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: City of Beloit

B. Facility Name: Beloit Wastewater Treatment Facility

C. Submitted by: Wisconsin Department of Natural Resources

D. State: Wisconsin **Substance:** Mercury **Date completed:** February 18, 2015

E. Permit #: 0023370-09 **WQSTS #:** (EPA USE ONLY)

F. Duration of Variance **Start Date:** Anticipated 7/1/15 **End Date:** Anticipated 6/30/20

G. Date of Variance Application: June 6, 2014

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:
Variance for Mercury from the wildlife water quality based criteria limit of 1.3 ηg/L to an interim limit of 3.3 ηg/L. The permittee has submitted an application for an alternative mercury effluent limitation (AMEL). The application included a pollutant minimization program (PMP) plan for mercury as required under s. NR 106.145(8), Wis. Adm. Code.
Citation: An alternative mercury effluent limitation under s. 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
Phillip Spranger	**Phillip.spranger@wisconsin.gov**	**608-273-5969**	Drafted permit, prepared mercury variance documents and complete assigned portions of EPA data sheet.
Amy Garbe	**Amy.garbe@wisconsin.gov**	**608-275-3258**	Review/approve Hg PMP, complete assigned portions of EPA data sheet

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: The DNR assumes that the primary source of mercury in wastewater is dental facilities with significant contributions from medical and educational facilities and legacy contamination. Inflow/Infiltration of rain water into sewer system could also be a source of mercury. Various studies have put concentrations of rainwater in Wisconsin in the range of 10 ηg/L.

D. **Ambient Substance Concentration:** 4.74 ηg/L ☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

E. If measured or estimated, what was the basis? Include citation.
Ambient mercury levels in the Rock River at Afton average 4.74 ng/L, which is above the 1.3 ng/L water quality criterion for protection of wildlife. Other water bodies in southern Wisconsin have been sampled and have measured concentrations. For example, concentrations are reported for the following: Devils Lake in Sauk County (2.88 ng/L), the Wisconsin River at Wisconsin Dells (2.83 ng/L), and the Pecatonica River (3.8 ng/L). Various studies have put concentrations of rainwater in Wisconsin in the range of 10 ng/L.

F. Average effluent discharge rate: 3.7 MGD **Maximum effluent discharge rate:** 16.6 MGD

G. Effluent Substance Concentration: 1.23 ng/L ☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

H. If measured or estimated, what was the basis? Include Citation.
Samples taken in January 2010 through July 2014 as required per the permit were averaged. These data were evaluated for sampling and analysis requirements in accordance with ss. NR 106.145 (9) and (10).

I. Level currently achievable (LCA): 3.3 ng/L

J. Variance Limit: 3.3 ng/L

K. What data were used to calculate the LCA, and how was the LCA derived? (*Immediate compliance with LCA is required.)*
Data from January 2010 through July 2014 was used to calculate the 1-day P99. See mercury WQBEL memo dated October 6, 2014.
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 = 1 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: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☒ 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: Rock County, State of Illinois

B. Receiving waterbody at discharge point: Rock River

C. Flows into which stream/river? Mississippi River (Illinois) **How many miles downstream?** 177

D. Coordinates of discharge point (UTM or Lat/Long): Lat – 44º 45’ 41” Long – 89º 38’ 22”

E. What are the designated uses associated with this waterbody?
Default Full Aquatic Life

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?
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-0028541	Watertown WWTF	Jefferson County	3.7
WI-0024333	Jefferson WWTF	Jefferson County	4.2
WI-0022489	Fort Atkinson WWTF	Jefferson County	5.0

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 list the impairments below. ☒ Yes ☐ No ☐ Unknown

River Mile	Pollutant	Impairment
Mile 214 to mile 249	Total Phosphorus (TP)	Low DO, Eutrophication
Lake Koshkonong - Mile 214 (inlet) to mile 207 (Outlet)	TP, Total Suspended Solids (TSS)	Low DO, Eutrophication, Degraded Habitat, Turbidity
Mile 201 to mile 207	TP, TSS, Mercury	Low DO, Degraded Habitat
Mile 171 (state line) to mile 201	PCBs, TP, TSS	Low DO, Degraded Habitat

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.
IPM Foods, LLC, Beloit Memorial Hospital, Frito Lay, Fairbanks Morse Engine Division, Genencor (January-June 2014 Pretreatment Semi-Annual Report)

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)
Yes

C. When were local pretreatment limits for mercury last calculated?
Change to Ordinance for lower Mercury Limit occurred on June 16, 2014. New limit is 25 ug/L, used to be 0.05 mg/L.

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
All industries have implemented wastewater BMPs. Industrial BMPs are reviewed during annual inspection and sample for Mercury once per year.

Section V: Public Notice

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: February 18, 2015 **Date of hearing:** **N/A**

E. Were comments received from the public in regards to this notice or hearing? *(If yes, please attach on a separate sheet)* Currently in public notice ☐ **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 1.3 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: Warm Water 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 higgnsii, endangered)
    - Winged Mapleleaf mussel (Quadrula fragosa, endangered)
    - Spectaclecase (Cumberlandia monodonta, candidate)
    - Sheepnose (Plethobasus cyphyus, 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
Dane	Sheepnose (Plethobasus cyphyus)	Endangered

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:
See above. The City developed and implemented a Mercury Pollutant Minimization Program under the Department's (voluntary) Green Tier program in 2007. The City's Mercury PMP was last updated March 11, 2014, and this March 2014 PMP was submitted to the Department as part of its proposed mercury variance request.

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 ore remote treatment technologies, planned research, etc. Include any citations.
The permittee has a Pollution Management Prevention (PMP) plan in place to reduce mercury discharge into the water way. The PMP plan is to identify and target source (i.e. dentist offices, hospitals, schools and industries) of mercury from discharging into sanitary sewer or water ways. In continuing efforts to reduce mercury, the permittee holds Clean Sweep programs annually. See the PMP report for more details.

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.
The permittee is required to submit a mercury reduction plan and be approved by the USEPA and WDNR. Thus, a correspondence memorandum dated March 13, 2014 was approved for the mercury reduction plan during the variance period.

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

A. Date of previous submittal: **09/15/2009** **Date of EPA Approval:** **11/24/2009**

B. Previous Permit #: **0023370-08** **Previous WQSTS #:** (EPA USE ONLY)

C. Effluent substance concentration: **3.6 ng/L** **Variance Limit:** **3.6 ng/L**

D. Target Value(s): **N/A** **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
Implement Mercury Pollutant Minimization Program	☒ **Yes** ☐ **No**
Submit Annual Status Reports	☒ **Yes** ☐ **No**