and Stage Monitoring Location
- River/Creek
- National Forest



Flow and Stage Monitoring Locations

Figure 6

LIST OF TABLES

Table 1: 2016 Pond Water Treatment Monitoring Program

Table 2: USEPA Discharge Criteria

Table 3: 2016 Flow and Stage Monitoring Locations

TABLE 1
2016 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
<p>Notes:</p> <p>1. Dissolved As, Al, Cd, Cr, Cu, Fe, Pb, Ni, Zn (off-site laboratory); total recoverable Se (off-site laboratory); pH (field); temperature (field)</p> <p>2. Dissolved Ca, Co, Mg, Mn, sulfate, TDS (off-site laboratory analysis)</p> <p>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)</p> <p>4. STLC is the Soluble Threshold Limit Concentration and TTLC is the Total Threshold Limit Concentration.</p> <p>5. Effluent samples were collected twice per week until discharge from the Pit Clarifier dropped below 5 gallons per minute.</p>				

**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 a 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 promptly 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
2016 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
Station 26 (10308800)	Bryant Creek above the confluence of Doud Springs and Bryant Creek	Continuous flow recorder and appurtenances, solar power supply, telemetry (real time provisional data available).	August 2001
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

APPENDICES

Appendix A - Data Summary for 2016 Pond Water Treatment

Table A-1: 2016 Pond Water Treatment, Daily Discharge Summary

Table A-2: 2016 Pond Water Treatment Effluent Field and Analytical Results

Table A-3: 2016 Pond Water Treatment Influent Field and Analytical Results

Table A-4: Summary of 2016 Pond Water Treatment Plant Operators' Logs

Table A-5: 2016 Pond Water Treatment Sludge Analytical Results

Table A-1
2016 Pond Water Treatment
Daily Discharge Summary

Date	Volume Discharged (Gallons)	Cumulative Discharge (Gallons)
7/11/2016	67,725	67,725
7/12/2016	218,160	285,885
7/13/2016	178,005	463,890
7/14/2016	175,680	639,570
7/15/2016	214,560	854,130
7/16/2016	214,560	1,068,690
7/17/2016	175,680	1,244,370
7/18/2016	72,870	1,317,240
7/19/2016	61,920	1,379,160
7/20/2016	102,420	1,481,580
7/21/2016	151,200	1,632,780
7/22/2016	175,680	1,808,460
7/23/2016	175,680	1,984,140
7/24/2016	162,720	2,146,860
7/25/2016	162,720	2,309,580
7/26/2016	222,330	2,531,910
7/27/2016	214,560	2,746,470
7/28/2016	129,600	2,876,070
7/29/2016	163,125	3,039,195
7/30/2016	175,680	3,214,875
7/31/2016	100,800	3,315,675
8/1/2016	76,320	3,391,995
8/2/2016	83,500	3,475,495
8/3/2016	168,885	3,644,380
8/4/2016	244,800	3,889,180
8/5/2016	167,550	4,056,730
8/6/2016	92,160	4,148,890
8/7/2016	69,120	4,218,010
8/8/2016	56,160	4,274,170
8/9/2016	61,920	4,336,090
8/10/2016	164,700	4,500,790
8/11/2016	260,640	4,761,430
8/12/2016	157,440	4,918,870
8/13/2016	69,120	4,987,990
8/14/2016	56,160	5,044,150
8/15/2016	50,400	5,094,550
8/16/2016	130,650	5,225,200
8/17/2016	123,045	5,348,245

8/18/2016	50,400	5,398,645
8/19/2016	44,640	5,443,285
8/20/2016	40,320	5,483,605
8/21/2016	34,560	5,518,165
8/22/2016	26,755	5,544,920
8/23/2016	23,112	5,568,032
8/24/2016	19,800	5,587,832
8/25/2016	16,790	5,604,622
8/26/2016	14,098	5,618,720
8/27/2016	11,693	5,630,413
8/28/2016	9,576	5,639,989
8/29/2016	7,704	5,647,693
8/30/2016	6,091	5,653,784
8/31/2016	4,694	5,658,478
9/1/2016	3,600	5,662,078
9/2/2016	2,592	5,664,670
9/3/2016	1,728	5,666,398
9/4/2016	1,152	5,667,550
9/5/2016	720	5,668,270

**Table A-2
2016 Pond Water Treatment Effluent Field and Analytical Results**

SAMPLE ID	Sample Description	SAMPLE DATE	pH	TEMP (°C)	Aluminum			Arsenic			Cadmium			Calcium			Chromium			Cobalt			Copper			Iron			Lead			Magnesium			Manganese			Nickel			Selenium			Sulfate (as SO ₄)			Total Dissolved Solids			Zinc				
					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					
USEPA Daily Maximum Discharge Criteria			6.0 - 9.0		4			0.34			0.009			NP			0.97			NP			0.026			2			0.136			NP			NP			0.84			NP			NP			NP			0.21				
USEPA 4-Day Average Discharge Criteria			NP		2			0.15			0.004			NP			0.31			NP			0.016			1			0.005			NP			NP			0.094			0.005			NP			NP			0.21				
1617PWT001-PC	Pre-Discharge	07/06/2016	7.45	19.8	0.671			0.00199			0.000300	U		968			0.00295			0.00421			0.00397			0.0500	U		0.000500	U				28.5			0.231			0.0208			0.00407			2500			3880			0.0100	U	
1617PWT002-PC	Pre-Discharge	07/07/2016	8.26	18.2	0.999			0.00511			0.000750	U		897			0.00423	J	J	0.0136			0.00959			0.0500	U		0.00125	U				26.5			0.775			0.0644			0.00450			2440			4000			0.0100	U	
1617PWT004-EFF	PWT Effluent	07/12/2016	7.15	17.3	0.0500	U		0.00506			0.000300	U		757			0.00468			0.00300			0.0117			0.191			0.00713			^	29.4			0.197			0.0236			0.00425			1970			3020			1.40		^	
1617PWT006-EFF	PWT Effluent	07/14/2016	7.91	25.9	0.0786	J	J	0.00389			0.000300	U		701			0.00303			0.00171			0.00581			0.115			0.000500	U				29.8			0.246	B		0.0192			0.00361			1700			2680			0.0100	U	
1617PWT008-EFF	PWT Effluent	07/19/2016	7.30	17.9	0.0500	U		0.00374			0.000300	U		657			0.00249			0.00249	J	*	0.00509			0.165			0.000500	U				29.8			0.227			0.0196			0.00402			1620			2480			0.0100	U	
1617PWT009-EFF	Duplicate	07/19/2016	7.30	17.9	0.0500	U		0.00341			0.000300	U		652			0.00253			0.00155	J		0.00540			0.113			0.000500	U				29.5			0.217			0.0189			0.00380			1580			2480			0.0100	U	
1617PWT010-FMB	Field Method Blank	07/21/2016	NA	NA	0.0500	U		0.000500	U		0.000300	U		3.78	**		0.00100	U		0.000704	J	J	0.00100	U		0.0500	U		0.000500	U				1.84	**		0.00425	**		0.00200	U		0.000500	U		0.500	U	10.0	U		0.0624	**		
1617PWT012-EFF	PWT Effluent	07/21/2016	6.63	18.7	0.0500	U		0.00440			0.000300	U		596			0.00228			0.00225	U		0.00483			0.0651	J	J	0.000500	U				27.9			0.237	U		0.0186			0.00370			2160			2560			0.0100	U	
1617PWT014-FMB	Field Method Blank	07/26/2016	NA	NA	0.0639	J	J	0.000500	U		0.000300	U		3.95	**		0.00123	J	J	0.00122	**		0.00100	U		0.0750	J	J	0.000500	U				1.83	**		0.00458	**		0.00200	U		0.000500	U		0.500	U	72.0	J	**	0.0614	**		
1617PWT015-EFF	PWT Effluent	07/26/2016	7.55	23.4	0.665			0.00657			0.000300	U		886			0.00360	U		0.00949			0.00483			0.262	U		0.000500	U				31.8			0.589			0.0483			0.00500			2030			3380	J-		0.0100	U	
1617PWT016-EFF	Duplicate	07/26/2016	7.55	23.4	0.680			0.00652			0.000300	U		885			0.00372	U		0.00926			0.00558			0.238	U		0.000500	U				32.9			0.608			0.0496			0.00460			2110			3310	J-		0.0100	U	
1617PWT018-EFF	PWT Effluent	07/29/2016	7.70	24.6	0.172	U		0.00415			0.000481	J	J	817			0.00357	J		0.0146			0.00552			0.188			0.000500	U				33.6			0.600			0.0512			0.00441			1890			3090			0.0100	U	
1617PWT020-EFF	PWT Effluent	08/02/2016	7.83	21.1	0.200	U		0.00241			0.000300	U		612			0.00283			0.00187			0.00382			0.117	J		0.000500	U				37.2			0.236			0.0209			0.00392			1510			2270			0.0100	U	
1617PWT022-EFF	PWT Effluent	08/05/2016	7.61	21.3	0.397			0.00714			0.000300	U		938			0.00374			0.0122			0.00488			0.174			0.000500	U				35.6			0.706			0.0540			0.00529			2380			3470			0.0100	U	
1617PWT024-EFF	PWT Effluent	08/09/2016	7.33	16.6	0.0500	U		0.00302			0.000300	U		596			0.00296	J+		0.00272			0.00494			0.127			0.000500	U				40.1			0.292			0.0266			0.00429			1530			2350			0.0100	U	
1617PWT026-EFF	PWT Effluent	08/12/2016	7.41	22.4	0.460			0.00634			0.000320	J	J	1030			0.00296	U		0.0130			0.00596			0.263			0.000500	U				38.8			0.899			0.0594			0.00423			2510			3710			0.0100	U	
1617PWT028-EFF	PWT Effluent	08/16/2016	7.33	15.6	0.0601	J	J	0.00248			0.000300	U		596			0.00308	U		0.00261			0.00409			0.0849	J	J	0.000500	U				41.5			0.288			0.0203			0.00348			1500			2440			0.0100	U	
1617PWT029-EFF	PWT Effluent	08/18/2016	7.53	20	0.0500	U		0.00245			0.000300	U		600			0.00275			0.00188			0.00486			0.0648	J	J	0.000500	U				44.9			0.270			0.0229			0.00380			1570			2370			0.0100	U	
1617PWT030-EFF	PWT Effluent	08/22/2016	6.94	20.1	0.100	U		0.00211			0.000307	J	J	556			0.00227			0.00178			0.00493			0.0500	U		0.000500	U				43.3			0.262			0.0223			0.00344			1490			2230			0.0100	U	
1617PWT031-EFF	PWT Effluent	08/25/2016	6.95	13.4	0.100	U		0.00208			0.000300	U		543			0.00241			0.00179			0.00513			0.0500	U		0.000500	U				45.5			0.292			0.0220			0.00358			1440			2310	J		0.0100	U	
1617PWT032-EFF	PWT Effluent	08/31/2016	7.27	16.6	0.100	U		0.00125	J	J	0.000750	U		506			0.00250	U		0.00140	J	J	0.00471	J	J	0.0500	U		0.00125	U				49.0			0.288			0.0185			0.00293			1550			2360			0.0109	J	J

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.

NP - Not Promulgated

NA - Not Analyzed

Data Qualifiers (DQ) from the Laboratory:

J = Analyte positively identified, but the quantitation was below the reporting limit.

U = Not detected at or above adjusted sample detection limit.

B = Analyte present in method blank.

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

J- = estimated concentration; potential for low bias

J+ = estimated concentration; potential for high bias

* = failed Relative Percent Difference assessment

** = failed Field Method Blank assessment

^ = Anomalous result

**Table A-3
2016 Pond Water Treatment Influent Field and Analytical Results**

Sample ID	Sample Description	Sample Date	PH	Temp (°C)	Aluminum			Arsenic			Cadmium			Calcium			Chromium			Cobalt			Copper			Iron			Lead			Magnesium			Manganese			Nickel			Selenium			Sulfate (as SO ₄)			Total Dissolved Solids			Zinc		
					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						
1617PWT003-INF	PWT Influent	07/12/2016	2.78	18.9	268			0.969			0.0294			261			0.576			1.68			1.37			253			0.000758	J	J	37.6			9.32			4.35			0.00232			3520			3970			0.789		
1617PWT005-INF	PWT Influent	07/14/2016	2.46	24.6	285			0.798			0.0272			335			0.541			1.63			1.26			243			0.000902	J	J	41.0			8.72	B		4.13			0.00324			3200			3970			0.824		
1617PWT007-INF	PWT Influent	07/19/2016	2.00	17.3	290			1.36			0.0298			318			0.624			1.77			1.40			288			0.00103			41.6			9.67			4.49			0.00309			3360			4370			0.913		
1617PWT011-INF	PWT Influent	07/21/2016	1.95	17.4	269			1.37			0.0298			276			0.585			1.64			1.38			272			0.000648	J	J	40.7			8.79			4.18			0.00152			4190	H2		4060	H3		0.825		J
1617PWT013-INF	PWT Influent	07/26/2016	2.57	24.1	319			1.41			0.0333			227			0.709			1.99			1.72			322			0.000638	J	J	45.0			10.3			4.89			0.00212			3050			4100			1.08		
1617PWT017-INF	PWT Influent	07/29/2016	2.51	25.3	299			1.13			0.0301			307			0.602			1.69			1.48			291			0.000615	J	J	44.7			8.95			4.22			0.00193			4000			4330			0.946		
1617PWT019-INF	PWT Influent	08/02/2016	2.65	20.8	333			1.37			0.0336			307			0.613			1.96			1.69			338			0.000561	J	J	48.5			10.4			5.19			0.00123			3220			4520	H1	J	0.948		
1617PWT021-INF	PWT Influent	08/05/2016	2.50	19.3	360			2.06			0.0389			294			0.847			2.48			2.07			363			0.000887	J	J	50.0			13.7			6.38			0.00204			3850			4880			0.970		
1617PWT023-INF	PWT Influent	08/09/2016	2.78	16.2	357			1.77			0.0410			400			0.809	J+		2.45			2.00			343			0.00128			51.3			13.8			6.25			0.00231			4250			4710			1.25		
1617PWT025-INF	PWT Influent	08/12/2016	2.79	10.9	337			1.05			0.0331			447			0.658			1.87			1.49			314			0.00108			50.7			10.5			4.63			0.00109			3870			4990			0.942		
1617PWT027-INF	PWT Influent	08/16/2016	2.54	10.1	335	J		1.42			0.0343			489	J		0.666			1.99			1.49		J	330			0.00135			52.0			11.3			4.99			0.000500	U		4120			5540			1.12		J

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.

Data Qualifiers (DQ) from the Laboratory:

J = Analyte positively identified, but the quantitation was below the reporting limit.

H1 = Sample analysis performed past holding time.

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

J = estimated concentration; the analyte was detected between the RL and DL and/or one or more quality control parameters were not met.

J+ = estimated concentration; potential for high bias

H2 = Original Sulfate sample was analyzed within hold time, however the results appeared to be anomalous since the sulfate concentration was higher than total dissolved solids, sample was re-analyzed on 8/3/16 and are still within hold time. Results from re-analysis on 8/3/16 are displayed in table and is still questionable.

H3 = Original Total Dissolved Solids sample was analyzed within hold time, however the results appeared to be anomalous since the sulfate concentration was higher than total dissolved solids, sample was re-analyzed on 8/5/16 and is eight days past hold. Result from the original analysis is displayed in table and is still questionable, the re-analysis result was 3960 mg/L.

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/05/16	12:30	150	3.20	2.53	61.30	8.40	8.40	64.50	7.98	8.15	70.80	ND	ND
07/05/16	13:30	NA	3.20	2.53	63.00	8.40	8.21	65.50	8.52	8.39	73.50	ND	ND
07/05/16	14:30	140	3.20	2.50	64.20	8.40	8.45	66.90	8.11	8.21	74.10	ND	ND
07/05/16	15:30	NA	3.20	2.49	65.40	8.45	8.60	67.20	8.44	8.40	75.20	ND	ND
07/05/16	16:30	144	3.20	2.51	66.60	8.48	8.44	68.60	8.51	8.35	74.80	ND	ND
07/05/16	17:30	NA	3.20	2.48	66.60	8.45	8.18	69.40	8.37	8.32	75.10	ND	ND
07/05/16	18:30	144	3.20	2.71	67.30	8.45	8.40	69.40	8.48	8.40	73.70	ND	ND
07/05/16	19:30	NA	2.71	ND	66.80	8.45	8.40	69.90	8.54	8.35	71.30	ND	ND
07/05/16	20:30	144	3.20	2.70	66.10	8.45	8.37	69.10	8.39	8.16	68.10	ND	ND
07/05/16	21:30	NA	3.20	2.70	65.10	8.45	8.40	68.70	8.42	8.12	66.80	ND	ND
07/05/16	22:30	144	3.20	2.71	64.40	8.45	8.63	68.10	8.69	8.50	65.40	ND	ND
07/05/16	23:30	NA	3.20	2.71	63.90	8.45	8.76	67.40	8.47	ND	ND	ND	ND
07/06/16	0:30	144	3.20	2.71	63.20	8.45	8.66	67.10	8.32	8.20	64.90	ND	ND
07/06/16	1:30	NA	3.20	2.70	62.50	8.45	8.72	66.90	8.71	8.37	62.60	ND	ND
07/06/16	2:30	144	3.20	2.68	61.80	8.45	8.38	65.80	8.43	8.26	59.50	ND	ND
07/06/16	3:30	NA	3.20	2.67	61.10	8.45	8.45	64.80	8.33	8.24	60.90	ND	ND
07/06/16	4:30	144	3.20	2.65	60.10	8.45	8.51	64.00	8.49	8.33	58.60	ND	ND
07/06/16	5:30	NA	3.20	2.67	59.70	8.45	8.27	63.30	8.01	8.13	59.50	ND	ND
07/06/16	6:30	144	3.20	2.70	58.90	8.45	8.23	62.70	8.76	7.39	55.40	ND	ND
07/06/16	7:30	NA	3.20	2.69	58.00	8.25	8.25	62.00	8.73	8.73	60.80	ND	ND
07/06/16	8:30	150	3.20	2.75	58.00	8.25	8.54	61.60	8.13	7.92	63.80	ND	ND
07/06/16	9:30	NA	3.20	2.75	58.20	8.25	8.53	61.60	8.62	8.34	67.00	ND	ND
07/06/16	10:30	155	3.20	2.73	59.20	8.40	8.46	62.00	8.65	7.44	68.10	ND	ND
07/06/16	11:30	NA	3.20	2.73	59.90	8.30	8.52	62.60	8.59	7.60	69.50	ND	ND
07/06/16	12:30	150	3.20	2.72	60.60	8.30	8.33	63.30	8.45	7.62	72.30	ND	ND
07/06/16	13:30	NA	3.20	4.04	62.00	8.30	8.17	64.30	8.69	7.62	72.30	ND	ND
07/06/16	14:30	144	4.50	4.48	63.50	8.30	8.72	65.20	8.64	7.72	73.00	ND	ND
07/06/16	15:30	NA	4.50	4.25	64.20	8.30	8.48	66.20	8.68	7.77	73.00	ND	ND
07/06/16	16:30	155	4.50	4.25	64.20	8.30	8.39	67.00	8.60	7.87	73.60	ND	ND
07/06/16	17:30	NA	4.50	4.11	66.30	8.30	8.53	68.10	8.61	8.15	73.50	ND	ND
07/06/16	18:30	160	4.50	4.09	66.80	8.30	8.58	68.70	8.49	8.25	70.80	ND	ND
07/06/16	19:30	NA	4.50	4.13	66.70	8.30	8.46	69.10	8.58	8.20	70.90	ND	ND
07/06/16	20:30	164	4.50	4.16	65.80	8.30	8.45	68.60	8.53	8.10	67.30	ND	ND
07/06/16	21:30	NA	4.50	4.15	65.40	8.30	8.73	68.30	8.41	8.22	66.90	ND	ND
07/06/16	22:30	164	4.50	4.19	64.70	8.30	8.40	67.70	8.46	8.20	65.40	ND	ND
07/06/16	23:30	NA	4.50	3.08	63.70	8.30	8.46	67.00	8.48	8.65	65.50	ND	ND
07/07/16	0:30	164	4.50	2.81	62.80	8.30	8.55	66.20	8.33	8.15	63.70	ND	ND
07/07/16	1:30	NA	4.50	2.74	62.50	8.30	8.31	65.90	8.18	8.14	63.60	ND	ND
07/07/16	2:30	164	4.50	2.67	61.30	8.30	8.10	64.90	8.50	8.26	60.60	ND	ND
07/07/16	3:30	NA	4.50	2.63	60.40	8.30	8.64	64.00	8.60	8.34	58.70	ND	ND
07/07/16	4:30	164	4.50	2.64	59.40	8.30	8.07	63.30	8.43	8.22	59.10	ND	ND
07/07/16	5:30	NA	4.50	2.63	58.90	8.30	8.07	62.30	8.29	8.22	60.20	ND	ND
07/07/16	6:30	164	4.50	2.63	58.00	8.30	8.55	61.80	8.44	8.30	59.30	ND	ND
07/07/16	7:30	NA	4.50	3.60	57.30	8.30	8.42	61.00	8.53	8.50	63.50	ND	ND
07/07/16	8:30	160	4.50	4.26	57.30	8.30	8.47	60.40	8.62	8.47	64.60	ND	ND
07/07/16	9:30	NA	4.50	4.28	57.50	8.25	8.86	60.50	8.45	8.30	66.00	ND	ND
07/07/16	10:30	160	4.50	4.31	58.70	8.25	8.78	61.10	8.51	8.29	67.20	ND	ND
07/07/16	11:30	NA	4.50	4.27	59.40	8.20	8.64	61.90	8.38	8.19	69.40	ND	ND
07/07/16	12:30	160	4.50	4.25	60.60	8.20	8.20	62.90	8.60	8.35	69.30	ND	ND
07/07/16	13:30	NA	4.50	4.23	61.80	8.20	8.70	63.80	8.47	8.24	71.70	ND	ND
07/07/16	14:30	160	4.50	4.15	63.20	8.15	8.71	65.10	8.40	8.18	73.70	ND	ND
07/07/16	15:30	NA	4.50	4.15	64.40	8.15	8.24	66.10	8.53	8.14	73.90	ND	ND
07/07/16	16:30	160	4.50	4.09	65.40	8.15	8.27	67.00	8.00	8.13	73.80	ND	ND
07/07/16	17:30	NA	4.50	4.11	66.60	8.15	8.21	68.10	8.33	8.05	74.10	ND	ND
07/07/16	18:30	160	4.50	4.14	66.30	8.15	8.24	68.60	8.50	8.20	73.90	ND	ND
07/07/16	19:30	NA	4.50	4.16	66.30	8.15	8.08	68.70	8.48	8.17	69.90	ND	ND
07/07/16	20:30	160	4.50	4.17	65.10	8.15	8.56	68.50	8.39	8.17	67.70	ND	ND
07/07/16	21:30	NA	4.50	4.18	65.40	8.15	8.07	68.30	8.43	8.18	67.10	ND	ND
07/07/16	22:30	160	4.50	4.18	64.70	8.15	8.66	67.70	8.20	8.15	65.20	ND	ND
07/07/16	23:30	NA	4.50	4.19	63.70	8.15	8.10	67.00	8.44	8.18	67.00	ND	ND
07/08/16	0:30	160	4.50	4.21	63.20	8.15	8.24	66.30	8.36	8.23	64.10	ND	ND
07/08/16	1:30	NA	4.50	4.17	62.50	8.15	8.36	65.70	8.35	8.18	59.90	ND	ND

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/08/16	2:30	160	4.50	4.18	61.60	8.15	8.06	65.20	8.38	8.17	62.50	ND	ND
07/08/16	3:30	NA	4.50	4.54	61.10	8.15	8.06	65.20	4.36	ND	ND	ND	ND
07/08/16	4:30	82	4.50	4.75	60.90	8.15	8.06	65.20	4.31	ND	ND	ND	ND
07/08/16	5:30	NA	4.50	6.11	60.40	8.15	8.06	65.20	4.43	ND	ND	ND	ND
07/08/16	6:30	81	4.50	7.77	60.10	8.15	8.06	65.20	4.68	ND	ND	ND	ND
07/08/16	7:30	NA	4.50	5.85	59.20	8.15	ND	ND	9.94	ND	ND	ND	ND
07/08/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/08/16	9:30	NA	4.50	4.08	57.90	8.35	8.31	64.00	8.10	8.02	64.30	ND	ND
07/08/16	10:30	160	4.50	4.16	58.70	8.35	8.92	64.20	8.46	8.34	66.30	ND	ND
07/08/16	11:30	NA	4.50	4.16	58.90	8.35	8.53	64.70	8.35	8.22	68.22	ND	ND
07/11/16	12:30	160	4.50	4.28	59.40	8.60	8.51	64.00	8.32	7.79	67.30	ND	ND
07/11/16	13:30	NA	4.50	4.29	61.30	8.60	8.69	65.90	8.41	8.03	66.90	7.20	65.30
07/11/16	14:30	160	4.50	4.24	62.00	8.75	8.91	67.10	8.40	8.05	70.00	7.11	69.20
07/11/16	15:30	NA	4.50	4.23	63.20	8.50	8.96	68.30	8.74	8.42	71.00	7.15	71.60
07/11/16	16:30	160	4.50	4.24	62.80	8.35	8.57	68.70	8.68	8.25	70.30	7.19	72.00
07/11/16	17:30	NA	4.50	4.23	63.00	8.35	8.49	68.70	8.57	8.15	71.00	7.22	71.60
07/11/16	18:30	160	4.50	4.26	63.70	8.35	8.47	69.00	8.57	8.18	70.60	7.18	71.20
07/11/16	19:30	NA	4.50	4.28	63.90	8.35	8.65	69.40	8.56	8.49	68.20	7.11	66.00
07/11/16	20:30	160	4.50	4.27	63.70	8.35	8.48	69.70	8.51	8.14	65.50	7.47	64.80
07/11/16	21:30	NA	4.50	4.29	63.50	8.35	8.49	69.40	8.59	8.25	65.90	7.77	64.70
07/11/16	22:30	155	4.50	4.36	63.00	8.35	8.70	69.00	8.51	8.44	63.20	7.56	63.60
07/11/16	23:30	NA	4.50	4.29	62.00	8.35	8.42	68.50	8.50	8.42	61.60	7.68	62.20
07/12/16	0:30	160	4.50	4.35	61.10	8.35	8.55	67.80	8.52	8.37	58.70	7.60	61.10
07/12/16	1:30	NA	4.50	4.31	60.10	8.35	8.74	66.40	8.46	8.25	60.20	7.80	60.50
07/12/16	2:30	160	4.50	4.33	59.20	8.35	8.46	65.40	8.52	8.37	57.80	7.87	59.90
07/12/16	3:30	NA	4.50	4.34	58.50	8.35	8.61	64.90	8.45	8.21	56.00	7.71	58.60
07/12/16	4:30	160	4.50	4.35	57.80	8.35	8.31	63.30	8.51	8.48	55.30	7.89	57.70
07/12/16	5:30	NA	4.50	4.34	56.80	8.35	8.43	63.00	8.53	8.48	55.30	7.55	57.70
07/12/16	6:30	160	4.50	4.34	56.60	8.35	8.67	62.50	8.61	8.53	54.40	7.89	57.00
07/12/16	7:30	NA	4.50	4.32	55.40	8.35	8.37	61.60	8.63	8.29	59.10	7.20	60.50
07/12/16	8:30	160	4.50	4.48	54.10	8.35	8.64	62.20	8.62	8.32	62.20	7.16	61.30
07/12/16	9:30	NA	4.50	4.16	55.10	8.35	8.22	60.90	8.52	8.29	62.00	7.15	63.20
07/12/16	10:30	160	4.50	4.18	55.60	8.30	8.56	61.40	8.54	8.27	62.20	7.18	64.70
07/12/16	11:30	NA	4.50	4.15	57.80	8.30	8.60	62.50	8.57	8.24	63.50	7.09	64.20
07/12/16	12:30	160	4.50	4.13	58.20	8.30	8.41	63.30	8.53	8.25	66.70	7.22	68.30
07/12/16	13:30	NA	4.50	4.12	59.40	8.30	8.34	64.40	8.48	8.18	67.00	7.14	68.10
07/12/16	14:30	160	4.50	4.11	61.10	8.30	8.41	65.60	8.38	8.15	69.20	7.09	68.50
07/12/16	15:30	NA	4.50	4.10	62.50	8.30	8.43	67.30	8.44	8.20	71.70	7.15	71.10
07/12/16	16:30	160	4.50	4.08	63.70	8.30	8.29	68.50	8.51	8.19	71.80	7.18	70.20
07/12/16	17:30	NA	4.50	4.06	64.90	8.30	8.18	69.70	7.79	7.80	70.80	7.17	72.60
07/12/16	18:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/12/16	19:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/12/16	20:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/12/16	21:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/12/16	22:30	155	4.50	2.99	65.50	8.35	9.03	70.40	8.34	8.13	60.70	7.66	60.20
07/12/16	23:30	NA	4.50	2.99	62.30	8.35	8.42	69.40	8.18	8.06	62.40	7.55	61.40
07/13/16	0:30	160	4.50	2.99	61.10	8.35	8.93	68.30	8.16	7.72	64.00	7.47	61.70
07/13/16	1:30	NA	4.50	2.99	59.40	8.35	8.45	66.10	8.10	7.78	59.50	7.62	58.70
07/13/16	2:30	160	4.50	2.99	59.10	8.35	9.73	65.90	8.10	7.70	58.90	7.55	58.30
07/13/16	3:30	NA	4.50	3.00	59.10	8.35	8.75	64.30	8.11	7.92	59.30	7.67	57.50
07/13/16	4:30	160	4.50	2.99	57.80	ND	ND	ND	ND	ND	ND	ND	ND
07/13/16	5:30	160	4.50	2.99	57.30	8.35	8.61	63.70	8.02	ND	ND	ND	ND
07/13/16	6:30	NA	4.50	2.99	59.20	8.35	8.69	62.00	8.68	7.07	69.00	7.49	63.50
07/13/16	7:30	NA	4.50	3.28	55.90	8.45	8.51	62.10	8.01	8.39	59.40	7.45	58.30
07/13/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/13/16	9:30	NA	4.50	4.30	56.30	8.45	8.76	61.80	8.44	8.55	62.10	7.82	64.60
07/13/16	10:30	160	4.50	4.14	57.00	8.45	8.52	62.50	8.39	8.58	64.60	7.77	67.20
07/13/16	11:30	NA	4.50	4.09	58.20	8.45	8.46	63.50	8.74	8.62	66.30	7.73	66.50
07/13/16	12:30	160	4.50	4.07	60.40	8.30	8.58	65.20	8.37	8.47	69.00	7.66	68.10
07/13/16	13:30	NA	4.50	4.03	63.00	8.30	8.37	67.30	8.55	8.43	68.70	7.62	68.00
07/13/16	14:30	160	4.50	4.07	66.10	8.27	8.66	69.40	8.37	8.28	69.10	7.60	68.50
07/13/16	15:30	NA	4.50	3.13	65.40	8.27	8.37	72.10	8.35	8.60	74.40	7.54	75.60

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/13/16	16:30	160	4.50	4.25	66.10	8.27	8.39	71.60	8.50	8.41	75.00	7.59	74.80
07/13/16	17:30	NA	4.50	4.24	66.80	8.27	8.68	72.10	8.63	8.39	77.20	7.61	78.90
07/13/16	18:30	160	4.50	4.16	67.00	8.27	8.42	72.30	8.44	8.42	77.00	7.63	79.10
07/13/16	19:30	NA	4.50	4.08	66.80	8.45	8.49	72.80	8.60	8.10	74.30	7.83	69.99
07/13/16	20:30	160	4.50	4.06	67.50	8.45	8.20	73.00	8.52	8.10	69.60	7.97	67.50
07/13/16	21:30	NA	4.50	4.04	67.50	8.45	8.89	73.50	8.61	8.15	67.20	7.82	65.90
07/13/16	22:30	160	4.50	4.04	66.30	8.45	8.33	72.50	8.45	8.12	67.40	7.76	65.60
07/13/16	23:30	NA	4.50	4.06	64.90	8.45	8.48	71.60	8.39	8.05	64.30	7.73	65.80
07/14/16	0:30	160	4.50	4.06	63.00	8.45	8.99	69.60	8.43	8.14	64.50	7.82	64.30
07/14/16	1:30	NA	4.50	4.05	62.80	8.45	8.45	69.70	8.41	8.32	65.50	7.72	65.30
07/14/16	2:30	160	4.50	4.04	61.60	8.45	8.99	68.30	8.49	8.13	61.40	7.89	62.40
07/14/16	3:30	NA	4.50	4.06	60.10	8.45	8.78	66.60	8.39	8.12	58.70	7.73	61.80
07/14/16	4:30	160	4.50	4.06	59.40	8.45	8.49	65.40	8.38	8.04	60.20	7.72	59.90
07/14/16	5:30	NA	4.50	4.06	58.50	8.45	8.26	64.90	8.38	8.02	61.70	7.81	60.90
07/14/16	6:30	160	4.50	4.06	59.30	8.45	8.47	65.30	8.44	8.07	60.70	7.84	60.20
07/14/16	7:30	160	4.50	2.94	56.00	8.25	8.35	62.80	8.28	7.77	64.00	6.90	65.40
07/14/16	8:30	165	4.50	2.90	56.30	8.25	8.60	62.50	8.11	7.42	67.20	6.90	67.70
07/14/16	9:30	NA	4.50	4.30	57.00	8.25	8.20	63.00	9.24	7.10	70.00	6.91	68.00
07/14/16	10:30	165	4.50	4.46	58.10	8.25	8.93	63.70	8.63	6.90	72.00	6.93	68.50
07/14/16	11:30	NA	4.50	4.62	60.90	8.15	8.65	65.20	8.50	7.09	73.00	ND	ND
07/14/16	12:30	165	4.50	4.69	61.10	8.15	8.53	66.80	8.54	6.98	78.00	7.80	73.50
07/14/16	13:30	NA	4.50	4.77	61.00	8.15	8.37	67.30	8.44	7.08	75.90	7.89	74.70
07/14/16	14:30	165	4.50	4.81	63.20	8.25	8.71	68.30	8.41	7.40	76.40	7.94	78.20
07/14/16	15:30	NA	4.50	5.01	64.40	8.25	8.71	69.70	8.60	7.62	73.60	7.91	78.70
07/14/16	16:30	165	4.50	4.84	66.10	8.25	8.53	70.60	8.59	6.94	78.00	6.84	76.30
07/14/16	17:30	NA	4.50	3.49	66.60	8.25	8.23	72.10	8.49	6.97	76.10	7.80	74.80
07/14/16	18:30	165	4.50	2.89	66.80	8.25	8.22	72.30	8.57	7.67	79.00	7.62	74.80
07/14/16	19:30	NA	4.50	2.77	67.30	8.35	8.61	73.00	8.25	7.67	71.80	7.08	74.50
07/14/16	20:30	157	4.50	4.43	67.50	8.35	8.81	73.50	8.44	8.06	71.00	7.84	68.90
07/14/16	21:30	NA	4.50	4.26	67.00	8.35	8.30	73.00	8.44	8.14	69.30	7.50	68.80
07/14/16	22:30	161	4.50	4.34	65.60	8.35	8.32	72.30	8.39	8.11	67.30	7.33	65.00
07/14/16	23:30	NA	4.50	4.37	64.70	8.35	8.45	70.90	8.44	8.04	66.00	7.36	64.50
07/15/16	0:30	162	4.50	4.40	63.20	8.35	8.47	69.90	8.47	8.05	64.90	7.37	63.60
07/15/16	1:30	NA	4.50	4.41	62.00	8.35	8.27	68.70	8.47	8.04	63.90	7.36	62.20
07/15/16	2:30	162	4.50	4.43	61.10	8.35	8.48	67.50	8.41	8.07	62.40	7.49	61.70
07/15/16	3:30	NA	4.50	4.44	60.10	8.35	8.51	66.40	8.51	8.10	62.10	7.35	62.10
07/15/16	4:30	162	4.50	4.42	59.20	8.35	8.47	65.40	8.39	8.03	60.20	7.41	59.20
07/15/16	5:30	NA	4.50	4.37	58.20	8.35	8.35	64.20	8.40	8.08	59.60	7.41	59.80
07/15/16	6:30	162	4.50	4.44	57.30	8.35	8.27	63.50	8.42	8.10	59.30	7.41	59.20
07/15/16	7:30	NA	4.50	4.47	56.80	8.25	8.78	63.50	8.40	7.35	61.50	7.65	58.10
07/15/16	8:30	165	4.50	4.42	56.10	8.25	8.37	62.30	8.41	6.46	65.00	7.34	63.50
07/15/16	9:30	NA	4.50	4.71	56.30	8.25	8.30	62.50	8.38	6.92	78.00	7.41	70.20
07/15/16	10:30	165	4.50	4.51	56.80	8.25	8.27	62.50	8.41	7.01	73.20	7.29	69.00
07/15/16	11:30	NA	4.50	3.40	58.20	8.25	8.52	63.30	8.44	7.14	73.60	7.72	66.70
07/15/16	12:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/15/16	13:30	NA	4.50	3.13	60.10	8.25	8.37	65.40	8.29	7.07	76.80	7.08	71.00
07/15/16	14:30	165	4.50	2.96	62.50	8.25	8.43	67.50	8.18	7.07	75.60	7.35	72.20
07/15/16	15:30	NA	4.50	2.96	63.90	8.25	8.08	69.20	8.15	7.11	79.10	7.39	76.00
07/15/16	16:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/15/16	17:30	NA	4.50	2.91	65.60	8.25	8.29	71.30	8.35	7.09	77.50	7.40	72.00
07/15/16	18:30	165	4.50	2.94	66.10	8.25	8.89	72.10	8.59	7.05	77.20	7.41	71.20
07/15/16	19:30	NA	4.50	2.80	65.80	8.15	8.07	72.10	8.47	7.94	69.60	7.05	71.50
07/15/16	20:30	160	4.15	3.79	65.40	8.15	8.20	71.60	8.22	8.10	69.70	7.47	69.60
07/15/16	21:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/15/16	22:30	150	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.34	66.70
07/15/16	23:30	NA	4.15	3.40	63.00	8.15	8.02	70.20	8.43	8.32	65.90	7.75	66.00
07/16/16	0:30	150	4.15	2.92	60.40	8.15	8.33	69.00	8.24	8.28	65.90	7.78	64.10
07/16/16	1:30	126	4.15	2.82	61.30	8.15	8.60	68.50	8.20	8.24	63.50	7.88	63.40
07/16/16	2:30	120	4.15	2.77	60.10	8.15	8.69	66.80	8.26	8.28	62.80	7.75	62.30
07/16/16	3:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/16/16	4:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.67	60.30
07/16/16	5:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.60	60.00

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/16/16	6:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	9:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	10:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	11:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	12:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	13:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	14:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	15:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	16:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	17:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/18/16	18:30	155	4.50	4.38	65.10	8.15	8.42	70.60	8.60	8.47	69.00	7.38	67.20
07/18/16	19:30	ND	4.50	4.31	65.10	8.1 / 8.7	8.29	70.90	8.53	8.34	68.70	7.80	66.40
07/18/16	20:30	155	4.50	4.30	64.70	8.1 / 8.7	8.17	70.60	8.55	8.47	66.30	7.91	65.10
07/18/16	21:30	ND	4.50	4.28	63.90	8.1 / 8.7	8.19	70.60	8.52	8.49	65.70	7.80	65.50
07/18/16	22:30	155	4.50	4.27	63.00	8.1 / 8.7	8.16	69.00	8.52	8.34	62.90	8.04	63.40
07/18/16	23:30	ND	4.50	4.24	62.30	8.1 / 8.7	8.21	69.70	8.57	8.47	64.50	8.16	62.40
07/19/16	0:30	155	4.50	3.23	60.60	8.1 / 8.7	8.34	68.30	8.13	8.42	64.90	8.00	63.50
07/19/16	1:30	ND	4.50	3.15	59.90	8.1 / 8.7	8.21	67.60	8.58	8.38	64.50	8.05	63.00
07/19/16	2:30	155	4.50	3.13	58.50	8.1 / 8.7	8.23	65.60	8.53	8.33	64.80	7.94	63.10
07/19/16	3:30	ND	4.50	3.13	58.20	8.1 / 8.7	8.23	65.20	8.51	8.34	64.80	7.94	63.10
07/19/16	4:30	155	4.50	3.11	57.60	8.1 / 8.7	8.49	64.70	8.57	8.33	64.70	8.13	61.20
07/19/16	5:30	ND	4.50	3.18	57.00	8.1 / 8.7	8.53	63.70	8.51	8.21	60.90	8.01	59.90
07/19/16	6:30	155	4.50	3.11	56.60	8.1 / 8.7	8.14	63.50	8.54	8.33	64.80	7.80	57.30
07/19/16	7:30	ND	4.50	3.24	55.10	8.15	8.03	62.10	8.58	8.49	63.20	7.61	59.30
07/19/16	8:30	155	4.50	4.48	55.60	8.15	8.22	61.40	8.99	8.60	63.40	7.41	62.30
07/19/16	9:30	ND	4.50	4.45	55.90	8.15	8.24	62.10	8.43	8.16	63.00	7.30	64.20
07/19/16	10:30	140	4.50	4.44	56.30	8.15	8.19	61.80	8.41	7.81	62.90	6.61	60.90
07/19/16	11:30	ND	4.50	4.23	57.30	8.15	8.32	62.50	8.43	7.99	63.80	6.87	61.40
07/19/16	12:30	140	4.50	4.09	59.40	8.15	8.44	63.70	8.44	8.21	64.80	7.15	66.30
07/19/16	13:30	ND	4.50	4.08	60.10	8.15	8.27	65.40	8.42	8.30	64.50	7.18	65.80
07/19/16	14:30	140	4.50	4.12	62.50	8.15	8.23	66.80	8.42	8.15	70.20	7.06	69.20
07/19/16	15:30	ND	4.50	4.19	64.20	8.15	8.21	68.50	8.41	8.22	71.30	7.10	70.00
07/19/16	16:30	140	4.50	4.20	65.40	8.15	8.32	69.90	8.49	8.19	72.40	7.16	71.10
07/19/16	17:30	ND	4.50	4.18	67.00	8.15	8.20	71.30	8.43	8.09	72.10	7.05	70.70
07/19/16	18:30	140	4.50	4.09	67.50	8.15	8.23	72.50	8.50	8.13	71.90	7.12	70.20
07/19/16	19:30	ND	4.50	4.12	66.80	8.15	8.10	72.50	8.45	7.78	72.20	7.63	68.70
07/19/16	20:30	155	4.50	4.12	65.60	8.15	8.39	72.30	8.45	8.01	59.90	7.80	67.10
07/19/16	21:30	ND	4.50	4.13	64.90	8.15	8.62	71.30	8.42	7.99	62.50	7.70	64.90
07/19/16	22:30	140	4.50	4.17	64.40	8.15	8.19	70.40	8.45	7.60	62.50	7.72	63.00
07/19/16	23:30	ND	4.50	4.14	65.50	8.15	8.45	69.90	8.41	7.84	66.10	7.78	64.90
07/20/16	0:30	140	4.50	4.15	62.50	8.15	8.31	69.20	8.44	7.81	68.70	7.80	65.70
07/20/16	1:30	ND	4.50	4.14	61.70	8.15	8.34	68.30	8.43	7.88	67.20	7.74	64.60
07/20/16	2:30	140	4.50	4.14	60.90	8.15	8.33	67.10	8.41	7.89	65.20	7.81	64.10
07/20/16	3:30	ND	4.50	4.16	59.70	8.15	8.15	66.70	8.43	8.04	64.40	7.89	62.90
07/20/16	4:30	140	4.50	4.17	58.90	8.15	8.32	65.20	8.42	7.81	65.80	7.74	62.90
07/20/16	5:30	ND	4.50	4.18	57.00	8.15	8.39	64.20	8.44	7.38	62.70	7.57	59.90
07/20/16	6:30	140	4.50	4.18	57.30	8.15	8.26	64.90	8.39	7.68	60.40	7.51	60.60
07/20/16	7:30	ND	4.50	4.20	56.10	8.15	8.53	62.50	8.43	7.97	61.30	7.80	60.20
07/20/16	8:30	155	4.50	4.20	54.40	8.15	8.51	62.10	8.46	8.16	61.00	7.69	60.70
07/20/16	9:30	ND	4.50	4.21	56.10	8.15	8.56	61.40	8.37	8.18	63.00	7.35	64.70
07/20/16	10:30	155	4.50	4.18	56.30	8.15	8.48	62.10	8.37	8.22	64.10	7.30	65.80
07/20/16	11:30	ND	4.50	4.17	57.50	8.15	8.17	63.00	8.36	8.05	66.30	7.24	68.80
07/20/16	12:30	155	4.50	4.15	59.20	8.15	8.09	63.70	8.34	8.12	65.90	7.15	68.00
07/20/16	13:30	ND	4.50	4.13	60.90	8.15	8.23	66.00	8.32	8.08	68.80	7.10	71.10
07/20/16	14:30	155	4.50	4.11	63.20	8.15	8.33	67.30	8.35	8.06	69.70	7.24	72.60
07/20/16	15:30	ND	4.50	4.19	64.70	8.15	8.25	69.20	8.38	8.10	70.30	7.21	73.40
07/20/16	16:30	155	4.50	4.19	66.30	8.15	8.24	70.40	8.34	8.13	72.50	7.11	74.00
07/20/16	17:30	ND	4.50	4.20	67.30	8.15	8.25	72.30	8.34	8.05	73.10	7.25	73.60
07/20/16	18:30	155	4.50	4.20	67.80	8.15	8.23	73.00	8.40	8.10	72.70	7.16	73.50
07/20/16	19:30	ND	4.50	4.21	68.00	8.15	8.19	74.00	8.38	7.79	72.50	6.97	73.20

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/20/16	20:30	155	4.50	4.24	68.00	8.15	8.44	73.70	8.35	8.15	69.80	7.09	72.30
07/20/16	21:30	ND	4.50	4.22	66.80	8.15	8.53	73.50	8.38	8.06	70.70	7.67	67.00
07/20/16	22:30	155	4.50	4.20	65.80	8.15	8.28	72.80	8.43	8.05	68.30	7.15	68.10
07/20/16	23:30	ND	4.50	4.21	65.40	8.15	8.15	70.60	8.42	8.09	67.00	7.10	68.10
07/21/16	0:30	155	4.50	4.21	63.70	8.15	8.07	70.40	8.39	8.20	64.10	7.17	63.90
07/21/16	1:30	ND	4.50	4.22	62.30	8.15	8.34	69.70	8.41	8.14	66.30	7.08	69.70
07/21/16	2:30	155	4.50	4.26	61.80	8.15	8.14	68.00	8.38	8.28	60.50	8.02	62.20
07/21/16	3:30	ND	4.50	4.29	61.10	8.15	8.30	67.30	8.36	8.14	64.40	7.27	70.10
07/21/16	4:30	155	4.50	4.21	59.90	8.15	8.27	66.10	8.37	8.11	62.70	7.10	66.70
07/21/16	5:30	ND	4.50	4.26	58.50	8.15	8.72	64.90	8.39	8.12	61.20	7.15	66.20
07/21/16	6:30	155	4.50	4.24	57.80	8.15	8.73	64.00	8.37	8.16	60.30	7.11	62.50
07/21/16	7:30	ND	4.50	4.24	56.80	8.15	8.10	63.50	8.37	8.25	59.80	7.47	60.70
07/21/16	8:30	150	4.50	4.26	56.30	8.15	8.33	62.50	8.34	8.20	61.20	7.52	63.50
07/21/16	9:30	ND	4.50	4.29	56.30	8.15	8.27	62.10	8.37	7.55	64.70	6.63	65.60
07/21/16	10:30	150	4.50	4.25	57.50	8.15	8.08	62.50	8.32	8.05	66.00	7.42	65.50
07/21/16	11:30	ND	4.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/21/16	12:30	150	4.50	4.18	60.40	8.15	8.12	65.40	8.31	8.15	66.50	7.48	73.00
07/21/16	13:30	ND	4.50	4.23	62.00	8.15	8.17	66.80	8.38	8.13	74.70	7.80	70.60
07/21/16	14:30	150	4.50	4.23	63.50	8.15	8.09	68.50	8.42	8.17	75.90	7.93	71.50
07/21/16	15:30	ND	4.50	4.25	65.50	8.15	8.11	70.00	8.37	8.17	76.50	7.82	70.10
07/21/16	16:30	150	4.50	4.19	66.90	8.15	8.09	71.60	8.39	8.11	76.90	7.76	73.90
07/21/16	17:30	ND	4.50	4.18	67.80	8.15	8.12	72.90	8.37	8.11	76.20	7.76	71.80
07/21/16	18:30	150	4.50	4.10	68.00	8.15	8.04	73.50	8.40	8.22	72.80	7.03	69.20
07/22/16	7:30	ND	4.50	3.19	57.80	8.15	7.97	64.70	8.52	8.24	61.40	8.23	63.40
07/22/16	8:30	150	4.50	3.17	57.50	8.15	7.85	64.20	8.54	8.18	68.90	8.01	65.90
07/22/16	9:30	ND	4.50	3.22	57.90	8.15	7.91	64.20	8.15	ND	ND	7.92	68.00
07/22/16	10:30	150	4.50	3.21	58.70	8.15	8.03	64.90	7.92	ND	ND	6.48	69.50
07/22/16	11:30	ND	4.50	3.21	59.40	8.15	7.98	65.40	8.18	7.13	80.60	7.30	70.70
07/22/16	12:30	150	4.50	3.19	60.60	8.15	7.88	66.40	8.40	ND	ND	6.92	74.00
07/22/16	13:30	ND	4.50	3.19	61.80	8.15	8.42	67.50	8.38	7.27	75.40	7.29	73.40
07/22/16	14:30	150	4.50	3.20	63.70	8.15	8.00	69.00	8.39	7.53	76.60	7.63	71.40
07/22/16	15:30	ND	4.50	3.20	65.50	8.15	8.15	70.60	8.35	7.62	76.40	7.60	71.80
07/22/16	16:30	150	4.50	3.19	66.20	8.15	8.02	72.00	8.38	7.68	76.30	7.75	72.60
07/22/16	17:30	ND	4.50	3.20	66.80	8.15	7.85	72.40	8.40	7.72	76.70	7.80	72.70
07/22/16	18:30	150	4.50	3.31	67.50	8.15	7.88	73.30	8.31	7.43	74.50	7.51	70.30
07/22/16	19:30	ND	4.50	3.31	66.80	8.15	7.90	73.00	8.28	7.36	69.90	6.66	73.00
07/22/16	20:30	150	4.50	3.31	67.80	8.15	7.91	74.10	8.39	7.37	71.00	6.67	73.00
07/22/16	21:30	ND	4.50	4.40	67.00	8.15	8.50	73.40	8.45	7.62	69.50	7.19	66.90
07/22/16	22:30	150	4.50	4.67	66.30	8.15	8.31	72.80	8.56	7.85	67.80	7.28	65.60
07/22/16	23:30	ND	4.50	4.87	64.90	8.15	8.32	71.10	8.56	8.00	65.80	7.63	63.90
07/23/16	0:30	150	4.50	4.87	63.70	8.15	8.25	70.20	8.55	7.96	63.90	7.57	62.80
07/23/16	1:30	ND	4.50	4.88	63.00	8.15	8.12	69.80	8.57	7.88	59.80	7.63	60.80
07/23/16	2:30	150	4.50	4.70	62.00	8.15	8.24	68.00	8.56	8.04	58.80	7.72	58.60
07/23/16	3:30	ND	4.50	4.91	62.00	8.15	8.33	67.30	8.56	8.00	54.80	7.72	52.40
07/23/16	4:30	150	4.50	4.91	60.10	8.15	8.55	66.10	8.56	8.01	54.80	7.77	58.10
07/23/16	5:30	ND	4.50	4.84	58.10	8.15	8.22	65.20	8.56	7.97	58.80	7.76	56.70
07/23/16	6:30	150	4.50	4.73	58.50	8.15	8.20	64.20	8.57	8.03	58.60	7.78	56.60
07/23/16	7:30	ND	4.50	4.62	57.50	8.15	8.17	63.60	8.55	6.80	57.80	6.98	60.60
07/23/16	8:30	150	4.50	4.60	56.90	8.15	8.17	63.10	8.54	6.95	61.70	7.04	62.10
07/23/16	9:30	ND	4.50	4.08	57.20	8.15	8.20	63.30	8.47	7.45	64.40	7.57	64.10
07/23/16	10:30	150	4.50	4.09	58.50	8.15	8.05	63.70	8.41	7.40	65.70	7.35	65.20
07/23/16	11:30	ND	4.50	4.07	60.00	8.15	8.03	64.90	8.42	7.15	68.40	7.21	66.20
07/23/16	12:30	150	4.50	4.05	61.60	8.15	8.04	66.70	8.42	7.63	74.40	7.77	69.00
07/23/16	13:30	ND	4.50	4.05	63.80	8.15	8.23	68.30	8.41	7.55	77.30	7.69	71.20
07/23/16	14:30	ND	ND	ND	ND	ND	ND	ND	4.23	ND	ND	ND	ND
07/23/16	15:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/23/16	16:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/23/16	17:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/23/16	18:30	150	4.50	2.68	67.00	8.15	ND	ND	8.34	7.08	74.20	7.19	70.10
07/23/16	19:30	ND	4.50	2.81	67.30	8.15	8.31	73.50	8.37	7.20	72.40	6.81	77.20
07/23/16	20:30	150	4.50	2.80	67.10	8.15	8.29	73.10	8.21	7.21	71.10	7.01	76.10
07/23/16	21:30	ND	4.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/23/16	22:30	150	4.50	2.78	66.50	8.15	8.12	73.30	8.28	7.12	64.00	7.12	65.00
07/23/16	23:30	ND	4.50	4.15	64.40	8.15	8.52	70.90	8.43	7.58	65.60	7.24	65.40
07/24/16	0:30	ND	4.50	3.50	63.20	8.15	8.24	69.90	8.42	7.69	63.40	7.46	61.40
07/24/16	1:30	ND	4.50	4.12	63.20	8.15	8.25	69.00	8.44	7.88	62.80	7.57	61.00
07/24/16	2:30	ND	4.50	4.29	61.80	8.15	8.47	68.30	8.44	7.76	59.90	7.51	63.60
07/24/16	3:30	ND	4.50	4.34	61.30	8.15	8.39	67.30	8.45	7.80	58.10	7.65	61.10
07/24/16	4:30	150	4.50	3.91	60.40	8.15	8.35	67.40	8.12	7.81	59.10	7.83	62.10
07/24/16	5:30	ND	4.50	2.98	58.00	8.15	8.46	66.00	8.35	7.80	61.00	7.81	62.20
07/24/16	6:30	150	4.50	4.02	58.90	8.15	8.23	65.20	8.42	7.82	62.10	7.90	62.10
07/24/16	7:30	ND	4.50	4.30	58.20	8.15	8.20	64.40	8.45	7.93	62.70	7.87	63.00
07/24/16	8:30	150	4.50	4.62	58.00	8.15	8.66	64.20	8.72	8.05	63.00	7.61	63.40
07/24/16	9:30	ND	4.50	3.63	57.80	8.15	8.33	64.40	8.53	7.85	65.30	7.14	66.30
07/24/16	10:30	ND	4.50	3.01	58.70	8.15	8.18	64.70	8.53	7.87	66.90	7.65	68.90
07/24/16	11:30	ND	4.50	2.79	60.10	8.15	8.21	65.40	8.49	7.89	67.20	7.61	68.40
07/24/16	12:30	ND	4.50	3.31	61.30	8.15	8.28	66.80	8.51	7.95	67.80	7.47	68.30
07/24/16	13:30	ND	4.50	4.08	63.50	8.15	8.19	68.50	8.49	7.68	72.00	7.14	74.00
07/24/16	14:30	150	4.50	4.15	65.40	8.15	8.18	69.90	8.50	7.63	74.20	7.21	73.90
07/24/16	15:30	ND	4.50	4.18	65.60	8.15	8.40	71.10	8.50	7.58	73.80	7.12	75.40
07/24/16	16:30	150	4.50	4.19	66.30	8.15	8.20	71.80	8.50	7.68	74.30	7.11	75.80
07/24/16	17:30	ND	4.50	4.18	67.00	8.15	8.17	72.30	8.46	7.72	74.10	7.14	73.80
07/24/16	18:30	150	4.50	3.44	67.30	8.15	8.45	72.80	8.49	7.66	74.00	7.12	74.40
07/24/16	19:30	ND	4.50	3.99	67.00	8.15	8.84	73.20	8.52	7.35	76.10	7.51	70.10
07/24/16	20:30	150	4.50	4.01	67.50	8.15	8.10	73.50	8.58	7.85	69.00	7.69	68.00
07/24/16	21:30	ND	4.50	4.03	66.80	8.15	8.13	73.00	8.52	7.66	67.50	7.48	68.10
07/24/16	22:30	150	4.50	4.04	66.70	8.15	8.23	72.80	8.50	7.76	66.30	7.56	66.10
07/24/16	23:30	ND	4.50	4.05	64.90	8.15	8.33	73.70	8.54	7.75	65.50	7.55	68.70
07/25/16	0:30	150	4.50	4.07	63.50	8.15	8.31	70.20	8.51	7.72	65.10	7.50	68.30
07/25/16	1:30	ND	4.50	4.06	62.50	8.15	8.19	69.20	8.56	7.83	64.50	7.52	67.50
07/25/16	2:30	150	4.50	4.10	67.30	8.15	8.21	67.20	8.50	7.24	65.70	7.48	66.90
07/25/16	3:30	ND	4.50	4.11	68.60	8.15	8.36	67.10	8.52	7.85	64.00	7.69	71.20
07/25/16	4:30	150	4.50	4.11	60.10	8.15	8.36	66.10	8.47	7.90	61.40	7.63	67.10
07/25/16	5:30	ND	4.50	4.06	59.20	8.15	8.19	63.90	8.48	7.80	66.10	7.53	71.00
07/25/16	6:30	150	4.50	4.10	58.50	8.15	8.34	64.20	8.49	7.82	61.70	7.64	67.50
07/25/16	7:30	ND	4.50	4.13	58.00	8.15	8.35	64.20	8.51	7.92	61.50	7.30	62.70
07/25/16	8:30	150	4.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/25/16	9:30	ND	4.50	3.85	58.20	8.15	8.40	64.00	8.56	8.30	66.00	7.82	71.60
07/25/16	10:30	150	4.50	3.87	58.50	8.10	8.15	64.20	8.48	8.13	67.50	7.00	73.60
07/25/16	11:30	ND	4.50	3.89	59.70	8.10	8.20	64.90	8.46	8.24	70.30	7.63	75.30
07/25/16	12:30	150	4.50	3.93	60.90	8.10	8.10	66.40	8.46	8.36	74.20	7.60	75.20
07/25/16	13:30	ND	4.50	4.15	62.50	8.10	8.23	67.10	8.60	8.23	72.10	7.52	72.50
07/25/16	14:30	95	4.50	4.25	63.70	8.10	8.35	68.50	8.50	8.20	72.50	7.34	72.10
07/25/16	15:30	ND	4.50	4.34	64.70	8.10	8.11	69.20	8.50	8.07	74.80	7.39	73.20
07/25/16	16:30	95	4.50	4.41	65.80	8.10	8.22	70.60	8.46	8.21	73.20	7.44	74.80
07/25/16	17:30	ND	4.50	4.32	66.60	8.10	8.39	71.10	8.41	8.11	74.20	7.43	74.40
07/25/16	18:30	95	4.50	4.34	67.00	8.10	8.14	71.80	8.60	8.20	73.20	7.57	74.80
07/25/16	19:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/25/16	20:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/25/16	21:30	ND	4.50	2.90	66.30	8.15	8.17	72.80	8.54	7.34	59.70	6.39	68.70
07/25/16	22:30	160	4.50	2.77	65.40	8.15	8.32	72.30	8.67	7.63	68.10	7.20	70.10
07/25/16	23:30	ND	4.50	2.79	63.90	8.15	8.36	71.10	8.23	7.43	65.60	7.29	68.20
07/26/16	0:30	160	4.50	2.69	62.30	8.15	8.03	69.70	8.14	7.33	73.10	7.32	69.50
07/26/16	1:30	ND	4.50	2.74	61.70	8.15	8.16	68.30	8.11	7.75	70.10	7.53	67.70
07/26/16	2:30	160	4.50	2.71	61.10	8.15	8.19	67.30	8.27	7.41	69.50	7.36	66.30
07/26/16	3:30	ND	4.50	2.69	60.90	8.15	7.91	68.20	8.31	7.68	64.60	7.29	67.70
07/26/16	4:30	160	4.50	2.77	61.70	8.15	8.00	67.20	8.24	7.53	66.20	7.32	69.00
07/26/16	5:30	ND	4.50	2.68	59.40	8.15	8.04	66.90	8.34	7.74	65.60	7.42	72.10
07/26/16	6:30	160	4.50	2.68	59.70	8.15	8.25	65.00	8.29	7.73	57.80	7.65	62.70
07/26/16	7:30	ND	4.50	2.87	58.70	8.15	8.31	65.20	8.57	8.23	61.60	7.56	60.50
07/26/16	8:30	140	4.50	3.94	58.70	8.15	8.27	64.70	8.50	8.26	63.40	7.51	65.60
07/26/16	9:30	ND	4.50	4.28	59.40	8.15	8.21	64.90	8.35	8.15	68.30	7.56	71.10
07/26/16	10:30	140	4.50	4.28	59.70	8.15	8.32	65.60	8.32	8.18	72.60	7.55	74.20
07/26/16	11:30	ND	4.50	4.23	61.80	8.15	8.21	66.40	8.30	8.11	72.80	7.05	72.40

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/26/16	12:30	140	4.50	4.25	64.70	8.15	8.36	68.50	8.28	8.14	73.10	7.22	72.90
07/26/16	13:30	ND	4.50	4.26	64.20	8.15	8.29	69.70	8.32	8.20	73.50	7.25	73.80
07/26/16	14:30	140	4.50	4.34	65.60	8.15	8.25	70.90	8.29	8.12	74.00	7.27	73.40
07/26/16	15:30	ND	4.50	4.28	65.60	8.15	8.21	71.30	8.34	8.10	74.20	7.21	74.00
07/26/16	16:30	150	4.50	4.23	64.90	8.15	8.28	71.60	8.27	8.18	73.90	7.34	74.50
07/26/16	17:30	ND	4.50	4.20	66.30	8.15	8.56	71.30	8.29	8.09	73.80	7.27	73.10
07/26/16	18:30	150	4.50	3.89	67.80	8.15	8.59	72.50	8.46	8.14	73.20	7.28	72.90
07/26/16	19:30	ND	4.50	3.87	67.30	8.15	8.11	73.00	8.36	7.99	73.70	7.36	71.70
07/26/16	20:30	150	4.50	2.99	67.50	8.15	7.97	73.30	8.23	8.15	72.70	7.43	69.70
07/26/16	21:30	ND	4.50	2.75	67.00	8.15	8.12	72.50	8.16	9.06	70.40	7.50	68.80
07/26/16	22:30	150	4.50	2.97	65.50	8.15	8.01	70.20	8.14	8.89	73.50	7.49	70.30
07/26/16	23:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/27/16	0:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/27/16	1:30	ND	4.50	2.89	62.90	8.15	8.14	68.70	8.16	8.20	63.80	8.10	64.15
07/27/16	2:30	140	4.50	3.14	63.00	8.15	8.03	69.80	8.22	8.06	64.50	7.96	65.70
07/27/16	3:30	ND	4.50	3.88	61.60	8.15	8.29	68.30	8.46	8.13	61.20	8.17	61.80
07/27/16	4:30	140	4.50	3.28	60.40	8.15	ND	ND	ND	ND	ND	ND	ND
07/27/16	5:30	ND	4.50	3.27	61.30	8.15	8.43	66.90	8.70	8.64	62.20	8.08	72.70
07/27/16	6:30	150	4.50	3.13	59.40	8.15	8.34	65.90	7.99	8.06	57.30	7.93	54.70
07/27/16	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/27/16	8:30	140	4.50	3.82	58.20	8.15	8.19	64.90	8.27	8.30	67.80	6.55	68.00
07/27/16	9:30	ND	4.50	2.93	58.70	8.20	8.26	64.90	8.12	8.03	67.70	6.15	71.40
07/27/16	10:30	140	4.50	3.98	59.90	8.20	8.12	65.40	8.33	8.02	68.20	6.35	74.60
07/27/16	11:30	ND	4.50	3.63	61.10	8.20	8.39	66.40	8.41	8.10	70.70	6.44	74.50
07/27/16	12:30	140	4.50	4.05	62.50	8.20	8.47	67.30	8.34	8.32	73.80	6.43	78.10
07/27/16	13:30	ND	4.50	4.15	63.00	8.20	8.17	69.00	8.37	8.23	73.20	6.56	78.60
07/27/16	14:30	135	4.50	3.48	64.20	8.20	8.21	69.70	8.35	8.21	74.80	6.55	78.70
07/27/16	15:30	ND	4.50	3.85	65.10	8.20	8.40	70.90	8.27	8.30	75.80	6.60	79.00
07/27/16	16:30	140	4.50	3.90	66.80	8.20	8.45	71.80	8.35	8.31	75.30	6.65	78.30
07/27/16	17:30	ND	4.50	3.97	65.80	8.20	8.15	72.50	8.41	8.32	76.30	6.67	78.40
07/27/16	18:30	140	4.50	4.11	66.30	8.20	8.18	72.10	8.43	8.34	75.30	6.75	77.20
07/28/16	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/28/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/28/16	9:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/28/16	10:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/28/16	11:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/28/16	12:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/28/16	13:30	ND	4.50	4.13	67.30	8.20	8.25	73.00	8.45	8.07	84.10	7.91	73.50
07/28/16	14:30	150	4.50	4.19	68.40	8.20	8.24	73.30	8.42	8.11	83.40	7.78	74.50
07/28/16	15:30	ND	4.50	4.18	69.00	8.20	ND	73.70	8.44	ND	ND	ND	ND
07/28/16	16:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/28/16	17:30	ND	4.50	3.41	66.70	8.20	8.27	73.10	8.34	8.31	78.30	8.06	70.00
07/28/16	18:30	150	4.50	2.95	66.80	8.20	8.25	72.80	8.45	8.18	75.70	8.01	71.60
07/28/16	19:30	ND	4.50	4.01	67.50	8.15	8.48	73.00	8.18	8.15	70.10	7.33	71.10
07/28/16	20:30	150	4.50	4.24	67.30	8.15	8.94	73.00	8.48	8.16	67.00	7.27	67.40
07/28/16	21:30	ND	4.50	4.49	66.30	8.15	8.33	72.30	8.55	8.21	67.50	7.59	67.00
07/28/16	22:30	150	4.50	4.69	65.80	8.15	8.24	72.10	8.51	8.19	67.00	7.72	65.30
07/28/16	23:30	ND	4.50	4.73	65.10	8.15	8.27	71.30	8.51	8.19	65.10	7.70	62.40
07/29/16	0:30	150	4.50	4.77	64.40	8.15	8.34	70.60	8.52	8.26	64.60	7.90	65.70
07/29/16	1:30	ND	4.50	4.81	63.70	8.15	8.22	69.20	8.51	8.35	64.10	8.24	65.60
07/29/16	2:30	150	4.50	4.75	63.20	8.15	8.31	69.20	8.51	8.25	62.50	8.10	64.90
07/29/16	3:30	ND	4.50	4.79	62.80	8.15	8.39	68.20	8.52	8.40	63.60	8.13	63.00
07/29/16	4:30	150	4.50	4.76	61.80	8.15	8.25	67.80	8.52	8.41	63.60	8.19	63.40
07/29/16	5:30	ND	4.50	4.79	61.60	8.15	8.46	67.50	8.54	8.40	63.70	8.21	64.10
07/29/16	6:30	150	4.50	4.76	60.70	8.15	8.44	67.10	8.53	8.43	64.10	8.22	64.00
07/29/16	7:30	ND	4.50	4.79	60.60	8.20	8.31	66.60	8.56	8.07	64.60	7.74	66.10
07/29/16	8:30	150	4.50	4.70	60.80	8.20	ND	66.60	ND	ND	ND	ND	ND
07/29/16	9:30	ND	4.50	4.70	61.30	8.20	8.50	66.80	8.46	8.00	73.30	7.78	69.30
07/29/16	10:30	150	4.50	4.73	62.50	8.20	8.25	67.80	8.44	7.73	75.40	7.71	72.20
07/29/16	11:30	ND	4.50	4.76	64.10	8.20	8.34	68.50	8.41	8.02	73.40	7.71	71.50
07/29/16	12:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/29/16	13:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
07/29/16	14:30	150	4.50	3.85	66.30	8.20	8.40	72.10	8.51	7.53	77.40	7.40	74.60
07/29/16	15:30	ND	4.50	4.00	66.80	8.20	8.23	73.00	8.44	8.12	86.50	7.70	76.30
07/29/16	16:30	150	4.50	4.04	70.40	8.20	8.30	74.10	8.45	8.05	78.60	7.58	74.50
07/29/16	17:30	ND	4.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/29/16	18:30	150	4.50	3.94	70.10	8.20	8.33	76.20	8.42	7.41	77.00	7.41	70.40
07/29/16	19:30	ND	4.50	3.78	70.10	8.20	8.31	76.30	8.51	8.60	76.00	8.15	84.00
07/29/16	20:30	150	4.50	3.94	70.10	8.20	8.33	75.90	8.43	8.28	71.80	7.81	75.10
07/29/16	21:30	ND	4.50	4.19	69.40	8.20	8.47	75.90	8.50	8.32	67.80	7.73	69.00
07/29/16	22:30	150	4.50	4.07	68.20	8.20	8.32	74.90	8.52	8.46	67.20	7.84	66.80
07/29/16	23:30	ND	4.50	4.38	67.80	8.20	8.55	73.70	8.46	8.45	66.50	7.81	65.70
07/30/16	0:30	150	4.50	4.70	66.30	8.20	8.60	72.50	8.41	8.41	66.00	8.21	65.60
07/30/16	1:30	ND	4.50	3.92	65.60	8.20	8.30	71.80	8.42	8.40	63.30	8.34	64.70
07/30/16	2:30	150	4.50	4.40	64.20	8.20	8.35	70.60	8.50	8.50	60.00	8.48	64.80
07/30/16	3:30	ND	4.50	4.59	63.70	8.20	8.26	69.70	8.44	8.52	61.20	8.49	63.20
07/30/16	4:30	150	4.50	4.72	63.20	8.20	8.26	69.20	8.46	8.56	64.80	8.55	63.90
07/30/16	5:30	ND	4.50	4.15	62.30	8.20	8.65	68.30	8.52	8.60	62.80	8.48	65.60
07/30/16	6:30	150	4.50	3.87	61.80	8.20	8.23	68.00	8.51	8.58	64.60	8.47	67.10
07/30/16	7:30	ND	4.50	4.43	61.30	8.20	8.17	67.30	8.49	8.06	65.30	7.68	65.30
07/30/16	8:30	150	4.50	4.82	61.30	8.20	8.35	67.10	8.47	8.07	69.80	7.70	68.20
07/30/16	9:30	ND	4.50	4.35	62.00	8.20	8.50	67.10	8.40	8.12	72.50	7.75	68.90
07/30/16	10:30	150	4.50	3.44	62.50	8.20	8.14	68.00	8.64	ND	ND	ND	ND
07/30/16	11:30	ND	4.50	4.21	63.90	8.20	8.30	69.00	8.63	ND	ND	ND	ND
07/30/16	12:30	150	4.50	4.51	65.60	8.20	8.29	70.20	8.48	8.26	74.80	8.05	74.10
07/30/16	13:30	ND	4.50	4.85	66.90	8.20	8.30	71.70	8.28	8.24	77.40	7.95	73.00
07/30/16	14:30	150	4.50	5.40	67.80	8.20	8.48	73.00	8.24	8.20	77.80	7.90	72.10
07/30/16	15:30	ND	4.50	4.83	68.90	8.20	ND	74.00	8.25	8.23	78.00	7.97	72.70
07/30/16	16:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/30/16	17:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
07/30/16	18:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/01/16	19:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/01/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/01/16	9:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/01/16	10:30	130	4.50	4.49	63.50	8.00	8.42	69.20	8.59	8.00	70.10	7.31	70.40
08/01/16	11:30	NA	4.50	4.43	63.10	8.00	8.25	69.90	8.69	8.05	69.20	6.95	74.10
08/01/16	12:30	130	4.50	4.33	63.50	8.00	8.40	69.90	8.32	8.04	70.20	7.31	73.30
08/01/16	13:30	NA	4.50	4.28	64.40	8.00	8.42	70.20	8.36	8.05	73.80	7.42	77.30
08/01/16	14:30	130	4.50	4.21	66.60	8.00	8.14	71.10	8.34	8.12	72.20	7.40	78.10
08/01/16	15:30	NA	4.50	4.45	67.30	8.00	8.26	72.80	8.36	8.05	76.60	7.51	79.20
08/01/16	16:30	130	4.50	4.59	68.50	8.00	8.41	75.70	8.31	8.05	77.40	7.52	79.40
08/01/16	17:30	NA	4.50	4.50	68.90	8.00	8.51	74.20	8.32	8.04	77.60	7.48	79.20
08/01/16	18:30	130	4.50	4.22	68.90	8.00	8.35	74.40	8.41	8.12	77.90	7.59	77.10
08/01/16	19:30	NA	4.50	4.20	68.70	8.00	8.96	74.70	8.44	8.00	71.90	7.39	71.70
08/01/16	20:30	130	4.50	4.18	68.70	8.00	8.18	74.90	8.52	8.03	66.30	7.89	72.60
08/01/16	21:30	NA	4.50	4.18	68.20	8.00	8.30	74.70	8.44	8.10	66.60	7.75	71.40
08/01/16	22:30	140	4.50	4.18	67.50	8.00	8.40	74.20	8.46	8.18	65.50	8.03	68.00
08/01/16	23:30	NA	4.50	4.18	66.80	8.00	8.18	73.30	8.44	8.43	64.60	8.29	64.20
08/02/16	0:30	140	4.50	4.18	65.10	8.00	8.34	72.30	8.49	8.44	61.20	8.20	63.00
08/02/16	1:30	NA	4.50	3.91	64.70	8.00	8.49	71.10	8.43	8.45	59.20	8.30	60.90
08/02/16	2:30	140	4.50	4.21	63.90	8.00	8.16	70.60	8.42	8.46	61.30	8.18	62.30
08/02/16	3:30	NA	4.50	4.40	63.00	8.00	8.40	69.20	8.47	8.39	61.90	8.30	63.00
08/02/16	4:30	140	4.50	4.30	63.20	8.00	8.43	70.10	8.45	8.40	62.00	8.31	63.00
08/02/16	5:30	NA	4.50	4.36	62.50	8.00	8.23	68.50	8.45	8.45	63.60	8.39	64.00
08/02/16	6:30	140	4.50	4.40	62.00	8.00	8.26	68.00	8.41	8.43	64.10	8.42	64.10
08/02/16	7:30	NA	4.50	4.39	61.60	8.00	8.22	67.80	8.41	8.03	64.00	6.69	62.40
08/02/16	8:30	130	4.50	4.59	61.30	8.00	8.38	67.30	8.44	8.04	64.60	7.72	68.00
08/02/16	9:30	NA	4.50	4.62	61.30	8.00	8.23	67.30	8.44	8.05	68.20	7.83	70.00
08/02/16	10:30	130	4.50	4.60	61.80	8.00	8.46	67.50	8.38	8.05	70.80	7.81	73.00
08/02/16	11:30	NA	4.50	4.44	62.80	8.00	8.36	68.30	8.42	8.04	73.40	7.72	76.80
08/02/16	12:30	130	4.50	4.40	63.90	8.00	8.40	69.20	8.43	8.05	74.60	7.67	78.40
08/02/16	13:30	NA	4.50	4.35	65.60	8.00	8.17	70.60	8.41	8.05	75.20	7.76	78.50
08/02/16	14:30	130	4.50	4.34	66.60	8.00	8.26	72.70	8.42	8.04	76.00	7.66	78.20
08/02/16	15:30	NA	4.50	4.35	67.80	8.00	8.15	72.50	8.42	8.08	77.60	7.56	78.10

Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
08/02/16	16:30	130	4.50	4.34	68.20	8.00	8.27	73.50	8.43	8.12	77.60	7.56	78.40
08/02/16	17:30	NA	4.50	4.32	68.20	8.00	8.43	74.20	8.43	8.12	77.60	7.56	77.20
08/02/16	18:30	130	4.50	4.32	68.50	8.00	8.24	74.20	8.47	8.09	72.40	7.52	76.70
08/02/16	19:30	NA	4.50	4.30	68.50	8.00	8.43	74.70	8.50	8.01	71.80	7.64	73.20
08/02/16	20:30	130	4.50	4.30	68.50	8.00	8.31	74.70	8.50	8.04	68.70	7.77	68.40
08/02/16	21:30	NA	4.50	4.30	67.50	8.00	9.04	74.20	8.50	8.04	68.00	7.89	68.00
08/02/16	22:30	130	4.50	3.86	66.80	8.00	8.13	73.50	8.50	8.13	61.40	7.77	62.30
08/02/16	23:30	NA	4.50	4.24	66.10	8.00	8.15	72.80	8.50	8.14	63.00	7.81	63.60
08/03/16	0:30	130	4.50	4.30	65.80	8.00	8.30	73.00	8.50	8.08	62.70	7.80	64.30
08/03/16	1:30	NA	4.50	4.36	64.90	8.00	8.44	71.10	8.58	8.14	58.90	7.88	60.00
08/03/16	2:30	130	4.50	4.40	63.20	8.00	8.22	70.40	8.51	8.07	59.10	7.84	60.60
08/03/16	3:30	NA	4.50	4.41	63.20	8.00	8.50	69.70	8.50	8.11	57.20	7.83	56.50
08/03/16	4:30	130	4.50	4.40	62.50	8.00	8.32	69.70	8.50	8.10	59.70	7.77	66.90
08/03/16	5:30	NA	4.50	4.41	61.60	8.00	8.71	68.00	8.49	8.12	60.00	7.75	63.70
08/03/16	6:30	130	4.50	4.42	61.10	8.00	9.21	67.30	8.47	8.07	57.30	7.75	59.10
08/03/16	7:30	NA	4.50	4.43	60.40	8.00	8.49	66.40	8.46	8.21	69.10	7.86	58.50
08/03/16	8:30	130	4.50	4.10	60.10	8.00	8.40	66.10	8.44	8.10	67.80	7.84	66.20
08/03/16	9:30	NA	4.50	4.11	60.40	8.00	8.16	66.10	8.46	8.06	69.10	7.72	69.60
08/03/16	10:30	130	4.50	4.15	60.60	8.00	8.27	66.40	8.42	8.06	71.20	7.71	72.60
08/03/16	11:30	NA	4.50	4.06	62.60	8.00	8.25	67.30	8.41	8.05	69.80	7.62	72.80
08/03/16	12:30	170	4.50	3.96	63.50	8.00	8.39	69.00	8.43	8.06	71.60	7.63	81.20
08/03/16	13:30	NA	4.50	2.82	64.90	8.00	8.12	70.40	8.34	8.06	76.10	7.66	80.30
08/03/16	14:30	170	4.50	3.85	67.00	8.00	8.36	72.10	8.43	8.12	72.50	7.55	82.10
08/03/16	15:30	NA	4.50	2.72	66.30	8.00	7.97	72.30	8.44	8.10	78.40	7.68	84.20
08/03/16	16:30	170	4.50	3.49	67.00	8.00	8.41	73.50	8.44	8.10	78.30	7.75	84.00
08/03/16	17:30	NA	4.50	4.01	68.50	8.00	8.20	74.40	8.44	8.11	78.40	7.58	82.30
08/03/16	18:30	170	4.50	4.10	68.60	8.00	8.32	74.20	8.42	8.10	78.00	7.73	85.70
08/03/16	19:30	NA	4.50	3.88	68.50	8.00	8.25	74.20	8.47	8.21	69.40	7.77	74.30
08/03/16	20:30	165	4.50	4.12	68.50	8.00	8.20	74.20	8.51	8.21	67.10	7.80	72.10
08/03/16	21:30	NA	4.50	4.19	68.20	8.00	8.39	74.20	8.45	8.16	66.40	7.93	67.70
08/03/16	22:30	165	4.50	4.25	68.00	8.00	8.32	73.00	8.49	8.17	65.10	7.93	65.70
08/03/16	23:30	NA	4.50	4.30	67.10	8.00	8.20	73.30	8.42	8.04	64.00	7.82	62.70
08/04/16	0:30	165	4.50	4.30	67.10	8.00	8.25	71.00	8.42	8.25	62.20	7.97	63.40
08/04/16	1:30	NA	4.50	4.30	64.90	8.00	8.12	71.00	8.14	8.10	58.60	7.86	60.40
08/04/16	2:30	165	4.50	4.33	63.90	8.00	8.52	69.90	8.43	8.05	61.40	7.77	60.80
08/04/16	3:30	NA	4.50	4.30	63.00	8.00	8.66	69.00	8.43	8.05	61.00	7.79	61.30
08/04/16	4:30	165	4.50	4.35	61.00	8.00	8.53	68.00	8.45	7.99	60.50	7.72	60.10
08/04/16	5:30	NA	4.50	4.36	61.10	8.00	8.36	67.50	8.41	8.05	60.90	7.89	58.50
08/04/16	6:30	165	4.50	4.36	60.90	8.00	8.30	66.80	8.43	8.10	61.00	7.87	60.50
08/04/16	7:30	NA	4.50	4.35	59.90	8.00	8.24	65.60	8.40	8.05	62.20	7.81	60.20
08/04/16	8:30	170	4.50	4.34	59.40	8.00	8.54	65.40	8.41	8.05	65.00	7.76	63.60
08/04/16	9:30	NA	4.50	4.42	59.90	8.00	8.26	65.40	8.32	8.02	68.30	7.77	72.20
08/04/16	10:30	170	4.50	4.42	60.60	8.00	8.37	65.90	8.33	8.00	69.50	7.62	74.20
08/04/16	11:30	NA	4.50	4.38	61.30	8.00	8.18	66.80	8.30	8.01	74.10	7.66	79.40
08/04/16	12:30	170	4.50	4.37	62.80	8.00	8.32	67.80	8.30	8.02	71.70	7.68	78.10
08/04/16	13:30	NA	4.50	4.33	63.50	8.00	8.32	68.70	8.32	8.00	73.10	7.62	79.20
08/04/16	14:30	170	4.50	4.29	64.70	8.00	8.17	69.70	8.38	8.00	75.80	7.63	80.70
08/04/16	15:30	NA	4.50	4.30	66.10	8.00	8.22	70.10	8.33	8.01	75.40	7.56	82.20
08/04/16	16:30	170	4.50	4.29	66.80	8.00	8.33	73.10	8.30	8.00	76.50	7.62	81.00
08/04/16	17:30	NA	4.50	4.29	67.00	8.00	8.14	72.50	8.34	8.01	76.00	7.54	82.10
08/04/16	18:30	170	4.50	4.29	67.30	8.00	8.46	73.00	8.41	8.05	75.60	7.55	78.50
08/04/16	19:30	NA	4.50	4.30	67.50	8.00	8.12	73.50	8.41	7.92	69.60	7.75	71.00
08/04/16	20:30	170	4.50	4.30	66.80	8.00	8.22	73.50	8.40	7.84	68.20	7.56	74.20
08/04/16	21:30	NA	4.50	4.30	66.30	8.00	8.27	72.50	8.38	7.92	65.10	7.62	66.60
08/04/16	22:30	170	4.50	4.30	65.80	8.00	8.16	72.10	8.38	7.95	62.40	7.70	61.90
08/04/16	23:30	NA	4.50	4.30	65.10	8.00	8.16	71.10	8.43	7.95	61.40	7.77	63.00
08/05/16	0:30	170	4.50	4.30	64.10	8.00	8.45	70.40	8.40	7.90	60.50	7.65	60.30
08/05/16	1:30	NA	4.50	4.30	63.50	8.00	8.36	69.90	8.42	7.95	60.30	7.65	60.50
08/05/16	2:30	170	4.50	4.30	62.80	8.00	8.25	68.90	8.37	7.87	58.90	8.01	61.10
08/05/16	3:30	NA	4.50	4.31	62.30	8.00	8.25	68.90	8.41	7.92	58.40	7.70	60.40
08/05/16	4:30	170	4.50	4.32	61.80	8.00	8.25	67.80	8.41	7.90	58.30	7.77	60.80
08/05/16	5:30	NA	4.50	4.31	60.40	8.00	8.42	66.10	8.45	7.92	57.10	7.79	54.80

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
08/05/16	6:30	170	4.50	4.32	59.90	8.00	8.16	66.10	8.45	8.01	58.10	7.59	60.00
08/05/16	7:30	NA	4.50	4.33	59.40	8.00	8.21	65.20	8.40	8.04	62.10	7.53	60.10
08/05/16	8:30	170	4.50	4.10	58.70	8.00	8.37	64.90	8.40	8.03	63.20	7.62	66.00
08/05/16	9:30	NA	4.50	4.27	58.90	8.00	8.44	64.90	8.39	8.07	68.00	7.61	70.30
08/05/16	10:30	170	4.50	4.34	59.70	8.00	8.29	65.20	8.39	8.02	65.90	7.57	73.00
08/05/16	11:30	NA	4.50	4.36	61.10	8.00	8.26	66.10	8.43	8.01	69.30	7.48	73.40
08/05/16	12:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/05/16	13:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/05/16	14:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/05/16	15:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/05/16	16:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/05/16	17:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/05/16	18:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/08/16	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/08/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/08/16	9:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/08/16	10:30	170	4.50	4.14	55.90	8.15	8.12	63.30	8.34	NA	NA	6.92	67.10
08/08/16	11:30	NA	4.50	4.25	56.10	8.15	8.16	62.80	8.31	7.65	63.20	6.76	67.70
08/08/16	12:30	170	4.50	4.39	57.80	8.15	8.29	63.00	8.40	7.76	64.60	6.47	70.40
08/08/16	13:30	NA	4.50	4.34	58.90	8.15	8.19	64.00	8.30	8.02	68.20	7.51	70.10
08/08/16	14:30	170	4.50	4.30	60.40	8.15	8.20	65.40	8.52	8.03	71.10	7.59	77.10
08/08/16	15:30	NA	4.50	4.09	61.00	8.15	8.52	66.60	8.39	8.03	69.10	7.58	76.40
08/08/16	16:30	170	4.50	3.62	62.50	8.15	NA	NA	NA	NA	NA	NA	NA
08/08/16	17:30	NA	4.50	4.24	63.90	8.15	8.62	68.70	8.42	8.08	70.00	7.57	73.60
08/08/16	18:30	170	4.50	4.16	63.50	8.15	8.44	69.70	8.38	8.04	70.10	7.62	75.20
08/08/16	19:30	NA	4.50	4.05	63.50	8.15	8.00	69.40	8.40	ND	ND	8.10	65.80
08/08/16	20:30	160	4.50	3.08	62.50	8.15	4.23	69.00	4.30	ND	ND	ND	ND
08/08/16	21:30	NA	4.50	3.78	62.00	8.15	8.27	68.70	8.32	7.72	60.40	7.45	63.90
08/08/16	22:30	160	4.50	3.46	61.30	8.15	4.78	67.50	5.68	ND	ND	ND	ND
08/08/16	23:30	NA	4.50	4.19	60.60	8.15	8.66	67.10	8.37	8.66	58.70	8.06	58.00
08/09/16	0:30	160	4.50	4.20	60.10	8.15	8.01	66.40	8.31	ND	ND	8.18	57.10
08/09/16	1:30	NA	4.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/09/16	2:30	160	4.50	4.58	58.90	8.15	8.25	64.1	8.36	ND	ND	ND	ND
08/09/16	3:30	NA	4.50	4.58	57.00	8.15	8.30	62.30	8.36	8.06	55.10	7.64	53.90
08/09/16	4:30	160	4.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/09/16	5:30	NA	4.50	2.98	59.90	8.15	4.33	61.00	4.13	ND	ND	ND	ND
08/09/16	6:30	160	4.50	4.10	54.20	8.15	7.72	60.40	8.33	7.64	51.30	7.93	50.00
08/09/16	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/09/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/09/16	9:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/09/16	10:30	160	4.50	3.12	54.00	8.20	8.22	59.70	8.10	ND	ND	6.74	69.60
08/09/16	11:30	NA	4.50	3.99	55.60	8.20	8.23	61.10	8.42	8.03	68.10	6.80	71.20
08/09/16	12:30	160	4.50	3.09	57.80	8.20	8.34	62.80	8.32	8.04	66.50	7.45	74.30
08/09/16	13:30	NA	4.50	3.16	57.50	8.20	8.32	64.00	8.12	8.00	66.40	7.48	74.80
08/09/16	14:30	160	4.50	3.86	59.20	8.20	8.42	64.90	8.30	8.03	67.80	7.49	70.80
08/09/16	15:30	NA	4.50	4.04	61.10	8.20	8.45	66.10	8.39	8.03	71.50	7.51	74.40
08/09/16	16:30	160	4.50	3.03	61.30	8.20	8.35	66.60	8.10	8.01	69.80	7.48	73.40
08/09/16	17:30	NA	4.50	4.03	62.30	8.20	8.27	67.80	8.25	8.03	71.70	7.44	79.70
08/09/16	18:30	160	4.50	4.17	62.80	8.20	ND	ND	ND	8.20	72.50	7.70	77.70
08/09/16	19:30	NA	4.50	4.24	62.00	8.20	8.17	68.30	8.53	7.99	64.10	7.64	66.90
08/09/16	20:30	160	4.50	4.25	62.00	8.20	8.30	68.30	8.53	8.05	62.70	7.66	61.70
08/09/16	21:30	NA	4.50	4.25	61.80	8.20	8.43	67.80	8.53	8.02	63.60	7.68	64.30
08/09/16	22:30	160	4.50	4.27	61.30	8.20	8.40	67.10	8.53	7.99	62.80	7.68	63.40
08/09/16	23:30	NA	4.50	4.28	61.10	8.20	8.44	66.80	8.55	7.92	63.70	7.63	65.10
08/10/16	0:30	160	4.50	3.47	60.00	8.20	8.45	65.90	8.56	8.08	60.80	7.69	60.80
08/10/16	1:30	NA	4.50	4.17	58.10	8.20	8.20	65.40	8.55	8.08	60.30	7.69	60.70
08/10/16	2:30	160	4.50	4.22	57.20	8.20	8.22	64.20	8.52	8.22	58.30	7.77	59.20
08/10/16	3:30	NA	4.50	4.26	57.00	8.20	8.11	63.30	8.53	8.09	56.90	7.78	56.80
08/10/16	4:30	160	4.50	4.28	55.90	8.20	8.18	63.10	8.50	7.98	60.00	7.71	56.50
08/10/16	5:30	NA	4.50	4.29	54.70	8.20	8.25	61.60	8.53	8.11	61.70	7.79	55.90
08/10/16	6:30	160	4.50	4.30	53.20	8.20	8.11	60.20	8.53	8.08	62.30	7.81	60.00
08/10/16	7:30	NA	NA	3.70	52.20	8.20	8.51	59.50	8.50	8.13	54.50	7.80	52.50

**Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs**

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
08/10/16	8:30	160	NA	3.11	52.30	8.20	8.04	58.40	8.25	8.09	59.60	7.77	57.10
08/10/16	9:30	NA	NA	2.92	52.80	8.25	8.15	59.00	8.33	8.04	61.90	7.66	65.10
08/10/16	10:30	160	NA	2.85	53.00	8.25	8.34	59.20	8.33	8.04	64.50	7.59	68.50
08/10/16	11:30	NA	NA	2.82	55.60	8.25	8.34	60.90	8.34	8.02	66.90	7.50	75.40
08/10/16	12:30	160	NA	2.81	56.10	8.25	8.35	62.10	8.42	8.06	66.60	7.53	73.10
08/10/16	13:30	NA	NA	2.85	57.60	8.25	8.43	62.80	8.40	8.06	66.70	7.46	76.40
08/10/16	14:30	160	NA	2.80	57.00	8.25	8.25	64.00	8.52	8.08	67.80	7.45	75.70
08/10/16	15:30	NA	NA	2.81	59.70	8.25	8.29	64.40	8.47	8.06	67.40	7.54	77.30
08/10/16	16:30	160	NA	2.81	61.10	8.25	8.19	66.60	8.49	8.13	72.30	7.46	78.20
08/10/16	17:30	NA	NA	2.79	61.60	8.25	8.40	67.30	8.46	8.13	72.60	7.54	79.40
08/10/16	18:30	160	NA	2.79	61.80	8.25	8.43	67.40	8.36	8.12	72.50	7.63	76.50
08/10/16	19:30	NA	NA	2.79	61.60	8.20	8.20	68.50	8.34	7.98	70.20	7.68	74.00
08/10/16	20:30	160	NA	2.79	61.00	8.20	8.46	68.30	8.36	7.93	66.00	7.69	69.20
08/10/16	21:30	NA	NA	2.79	62.00	8.20	8.36	68.30	8.32	7.84	64.30	7.57	65.00
08/10/16	22:30	160	NA	2.78	61.60	8.20	8.40	68.30	8.28	7.84	63.10	7.58	63.10
08/10/16	23:30	NA	NA	2.78	60.40	8.20	8.30	67.50	8.36	7.91	61.70	7.60	62.80
08/11/16	0:30	160	NA	2.78	59.40	8.20	8.30	65.60	8.30	7.90	58.90	7.64	59.40
08/11/16	1:30	NA	NA	2.78	58.20	8.20	8.44	65.20	8.30	7.88	58.80	7.61	58.50
08/11/16	2:30	160	NA	2.78	56.80	8.20	8.35	64.00	8.30	7.84	58.10	7.61	58.90
08/11/16	3:30	NA	NA	2.78	55.60	8.20	8.40	62.80	8.32	7.88	57.40	7.63	57.90
08/11/16	4:30	160	NA	2.76	54.90	8.20	8.40	61.80	8.20	7.89	56.90	7.77	59.10
08/11/16	5:30	NA	NA	2.75	55.30	8.20	8.30	60.40	7.90	ND	ND	7.38	55.50
08/11/16	6:30	160	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/11/16	7:30	NA	NA	2.75	52.00	8.25	8.21	59.00	8.16	8.04	56.70	7.40	55.50
08/11/16	8:30	160	NA	2.75	51.10	8.25	8.29	58.50	8.14	8.03	57.90	7.30	57.40
08/11/16	9:30	NA	NA	2.77	51.60	8.25	8.43	58.30	8.34	8.00	67.00	7.66	65.60
08/11/16	10:30	160	NA	2.78	53.00	8.25	8.57	59.00	8.26	8.10	62.70	7.45	70.20
08/11/16	11:30	NA	NA	2.80	56.80	8.25	8.39	60.40	8.29	8.00	64.50	7.42	73.80
08/11/16	12:30	160	NA	2.80	58.90	8.25	8.28	63.00	8.38	8.04	68.00	7.43	77.10
08/11/16	13:30	NA	NA	2.79	61.80	8.25	8.32	66.10	8.47	8.08	71.50	7.42	78.20
08/11/16	14:30	160	NA	2.79	62.80	8.25	8.32	67.80	8.55	8.12	73.30	7.54	78.10
08/11/16	15:30	NA	NA	2.79	64.40	8.25	8.50	69.40	8.49	8.14	73.60	7.38	79.90
08/11/16	16:30	160	NA	2.79	64.70	8.25	8.31	70.90	8.47	8.13	74.40	7.49	80.10
08/11/16	17:30	NA	NA	2.80	65.60	8.25	8.54	71.60	8.63	8.18	83.40	7.61	80.50
08/11/16	18:30	160	NA	2.81	65.80	8.25	8.40	71.80	8.50	8.18	76.90	7.64	80.10
08/11/16	19:30	NA	NA	2.81	65.60	8.20	8.25	72.50	8.42	8.10	68.60	7.35	76.00
08/11/16	20:30	160	NA	2.81	65.40	8.20	8.24	72.30	8.53	8.08	67.20	7.46	71.50
08/11/16	21:30	NA	NA	2.81	64.90	8.20	8.33	71.60	8.52	7.70	65.00	7.55	66.00
08/11/16	22:30	160	NA	2.81	63.90	8.20	8.40	71.10	8.58	8.00	61.80	7.20	60.30
08/11/16	23:30	NA	NA	2.81	62.50	8.20	8.49	70.00	8.48	8.05	62.90	7.33	61.00
08/12/16	0:30	160	NA	2.81	61.10	8.20	8.50	68.00	8.49	7.99	60.00	7.63	62.40
08/12/16	1:30	NA	NA	2.81	60.90	8.20	8.25	66.80	8.41	8.11	59.10	7.77	60.80
08/12/16	2:30	160	NA	2.81	60.80	8.20	8.22	63.70	8.41	7.92	59.10	7.49	60.70
08/12/16	3:30	NA	NA	2.81	59.80	8.20	8.31	64.00	8.38	7.78	58.40	7.50	60.00
08/12/16	4:30	160	NA	2.81	56.60	8.20	8.40	62.80	8.28	7.81	60.70	7.37	65.60
08/12/16	5:30	NA	NA	2.79	54.20	8.20	8.26	61.60	8.20	7.78	64.50	7.35	65.90
08/12/16	6:30	160	NA	2.81	53.00	8.20	8.30	60.80	8.16	7.50	61.00	7.48	59.10
08/12/16	7:30	NA	NA	2.79	52.30	8.25	8.19	59.50	8.30	8.12	58.00	7.20	59.00
08/12/16	8:30	160	NA	2.79	51.80	8.25	8.43	58.50	8.18	8.09	59.60	7.10	62.00
08/12/16	9:30	NA	NA	2.79	52.00	8.25	8.46	58.50	8.46	8.08	63.60	7.41	72.30
08/12/16	10:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/12/16	11:30	NA	NA	2.81	56.10	8.25	8.21	60.60	8.38	8.04	66.20	7.35	78.30
08/12/16	12:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/12/16	13:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/12/16	14:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/12/16	15:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/12/16	16:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/12/16	17:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/12/16	18:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/15/16	7:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/15/16	8:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/15/16	9:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table A-4
Summary of 2016
Pond Water Treatment Plant Operator's Logs

Date	Time	Influent Flowrate (gpm)	R-1 Setpoint	R-1 pH	R-1 temp °F	R-2 Setpoint	R-2 pH	R-2 temp °F	FF-2 pH	Clarifier Pit pH	Clarifier Pit temp °F	Discharge Weir pH	Discharge Weir temp °F
08/15/16	10:30	160	ND	2.83	56.30	8.25	8.47	65.40	8.38	8.08	69.10	6.78	75.70
08/15/16	11:30	ND	ND	2.84	57.50	8.25	8.32	64.20	8.49	8.05	68.40	7.21	72.10
08/15/16	12:30	140	ND	2.84	59.40	8.25	8.44	64.20	8.39	8.06	69.80	7.36	78.20
08/15/16	13:30	ND	ND	2.85	62.30	8.25	8.26	66.80	8.34	8.06	78.90	7.52	81.40
08/15/16	14:30	140	ND	2.83	66.10	8.25	8.46	69.70	8.40	8.05	70.20	7.39	75.90
08/15/16	15:30	ND	ND	2.84	66.60	8.25	8.39	72.30	8.30	8.00	72.30	7.48	77.30
08/15/16	16:30	140	ND	2.83	67.80	8.50	8.46	73.50	8.36	8.07	74.50	7.44	77.10
08/15/16	17:30	ND	ND	2.84	68.20	8.50	8.49	74.40	8.35	8.10	76.20	7.44	77.60
08/15/16	18:30	140	ND	2.60	68.50	8.50	8.41	74.90	8.57	8.30	76.20	7.49	77.30
08/15/16	19:30	ND	ND	2.58	68.00	8.25	8.00	74.90	8.51	8.13	73.10	7.58	78.30
08/15/16	20:30	170	ND	2.58	68.00	8.25	7.25	74.40	8.47	8.06	71.30	7.52	71.50
08/15/16	21:30	ND	ND	2.58	66.30	8.25	8.27	74.00	8.41	8.17	68.90	7.66	69.90
08/15/16	22:30	170	ND	2.58	64.20	8.25	8.30	72.10	8.40	8.01	65.40	7.70	63.00
08/15/16	23:30	ND	ND	2.57	63.20	8.25	8.29	71.30	8.30	7.89	62.80	7.71	62.60
08/16/16	0:30	170	ND	2.57	60.60	8.25	8.20	68.70	8.30	7.83	62.10	7.60	61.20
08/16/16	1:30	ND	ND	2.57	59.20	8.45	8.34	67.10	8.20	7.77	60.00	7.62	61.20
08/16/16	2:30	150	ND	2.58	57.00	8.45	8.40	65.00	7.98	ND	ND	ND	ND
08/16/16	3:30	ND	ND	2.58	56.90	8.55	8.58	63.70	8.38	7.77	63.40	7.56	70.50
08/16/16	4:30	150	ND	2.59	54.40	8.55	8.47	62.10	8.30	7.92	60.00	7.27	64.00
08/16/16	5:30	ND	ND	2.58	53.20	8.55	8.59	60.90	8.20	ND	ND	7.55	64.10
08/16/16	6:30	150	ND	2.58	51.60	8.55	8.50	59.50	8.20	7.99	60.80	7.51	65.10
08/16/16	7:30	ND	ND	2.57	50.90	8.30	8.17	58.30	8.65	8.34	56.60	7.30	55.50
08/16/16	8:30	170	ND	2.57	50.10	8.30	8.51	57.50	8.54	8.19	60.30	7.33	60.10
08/16/16	9:30	ND	ND	2.57	50.40	8.30	8.37	57.80	8.38	8.19	63.70	7.57	68.60
08/16/16	10:30	170	ND	2.59	52.80	8.30	8.27	58.30	8.33	8.10	64.60	7.43	71.20
08/16/16	11:30	ND	ND	2.58	55.40	8.30	8.34	60.20	8.26	8.08	66.50	7.53	75.50
08/16/16	12:30	170	ND	2.59	58.50	8.30	8.54	62.50	8.20	8.01	67.70	7.51	76.10
08/16/16	13:30	ND	ND	2.59	61.80	8.30	8.51	65.40	8.32	8.12	70.10	7.53	79.10
08/16/16	14:30	170	ND	2.59	63.70	8.30	8.56	68.50	8.47	8.24	71.10	7.49	74.70
08/16/16	15:30	ND	ND	2.60	64.50	8.30	8.21	68.90	8.56	8.24	72.30	7.55	75.20
08/16/16	16:30	170	ND	2.60	65.10	8.30	8.58	70.90	8.47	8.33	71.00	7.53	73.10
08/16/16	17:30	ND	ND	2.61	64.70	8.30	8.35	71.30	8.34	8.24	72.70	7.51	76.60
08/16/16	18:30	170	ND	2.76	64.70	8.30	8.54	71.10	8.43	8.28	74.80	7.56	77.10
08/16/16	19:30	ND	ND	2.76	64.70	8.20	8.07	71.10	8.48	8.06	70.90	7.77	70.00
08/16/16	20:30	150	ND	2.76	63.00	8.30	8.40	70.90	8.54	8.10	63.00	7.77	64.60
08/16/16	21:30	ND	ND	2.75	60.60	8.40	3.65	68.70	3.74	ND	ND	ND	ND
08/16/16	22:30	150	ND	2.77	58.20	8.40	8.45	67.10	8.32	7.42	59.50	7.56	60.00
08/16/16	23:30	ND	ND	2.78	56.80	8.50	8.39	65.40	8.24	7.83	62.30	7.68	64.50
08/17/16	0:30	150	ND	2.78	54.70	8.50	8.38	63.50	8.25	7.77	60.50	7.53	65.60
08/17/16	1:30	ND	ND	2.79	52.50	8.50	8.44	61.40	8.27	ND	ND	7.50	63.30
08/17/16	2:30	150	ND	2.79	50.90	8.50	8.48	59.20	8.20	7.70	58.90	7.45	64.30
08/17/16	3:30	ND	ND	2.79	49.90	8.50	9.00	58.00	8.20	7.71	58.90	7.48	64.00
08/17/16	4:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/17/16	5:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
08/17/16	6:30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

NA = Not applicable

ND = No Data

Note: Missing data sheet from July 21st 19:30 to July 22nd 06:30

Appendices B through D (on compact disc)

Appendix B – 2016 Pond Water Treatment Data

Laboratory Reports (PDF format)

Analytical Laboratory Electronic Data Deliverable Files (Microsoft Excel format)

Appendix C – 2016 Water Year USGS Flow and Stage Annual Data Reports

Annual Water Data Reports for 13 Stations (Microsoft Excel format)

**Appendix D – URS: Leviathan Mine Pond Water Treatment, 2016 Data
Summary Report**

Attachment 4 – Data Quality Summary (PDF format)