MUNICIPAL FACILITY FACT SHEET

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT TO DISCHARGE TREATED WASTEWATER
TO WATERS OF THE UNITED STATES

Permit No.: MS0058645 Last Updated: March 18, 2025

1. Summary of Permit Changes

A. Instream monitoring for conductivity (Upstream and Downstream) has been removed from instream monitoring requirements.

B. Total nitrogen and total phosphorus have been added to the instream monitoring (Upstream and Downstream) with quarterly reporting requirements. This was done to provide additional site-specific data.

2. Facility Information

A. Name and Address of Permittee: Mississippi Band of Choctaw Indians
Post Office Box 6366
Choctaw, Mississippi 39350

B. Facility Address: New Harmony Wastewater Treatment Facility
11352 County Road 149
Philadelphia, Mississippi 39350

C. Type of Facility: Municipal Wastewater Treatment Plant
Publicly-Owned Treatment Works (POTW)
Standard Industrial Classification Code: 4952

D. Location and Description of the discharge (as reported by applicant):

Outfall	**Latitude**	**Longitude**	**Receiving Waterbody**	**Watershed**
001	32°46’2” N	89°16’26.9” W	Unnamed Tributary to Beasha Creek	Upper Pearl Basin HUC 03180001

E. Permitted Capacity: 0.13 MGD

F. Description of Wastewater Treatment Facility:

Outfall	Operation Description	Treatment Description
1	Sanitary Wastewater	Treatment consists of physical treatment with influent screening, followed by biological treatment with aeration and clarification. Sludge is to pass through an aerobic digester before disposal. Before discharge, the effluent passes through a chlorine contact chamber and dechlorination and post-treatment aeration chamber. Population served is approximately 5660.

G. Type of Wastewater Discharge:

☐ Process Wastewater ☐ Stormwater
☒ Domestic Wastewater ☐ Combined (describe)
☐ Other (describe)

H. Characterization of Effluent

Outfall No. 001 (As reported on application)

Effluent Characteristic	Minimum Daily Value	Average Daily Value	Maximum Daily Value
Flow, MGD	---	0.12	0.48
Carbonaceous Biochemical Oxygen Demand, 5-day ($CBOD_5$), mg/L	---	4.52	39.0
Total Suspended Solids, mg/L	---	7.1	35.00
Fecal Coliform Bacteria, #/100mL	---	456.5	2419.6
pH, S.U.	6.49	---	7.69

Outfall No. 001 (Summary of DMR data from reports 3/31/2019-10/31/2023; See Appendix 2)

Effluent Characteristic	Minimum Daily Minimum	Average Monthly Average	Maximum Daily Maximum/Weekly Average
Flow (MGD)	---	0.13	0.22
Carbonaceous Biochemical Oxygen Demand, 5-day ($CBOD_5$), mg/L	---	3.9	6.36

$CBOD_5$ Percent Removal, %	---	96.2%	---
Total Suspended Solids (TSS), mg/L	---	6.4	11.3
TSS Percent Removal, %	81	94.4	---
E. coli, #/100mL	---	59.94	2420.00
Total Ammonia as Nitrogen, mg/L	---	1.4	2.5
Total Residual Chlorine (TRC), mg/L	---	--	.76
Dissolved Oxygen (DO), mg/L	0.27	7.82	---
pH, SU	6.00	---	8.60

3. Water Quality Standards & Receiving Waterbody Information

A. Receiving Waterbody Classification and Information – The Mississippi Band of Choctaw Indians (MBCI) has not promulgated their own Water Quality Standards, therefore there are no Water Quality Standards applicable to the Tribal waters at this time. This facility discharges into an unnamed tributary which enters the State of Mississippi before the confluence with Beasha Creek. The Mississippi Water Quality Standards (part 6, chapter 2, Rule 2.4) are applicable at the State/Tribal Boundary and for downstream state waters, therefore the EPA applied Mississippi Water Quality Standards to determine reasonable potential. Beasha Creek has a designated use of Fish and Wildlife in the State of Mississippi. This permit has been drafted to be protective of designated uses of state waters in the State of Mississippi.

B. Specific Water Quality Criteria for Classified Water Usage

The following are the most protective of criteria within the following applicable use classifications: Mississippi Fish and Wildlife use:

a. pH: The normal pH of the waters shall be 6.0 to 9.0. The discharge of waters or wastewaters shall not cause the pH to vary more than 1.0 unit within this range, nor be less than 6.0, nor be greater than 9.0.

b. Water Temperature: The maximum water temperature increase above natural temperatures shall not exceed 5 °F (2.8 °C) in streams, lakes, and reservoirs nor shall the maximum water temperature exceed 90 °F (32.2 °C)

c. Specific Conductance: There shall be no substances added to increase the conductivity above 1000 micro ohms/cm for freshwater streams.

d. Dissolved Solids: There shall be no substances added to the waters to cause the dissolved solids to exceed 750 mg/l as a monthly average value, nor exceed 1500 mg/l at any time for freshwater streams.

e. Ammonia (toxicity): Ammonia toxicity shall be evaluated according to the EPA guidelines published in *1999 Update of Ambient Water Quality Criteria for Ammonia;* the EPA document number EPA-822-R-99-014 or *Ambient Water Quality Criteria for Ammonia (Saltwater) – 1989*; the EPA document number 440/5-88-004, and any subsequent amendments and additions.

f. Dissolved Oxygen: Dissolved oxygen concentrations shall be maintained at a daily average of no less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l.

g. Bacteria: Culturable escherichia coli shall not exceed a geometric mean of 126 per 100 mL over a 30-day period, nor shall the samples examined during a 30-day period exceed 410 per 100 mL more than 10% of the time.

h. Toxicants

   i. Narrative:
      1. Municipal wastes, industrial wastes, or other wastes shall receive effective treatment or control in accordance with Section 301, 306, and 307 of the Federal Clean Water Act. A degree of treatment greater than defined in these sections may be required when necessary to protect legitimate water uses.

      2. Aquatic Life Criteria: The concentration of toxic substances in State waters shall not result in chronic or acute toxicity or impairment of the uses of aquatic life. Toxicity concentrations in State waters in excess of these values shown in Table 2 will be assessed to determine chronic or acute toxicity, and/or the impairment of the uses of aquatic life. Chronic and/or acute toxicity will be determined in accordance with the *Water Quality Standards Handbook: Second Edition* (EPA-823-B-94-005a, August 1994) and *Technical Support Document for Water Quality-Based Toxics Control* (EPA-505/2-90-001, March 1991). Regardless of the results of chronic or acute toxicity bioassay surveys, the concentrations of toxic substances shall not exceed the chronic or acute values, except as provided for in Rules 2.2.F.5(a) and 2.2.F.5(b) for establishing alternative criteria. *Part 6: Chapter 2: Mississippi Commission on Environmental Quality Regulations for Water Quality Criteria For Intrastate, Interstate, And Coastal Waters: Table 2 (February 25, 2016)*

      3. Human Health Criteria: The concentration of toxic substances shall not

exceed the level necessary to protect human health through exposure routes of fish (and shellfish) tissue consumption, water consumption, or other routes identified as appropriate for the water body.

ii. Numerics: Numeric criteria for all waters are established herein for certain toxic pollutants for which the EPA has published national criteria for the protection of aquatic life and human health pursuant to Section 304(a) of the Federal Clean Water Act in addition to chlorine and ammonia. The pollutants are listed in Table 2 and are expressed as the dissolved phase of the parameter. *Part 6: Chapter 2: Mississippi Commission on Environmental Quality Regulations for Water Quality Criteria for Intrastate, Interstate, And Coastal Waters: Table 2 (February 25, 2016)*

i. "Free-Froms"

i. Waters shall be free from substances attributable to municipal, industrial, agricultural, or other discharges that will settle to form putrescent or otherwise objectionable sludge deposits.

ii. Waters shall be free from floating debris, oil, scum, and other floating materials attributable to municipal, industrial, agricultural, or other discharges in amounts sufficient to be unsightly or deleterious.

iii. Waters shall be free from materials attributable to municipal, industrial, agricultural, or other discharges producing color, odor, taste, total suspended or dissolved solids, sediment, turbidity, or other conditions in such degree as to create a nuisance, render the waters injurious to public health, recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated use. Except as prohibited in Rule 2.1.H. above, the turbidity outside the limits of a 750- foot mixing zone shall not exceed the background turbidity at the time of discharge by more than 50 Nephelometric Turbidity Units (NTU). Exemptions to the turbidity standard may be granted under the following circumstances

1. in cases of emergency to protect the public health and welfare

2. for environmental restoration projects which will result in reasonable and temporary deviations, and which have been reviewed and approved by the Mississippi Department of Environmental Quality (MDEQ).

iv. Waters shall be free from substances attributable to municipal, industrial, agricultural, or other discharges in concentrations or combinations that are toxic or harmful to humans, animals, or aquatic life.

C. Critical Flows – Due to lack of flow gage data in the receiving waterbody, conservative assumptions were made regarding critical flows as follows:

Beasha Creek: 7Q10 = 0.076 cfs

D. 303(d) Status – Beasha Creek has not been assessed for water quality by the MBCI, nor does it appear on the state of Mississippi 2024 303(d) List.

E. Total Maximum Daily Loads – TMDLs exist in The Pearl River for mercury, nutrients (total nitrogen and total phosphorous), pesticides, pH, and sediment. New Harmony Wastewater Treatment Facility (WWTF) is not expected to contain mercury or pesticides in its effluent nor is it expected to cause or contribute to the pH or sediment impairments. MDEQ approved the *TMDL for Total Nitrogen and Total Phosphorus for the Pearl River* in 2009. Discharges from Tribal lands, including from the New Harmony WWTF, were not included in the TMDL as a source of total nitrogen or total phosphorus, and due to the size of the facility, we presume that New Harmony WWTF is a de minimus source of nutrients at the state line.

4. Effluent Limits and Permit Conditions

A. Proposed Effluent Limitations for Outfall 001

PARAMETERS	**DISCHARGE LIMITATIONS**				**MONITORING REQUIREMENTS**		
	Daily Min	Monthly Avg	Weekly Avg	Daily Max	Sampling Location	Measurement Frequency	Sample Type
Flow, MGD	---	Report	Report	---	Effluent	1/Week	Instantaneous
Dissolved Oxygen (DO), mg/l	6.0	---	---	---	Effluent	1/Week	Grab
Carbonaceous Biochemical Oxygen Demand 5-Day ($CBOD_5$), mg/l (lbs/day)	--- --- ---	Report 10.0 (10.84)	--- 15.0 (16.26)	--- --- ---	Influent Effluent	1/Week	Grab

PARAMETERS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS		
	Daily Min	Monthly Avg	Weekly Avg	Daily Max	Sampling Location	Measurement Frequency	Sample Type
Carbonaceous Biochemical Oxygen Demand 5-Day ($CBOD_5$) Percent Removal, %	85%[a]				Influent/ Effluent	1/Week	Calculated
Total Suspended Solids (TSS), mg/l (lbs/day)	--- --- ---	Report 30.0 (32.53)	--- 45.0 (48.79)	--- --- ---	Influent Effluent	1/Week	Grab
Total Suspended Solids (TSS) Percent Removal, %	85%[a]				Influent/ Effluent	1/Week	Calculated
pH, standard units (SU)	6.0	---	---	9.0	Effluent	1/Week	Instantaneous
E. coli, #/100 mL	---	126[b]	---	410	Effluent	1/Week	Grab
Total Residual Chlorine (TRC), mg/l	---	---	---	0.011	Effluent	1/Week	Grab
Total Nitrogen (TN) as Nitrogen, mg/l	---	Report	Report	---	Effluent	Quarterly	Grab
Total Phosphorus, (TP) as Phosphorous, mg/l	---	Report	Report	---	Effluent	Quarterly	Grab
Ammonia Nitrogen, (NH3-N), mg/l	---	2.0 (2.17)	3.0 (3.25)	---	Effluent	1/Week	Grab

PARAMETERS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS		
	Daily Min	Monthly Avg	Weekly Avg	Daily Max	Sampling Location	Measurement Frequency	Sample Type
Chronic Whole Effluent Toxicity, IC25	---	---	---	---	Effluent	See Item 8 on page 6 and Part IV	
In-stream Monitoring	---	---		---	Upstream / Downstream	See Item 5 & 6	Grab

[a] Each month, the average effluent $CBOD_5$ and TSS concentrations shall not exceed 15% of the average of their respective influent concentration values (85% removal). The percent removal shall be reported on the Discharge Monitoring Report (DMR) form (EPA No. 3320-1)
[b] The geometric mean of the E. coli values collected during any monthly period shall not exceed 126 colonies per 100 ml of effluent sample and shall be reported as the monthly average value.

B. Reasonable Potential (RP)

Title 40 of the Federal Code of Regulations, 40 CFR 122.44(d) requires NPDES permit issuing authorities to develop procedures for determining whether a discharge causes, has the reasonable potential to cause, or contributes to an instream excursion above a narrative or numeric criterion. If such reasonable potential is determined to exist, the NPDES permit must contain pollutant effluent limits and/or effluent limits for whole effluent toxicity. The EPA's reasonable potential analysis is based on guidelines provided in the "U.S. EPA NPDES Permit Writer's Manual (2010)" and its references. Additional information on the process and results of the reasonable potential analysis can be found in Appendix 3.

C. Total Nitrogen and Total Phosphorus

To protect and maintain waters of the State, consideration must be given to control nutrients reaching Mississippi's waterways. Excessive nutrient concentrations in a river can produce an overabundance of algae that create eutrophic conditions. There are no numeric water quality criteria for Total Phosphorus (TP) and Total Nitrogen (TN) in MS and the MBCI has not promulgated their own Water Quality Standards. Therefore, EPA interpreted MDEQ's narrative nutrient criteria that is applicable to all waterbodies to assess for reasonable potential for TN and TP.

<u>Interpretation of MDEQ Narrative Nutrient Criteria</u>

Where a State or Tribe has not established a numeric water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the

reasonable potential to cause, or contributes to an excursion above a narrative criterion, the permitting authority must establish effluent limits using one or more of the options provided in 40 CFR 122.44(d)(1)(vi).

EPA has interpreted the State of Mississippi's narrative criterion, which states that "waters shall be free from materials attributable to municipal, industrial, agricultural, or other discharges in concentrations or combinations that are toxic or harmful to humans, animals, or aquatic life." (___ Part 6. Chapter 2 Rule 2.2 A. (4))

To interpret Mississippi's narrative nutrient criteria, EPA compared approved ecoregion Total Nitrogen (TN) and Total Phosphorus (TP) concentrations with target values used in the EPA approved Pearl River TMDL.

Various Reference Nutrient Concentrations for Rivers and Streams				
Parameter	**EPA Ecoregion IX Subecoregion 65**	**EPA Ecoregion IX**	**State of Florida Panhandle (West)**	**Pearl River TMDL targets for Ecoregion 65**
Total Nitrogen (mg/L)	0.395 – 0.618	0.69	0.67	0.7
Total Phosphorus (mg/L)	0.0225	36.56 (ug/L)	0.06	0.1

Due to the proximity of the discharge to the Pearl River, it was determined that use of the target values identified by MDEQ within the TMDL would be an appropriate interpretation for the narrative nutrient criteria applicable at the tribal boundary.

Reasonable Potential and status of receiving water body

EPA used reported quarterly effluent data at harmonic mean flows to assess reasonable potential for the likelihood of the discharger to cause or contribute to an exceedance of Water Quality Standards. Limited receiving water body (RWB) data available requires EPA to make conservative assumptions that may not be representative of the current conditions in the RWB. Therefore, EPA is requiring the permittee to provide additional site-specific data which will be used to determine if RP exists. Instream data collected throughout the next permit cycle will be included as inputs for the dynamic WASP model and aid in a more demonstrative RPA. If it is determined during the next permit cycle that there is RP to cause or contribute to an exceedance of Water Quality Standards, the instream data and WASP model outputs will be used to develop appropriate effluent limits.

Additional Instream Monitoring

The unnamed tributary and Beasha Creek are currently not assessed, however the downstream waterbody falls under the Pearl River TMDL which includes Waste Load Allocations (WLA) for TN and TP. This TMDL only covers major dischargers that directly discharge into the Pearl River; therefore, this facility is not included in the TMDL.

In order to understand if this facility is potentially contributing to the downstream impairment, the facility will be required to add TP and TN to their current instream monitoring parameters. The instream monitoring data will allow EPA to better assess the impact of the facility on Beasha Creek and the Pearl River. This data will be used to develop models and run a more comprehensive RPA analysis to determine if NPDES permit effluent limits for TN and TP are needed in the future.

D. Whole Effluent Toxicity (WET)

The chronic WET test measures the effect of wastewater on an indicator organism's growth, reproduction and survival. The two species of indicator organisms designated in this permit are *Ceriodaphnia dubia* and *Pimephales promelas*. The effects of an effluent in chronic toxicity tests are estimated based on the statistical calculation of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms. This inhibition concentration, denoted as IC_{25}, is then compared to the instream waste concentration (IWC), which is the proportion of effluent in the receiving water, to determine if toxicity has occurred at a level of concern. If the IC_{25} is lower than the IWC, the effluent has the potential to inhibit aquatic organisms in the receiving water. WET testing also requires a measure of test sensitivity known as Percent Minimum Significant Difference (PMSD). See the table below from Section 10.2.8.3 of Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, 4th Edition, EPA 821-R-02-013, 2002 for PMSD variability criteria.

TABLE 6. VARIABILITY CRITERIA (UPPER AND LOWER PMSD BOUNDS) FOR SUBLETHAL HYPOTHESIS TESTING ENDPOINTS SUBMITTED UNDER NPDES PERMITS.[1]

Test Method	Endpoint	Lower PMSD Bound	Upper PMSD Bound
Method 1000.0, Fathead Minnow Larval Survival and Growth Test	growth	12	30
Method 1002.0, *Ceriodaphnia dubia* Survival and Reproduction Test	reproduction	13	47
Method 1003.0, *Selenastrum capricornutum* Growth Test	growth	9.1	29

[1] Lower and upper PMSD bounds were determined from the 10th and 90th percentile, respectively, of PMSD data from EPA's WET Interlaboratory Variability Study (USEPA, 2001a; USEPA, 2001b).

The permittee submitted the results of four individual multi-species annual chronic WET tests with the permit renewal application. The first test submitted was performed November 5, 2019 and the facility passed the tests for both species. The second test submitted was performed August 22, 2020, and the facility passed the tests for both species. The third test performed on September 16, 2021 showed chronic toxicity in the effluent for *Ceriodaphnia dubia* (Daphnid). The facility passed the follow-up test on September 29, 2022 for both species.

Due to the failures in the submitted information for the application it is believed that there is reasonable potential for WET and a chronic WET limit has been deemed necessary. A chronic WET limit where an inhibition concentration (IC_{25}) of less than 72.5% will constitute a violation has been included in the permit, along with a requirement for annual testing for two species, *Ceriodaphnia dubia* and *Pimephales promelas*. These requirements are as stringent as the requirements in the previous permit and are protective of the State of Mississippi's Water Quality Standards downstream of the outfall.

E. Basis for Conventional Pollutants Limits

Pollutant of Concern	**Basis**
pH, SU	The effluent limitation range for pH was based on minimum level of effluent quality requirements of 40 CFR § 133.102 for discharges of wastewater from POTWs.
5-Day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), mg/l	Effluent $CBOD_5$ limits in the permit include a monthly average concentration of 10.0 mg/l and a weekly average concentration of 15.0 mg/l. Effluent $CBOD_5$ loading limits of 10.84 lbs/day monthly average and 16.26 lbs/day weekly average are also included in this permit. The concentration limits remained unchanged from the previous permit and are protective of the State of Mississippi's downstream water quality standard for dissolved oxygen based on a historical model's results. The loading limits were changed to reflect the design flow of 0.13 MGD reported on the application. These limits are more stringent than minimum level of effluent quality requirements of 40 CFR § 133.102 for discharges of wastewater from POTWs. The previous NPDES permit had cited using best professional judgement (BPJ) for determination of the loading limits. In the permit that became effective August 1, 2003 increased loadings were justified to satisfy the stipulations of a Total Maximum Daily Load for Toxicity due to Pesticides and Other Pollutants in the Pearl River, developed by the EPA July 2, 2001. This TMDL is for Toxicity due to Pesticides therefore this is not an applicable use for $CBOD_5$ load determination.

	The percent removal limitation for $CBOD_5$ has been added to this permit and is based on the minimum level of effluent quality requirements of 40 CFR § 133.102 for discharge of waters from POTWs. For calculation of the percent removal, influent $CBOD_5$ monitoring has been added.
Total Suspended Solids (TSS), mg/l	The permit includes monthly average limits of 30 mg/l and 32.53 lbs/day and weekly average limits of 45 mg/l and 48.79 lbs/day, as well as an 85% removal limitation and influent monitoring. TSS concentration limits and monitoring requirements are unchanged from the previous permit.
E. coli, #/100ml	The limits include a monthly geometric mean of 126 #/100 mL and a daily maximum of 410 #/100 ml. Monitoring requirements are consistent with the previous NPDES permit and the anti-backsliding provisions of 40 CFR § 122.44(l).

F. Basis for Nonconventional Pollutants Limits

Pollutant of Concern	**Basis**
Ammonia, mg/l	The permit includes monthly average ammonia limits of 2.0 mg/l and 2.17 lbs/day and weekly average ammonia limits of 3.0 mg/l and 3.25 lbs/day. These limits are unchanged from the previous permit and are protective of the State of Mississippi downstream water quality standard for dissolved oxygen based on model results. MDEQ currently interprets their ammonia toxicity water quality standard for freshwater to be the EPA 1999 Update of Ambient Water Quality Criteria for Ammonia. The DO-based ammonia limits included in this permit are more stringent than the calculated toxicity-based ammonia limits and are therefore protective of the MDEQ toxicity-based ammonia water quality standard (The EPA 1999 Update of Ambient Water Quality Criteria for Ammonia).
Dissolved Oxygen, DO, mg/l	The permit includes a daily minimum dissolved oxygen limit of 6.0 mg/l. This limit is unchanged from the previous permit and is protective of the State of Mississippi downstream water quality standard for dissolved oxygen based on model results.
Total Nitrogen, mg/l	Monitoring for Total Nitrogen is being required so that sufficient information will be available from this point source should it be necessary at some later time to impose limits on this discharge.
Total Phosphorus, mg/l	Monitoring for Total Phosphorus is being required so that sufficient information will be available from this point source should it be necessary at some later time to impose limits on this discharge.
Chronic Whole Effluent Toxicity, IC_{25}	A chronic WET limit of $IC_{25} \geq 72.5\%$ has been included in the permit with a requirement for annual testing for two species, *Ceriodaphnia dubia* and *Pimephales promelas*. These requirements are as stringent as the requirements in the previous permit. For more information see paragraph 4.C. above.

G. Calculations for Water Quality-Based Effluent Limits (WQBELs)

a. Instream Waste Concentration (IWC)

$$IWC\ (\%) = \frac{\text{Design Flow (gpd)}}{\text{Design Flow (gpd)+7Q10(gpd)}} x\ 100\%$$

$$IWC\ (\%) = \frac{130{,}000\ \text{gpd}}{130{,}000\ \text{gpd} + 49{,}000\ \text{gpd}}\ x\ 100\%$$

$IWC\ (\%) = 72.5\%$ in the Unnamed Tributary to Beasha Creek

b. Dissolved Oxygen (DO)

The Mississippi Band of Choctaw Indians have not promulgated Water Quality Standards. The State of Mississippi has promulgated a DO standard that states that DO concentrations shall be maintained at a minimum daily average of at least 5.0 mg/L and an instantaneous minimum of at least 4.0 mg/L. A historical model was used to analyze the effect of the facility's effluent on the receiving waterbody and determine $CBOD_5$, ammonia, and DO limits that are protective of these criteria. A minimum DO limit of 6.0 mg/L in the effluent was determined to be protective. See Appendix 1 for a detailed description of the model.

Permit Limit: DO shall not be less than 6.0 mg/L

c. Carbonaceous Biochemical Oxygen Demand (5-day) ($CBOD_5$)

A monthly average $CBOD_5$ WQBEL of 10 mg/L was developed using a historical model to be protective of instream DO.

Monthly average $CBOD_5$ limit = 10.0 mg/L

Monthly average $CBOD_5$ loading limit = 10.84 lb/day

A weekly average $CBOD_5$ limit was developed using the following equation:

Weekly average $CBOD_5$ limit = Monthly average $CBOD_5$ limit x 1.5

Weekly average $CBOD_5$ limit = 10.0 mg/L x 1.5

Weekly average $CBOD_5$ limit = 15 mg/L

Weekly average $CBOD_5$ loading limit = 16.26 lb/day

Loading limits were developed using the following equation:

Loading limit (lbs/day) = Concentration limit (mg/l) x Design flow (MGD) x 8.34

d. Ammonia

i. Ammonia Toxicity Analysis

The MBCI has not promulgated Water Quality Standards. The State of Mississippi has adopted the *1999 Update of Ambient Water Quality Criteria for Ammonia;* The EPA document number *EPA-822-R-99-014* for ammonia toxicity. Toxicity-based ammonia limits have been developed for this permit so that these criteria will be met at the State/Tribal boundary and in state waters.

Criterion Maximum Concentration (CMC) - Salmonid Fish Present

$$CMC = \frac{0.0577}{1+10^{(7.204 - pH)}} + \frac{39.0}{1+10^{(pH - 7.204)}}$$

CMC = Instream criterion maximum concentration for total ammonia

pH = 7 SU

Instream CMC = 24.10 mg/L

$$C_E = \frac{[CMC \times (Design\ Flow + 7Q10)] - (7Q10 \times C_B)}{Design\ Flow}$$

$$C_E = \frac{[24.1 \times (0.13 + 0.05)] - (0.05 \times 0)}{0.13}$$

Where:

C_B = Upstream ammonia concentration = 0 mg/L

C_E = Allowable ammonia effluent concentration, mg/L

C_E = 33.4 mg/L

Criterion Continuous Concentration (CCC) – Early Life Stages Present

$$CCC = \left(\frac{0.13}{1+10^{(7.688 - \mathrm{pH})}} + \frac{2.487}{1+10^{(\mathrm{pH} - 7.688)}}\right) \times MIN(2.85, 1.45 \times 10^{[0.028 \times (25-T)]})$$

$$CCC = \left(\frac{0.13}{1+10^{(7.688 - 7)}} + \frac{2.487}{1+10^{(7 - 7.688)}}\right) \times MIN(2.85, 1.45 \times 10^{[0.028 \times (25-30)]})$$

CCC = Instream criterion continuous concentration for total ammonia

$$C_E = \frac{[CCC \times (Design\ Flow + 7Q10)] - (7Q10 \times C_B)}{Design\ Flow}$$

$$C_E = \frac{[2.18 \times (0.13 + 0.05)] - (0.05 \times 0)}{0.13}$$

Where:

C_B = Upstream ammonia concentration = 0 mg/L

C_E = Allowable ammonia effluent concentration, mg/L

pH = 7 SU, T = 30 °C

CCC = 2.18 mg/L

C_E = 3.01 mg/L

The seasonal limits based on the Instream CCC criteria are more stringent than the limit based on the Instream CMC criteria. Therefore, the limits of 3.01 mg/L will be used to compare against the DO-based ammonia WQBELs developed in a historical model.

ii. DO-Based Ammonia Limits

Monthly average ammonia WQBELs of 2.0 mg/L was developed using the historic model to be protective of instream DO. This WQBEL are more stringent than those developed to be protective of toxicity (3.01 mg/L). Therefore, the DO-based ammonia WQBEL will be used to protect against toxicity while protecting instream DO.

Monthly average total ammonia limit = 2.0 mg/L

Monthly average total ammonia loading limit = 2.17 lb/day

Weekly average total ammonia limits were developed using the following equation:

Weekly average total ammonia limit = Monthly average total ammonia limit x 1.5

Weekly average total ammonia limit = 2.0 mg/L x 1.5

Weekly average total ammonia limit = 3.0 mg/L

Weekly average total ammonia loading limit = 3.25 lb/day

e. Total Residual Chlorine (TRC)

The MBCI has not promulgated WQS. The State of Mississippi has promulgated Fresh Water chlorine chronic criteria of 0.011 mg/L and acute criteria of 0.019 mg/L. A total residual chlorine limit has been developed for this permit so that these criteria will be met at the State/Tribal boundary and in state waters.

$$C_D = \frac{(Q_R \times C_R) + (Q_E \times C_E)}{Q_D}$$

Q_R = Critical streamflow = 7Q10 = 0.08 cfs
C_R = Upstream concentration = 0 mg/L
Q_E = Effluent design flow = 0.13 MGD
C_E = Effluent concentration
Q_D = Combined downstream flow = $Q_D + Q_E$ = 0.19 MGD
C_D = Downstream concentration = 0.011 mg/L

$$0.011\ mg/L = \frac{(0.08\ cfs \times 0\ mg/L) + (0.13\ MGD \times C_E)}{0.13\ MGD}$$

$$C_E = 0.011\ mg/L$$

Daily Maximum Limit = 0.011 mg/L

H. Applicable Technology-Based Effluent Limits (TBELs)

Technology-based effluent limitations aim to prevent pollution by requiring a minimum level of effluent quality that is attainable using demonstrated technologies for reducing discharges of pollutants or pollution into the waters of the United States.

i. Secondary Treatment Standards

Parameter	**Secondary Treatment Standard**
BOD_5 ($CBOD_5$)	30 mg/L (25 mg/L) Monthly Average 45 mg/L (37.5 mg/L) Weekly Average
TSS	30 mg/L Monthly Average 45 mg/L Weekly Average
Removal	85% BOD_5 (or $CBOD_5$) and TSS

pH	Maintained within the limits of 6.0-9.0 standard units

I. Comparison & Summary of Water Quality-Based vs. Technology-Based Effluent Limits

For each parameter, applicable technology-based limits (TBELs) were compared to the applicable water-quality based limits WQBELs), and the most stringent limits were selected for the permit. The selected limits, indicated by bold text, were compared to the limits in the current permit, and all are at least as stringent as the current permit limits.

Parameter	**Current Permit Limits**				**Proposed Permit Limits**							
					WQBELs				**TBELs**			
	Daily Min	Monthly Avg	Weekly Avg	Daily Max	Daily Min	Monthly Avg	Weekly Avg	Daily Max	Daily Min	Monthly Avg	Weekly Avg	Daily Max
Flow, MGD	---	Report	Report	---	---	**Report**	**Report**	---	---	---	---	---
Dissolved Oxygen, mg/l	6.0	---			**6.0**	---			---			
$CBOD_5$, mg/l (lb/d)	---	10.0 (15.88)	15.0 (23.82)	---	---	**10.0 (10.84)**	**15.0 (16.26)**	---	---	25	37.5	---
$CBOD_5$ % Removal	---				---				**85%**			
TSS, mg/l (lb/d)	---	30.0 (125.1)	45.0 (187.6)	---	---				**---**	**30.0 (32.53)**	**45.0 (48.79)**	**---**
TSS % Removal	85%				---				**85%**			
Total Ammonia as Nitrogen, mg/l (lb/d)	---	2.0 (8.34)	3.0 (12.51)	---	---	**2.0 (2.17)**	**3.0 (3.25)**	---	---			
pH, S.U.	6.0	---		9.0	**6.0**	---		**9.0**	6.0	---		9.0
Fecal Coliform, Summer, #/100 ml	---	200	400	---	**---**	---	**---**	**---**	---			
Fecal Coliform, Winter, #/100 ml	---	2000	4000	---	**---**	---	**---**	**---**	---			
E. coli, #/100 ml	---	---	---	---	**---**	**126**	**---**	**410**	---			

TN, mg/l	---	---	---	Report	---	**Report**	**Report**	---	---
TP, mg/l	---	---	---	Report	---	**Report**	**Report**	---	---
Chronic WET	IC_{25} > 72.5%				**IC_{25} > 72.5%**				---
Instream Monitoring	Upstream/Downstream DO, pH, temperature, conductivity				**Upstream/Downstream DO, pH, temperature, TP and TN**				---

5. 401 Certification

The Clean Water Act (CWA) § 401 statute and regulations stipulate that no federal permit or license can be issued that may result in a discharge to waters of the United States unless the state or authorized tribe certifies that the discharge is consistent with water quality standards and other water quality goals or waives its certification authority. The EPA Regional offices are the certifying authority on behalf of tribes without CWA § 401 program authority.

The CWA § 401 regulations direct certifying authorities to conclude that the permitted activity will be consistent with effluent limitations for conventional and non-conventional pollutants, water quality standards, new source performance standards, and toxic pollutant limitations, and any other appropriate state and/or tribal requirements. A second component of the scope of the CWA § 401 review is determining whether an activity requiring certification in one state or tribe (i.e., in the location where the discharge originates) may potentially impact the water quality of a neighboring state or tribe. In those instances, the EPA is directed to notify the state or tribe whose water quality may be affected, and neighboring state or tribe may object to permit issuance.
The MBCI has not promulgated water quality standards, and discharges from the Pearl River WWTF will occur just upstream of the Mississippi state boundary. The subject permit was developed to be consistent with the State of Mississippi's Water Quality Standards (11 Miss. Admin. Code Pt 6 Ch. 2, Rule 2.4 4). It is protective of designated uses of state waters and with the other applicable provisions of the CWA (i.e., §§ 301, 302, 303, 306, and 307). On March 12, 2025, the Mississippi Department of Environmental Quality determined that there was no reason for objection or concerns that the project, when operated and maintained as required, would affect water quality within the jurisdiction of the State of Mississippi.

6. Services Consultation

In accordance with 40 CFR § 122.49(c) the EPA is required to ensure, in consultation with the U.S. Fish and Wildlife Service (Service), that "any action authorized by the EPA is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat". In a letter dated September 27, 2024 the Service concurred with the EPA determination that the proposed project "May affect, but [is] not likely to adversely affect" federally listed species or critical habitat.

7. National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA), and implementing regulations 36 CFR Part 800 require the EPA, before issuing a license (permit), to identify the area of potential effect of a permitted discharge and, if historic or cultural resources within that area would be adversely affected by the discharge, to adopt measures when feasible to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register of Historic Places. The MBCI is responsible for administering the NHPA within tribal boundaries. In a letter dated August 13, 2024, EPA sent out a determination letter to the tribe that the permit issuance will have no effect to historic or cultural properties. EPA received no comments from the tribe.

8. Public Participation

The public notice for this draft permit was published in The Clarion-Ledger with the permit documents available on the EPA Region 4 website from November 6, 2024, to December 6, 2024. No comments were received.

Appendix 1 – Summary of DMR Data

Effluent Flow

Monitoring Period End Date	Monthly Average, MGD	Weekly Average, MGD
03/31/2019	0.11	0.16
04/30/2019	0.16	0.26
05/31/2019	0.08	0.09
06/30/2019	0.07	0.07
07/31/2019	0.09	0.11
08/31/2019	0.11	0.13
09/30/2019	0.08	0.08
10/31/2019	0.20	0.38
11/30/2019	0.11	0.13
12/31/2019	0.21	0.39
01/31/2020	0.11	0.15
02/29/2020	0.42	0.86
03/31/2020	0.19	0.38
04/30/2020	0.08	0.08
05/31/2020	0.17	0.30
06/30/2020	0.16	0.18
07/31/2020	0.10	0.13
08/31/2020	0.12	0.29
09/30/2020	0.08	0.10
10/31/2020	0.07	0.08
11/30/2020	0.08	0.08
12/31/2020	0.08	0.09
01/31/2021	0.19	0.26
02/28/2021	0.13	0.15
03/31/2021	0.17	0.26
04/30/2021	0.09	0.18
05/31/2021	0.06	0.07
06/30/2021	0.21	0.28
07/31/2021	0.10	0.10
08/31/2021	0.08	0.08
09/30/2021	0.16	0.38
10/31/2021	0.13	0.23
11/30/2021	0.08	0.10
12/31/2021	0.19	0.48
01/31/2022	0.14	0.36
02/28/2022	0.10	0.32
03/31/2022	0.18	0.68
04/30/2022	0.09	0.09
05/31/2022	0.09	0.12
06/30/2022	0.08	0.08
07/31/2022	0.09	0.11
08/31/2022	0.10	0.25
09/30/2022	0.06	0.06
10/31/2022	0.10	0.11
11/30/2022	0.17	0.22
12/31/2022	0.08	0.11
01/31/2023	0.23	0.34
02/28/2023	0.03	0.04
03/31/2023	0.02	0.05
04/30/2023	0.22	0.31
05/31/2023	0.16	0.26
06/30/2023	0.19	0.33
07/31/2023	0.11	0.16
08/31/2023	0.06	0.07
09/30/2023	0.31	1.06
10/31/2023	0.11	0.11

Data Points, n	56	56
Average	0.13	0.22
Maximum	0.42	1.06

$CBOD_5$

Monitoring Period End Date	Monthly Average, mg/L	Weekly Average, mg/L
03/31/2019	3.80	6.00
04/30/2019	2.60	6.00
05/31/2019	1.30	2.00
06/30/2019	2.80	7.00
07/31/2019	1.70	3.00
08/31/2019	1.40	1.60
09/30/2019	3.10	6.10
10/31/2019	2.00	2.00
11/30/2019	2.10	2.20
12/31/2019	2.40	2.80
01/31/2020	2.50	2.80
02/29/2020	2.50	3.00
03/31/2020	2.40	3.20
04/30/2020	2.30	2.50
05/31/2020	2.60	4.20
06/30/2020	2.00	2.00
07/31/2020	2.00	2.00
08/31/2020	2.00	2.00
09/30/2020	2.00	2.00
10/31/2020	2.10	2.10
11/30/2020	3.00	5.00
12/31/2020	2.10	2.50
01/31/2021	2.30	2.40
02/28/2021	2.00	2.00
03/31/2021	2.20	2.40
04/30/2021	2.00	2.00
05/31/2021	2.00	2.00
06/30/2021	2.00	2.20
07/31/2021	77.50	152.50
08/31/2021	1.50	2.00
09/30/2021	3.00	7.00
10/31/2021	2.70	4.10
11/30/2021	1.60	2.40
12/31/2021	2.00	3.00
01/31/2022	2.00	2.10
02/28/2022	2.30	2.80
03/31/2022	2.00	2.00
04/30/2022	2.10	2.30
05/31/2022	1.80	2.00
06/30/2022	2.00	2.00
07/31/2022	2.00	2.00
08/31/2022	2.00	2.00
09/30/2022	2.00	2.00
10/31/2022	2.00	2.00
11/30/2022	1.80	2.30
12/31/2022	2.00	2.00
01/31/2023	2.20	3.00
02/28/2023	2.00	2.00
03/31/2023	2.00	2.00
04/30/2023	4.00	7.00
05/31/2023	2.30	3.40
06/30/2023	2.30	3.00
07/31/2023	16.70	39.00
08/31/2023	2.20	2.50
09/30/2023	4.50	6.40
10/31/2023	6.40	6.40

Data Points, n	56	56
Average	3.9	6.36
Maximum	77.5	152.5

** Data Unavailable

TSS

Monitoring Period End Date	Weekly Average, mg/L	Monthly Average, mg/L	TSS Removal, %
03/31/2019	34.00	15.00	90.10
04/30/2019	43.00	14.00	92.80
05/31/2019	5.00	5.00	96.00
06/30/2019	24.00	10.00	92.00
07/31/2019	17.00	8.00	91.40
08/31/2019	5.00	3.00	97.40
09/30/2019	14.00	6.00	89.10
10/31/2019	10.00	6.00	93.70
11/30/2019	5.00	4.00	95.00
12/31/2019	9.00	7.00	96.70
01/31/2020	16.00	12.00	85.30
02/29/2020	13.00	10.00	88.80
03/31/2020	12.00	8.00	92.10
04/30/2020	8.00	6.00	94.00
05/31/2020	48.00	16.00	81.00
06/30/2020	9.00	6.00	95.50
07/31/2020	4.00	3.00	97.60
08/31/2020	9.00	5.00	97.10
09/30/2020	8.00	6.00	94.10
10/31/2020	7.00	5.00	96.70
11/30/2020	7.00	6.00	97.00
12/31/2020	6.00	4.00	97.70
01/31/2021	7.00	4.00	96.30
02/28/2021	4.00	3.00	97.70
03/31/2021	8.00	5.00	97.90
04/30/2021	10.00	6.00	94.10
05/31/2021	5.00	4.00	98.00
06/30/2021	8.00	5.00	96.90
07/31/2021	34.00	19.00	86.40
08/31/2021	18.00	9.00	92.30
09/30/2021	7.00	4.00	96.00
10/31/2021	4.00	3.00	96.00
11/30/2021	18.00	8.00	92.00
12/31/2021	5.00	3.00	96.80
01/31/2022	7.00	5.00	96.80
02/28/2022	6.00	4.00	95.90
03/31/2022	7.00	3.00	98.00
04/30/2022	9.00	7.00	94.50
05/31/2022	10.00	7.00	95.50
06/30/2022	8.00	5.00	97.00
07/31/2022	4.00	3.00	96.20
08/31/2022	4.00	3.00	94.90
09/30/2022	3.00	3.00	97.30
10/31/2022	5.00	4.00	96.30
11/30/2022	7.00	4.00	96.10
12/31/2022	6.00	5.00	94.00
01/31/2023	9.00	4.00	97.30
02/28/2023	3.00	2.00	97.70
03/31/2023	5.00	4.00	97.20
04/30/2023	7.00	4.00	96.00
05/31/2023	35.00	9.00	96.20
06/30/2023	4.00	3.00	98.10
07/31/2023	24.00	17.00	90.40
08/31/2023	5.00	3.00	96.40
09/30/2023	12.00	10.00	88.60
10/31/2023	12.00	12.00	85.80

Data Point, n	56	56	56
Average	11.30	6.41	94.42
Max (Min)	48.00	19.00	81.00

Total Ammonia as N

Monitoring Period End Date	Monthly Average, mg/L	Weekly Average, mg/L
03/31/2019	0.10	0.20
04/30/2019	0.10	0.30
05/31/2019	0.10	0.10
06/30/2019	0.40	0.80
07/31/2019	0.20	0.70
08/31/2019	0.70	1.40
09/30/2019	7.00	15.10
10/31/2019	0.10	0.20
11/30/2019	0.10	0.30
12/31/2019	0.30	0.70
01/31/2020	0.10	0.10
02/29/2020	0.30	0.60
03/31/2020	0.70	2.30
04/30/2020	0.40	1.00
05/31/2020	0.20	0.80
06/30/2020	0.10	0.20
07/31/2020	0.10	0.20
08/31/2020	0.10	0.10
09/30/2020	0.10	0.20
10/31/2020	0.00	0.10
11/30/2020	0.10	0.10
12/31/2020	**	0.10
01/31/2021	**	**
02/28/2021	**	0.01
03/31/2021	0.30	1.00
04/30/2021	0.10	0.20
05/31/2021	**	0.10
06/30/2021	0.60	2.50
07/31/2021	0.60	0.70
08/31/2021	0.20	0.30
09/30/2021	0.20	0.60
10/31/2021	7.20	13.00
11/30/2021	**	0.10
12/31/2021	**	0.10
01/31/2022	**	0.00
02/28/2022	2.40	7.90
03/31/2022	0.90	4.20
04/30/2022	0.20	0.60
05/31/2022	0.10	0.10
06/30/2022	0.10	0.20
07/31/2022	0.06	0.09
08/31/2022	**	**
09/30/2022	**	**
10/31/2022	**	**
11/30/2022	0.20	0.80
12/31/2022	0.00	0.10
01/31/2023	0.80	4.10
02/28/2023	0.02	0.02
03/31/2023	**	**
04/30/2023	**	**
05/31/2023	0.30	1.50
06/30/2023	3.10	8.10
07/31/2023	15.30	23.40
08/31/2023	3.50	4.60
09/30/2023	10.90	11.80
10/31/2023	12.50	12.50

Data Points, n	44	50
Average	1.35	2.48
Maximum	15.3	23.4

** Data Unavailable

pH

Monitoring Period End Date	Daily Max, SU	Daily Min, SU
03/31/2019	6.90	6.70
04/30/2019	7.30	6.80
05/31/2019	7.20	7.10
06/30/2019	7.30	7.00
07/31/2019	7.50	7.10
08/31/2019	7.00	6.60
09/30/2019	7.10	6.60
10/31/2019	6.80	6.00
11/30/2019	7.20	**
12/31/2019	6.80	6.70
01/31/2020	6.90	6.60
02/29/2020	6.90	6.20
03/31/2020	7.20	6.70
04/30/2020	7.30	6.90
05/31/2020	7.30	7.10
06/30/2020	7.20	6.90
07/31/2020	7.20	7.00
08/31/2020	7.30	7.20
09/30/2020	7.30	7.00
10/31/2020	7.10	6.80
11/30/2020	7.10	6.90
12/31/2020	7.00	6.70
01/31/2021	7.00	6.70
02/28/2021	7.20	6.90
03/31/2021	7.10	6.80
04/30/2021	7.30	6.50
05/31/2021	7.30	6.70
06/30/2021	7.30	6.80
07/31/2021	7.50	6.80
08/31/2021	7.20	6.90
09/30/2021	7.30	6.90
10/31/2021	7.10	6.90
11/30/2021	7.30	6.30
12/31/2021	7.20	6.70
01/31/2022	6.80	6.60
02/28/2022	7.40	6.50
03/31/2022	6.90	6.70
04/30/2022	6.90	6.40
05/31/2022	7.40	6.70
06/30/2022	7.70	7.10
07/31/2022	7.70	7.30
08/31/2022	8.60	7.40
09/30/2022	7.90	7.00
10/31/2022	8.60	8.10
11/30/2022	8.30	6.60
12/31/2022	7.70	6.60
01/31/2023	7.10	6.50
02/28/2023	6.90	6.50
03/31/2023	7.00	6.80
04/30/2023	7.00	6.70
05/31/2023	7.20	6.90
06/30/2023	7.70	6.90
07/31/2023	7.20	6.90
08/31/2023	7.60	7.10
09/30/2023	7.30	6.90
10/31/2023	7.50	7.40

Data Points, n	56	55
Average	7.29	6.82
Min/Max	8.60	6.00

**Data Unavailable

Dissolved Oxygen (DO)

Monitoring Period End Date	Daily Minimum, mg/L
03/31/2019	7.70
04/30/2019	7.30
05/31/2019	7.30
06/30/2019	7.00
07/31/2019	6.70
08/31/2019	6.90
09/30/2019	6.70
10/31/2019	7.40
11/30/2019	9.20
12/31/2019	9.00
01/31/2020	7.60
02/29/2020	9.40
03/31/2020	8.40
04/30/2020	8.60
05/31/2020	7.30
06/30/2020	7.70
07/31/2020	7.20
08/31/2020	6.80
09/30/2020	6.40
10/31/2020	8.00
11/30/2020	8.70
12/31/2020	8.60
01/31/2021	9.40
02/28/2021	10.10
03/31/2021	9.20
04/30/2021	8.80
05/31/2021	8.40
06/30/2021	7.70
07/31/2021	6.50
08/31/2021	6.50
09/30/2021	7.30
10/31/2021	7.50
11/30/2021	8.70
12/31/2021	8.40
01/31/2022	9.80
02/28/2022	9.30
03/31/2022	9.00
04/30/2022	8.60
05/31/2022	7.40
06/30/2022	7.10
07/31/2022	7.10
08/31/2022	7.40
09/30/2022	7.60
10/31/2022	8.00
11/30/2022	8.10
12/31/2022	8.80
01/31/2023	8.70
02/28/2023	8.60
03/31/2023	9.00
04/30/2023	8.40
05/31/2023	7.40
06/30/2023	7.20
07/31/2023	0.27
08/31/2023	7.10
09/30/2023	6.90
10/31/2023	7.60

Data Points, n	56
Average	7.82
Minimum	0.27

Escherichia coli (E. coli)

Monitoring Period End Date	Monthly Average, #/100mL	Daily Max, #/100mL
07/31/2019	34.00	590.00
08/31/2019	10.00	29.00
09/30/2019	307.00	2,419.00
10/31/2019	4.00	25.00
01/31/2020	80.00	2,419.00
02/29/2020	5.00	8.00
03/31/2020	5.00	13.00
04/30/2020	18.00	236.00
05/31/2020	10.00	365.00
06/30/2020	20.00	58.00
07/31/2020	76.00	2,419.00
08/31/2020	5.00	21.00
09/30/2020	31.00	144.00
10/31/2020	22.00	33.00
11/30/2020	6.00	24.00
12/31/2020	61.00	548.00
01/31/2021	31.00	119.00
02/28/2021	17.00	109.00
03/31/2021	18.00	58.00
04/30/2021	25.00	36.00
05/31/2021	4.00	8.00
06/30/2021	114.00	1,986.00
07/31/2021	751.00	2,419.00
08/31/2021	64.00	411.00
09/30/2021	5.00	172.00
10/31/2021	136.00	2,420.00
11/30/2021	90.00	649.00
12/31/2021	17.00	25.00

Monitoring Period End Date	Monthly Average #/100mL	Daily Max, #/100mL
01/31/2022	11.00	37.00
02/28/2022	29.00	2,419.00
03/31/2022	27.00	66.00
04/30/2022	33.00	54.00
05/31/2022	14.00	53.00
06/30/2022	6.00	13.00
07/31/2022	14.00	19.00
08/31/2022	11.00	68.00
09/30/2022	26.00	145.00
10/31/2022	3.00	9.00
11/30/2022	11.00	242.00
12/31/2022	21.00	47.00
01/31/2023	34.00	141.00
02/28/2023	9.00	17.00
03/31/2023	9.00	18.00
04/30/2023	25.00	33.00
05/31/2023	25.00	2,420.00
06/30/2023	62.00	2,420.00
07/31/2023	119.00	2,420.00
08/31/2023	6.00	32.00
09/30/2023	13.00	133.00
10/31/2023	523.00	2,420.00

Data Points, n	50	50
Average	59.94	619.78
Maximum	751.00	2420.00

** Data Unavailable

Total Nitrogen as N

Monitoring Period End Date	Monthly Average, mg/L	Weekly Average, mg/L	Daily Max, mg/L
03/31/2019	**	**	15.11
06/30/2019	**	**	13.79
09/30/2019	2.92	2.92	**
12/31/2019	13.70	13.70	**
03/31/2020	11.20	11.20	**
06/30/2020	2.56	2.56	**
09/30/2020	12.40	12.40	**
12/31/2020	12.50	0.01	**
03/31/2021	6.46	6.46	**
06/30/2021	2.15	2.15	**
09/30/2021	2.46	2.46	**
12/31/2021	7.20	7.20	**
03/31/2022	5.10	5.10	**
06/30/2022	12.40	12.40	**
09/30/2022	9.87	9.87	**
12/31/2022	8.27	8.27	**
09/30/2023	10.60	10.60	**
12/31/2023	20.80	20.80	**

Data Points, n	16	16	2
Average	8.79	8.00	14.45
Maximum	20.8	20.8	15.11

** Data Unavailable

Total Phosphorous as P

Monitoring Period End Date	Monthly Average, mg/L	Weekly Average , mg/L	Daily Max, mg/L
03/31/2019	**	**	0.95
06/30/2019	**	**	0.62
09/30/2019	1.08	2.39	**
12/31/2019	1.40	2.40	**
03/31/2020	3.27	1.62	**
06/30/2020	4.14	0.25	**
09/30/2020	3.36	3.36	**
12/31/2020	12.50	12.50	**
03/31/2021	1.26	1.26	**
06/30/2021	1.26	1.26	**
09/30/2021	0.99	0.99	**
12/31/2021	1.21	1.21	**
03/31/2022	0.20	0.20	**
06/30/2022	1.96	1.96	**
09/30/2022	4.08	4.08	**
12/31/2022	1.38	1.38	**
09/30/2023	0.05	0.05	**
12/31/2023	0.81	0.81	**

Data Points, n	16	16	2
Average	2.43	2.24	0.79
Maximum	12.50	12.5	0.95

Appendix 2 – Summary of Instream Monitoring

Conductivity

Monitoring Period End Date	Upstream – Beasha Creek before confluence with Unnamed Tributary			Downstream – Beasha Creek below confluence with Unnamed Tributary		
	Daily Min, umho/cm	**Daily Avg, umho/cm**	**Daily Max, umho/cm**	**Daily Min, umho/cm**	**Daily Avg, umho/cm**	**Daily Max, umho/cm**
06/30/2019	54.30	58.90	63.40	60.90	64.20	67.50
07/31/2019	64.10	71.20	78.20	58.20	60.80	63.30
08/31/2019	54.00	57.00	60.00	47.00	50.50	54.00
09/30/2019	72.00	76.00	80.00	79.00	80.50	82.00
06/30/2020	52.00	54.40	57.00	50.00	51.50	53.00
07/31/2020	45.00	46.70	48.30	38.00	41.50	45.00
08/31/2020	62.70	63.20	63.60	58.30	59.70	61.00
09/30/2020	67.90	69.20	71.00	68.10	72.20	77.50
06/30/2021	26.30	44.50	62.60	27.80	37.90	48.00
07/31/2021	41.60	57.60	73.60	31.00	47.00	63.00
08/31/2021	51.80	67.40	83.00	54.00	62.00	70.00
09/30/2021	47.50	56.60	72.40	31.00	47.70	66.00
06/30/2022	78.90	78.90	78.90	69.70	74.70	79.70
07/31/2022	78.10	78.50	78.90	62.60	68.10	73.50
08/31/2022	59.20	74.30	89.40	50.60	63.20	75.80
09/30/2022	71.30	74.70	78.10	63.20	68.40	73.60
06/30/2023	58.10	62.20	66.30	53.50	64.00	74.40
07/31/2023	56.20	59.50	62.70	36.10	44.40	52.70
08/31/2023	84.50	86.10	87.60	82.10	89.40	94.90
09/30/2023	76.40	77.20	77.90	83.50	83.50	83.50

Data Points, n	20	20	20	20	20	20
Minimum	26.30			27.80		
Average		65.71			61.56	
Maximum			89.40			94.90

Dissolved Oxygen (DO)

Monitoring Period End Date	Upstream – Beasha Creek before confluence with Unnamed Tributary			Downstream – Beasha Creek below confluence with Unnamed Tributary		
	Daily Min, umho/cm	**Daily Avg, umho/cm**	**Daily Max, umho/cm**	**Daily Min, umho/cm**	**Daily Avg, umho/cm**	**Daily Max, umho/cm**
06/30/2019	7.70	7.80	8.00	7.60	7.70	7.80
07/31/2019	7.30	7.60	7.80	7.30	7.40	7.60
08/31/2019	7.90	8.10	8.30	7.20	7.50	7.80
09/30/2019	6.90	7.20	7.50	6.90	7.00	7.00
06/30/2020	7.10	7.80	8.40	6.50	7.40	8.20
07/31/2020	7.60	7.80	8.00	5.50	6.30	7.10
08/31/2020	7.50	7.70	7.90	7.30	7.50	7.70
09/30/2020	7.20	8.10	9.00	7.00	7.80	8.70
06/30/2021	7.50	7.80	8.10	4.60	6.50	8.50
07/31/2021	7.80	8.00	8.10	6.80	7.30	7.80
08/31/2021	4.00	5.40	6.80	7.50	7.80	8.00
09/30/2021	7.90	8.00	8.10	6.50	7.30	8.10
06/30/2022	7.66	7.66	7.66	7.24	7.43	7.63
07/31/2022	7.60	7.70	7.80	7.20	7.30	7.40
08/31/2022	7.40	7.40	7.50	6.10	6.80	7.40
09/30/2022	7.50	7.60	7.70	7.30	7.30	7.40
06/30/2023	7.70	7.90	8.20	6.10	6.50	6.90
07/31/2023	7.50	7.60	7.70	3.50	5.30	7.10
08/31/2023	7.00	7.20	7.30	5.90	6.10	6.40
09/30/2023	7.60	7.70	7.70	7.40	7.50	7.70

Data Points, n	20	20	20	20	20	20
Minimum	4.00			3.50		
Average		7.60			7.09	
Maximum			9.00			8.70

pH

Monitoring Period End Date	Upstream – Beasha Creek before confluence with Unnamed Tributary		Downstream – Beasha Creek below confluence with Unnamed Tributary	
	Daily Min, S.U.	**Daily Max, S.U.**	**Daily Min, S.U.**	**Daily Max, S.U.**
06/30/2019	6.80	6.90	7.10	7.10
07/31/2019	7.10	7.20	7.00	7.00
08/31/2019	5.80	6.10	5.50	5.70
09/30/2019	6.70	6.70	6.70	6.70
06/30/2020	5.60	6.00	6.20	6.30
07/31/2020	5.40	6.80	6.10	6.60
08/31/2020	7.30	7.30	7.10	7.20
09/30/2020	7.10	7.40	7.10	7.30
06/30/2021	6.20	7.10	5.40	6.90
07/31/2021	6.50	7.20	6.30	7.10
08/31/2021	6.70	6.90	6.80	7.10
09/30/2021	6.60	7.10	6.00	7.00
06/30/2022	7.19	7.19	7.10	7.16
07/31/2022	7.10	7.20	7.00	7.10
08/31/2022	6.80	7.10	6.40	7.10
09/30/2022	6.90	7.00	6.80	7.00
06/30/2023	6.80	6.90	6.10	6.70
07/31/2023	6.80	7.00	5.90	6.60
08/31/2023	7.00	7.20	6.80	7.10
09/30/2023	6.80	7.00	7.10	7.20

Data Points, n	20	20	20	20
Minimum	5.40		5.40	
Maximum		7.40		7.30

Temperature

Monitoring Period End Date	Upstream – Beasha Creek before confluence with Unnamed Tributary			Downstream – Beasha Creek below confluence with Unnamed Tributary		
	Daily Min, Deg F	**Daily Avg, Deg F**	**Daily Max, Deg F**	**Daily Min, Deg F**	**Daily Avg, Deg F**	**Daily Max, Deg F**
06/30/2019	72.10	73.20	74.30	76.60	77.50	78.40
07/31/2019	73.00	74.60	76.10	75.40	75.80	76.30
08/31/2019	76.00	78.20	80.50	76.40	78.10	79.90
09/30/2019	78.70	79.00	79.40	78.50	79.70	81.00
06/30/2020	72.90	73.20	73.50	73.50	74.10	74.60
07/31/2020	75.30	77.60	79.90	75.20	77.60	80.10
08/31/2020	76.80	77.40	77.90	77.40	77.80	78.30
09/30/2020	65.50	73.10	81.00	66.00	73.80	81.50
06/30/2021	73.20	75.60	77.90	72.90	73.80	74.70
07/31/2021	72.70	74.20	75.70	74.10	74.70	75.20
08/31/2021	73.20	74.00	74.80	74.30	75.40	76.50
09/30/2021	70.90	72.60	74.70	69.10	72.30	74.80
06/30/2022	25.80	25.80	25.80	24.40	25.30	26.20
07/31/2022	76.10	76.20	76.30	79.50	79.90	80.20
08/31/2022	77.00	77.30	77.50	76.80	77.10	77.40
09/30/2022	75.00	75.10	75.20	74.80	75.70	76.50
06/30/2023	70.50	73.80	77.10	73.60	75.90	78.30
07/31/2023	76.80	77.50	78.30	77.40	77.80	78.30
08/31/2023	76.80	78.20	79.20	77.50	79.00	79.90
09/30/2023	73.80	73.80	73.80	74.10	74.30	74.50

Data Points, n	20	20	20	20	20	20
Minimum	25.80			24.40		
Average		73.02			73.78	
Maximum			81.00			81.50

Appendix 3- Reasonable Potential Analysis

Method

The Mississippi Band of Choctaw Indians have not promulgated Water Quality Standards for metals and organics for tribal waters. The receiving waterbody crosses the State/Tribal boundary shortly downstream of the outfall, and the State of Mississippi has promulgated metals and organics Water Quality Standards. Therefore, the reasonable potential analysis was designed to assess if there is reasonable potential for the Pearl River WWTF's effluent to cause or contribute to the exceedance of the State of Mississippi's Water Quality Standards at the State/Tribal boundary.

The EPA's *Technical Support Document for Water Quality-Based Toxics Control* (1991 EPA/505/2-90-001) (TSD) provides guidance for assessing potential toxicity for metals and man-made organic toxicant pollutants. The following from the TSD Chapter 3 page 53 illustrates the methodology employed for this permit reissuance. The method references a Table 3-1 or 3-2 in the TSD for selection of reasonable potential multiplying factors. For this analysis, the EPA used the 95%ile (Table 3-2).

Box 3-2. Determining "Reasonable Potential" for Excursions Above Ambient Criteria Using Effluent Data Only

EPA recommends finding that a permittee has "reasonable potential" to exceed a receiving water quality standard if it cannot be demonstrated with a high confidence level that the upper bound of the lognormal distribution of effluent concentrations is below the receiving water criteria at specified low-flow conditions.

Step 1 Determine the number of total observations ("*n*") for a particular set of effluent data (concentrations or toxic units [TUs]), and determine the highest value from that data set.

Step 2 Determine the coefficient of variation for the data set. For a data set where $n<10$, the coefficient of variation (CV) is estimated to equal 0.6, or the CV is calculated from data obtained from a discharger. For a data set where $n>10$, the CV is calculated as standard deviation/mean (see Figure 3-1). For less than 10 items of data, the uncertainty in the CV is too large to calculate a standard deviation or mean with sufficient confidence.

Step 3 Determine the appropriate ratio from Table 3-1 or 3-2.

Step 4 Multiply the highest value from a data set by the value from Table 3-1 or 3-2. Use this value with the appropriate dilution to project a maximum receiving water concentration (RWC).

Step 5 Compare the projected maximum RWC to the applicable standard (criteria maximum concentration, criteria continuous concentration [CCC], or reference ambient concentration). EPA recommends that permitting authorities find reasonable potential when the projected RWC is greater than an ambient criterion.

Example

Consider the following results of toxicity measurements of an effluent that is being characterized: 5 TU_c, 2 TU_c, 9 TU_c, and 6 TU_c. Assume that the effluent is diluted to 2 percent at the edge of the mixing zone. Further assume that the CV is 0.6, the upper bound of the effluent distribution is the 99th percentile, and the confidence level is 99 percent.

Step 1 There are four samples, and the maximum value of the sample results is 9 TU_c.

Step 2 The value of the CV is 0.6.

Step 3 The value of the ratio for four pieces of data and a CV of 0.6 is 4.7.

Step 4 The value that exceeds the 99th percentile of the distribution (ratio times x_{max}) after dilution is calculated as:

$$[9\ TU_c \times 4.7 \times 0.02] = 0.85\ TU_c.$$

Step 5 0.85 TU_c is less than the ambient criteria concentration of 1.0 TU_c. There is no reasonable potential for this effluent to cause an excursion above the CCC.