CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: September 23, 2014 FILE REF: 3200

TO: Laura Dietrich - SER

FROM: Nick Lent - SER

SUBJECT: Water Quality-Based Effluent Limitations for the Burlington Wastewater Treatment Facility – Variable Daily Maximum Ammonia Limitations (WPDES Permit # WI-0022926)

This is in response to your request for a variable limits table for the daily ammonia nitrogen limitations for the Burlington Wastewater Treatment Facility. In the January 21, 2014 memo a daily maximum limitation of 10 mg/L from November – April was recommended based on an evaluation of the effluent pH data for the previous permit term. The permittee has requested a variable limits table in place of this single limit. Presented below is a table of daily maximum limitations corresponding to various effluent pH values. This table only addresses daily NH_3-N limits; **the average monthly NH_3-N limit of 13mg/L for October still applies.**

Daily Maximum Limits – WWSF, WWFF & LFF

Effluent pH - su	NH_3-N Limit – mg/L	Effluent pH - su	NH_3-N Limit – mg/L
pH ≤ 7.5	No Limit	8.2 < pH ≤ 8.3	9.4
7.5 < pH ≤ 7.6	34*	8.3 < pH ≤ 8.4	7.8
7.6 < pH ≤ 7.7	29*	8.4 < pH ≤ 8.5	6.4
7.7 < pH ≤ 7.8	24*	8.5 < pH ≤ 8.6	5.3
7.8 < pH ≤ 7.9	20*	8.6 < pH ≤ 8.7	4.4
7.9 < pH ≤ 8.0	17	8.7 < pH ≤ 8.8	3.7
8.0 < pH ≤ 8.1	14	8.8 < pH ≤ 8.9	3.1
8.1 < pH ≤ 8.2	11	8.9 < pH ≤ 9.0	2.6

* During the months of May through October if the pH is less than or equal to 7.9 there is no **daily** maximum limit for NH_3-N for municipal WWTF's treating primarily domestic wastewater.. Limits shown in the table above with an asterisk* apply from November through April only.

Section NR 106.33(2) specifies that the department may not include limits for Ammonia Nitrogen in WPDES permits for municipal WWTF's treating primarily domestic wastewater, when the calculated limits are equal to or greater than 20 mg/L from May through October, and equal to or greater than 40 mg/L from November through April. This was the basis for the need for a limit from November – April only. When this table is included in the permit this table applies year-round.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC):
Daily maximum limitations are based on acute toxicity criteria, 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.

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

Where:

A = 0.411 and B = 58.4 for a Warmwater Sport fishery, and
pH (su) = that characteristic of the <u>effluent.</u>

If there are any questions or comments, please contact Nick Lent at (414) 263- 8623 or Nicholas.Lent@wisconsin or Diane Figiel at (608) 264-6274 or Diane.Figiel@wisconsin.gov.

PREPARED BY: Nick Lent

APPROVED BY: _____ date: _____
Diane Figiel, PE,
Water Resources Engineer

Cc: