U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 8
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STATEMENT OF BASIS

PERMITTEE:	**Lower Brule Sioux Tribe**
FACILITY NAME AND ADDRESS:	**Lower Brule Lagoon System** 187 Oyate Circle Lower Brule, SD 57548
PERMIT NUMBER:	**SD-0020800**
RESPONSIBLE OFFICIAL:	Mary Jane Gourneau, Environmental Director 187 Oyate Circle Lower Brule, SD 57548 605-730-1052 mjgourneau@lbst-epo.org
FACILITY CONTACT:	Tim Estes, Operator 605-730-3140 timestes@lbst-epo.org
PERMIT TYPE:	Minor, Permit Renewal, Municipal
FACILITY LOCATION:	East 1/2 of Section 15, Township 107 N, Range 73 W, approximate latitude 44.071667º N, longitude 99.573611º W

1. INTRODUCTION

This statement of basis (SoB) is for the issuance of a National Pollutant Discharge Elimination System (NPDES) permit (the Permit) to Lower Brule Rural Water for the Lower Brule Lagoon System (Facility). The Permit establishes discharge limitations for any discharge of wastewater from the Facility through Outfall 001 to the bank of Lake Sharpe, on the Missouri River. The SoB explains the nature of the discharges, EPA's decisions for limiting the pollutants in the wastewater, and the regulatory and technical basis for these decisions.

The Facility is located on the Lower Brule Reservation. EPA Region 8 is the permitting authority for facilities located in Indian country, as defined in 18 U.S.C. § 1151, located within Region 8 states and implements federal environmental laws in Indian country consistent with the EPA Policy for the Administration of Environmental Programs on Indian Reservations and the federal government's general trust responsibility to federally recognized Indian tribes.

2. MAJOR CHANGES FROM PREVIOUS PERMIT

Major changes from the previous permit include the following. See the sections called out below for further details:

- Reporting for percent removal has been added for TSS and BOD_5 on system effluent. Section 5.1.
- The pH effluent limitation range has been reduced. Section 5.2.3.
- Influent monitoring requirements have been added for total suspended solids (TSS) mg/L and biochemical oxygen demand (BOD_5) mg/L. Section 6.2
- Receiving water monitoring requirements have been added. Section 6.3.

3. BACKGROUND INFORMATION

The Lower Brule Lagoon System is a publicly owned wastewater treatment system, comprised of 3 lagoon cells operated in series. The Facility is located on the south side of the Missouri River (Lake Sharpe) in the E 1/2 of Section 15, T 107 N, R 73 W, in Lyman County, South Dakota. The Facility is owned and operated by the Lower Brule Sioux Tribe (Tribe). The lagoon system is located on the Lower Brule Reservation.

3.1. Service Area Description

The Lower Brule Lagoon System serves a population of approximately 400 people. Based on the permit application, information from the last facility inspection, and the 2016 permit issuance, the community also includes a school, community center, casino, and other businesses that would typically only discharge domestic wastewater (e.g., a bank, retail store). According to measurements taken by the Indian Health Service (IHS) in March 2020 (also reported in the permit application), the volume of wastewater discharged to the lagoon

system averages about 0.11 million gallons per day (MGD). About 35,0000 gallons of the total influent received by the lagoon system daily is wastewater from the Lower Brule water treatment plant (WTP), which utilizes the membrane microfiltration filtration process. Most of the wastewater from this type of WTP consists of filter "backwash water" to remove solids that have accumulated in the filter media. Low concentrations of chlorine have been detected in the backwash. Periodically, once a year or less, it is necessary to clean system elements more thoroughly to remove growths, etc., from the membranes. This is done using a chlorine solution of about 300 mg/L. Occasionally, a more thorough cleaning is done using chemicals such as citric acid followed by a mixture of sodium hydroxide and sodium hypochloride. The WTP operators indicate more thorough cleaning had not been conducted in the last 1.5 years. The operator of the WTP has indicated that the wastewaters from the chemical cleaning operations are held in a holding tank until the chlorine dissipates to an acceptable level, then is discharged to the lagoon system via a lift station. The design hydraulic detention time in the lagoon (>100 days) is more than adequate to allow for dissipation of any chlorine in the wastewater from the WTP. The satellite image is shown below in Figure 1.

3.2. Treatment Process

The Facility's lagoon system was expanded from a small, 2-cell primary treatment lagoon system to a 3-cell secondary treatment lagoon system in 2001. IHS was involved in the expansion of the lagoon system. The middle dike of the 2-cell lagoon system was removed to form one cell, which became the 1st cell of the 3-cell lagoon system. According to IHS, the total area of the 3 cells at the high-water mark is 32.5 acres. The 3 cells of the lagoon system operate in series, positioned in a line running from the northwest to the southeast. The 1st cell is at the NW end, the 2nd cell is in the middle and the 3rd cell is at the SE end. Influent normally goes to cell #1 but can be routed around cell #1 to cell #2. The only discharge point is from cell #3, with the outfall line going through the dike that parallels the river and is closest to the river. There is no flow measurement device on the outfall line or following the outfall line.

The permit record indicates that the Facility discharged only twice between the years of 2007 and 2017. However, the most recent permit application states that the Facility typically discharges twice a year. DMR data indicates that the Facility began discharging more consistently in 2018. However, the Facility discharged more frequently than indicated by the application (twice a year, for 6 days) in 2019. Discharge monitoring report (DMR) data indicates that the Facility discharged for over 300 days in 2019, the operator stated that this was due to impacts from a flooding event and is not a typical practice for the Facility. In 2020, the IHS conducted an inspection of the lagoon system's intake works, the results indicated that the lagoon system is functioning properly and no issues, such as inflow & infiltration, were detected in the Facility's collection system.

Figure 1. Lower Brule Lagoon System Aerial a/

a/ Image Accessed Via EPA Geoportal. ESRI World Imagery Metadata. Updated June 9, 2021.

3.3. Chemicals Used

The Facility lagoon system does not utilize chemical treatment processes.

3.4. Permit History

According to EPA records maintained for the Facility, this renewal is at least the 4th issuance of this NPDES permit. The previous permit for the Facility became effective on February 1, 2016 and an expiration date of December 31, 2020. The permit application was received before December 31, 2020 and the permit was administratively extended.

3.5. Discharge Monitoring Report (DMR) Data

The permit record indicates that the Facility has primarily remained in compliance with the effluent limitations set in previous issuances of its NPDES permit. Per DMR data and the last inspection report on file for the Facility conducted on DATE, overdue DMR reports was the only violation type indicated for the Facility in the last permitting cycle. The effluent flow measurements reported appear to be an estimate of total flow per discharge rather than a 30-day average. The operator indicated that there is no flow measurement device in use at the

Facility and that all effluent flow values reported to DMR are estimates based upon the position of the effluent valve and the number of hours discharge occurs.

Table 1. Summary of the Facility's DMR Effluent Data a/

Parameter	Reporting Year	30-Day Average	7-Day Average	Daily Maximum	Reported Range
BOD_5, mg/L	2018	2.5	2.5	--	2.0 – 3.0
	2019	6.1	4.8	--	3.0 – 6.5
	2020	2.3	2.3	--	2.0– 2.5
TSS, mg/L	2018	13.8	8.0	--	3.0- 6.5
	2019	13.7	12.2	--	8.0-18.5
	2020	3.0	3.0	--	NA
TRC, µg/L	2018	--	--	--	NA
	2019	--	--	--	NA
	2020	--	--	--	NA
E. coli, cfu/100 mL	2018	7.4	--	7.4	NA
	2019	2.4	--	4.0	2.0 – 4.0
	2020	67.6	--	67.6	NA

pH, s.u. (max & min)	2018			8.9 Max.	7.8 – 8.9
	2019			8.1 Max.	6.1- 8.1
	2020			7.8 Max.	6.2 -7.8
Oil and Grease, mg/L	2018			2	NA
	2019			0	NA
	2020			0	NA
Oil and Grease, Visual	2018			no	NA
	2019			no	NA
	2020			no	NA
Flow, gallons	2018	2,585,400.0b/		432,000.0	316,800.0 – 432,000.0
	2019	2,690,200.0b/		316,800.0	14,400.0 – 316,800.0
	2020	1,768,800.0b/		316,800.0	132,000.0 – 2,217,600.0
No. Days Discharge	2018	22.0			--
	2019	309.5 c/			--

	2020	11.2	--

a/ Summary of the DMR Data (2016 – 2020) for Outfall 001 from EPA Integrated Compliance Information System (ICIS) database - data accessed on 01/19/2021. Data rounded to the nearest tenth for uniformity, all data is based on actual reported values and information submitted by the Facility.

b/ Appears to be reporting error. Values reported appear to be total volume discharged rather than a 30-day average.

c/ This discharge event coincided with a flooding event in the winter of 2019 and does not reflect typical operations for the Facility.

3.6. Other Facility History

As described above, the discharge from the Facility lagoon system flows to the bank of the Missouri River just a few feet from the lagoon dike and flows down the bank into the river. There has been significant erosion of the bank along where the lagoon is located. At the time of the 2016 permit issuance there was about 50-60 yards from the outfall to the edge of the river.

In April 2017 the Tribe submitted a letter of request under Section 203 of Water Resources Development Act (WRDA) which authorizes the US Army Corps of Engineers (the Corps) to partner with Native American Tribes in order to address specific water resources issues. The work plan resulting from the request included bank stabilization, ecosystem restoration, and recreation area improvement. The primary mechanism for bank stabilization would be a 5,280 ft long breakwater constructed at the 3-foot depth contour within Lake Sharpe. During March of 2019, a large rain event rapidly melted the relatively heavy snowpack that had developed across the state of South Dakota. This event caused significant erosion to occur at the narrowest point between the riverbank and the sewage lagoon embankments, leaving about 20 yards of land remaining between the riverbank and the sewage lagoon embankments. There remains concern that unless corrective measures are taken, the erosion will compromise the lagoon system.

During the development of this permit renewal, the breakwater authorized through the 2017 Section 203 request was under construction. Concurrently, the Lower Brule Sioux Tribe received funding through a Rural Development grant to pursue the construction of a mechanical treatment plant intended replace the lagoon system. Start up for the mechanical plant was set for Fall 2021, however, as of April 2021 changes to project scope and estimated costs have impacted the timeline to completion. As a result, EPA Region 8 has elected to reissue the lagoon's NPDES permit rather than a permit for the mechanical plant.

4. DESCRIPTION OF RECEIVING WATER

Based on the Facility's permit application, Outfall 001 is located at latitude 44.071667º N, longitude 99.573611º W. The discharge from the Facility lagoon system flows overland into

the Missouri River (Lake Sharpe). Lake Sharpe was formed by the construction of the Big Bend Dam near Fort Thompson, South Dakota, approximately 6 river miles downstream of the lagoon system. Lake Sharpe extends from the Big Bend Dam upstream to the Oahe Dam, a distance of approximately 80 river miles. The capacity of Lake Sharpe is given as 1,910,000 acre-feet, approximately 622,000 million gallons. Although the river is not free flowing, the minimum flow released from Lake Oahe to Lake Sharpe usually is at least several thousand cfs but could be 1,200 cfs or less at times. The beneficial uses of Lake Sharpe are discussed in Section 5.2 below.

The Corps monitors water quality six times per year at four locations: the outflow of Oahe Dam, which is considered inflow to Lake Sharpe; the outflow of Big Bend Dam; at Big Bend Dam; and upstream of Big Bend Dam. The USGS collects and analyzes samples six times per year on the Missouri River near Pierre, South Dakota. This data indicates that periodic algal blooms occur in Lake Sharpe when sufficient nutrients are coupled with ideal weather conditions.

5. PERMIT LIMITATIONS

5.1. Technology Based Effluent Limitations (TBELs)

The secondary treatment standards (40 CFR § 133) have been developed by EPA and represent the level of effluent quality attainable through the application of secondary or equivalent treatment. The regulation applies to all publicly owned treatment works (POTWs). The Facility is a POTW as defined in 40 C.F.R. § 403.3. Therefore, the National Secondary Standards (NSS) will be referenced for establishing effluent limits. Neither the EPA nor the Lower Brule Sioux Tribe have developed any additional TBELs that apply to discharges from the Facility. The TBELs for the Facility are listed in Table 2.

The 5-day biological oxygen demand (BOD_5) and total suspended solids (TSS) percent removal requirements from 40 C.F.R. § 133.105(a)(3) and (b)(3) are the basis for the effluent limits added in the Permit. Compliance with percent removal requirements is generally based on influent and effluent characteristics measured at approximately the same time. Since percent removal has not been included in previous permits, there is no current facility influent data available to evaluate the quality of wastewater (e.g. receipt of less concentrated wastewater) received by the permittee. Therefore, additional influent monitoring data is needed. In order to gather this data, ensure that the Facility meets the minimum equivalent to secondary treatment requirements (taking into consideration the allowances per 40 C.F.R. §133.101(g) for facilities utilizing waste stabilization ponds as their principal process), ensure significant biological treatment as defined in 40 C.F.R. §133.101(k), and to better support future decision making regarding the application of these regulations, including 40 C.F.R. § 133.103(d), and 133.105 (a)(3) and (b)(3), EPA is adding the following BOD_5 and TSS percent removal limits from 40 C.F.R. § 133.102(a)(3) and (b)(3) to the permit :

- BOD_5 percent removal: the 30-day average percent removal calculations shall not be less than 65 percent

- TSS percent removal: the 30-day average percent removal calculations shall not be less than 65 percent

Table 2. Technology Based Effluent Limitations Outfall 001

Parameter	30-day average (mg/L)a/	7-day average (mg/L) a/	Daily Maximum a/
Biological Oxygen Demand, BOD_5, mg/L, b/	30	45	NA
BOD_5, percent removal, c/	$\geq$ 65%	NA	NA
Total Suspended Solids, TSS, mg/L, b/	30	45	NA
TSS, percent removal, c/	$\geq$ 65%	NA	NA

a/ See Definitions, Section 1.1. of the Permit, for definition of terms.

b/ The limits for BOD_5 and TSS are based on the National Secondary Treatment Standards (40 C.F.R. Part 133).

c/ The percent removal requirements for BOD_5 and TSS are based on 40 C.F.R. § 133.105(a)(3) and (b)(3) and are being included in the Permit to ensure that the Permittee meets the minimum equivalent to secondary treatment requirements, taking into consideration the allowances in 40 C.F.R. §133.101(g) for facilities utilizing waste stabilization ponds (e.g. lagoons) as their principal process, and to better support future decision making regarding the application of the regulations in 40 C.F.R. § 133.103(c) and 133.105(b).

5.2. Water Quality Based Effluent Limitations (WQBELS)

The receiving water is within the Lower Brule Sioux Tribe Reservation. The Lower Brule Sioux Tribe does not have EPA-approved water quality standards under Section 303(c) of the Clean Water Act. Section 101(a)(2) of the Clean Water Act states, "[I]t is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water to be achieved by July 1, 1983." To achieve this Congressional goal in the absence of Tribal water quality standards (WQS) on the Reservation, EPA considers the beneficial uses of the receiving waters to include aquatic life, human health, and recreation. EPA relied on CWA § 301(b)(1)(C) in establishing WQBELs based on EPA's Section 304(a) recommended water quality criteria (WQC) to protect the uses of the receiving waters.

Per USACE's 2018 Water Quality Report entitled, "Water Quality Conditions in the Missouri River Mainstem System," beneficial uses of Lake Sharpe include: domestic water supply waters, coldwater permanent fish life propagation waters, immersion recreation waters, limited-contact recreation waters, commerce and industry waters, agricultural water supply (i.e. irrigation and stock watering), and fish and wildlife propagation. There is a good likelihood that most of those beneficial uses occur in at least portions of Lake Sharpe located within the boundaries of the reservation. The water supply intake for the Lower Brule Water treatment Plant is located in Lake Sharpe approximately 0.75-1.0 mile upstream

of the discharge from the Lower Brule lagoon system. Because the intake is upstream, this use was not considered in the development of effluent limits. A 2004 copy of "Lake Sharpe, Big Bend Dam, Boating and Recreation Guide" by the US Army Corps of Engineers, Omaha District lists 26 public recreation facilities located along Lake Sharpe. These facilities range from boat ramps to developed campgrounds. Four swimming beaches were listed with three located upstream of the Lower Brule lagoon system and one located downstream near the Big Bend Dam.

5.2.1. *E. coli*

The EPA will utilize the adopted numeric human health criteria for bacteria for the protection of primary contact recreational uses per EPA's 2012 recommended *E. coli* criteria for primary contact recreation ("Recreational Water Quality Criteria", Office of Water 820-F-12-058). These contact values for *E. coli* are 410 colonies/100 mL (one-time grab) and 126 colonies/100 mL (geometric mean). The 30-day geometric mean limitation will not require a minimum of five samples but instead will be based on the geometric mean from the total number of samples collected during the 30-day period. The permittee may collect more samples than the weekly samples specified in the self-monitoring requirements. The maximum limitation in any sample will be 410/100 mL. The above effluent limitations apply at the end of the discharge pipe and no allowance was given for a mixing zone when determining the effluent limitations.

5.2.2. Total Residual Chlorine

The presence of chlorine in the effluent is of potential concern because of toxicity of chlorine to aquatic life. As described in Section 3.1 of this SoB, the lagoon accepts backwash from a WTP which may contain low concentrations of chlorine, additionally chlorine is used in various forms by the Facility operator for cleaning and maintenance activities. Therefore, the permittee will be required to monitor for, and comply with effluent limits for chlorine.

Monitoring requirements have been adjusted in this Permit issuance to ensure that limits are sufficiently protective of the receiving water. In a 1998 letter from the EPA Office of Water (OW) to the Connecticut Water Pollution Abatement Association, the EPA OW established that effluent limitations for POTWs should be stated as average weekly and average monthly discharge limitations unless it is "impracticable" to do so. EPA has interpreted this guidance with regard to water quality – based permitting for toxics through the Technical Support Document for Water Quality-based Toxics Control (TSD) (EPA 505/2/90-001, March 1991) to determine that for purposes of assuring an effluent discharge meets water quality standards and, thus, complies with the Clean Water Act, it is impracticable to express water quality-based effluent limitations for toxics in POTW permits as only average weekly and average monthly limits. By using only average weekly and average monthly limits, it is quite possible that a permitted discharge could meet its effluent limits, but exceed the applicable water quality standards, depending upon the toxicity of the pollutant and the type of treatment applied. For a pollutant like chlorine, which can quickly cause lethality and for which both the introduction and removal is conducive to spike loads, an average weekly limit is impracticable. EPA has determined, based on this guidance, that the max daily limit set by

the previous permit in conjunction with a 30- average limitation will be sufficient to monitor both short -term and longer term TRC concentration fluctuations in the effluent.

The EPA is using the WQC for Aquatic Life to establish chlorine effluent limits: Acute 19 µg/L, Chronic 11 µg/L. These concentrations are used as the limits for daily maximum and 30-day average, respectively. Sufficiently sensitive monitoring methods must be used. For total residual chlorine a sufficiently sensitive method will have a method minimum level (ML) of 50 µg/L. The ML represents the lowest concentration at which an analyte can be measured with a known level of confidence in wastewater discharges. The chlorine effluent limitation will be maintained at the end of pipe.

5.2.3. pH

EPA has determined that the WQC for pH to protect aquatic life should be applied to ensure the protection of aquatic life and the receiving water's current status as a coldwater fisheries habitat. Therefore, discharges must be maintained within a pH range from 6.5 to 9.0 per guidance established by "EPA National Recommended Water Quality Criteria for Aquatic Life" (2002).

5.3. Previous Permit Limitations

At the time of development of this permit reissuance, there were no specific concentration Effluent Limit Guidelines (ELGs) or Federal WQSs developed for concentration limitations on oil and grease specific to POTWs, lagoons, or equivalent facilities. In compliance with EPA anti- backsliding policies, the oil and grease limit shall be incorporated into this Permit based on the provisions of the 2016 permit issuance. There also exists potential for, even if not great, the spilling of oil and/or grease related to facility operations (e.g. spills, leakage from pumps, etc.).

If a visible sheen or floating oil is detected in the discharge, a grab sample shall be taken immediately, analyzed and recorded in accordance with the requirements of 40 C.F.R. Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample.

5.4. Final Effluent Limitations

Applicable TBELs and WQBELs were compared, and the most stringent of the two was selected for the following effluent limits (Table 3).

Table 3. Final Effluent Limitations - Outfall 001

Effluent Characteristic	30-Day Average Effluent Limitations a/	7-Day Average Effluent Limitations a/	Daily Maximum Effluent Limitations a/	Limit Basis
BOD_5, mg/L	30	45	N/A	40 CFR 133
BOD_5, percent removal	$\geq$ 65%	N/A	N/A	40 CFR 133

Effluent Characteristic	**30-Day Average Effluent Limitations a/**	**7-Day Average Effluent Limitations a/**	**Daily Maximum Effluent Limitations a/**	**Limit Basis**
TSS, mg/L	30	45	N/A	40 CFR 133
TSS, percent removal	≥ 65%	N/A	N/A	40 CFR 133
Escherichia coli (E. coli), Number/100 mL	126 c/	N/A	410 d/	WQBEL b/
Total Residual Chlorine, µg/L e/	11	N/A	19	WQBEL
pH	Must remain in the range of 6.5 to 9.0 at all times.			WQBEL
Oil & Grease, Visual Limit, mg/L	There be no visible sheen in the receiving water or adjoining shoreline.			Previous Permit
Oil & Grease, mg/L	The concentration of oil and grease in any single sample shall not exceed 10 mg/L.			Previous Permit

a/ See Permit Definitions, section 1, for definition of terms.

b/ WQBEL = Limitation based on water quality-based effluent limit;

c/ 30-Day Geometric Mean. The 30-day geometric mean calculation will be based on the geometric mean from the total number of samples collected during the 30-day period. The Permittee may collect more samples than the monthly samples specified in the self-monitoring requirements, all samples must be included in the 30-Day Geometric Mean calculation. See Section 6.6 of the permit for further details regarding requirements for additional monitoring.

d/ Not to be exceeded in any sample - the daily maximum limitation will be 410 Number/100 mL

e/ The minimum limit of analytical reliability in the analysis for total residual chlorine is 50 µg/L. For purposes of calculating averages and reporting in the Discharge Monitoring Report form, analytical values less than 50 µg/L shall be considered to be in compliance with this permit.

5.5. Antidegradation

N/A. Discharges from the Facility are existing, and no changes to effluent quality are proposed. No exceedances of numeric or narrative surface water quality requirements will be allowed in the Permit.

5.6. Anti-Backsliding

Federal regulations require at 40 CFR Part 122.44(l)(1) that when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit unless the

circumstances on which the previous permit were based have materially and substantially changed since the time the Permit was issued and would constitute cause for permit modification or revocation and reissuance under 40 CFR Part 122.62.

This permit renewal complies with anti-backsliding regulatory requirements. All effluent limitations, and conditions in the Permit are either equal to or more stringent than those in the previous permit.

6. MONITORING REQUIREMENTS

6.1. Self-Monitoring Requirements – Effluent

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, as required in 40 CFR Part 122.41(j), unless another method is required under 40 CFR subchapters N or O. Based on the information provided in the renewal application and information available at the time of the Permit development, the Lower Brule Sioux Tribe has not indicated changes to the designated uses since the previous permit issuance. Therefore, the previous permit monitoring requirements for Facility effluent shall be maintained along with the additional requirements called out in Section 2 above. As mentioned in Section 3.2 above, the Facility began discharging more regularly about halfway through the previous permitting cycle. The Facility discharged twice between 2007 and 2017, resulting in a lack of nutrient monitoring data in the previous permitting cycle. Due to the EPA's increased emphasis on nutrients in the nation's streams as pollutants of concern, effluent monitoring requirements for total nitrogen and total phosphorus will be maintained in this reissuance of the permit.

The need for ammonia monitoring was also identified in the 2016 permit issuance, which identified ammonia as a pollutant of concern for POTWs. However, as previously mentioned, the permit record indicates that the Facility discharged twice between the years of 2007 and 2017. Due to the historically infrequent occurrences of discharge from the Facility, there is limited data available to evaluate the potential for ammonia impacts on the beneficial uses downstream of the Facility's discharge. As indicated in Table 4 below, ammonia monitoring requirements established by the previous permit will be maintained in this reissuance to provide data for determining reasonable potential in future permitting actions

Ammonia monitoring requirements from the previous permitting cycle will be applied in this reissuance. Any potential future ammonia limit will be based on the temperature and pH of the receiving water. To continue to establish baseline data for determining reasonable potential in future permitting actions, a temperature monitoring requirement will be included in this permit.

Monitoring requirements, including sampling methods, for Outfall 001 are listed in Table 4 below - please see Section 1 of the Permit for definitions of relevant terms. The collection of a grab sample is appropriate for monitoring BOD_5 and TSS at Outfall 001 due to the Facility's status as an infrequent discharger and the expectation (based on the effluent monitoring data collected in the previous permitting cycle) that Facility effluent will be fairly homogenous. The other parameters included in Table 4 (pH, temperature, chlorine, oil and

grease, and E. coli) are not amenable to composite sampling, therefore grab sampling will be required to properly monitor these effluent characteristics as well.

6.1.1. Final Effluent Monitoring Requirements

Table 4. Monitoring Requirements for Outfall 001

Effluent Characteristic	**Monitoring Frequency**	**Sample Type a/**	**DMR Coverage Period**	**Data Reported on DMR**
Flow, mgd	b/	c/	Quarterly	Daily Max. 30-Day Avg.
E. coli, number/100 mL	b/	Grab	Quarterly	Daily Max. 30-Day Avg.
O&G, visual d/	b/	Visual	Quarterly	Narrative
O&G, m/L d/	Immediately if visual sheen detected b/	Grab	Quarterly	Daily Max.
Total Residual Chlorine (TRC), µg/L e/	b/	Grab	Quarterly	Daily Max. 30-Day Avg.
Total Ammonia Nitrogen (as N), mg/L	b/	Grab	Quarterly	Daily Max. 30-Day Avg.
Total Nitrogen f/	b/	Grab	Quarterly	Daily Max. 30-Day Avg.
BOD_5, mg/L g/	b/	Grab	Quarterly	30-Day Avg. 7-Day Avg. 30-Day Avg. % removal
TSS, mg/L g/	b/	Grab	Quarterly	30-Day Avg. 7-Day Avg. 30-Day Avg. % removal
Total Phosphorus (P), mg/L	b/	Grab	Quarterly	Daily Max. 30-Day Avg.
pH, units	b/	Grab	Quarterly	Instantaneous Min. Instantaneous Max.

a/ See Permit Definitions, section 1, for definition of terms.

b/ A minimum of three (3) samples shall be taken during any discharge of wastewater. It is required that a sample be taken at the beginning, middle, and end of the discharge if the discharge is less than one week in duration. If a single, continuous

discharge is greater than one week in duration, three (3) samples shall be taken during the first week and one (1) during each following week. All of the samples collected during the 7-day or 30-day period are to be used in determining the averages.

c/ Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate in million gallons per day (mgd) during the reporting period and the maximum flow rate observed, in mgd, shall be reported. The date and time of the start and termination of each discharge shall be recorded and maintained in the Facility's sampling records.

d/ If a visible sheen or floating oil is observed in the discharge, a grab sample shall be taken immediately, analyzed, and recorded in accordance with the requirements of 40 C.F.R. Part 136.

e/ The analysis for TRC shall be conducted using reliable devices (Equivalent to EPA Standard Methods 4500-Cl-G). The method detection limit is 50 µg/L. When calculating average TRC concentrations, analytical results below the method detection limit shall be considered to be zero for calculation purposes. If every analytical result is below the method detection limit, then "< 50 µg/L" shall be reported on the quarterly Discharge Monitoring Report (DMR). Otherwise, report the calculated average and daily maximum value.

f/ At the time of the Permit development, there was no EPA approved analytical method for Total Nitrogen listed in 40 C.F.R. Part 136. For the purposes of the Permit, the term "Total Nitrogen (TN)" is defined as the calculated sum of analytical results from "Total Kjeldahl Nitrogen (TKN)" plus "Nitrate-Nitrite."

g/ *Percent removal is defined in 40 C.F.R.* § *133.101(j)* as a percentage expression of the removal efficiency across a treatment plant for a given pollutant parameter, as determined from the 30-day average values of the raw wastewater influent pollutant concentrations to the Facility and the 30-day average values of the effluent pollutant concentrations for a given time period. Based on this definition, an example BOD percent removal calculation is provided below. On a quarterly DMR reporting basis, the average of all 30-day average effluent BOD values reported over the previous 6 months and the average of all 30-day average influent BOD values reported over the previous 6 months shall be used to calculate the BOD percent removal that will be reported for that quarterly DMR reporting period, if a discharge occurred within the quarterly reporting period. This will result in a rolling 6-month window of data used for quarterly calculations. Months where no sampling occurred should not be included in the calculation. If no discharge occurred within a quarterly reporting period, no percent removal calculation is necessary for that reporting period.

Example calculation for 1st Calendar Quarter DMR Reporting (January-March):

Average <u>Effluent</u> 30-day BOD for 6 months =

$$\frac{\text{(October effluent BOD 30day average + November effluent BOD 30day average + December effluent BOD 30day average + January effluent BOD 30day average + February effluent BOD 30day average + March effluent BOD 30day average)}}{\text{(\# of months for which effluent data was reported (e.g. "6" if there is data for all 6 months)}}$$

Average Influent 30-day BOD for 6 months =

$$\frac{\text{(October influent BOD 30day average + November influent BOD 30day average + December influent BOD 30day average + January influent BOD 30day average + February influent BOD 30day average + March influent BOD 30day average)}}{\text{(\# of months for which influent data was reported (e.g. "6" if there is data for all 6 months)}}$$

Quarterly DMR percent removal reported value =

$$\frac{\textbf{(Average Influent 30day BOD for 6 months} - \textbf{Average Effluent 30day BOD for 6 months)}}{\textbf{Average Influent 30day BOD for 6 months}}$$

6.2. Self-Monitoring Requirements – Influent Monitoring Location I001

The 5-day BOD_5 and TSS percent removal requirements from 40 C.F.R. § 133.105(a)(3) and (b)(3) have been added. The percent removal requirements are being added to ensure the Permit meets the minimum equivalent to secondary treatment requirements.

This will require that additional influent sampling and an influent sample location be added to collect BOD_5 data at the influent point to the wastewater treatment facility system (e.g. prior to any treatment) so that the percent removal can be calculated when the facilities discharge. A minimum of quarterly influent sampling (regardless of discharge status) shall be implemented. This minimum influent sampling will provide data that accounts for influent characteristics over time and potential seasonal variations to be able to make a more valid comparison between influent and effluent concentrations. To account for potential variability in influent quality, the permittee will utilize a composite sampling type for both BOD_5 and TSS.

6.2.1 Final Influent Monitoring Requirements – I001

Table 5. Baseline Influent Monitoring Requirements, Influent Monitoring Location, I001

Influent Characteristic	**Frequency**	**Sample Type** a/
Biochemical Oxygen Demand (BOD_5), mg/L	b/	Composite

Influent Characteristic	**Frequency**	**Sample Type** a/
Total Suspended Solids (TSS), mg/L	b/	Composite

a/ See Definitions, Part 1.1. of the Permit, for definition of terms.

b/ BOD_5 and TSS influent sampling will be required for each discharge event. Additional samples may be taken at the Permittee's discretion if a large amount of variability is anticipated in the influent within a quarter. Any additional sample results must be included in the 30-day average influent DMR reporting for the month in which the sampling is performed. See Section 6.6 of the Permit for further details on the requirements for additional sampling. See footnote g/ in Table 4for additional information/example calculations. If only one sample is taken within a month, that result will be the 30-average for the month.

6.3 Final Receiving Stream Monitoring Requirements – R001

Total ammonia is present in the aqueous environment in both ionized and un-ionized forms in equilibrium. The un-ionized form is toxic to aquatic life. The portion of total ammonia present in un-ionized form is a function of pH and temperature characteristics in the receiving water. Ammonia is non-conservative (i.e., concentrations are affected by biological processes) and its toxicity is affected by environmental conditions, specifically pH and temperature, in the receiving stream. Hence monitoring for ammonia, temperature and pH in the receiving will be required.

Presently, there is limited stream data available for Lake Sharpe in the vicinity of the effluent discharge point. The intent of gathering stream data within the Permit period is to be able to evaluate the need for ammonia effluent limitation in future permits to protect beneficial uses of the receiving water.

Sampling shall be conducted at the location defined as R001 in the Permit. Samples collected and analyzed to meet self-monitoring requirements for R001 shall be collected in a consistent location in Lake Sharpe, **directly upstream** of the confluence where the Facility's effluent discharge enters Lake Sharpe.

The sample shall be collected after a week of no discharge to ensure that the receiving water is being monitored without contributions from treated discharge. Samples shall be collected between the hours of 2 and 4pm to reflect receiving water conditions at the warmest part of the day. The monitoring frequency shall be a monthly (minimum) for the effective period of the Permit. The Permittee is required to report all monitoring data resulting from any additional sampling activities, see Section 6.6 of the Permit for further requirements pertaining to additional monitoring and sampling activities. Stream monitoring shall be conducted when there is flow at R001 and access is practical and accessible (e.g., access is not impeded by snow, ice, flooding, other unsafe conditions, etc.). Any unsafe conditions shall be recorded. All receiving stream monthly monitored data collected, including detailed location (latitude, longitude), dates and times of the sample collections, shall be recorded and

maintained in the Facility's sampling records. Sampling shall be conducted regardless of the discharge status of the Facility**.**

Monitoring must be conducted according to test procedures approved under 40 C.F.R. Part 136 unless another method is required under 40 C.F.R. subchapters N or O.

Table 6. Receiving Water Monitoring Requirements – R001

Receiving Characteristic	**Frequency**	**Sample Type a/**
pH, standard units	Monthly	Grab, b/
Temperature, °C	Monthly	Grab, b/
Total Ammonia Nitrogen (as N), mg/L	Monthly	Grab

a/ Temperature and pH samples shall be collected at the same time as sampling for the total ammonia. Ammonia, temperature and pH measurements shall be collected be collected between 2pm and 4pm.

b/ See Definitions, Section 1.1. of the Permit, for definition of terms.

c/ The sample shall be collected after a week of no discharge to ensure that the receiving water is being monitored without contributions from treated discharge.

7 SPECIALCONDITIONS

N/A.

8 REPORTING REQUIREMENTS

Reporting requirements are based on requirements in 40 CFR §§ 122.44, 122.48, and 127 and 40 CFR § 3. A discharge monitoring report (DMR) frequency of quarterly was chosen, because under normal operating conditions discharges from the Facility are intermittent and typically less than quarterly in their frequency within a calendar year, however, the Facility occasionally discharges more frequently, as it did in 2019.

9 COMPLIANCE RESPONSIBILITIES AND GENERAL REQUIREMENTS

9.2 Inspection Requirements

Per Section 1.3.3 of the Permit, the permittee will inspect its wastewater treatment facility on a weekly basis, unless otherwise modified in writing by EPA. The permittee shall document the inspection, as required by the Permit. Inspections are required to ensure that system conditions are properly monitored and to ensure proper Operations and Maintenance (O&M) are completed in accordance with 40 CFR 122.41(e).

9.3 Operation and Maintenance

40 CFR 122.41(e) requires permittees to properly operate and maintain all facilities and systems of treatment and control which are installed or used by the permittee to achieve compliance with the conditions of this permit. In addition to an operation and maintenance plan, regular facility inspections, an asset management plan, and consideration of staff and funding resources are important aspects of proper operation and maintenance. Asset management planning provides a framework for setting and operating quality assurance procedures and helps to ensure the permittee has sufficient financial and technical resources to continually maintain a targeted level of service. Consideration of staff and funding provide the permittee with the necessary resources to operate and maintain a well-functioning facility. These requirements have been established in section 7.6 of the Permit to help ensure compliance with the provisions of 40 CFR 122.41(e).

9.4 Industrial Waste Management

The Facility is a Publicly Owned Treatment Works (POTW) as defined in 40 CFR § 403.3. The Permit contains requirements for the Permittee to protect the POTW from pollutants which would inhibit, interfere, or otherwise be incompatible with operation of the treatment works including interference with the use or disposal of municipal sludge. Pass through and interference are defined in 40 CFR §§ 403.3(p), (k), respectively.

The Facility will not be required to conduct an Industrial Waste Survey (IWS), because neither the permit application nor the most recent inspection, performed on August 14th, 2018 identify the presence of industrials users other than the Lower Brule WTP. Influent received from the Lower Brule WTP is unlikely to impact the performance of the lagoon system and any potential impacts to system effluent quality are addressed through the effluent limitations and monitoring requirements described in this SoB, see sections 3.1 and 5.2.2 above.

10 ENDANGERED SPECIES CONSIDERATIONS

The Endangered Species Act of 1973 requires all Federal Agencies to ensure, in consultation with the U.S. Fish and Wildlife Service (FWS), that any Federal action carried out by the Agency is not likely to jeopardize the continued existence of any endangered species or threatened species (together, "listed" species), or result in the adverse modification or destruction of habitat of such species that is designated by the FWS as critical ("critical habitat"). See 16 U.S.C. § 1536(a)(2), 50 CFR Part 402. When a Federal agency's action "may affect" a protected species, that agency is required to consult with the FWS, depending upon the endangered species, threatened species, or designated critical habitat that may be affected by the action (50 CFR § 402.14(a)).

The FWS Wildlife Information for Planning and Conservation (IPaC) website program was utilized to determine what federally listed Endangered, Threatened, Proposed and Candidate Species may occur within the project area. The federally-listed threatened and endangered

species that may occur within the project area in Lower Brule, South Dakota, within Lyman County for activities occurring in the area designated in Figure 2 (below) include:

Figure 2. Area of the Facility Lagoon Cells Utilized for IPaC Species Determination

Table 7. IPaC Federally-listed Threatened and Endangered Species

Species	Scientific Name	Status	Habitat
Black-footed Ferret	*Mustela nigripes*	EXPN, CR	"Experimental, non-essential population of black-footed ferrets established pursuant to Section 10(j) of the ESA. Section 7 consultation not required except on lands administered by the U.S. Fish and Wildlife Service or the National Park Service."
Northern Long-eared Bat	*Myotis septentrionalis*	T, CR	NA
Piping Plover (CH)	*Charadrius melodus*	T	"There is final critical habitat for this species (published in the Federal Register on May 19,

Species	Scientific Name	Status	Habitat
			2009). Your location is outside the critical habitat."
Red Knot	*Calidris canutus rufa*	T, CR	NA
Whooping Crane (CH)	*Grus americana*	E	"There is final critical habitat for this species (published in the Federal Register on May 15, 1978). Your location is outside the critical habitat."
Pallid Sturgeon	*Scaphirhynchus albus*	E, CR	NA

Symbols / Acronyms:

- EXPN = Experimental Population
- CR = Final critical habitat. IPaC lists no critical habitats for this area.
- T = Threatened
- E = Endangered
- NA = Not Applicable

Biological Evaluation

The Facility was previously covered under an EPA Region 8 wastewater lagoon individual permit.

Based on the IPaC information generated, the Facility location is outside of the critical habitat for the Black-footed Ferret, Piping Plover, and the Whooping Crane. These are terrestrial species. EPA's determination for these species is "No Effect" because of Habitat information in Table 7.

There is no critical habitat listed for the Northern Long-eared Bat, Red Knot, or Pallid Sturgeon. Except for the Pallid Sturgeon the species listed are terrestrial species. The Pallid Sturgeon's endangered status is due to loss of habitat. As stated in Section 5.6 above the Facility will be required to comply with TBELs and WQBELs at least as stringent as those in the previous permit such that no loss of aquatic habitat due to discharges from the Facility to Lake Sharpe are anticipated. The Facility's treated water discharges into Lake Sharpe, which is an impoundment along the Missouri River system. Due to Lake Sharpe's relative shallowness (~90ft at the deepest point) and the frequency of high volume releases from both the upstream Oahe Dam and the down stream Big Bend Project, a high level of mixing is present. However, pollutants identified in the discharge through monitoring still have the

potential to impact the species identified in Table 7 above. Therefore, EPA's determination for these species is "may affect, but is not likely to adversely affect".

Before going to public notice, a copy of the draft Permit and this Statement of Basis was sent to the USFWS requesting concurrence with EPA's finding that reissuance of this NPDES Permit is Not Likely to Adversely Affect/has No Effect ony any of the species listed as threatened or endangered for Lyman County by the USFWS under the Endangered Species Act nor their critical habitat.

On September 07, 2021 the USFWS concurred with EPA's conclusion that the described discharge will not adversely affect listed species.

11 NATIONAL HISTORIC PRESERVATION ACT REQUIREMENTS

Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. The first step in this analysis is to consider whether the undertaking has the potential to affect historic properties, if any are present. See 36 CFR 800.3(a)(1). Permit renewals where there is no new construction are generally not the type of action with the potential to cause effects on historic properties.

12. 401 CERTIFICATION

At the time of the Permit reissuance, the EPA was the Clean Water Act (Act) Section 401 certifying authority for the Permit, because the Tribe had not received authorization to implement section 303(c) of the Act. EPA has determined § 401 conditions are unnecessary.

13 MISCELLANEOUS

The effective date of the Permit and the Permit expiration date will be determined upon issuance of the Permit. The intention is to issue the Permit for a period not to exceed 5 years.

Permit drafted by Margaret Kennedy U.S. EPA, 303.312.6644, April 2021.

ADDENDUM:

PUBLIC NOTICE AND RESPONSE TO COMMENTS

The Permit and statement of basis, including the CWA section 401 certification, were public noticed in the Central Dakota Times on September 22nd, 2021. No comments were received. Upon addressing all comments received during the public notice comment period related to Section 401 certification requirements, the signing of the Permit shall constitute the EPA's Section 401 certification.