Permit Fact Sheet

1 General Information

Permit Number:	WI-0040223-08-0
Permittee Name:	Dairyland Power Coop Alma Site
Address:	500 OLD STH 35
City/State/Zip:	ALMA WI 54610
Discharge Location:	East bank of Mississippi River, south of J.P. Madgett screenhouse. N44 18.363' W91 54.787'
Receiving Water:	Mississippi River
StreamFlow ($Q_{7,10}$):	6100 cfs
Stream Classification:	Warm Water Sport Fish Community, Non-public Water Supply

2 Facility Description

Dairyland Power Cooperative owns and operates the J.P. Madgett Unit coal-fired power station near Alma, Wisconsin. Previously the permittee operated Alma units 1-5 and J.P. Madgett Unit, however the final Alma units was taken offline in October 2014.

The J.P. Madgett Unit has been in commercial operation since November 1979. The single unit station has a generating capacity of 400 MW of electricity. All discharges covered by this permit are to the Mississippi River with the exception of the coal pile runoff which would discharge to groundwater. The only time the coal pile basins have had any water in them is when the river levels are high. Outfall 006 is process wastewater from a treatment system which consists of chemically assisted settling. De-ice water and intake and screen backwash water are diversions of cooling water and river water and are listed as Outfalls for reporting purposes. Outfalls 011, 012, 013, and 014 are being inactivated because they are associated with cooling water, intake screen backwash, and intake de-icing water for the retired units at the Alma station. Stormwater from Outfalls 011 and 012 will continue to be covered by the facility's industrial stormwater permit. The facility's dry Flue Gas Desulfurization (FGD) system does not contribute wastewater. See Figure 1 for the site map.

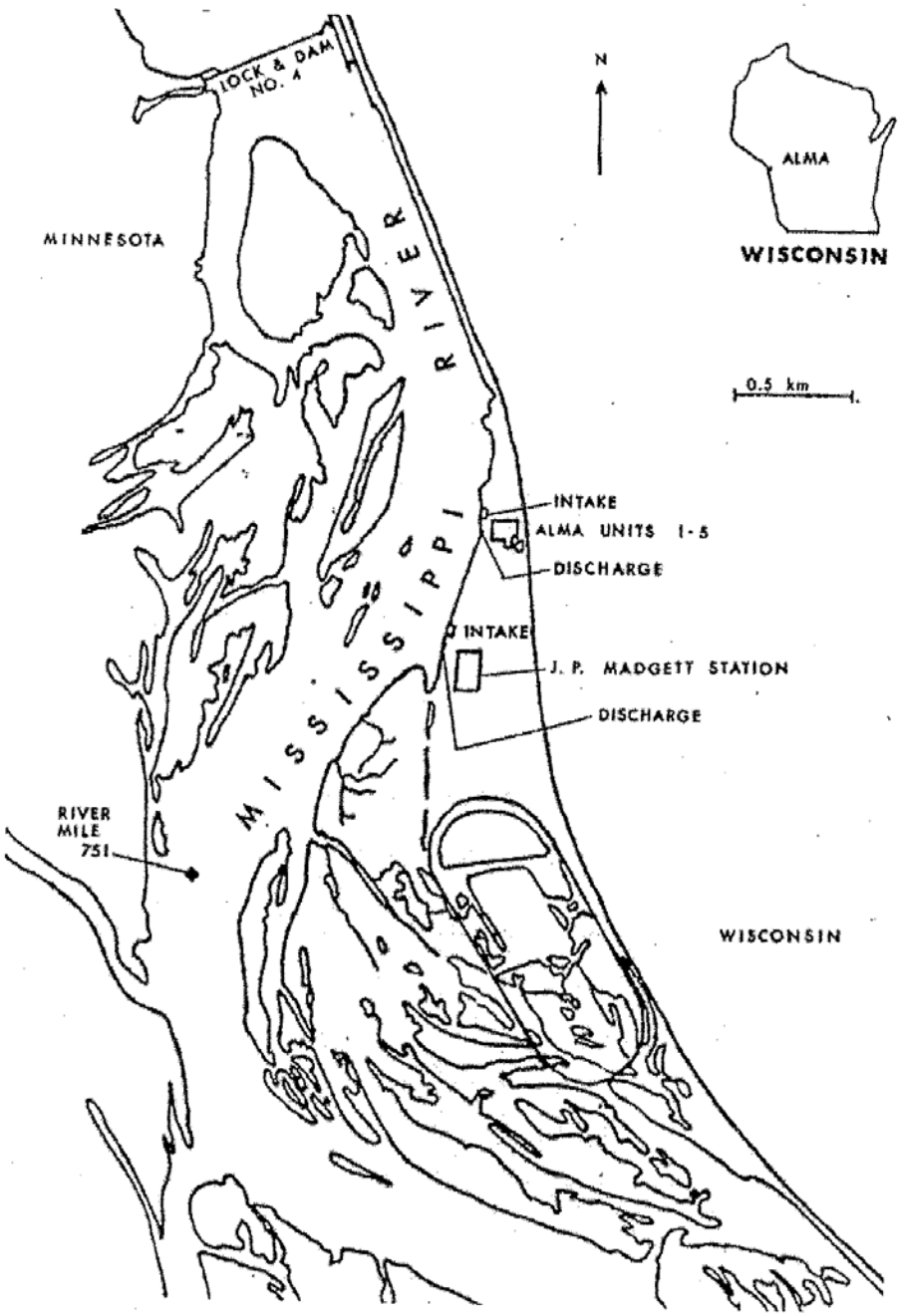


Figure 1: Site Map

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
703	Not applicable	Intake screening system and intake water monitoring
001	273.8 MGD maximum daily flow	East bank of the Mississippi River, South of J.P. Madgett screenhouse. N 44° 18.363’ W 91° 54.787’. Non-contact condenser cooling water from J.P. Madgett. No treatment provided.
002	Not applicable. Permittee reported no discharge from this Outfall in the permit application.	East bank of the Mississippi River, South of J.P. Madgett screenhouse. N 44° 18.435’ W 91° 54.797’. Coal pile runoff from Alma 1-5. Treatment consists of settling. The permittee has requested that this Outfall remain active throughout the decommissioning process scheduled for 2015/2016.
003	0.115 MGD maximum daily flow	East bank of the Mississippi River, South of J.P. Madgett screenhouse. N 44° 18.370’ W 91° 54.815’. J.P. Madgett intake screen backwash. No treatment provided.
004	0.062 MGD maximum daily flow	East bank of the Mississippi River at the J.P. Madgett screenhouse. N44° 18.370’ W 91° 54.815’.J.P.Madgett fish return, screen backwash. No treatment provided.
005	37.01 MGD maximum daily flow	East bank of the Mississippi River, South of J.P. Madgett screenhouse. N 44° 18.370’ W 91° 54.815’. J.P. Madgett intake de-icing water. No treatment provided.
006	0.5341 MGD maximum daily flow	East bank of the Mississippi River, South of J.P. Madgett screenhouse. N 44° 18.183’ W 91° 54.808’. Boiler blowdown, demineralization wastewater, bottom ash contact wastewater, metal cleaning wastewater, and other power plant low volume wastewaters. Treatment consists of pH adjustments and settling.
007	Not applicable. Permittee reported no discharge from this Outfall in the permit application.	South of the bottom ash dewatering building. Outfall discharges to the Mississippi river backwater area. N44° 17.948’ W91° 54.719’. J.P. Madgett coal pile runoff. Treatment consists of settling.
008	Not applicable	Storm water absorption basin located east of J.P. Madgett screenhouse. NW 1/4, NW1/4, Section 13, Township 21N, Range 13W. Seepage from Alma 1-5 coal pile runoff basin. The permittee has requested that this Outfall remain active throughout the decommissioning process scheduled for 2015/2016.
009	Not applicable	Storm water absorption basin located south of the bottom ash dewatering building. NW 1/4, NW1/4, Section 13, Township 21N, Range 13W. Seepage from J.P. Madgett coal pile runoff basin
101	Not applicable	Field blank sample collected at the same time as the effluent sample

3 Influent - Proposed Monitoring

3.1 Sample Point Number: 703- Influent from Mississippi R.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Temperature, Average		deg F	Daily	Continuous	
Mercury, Total Recoverable		ug/L	Monthly	Grab	

3.1.1 Changes from Previous Permit:

No changes from the previous permit.

4 Surface Water - Proposed Monitoring and Limitations

4.1 Sample Point Number: 001- CONDENSER COOLING WATER - JPM

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Temperature Maximum	Daily Max	deg F	Daily	Continuous	
Temperature Difference	Daily Max	deg F	Daily	Calculated	
pH Field	Daily Max	9.0 su	Weekly	Grab	
pH Field	Daily Min	6.0 su	Weekly	Grab	

4.1.1 Changes from Previous Permit

The monitoring requirement for maximum temperature is included in the proposed permit to provide data if changes occur that result in significantly higher effluent flows or temperatures. The thermal limits were calculated for this Outfall, per ch. NR 106, Wis. Adm. Code, and it was determined that the current limits are protective of water quality. The temperature monitoring will continue during this permit cycle.

4.1.2 Explanation of Limits and Monitoring Requirements

See the water quality based effluent limit memo, dated September 12, 2011 and the follow-up email message from Pat Oldenburg dated January 20, 2015. The 2011 limit memo recommended thermal limits for Outfall 001 based on ch. NR 106 Wis. Adm. Code; however, the follow-up 2015 email indicated that the existing temperature limits are protective of water quality based on the 2012 Alma 1-5/PJ.P. Madgett Station – Thermal Plume Mapping and Modeling Study.

Categorical Limits

No Categorical Limits are applicable for this Outfall. The pH limitation of 6.0-9.0 is a water quality standard.

4.2 Sample Point Number: 002- COAL PILE RUNOFF - ALMA

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Estimated	
Suspended Solids, Total	Daily Max	50 mg/L	Weekly	24-Hr Comp	This limitation is subject to the provisions of s. NR 290.12 (1) (f) Wis. Adm. Code. Sample required during any week with a coal pile runoff discharge to the river.
pH Field	Daily Max	9.0 su	Weekly	Grab	Sample required during any week with a coal pile runoff discharge to the river.
pH Field	Daily Min	6.0 su	Weekly	Grab	Sample required during any week with a coal pile runoff discharge to the river.

4.2.1 Changes from Previous Permit

There are no changes from the previous permit.

4.3 Sample Point Number: 003- INTAKE SCREEN BACKWASH - JPM

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	

4.3.1 Changes from Previous Permit

No change from the previous permit.

4.4 Sample Point Number: 004- FISH RETURN - JPM

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	

4.4.1 Changes from Previous Permit

No change from the previous permit.

4.5 Sample Point Number: 005- DE-ICING WATER - JPM

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	

4.5.1 Changes from Previous Permit

No changes from the previous permit.

4.6 Sample Point Number: 006- TREATED PROCESS WW

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
Suspended Solids, Total	Daily Max	100 mg/L	Daily	24-Hr Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	Daily	24-Hr Comp	
Temperature Maximum	Weekly Average	See table below	3/week	Continuous	See table in Section 2.2.6.3 of the permit for Weekly Average temperature limits.
Temperature Maximum	Daily Max	See table below	3/week	Continuous	See table in Section 2.2.6.3 of the permit for Daily Maximum temperature limits.
Oil & Grease (Hexane)	Daily Max	20 mg/L	Quarterly	Grab	
Oil & Grease (Hexane)	Monthly Avg	15 mg/L	Quarterly	Grab	
Phosphorus, Total	Annual Avg	0.1 mg/L	Monthly	Grab	This is the final effluent limit that will become effective on 01/01/2020. An interim annual average limit of 0.12 mg/L shall be effective through 12/31/2019.
Phosphorus, Total	Annual Avg	0.1 mg/L	Monthly	Grab	Effective starting January 1, 2019.
Phosphorus, Total	Monthly Avg	0.3 mg/L	Monthly	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable	Daily Max	4.6 ng/L	Monthly	Grab	Sample Point Number 101 will be used to report the effluent field blank.
Iron, Total Recoverable	Daily Max	1.0 mg/L	Daily	24-Hr Comp	Sample required on any day with a metal cleaning waste water discharge to the river.
Copper, Total Recoverable	Daily Max	100 ug/L	See Permit Note	24-Hr Comp	Sample required on any day with a metal cleaning waste water discharge to the river.
Copper, Total Recoverable	Daily Max	1.2 lbs/day	See Permit Note	Calculated	Sample required on any day with a metal cleaning waste water discharge to the river.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Comp	See WET footnote below.
Chronic WET		rTUc	See Listed Qtr(s)	24-Hr Comp	See WET footnote below.
pH (Continuous)			Daily	Continuous	See Section 2.2.6.5 for limits and allowed excursions

4.6.1 Changes from Previous Permit

Temperature limits, Phosphorus limits, mercury limits and chronic Whole Effluent Toxicity monitoring was added. This permit contains a compliance schedule to meet the new water quality-based effluent limit (WQBEL) for phosphorus in accordance with s. NR 217.17, Wis. Adm. Code. As such an interim limitation is required which in this case is a limit of 1.2 mg/L monthly average based on the 30-day P99 of phosphorus effluent data from January 2012 through April 2015.

4.6.2 Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements and Disinfection

It was determined that the effluent from Outfall 006 enters a backwater section of the Mississippi River, limiting the amount of mixing available at the point of discharge. Recent changes to NR 102 and 217 include new phosphorus criteria related procedures for calculating water quality based effluent limitations for phosphorus. See the September 12, 2011 Water Quality-Based Effluent Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett (WI-0040223) memorandum, the March 30, 2012 Revision, and the September 15, 2015 Mercury Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett memorandum for further details.

Temperature -

Because of limited amount of mixing available at the point of discharge, it is the judgment of the limit calculator and permit drafter to include temperature limits during the proposed permit cycle.

Table of Weekly Average Temperature Limits and Daily Maximum Temperature Limits

Month	Weekly Average Limit (°F)	Daily Maximum Limit (°F)
January	59	86
February	59	87
March	60	87
April	60	90
May	69	89
June	77	90
July	83	90
August	80	89
September	76	89
October	63	88
November	54	89
December	59	90

Phosphorus -
The final calculated limitations are 0.10 mg/L as an annual average and 0.30 mg/L as a monthly average. Monitoring data collected during the current permit term indicates that the effluent data may be less than that of the calculated effluent limit, however due to detection limit used (0.1 mg/L), it is difficult to make a final determination on reasonable potential. Based on the 30-day P99, the interim Phosphorus annual average limit is 0.12 mg/L. After the facility analyzes additional samples, the P99 value may allow these limits to be removed from the permit and decrease further testing requirements. Once additional sample results have been submitted the permittee may request a reevaluation of these limit recommendations.

Whole Effluent Toxicity (WET)-

Because of limited amount of mixing available at the point of discharge, it is the judgment of the limit calculator and permit drafter to include Whole Effluent Toxicity monitoring during the proposed permit cycle.

A total of two chronic WET and two Acute WET tests should be performed during the permit cycle. One chronic WET and one acute WET test shall be performed during the first quarter of 2017, and again during the second quarter of 2020.

Categorical Limits

S. NR 290 includes the categorical limit for total suspended solids, oil and grease, iron, and copper for Metal Cleaning Wastes.

4.7 Sample Point Number: 007- COAL PILE RUNOFF - JPM

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Estimated	
Suspended Solids, Total	Daily Max	50 mg/L	Weekly	24-Hr Comp	This limitation is subject to the provisions of s. NR 290.12 (1) (f). Sample required during any week with a coal pile runoff discharge to the river.
pH Field	Daily Max	9.0 su	Weekly	Grab	Sample required during any week with a coal pile runoff discharge to the river.
pH Field	Daily Min	6.0 su	Weekly	Grab	Sample required during any week with a coal pile runoff discharge to the river.

4.7.1 Changes from Previous Permit

No changes from the previous permit.

5 Land Treatment – Proposed Monitoring and Limitations

5.1 Sample Point Number: 008- COAL PILE RUNOFF BSN - ALMA

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	

5.1.1 Changes from Previous Permit:

No changes from the previous permit.

5.2 Sample Point Number: 009- COAL PILE RUNOFF BSN - JPM

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	

5.2.1 Changes from Previous Permit:

No changes from the previous permit.

6 Compliance Schedules

6.1 Mercury Pollutant Minimization Plan

As a condition of the variance to the water quality based effluent limitation for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Submit Annual Status Report: The permittee shall submit to the Department an annual status report on the progress of the Mercury PMP as required by s. NR 106.145(7), Wis Adm. Code. Submittal of the annual status report is required by the date due.	01/01/2017
Submit Annual Status Report: The permittee shall submit to the Department an annual status report on the progress of the Mercury PMP as required by s. NR 106.145(7), Wis Adm. Code. Submittal of the annual status report is required by the date due.	01/01/2017
Submit Annual Status Report: The permittee shall submit to the Department an annual status report on the progress of the Mercury PMP as required by s. NR 106.145(7), Wis Adm. Code. Submittal of the annual status report is required by the date due.	01/01/2018
Submit Annual Status Report: The permittee shall submit to the Department an annual status report on the progress of the Mercury PMP as required by s. NR 106.145(7), Wis Adm. Code. Submittal of the annual status report is required by the date due.	01/01/2019
Submit Annual Status Report: The permittee shall submit to the Department an annual status report on the progress of the Mercury PMP as required by s. NR 106.145(7), Wis Adm. Code. Submittal of the annual status report is required by the date due.	01/01/2020
Submit Annual Status Report: The permittee shall submit to the Department an annual status report on the progress of the Mercury PMP as required by s. NR 106.145(7), Wis Adm. Code. Submittal of the annual status report is required by the date due.	01/01/2021

6.2 Intake Structure Submittals

The permittee has submitted an intake study plan to the department to evaluate entrainment. The permittee shall submit the results according to the schedule below.

Required Action	Due Date
Submit Results of Study: The permittee shall submit the materials required in 40 CFR Part 122.21(r).	01/01/2020
Annual Certification: The permittee shall cubmit an Annual Certification statement and Report as described in Section 1.6.2.	01/31/2017
Annual Certification: The permittee shall cubmit an Annual Certification statement and Report as described in Section 1.6.2.	01/31/2018
Annual Certification: The permittee shall cubmit an Annual Certification statement and Report as described in Section 1.6.2.	01/31/2019

Annual Certification: The permittee shall cubmit an Annual Certification statement and Report as described in Section 1.6.2.	01/31/2020
Submit Application Materials: The permittee shall submit the application materials required in 40 CFR Part 122.21(r). Note: the Department may wave the second year of entertainment data collection if the first year's data is substantially similar to historical data.04/01/2020	04/01/2020
Inform the Department of Selected Alternative: The permittee shall inform the department of the selected alternatives for impingement and entrainment BTA compliance.	01/14/2021

6.3 Temperature Limits Compliance

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Preliminary Compliance Report: The permittee shall submit a preliminary compliance report by the date due indicating alternatives to achieve the final temperature limits. Informational note: refer to NR 106 Subchapters V & VI or NR 102.26, Wis. Adm. Code, for information regarding the reevaluation of limits.	04/01/2017
Action Plan: The permittee shall submit an action plan for complying with all applicable effluent temperature limits.	04/01/2018
Initiate Actions: The permittee shall initiate actions identified in the Action Plan.	04/01/2019
Submit Status Report: The permittee shall submit to the Department an annual status report on the progress of initiating items in the Action Plan.	04/01/2020
Complete Actions: The permittee shall complete actions necessary to achieve compliance with effluent temperature limits.	03/01/2021

6.4 Phosphorus

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Operational Evaluation Report: The permittee shall prepare and operational evaluation report and submit it for Department approval. The report shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements or other minor modifications that would enable compliance with the final phosphorus WQBEL (water quality based effluent limit) or some improved level of effluent quality using the existing wastewater treatment system. If the operational evaluation report concludes that the facility can achieve the final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, or minor facility modifications, the report shall contain a schedule for implementation of the improvements or other report recommendations necessary to meet final phosphorus WQBELs. The implementation schedule shall be based on providing compliance with the final phosphorus WQBEL as soon as reasonably possible. Once the report is approved by the Department, the permittee shall take the steps called for in the operational evaluation report and follow the schedule of implementation as approved. If the department approved report concludes that the facility cannot achieve the phosphorus limit with source reduction measures, operational improvements, or other minor facility modifications, the permittee shall initiate a Facility Planning Study, and comply with the remaining schedule of compliance. Regardless of the conclusion of	04/01/2017

the operational evaluation report, the report shall also include a plan and implementation schedule for optimizing the treatment plant's removal of phosphorus during the period prior to complying with the WQBELs. Once the operational evaluation report is approved by the Department, the permittee shall proceed with implementation of the optimization plan and follow the schedule of implementation as approved.	
Facility Plan: The permittee shall submit a Facility Plan that evaluates feasible alternatives for meeting the phosphorus WQBELs. Alternatives may include: upgrading wastewater treatment facilities, selecting the Watershed Adaptive Management Option pursuant to s. NR 217.18, Wis. Adm. Code, using Water Quality Trading in conjunction with or in place of facility upgrading, site specific water quality criteria development, or a variance from water quality standards pursuant to s. 283.15, Stats.	01/01/2018
Final Plan and Specifications: If the facility plan concluded that upgrading of the permittee's wastewater treatment system is necessary to meet final water quality based effluent limits, submit construction plans and specifications for Department approval.	01/01/2019
Construction Progress Report: Submit a progress report on meeting the final WQBEL for Phosphorus.	07/01/2019
Complete Construction: Complete construction of wastewater treatment system upgrades. Comply with final phosphorus limits.	01/01/2020

6.5 Explanation of Schedules

Mercury Schedule: A pollutant minimization program (PMP) is a required component when a water quality standards variance is granted. PMP efforts are a means to make progress toward compliance with the water quality based effluent limit. A mercury PMP was prepared for Dairyland Power Alma Site under the previous permit and was approved by the Department. The PMP continues to be implemented with annual reports submitted on the progress.

Intake Structure Schedule: Because the department has determined that the facility does not currently meet interim Best Professional Judgment for Best Technology Available Determination (BTA), a schedule for completing and submitting the results of an intake study and selecting an alternative for impingement and entrainment BTA is being included in the proposed permit.

Thermal Compliance Schedule: Since this permit was last issued, Wisconsin has developed Thermal water quality limits. The Thermal compliance schedule is being included in the permit to allow the facility to determine if process or treatment modifications are necessary and to give the facility time to make any necessary changes to meet the proposed limits.

Phosphorus Compliance Schedule: Monitoring data collected during the current permit term indicates that the effluent data may be less than that of the calculated effluent limit. The Phosphorus schedule is being included in the permit to allow the facility to determine if process or treatment modifications are necessary and to give the facility time to make any necessary changes to meet the proposed limits.

7 Other Comments:

The department has determined that the facility does not meet interim Best Professional Judgment for Best Technology Available Determination (BTA). Because the permit expired and the application was received before October 2014, the department used the 2009 guidance for BTA determination. This guidance states that it should be appropriate to determine that the intake represents BTA if **two** or more of the following scenarios are met:

- If the intake design flow velocity is < 0.5 fps;
- If the facility's intake structure includes a wedge-wire screen;
- **If the intake design flow is < 5% of the mean annual flow from the source water;**
- If the facility uses a closed-cycle system for ≤ 95% of their cooling needs or has reduced intake flow ≤ 95% compared to once-through cooling;
- If the facility has data that shows impingement mortality (and entrainment, if applicable) has been/will be reduced 80-95% (60-90% for entrainment) compared to a once-through cooling system with 3/8" traveling screens;
- If there is biological data demonstrating that: 1) the source water body does not include threatened or endangered species in the vicinity of the intake, and 2) there are no known aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure.

The facility reports that the mean annual river flow in the vicinity of the cooling water intake structure is 26,120 cfs; at full capacity Alma site withdrawals less than 5% of this flow. However, the facility does not meet any of the other scenarios.

The permit requires the facility to take steps to come into compliance with BTA requirements. The facility shall submit the results of the entrainment characterization study and the cost benefit analysis by July 14, 2018 and inform the department of the selected alternative for BTA compliance by July 14, 2019. These two submittals will constitute taking steps into compliance.

Because the facility has an actual intake flow of greater than 125 MGD, two years of entrainment characterization is required under 40 CFR 122.21(r)(9).

40 CFR 125.98(f)(2) requires the permit drafter to consider "number and types of organisms entrained." Therefore, in situations where no representative historic entrainment information is available (including representative data from nearby facilities), a minimum of monthly entrainment monitoring and characterization should be required for one primary period of reproduction (the primary period of reproduction is the period when eggs and larvae are present in the vicinity of the intake, as identified by the regional fisheries biologist. A default period of April-September should be used in the absence of information from the regional biologist).

The permittee has completed two years of impingement mortality studies; the result of the studies was received by the Department on December 23, 2008. These studies included information for requirements in §122.21(R)(2),(3), and (5). The calculation baseline impingement mortality estimates for J.P. Madgett (JPM) are 29,493 fish/year based on design flow and 27,626/year based on actual flow. These estimates exclude passively collected dead and moribund gizzard shad.

8 Attachments:

September 12, 2011 Water Quality-Based Effluent Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett (WI-0040223) memorandum a

March 30, 2012 Water Quality-Based Effluent Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett (WI-0040223) memorandum REVISION.

September 14, 2015 Mercury Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett Memorandum.

Substantial compliance determination.

Map of variances near the discharge location.

EPA data sheet for the Mercury Variance.

Mercury trends since 2010.

9 Proposed Expiration Date:

June 30, 2021

Prepared By:

Jonathan Hill, Wastewater Engineer

Date: April 08, 2015

CORRESPONDENCE / MEMORANDUM **State of Wisconsin**

DATE: September 12, 2011 FILE REF: 3200

TO: Jeff Brauer – WT/3

FROM: Patrick Oldenburg - WCR

SUBJECT: Water Quality-Based Effluent Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett (WI-0040223)

This is in response to your request for an evaluation of water quality-based effluent limitations for toxic substances using chs. NR 102, 105, 106, and 217 of the Wisconsin Administrative Code (where applicable), for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett's discharge to the Mississippi River. The discharge is located in the Lower Buffalo River Watershed of the Buffalo-Trempealeau River Basin in Buffalo County.

Based on our review, the following recommended changes are made on a chemical-specific basis:

- Outfall 001, 011, and 012:
  - No new chemical specific limitations or monitoring requirements are recommended. However, thermal limitations will need to be updated to be consistent with new thermal regulations which became effective in October 2010. The permittee is currently developing site-specific mixing zone data, final effluent limitations cannot be developed until such work is complete. The attachment contains the recommended thermal limitations that would apply in the absence of such activities.

- Outfall 006:
  - No changes are recommended to the current daily maximum copper effluent limitations of 100 µg/L and 1.2 lbs/day.
  - The calculated temperature limitation is 120°F, daily maximum. Further evaluation is needed to determine if this limitation needs to be included in the reissued permit. See attachment for further details.
  - Based on the data collected over the course of the permit term, a mercury limitation is warranted for this outfall. The calculated water quality based limit is 1.3 ng/L as a monthly average. Ch. NR 106.145(4) allows for eligibility for an alternative mercury effluent limitation if the permittee submits an application for an alternative mercury limit, which includes the submittal of a pollutant minimization plan. Ch. NR 106.145(5) specifies that an alternative limitation shall equal the 1-day P99 of the effluent data, and shall be expressed as a daily maximum concentration. Using this approach, the calculated alternative mercury limitation would be 19 ng/L.
  - Recent changes to chs. NR 102 and 217 include new phosphorus criteria and

related procedures for calculating water quality based effluent limitations for phosphorus. The calculated limitations are 0.10 mg/L as an annual average and 0.30 mg/L as a monthly average. Monitoring data collected during the current permit term indicates that the effluent data may be less than that of the calculated effluent limit, however due to detection limit used (0.1 mg/L), it is difficult to make a final determination on reasonable potential. Therefore it is recommended at this time that the calculated limits be included in the reissued permit. After the facility analyzes additional samples, the P99 value may allow these limits to be removed from the permit and decrease further testing requirements. Once additional sample results have been submitted the permittee may request a reevaluation of these limit recommendations.

- Based on the available dilution and past whole effluent toxicity, no wet testing is recommended for inclusion in the reissued permit.

If there are any questions or comments, please contact Pat Oldenburg at (715) 831-3262 or via e-mail at Patrick.Oldenburg@wisconsin.gov.

cc: Pete Skorseth - WCR/Baldwin (via e-mail)
John Sullivan - WCR/La Crosse (via e-mail)
Jim Schmidt - WT/3

Addendum 1:
Water Quality-Based Effluent Limitations for
Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett (WI-0040223)

Prepared by:
Pat Oldenburg – WCR
September 12, 2011

Facility Description:

Dairyland Power Cooperative (DPC) owns and operates several coal-fired power stations near Alma, Wisconsin. They consist of Alma Units 1-5 and J.P. Madgett Unit 6. Because of their close proximity, all six are regulated under one WPDES permit. All discharges are to the Mississippi River with the exception of the coal pile runoff which in theory discharges to the ground water (in actuality the only time the basins have any water in them is when the river levels are high). Outfall 006 is wastewater from a treatment system which consists of chemically assisted settling. Intake deice water and screen backwash water are not outfalls, per se, but really just diversions of cooling water and river water.

Outfall Number	Composition
Alma 1-5:	
011	Condenser cooling water
012	Noncontact cooling water
013	Intake screen backwash
014	Intake deice water
J.P. Madgett	
001	Condenser cooling water
002	Coal pile runoff from Alma 1-5
003	Intake screen backwash
004	Fish and debris return
005	Intake deice water
006	Low volume waste, boiler blowdown, bottom ash dewatering outflow, and metal cleaning wastewater
007	Coal pile runoff
008	Coal pile runoff, lagoon seepage
009	Coal pile runoff, lagoon seepage

Of these 13 outfalls only outfalls 001, 006, 011, and 012 will be addressed in detail in this review. Outfalls 003, 004, and 013 consist of water withdrawn from the Mississippi River and returned to the river without significant changes in chemical composition due to plant operations. Outfalls 005 and 014 discharge only on a seasonal basis and would contain the same chemical composition as the condenser cooling water discharges (001 and 011). Outfalls 002 and 007 are designed to discharge only following significant precipitation but have had no recent instances of measured flow. Outfalls 008 and 009 contain storm water runoff only.

Along with the substances for which monitoring was required in the permit, this facility was required to perform a priority pollutant scan on outfalls 001 and 006 (wastewaters from 011 are substantively identical tp wastewaters from 001). Non-contact cooling water from outfall 012 was sampled for a shorter list of metals, conventional, and non-conventional pollutants (nutrients

& hardness). Detected substances with ch. NR 105 criteria (except ammonia) are shown in the effluent summary section below. Summary results for substances tested multiple times are listed at the end of this document.

Effluent Limit and Monitoring Recommendations:

Copper: A daily maximum water quality based limitation for copper is recommended for Outfall 006. Outfall 006 contains "metal cleaning wastes", and ch. NR 290 requires a categorical 1 mg/L copper limit for these wastes, however since the calculated water quality based effluent limitation is less that the categorical limit, the water quality based limit is recommended (see s. NR 106.04 (1)). No changes are recommended to the current effluent limitations of 100 µg/L and 1.2 lbs/day (both rounded to two significant figures).

Mercury: The effluent limits in the tables for limitations based on wildlife and human threshold criteria are set equal to the criteria in accordance with s. NR 106.06(6), because the background concentration exceeds the wildlife and human threshold criteria.

Mercury data submitted as part of the permit application for Outfalls 001 and 012 indicate that neither of these outfalls are likely to be a net source of mercury to the receiving water as the effluent results are substantively identical to the intake waters. This is not unexpected given that these wastewaters are once-through cooling waters withdrawn from the receiving water.

However, outfall 006 does represent a net discharge of mercury to the receiving water. DPC collected 65 valid test results for mercury from January 206 through May 2011. The upper 99th percentile of 30 day average discharge concentrations, as determined by the procedure specified in NR 106.05(5)(a), is 5.0 ng/L, which exceeds a potential limit of 1.3 ng/l. Therefore, a limit for mercury is recommended.

Ch. NR 106.145(4) allows for eligibility for an alternative mercury effluent limitation if the permittee submits an application for an alternative mercury limit, which includes the submittal of a pollutant minimization plan. Ch. NR 106.145(5) specifies that an alternative limitation shall equal the 1-day P99 of the effluent data, and shall be expressed as a daily maximum concentration. Using this approach, the calculated alternative mercury limitation would be 19 ng/L.

Temperature: Chapter NR 102, Subchapter II of the Wisconsin Administrative Code establishes water quality standards for temperature, in order to protect fish and other aquatic life from lethal and sublethal effects. Chapter NR 106, Subchapter V, specifies procedures for calculating water quality based effluent limitations for temperature. These rule changes became effective on October 1st, 2010.

DPC is currently in the process of conducting field studies to support a site-specific mixing zone analysis. Similar field work was conducted after the J.P. Madgett Unit came on line[1]. Based on

[1] J. Johnston, W. Kowalski and J. Thiel. 1986. Report on the effects from the addition of the John P. Madgett Unit #1 at the Alma, Wisconsin Power Generation Site on the fishery of Pool % of the Mississippi River (post operational studies 1981-1983). Dairyland Power Cooperative.

that data set, it appears that the thermal plumes from outfalls 001 and 011 can be considered separately. However, due to the close proximity of Outfalls 011 and 012, these should be considered as sharing the same mixing zone for calculation of thermal limitations. Realizing that the permittee will be submitting additional information the calculated limitations presented here are a demonstration of what the limitations would be based on the default procedures in s. NR 106.55.

In accordance with ch. NR 106.53(2)(b), the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with ch. NR 106.53(2)(c), the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation.

Based on the default procedures in s. NR 106.55, it would appear that only a slightly higher percentage of the 7Q10 would be needed to avoid more stringent limitations. Using the default procedures for Outfall 001, there appears that more stringent limitations are only during the months of May – August. Similarly, more stringent limitations are needed for the months of June – August for 011 and 012 combined. The heat load between 011 and 012 could be allocated between the two outfalls (i.e. the two outfalls could have different temperature limits) but in no case could the effluent limit on Outfall 012 be greater than 120°F unless it were discharged in a manner that will cause potential for scalding of humans.

Outfall 001:

	Recommended Weekly Average Limits	
Month	Outfall 001 (°F)	Outfalls 011 & 012 Combined (°F)
MAY	75	-
JUN	81	87
JUL	88	95
AUG	85	90

Note that Outfall 001 currently has the following temperature limitations:

Parameter	Limit Type	Limit and Units	Notes
Temperature Difference	Daily Max	21 deg F	1
Temperature Difference	Daily Max	40 deg F	2
BTU's		MMBTU/day	3

1. The discharge temperature shall not exceed 21°F above the ambient receiving water temperature for the months of May through October.
2. The discharge temperature shall not exceed 40°F above the ambient receiving water temperature for the months of November through April.
3. At no time shall the heat discharged exceed 2.197 billion BTU/hr.

Retention of these temperature limitations at Outfall 001 in the reissued permit is at the discretion of the permit drafter and basins staff.

Outfall 006 is not directly influenced by the other outfalls, therefore the calculated limit for this outfall would be 120° F daily maximum. There has been no systematic collection of temperature data at this outfall, and it is unclear to this reviewer if there is any reasonable potential for this limitation to be exceeded. Barring a determination based on best professional judgment by the permit drafter that there is no reasonable potential for the limitation to be exceeded, in accordance with ch. NR 106.56((12), when representative effluent temperature data is not available at the time of permit reissuance, the proposed permit shall include effluent temperature monitoring (for at least one year), water quality based effluent limits for temperature, and a compliance schedule to meet the temperature limits. The proposed permit shall also include a condition that invalidates the limitations and compliance schedule if the data that is collected as a condition of the reissued permit demonstrates that limitations are not necessary.

See Chapter 17 of the draft *Guidance for Implementation of Wisconsin's Thermal Water Quality Standards* for more information on relevant permit conditions.

Phosphorus: Recent changes to chs. NR 102 and 217 include new phosphorus criteria and related procedures for calculating water quality based effluent limitations for phosphorus. These rule changes became effective on December 1st, 2010. How these rule changes will specifically affect this permittee at this time are unclear as implementation guidance has yet to be fully developed. Based on data collected by the USGS at L&D4, the Mississippi River exceeds the water quality criteria for phosphorus. Based on the fact that the data indicates that the receiving stream is exceeding the criteria, it is recommended that the water-quality based effluent limit be set equal to criterion (s. NR 217.13(7)).

The calculated limitations are 0.100 mg/L as an annual average and 0.3 mg/L as a monthly average. Since the calculated monthly average limitation is less than 0.3 mg/L, the limitation is expressed as an annual average. When a concentration limitation expressed as an annual average is included in a permit, a monthly average concentration limitation equal to three times that limitation should also be included in the permit (see s. NR 217.14(2)).

Based on the process and data submitted with the permit application, there is no net discharge of phosphorus from most of the outfalls at the facility as they consist of cooling waters withdrawn entirely from the receiving water. Outfall 006 however, does represent a source of phosphorus to the receiving water, as the source water for this discharge is groundwater. Monitoring data collected during the current permit term indicates that the effluent data may be less than that of the calculated effluent limit, however due to detection limit used (0.1 mg/L), it is difficult to make a final determination on reasonable potential. Therefore it is recommended at this time that the calculated limits be included in the reissued permit. After the facility analyzes additional samples, the P99 value may allow these limits to be removed from the permit and decrease further testing requirements. The analytical methodology used shall enable the laboratory to quantitate all substances for which monitoring is required at levels below the effluent limitation. Once additional sample results have been submitted the permittee may request a reevaluation of these limit recommendations.

Whole Effluent Toxicity: Based on the data collected during the current and previous permit terms, and the guidance provided in the July 1, 2008 *Whole Effluent Toxicity Program Guidance*

Document - Revision #8 no Whole Effluent Toxicity (WET) testing is recommended for outfall 006 due to the large amount of dilution available and past WET testing history (no failures on record).

The discharges resulting from the condenser cooling water was considered for possible WET testing. However, based on the nature of the discharge (once through cooling water) and the lack of additives being added to the cooling water, it has been determined that WET testing of these outfalls is unnecessary at this time.

Effluent limit calculations for:	Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett
WPDES Permit #:	0040223
Permit Drafter:	Jeff Brauer
Basin Engineer:	Pete Skorseth - WCR/Baldwin
WQ Reviewer:	John Sullivan - WCR/La Crosse
Receiving Water Information:	
Receiving Water:	Mississippi River
Watershed:	Lower Buffalo River Watershed
Basin:	Buffalo-Trempealeau River Basin
County:	Buffalo
Classification:	Warm Water Sport Fish Community, Non-public Water Supply

Flows	7Q10	7Q2	90Q10	Estimated Harmonic Mean	Basin Area (mi 2)
	6100	10050		29590*	

* Arithmetic mean flow from the Mississippi River at Winona

% Used For Mixing	=	25	
Hardness	=	142	PPM

Background Metals Data Source: LD 3 - Red Wing; Sullivan 2001-2005

Substance	Result
Cadmium	0.037
Chromium	0.730
Copper	1.962
Lead	0.791
Mercury	3.53E-03
Zinc	5.220

Effluent Information:			Daily Average Flow	
Outfall Number		f	(mgd)	(cfs)
	001	1	301.5	466.50
	Σ	1	301.5	466.50
Effluent Hardness		=	225	PPM
Effluent Dilution due to ZID		=		NA
7Q10:Qe		=	13.1	:1

Note: In evaluating the multiple outfalls from this facility the have been considered separately for purposes of calculating limits under NR 106. This is based on the fact that the earlier mixing zone study showing the lack of plume interaction for Outfalls 001 and 011, and that the discharges from the other outfalls are relatively small compared to the receiving water flow, and for all detected substances (apart from mercury), the limitations based on acute criteria are protective of other uses and criteria.

Outfall 001:

CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)

SUBSTANCE	Ref. Hard. or pH	ATC	Daily Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	1-day P99	1-day Max. Conc.
Chromium (+3)	225	3503.04	7006.08	1401.22	0.68		
Copper	225	33.35	66.70	13.34	7.1		10
Mercury		0.83	1.66	0.33	2.21E-03		
Nickel	225	904.63	1809.26	361.85	1.93		
Chloride (mg/L)		757	1514.00		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)

Receiving Water Flow = 1525 cfs

SUBSTANCE	Ref. Hard. or pH	CTC	Mean Back-ground	Weekly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	4-day P99	4-day Max. Conc.
Chromium (+3)	142	176.06	0.730	573.89	114.78	0.68		
Copper	142	13.97	1.962	41.22	8.24	7.12		
Nickel	142	70.22		229.55	45.91	1.93		
Mercury		0.44	0.004	1.43	0.29	2.21E-03		
Chloride (mg/L)		395	10	1268.57		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON WC (ug/L)

Receiving Water Flow = 2135.63 cfs

SUBSTANCE	WC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Mercury	1.30E-03	3.53E-03	3.53E-03		2.21E-03		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)

Receiving Water Flow = 7397.45 cfs

SUBSTANCE	Ref. Hard. or pH	HTC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Chromium (+3)		3.82E+06	0.73	6.05E+07	1.21E+07	0.68		
Mercury		1.50E-03	3.53E-03	3.53E-03	-5.74E-03	2.21E-03		
Nickel		4.30E+04		6.82E+05	1.36E+05	1.93		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)

Receiving Water Flow = 7397.45 cfs

SUBSTANCE	Ref. Hard. or pH	HCC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
None detected								

Outfall 012:

Effluent Information:			Daily Average Flow	
Outfall Number		f	(mgd)	(cfs)
	012	1	2.877	4.45
	Σ	1	2.877	4.45
Effluent Hardness		=	220	PPM
Effluent Dilution due to ZID		=		NA
7Q10:Qe		=	1370.3	:1

CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)

SUBSTANCE	Ref. Hard. or pH	ATC	Daily Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	1-day P99	1-day Max. Conc.
Chromium (+3)	225	3503.04	7006.08	1401.22	0.68		
Copper	225	33.35	66.70	13.34	7.1		10
Mercury		0.83	1.66	0.33	2.21E-03		
Nickel	225	904.63	1809.26	361.85	1.93		
Chloride (mg/L)		757	1514.00		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)

Receiving Water Flow = 1525 cfs

SUBSTANCE	Ref. Hard. or pH	CTC	Mean Back-ground	Weekly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	4-day P99	4-day Max. Conc.
Chromium (+3)	142	176.06	0.730	573.89	114.78	0.68		
Copper	142	13.97	1.962	41.22	8.24	7.12		
Nickel	142	70.22		229.55	45.91	1.93		
Mercury		0.44	0.004	1.43	0.29	2.21E-03		
Chloride (mg/L)		395	10	1268.57		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON WC (ug/L)

Receiving Water Flow = 2135.63 cfs

SUBSTANCE	WC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Mercury	1.30E-03	3.53E-03	3.53E-03	7.07E-04	2.21E-03		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)

Receiving Water Flow = 7397.45 cfs

SUBSTANCE	Ref. Hard. or pH	HTC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Cadmium		370	0.037	5867	1173			
Chromium (+3)		3.82E+06	0.73	6.05E+07	1.21E+07	0.68		
Lead		140	0.791	2208	442			
Mercury		1.50E-03	3.53E-03	3.53E-03	7.07E-04	2.21E-03		
Nickel		4.30E+04		6.82E+05	1.36E+05	1.93		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)

Receiving Water Flow = 7397.45 cfs

SUBSTANCE	Ref. Hard. or pH	HCC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
None detected								

Outfall 006:

Effluent Information:			Daily Average Flow	
Outfall Number		f	(mgd)	(cfs)
	006	0	0.8967	1.39
	Σ	1	0.8967	1.39
Effluent Hardness		=	489	PPM
Effluent Dilution due to ZID		=		NA
7Q10:Qe		=	4396.6	:1

CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)

SUBSTANCE	Ref. Hard. or pH	ATC	Daily Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	1-day P99	1-day Max. Conc.
Copper	489	69.37	138.74	27.75	4.9		7
Cyanide		45.78	91.56	18.31	6.1		
Mercury		0.83	1.66			1.88E-02	2.92E-02
Nickel	268	1048.88	2097.76	419.55	2.29		
Zinc	333	344.68	689.36	137.87			
Chloride (mg/L)		757	1514.00		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)

Receiving Water Flow = 1525 cfs

SUBSTANCE	Ref. Hard. or pH	CTC	Mean Back-ground	Weekly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	4-day P99	4-day Max. Conc.
Chromium (+3)	142	176.06	0.730	192714.64	38542.93	1.27		
Copper	142	13.97	1.962	13200.55	2640.11	4.90		
Cyanide		11.47	0.791	11738.61	2347.72	6.10		
Nickel	142	70.22		77182.29	15436.46	2.29		
Mercury		0.44	3.53E-03	479.74			1.02E-02	
Chloride (mg/L)		395		434164.12		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON WC (ug/L)

Receiving Water Flow = 2135.63 cfs

SUBSTANCE	WC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Mercury	1.30E-03	3.53E-03	1.50E-03			4.96E-03	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)

Receiving Water Flow = 2122.50 cfs

SUBSTANCE	Ref. Hard. or pH	HTC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Antimony		373		570615	114123	0.88		
Chromium (+3)		3.82E+06	0.73	5.84E+09	1.17E+09	1.27		
Lead		140	0.791	212963	42593	6.10		
Mercury		1.50E-03	3.53E-03	1.50E-03			4.96E-03	
Nickel		4.30E+04		6.58E+07	1.32E+07	2.29		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)

Receiving Water Flow = 2122.50 cfs

SUBSTANCE	Ref. Hard. or pH	HCC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
None detected								

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility:	DPC Alma (J.P. Madgett)	**Data Range**	**7Q10 or 4Q3:**	6100	cfs
Outfall(s):	001	**Start:** 01/01/08	**Dilution:**	25%	
Date Prepared:	21-Jun-11	**End:** 02/28/11	**f:**	1	
Design Flow (Qe):	301.5 mgd		**Stream type:**	Mississippi River	
			Qs:Qe ratio:	3.3 :1	
			Calculation Needed?	**YES**	

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		Representative Highest Monthly Effluent Temperature		99th Percentile of Representative Data		**Calculated Effluent Limits**	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Ave (Qesl)	Daily Max Flow Rate (Qea)	Weekly Ave	Daily Max	Weekly Ave	Daily Max*	**Weekly Ave Limit**	**Daily Max Limit**
	(°F)	(°F)	(°F)	(cfs)	(mgd)	(mgd)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)
JAN	32	49	75	1525.00	274.20	274.20	63	67	63	NA	93	120
FEB	33	50	76	1525.00	274.20	274.20	62	66	62	NA	94	120
MAR	36	52	76	1525.00	274.20	274.20	69	71	68	79	94	120
APR	47	55	79	1525.00	322.60	322.60	68	72	68	77	71	120
MAY	60	65	82	1525.00	322.60	322.60	**81**	84	**76**	84	**75**	120
JUN	72	75	85	1525.00	322.60	322.60	**89**	92	**86**	91	**81**	112
JUL	76	80	86	1525.00	322.60	322.60	**91**	94	**91**	95	**88**	107
AUG	76	79	86	1525.00	322.60	322.60	**92**	94	**91**	95	**85**	107
SEP	67	73	84	1525.00	322.60	322.60	83	90	83	92	85	119
OCT	54	61	81	1525.00	322.60	322.60	73	75	71	77	75	120
NOV	40	50	77	1525.00	322.60	322.60	63	65	61	71	71	120
DEC	33	49	76	1525.00	297.24	322.60	51	58	51	56	86	120

*NA - Indicates that there are greater than 100 daily maximum values, therefore 99th percentile would be a value less than the recorded daily maximum.

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility:	DPC Alma 1-5	**Data Range**	**7Q10 or 4Q3:**	6100	cfs
Outfall(s):	011 & 012	**Start:** 01/01/08	**Dilution:**	25%	
Date Prepared:	21-Jun-11	**End:** 02/28/11	**f:**	1	
Design Flow (Qe):	175.6 mgd		**Stream type:**	Mississippi River	
			Qs:Qe ratio:	5.6 :1	
			Calculation Needed?	**YES**	

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		Representative Highest Monthly Effluent Temperature		99th Percentile of Representative Data		**Calculated Effluent Limits**	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Ave (Qesl)	Daily Max Flow Rate (Qea)	Weekly Ave	Daily Max	Weekly Ave	Daily Max*	**Weekly Ave Limit**	**Daily Max Limit**
	(°F)	(°F)	(°F)	(cfs)	(mgd)	(mgd)	(°F)	(°F)	(°F)	(°F)	(°F)	(°F)
JAN	32	49	75	1525.00	205.259	205.346	53	59	52	NA	114	120
FEB	33	50	76	1525.00	162.965	162.965	51	53	51	NA	-	120
MAR	36	52	76	1525.00	160.052	162.669	54	58	52	59	-	120
APR	47	55	79	1525.00	202.812	202.946	74	76	67	78	86	120
MAY	60	65	82	1525.00	202.98	203.066	78	79	74	84	84	120
JUN	72	75	85	1525.00	203.217	205.015	**91**	**94**	**87**	97	**87**	120
JUL	76	80	86	1525.00	203.683	203.716	**96**	**99**	**94**	107	**95**	120
AUG	76	79	86	1525.00	203.949	203.949	**95**	**97**	**93**	104	**90**	120
SEP	67	73	84	1525.00	326.339	326.339	85	92	83	95	85	118
OCT	54	61	81	1525.00	203.011	205.441	72	78	67	77	88	120
NOV	40	50	77	1525.00	202.892	203.11	64	66	57	68	89	120
DEC	33	49	76	1525.00	201.993	201.993	48	56	48	55	111	120

*NA - Indicates that there are greater than 100 daily maximum values, therefore 99th percentile would be a value less than the recorded daily maximum.

Note – flow data are 001 & 012 combined, temperature data from 011 only.

Outfall 001:

Date	Cu (µg/L)	Hardness (mg/L as $CaCO_3$)
01-Apr-10	10	196
06-Apr-10	8.48	222
09-Apr-10	4.06	239
12-Apr-10	5.95	247

Outfall 006:

Date	Hardness (mg/L as $CaCO_3$)	Date	Cu (µg/L)
06-Apr-10	472	07-Sep-09	7
09-Apr-10	469	08-Sep-09	4.5
12-Apr-10	473	10-Sep-09	3.1
15-Apr-10	547	11-Sep-09	5

Date	Hg (ng/L)	Date	Hg (ng/L)	Date	Hg (ng/L)	Date	Hg (ng/L)
18-Jan-06	2.16	12-Jun-07	0.778	18-Nov-08	2.41	7-Apr-10	3.97
7-Feb-06	1.08	10-Jul-07	0.989	9-Dec-08	1.94	12-May-10	0.928
14-Mar-06	1.42	7-Aug-07	0.989	21-Jan-09	3.1	10-Jun-10	0.906
10-Apr-06	2.87	11-Sep-07	1.04	11-Feb-09	2.33	7-Jul-10	5.97*
8-May-06	2.15	2-Oct-07	1.96	10-Mar-09	1.98	11-Aug-10	9.78
21-Jun-06	1.18	6-Nov-07	1.74	14-Apr-09	0.729	8-Sep-10	2.33
11-Jul-06	1.323	4-Dec-07	2.53*	12-May-09	2.03	14-Oct-10	11.4
9-Aug-06	0.929	8-Jan-08	2.36	9-Jun-09	1.25	9-Nov-10	9.5
6-Sep-06	0.402	13-Feb-08	4.18	9-Jul-09	0.835	16-Dec-10	4.2
3-Oct-06	4.14	11-Mar-08	1.46	13-Aug-09	1.55	12-Jan-11	0.706
8-Nov-06	1.6	9-Apr-08	5.72	17-Sep-09	2.4	17-Feb-11	1.09
7-Dec-06	1.84	13-May-08	4.93	7-Oct-09	29.2	8-Mar-11	0.473
9-Jan-07	1.08	10-Jun-08	3.26	10-Nov-09	1.81	7-Apr-11	0.322
20-Feb-07	1.51	8-Jul-08	2.51	8-Dec-09	1.92*	17-May-11	4.37
13-Mar-07	1.47	20-Aug-08	1.25	12-Jan-10	2.08		
17-Apr-07	0.972	16-Sep-08	5.45	10-Feb-10	1.6		
8-May-07	1.35	14-Oct-08	1.22	9-Mar-10	1.62		

*data not used in P99 calculations due to lack of field blank data.

Outfall 012:

Date	Cu (µg/L)	Hardness (mg/L as $CaCO_3$)
31-Mar-10	9.67	184
07-Apr-10	7.33	224
20-Apr-10	18.8	242
23-Apr-10	19	235
25-May-10	16.3	
28-May-10	18.1	
01-Jun-10	17.5	
04-Jun-10	16.5	
08-Jun-10	18.1	
11-Jun-10	13.9	
15-Jun-10	13.3	

CORRESPONDENCE / MEMORANDUM **State of Wisconsin**

DATE: March 30, 2012 FILE REF: 3200

TO: Jeff Brauer – WT/3

FROM: Patrick Oldenburg - WCR

SUBJECT: Water Quality-Based Effluent Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett (WI-0040223) REVISION

This is a revision to elements of the September 12, 2011 evaluation of water quality-based effluent limitations for toxic substances using chs. NR 102, 105, 106, and 217 of the Wisconsin Administrative Code (where applicable), for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett's discharge to the Mississippi River. The discharge is located in the Lower Buffalo River Watershed of the Buffalo-Trempealeau River Basin in Buffalo County.

The revision is based on supplementary information regarding the mixing characteristics at Outfall 006. The September 12, 2011 effluent limit recommendations memo treated this discharge as though it discharged to the main channel of the Mississippi River, when in actuality the discharge is in a small backwater with little or no current. In that light, it is more appropriate to consider the chronic mixing zone more of a non-unidirectional flow situation for substances with shorter term criteria (e.g. temperature and chronic toxicity criteria)

This change in approach impacts the recommended temperature limits and whole effluent toxicity monitoring recommendations. It does not change the copper, mercury or phosphorus water quality based limits recommended in the September 12, 2011 effluent limit recommendations.

The calculated temperature limits are as follows:

Month	Weekly Ave Limit (°F)	Daily Max Limit (°F)
JAN	59	86
FEB	59	87
MAR	60	87
APR	60	90
MAY	69	89
JUN	77	90
JUL	83	90
AUG	80	89
SEP	76	89
OCT	63	88
NOV	54	89
DEC	59	90

There has been no systematic collection of temperature data at this outfall, and it is unclear to

this reviewer if there is any reasonable potential for these limitations to be exceeded. Barring a determination based on best professional judgment by the permit drafter that there is no reasonable potential for the limitation to be exceeded, in accordance with ch. NR 106.56((12), when representative effluent temperature data is not available at the time of permit reissuance, the proposed permit shall include effluent temperature monitoring (for at least one year), water quality based effluent limits for temperature, and a compliance schedule to meet the temperature limits. The proposed permit shall also include a condition that invalidates the limitations and compliance schedule if the data that is collected as a condition of the reissued permit demonstrates that limitations are not necessary.

See Chapter 17 of the draft *Guidance for Implementation of Wisconsin's Thermal Water Quality Standards* for more information on relevant permit conditions

Based on the data collected during the current and previous permit terms, and the guidance provided in the July 1, 2008 *Whole Effluent Toxicity Program Guidance Document - Revision #8* two acute and two chronic Whole Effluent Toxicity (WET) tests are recommended.

If there are any questions or comments, please contact Pat Oldenburg at (715) 831-3262 or via e-mail at Patrick.Oldenburg@wisconsin.gov.

e-cc: Pete Skorseth - WCR/Baldwin
John Sullivan - WCR/La Crosse
Amanda Minks - WT/3
Diane Figiel - WT/3

Effluent limit calculations for:	Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett
WPDES Permit #:	0040223
Permit Drafter:	Jeff Brauer
Basin Engineer:	Pete Skorseth - WCR/Baldwin
WQ Reviewer:	John Sullivan - WCR/La Crosse
Receiving Water Information:	
Receiving Water:	Mississippi River
Watershed:	Lower Buffalo River Watershed
Basin:	Buffalo-Trempealeau River Basin
County:	Buffalo
Classification:	Warm Water Sport Fish Community, Non-public Water Supply

Lake Dilution Factor	=	10	parts lake water to 1 part effluent
% Used For Mixing	=	25	
Hardness	=	142	PPM

Background Metals Data Source: LD 3 - Red Wing; Sullivan 2001-2005

Substance	Result
Cadmium	0.037
Chromium	0.730
Copper	1.962
Lead	0.791
Mercury	3.53E-03
Zinc	5.220

Effluent Information:

Outfall Number		f	Daily Average Flow (mgd)	(cfs)
	006	0	0.8967	1.39
	Σ	1	0.8967	1.39

Effluent Hardness	=	489	PPM
Effluent Dilution due to ZID	=		NA

CALCULATION OF EFFLUENT LIMITATIONS BASED ON ATC (ug/L)

SUBSTANCE	Ref. Hard. or pH	ATC	Daily Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	1-day P99	1-day Max. Conc.
Chromium (+3)	301	4445.84	8891.68	1778.34	1.27		
Copper	489	69.37	138.74	27.75	4.9		7
Cyanide		45.78	91.56	18.31	6.1		
Mercury		0.83	1.66			1.86E-02	2.92E-02
Nickel	268	1048.88	2097.76	419.55	2.29		
Chloride (mg/L)		757	1514.00		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON CTC (ug/L)

Dilution Factor = 10 to 1

SUBSTANCE	Ref. Hard. or pH	CTC	Mean Back-ground	Weekly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	4-day P99	4-day Max. Conc.
Chromium (+3)	142	176.06	0.730	1929.36	385.87	1.27		
Copper	142	13.97	1.962	134.05	26.81	4.90		
Cyanide		11.47	0.791	126.17	25.23	6.10		
Nickel	142	70.22		772.42	154.48	2.29		
Mercury		0.44	0.004	4.84			1.01E-02	
Chloride (mg/L)		395	10	4.34E+06		13.2		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON WC (ug/L)

Dilution Factor = 10 to 1

SUBSTANCE	WC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Mercury	1.30E-03	3.53E-03	1.50E-03			4.93E-03	

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HTC (ug/L)

Dilution Factor = 10 to 1

SUBSTANCE	Ref. Hard. or pH	HTC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
Chromium (+3)		3.82E+06	0.73	4.20E+07	8.40E+06	1.27		
Lead		9300		102300	20460	6.10		
Mercury		1.50E-03	3.53E-03	1.50E-03			4.93E-03	
Nickel		4.30E+04		473000	94600	2.29		

CALCULATION OF EFFLUENT LIMITATIONS BASED ON HCC (ug/L)

Dilution Factor = 10 to 1

SUBSTANCE	Ref. Hard. or pH	HCC	Mean Back-ground	Monthly Effl. Limit	1/5 of Effl. Limit	Mean Effl. Conc.	30-day P99	30-day Max. Conc.
None detected								

WHOLE EFFLUENT TOXICITY (WET) TESTING CHECKLIST SUMMARY

	Acute	Chronic
IWC	Not Applicable for Acute	Instream Waste Concentration : 9 (< 35% = 0 pts; 36 - 65% = 1- pts; >65% = 15 pts) **Total Points: 0**
Historical Data	Acute RPF : 0 a limit is required if >= 0.3 **Total Points: 0**	Chronic RPF : 0 a limit is required if >= 0.3 **Total Points: 5**
Effluent Variability	Points assessed for effluent variability, permit violations and WWTP operations **Total Points: 0**	Same as Acute **Total Points: 0**
Stream Classification	Points assessed due to receiving water classification **5**	Same as Acute **Total Points: 5**
Chemical Specific Data	Acute WQBEL required: 0 Substances detected without WQBEL: 6 Additional compounds of concern: 0 **Total Points: 3**	Chronic WQBEL required: 0 Substances detected without WQBEL: 6 Additional compounds of concern: 0 **Total Points: 3**
Additives	# Biocide(s): 0 # Water Quality Conditioners: 2 **Total Points: 2**	Same as Acute **Total Points: 2**
Discharge Category	Industrial Type 0 **Total Points: 5**	Same as Acute **Total Points: 5**
Wastewater Treatment	Points assessed for effluent variability, permit violations and WWTP operations **Total Points: 0**	Same as Acute **Total Points: 0**
Downstream Impacts	Points assessed due to ecological impacts solely or partially due to the discharge **Total Points: 0**	Same as Acute **Total Points: 0**
TOTAL POINTS	**Acute : 15**	**Chronic : 20**

Facility Type:	Industrial
Secondary values considered and no WET data?	N
Is this facility classified as either a Major Municipal or Primarily Industrial Facility?	N
Effluent limits based on a dissolved water quality criterion?	N
Acute Frequency:	2 tests in permit term
Chronic Frequency:	2 tests in permit term
Recommended Chronic Dilution Series:	100% 30% 10% 3% 1%
NEW IWC:	9

Temperature limits for receiving waters without unidirectional flow

(calculation using default ambient temperature data)*

Southern Inland Lakes | Dairyland Alma

Inland lake or impoundment shore discharge

Date Prepared: 02/02/2012

Design Flow (Qe): 0.8967 mgd

Data Range

Start: 01/02/08

End: 02/28/11

Lake Type:

Discharge Type:

Maximum area of mixing zone allowed (coefficient "A"): 15,708 ft^2

Month	Water Quality Criteria			Representative Highest Effluent Flow Rate (Qe)		NR 106.55(7) Coefficients			Representative Highest Monthly Effluent Temperature		99th Percentile of Representative Data		**Calculated Effluent Limits**	
	Ta (default)	Sub-Lethal WQC	Acute WQC	7-day Rolling Ave (Qesl)	Daily Max Flow Rate (Qea)	B	e^{-a}	e^{-a}	Weekly Ave	Daily Max	Weekly Ave	Daily Max	**Weekly Ave Limit**	**Daily Max Limit**
	(°F)	(°F)	(°F)	(mgd)	(mgd)				(°F)	(°F)	(°F)	(°F)	(°F)	(°F)
JAN	32	49	75	0.48	0.98	0.405	0.638	0.800					59	86
FEB	33	50	76	0.51	0.940	0.405	0.652	0.794					59	87
MAR	36	52	76	0.52	0.915	0.405	0.659	0.789					60	87
APR	47	55	79	0.46	0.715	0.405	0.626	0.738					60	90
MAY	60	65	82	0.47	0.915	0.555	0.577	0.753					69	89
JUN	72	75	85	0.51	0.897	0.667	0.567	0.723					77	90
JUL	76	80	86	0.53	0.946	0.667	0.575	0.735					83	90
AUG	76	79	86	1.01	1.130	0.667	0.749	0.773					80	89
SEP	67	73	84	0.60	0.969	0.555	0.648	0.765					76	89
OCT	54	61	81	0.74	1.003	0.405	0.746	0.805					63	88
NOV	40	50	77	0.59	0.798	0.405	0.691	0.762					54	89
DEC	33	49	76	0.43	0.790	0.405	0.605	0.760					59	90

*Default ambient Mississippi River temperatures used in calculation of criteria.

CORRESPONDENCE / MEMORANDUM **State of Wisconsin**

DATE: September 14, 2015

TO: Johnathan Hill – WY/3

FROM: Patrick Oldenburg – Eau Claire

SUBJECT: Mercury Limitations for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett (WI-0040223)

This is in response to your request for an evaluation of water quality-based effluent limitations for mercury using chs. NR 105 and 106 of the Wisconsin Administrative Code (where applicable), for Dairyland Power Cooperative, Alma 1-5 and J.P. Madgett's discharge to the Mississippi River. The discharge is located in the Lower Buffalo River Watershed of the Buffalo-Trempealeau River Basin in Buffalo County.

The revision is based on supplementary mercury information gathered since the September 12, 2011 effluent limit recommendations memo. That memo determined that based on 65 valid test results for mercury collected from Outfall 006 from January 2006 through May 2011 the upper 99th percentile of 30 day average discharge concentrations, as determined by the procedure specified in s. NR 106.05(5)(a), was 5.0 ng/L, which exceeded a potential limit of 1.3 ng/l. Therefore, a limit for mercury was recommended. Under s. NR 106.145(4), a permittee may be eligible for an alternative mercury effluent limitation. Using the outlined in s. NR 106.145(5) approach, the calculated alternative mercury limitation at that time was 19 ng/L.

Dairyland Power implemented their mercury pollutant minimization plan in 2009. Two key sources of mercury that the plan focused on are reduction in the use of mercury containing materials and wastewater reuse. One source of mercury to the wastewater treatment system is the sulfuric acid and sodium hydroxide used in the boiler water purification process. Dairyland Power had previously switched to a membrane grade caustic to reduce mercury inputs. In late 2011, the facility installed a reverse osmosis unit to the boiler water treatment system. Prior to installation of the system, 45,000 gallons of sulfuric acid and 50,000 gallons of sodium hydroxide were used on an annual basis. In 2014, this usage had dropped to 909 gallons of sulfuric acid and 1,353 gallons of sodium hydroxide. This low usage rate is expected to continue in the future.

Another mercury input to the wastewater treatment system that has been reduced is leachate from the ash disposal landfill. Steps have been taken to develop the landfill in smaller cells which results in less acreage at the landfill exposed to rainfall and hence less leachate production. Leachate is also reused in the ash conditioning process, and it is projected that this use will increase in the future, further limiting the amount of leachate that is treated and discharged through Outfall 006.

Based on the number of changes that have occurred at this facility since the start of the mercury minimization program, it is appropriate that mercury limitations be re-evaluated as it appears that the data used in the 2011 evaluation are no longer representative of the current discharge.

It is also too early to judge the effects of the recent shutdown of Alma Units 1-5 on effluent mercury results, although it is anticipated that this will result in a further decrease in mercury discharges. Many of the changes undertaken to reduce mercury discharges at Dairyland Power are incremental and ongoing. In addition, many of these same steps have reduced the volume of wastewater discharged, which makes it somewhat difficult to pick clear break points in the effluent concentration data. However, installation of the RO system and other activities taking place in 2011 appear to represent a significant step in reducing the amount of mercury discharged from 006 as the total mass of mercury is has been greatly reduced from 2012 onwards:

Year	Total Annual Flow (MG)	Mean Annual Hg (ng/L)	Annual Mass Discharged (g)
2006	177.20	1.76	1.18
2007	138.01	1.26	0.66
2008	104.25	3.06	1.21
2009	67.83	4.09	1.05
2010	65.39	4.39	1.09
2011	73.09	2.62	0.72
2012	75.99	0.91	0.26
2013	69.64	0.67	0.18
2014	67.43	1.33	0.34

Because of this significant drop in the mass of mercury discharged, the beginning of calendar year 2012 is a reasonable place to consider historic mercury data as representative of the current discharge. Dairyland Power collected 39 valid test results for mercury from January 2012 through April 2015 (data attached). The upper 99th percentile of 30 day average discharge concentrations, as determined by the procedure specified in NR 106.05(5)(a), is 1.4 ng/L, which exceeds a potential monthly average limit of 1.3 ng/l. Therefore, a limit for mercury is still recommended at Outfall 006.

Using this approach outlined in s. NR 106.145(5), which specifies that an alternative limitation shall equal the 1-day P99 of the effluent data, and shall be expressed as a daily maximum concentration, the calculated alternative mercury limitation would be 4.6 ng/L.

If there are any questions or comments, please contact Pat Oldenburg at (715) 831-3262 or via e-mail at Patrick.Oldenburg@wisconsin.gov.

e-cc: Lori Fassbender – Black River Falls
Shawn Giblin - La Crosse
Diane Figiel - WY/3

Date	Hg (ng/L)	Date	Hg (ng/L)	Date	Hg (ng/L)	Date	Hg (ng/L)
10-Jan-12	1	10-Jan-13	0.566	16-Jan-14	0.253	14-Jan-15	1.24
07-Feb-12	0.581	13-Feb-13	0.764	19-Feb-14	0.596	24-Feb-15	0.742
07-Mar-12	0.669	21-Mar-13	0.342	13-Mar-14	0.974	19-Mar-15	0.585
20-Apr-12	0.791	10-Apr-13	1.28	09-Apr-14	2.64	10-Apr-15	1.85
08-May-12	1.49	21-May-13	1.2	13-May-14	5.75		
12-Jun-12	1.1	19-Jun-13	0.786	10-Jun-14	0.607		
10-Jul-12	2.11	09-Jul-13	0.909	09-Jul-14	0.758		
09-Aug-12	0.727	06-Aug-13	0.372	07-Aug-14	0.572		
18-Sep-12	0.706	12-Sep-13	0.266	09-Sep-14	0.979		
11-Oct-12	0.568	16-Oct-13	0.904	30-Oct-14	1.99*		
16-Nov-12	0.528	13-Nov-13	0.267	24-Nov-14	0.736		
11-Dec-12	0.663	12-Dec-13	0.363	11-Dec-14	0.752		

*data excluded due to lack of concurrent field blank.

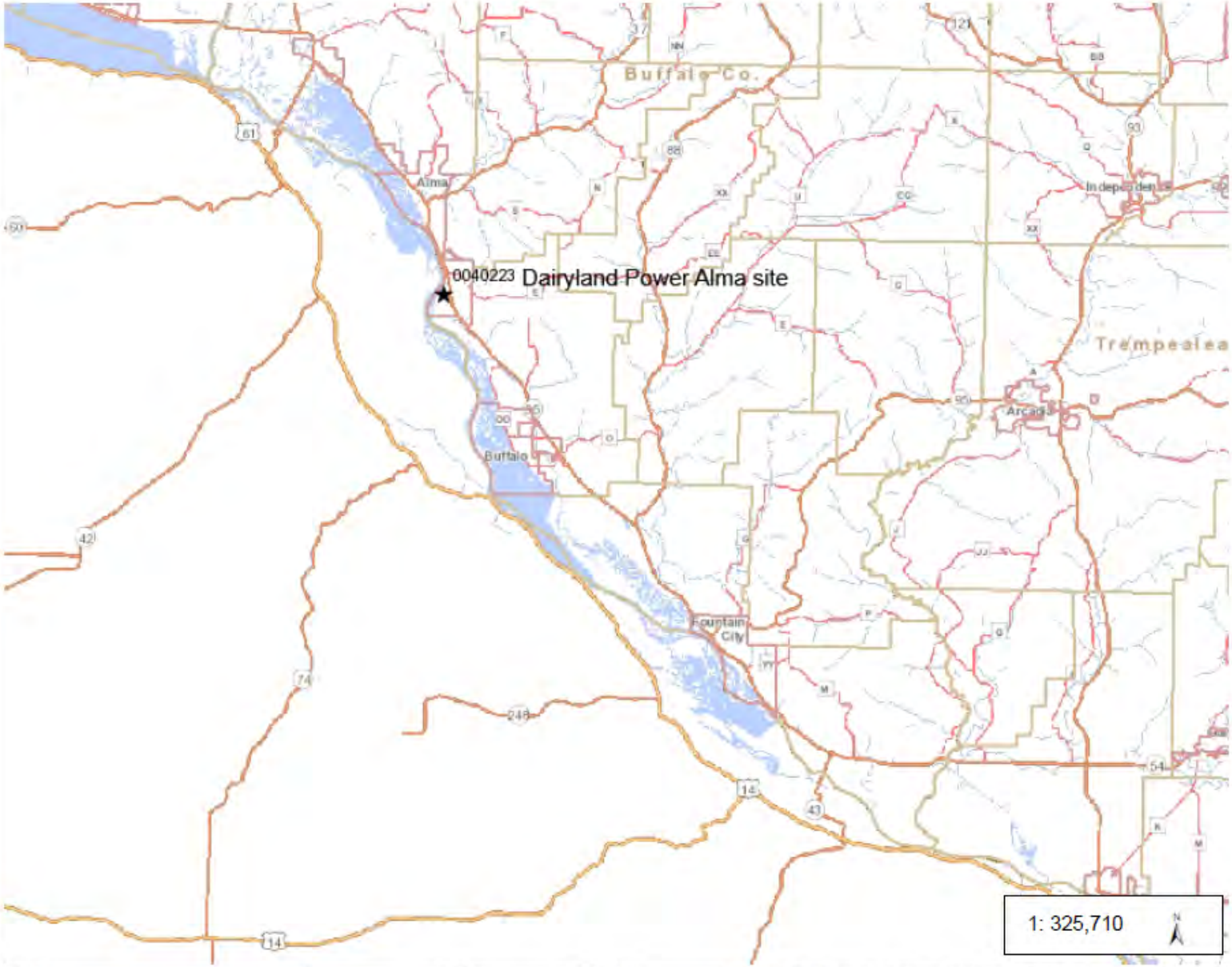
SUBSTANTIAL COMPLIANCE DETERMINATION

Permittee Name –
Dairyland Power COOP Alma 1-5 & JP Madgett Plant

WPDES Permit Number: WI-0040223-07-1

	Compliance	Comments
Discharge Limits	Yes	
Sampling/testing requirements	Yes	
Groundwater standards	NA	
Reporting requirements	Yes	
Compliance schedules	Yes	In compliance with the conditions of all compliance schedules: - Cooling Water Intake System Evaluation - Mercury Pollutant Minimization Program
Other:	None	
Enforcement considerations	None	
Operator certification	Yes	Required – 3K, Sherry Koenig and Janet Cleveland are both certified at 3-JK. Janet and submitted her experience form to bring her level from T (training) up to level 3. J – labs K- special
In substantial compliance? Yes	**Name: Lori Fassbender**	**Date: 5/15/2015**

Variances near Dairyland Power Alma



Legend

Cities, Towns & Villages
- City
- Village
- Civil Town

Other Cities

Major Roads
- Interstates
- US Highways
- State Highways

Rivers and Streams

Open Water

Current Variances
- Arsenic (Current)
- Chloride (Current)
- Copper (Current)
- Mercury (Current)

Variances Pending Approval
- Arsenic (Pending)
- Chloride (Pending)
- Copper (Pending)
- Mercury (Pending)
- Phosphorus (Pending)
- Thermal (Pending)

Notes

10.3 0 5.14 10.3 Miles

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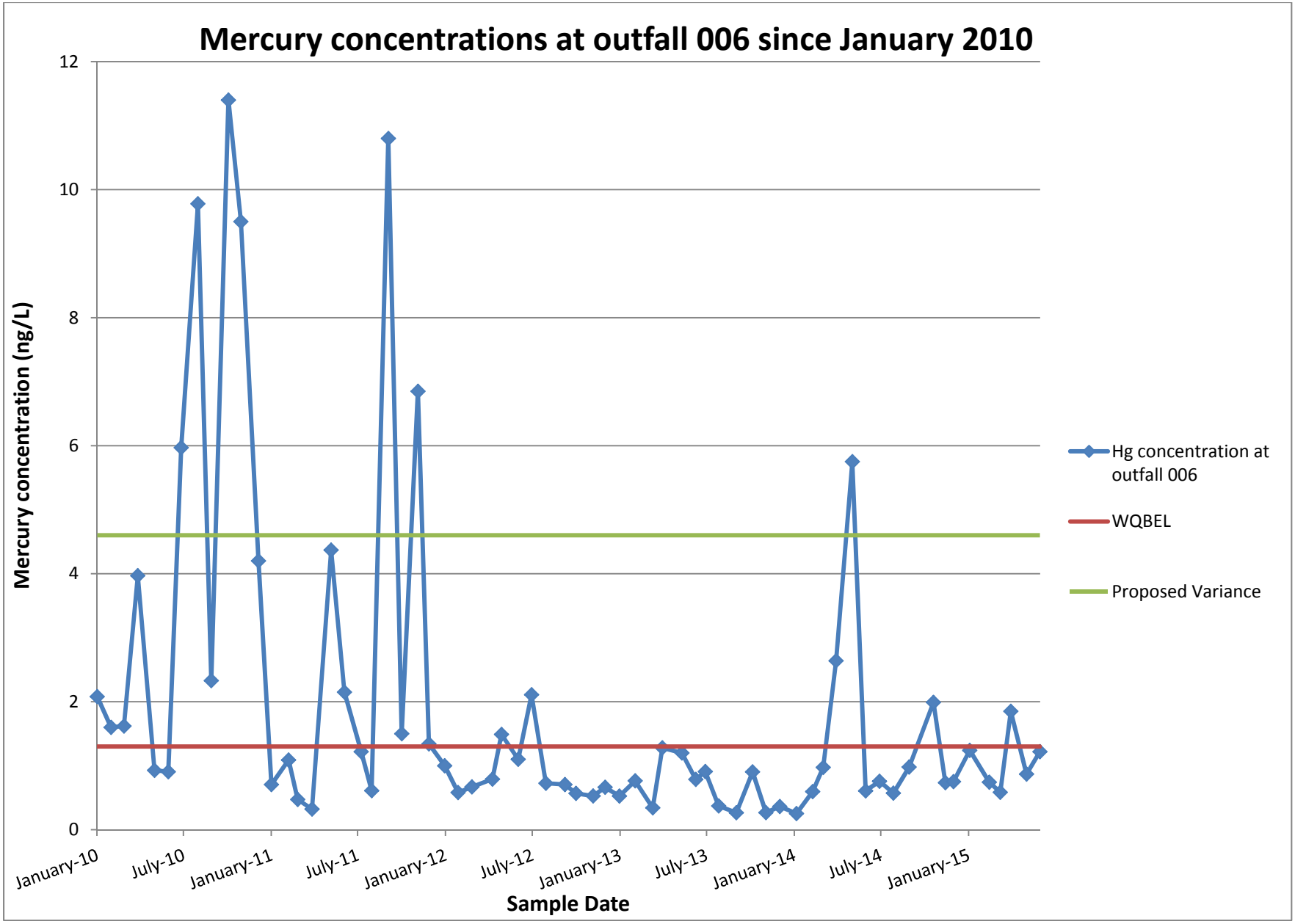
Mercury concentrations at outfall 006 since January 2010
Mercury concentration (ng/L)
12
10
8
6
4
2
0
January-10
July-10
January-11
July-11
January-12
July-12
January-13
July-13
January-14
July-14
January-15
Sample Date
Hg concentration at outfall 006
WQBEL
Proposed Variance