ODells Bay Sanitary District No. 1 Public Noticed Permit Fact Sheet

General Information

Permit Number	WI-0036536-08-0
Permittee Name and Address	ODells Bay Sanitary District No. 1, W5240 North Osprey Dr., PO Box 56, New Lisbon, WI 53950
Permitted Facility Name and Address	ODells Bay Sanitary District No. 1, W5387 37th St., New Lisbon, WI 53950
Permit Term	April 01, 2025 to March 31, 2030
Discharge Location	NW ¼, NW ¼, Section 28, T17N, R4E, Juneau County, WI
Receiving Water	Yellow River Arm of Castle Rock Lake in Lower Yellow (Juneau Co.) River of Wisconsin River Southern Sub-Basin in Juneau County
Stream Flow ($Q_{7,10}$)	A ten-to-one dilution ratio was used for calculating effluent limitations based on chronic or long-term impacts, in accordance with s. NR 106.06(4)(b)2, Wis. Adm. Code, because the receiving water does not exhibit a unidirectional flow at the point of discharge.
Stream Classification	Warmwater Sportfish, Non-public Water supply
Discharge Type	Existing, continuous
Annual Average Design Flow (MGD)	0.063 MGD
Industrial or Commercial Contributors	None
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; D - Disinfection
Approved Pretreatment Program?	N/A

Facility Description

The ODells Bay Sanitary District No. 1 owns and operates a 0.063 million gallon per day (MGD) aerated lagoon type wastewater treatment facility for treatment of domestic waste. The annual average influent flow in 2024 was 0.057 MGD and the annual average effluent flow in 2024 was 0.058 MGD. Wastewater treatment is provided by three aerated lagoons, typically operated in series and an ammonia polishing reactor. All three lagoons have insulated covers to improve treatment performance. Lagoon 1 operates as a completely-mixed basin, while Lagoon 2 operates as a partially-mixed basin. The third lagoon provides quiescent settling and contains a small amount of diffused aeration for stabilization of biological oxygen demand. Phosphorus is removed via chemical addition of ferric chloride. Wastewater is disinfected via ultraviolet light prior to discharge to the Yellow River Arm of Castle Rock Lake. During the last permit term a facility upgraded occurred that included the following changes: fine bubble diffuser membranes, new blowers for lagoons, new manholes and process piping, construction of a concrete tank ammonia polishing reactor and a control building to house the office, laboratory, chemical phosphorus removal equipment & electrical equipment, and installation of a new backup generator. Significant effluent monitoring and/or limit changes proposed in the upcoming term are as follows: 1) the sample frequency for flow has been changed from “continuous” to “daily” for eDMR reporting purposes, 2) addition of chronic WET testing twice during the permit term, 3) fecal coliform monitoring & limit have been replaced with

Escherichia coli (E. coli) monitoring and limits, 4) increase in the ammonia monitoring frequency from weekly to twice weekly, 5) an increase in the pH monitoring frequency from weekly to 5/week , and 6) a reduction in the phosphorus TMDL mass limit (goes from 0.97 lbs/day to 0.35 lbs/day, monthly avg), along with a compliance schedule to meet the limit. Radium and PCB sludge monitoring has been removed. Clarification language has been added notifying the permittee they must monitor sludge for List 2 nutrients and meet the requirements of List 3 (Pathogen Control) and List 4 (Vector Attraction Reduction) prior to landspreading if they remove sludge from the lagoon(s). A schedule has been included requiring the permittee submit a sludge management plan prior to removal and land application of sludge from the pond(s). Additionally, to quantitate the risk, PFAS sludge sampling has been included in the permit pursuant to ss. NR214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

Substantial Compliance Determination

Enforcement During Last Permit: None

After a desktop review of all discharge monitoring reports, land application reports, compliance schedule items, and a site visit on 7/31/2024, The permittee has been found to be in substantial compliance with their current WPDES permit.

Compliance determination made by Tanner Connors on 08/09/2024.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	Influent to WWTF: 0.057 MGD (2024)	Representative influent samples shall be collected at the manhole prior to pond #1.
001	Effluent to Castle Rock River: 0.058 MGD (2024)	Representative composite and grab samples shall be collected at the effluent channel after pond #3; grab samples for E coli shall be collected after the UV light disinfection treatment.
601	N/A – receiving water	Representative samples of the receiving water, Castle Rock Lake, shall be collected from a point which is representative of the mixed receiving water and effluent at a point where chemical equilibrium has been reached.
002	Lagoon Sludge: Lagoon sludge last removed in 2021 from Lagoon #3. Permittee does not intend to remove sludge this permit term.	Representative composite sludge samples shall be collected in 2026 and monitored for the parameters as listed in the table below. If the permittee plans to remove sludge, they shall monitor sludge for Lists 1, 2, 3 & 4 prior to land application. The Department shall be notified at least 30 days in advance of sludge removal so that appropriate monitoring forms can be provided. Approval of landspreading sites must be completed prior to sludge removal.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and the only change made from the previous permit is that the sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT to CASTLE ROCK LAKE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	Weekly	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	Weekly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total	Monthly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Daily max variable limit applies year-round. Look up the variable ammonia limit from the 'Variable Ammonia Limitation' table and report the variable limit in the Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	39 mg/L	2/Week	24-Hr Flow Prop Comp	Limit applies Jan - April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	24 mg/L	2/Week	24-Hr Flow Prop Comp	Limit applies Jan - April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	16 mg/L	2/Week	24-Hr Flow Prop Comp	Limit applies May - Sept
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	10 mg/L	2/Week	24-Hr Flow Prop Comp	Limit applies May - Sept
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	2/Week	24-Hr Flow Prop Comp	Limit applies Oct - Dec
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	108 mg/L	2/Week	24-Hr Flow Prop Comp	Limit applies Oct - Dec
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit & monitoring apply May-Sept
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit & monitoring apply May-Sept. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Copper, Total Recoverable	Daily Max	0.073 lbs/day	Monthly	Calculated	Additional instream monitoring of the receiving water is required to support the dissolved-based copper limitation calculation. See Sample Pt 601 below for more info. Effluent copper samples shall be collected at the sample time as a quarterly hardness sample and a scheduled WET test.
Copper, Total Recoverable	Daily Max	25 ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Weekly Avg	25 ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Monthly Avg	25 ug/L	Monthly	24-Hr Flow Prop Comp	
Hardness, Total as CaCO3		mg/L	Quarterly	24-Hr Flow Prop Comp	A quarterly hardness samples shall be collected at the same time as a monthly effluent copper sample.
Phosphorus, Total	Monthly Avg	5.9 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	0.97 lbs/day	Weekly	Calculated	Limit effective through 03/31/2028. See phosphorus section below and associated compliance schedule.
Phosphorus, Total	Monthly Avg	0.35 lbs/day	Weekly	Calculated	Limit effective 04/01/2028. See phosphorus section below and associated compliance schedule.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL section below.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL section below.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Monitoring required annually in specific quarters. See Nitrogen Series Monitoring section below. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section below
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	

2.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following significant changes were made from the previous permit: 1) the sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes, 2) addition of chronic WET testing twice during the permit term, 3) fecal coliform monitoring & limit have been replaced with Escherichia coli (E. coli) monitoring and limits, 4) increase in the ammonia monitoring frequency from weekly to twice weekly, 5) an increase in the pH monitoring frequency from weekly to 5/week, and 6) a reduction in the phosphorus TMDL mass limit (goes from 0.97 lbs/day to 0.35 lbs/day, monthly avg) because of using the site specific criteria in appendix K of the WRB TMDL.

2.1.2 Explanation of Limits and Monitoring Requirements

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. Using the previously stated guidelines and reasoning, monitoring frequencies have been increased from weekly to 5/week for pH and from weekly to 2/week for ammonia.

Limits were determined for ODells Bay's existing discharge to the Yellow River arm of the Castle Rock Flowage using chs. NR 102, 104, 105, 106, 207, 210, 212 and 217 of the Wisconsin Administrative Code (where applicable). For additional information on any of the limits see the November 22, 2024 memo from Ben Hartenbower to Holly Heldstab titled "Water Quality-Based Effluent Limitations for ODells Bay Wastewater Treatment Facility WPDES Permit No. WI-0036536".

MUNICIPAL EFFLUENT LIMITS – In accordance with the federal regulation 40 CFR 122.45(d), and to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable.

BOD5, Total Suspended Solids and pH- Categorical limits and WQBELs are included in the permit as outlined in ch. NR 210, Wis. Adm. Code. The effluent limitations for BOD5, Total Suspended Solids and pH are carried over from the previous permit and are not subject to change at this time because the receiving water characteristics have not changed.

Ammonia: Water quality-based effluent limitations were evaluated for Ammonia Nitrogen based upon water quality criteria in ch. NR 105 (as revised March 2004), including acute toxicity criteria (ATC) and chronic toxicity criteria (CTC). Effluent limitations for ammonia are calculated using the procedures in s. NR 106.32, Wis. Adm. Code and are shown in the WQBEL memo dated 09/19/2024 referenced above. In addition to weekly and monthly average ammonia limits that vary by month, daily maximum ammonia limits that vary with effluent pH apply year-round. See table below for more information. pH sampling shall occur on the same day total ammonia (NH3-N) sampling occurs.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

Disinfection/Fecal Coliform/E. Coli--ODells Bay disinfects the effluent seasonally, May-Sept, via UV light. Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period and establish effluent limitations for E. coli established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to E. coli to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

Copper: Effluent data from February 2020 to September 2024 indicate the need for copper limits. The permittee requested limits be calculated using the dissolved-based approach on December 19, 2024 via an email to Tanner Connors. See the requirements at Sample Point 601 below for more information on additional instream monitoring required of the permittee when using the dissolved-based limit calculation. Also see the November 22, 2024 WQBEL memo referenced above that details the calculations used to derive the limits.

Hardness: Quarterly hardness monitoring is required because of the relationship between hardness and daily maximum copper limits based on acute toxicity.

Phosphorus- Chapter NR 217, Wis. Adm. Code. specifies WQBELs (water quality based effluent limits) for discharges of phosphorus to surface waters of the state. WQBELs for phosphorus are needed whenever the discharge contains phosphorus at concentrations or loadings that will cause or contribute to an exceedance of the water quality standards.

ODells Bay is included within the Wisconsin River Basin (WRB) total maximum daily load (TMDL), which was approved by EPA April 26, 2019. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amount of phosphorus that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from Site-Specific Criteria (SSC) for Lakes Petenwell, Castle Rock, and Wisconsin originally included in Appendix K of the TMDL report and approved by the U.S. Environmental Protection Agency on July 9, 2020.

The permittee's approved SSC-based WLA for this permittee is 70 lbs/yr and results in a calculated phosphorus mass limit of 0.35 lbs/day expressed as a monthly average. A compliance schedule in included in the permit that requires the permittee meet the lower limit by 04/01/2028. The 12-month rolling sum of total monthly phosphorus (lbs/yr) shall be reported each month for direct comparison to the facility's WLA.

Facilities with WRB TMDL based effluent limits for phosphorus must report the 12-month rolling sum of total monthly discharge (lbs/yr). If reported 12-month rolling sums exceed the facility's max annual WLA, the facility's mass limits (monthly average) may be recalculated using more appropriate CVs or monitoring frequencies when the permit is reissued to bring discharge levels into compliance with the facility's given WLA.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N)- The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019. Annual tests are scheduled in the following rotating quarters:

- 3rd quarter (July – Sept) 2025
- 4th quarter (Oct – Dec) 2026
- 2nd quarter (April – June) 2027
- 1st quarter (Jan – March) 2028
- 3rd quarter (July – Sept) 2029

Whole Effluent Toxicity- Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html). Acute and chronic WET tests are required in the following quarters:

- 4th quarter (Oct – Dec) 2025
- 3rd quarter (July – Sept) 2028

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

2.2 Sample Point Number: 601- Castle Rock Lake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Copper Dissolved		ug/L	See Listed Qtr(s)	Grab	Monitoring required 3rd quarter (July-Sept) 2025 and 2nd quarter (April - June) 2026. See below for more info.
Copper, Total Recoverable		ug/L	See Listed Qtr(s)	Grab	
Suspended Solids, Total		mg/L	See Listed Qtr(s)	Grab	

2.2.1 Changes from Previous Permit

Monitoring requirements were evaluated for this permit term and no changes were required in this permit section. Sampling requirements and frequencies are the same as the previous permit.

2.2.2 Explanation of Limits and Monitoring Requirements

Dissolved-based copper limits were evaluated for the Whitehall Wastewater Treatment Facility pursuant to chs. NR 105 and 106, Wis. Adm. Code. The permittee is required to collect on-site receiving water information to verify a site-specific translator for copper dissolved based calculations. Monitoring of the receiving water, the Trempealeau River, for the above parameters is required twice, once each in the following quarters:

- 3rd quarter (July-Sept) 2025
- 2nd quarter (April - June) 2026

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Fecal Coliform	Injection	Land Application	Permittee last removed sludge in 2021 (pond 3), but does not expect to remove sludge from any ponds this permit term.
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? Np						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

3.1 Sample Point Number: 002- POND #1 SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	
Nitrogen, Ammonia (NH3-N) Total		Percent	Per Application	Composite	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

3.1.1 Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit:

List 2 Nutrient monitoring – Monitoring for list 2 (nutrients) is highly recommended at the same time as the monitoring of List 1 (metals) in year 2 of the permit. Results will assist in the determination of the acres needed for land application of sludge should it be necessary.

Change in form submittal – In prior permit reissuances when it has been noted in the application that sludge would not be removed during the permit term, the department required sampling during the second year of the permit term and the sludge characteristic report (3400-049) would be generated only during that year. Due to moving to electronic submittal of forms via Switchboard, forms 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 ("Annual Land Application") will now be generated by the department and the permittee will be required to submit all three reports each year of the permit term. This change was adopted to provide the permittee flexibility because many lagoon desludging projects can be unexpected, are delayed or staggered over multiple years. Additionally, it is used to officially report that no land application of sludge has occurred, and annual submittal of the forms is required per the standard requirements section.

PFAS – Monitoring for PFAS has been added once during the permit term pursuant s. NR 204.06(2)(b)9., Wis. Adm. Code.

Radium-226 monitoring has been removed because the permittee did not have a sample result for radium-226 above 2.0 pCi/L in their drinking water during the last permit term.

PCB sludge sampling has been waived this permit term because ODells Bay is a lagoon facility with a design flow under 0.25 MGD, they have no industrial contributors, and they sampled their sludge for PCBs during the previous permit term.

3.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements.

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS."

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department's implementation of EPA's

recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

4 Schedules

4.1 Phosphorus Wisconsin River Basin TMDL Limit

No later than 30 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance with the required action. If a submittal is part of the required action then a timely submittal fulfills the written notification requirement.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of phosphorus with conclusions regarding compliance. Included in the report shall be an action plan that details how the permittee will comply with the 0.35 lbs/day Wisconsin River Basin Total Maximum Daily Load (TMDL) monthly average limit.	03/31/2026
Initiate Actions: Initiate actions identified in the plan.	06/30/2026
Progress Report: The permittee shall submit a progress report on complying with the 0.6 mg/L phosphorus limit.	03/31/2027
Complete Actions: Complete actions identified in the plan and achieve compliance with the 0.35 lbs/day monthly average limit. The limit becomes effective 04/01/2028.	03/31/2028

Explanation of Phosphorus Wisconsin River Basin TMDL Limit Schedule: The compliance schedule provides a schedule for conducting the actions necessary to comply with the lower phosphorus limits based on the site specific criteria of the Wisconsin River Basin TMDL. The compliance schedule lays out a timeline for the permittee to investigate and implement a plan to comply with the limits.

4.2 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit a management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204, Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3) How will the sludge be removed with details on volume, characterization and how will the treatment plant continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify approved land application sites, apply for needed sites, site limitations, total acres needed and vegetative cover management; 6) Specify record keeping procedures including site loading; 7) Address contingency plans for adverse weather and odor/nuisance abatement; and 8) Include any other pertinent information such as other disposal options that may be used or specifications of any pretreatment processes Once approved, all sludge management activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed.	

The plan is due at least 60 days prior to desludging.	

Explanation of Sludge Management Plan Schedule: If the lagoons are to be de-sludged during this permit term, a management plan is needed to show compliance with ch NR 204, Wis. Adm. Code that clearly explains how the sludge will be safely removed, what contingencies are in place, the type of equipment that will be used and how the sludge will be land applied to ensure the proper precautions are in place to prevent any negative impacts to surface water or groundwater.

Other Comments

Public Notice Newspaper: Juneau County Star Times, PO Box 220, Mauston, WI 53948-0220

Attachments

Water Quality Based Effluent Limits: November 22, 2024 memo from Ben Hartenbower to Holly Heldstab titled "Water Quality-Based Effluent Limitations for ODells Bay Wastewater Treatment Facility WPDES Permit No. WI-0036536".

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Holly Heldstab, Wastewater Specialist **Date:** February 10, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: November 22, 2024

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility
WPDES Permit No. WI-0036536

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility in Juneau County. This municipal wastewater treatment facility (WWTF) discharges to Castle Rock Lake, located in the Lower Yellow (Juneau Co.) River Watershed in the Central Wisconsin River Basin. This discharge is included in the Wisconsin River TMDL as approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD_5			45 mg/L	30 mg/L	1
TSS			45 mg/L	30 mg/L	1
pH	9.0 s.u.	6.0 s.u.			1
Ammonia Nitrogen January - April May - September October - December	 Variable Variable Variable		 **39 mg/L** **16 mg/L** **108 mg/L**	 24 mg/L 10 mg/L **108 mg/L**	1, 3,4
E. Coli				126 #/100 mL geometric mean	5
Copper	25 µg/L, 0.073 lbs/day		**25 µg/L**	**25 µg/L**	4,6
Hardness					7
Phosphorus Interim TMDL Limit				 5.9 mg/L 0.35 lbs/day	8
TKN, Nitrate+Nitrite, and Total Nitrogen					9
Acute WET					10
Chronic WET					10,11

Footnotes:

1. No changes from the current permit.
2. Monitoring only.

3. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. Bacteria limits apply during the disinfection season of May - September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Dissolved based copper limits: If the dissolved based limits are not requested in accordance with the procedures in s. NR 106.06(7)(b), Wis. Adm. Code, the daily maximum, weekly, and monthly average copper limits would be 23 µg/L along with a daily maximum mass limit of 0.070 lbs/day.
7. Hardness monitoring is recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.
8. The phosphorus mass limit is based on the Total Maximum Daily Load (TMDL) for the Wisconsin River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 2020.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
10. Two acute and chronic WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).
11. The Instream Waste Concentration (IWC) to assess chronic test results is 9%. According to the State of Wisconsin Aquatic Life Toxicity Testing Methods Manual (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 30%, 10%, 3% & 1% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from Castle Rock Lake.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Benjamin Hartenbower at (715) 225-4705 or Benjamin.Hartenbower@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table, & Map

PREPARED BY: _____ Date: 11/22/2024

Benjamin Hartenbower, PE,
Water Resources Engineer

E-cc:

Tanner Connors,Wastewater Engineer – SCR/Fitchburg
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Scott Provost, Water Quality Biologist – WCR/Wisconsin Rapids
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility
WPDES Permit No. WI-0036536

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description:
The ODell's Bay Sanitary District wastewater treatment facility consists of three covered lagoons. Two aerated (operated in series) lagoons and a settling lagoon, chemical phosphorus removal by adding of ferric chloride, a UV disinfection chamber, and influent & effluent flow metering with composite samplers. The discharge is located at the west bank of the Yellow River arm of Castle Rock Lake, Approximately 3,300 feet east of the treatment facility.

Attachment #3 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations
The current permit, expiring on December 31, 2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1,2
BOD_5			45 mg/L	30 mg/L	1
TSS			45 mg/L	30 mg/L	1
pH	9.0 s.u.	6.0 s.u.			1
Ammonia Nitrogen January - April May - September October - December	 Variable Variable Variable		 **39 mg/L** **16 mg/L** **108 mg/L**	 24 mg/L 10 mg/L **108 mg/L**	3,4
Fecal Coliform May - September			**656 #/100 mL geometric mean**	400 #/100 mL geometric mean	
Copper	25 µg/L, 0.073 lbs/day		**25 µg/L**	**25 µg/L**	4,5
Hardness					2
Phosphorus Interim TMDL Limit				 5.90 mg/L 0.97 lbs/day	6
TKN, Nitrate+Nitrite, and Total Nitrogen					2
Acute WET					7

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. Monitoring only.
3. The variable daily maximum ammonia nitrogen limit table corresponding to effluent pH values. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. Dissolved based copper limits based on the procedures in s. NR 106.06(7), Wis. Adm. Code.
6. A compliance schedule is in the current permit to meet the TMDL Limit by May 1, 2022.
7. Acute WET testing required: July - Sept 2021 and Jan - March 2024.

Receiving Water Information

- Name: Castle Rock Lake
- Waterbody Identification Code (WBIC): 1345700
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- A ten-to-one dilution ratio will be used for calculating effluent limitations based on chronic or long-term impacts, in accordance with s. NR 106.06(4)(b)2, Wis. Adm. Code, because the receiving water does not exhibit a unidirectional flow at the point of discharge.
- Hardness = 60 mg/L as $CaCO_3$. This value represents the geometric mean of 25 samples collected in the Wisconsin River at Petenwell Dam from 01/25/1995 to 01/25/2001.
- Source of background concentration data: Chloride data is from Castle Rock Lake. Metals data taken from the Wisconsin River at Conover is used in this evaluation. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None
- Impaired water status: This discharge is located within the WI River TMDL for phosphorus

Effluent Information:

- Design Flow Rates(s):
  Annual Average = 0.063 MGD (Million Gallons per Day)
  Peak daily = 0.364 MGD
  For reference, the actual average flow from February 2020 to September 2024 was 0.063 MGD.
- Hardness = 74 mg/L as $CaCO_3$. This value represents the geometric mean of 20 effluent samples collected from 03/25/2020 to 10/02/2024.
- Acute dilution factor used in accordance with s. NR 106.06 (3) (c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water Source: Domestic wastewater with water supply from private wells.
- Additives: Ferric Chloride for phosphorus reduction and soda ash for pH adjustment.
- Total Phosphorus Wasteload Allocation: 70 lbs/year = 0.192 lbs/day
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus Chloride. The permit-required monitoring for Ammonia Nitrogen, Copper, Hardness, and Phosphorus from February 2020 to September 2024 is used in this evaluation.

Chemical Specific Effluent Data at Outfall 001

	Copper µg/L
1-day P_{99}	62.29
4-day P_{99}	38.27
30-day P_{99}	26.15
Mean	20.57
Std	11.93
Sample size	67
Range	5.2 - 79.2

Chemical Specific Effluent Data at Outfall 001

Sample Date	Chloride mg/L
06/21/2023	210
06/28/2023	230
07/06/2023	210
07/12/2023	230
mean	220

Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”.

The following table presents the average concentrations and loadings at Outfall 001 from February 2020 to September 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

Attachment #1

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	19.7 mg/L*	
TSS	9.4 mg/L*	
pH	6.98 s.u.	
Ammonia Nitrogen	4.85 mg/L*	
Fecal Coliform	23#/100 mL	
Copper	20.57 µg/L	0.011 lbs/day
Phosphorus	2.71 mg/L*	1.32 lbs/day

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340		680	136	<7.7		
Cadmium	74	7.3	0.006	14.6	2.9	<0.41		
Chromium (+3)	74	1411	0.265	2822	564	1.2		
Copper	74	11.7	0.268	23.4			62.3	79.2
Lead	74	80	0.168	160	32	<1.4		
Nickel	74	364		728	146	6.6		
Zinc	74	93	0.603	185	37	29.70		
Chloride		757	11.6	1514	303	220		230

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 10:1 dilution

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152		1674	335	<7.7	
Cadmium	60	1.6	0.006	18.1	3.6	<0.41	
Chromium (+3)	60	87	0.265	954	191	1.2	
Copper	60	6.7	0.268	70.8			38.3
Lead	60	17	0.168	186	37	<1.4	
Nickel	60	34		373	75	6.6	
Zinc	60	77	0.603	841	168	29.70	
Chloride		395	11.6	4229	846	220	

Monthly Average Limits based on Wildlife Criteria (WC)

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Attachment #1

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 10:1 dilution

SUBSTANCE	HTC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370.0	0.006	4069.9	814.0	<0.41	
Chromium (+3)	3818000	0.265	41997997	8399599	1.2	
Lead	140	0.168	1538	308	<1.4	
Nickel	43000		473000	94600	6.6	

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 10:1 dilution

SUBSTANCE	HCC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Arsenic	13.3		146.3	29.3	<7.7	

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, limits are required for Copper.

Copper – Considering available effluent data from the current permit term (February 2020 to September 2024), the 30-day P_{99} concentration is 26.2 µg/L, the 4-day P_{99} concentration is 38.3 µg/L, and the 1-day P_{99} concentration is 62.3 µg/L, with a maximum concentration of 79.2 µg/L. The maximum effluent concentration and the 1-day P_{99} of the effluent data exceed the calculated daily maximum limit, therefore concentration and mass limits, as well as monthly monitoring, are required.

Quarterly hardness monitoring is also recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.

Dissolved-based limits may be evaluated for the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility pursuant to chs. NR 105 and 106, Wis. Adm. Code. Consideration of dissolved-based limits will be according to procedures in s. NR 106.06(7)(b), Wis. Adm. Code.

Information required for the calculation of dissolved-based limits includes the conversion factors from ss. NR 105.05(5) (for acute criteria), or NR 105.06(8) (for chronic criteria), Wis. Adm. Code. Background data is also required to translate the dissolved criteria into a site-specific number (the "translator") from which a total recoverable limit may be calculated based on the fraction of the discharged metal which would be dissolved in the receiving water. To perform this translation the following background data is required:

$$\text{Translator} = \frac{M_{tr}}{M_d}$$

Where:

M_d: Dissolved metals concentration in the receiving water (µg/L)
M_{Tr}: Total Recoverable metals concentration in the receiving water (µg/L)

Metals data for the receiving water is not available. However, the nearest site with such data is in a nearby basin, namely the Yellow River at Necedah. Use of a data from nearby basins may be considered per s. NR 106.06(4)(e)1. There are data on total recoverable and dissolved copper such that a translator may be estimated at the site:

Date	Total Recoverable Copper (µg/L)	Dissolved Copper (µg/L)	Translator
9-Oct-07	2.84, 2.85	2.1, 2.1	1.35
3-Oct-08	0.434	0.263	1.65
25-Aug-10	0.982, 0.988	0.641, 0.628	1.55
01-Nov-11	0.949	0.728	1.30
		Geomean	1.46

Multiplying the translator, the conversion factor from ch. NR 105 and the applicable criterion will give an indication of the amount of "relief" potentially available to the recommended permit limits if the dissolved fraction is considered from the available data:

Translated Criteria = NR 105 Criterion * Conversion Factor * Translator

Copper = 11.70 µg/L * 0.960 * 1.46 = 16.38 µg/L

Effluent limits calculated based on the translated criteria are as follows:

Daily Maximum Limit: 2 * ATC = 2 * 16.38 = 32.76 µg/L

Using the dissolved-based approach for copper limits, the daily maximum limit is 33 µg/L (rounded to two significant digits). The associated mass limit would be 0.099 lbs/day (rounded) and is based on the reported peak daily design flow of 0.364 MGD.

The permittee can collect on-site information to support either the estimated dissolved-based criteria or some alternate criteria. The following monitoring would be recommended for copper at or near the O'Dell's Bay Sanitary District outfall:

- At least two rounds of monitoring of total suspended solids and both total recoverable and filterable copper in the receiving water would be needed. This information would be used to further verify a site-specific translator for each metal. The monitoring (grab sampling) should take place at a point downstream that is representative of mixed receiving water and effluent, where chemical equilibrium has been reached.

Based on the variability of stream data collected to date, further in-stream metals monitoring is necessary during this permit term if the permittee chooses to continue the dissolved based approach for copper limits in the reissued permit.

Antidegradation:
The calculated daily maximum limit of 33 µg/L is less restrictive than the limit of 25 µg/L in the current permit. Without a demonstration of need for a higher limit in accordance with s. NR 207.04 Wis. Adm. Code, the **current limits of 25 µg/L and 0.073 lbs/day must be continued** in the reissued permit.

Expression of Limits:
Revisions to ch. NR 106, Wis. Adm. Code, in September 2016 aligned Wisconsin's WQBELs with 40 CFR § 122.45(d), which specifies that effluent limits for continuous dischargers must be expressed as weekly and monthly averages for publicly owned treatment works and as daily maximums and monthly averages for all other dischargers, unless shown to be impracticable. Because a daily maximum copper limit is necessary for the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility, weekly and monthly average limits are also required under this code revision.

The methods for calculating limitations for municipal treatment facilities to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3), Wis. Adm. Code, and are as follows:

> Whenever a daily maximum limitation is determined necessary to protect water quality, a weekly and monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.

Therefore, **monthly and weekly average limits of 25 µg/L** are recommended to continue.

PFOS and PFOA
The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98, Wis. Adm. Code. Based on the annual design flow and lack of nondomestic contributions, it is unlikely that the effluent will contain PFOS or PFOA. **Therefore, monitoring is not recommended.** If information becomes available that indicates PFOS or PFOA may be present in the effluent, the monitoring requirements may change.

Mercury – The permit application did not require monitoring for mercury because the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5). A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2020 to 2023 was 0.14 mg/kg, with a maximum reported concentration of 0.33 mg/kg. Therefore, no mercury monitoring is recommended at Outfall 001.

Attachment #1

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average, and monthly average limits. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The maximum expected effluent pH has changed.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC):
Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation.

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - pH)})] + [B \div (1 + 10^{(pH - 7.204)})]$$

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 245 sample results were reported from February 2020 to September 2024. The maximum reported value was 8.63 s.u. (Standard pH Units). The effluent pH was 8.31 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 9.28 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 9.03 s.u. Therefore, a value of 9.28 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 9.28 s.u. into the equation above yields an ATC = 0.89 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the 1-Q_{10} receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	1.79
1-Q_{10}	8.08

The 2×ATC method yields the most stringent limits for the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility.

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – WWSF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	108	$7.0 < pH \leq 7.1$	66	$8.0 < pH \leq 8.1$	14
$6.1 < pH \leq 6.2$	106	$7.1 < pH \leq 7.2$	59	$8.1 < pH \leq 8.2$	11
$6.2 < pH \leq 6.3$	104	$7.2 < pH \leq 7.3$	52	$8.2 < pH \leq 8.3$	9.4
$6.3 < pH \leq 6.4$	101	$7.3 < pH \leq 7.4$	46	$8.3 < pH \leq 8.4$	7.8
$6.4 < pH \leq 6.5$	98	$7.4 < pH \leq 7.5$	40	$8.4 < pH \leq 8.5$	6.4
$6.5 < pH \leq 6.6$	94	$7.5 < pH \leq 7.6$	34	$8.5 < pH \leq 8.6$	5.3
$6.6 < pH \leq 6.7$	89	$7.6 < pH \leq 7.7$	29	$8.6 < pH \leq 8.7$	4.4
$6.7 < pH \leq 6.8$	84	$7.7 < pH \leq 7.8$	24	$8.7 < pH \leq 8.8$	3.7
$6.8 < pH \leq 6.9$	78	$7.8 < pH \leq 7.9$	20	$8.8 < pH \leq 8.9$	3.1
$6.9 < pH \leq 7.0$	72	$7.9 < pH \leq 8.0$	17	$8.9 < pH \leq 9.0$	2.6

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)

The ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria for ammonia, since those limits relate to the assimilative capacity of the receiving water.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

$$CTC = E \times \{[0.0676 \div (1 + 10^{(7.688 - pH)})] + [2.912 \div (1 + 10^{(pH - 7.688)})]\} \times C$$

Where:

pH = the pH (s.u.) of the receiving water,

E = 0.854,

C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or

C = $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and

T= the temperature (ºC) of the receiving water – (Early Life Stages Present), or

T = the maximum of the actual temperature (ºC) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used to derive weekly average limitations, and the 30-day criteria are used to derive monthly average limitations, both by a mass-balance using a ten-to-one dilution ratio.

Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 ºC, during the winter and spring months. Based on a review of the DNR Fisheries database, burbot, an early spawning species, are not believed to be present in Castle Rock Lake. So "ELS Absent" criteria apply from October through March, and "ELS Present" criteria will apply from April through September for a WWSF classification.

The "default" basin assumed values are used for temperature and background ammonia concentrations, because minimum ambient data is available. The values for pH are based on data collected from Castle Rock Lake. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – WWSF

		January-April	May-September	October-December
Effluent Flow	Qe (MGD)	0.063	0.063	0.063
Background Information	Ammonia (mg/L)	0.18	0.07	0.06
	Temperature (°C)	8.9	20.6	10.0
	pH (s.u.)	7.67	8.16	7.42
	Dillution Factor	10	10	10
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	9.26	3.24	11.62
	Early Life Stages Absent	13.32	3.24	15.55
	30-day Chronic			
	Early Life Stages Present	3.70	1.30	4.65
	Early Life Stages Absent	5.33	1.30	6.22
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	100	35	
	Early Life Stages Absent			170
	Monthly Average			
	Early Life Stages Present	39	14	
	Early Life Stages Absent			68

Attachment #1

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from February 2020 to September 2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility permit for the respective month ranges.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	January-April	May-September	October-December
1-day P_{99}	34.24	18.59	2.43
4-day P_{99}	21.81	10.66	1.24
30-day P_{99}	13.44	5.45	0.60
Mean*	9.76	3.23	0.28
Std	6.81	4.26	0.64
Sample size	82	110	49
Range	<0.2 - 25	<0.02 - 19	<0.02 - 2.2

*Values lower than the level of detection were substituted with a zero.

Based on this comparison, daily limits are required year-round.

The permit currently has daily maximum, weekly average, and monthly average limits. Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

> (b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Conclusions and Recommendations

In summary, **the current limits and monitoring for ammonia nitrogen are recommended to continue.**

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
January-April	Variable	39	24
May-September	Variable	16	10
October-December	Variable	108	108

Attachment #1

FOR BACTERIA

Section NR 102.04(5), Wis. Adm. Code, states that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet *E. coli* limits and protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May through September. No changes are recommended to the required disinfection season.

Effluent Data
The ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility has monitored effluent *E. coli* from May 2024 to June 2024 and a total of 5 results are available. A geometric mean of 126 counts/100 mL was never exceeded, with a maximum monthly geometric mean of 6 counts/100 mL. Effluent data never exceeded 410 counts/100 mL. The maximum reported value was 6 counts/100 mL. Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because the ODell's Bay Sanitary District No. 1 Wastewater Treatment Facility does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance to s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore a technology-based limit is not required.

Annual Average Mass Total Phosphorus Loading

Month	Monthly Avg. mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
Sep 2023	0.06	2.04	1.02
Oct 2023	0.10	1.77	1.41
Nov 2023	0.05	1.40	0.58
Jan 2024	1.04	1.42	12.30
Feb 2024	0.07	0.98	0.53
Mar 2024	0.33	1.17	3.21
Apr 2024	0.80	1.32	8.79
May 2024	1.10	1.84	16.84
Jun 2024	1.83	2.41	36.65
Jul 2024	1.10	3.19	29.38
Aug 2024	0.72	2.74	16.48
Sep 2024	0.82	1.72	11.74
		Average =	**11.58**

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
Where total flow is the sum of the actual (not design) flow (in MGD) for that month

TMDL Limits – Phosphorus
Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (May 2020). The wasteload allocations (WLA) that implement site-specific criteria for Lakes Petenwell, Castle Rock, and Wisconsin are found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin* (WRB TMDL) report dated April 26, 2019 and are expressed as maximum annual loads (lbs/year) and maximum daily loads (lbs/day). The WLA that implement statewide criteria found in Appendix J of the TMDL report are no longer applicable following approval of these site-specific criteria. The daily WLAs in the WRB TMDL equals the annual WLA divided by the number of days in the year. Therefore, the daily WLA is an annual average. Since the derivation of daily WLAs from annual WLAs does not take effluent variability or monitoring frequency into consideration, maximum daily WLAs from the WRB TMDL should not be used directly as permit effluent limits.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing*

Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL.

Therefore, limits given to continuously discharging facilities covered by the WRB TMDL are given monthly average mass limits. If the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

TP Equivalent Effluent Concentration = Daily WLA ÷ (Flow Rate * Conversion Factor)
= 0.192 lbs/day ÷ (0.063 MGD * 8.34)
= 0.36 mg/L

Since this value is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus and no six-month average limit is required.

TP Monthly Average Permit Limit = Daily WLA * Monthly average multiplier
= 0.192 lbs/day * 1.85
= 0.35 lbs/day

The multiplier used in the monthly average calculation was determined according to TMDL implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.9. The facility is not able to meet the permit limits based on the WLA, so a standard CV of 0.6 is used. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

The WRB TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Wisconsin River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual wasteload allocation. Six-month average limits apply in the periods May – October and November – April.

Effluent Data

The following table lists the statistics for effluent phosphorus levels from February 2020 to September 2024 for informational purposes. In the cases where reporting the mass discharge is not required in the current permit, the mass is calculated using the reported phosphorus concentration and the effluent flow rate for that day.

Total Phosphorus Statistics

	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P_{99}	9.46	5.83
4-day P_{99}	5.79	3.32
30-day P_{99}	3.66	1.92
Mean	2.71	1.32
Std	1.87	1.19
Sample Size	241	240
Range	<0.21 - 6.7	0.00 - 6.46

Conclusions

In summary, the following limits are recommended by this evaluation:

- Monthly average concentration limit of 5.9 mg/L
- Monthly average Total Phosphorus mass limit of 0.35 lbs/day

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from February 2020 to September 2024.

The table below summarizes the maximum temperatures reported during monitoring from June 2013 to

March 2014.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	40	41	NA	120
FEB	38	38	NA	120
MAR	38	39	NA	120
APR			NA	120
MAY			NA	120
JUN	61	61	NA	120
JUL	67	67	NA	120
AUG	67	69	NA	120
SEP	69	69	NA	120
OCT	66	66	NA	120
NOV	57	57	NA	120
DEC	48	48	NA	120

The lowest calculated limitation is 120° F. For lagoon treatment systems of domestic waste, there is no reasonable potential for the discharge to exceed this limit. **Therefore, no temperature limits or monitoring are recommended.**

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022).*

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC50 (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to

organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent).

The IWC is 9% based on dilution of 10 parts lake water to 1-part effluent, as specified in s. NR 106.06(4)(b)2, Wis. Adm. Code, or a factor of 1 in 11 to calculate the IWC.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*, a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

- Receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %					Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Algae (IC_{50})	Pass or Fail?	Use in RP?	
08/04/2021	>100	>100	Pass	Yes						
02/28/2024	>100	>100	Pass	Yes						

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.

Acute Reasonable Potential = [(TUa effluent)(B)]

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa effluent values are equal to zero whenever toxicity is not detected (i.e. when the $LC_{50} \geq 100\%$).

Acute Reasonable Potential = 0 < 1.0, **reasonable potential is not shown, and a limit is not required.**

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. **0 Points**	IWC = 9% **0 Points**
Historical Data	Two tests used to calculate RP. No tests failed. **0 Points**	Data not available. **5 Points**
Effluent Variability	BOD_5, Copper, Fecal Coliform, Ammonia Nitrogen, pH, Phosphorus, and TSS exceedances. **5 Points**	Same as Acute. **5 Points**
Receiving Water Classification	Warm Water Sport Fish (WWSF) (5 pts) **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable potential for Ammonia and Copper limits based on ATC; (6 pts) Chromium, Nickel, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: none **9 Points**	No reasonable potential for limits based on CTC. Ammonia nitrogen limit carried over from the current permit. Chromium, Copper, Nickel, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: none **3 Points**
Additives	No biocides and two water quality conditioners (2 pts) added. Permittee has proper P chemical SOPs in place. **2 Points**	All additives used more than once per 4 days. **2 Points**
Discharge Category	No Industrial Contributors **0 Points**	Same as Acute. **0 Points**
Wastewater Treatment	Secondary or Better **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**21 Points**	**20 Points**
Recommended Monitoring Frequency (from Checklist):	2 tests during permit term	2 tests during permit term

	Acute	Chronic
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, two acute and chronic WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Attachment #2

Temperature limits for receiving waters without unidirectional flow

(calculation using default ambient temperature data)

Facility: ODell's Bay Sanitary District

Outfall(s): 001

Date Prepared: 11/13/2024

Design Flow (Qe): 0.063 MGD

Lake Type: Southern Inland Lakes

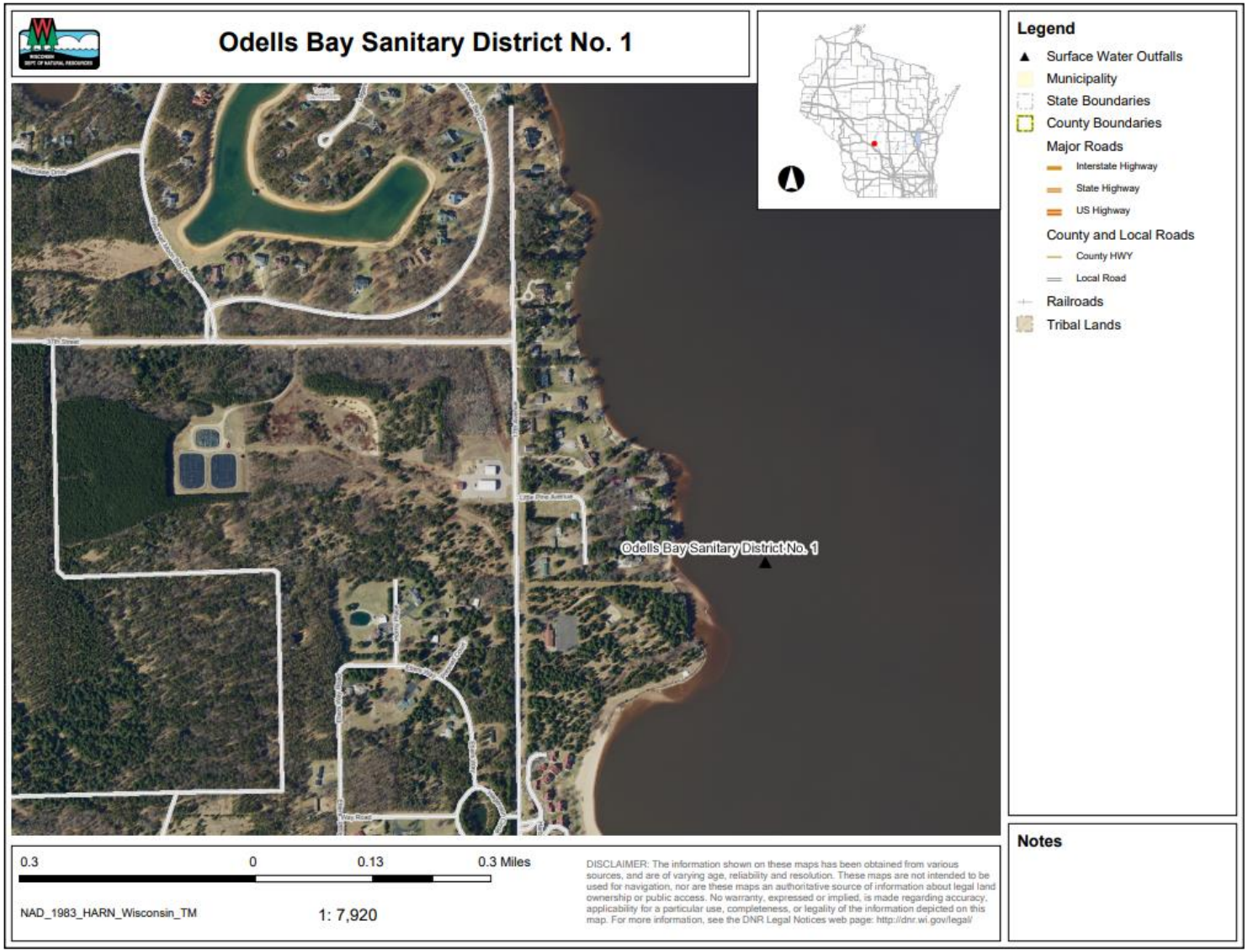
Inland lake or impoundment

Discharge Type: off-shore discharge

	Temp Dates	Flow Dates
	06/01/13	02/01/20
	03/31/14	09/30/24

Maximum area of mixing zone allowed (coefficient "A"): 31,416 ft^2

Month	Water Quality Criteria			Representative Highest Effluent Flow Rate (Qe)		B	e^{-a} (for SL-WQBEL)	e^{-a} (for A-WQBEL)	Representative Highest Monthly Effluent Temperature		**Calculated Effluent Limit**	
	Ta (default)	Sub-Lethal WQC	Acute WQC	7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)				Weekly Average	Daily Maximum	**Weekly Average Effluent Limitation**	**Daily Maximum Effluent Limitation**
	(°F)	(°F)	(°F)	(MGD)	(MGD)				(°F)	(°F)	(°F)	(°F)
JAN	35	49	77	0.07	0.13	0.405	0.002	0.037	40	41	NA	120
FEB	39	52	78	0.06	0.08	0.405	0.001	0.005	38	38	NA	120
MAR	41	55	78	0.07	0.10	0.405	0.002	0.012	38	39	NA	120
APR	49	60	80	0.08	0.12	0.405	0.003	0.023			NA	120
MAY	58	68	82	0.11	0.16	0.405	0.021	0.068			NA	120
JUN	70	75	86	0.11	0.15	0.667	0.005	0.020	61	61	NA	120
JUL	77	80	87	0.16	0.20	0.667	0.023	0.054	67	67	NA	120
AUG	76	80	87	0.12	0.25	0.667	0.009	0.095	67	69	NA	120
SEP	67	73	85	0.11	0.15	0.555	0.009	0.034	69	69	NA	120
OCT	54	61	81	0.08	0.12	0.405	0.004	0.028	66	66	NA	120
NOV	42	50	78	0.09	0.13	0.405	0.007	0.035	57	57	NA	120
DEC	35	49	77	0.07	0.08	0.405	0.002	0.004	48	48	NA	120


Odells Bay Sanitary District No. 1
Legend
Surface Water Outfalls
Municipality
State Boundaries
County Boundaries
Major Roads
Interstate Highway
State Highway
US Highway
County and Local Roads
County HWY
Local Road
Railroads
Tribal Lands
Odell's Bay Sanitary District No. 1
0.3
0
0.13
0.3 Miles
NAD_1983_HARN_Wisconsin_TM
1: 7,920
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal/
Notes