Georgia Power Company
Plant Arkwright
Preliminary
Dewatering Plan

August 2023

Georgia Power

Purpose

Plant Arkwright was retired in 2002. Prior to retirement, the plant operated four coal fired units that had a combined production capacity of 160 MW of electricity. Plant Arkwright is now applying for a National Pollutant Discharge Elimination System (NPDES) permit to treat water generated by the removal of the former plant's CCR units (Coal Combustion Residual). This Dewatering Plan (Plan) describes the procedures, safeguards, and enhanced wastewater treatment measures that Georgia Power Company (GPC) will implement to ensure the facility's NPDES permit effluent limitations are met and the receiving waterbody is protected during the dewatering process. This Plan provides an overview of the Wastewater Treatment System (Treatment System), describes the key processes, details the major process control measurements being performed, and explains the effluent monitoring to be conducted during dewatering.

AP1, AP2-Dry Ash Stack (DAS), and AP3/Monofill are located on property owned by GPC. See Figure 3 for a site location map. The CCR units will be removed by excavation of ash and sending the removed material either to a permitted landfill or offsite for to a beneficial reuse facility. The material in the existing monofill will also be removed and placed within a permitted landfill. AP1, AP2-DAS, and AP3/Monofill are approximately 31, 9, and 46 acres, respectively. These units were certified as closed by the Georgia Environmental Protection Division (EPD) in 2010. Best management practices (BMPs) will be utilized to minimize ash-contact stormwater, provide detention of collected water (to reduce sediment transport), and provide hydraulic control prior to treatment. BMPs employed will be varied and implemented as needed to support the CCR unit closure activities. These BMPs may include systems for covering the ash, such as tarps and rain flaps, as well as systems to hydraulically control runoff, such as detention ponds.

This Plan will be implemented upon commencement of active CCR removal activities. Following approval of the Plan by the Georgia Environmental Protection Division (EPD) and prior to commencement of dewatering, Georgia Power Company will provide EPD with notification of dewatering implementation. As explained below, in addition to the requirements implemented during the dewatering process, GPC will meet the effluent limitations of the NPDES permit and comply with all requirements of the NPDES permit.

Wastewater Treatment System

The Treatment System for dewatering the CCR units will consist of a physical-chemical treatment plant. This physical-chemical treatment plant will include sodium hypochlorite addition, an equalization tank, pH adjustment, solids separation by flocculation/clarification, treated water monitoring, and bag filtration. Sludge and solids from the clarifier will be pumped to the solids handling tank. The sludge may then be returned to the CCR unit or dewatered and disposed of at an approved landfill. The Treatment System will operate on an as needed basis up to 24 hours per day. The Treatment System will be capable of handling up to 2,500 gallons per minute (gpm). In accordance with the NPDES permit, GPC will provide the EPD with advanced notice of any treatment system upgrades. A process schematic is depicted in Figure 1.

Location

The Treatment System will be located onsite to the north of AP1. The Treatment System will be placed on a prepared pad within a containment area with a geomembrane liner system. The liner system will assure that in the unlikely event of an overflow or leak of water from the Treatment System will be collected and not allowed to be discharged, except in compliance with this Plan and the NPDES permit.

Influent

As shown in the process flow diagram (Figure 2), wastewater will be pumped to the Treatment System from the CCR units. As the water level in the CCR units drop, influent to the treatment system may cease until the volume of water becomes adequate for operations, or other measures may be implemented to provide sufficient water volume for pumping to the Treatment System. Water levels in the CCR units fluctuate based upon stormwater inflows, operational management, and dewatering activities. As overall water volumes in the CCR units decrease, operation of the Treatment System may be intermittent and on an "as needed" basis. However, continuous operation may be utilized in response to wet weather conditions.

The influent of the Treatment System will be monitored for pH and turbidity. These parameters will be used as a guide for the Treatment System's treatment requirements. Influent flow rates to the Treatment System will be managed to ensure structural integrity of the impoundment as determined by the professional engineer.

Sodium Hypochlorite Addition

Depending on the quality of the influent water coming from the CCR units, the influent water pumped to the Treatment System may be treated with sodium hypochlorite to control biological growth in the system. Treating the water for biological growth improves the Treatment System efficiency and reduces the amount of maintenance required. Based upon the demand for chlorine in the influent water, sodium hypochlorite addition will be adjusted. The dosage rate for sodium hypochlorite will depend upon the flow rate, sediment load, and water temperature.

Equalization Tank

Water pumped to the Treatment System will be sent to the equalization (EQ) tank after any needed sodium hypochlorite addition occurs. Residence time will be provided in the equalization tank. Solids that settle in this tank will be sent to the off-spec tank.

pH Adjustment & Flocculant/ Coagulant Addition

The pH of the water pumped to the Treatment System will be continuously tested prior to reaching the equalization tank. After the equalization tank, pH adjustment may be performed. Based upon the pH measurement, the pH can be adjusted to the optimal range for coagulation. Following pH adjustment, a coagulant and polymer may be injected to aid in flocculation. The dosage rates for all chemicals will depend upon the flow rates, sediment loads, and inlet pH. Dosage rates will be documented and kept onsite.

Clarifier

The treated water flows into a clarifier and the flocculated material gravity-settles to the bottom of the clarifier. A pump pulls the underflow at the bottom of the clarifier towards the underflow discharge point to be pumped to a solids handling tank. The solids from the solids handling tank may be returned to the CCR unit system or dewatered through a filter press or solidified to meet moisture disposal requirements for disposal at an approved landfill. Clarified water is sent to the treated water tank.

In the event any system issues are identified related to turbidity or pH at the clarifier, the effluent from the clarifier will be sent to the off-spec water tank. Effluent from the off-spec water tank will then be recirculated to the CCR unit.

Treated Water Tank

The treated water is sent from the clarifier to the treated water tank. As water moves through the Treatment System, some of the free chlorine will be consumed and any remaining chlorine will be neutralized in the treated water tank. Sodium bisulfite will be maintained onsite, as a backup, to remove any residual chlorine.

Filters

Following the treated water tank, water is then fed into the bag filtration system. The bag filtration system is comprised of two housings with six sock filters each. Each housing is rated for 100% of the design flowrate, which allows for sock replacement without interruption of operation. The sock filters are initially planned to be 100 microns, but the size can be adjusted during the CCR unit closure process to optimize solids removal. The clarified water passes through the bag filter system as the final particulate removal step prior to discharge. The bag filter system has pressure differential gauges that require monitoring to determine when a change of the sock filters is required. The pressure differential gauges are monitored frequently by onsite personnel to ensure change-out of the bag filter when needed. The bag filtration system is the final treatment process prior to the discharge to Outfall 001.

Monitoring

A set of instrumentation that checks the quality of the treated water will be located after the filters. During operation, effluent from the filters will be continuously measured for flow and monitored for pH, turbidity and chlorine. This information will be used to monitor the Treatment System operation. If an inline instrument detects a reading above an effluent quality standard (EQS) set-point, the effluent will not be discharged and instead will be diverted to the CCR unit.

Operation

The operational oversight of the Treatment System will be performed by a certified wastewater treatment plant operator in accordance with the certification requirements of the Georgia Water and Wastewater Treatment Plant Operators and Laboratory Analysts Rule.

Figure 1
Plant Arkwright Process Schematic

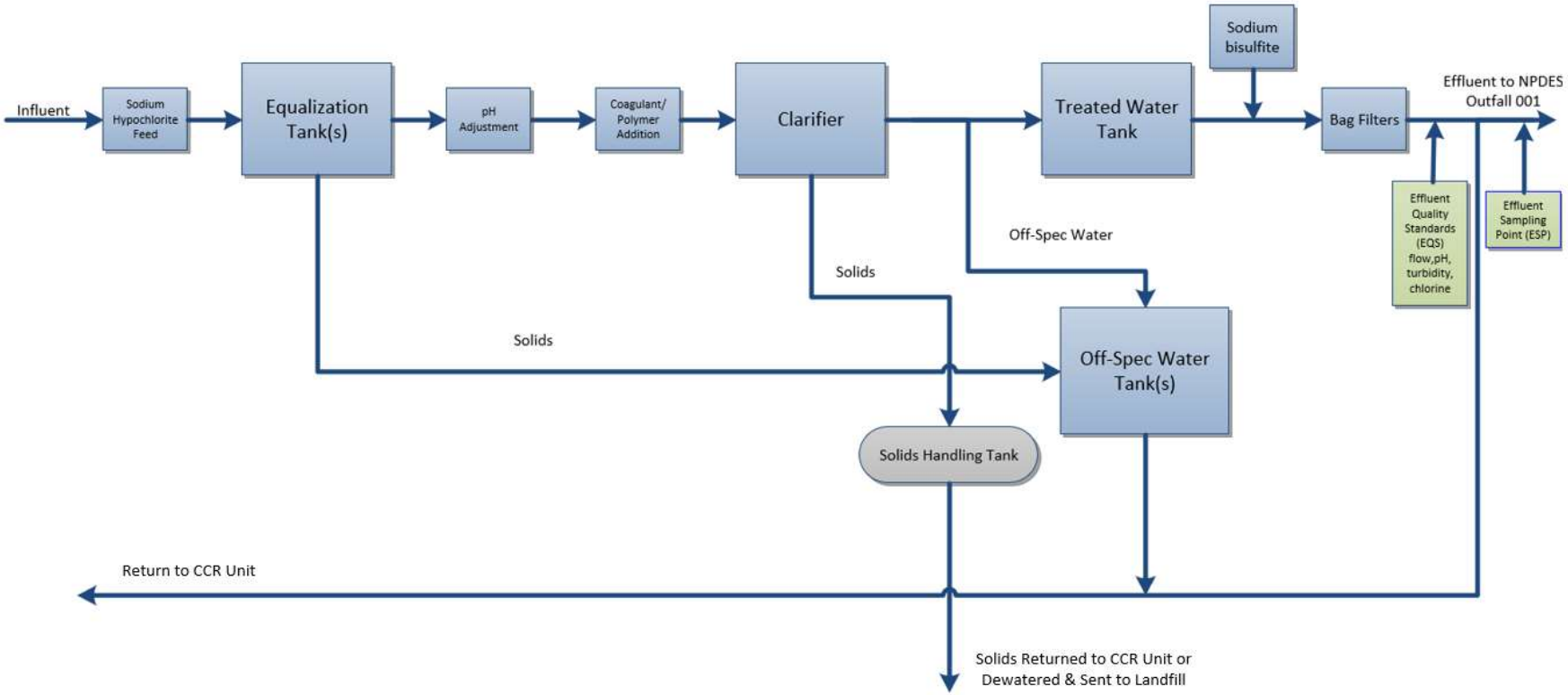


Figure 2
Plant Arkwright Process Flow Diagram

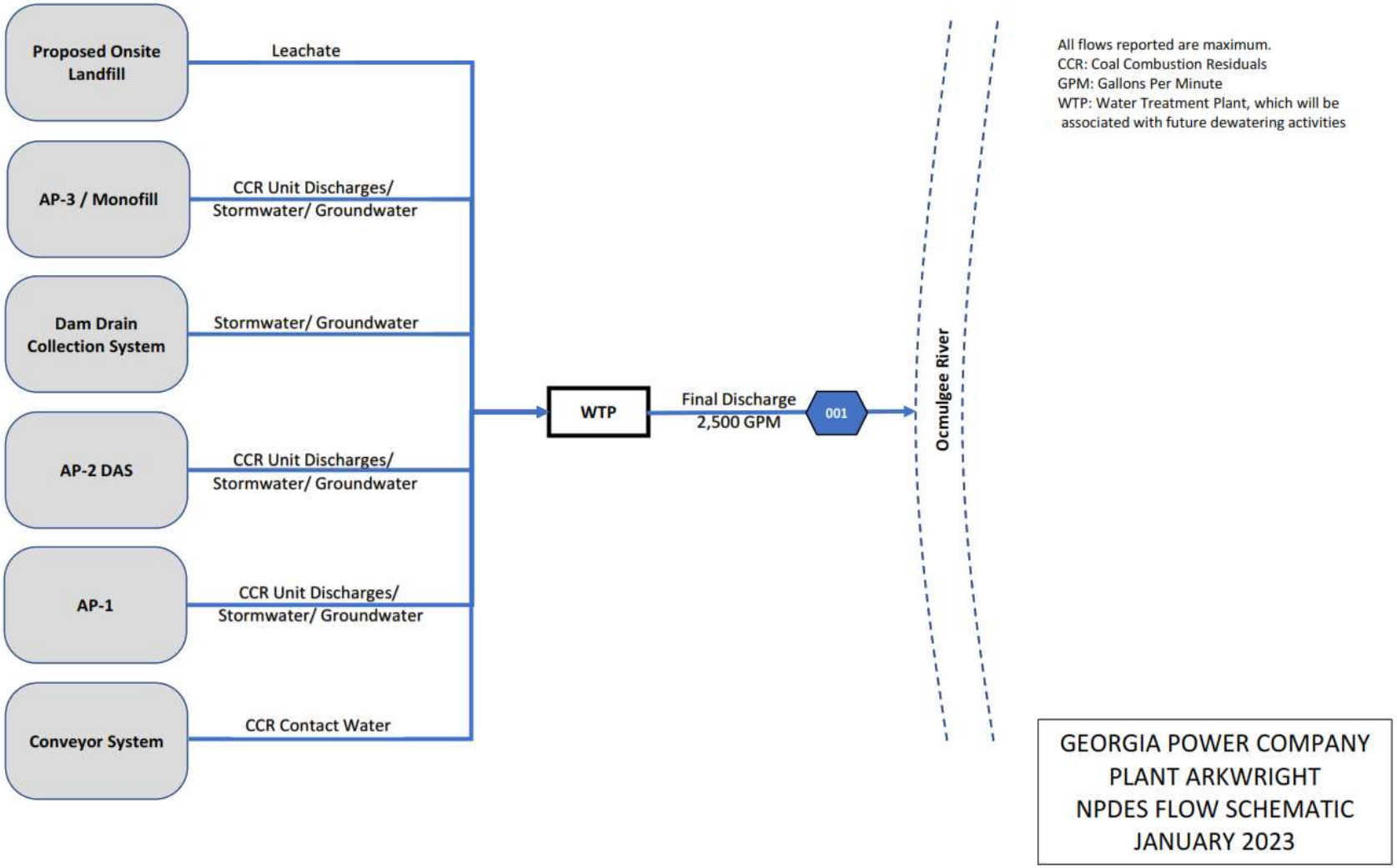
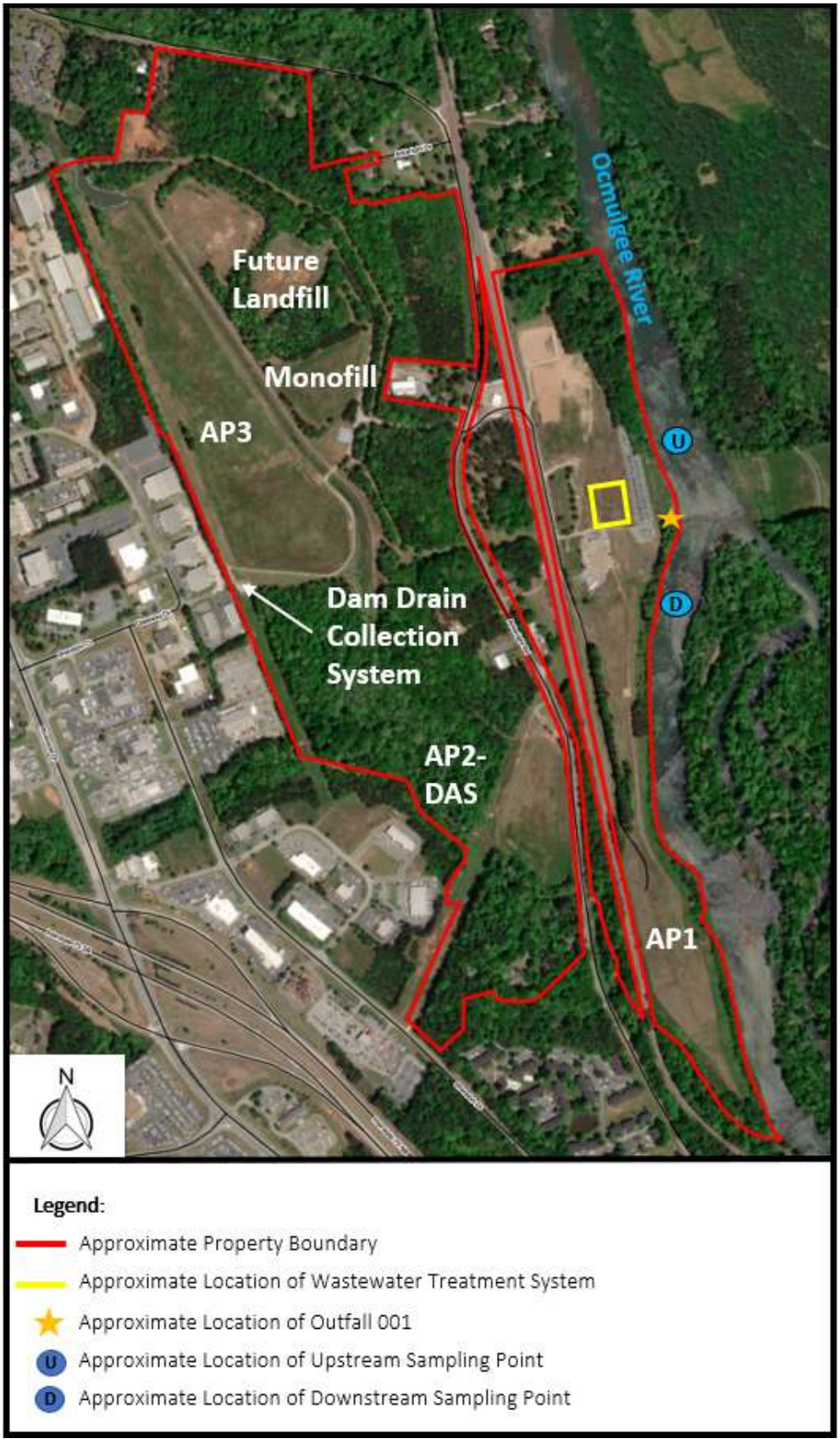


Figure 3
Site Location Map



Process Control Monitoring

Each day following Treatment System startup, pH and turbidity of the influent and effluent of the Treatment System will be verified prior to discharge of treated water to the permitted outfall. Upon verification that the Treatment System performs as expected, the discharge will be routed to Outfall 001.

During discharge operations, pH, chlorine, and turbidity are continuously measured at the Effluent Quality Standards sampling point and the discharge will be visually inspected, to ensure Effluent Quality Standards (EQSs) listed below are met. If the treated effluent does not meet the pH, chlorine, and turbidity EQSs during operations, the discharge to the permitted outfall will be automatically diverted and the treated water will be returned to the CCR Units while adjustments are made. After any issues are resolved, the Treatment System will be returned to normal operation with discharge to Outfall 001, following verification that the system performs as expected.

Maintenance

Instrumentation for use on the site will be maintained to ensure optimal performance and provide accurate results. Each piece of technical equipment will be calibrated at the manufacturer's recommended intervals and more often if deemed necessary by onsite personnel. Instrumentation equipment includes turbidity meters, pH meters, flow meters, and chemical feed pumps.

Testing

Samples are collected from both the influent and the Treatment System Effluent Sampling Point (ESP) to guide system operation and compare against the Effluent Quality Standards (EQSs) listed below. The results will be used to verify that the Treatment System is performing optimally, as well as to obtain data to establish and update the correlation between the total suspended solids (TSS) and turbidity of the Treatment System effluent. TSS/turbidity control is an indicator of a Treatment System's efficient operation and is correlated to metal removal efficiencies, as further confirmed by weekly monitoring results. The initial TSS and turbidity correlation curve and EQS results will be provided to the EPD prior to commencement of dewatering activities and updated quarterly or more frequently on an as needed basis. Furthermore, the TSS/turbidity correlation will be updated if the EQS for TSS is exceeded. EQS results, including TSS/turbidity correlation curves, will be available onsite for EPD review. TSS correlation to turbidity will be used to establish a turbidity set-point for the effluent. Effluent reaching this set-point will be recycled back to the CCR units for additional treatment.

Effluent Quality Standards (EQSs)

- **pH**: 6.4 to 8.6 operational limits
- **Turbidity**: Determined by TSS correlation
- **Flow rate**: ≤2,500 gpm
- **TSS**: ≤26 mg/L; determined by turbidity correlation
- **Oil & Grease**: ≤15 mg/L daily average with ≤20 mg/L daily maximum over a monthly period
- **Total Residual Chlorine:** Non-Detect

Analytical Instrument Description

The following instrumentation (or equivalent) will be used:

- **pH**: Hach DPD1P1, pH probe with a Hach SC200 transmitter
- **Turbidity**: Hach LXG324.99 with a Hach SC200 transmitter
- **Chlorine**: Hach CL17 with personal transmitter
- **Flow rate**: Siemens Sitrans F M Mag 6000 10" magnetic flow meter

Monitoring and Reporting

Stream Monitoring

Constituent (mg/L or Unit)	Requirement	Measurement Frequency	Sample Type	Sample Location
pH (S.U.)	Report	2/Month	Grab	Upstream & Downstream*
TSS	Report	2/Month	Grab	Upstream & Downstream*
$BOD_{5\text{-day}}$	Report	2/Month	Grab	Upstream & Downstream*
Oil & Grease	Report	2/Month	Grab	Upstream & Downstream*
Turbidity (NTU)	Report	2/Month	Grab	Upstream & Downstream*
TDS	Report	2/Month	Grab	Upstream & Downstream*
Copper, total	Report	2/Month	Grab	Upstream & Downstream*
Selenium, total	Report	2/Month	Grab	Upstream & Downstream*
Arsenic, total	Report	2/Month	Grab	Upstream & Downstream*
Mercury, total	Report	2/Month	Grab	Upstream & Downstream*
Chromium, total	Report	2/Month	Grab	Upstream & Downstream*
Lead, total	Report	2/Month	Grab	Upstream & Downstream*
Cadmium, total	Report	2/Month	Grab	Upstream & Downstream*
Zinc, total	Report	2/Month	Grab	Upstream & Downstream*
Nickel, total	Report	2/Month	Grab	Upstream & Downstream*
Antimony, total	Report	2/Month	Grab	Upstream & Downstream*
Thallium, total	Report	2/Month	Grab	Upstream & Downstream*
Ammonia-N	Report	2/Month	Grab	Upstream & Downstream*
TKN	Report	2/Month	Grab	Upstream & Downstream*
Organic Nitrogen	Report	2/Month	Grab	Upstream & Downstream*
Nitrate/Nitrite	Report	2/Month	Grab	Upstream & Downstream*
Phosphorus, total	Report	2/Month	Grab	Upstream & Downstream*
Orthophosphate-P	Report	2/Month	Grab	Upstream & Downstream*
Hardness	Report	2/Month	Grab	Upstream & Downstream*

Notes:

Sampling and monitoring to be performed using standard methods specified in U.S. EPA 40 CFR Part 136, which will be a "sufficiently sensitive analytical method".

* Instream sampling shall occur at approximately 500 ft upstream and downstream of the final discharge (Outfall 001) to the Ocmulgee River and as depicted on Figure 3.

Effluent Monitoring

Constituent (mg/L or Unit)	Monthly Average	Daily Maximum	Measure Frequency	Sample Type	Sample Location
Flow (MGD)	Report	Report	Daily	Continuous	Effluent Quality Standard (EQS)
pH (S.U.)	Report	Report	Daily	Continuous	EQS
TRC	Report	Report	Daily	Continuous	EQS
Turbidity (NTU)	Report	Report	Daily	Continuous	EQS
TSS	Report	Report	Weekly	Grab	Effluent Sampling Point (ESP)
$BOD_{5\text{-day}}$	Report	Report	Weekly	Grab	ESP
Oil & Grease	Report	Report	Weekly	Grab	ESP
TDS	Report	Report	Weekly	Grab	ESP
Copper, total	Report	Report	Weekly	Grab	ESP
Selenium, total	Report	Report	Weekly	Grab	ESP
Arsenic, total	Report	Report	Weekly	Grab	ESP
Mercury, total	Report	Report	Weekly	Grab	ESP
Chromium, total	Report	Report	Weekly	Grab	ESP
Lead, total	Report	Report	Weekly	Grab	ESP
Cadmium, total	Report	Report	Weekly	Grab	ESP
Zinc, total	Report	Report	Weekly	Grab	ESP
Nickel, total	Report	Report	Weekly	Grab	ESP
Antimony, total	Report	Report	Weekly	Grab	ESP
Thallium, total	Report	Report	Weekly	Grab	ESP
Ammonia-N	Report	Report	Weekly	Grab	ESP
TKN	Report	Report	Weekly	Grab	ESP
Organic Nitrogen	Report	Report	Weekly	Grab	ESP
Nitrate/Nitrite	Report	Report	Weekly	Grab	ESP
Phosphorus, total	Report	Report	Weekly	Grab	ESP
Orthophosphate-P	Report	Report	Weekly	Grab	ESP
Hardness	Report	Report	Weekly	Grab	ESP

Notes:

Sampling and monitoring to be performed using standard methods specified in U.S. EPA 40 CFR Part 136, which will be a "sufficiently sensitive analytical method". ESP is the discharge from the Treatment System prior to Outfall 001.

Reporting and Notification

Effluent and instream monitoring results will be submitted to the EPD via e-mail by the 15th day of the month following the sampling period. Results shall be submitted in an Excel spreadsheet to both the EPD Compliance Office and the Industrial Permitting Unit. Laboratory analysis and data sheets shall be retained onsite. The first report will be submitted the month following system startup. In addition, quarterly updates of the TSS vs. Turbidity correlation curve and other updates based on an exceedance of the EQS for TSS, will also be submitted to EPD via e-mail by the 15th of the month following the end of the quarter or the month after the EQS exceedance.

Immediate (within 24 hours) notification to both the EPD Compliance Office and Industrial Permitting Unit will occur if any of the EQSs for pH, total residual chlorine, or turbidity are not achieved and the automatic recirculation system fails or if there is visible foam other than trace amounts discharged to waters of the State of Georgia.