Modified Permit Fact Sheet

1 General Information

Permit Number:	WI-0025631-10-1	
Permittee Name:	VILLAGE OF TURTLE LAKE	
Address:	P.O. Box 11 114 Martin Avenue East	
City/State/Zip:	Turtle Lake WI 54889	
Discharge Location:	522 Logan Avenue, Turtle Lake, Wisconsin (NW¼ SW¼ of section 32; T34N-R14W)	
Receiving Water:	Wetland To an Unnamed Stream into Moon Creek Within the Hay River Watershed in the Lower Chippewa Drainage Basin in Barron County.	
StreamFlow ($Q_{7,10}$):	0.0 cfs	
Stream Classification:	Effluent is discharged to a wetland flowing to an Unnamed Stream meandering about 3.5 miles before reaching Moon Creek. The wetland is designated as Limited Aquatic Life waters. The unnamed stream and Moon Creek are classified as Fish and Aquatic Life.	
Design Flow(s)	Daily Maximum	0.761 MGD
	Annual Average	0.546 MGD
Significant Industrial Loading?	Yes, the potential toxic dischargers are World Foods Products who produce soy bean protein (in the old Kerry Ingredients and Flavours building) and ~~GreenWhey Energies a bio digestor of primarily cheese wastes.~~ Lake Country Dairy a cheese factory. *(Note: (Changes highlighted in yellow) The Village and GreenWhey Energies informed the Department mid-December 2014 that GreenWhey industrial wastewater would no longer be discharged to the Village wastewater treatment facility. February 12, 2014 the Village clarified that Lake Country Dairy waste is treated by the Village.)*	
Operator at Proper Grade?	Yes	

2 Facility Description

The Village of Turtle Lake owns and operates a domestic wastewater treatment system. The plant designed to treat 546,000 gallons per day actually treats an average of 382,000 gallons per day (2009-2013 data). The activated sludge treatment system consists of two gravity sanitary sewer lines to convey the domestic and industrial influent (untreated) wastewater flows to the site. The effluent flows into a screening and sampling building. Here inorganic trash and debris is removed before it enters three anaerobic (non-oxygenated) cells where it mixes with some activated sludge which breaks down the organic matter and provides phosphorus and ammonia removal. Activated sludge is composed of settled solids containing naturally occurring bacteria and protozoa recycled from the treatment system. The wastewater then flows to two oxidation ditches (circular basins) operated in parallel where BOD and ammonia is reduced. Chemicals which cause phosphorus to settle can then be added if needed at the chemical mixing manhole. The water is then pumped into two final clarifiers operated in parallel where solids are settled out. The settled solids (sludge) is removed from the clarifier and is either treated in an aerobic digester, thickened in the sludge centrifuge, and stored as cake before being land applied to DNR approved farmland sites or returned to the anaerobic cells to re-seed the new wastewater entering the tank. The cleaned wastewater (effluent) from the clarifiers is discharged to a wetland connected to an unnamed stream tributary to Moon Creek.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
703	INFLUENT An average of 0.336 MGD (2009-2013 data) *see *Note below*	Representative samples shall be collected in the influent sampling point where the industrial and municipal influents combine prior to the anaerobic cells.
004	SLUDGE An average of 155 dry US tons (2010-2012 data)	Biosolids samples shall be collected at a location and in a manner representative of the sludge being tested. Samples shall be collected at a time appropriate for the specific test being conducted.
005	EFFLUENT An average of 0.382 MGD (2009-2013 data) *see *Note below*	Representative samples shall be collected from the effluent manhole prior to discharge to the wetland connected to an unnamed stream into Moon Creek.

**Note: The elimination of the contribution from GreenWhey reduces the influent and effluent volume by approximately half (Effluent 0.511 MGD (Jan 1, 2014 – December 18, 2014) vs. 0.307 MGD (December 19, 2014 – January 31, 2015)) and (Influent 0.457 MGD (Jan 1, 2014 – December 18, 2014) vs. 0.271 MGD (December 19, 2014 – January 31, 2015).*

3 Influent - Proposed Monitoring

3.1 Sample Point Number: 703- INFLUENT TO OXIDATION DITCH

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total		mg/L	Monthly	24-Hr Flow Prop Comp	

3.1.1 Changes from Previous Permit:

No changes from the permit effective July 1, 2014. The parameters and monitoring frequency are appropriate for an activated sludge system.

4 Surface Water - Proposed Monitoring and Limitations

4.1 Sample Point Number: 005- EFFLUENT FROM OXIDATION DITCH

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Dissolved Oxygen	Daily Min	4.0 mg/L	3/Week	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Phosphorus, Total	Monthly Avg	2.0 mg/L	3/Week	24-Hr Flow Prop Comp	See the "Phosphorus" footnotes for more information.
Phosphorus, Total	Monthly Avg	6.7 lbs/day	3/Week	Calculated	See the "Phosphorus" footnote 2.2.1.5 for more information.
Phosphorus, Total		lbs/yr	3/Week	Calculated	See the "Phosphorus" footnote 2.2.1.5 for more information.
~~Chloride~~	~~Daily Max~~	~~1,500 mg/L~~	~~Weekly~~	~~24-Hr Flow Prop Comp~~	
Chloride	Weekly Avg	~~400 mg/L~~ 920 mg/L	Weekly	24-Hr Flow Prop Comp	This is an interim limit based on a variance. See the "Chloride" footnote 2.2.1.8 for more information.
Chloride	~~Weekly Ave~~	~~1,800~~ lbs/day	Weekly	Calculated	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	11 mg/L	Weekly	24-Hr Flow Prop Comp	Limit is effective May through October.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	24-Hr Flow Prop Comp	Variable limits are effective November through April.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia Variable Limit		mg/L	Weekly	Calculated	Refer to the Variable Ammonia Limit table to determine the appropriate limits for the months of November through April.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Four ~~Two~~ acute WET tests are required. See the "WET Testing" footnote for more information.
Chronic WET		rTUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Four ~~Two~~ chronic WET tests are required. See the "WET Testing" footnote for more information.

4.1.1 Changes from Previous Permit

The only changes from the permit effective July 1, 2014 are **chloride** (highlighted in yellow).

Chloride - A variance is proposed from the calculated chloride limit of 400 mg/L due to the lack of any feasible treatment alternatives (chloride can only be concentrated and not really treated). A weekly average interim limit (920 mg/L) is included in the permit. As a condition of this variance, a compliance schedule is included for Turtle Lake to look at source reduction and strive to meet a target value (830 mg/L).

4.1.2 Changes from the public noticed permit

Chloride - Additional Source Reduction Measures (SRM) have been added to the permit. The section now includes:

Chloride Variance – Implement Source Reduction Measures

This permit contains a variance to the water quality-based effluent limit (WQBEL) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the table above, (b) implement the chloride source reduction measures specified below, and (c) perform the actions listed in the compliance schedule. (See the Schedules of Compliance section herein.):

Tier 1

Activities that identify sources of chloride, educate salt users and other activities similar in nature.

Residential Sources

1) Identify sources of chloride in effluent from the wastewater treatment facility.
2) Complete a survey of all residents to document water softener usage such as type (time or flow-based), the amount of salt used, and other pertinent information. Develop a list of action items (with a timeline) for potential corrective actions.
3) Develop a series of informational/educational materials for homeowners on the impact of chloride from residential softeners. Discuss options available for increasing softener salt efficiency and request voluntary compliance.

Street Maintenance

1) Investigate streets and other areas that require high salt use in winter whereby salt is entering the collection system and conduct appropriate maintenance.
2) Complete an inventory of all manhole covers. Upgrade manholes as needed.

Industrial Sources

1) Identify sources of chloride in effluent from the wastewater treatment facility.
2) Educate plant personnel on the need to minimize salt and softened water demands and promote better housekeeping practices that will reduce chloride and softened water consumption.

Tier 2

Require significant industrial and commercial contributors to evaluate their water treatment systems with regard to softened water requirements, with the results of that evaluation being the basis for potential restrictions of chloride inputs.

Dairies

1) Improve the handling of salt brines and the handling of cheese into and out of brine systems. Consider capital improvements such as automating the brine system, properly designed drip pans and splash guards.
2) Optimize softener operation to ensure the appropriate regeneration interval and salt dosage are used.
3) If the regeneration is manual or timer-initiated, evaluate the feasibility of switching to a DIR controller.
4) Evaluate the feasibility of softener brine reclamation.
5) Determine which subprocesses can tolerate unsoftened water, and make appropriate changes.
6) Determine whether once-through cooling systems can be close-looped, and make appropriate changes.
7) For plants that condense whey, evaluate the feasibility of using condensate of whey (COW) water for the first rinse for clean-in-place (CIP) systems and for boiler makeup water.

WET Testing – Two additional acute and chronic WET tests were added. The additional tests will assist in evaluating the toxicity of the facility during the variance period. The new WET testing schedule for both acute and chronic WET tests are:

- October – December 2015
- July – September 2016
- April – June 2017
- January-March 2018

WET testing shall continue **once a year** after the permit expiration date (until the permit is reissued) in accordance with the WET requirements specified for the second calendar year of this permit. For example, the next test would be required July – September 2019.

4.2 Sample Point Number: 004- AEROBIC CAKE SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Sample once during the 2016 calendar year.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Sample once during the 2016 calendar year.

4.2.1 Changes from Previous Permit:

No changes from the permit effective July 1, 2014. The requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis Adm Code.

5 Compliance Schedules

5.1 Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus

Required Action	Due Date
Operational Evaluation Report: The permittee shall prepare and submit to the Department for approval an operational evaluation report. The report shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements or other minor facility modifications that will optimize reductions in phosphorus discharges from the treatment plant during the period prior to complying with final phosphorus WQBELs and, where possible, enable compliance with final phosphorus WQBELs by July 1, 2017. The report shall provide a plan and schedule for implementation of the measures, improvements, and modifications as soon as possible, but not later than July 1, 2017 and state whether the measures, improvements, and modifications will enable compliance with final phosphorus WQBELs. Regardless of whether they are expected to result in compliance, the permittee shall implement the measures, improvements, and modifications in accordance with the plan and schedule specified in the operational evaluation report. If the operational evaluation report concludes that the facility can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the permittee shall comply with the final phosphorus WQBEL by July 1, 2017 and is not required to comply with the milestones identified below for years 3 through 9 of this compliance schedule ('Preliminary Compliance Alternatives Plan', 'Final Compliance Alternatives Plan', 'Treatment Plant Upgrade to Meet WQBELs','Final Plans and Specifications, 'Complete Construction, 'Achieve Compliance'). Study of Feasible Alternatives: If the Operational Evaluation Report concludes that the permittee cannot achieve final phosphorus WQBELs with source reduction measures, operational improvements and other minor facility modifications, the permittee shall initiate a study of feasible alternatives for meeting final phosphorus WQBELs and comply with the remaining required actions of this schedule of compliance. If the Department disagrees with the conclusion of the report, and determines that the permittee can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the Department may reopen and modify the permit to include an implementation schedule for achieving the final phosphorus WQBELs sooner than July 1, 2023.	07/01/2015
Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges and, to the extent that such measures, improvements, and modifications will not enable compliance with the WQBELs, (2) status evaluating feasible alternatives for meeting phosphorus WQBELs.	07/01/2016
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment facility is necessary to achieve final phosphorus WQBELs, the submittal shall include a preliminary engineering design report. If water quality trading will be undertaken, the plan must state that trading will be pursued.	07/01/2017
Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives plan	07/01/2018

to the Department. If the plan concludes upgrading of the permittee's wastewater treatment is necessary to meet final phosphorus WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110. If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/01/2019
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Water Quality Trading measures or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/01/2020
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	10/01/2020
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/01/2021
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/01/2022
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of his permit.	06/30/2023

5.2 Chloride Target Value

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report. The annual chloride progress report shall: indicate which chloride source reduction measures have been implemented;	07/01/2016

include an analysis of trends in weekly average, monthly average and annual total effluent chloride concentrations and mass discharge of chloride based on chloride sampling and flow data; and include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system. After the first progress report is submitted, the permittee may submit a written request to the department to waive further annual progress reports. If after evaluating the progress of the source reduction measures, the department decides to accommodate the request, the department shall notify the permittee in writing that the subsequent annual reports are waived. The Final Chloride Report cannot be waived and shall be submitted by the Date Due. Note that the interim limitation of 920mg/L remains enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due.	
Annual Chloride Progress Report #2: Submit the chloride progress report as defined above.	07/01/2017
Annual Chloride Progress Report #3: Submit the chloride progress report as defined above.	07/01/2018
Final Chloride Report: Submit the final chloride report documenting the success in meeting the chloride target value of 830 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall summarize chloride source reduction measures that have been implemented during the current permit term. The report shall include an analysis of trends in weekly average, monthly average and annual total effluent chloride concentrations and mass discharge of chloride based on chloride sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system. Additionally the report shall include proposed target values and source reduction measures for negotiations with the department if the permittee intends to seek a renewed chloride variance per s. NR 106.83, Wis. Adm. Code, for the reissued permit. Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures, but is not an enforceable limitation under the terms of this permit.	06/30/2019
Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual chloride reports each year covering source reduction measures implemented and chloride concentration and mass discharge trends.	

5.3 Explanation of Compliance Schedules

The only change from the permit effective July 1, 2014 is the inclusion of a "Chloride Target Value" schedule. This schedule is a requirement when a chloride variance is permitted. The schedule requires investigation of chloride sources and implementation of reduction measures with the ultimate goal of meeting a target value of 830 mg/L.

6 Proposed Expiration Date:

The expiration date remains June 30, 2019.

Prepared By:

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Date: February 18, 2015

cc: Michelle Balk, Spooner