

Facility Specific Standard Variance Data Sheet

Directions: Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.

Section I: General Information

A. Name of Permittee: Dairyland Power Cooperative

B. Facility Name: Dairyland Alma site

C. Submitted by: Wisconsin Department of Natural Resources

D. State: Wisconsin **Substance:** Mercury **Date completed:** May 22, 2014

E. Permit #: WI-0040223-08 **WQSTS #:** (EPA USE ONLY)

F. Duration of Variance **Start Date:** April 1, 2016 **End Date:** March 31, 2021

G. Date of Variance Application: June 30, 2010

H. Is this permit a: **First time submittal for variance**
 Renewal of a previous submittal for variance (*Complete Section X*)

I. Description of proposed variance:

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

Outfall 006 consists of 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.

The JPM Station has a generating capacity of 400 MW of electricity.

An alternative mercury effluent limitation under s. NR 106.145, Wis. Adm. Code represents a variance to water quality standards authorized by s. 283.15, Wis. Stats. The Department concludes that Dairyland Power Cooperative has met the requirements of s. NR 106.145, Wis. Adm. Code, and s. 283.15, Wis. Stats. The Department further concludes that requiring Dairyland Power Cooperative to meet the water quality standard for mercury would result in substantial and widespread adverse social and economic impacts in the service area of Dairyland Power Cooperative Alma site Power Plant. The Department proposes a variance to the water quality standard for wildlife.

Citation: An alternative mercury effluent limitation under s. NR 106.145, Wis. Adm. Code represents a variance to water quality standards authorized by s. 283.15, Wis. Stats.

J. List of all who assisted in the compilation of data for this form

Name	Email	Phone	Contribution
Jonathan Hill	Jonathan.hill@wisconsin.gov	(608) 267-7627	Sections I-X
Pat Oldenburg	Pat.oldenburg@wisconsin.gov	(715) 831-3262	Parts II D-H and J

Section II: Criteria and Variance Information

A. Water Quality Standard from which variance is sought: 1.3 ng/L Wildlife Criterion

B. List other criteria likely to be affected by variance: 1.5 ng/L Human Threshold Criterion

C. Source of Substance:

- Sulfuric acid and sodium hydroxide used in the demineralization of boiler water and also pH neutralization of wastewater prior to discharge.
- Leachate and runoff pond water from the Alma Off-site ash disposal facility that is periodically discharged through the process wastewater system.

D. Ambient Substance Concentration: 3.5 ng/L **Measured** **Estimated**
 Default **Unknown**

E. If measured or estimated, what was the basis? Include citation.			
Data from Lock & Dam #3 at Red Wing MN 2001-2005.			
F. Average effluent discharge rate:	0.254 MGD (January, 2012- April, 2015)	Maximum effluent discharge rate:	0.916 MGD (November 17, 2014)
G. Effluent Substance Concentration:	Mean = 1.96 ng/L One-Day upper 99 th percentile value = 4.6 ng/L	<input checked="" type="checkbox"/> Measured <input type="checkbox"/> Default	<input type="checkbox"/> Estimated <input type="checkbox"/> Unknown
H. If measured or estimated, what was the basis? Include Citation.			
Data collected on Discharge Monitoring Reports from the facility during the time from January 2012 through April 2015 (n=39). See July 2015 memo from Pat Oldenburg to Jonathan Hill			
I. Level currently achievable (LCA): 4.6 ng/L daily maximum			
J. Variance Limit: 4.6 ng/L daily maximum			
K. What data were used to calculate the LCA, and how was the LCA derived? (Immediate compliance with LCA is required.)			
The LCA is the one-day P99 of the representative effluent data (January 2012 – April 2015; n=39). Citation: s. NR 106.145(5), Wis. Adm. Code.			
L. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation.			
The variance limit = one-day P99. The limit is established in accordance with s. NR 106.145(5), Wis. Adm. Code.			
M. Select all factors applicable as the basis for the variance provided under 40 CFR 131.10(g). Summarize justification below: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input checked="" type="checkbox"/> 6			
Section NR 106.145(1), Wis. Adm. Code, outlines several findings that justify variances for mercury. The Department intended that this provision be generally applicable to all dischargers of mercury, which produce large volumes of effluent with already extremely low mercury concentrations. The Department considers treating these large volumes to produce effluent with even lower concentrations to be technically and economically infeasible. Citation: Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy, April 24, 1997, Ohio Environmental Protection Agency, Division of Surface Water and Foster Wheeler Environmental Corporation and DRI/McGraw-Hill in support of Amended and New Rules in OAC Chapters 3745-1, -2, and -33.			
Section III: Location Information			
A. Counties in which water quality is potentially impacted: <u>Buffalo County</u>			
B. Receiving waterbody at discharge point: <u>Mississippi River</u>			
C. Flows into which stream/river? <u>NA</u> How many miles downstream? <u>NA</u>			
D. Coordinates of discharge point (UTM or Lat/Long): Lat: 44° 18' 18.8", Long: -91° 54' 47.8"			
E. What are the designated uses associated with this waterbody? Warmwater sport-fish, non-public water supply.			
F. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection? Not applicable. The ambient condition is above the wildlife criterion of 1.3 ng/L, so it is not expected that the limit will be achievable at or near the discharge point.			
G. Provide the equation used to calculate that distance (Include definitions of all variables, identify the values used for the clarification, and include citation): See above.			
H. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody:			
Permit Number	Facility Name	Facility Location	Variance Limit [ng/L]
WI-0002381-06	Alliant Nelson Dewey	11999 Cty Hwy VV Cassville, WI	9.01
WI-0003239-09	Dairyland Genoa	S4651 State Road 35, Genoa, WI	12
WI-0029581-09	La Crosse	905 Houska Park Drive, La Crosse, WI	4.8
Please attach a map, photographs, or a simple schematic showing the location of the discharge point as			

well as all variances for the substance currently draining to this waterbody on a separate sheet

I. Is the receiving waterbody on the CWA 303(d) list? If yes, please Yes No Unknown
list the impairments below.

(from <http://dnr.wi.gov/water/impairedSearch.aspx>)

River Mile	Pollutant	Impairment
Mississippi (Reach 6) Apple-Plum LD 11 to Wisconsin State Line (upper Pool 12)	Mercury	Water Quality Use Restrictions
Mississippi (Reach 6) Apple-Plum LD 11 to Wisconsin State Line (upper Pool 12)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 5) Grant-Maquoketa Wisconsin River to LD 11 (mid Pool 10 to LD 12)	Mercury	Water Quality Use Restrictions
Mississippi (Reach 5) Grant-Maquoketa Wisconsin River to LD 11 (mid Pool 10 to LD 12)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 4) Coon-Yellow - Pool 10 portion - Wis R to LD 9)	Mercury	Water Quality Use Restrictions
Mississippi (Reach 4) Coon-Yellow - Pool 10 portion - Wis R to LD 9)	Total Phosphorus	Impairment Unknown
Mississippi (Reach 4) Coon-Yellow - Pool 10 portion - Wis R to LD 9)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 4) Coon-Yellow - Pool 9 portion - LD 9 to LD 8)	Total Phosphorus	Impairment Unknown
Mississippi (Reach 4) Coon-Yellow - Pool 9 portion - LD 9 to LD 8)	Mercury	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 4) Coon-Yellow - Pool 9 portion - LD 9 to LD 8)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 4) Coon-Yellow - Pool 8 portion - LD 8 to Root R.)	Total Phosphorus	Impairment Unknown
Mississippi (Reach 4) Coon-Yellow - Pool 8 portion - LD 8 to Root R.)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 4) Coon-Yellow - Pool 8 portion - LD 8 to Root R.)	Mercury	Water Quality Use Restrictions
Mississippi (Reach 3) LaCrosse-Pine - LD 6 to Root River (Pool 7 to upper Pool 8)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions

Mississippi (Reach 3) LaCrosse-Pine - LD 6 to Root River (Pool 7 to upper Pool 8)	Total Phosphorus	Impairment Unknown
Mississippi (Reach 3) LaCrosse-Pine - LD 6 to Root River (Pool 7 to upper Pool 8)	Mercury	Water Quality Use Restrictions
Mississippi (Reach 2) Buffalo-Whitewater - Chippewa River to LD 6 (lower Pool 4 to Pool 6)	Mercury	Water Quality Use Restrictions
Mississippi (Reach 2) Buffalo-Whitewater - Chippewa River to LD 6 (lower Pool 4 to Pool 6)	PFOs	Contaminated Fish Tissue
Mississippi (Reach 2) Buffalo-Whitewater - Chippewa River to LD 6 (lower Pool 4 to Pool 6)	Total Phosphorus	Impairment Unknown
Mississippi (Reach 2) Buffalo-Whitewater - Chippewa River to LD 6 (lower Pool 4 to Pool 6)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 1) Rush-Vermillion - St. Croix R to Chippewa R(Pools 3- lower Pool 4, Lake Pepin)	PCBs	Contaminated Fish Tissue, Water Quality Use Restrictions
Mississippi (Reach 1) Rush-Vermillion - St. Croix R to Chippewa R(Pools 3- lower Pool 4, Lake Pepin)	PFOs	Contaminated Fish Tissue
Mississippi (Reach 1) Rush-Vermillion - St. Croix R to Chippewa R(Pools 3- lower Pool 4, Lake Pepin)	Sediment/Total Suspended Solids	Degraded Submerged Aquatic Vegetation (SAV)
Mississippi (Reach 1) Rush-Vermillion - St. Croix R to Chippewa R(Pools 3- lower Pool 4, Lake Pepin)	Total Phosphorus	Degraded Biological Community
Mississippi (Reach 1) Rush-Vermillion - St. Croix R to Chippewa R(Pools 3- lower Pool 4, Lake Pepin)	Mercury	Water Quality Use Restrictions

Section IV: Pretreatment (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)

A. Are there any industrial users contributing mercury to the POTW? If so, please list.

N/A

B. Are all industrial users in compliance with local pretreatment limits for mercury? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc)

N/A

C. When were local pretreatment limits for mercury last calculated?

N/A

D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry's discharge of the variance pollutant to the POTW
N/A

Section V: Public Notice TDD

- A. Has a public notice been given for this proposed variance? Yes No
- B. If yes, was a public hearing held as well? Yes No N/A
- C. What type of notice was given? Notice of variance included in notice for permit
 Separate notice of variance
- D. Date of public notice: _____ Date of hearing: _____
- E. Were comments received from the public in regards to this notice or hearing? (If yes, please attach on a separate sheet) Yes No

Section VI: Human Health

- A. Is the receiving water designated as a Public Water Supply? Yes No
- B. Applicable criteria affected by variance: 1.5 ng/L Human Threshold Criterion
- C. Identify any expected impacts that the variance may have upon human health, and include any citations:
- The proposed variance will not adversely affect human health directly through the drinking water.
 - Wisconsin's fish consumption advisory program is designed to mitigate the effect of any ambient mercury concentration above the 1.5 ng/L water quality criterion for the protection of the fish-consuming human population by providing advice to the public to guide them on the amounts of fish that may be consumed safely.
 - Given the lack of wastewater treatment technologies capable of reducing mercury concentrations to achieve a 1.5 ng/L effluent limit, granting a variance in this situation is consistent with protecting the public health, safety and welfare because of the substantial public health and safety benefits of providing wastewater treatment, the continued commitment towards further mercury pollutant minimization, the Wisconsin fish advisory program, and the limited impact of the elevated effluent concentrations given the background mercury concentrations.

Section VII: Aquatic Life and Environmental Impact

- A. Aquatic life use designation of receiving water: Warmwater sport-fish
- B. Applicable criteria affected by variance: 1.3 ng/L Wildlife Criterion
- C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:
- Not Likely to Adversely Affect
- Ambient mercury concentrations resulting from the variance will be substantially less than levels that result in direct toxicity to aquatic organisms. EPA's current chronic aquatic life criterion for mercury is 0.9081 µg/L, which is approximately three orders of magnitude greater than the wildlife criteria (0.0013 µg/L). Wisconsin's criteria are 0.44 µg/L and 0.83 µg/L for chronic and acute toxicity, respectively.
 - Hine's emerald dragonfly (*Somatochlora hineana*, endangered)
 - Higgins' Eye mussel (*Lampsilis higginsii*, endangered)
 - Winged Mapleleaf mussel (*Quadrula fragosa*, endangered)
 - Spectaclecase (*Cumberlandia monodonta*, candidate)
 - Sheepnose (*Plethobasus cyphus*, candidate)
 - Low trophic level prey where mercury in prey is unlikely to accumulate to toxic levels in the organism.
 - Piping plover (*Charadrius melodus*, endangered)
 - Eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*, candidate)
- May Affect, Not Likely to Adversely Affect
- Bald eagle (*Haliaeetus leucocephalus*, Delisted due to Recovery)
Bald eagles consume fish and waterfowl from surface waters, which puts them at risk of exposure to toxic levels of mercury due to bioaccumulation of mercury in their prey organisms. However, despite the potential for exposure, ambient surface water data show that in recent decades, mercury levels have not increased and bald eagle populations have continued to grow. This indicates that current ambient concentrations of mercury and mercury concentrations in prey organisms do not appear to be limiting

recovery of bald eagle populations in Wisconsin. Although this variance will allow permitted dischargers additional time to identify and control sources of mercury in their discharges, the pollutant minimization component of the variances should result in a net reduction in the amount of mercury discharged to Wisconsin surface waters from permitted point sources, further reducing any risk to bald eagles. In addition, the pollutant minimization programs encourage other pollution prevention efforts, which has a beneficial indirect effect of reducing the use and production of products and processes that use or contribute mercury to the environment. These efforts will also benefit bald eagles.

D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations:

County	Species	Status
Buffalo	Higgins eye (pearlymussel) (<i>Lampsilis higginsii</i>)	Endangered
	Sheepnose Mussel (<i>Plethobasus cyphus</i>)	Endangered
	Northern Long-Eared Bat (<i>Myotis septentrionalis</i>)	Threatened
	Eastern Massasauga (rattlesnake) (<i>Sistrurus catenatus</i>)	Candidate

Citation: U.S. Fish & Wildlife Service – Environmental Conservation Online System (<http://www.fws.gov/endangered/>) and National Heritage Index (<http://dnr.wi.gov/topic/nhi/>)

Section VIII: Economic Impact and Feasibility

A. What modifications would be necessary to comply with the current limits? Include any citations.

Unknown but source reduction measures continue to be required via implementation of a pollutant minimization plan (PMP). The Department considers treating these large volumes to produce effluent with even lower concentrations to be technically and economically infeasible.

Citation: Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy, April 24, 1997, Ohio Environmental Protection Agency, Division of Surface Water and Foster Wheeler Environmental Corporation and DRI/McGraw-Hill in support of Amended and New Rules in OAC Chapters 3745-1, -2, and -33.

B. Identify any expected environmental impacts that would result from further treatment, and include any citations:

See above.

C. Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge? Yes No Unknown

(Provide the basis for this conclusion, including citations. If treatment is technically infeasible, provide an analysis of the factors that demonstrates technical infeasibility. If treatment is economically infeasible, provide an analysis of the economic cost to ratepayers that demonstrate economic infeasibility. Attach additional sheets if necessary.)

The Department considers treating these large volumes to produce effluent with even lower concentrations to be technically and economically infeasible.

Citation: Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy, April 24, 1997, Ohio Environmental Protection Agency, Division of Surface Water and Foster Wheeler Environmental Corporation and DRI/McGraw-Hill in support of Amended and New Rules in OAC Chapters 3745-1, -2, and -33.

D. If treatment is possible, is it possible to comply with the limits on the substance? Yes No Unknown

E. If yes, what prevents this from being done? Include any citations.

See above.

F. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:

No alternatives have been rejected. The facility has made several changes to operation to limit the amount of water discharged and reduce the total mercury discharged. See Section IX below.

Section IX: Compliance with Water Quality Standards

A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations.

From the Mercury Variance Application:

- The permittee changed to a membrane grade caustic which has reduced the concentration of mercury in the sodium hydroxide used at the site. The permittee continues to search for a lower mercury acid source to use at the site.
- The permittee is now utilizing the leachate water in the ash conditioning process at the AOS. This operational change has eliminated the need to discharge water from the wastewater treatment system when the AOS is processing ash. Previously, only ground water was used in the ash conditioning process.
- During the 4th quarter of 2011, the permittee installed a reverse osmosis (RO) unit to the boiler water treatment system to reduce the frequency of demineralizer regeneration. The RO unit has reduced the amount of sulfuric acid used from 45,000 gallons annually to 909 gallons annually and the amount of sodium hydroxide used from 50,000 gallons annually to 1,353 gallons annually.
- The permittee is following the development of an experimental technology that utilizes a reactive filtration process to remove mercury from wastewater. The experimental technology, which has been installed for a pilot study at two municipal wastewater plants in Minnesota, has shown promise of being able to meet the mercury concentration limits that will be required.

B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.

Provide an update of the Mercury Pollutant Minimization Efforts.

Update the Mercury PMP.

Submit Annual Status Reports.

Section X: Compliance with Previous Permit (*Variance Reissuances Only*)

A. Date of previous submittal: Not applicable **Date of EPA Approval:** Not applicable

B. Previous Permit #: Not applicable **Previous WQSTS #:** _____ (EPA USE ONLY)

C. Effluent substance concentration: Not applicable **Variance Limit:** Not applicable

D. Target Value(s): _____ **Achieved?** Yes No Partial

E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.

Condition of Previous Variance	Compliance
Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No