

Submittal Review for the Wisconsin Department of Natural Resources (WDNR)  
Request for Approval of a Variance from Water Quality Standard for Mercury  
(City of Burlington, WPDES Permit Number WI-0022926-08)<sup>1</sup>

Date: JUN 08 2009

This review documents the basis for U.S. Environmental Protection Agency's action on its review of the approval request from the WDNR for a water quality standards (WQS) variance for discharge by the city of Burlington.

### **Summary**

#### **Submittal History:**

On April 6, 2009, WDNR submitted a request to EPA for approval of a variance from the WQS for mercury for a discharge by the city of Burlington, Wisconsin (WPDES Permit Number WI-0022926-08). This submittal was received by EPA on April 20, 2009, and included the following documents:

- Transmittal letter from WDNR to EPA, dated April 6, 2009.
- Certification Statement for Approval of a Variance to Water Quality Standards, City of Burlington, WPDES Permit Number WI-0022926-08, dated April 2, 2009.
- Burlington Environment Impacts Evaluation, dated January 15, 2009.
- Justification for Alternative Mercury Effluent Limitation under S. NR 106.145, Wisconsin Administrative Code, dated February 10, 2009.

Additionally, on April 21, 2009, WDNR submitted the following documents electronically to EPA:

- Public Notice of Intent to Reissue the Permit and Approve a Variance.
- Draft Permit.
- Permit Fact Sheet.
- Water Quality-Based Effluent Limitation Evaluation Document.
- Public Notice of No Comments Received.

#### **Description of Action:**

WDNR proposes to grant the city of Burlington a variance from Wisconsin's water quality criteria for mercury applicable to the Southeastern Fox River in Racine County. The water quality-based effluent limit for mercury of 1.3 ng/L as a monthly average is exceeded in the effluent from the Burlington wastewater treatment facility, which averages 1.75 ng/L. An alternative mercury effluent limit of 5.8 ng/L expressed as a daily maximum is proposed along

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<sup>1</sup> This review is also documented and all electronic files are maintained in the Region 5 Water Quality Standards Tracking System (WQSTS) as submission number: WI2009-294.

with continued influent and effluent monitoring, continued implementation of an approved Pollution Minimization Program (PMP) for mercury, and annual PMP progress reports. The 5.8 ng/L limit selected as the proposed alternative limit equals the 99<sup>th</sup> percentile of the available effluent monitoring data.

**Basis of Action:**

Wisconsin’s administrative rules at Wis. Admin. Code § NR 106.145 provide for “alternative mercury effluent limits” based on a determination by WDNR that, “Requiring all dischargers of mercury to remove mercury using wastewater treatment technology to achieve discharge concentrations necessary to meet WQS would result in substantial and widespread adverse social and economic impacts.” (NR 106.145(1)(a)) This finding is based on, “Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy,” prepared in 1997 by the Ohio Environmental Protection Agency, Foster Wheeler Environmental Corporation and DRI/McGraw-Hill in support of the multiple discharger variance adopted by the State of Ohio. The primary conclusion of this study was that the treatment technology that is necessary to remove mercury to the level of the WQS are either not available or are prohibitively expensive and would have a widespread economic and social impact. In addition, WDNR evaluated the mercury removal levels achieved by the Burlington wastewater treatment facility. The available data show that facility achieves an approximate 97% mercury removal rate from the liquid stream.

Based on this information, WDNR concluded that:

- 1) The Burlington wastewater treatment facility does not comply currently with a 1.3 ng/L monthly average permit limit for mercury;
- 2) The Burlington wastewater treatment facility is well-operated and achieving mercury removal rates appropriate for such a facility;
- 3) Additional end-of-pipe treatment would be necessary to comply with a 1.3 ng/L water quality-based effluent limit; and such treatment would be technically and economically infeasible. This conclusion was based in part on the expense of building and operating additional treatment to comply with a 1.3 ng/L water quality-based effluent limit, which would result in widespread social and economic harm, allowing the facility to seek a variance consistent with s. 283.15, Wis. Stats., Wis. Admin. Code § NR 106.145 and Federal regulations at 40 CFR 131.10(g).

**Area Affected and Environmental Impacts**

**Area Affected:**

The area affected by this variance is the Southeastern Fox River in Racine County, Wisconsin, which has been classified as a warm water sport fishery. The annual average design flow of the Burlington facility is 3.55 MGD (5.5 cfs), with a daily maximum of 9.64 MGD (14.9 cfs). The seven-day, ten-year low flow (7Q10) for the Fox at Burlington is 44 cfs, and the harmonic mean flow of the Fox River is 185 cfs.

## **Environmental Impacts:**

### **Aquatic Life**

Wisconsin's aquatic life criteria for mercury are: Acute Mercury (+2) Criterion = 830 ng/L and Chronic Mercury (+2) Criterion = 440 ng/L. The proposed effluent limitation of 5.8 ng/L, is significantly less than both the acute and chronic criteria to protect aquatic life. Thus, the variance will have no effect on exposed aquatic life. Because the discharge concentration of mercury in the effluent will be limited by the variance to 5.8 ng/L, both the acute and chronic aquatic life criteria will be met at the point where the effluent enters the Fox River.

### **Human Health & Wildlife**

As a condition of the proposed variance, the discharge concentration is limited in the permit to 5.8 ng/L as a daily maximum effluent concentration. This concentration is substantially less than EPA's current maximum contaminant level of 2 µg/L for mercury in drinking water. In addition, the river is not designated as a public water supply. Thus, the proposed variance will not adversely affect human health directly via drinking water.

The more limiting WQS is the 1.3 ng/L criterion for wildlife. While the city of Burlington has not measured mercury levels in the Fox River upstream from its wastewater treatment facility, various other Wisconsin rivers and streams characterized by WDNR as "similar" have been found to have ambient mercury concentrations ranging from 5.75 to 15.71 ng/L, and rainwater is said to contain concentrations around 10 ng/L in Wisconsin. Therefore, the presumption is that a discharge concentration limited to 5.8 ng/L as a daily maximum concentration will reduce ambient mercury concentrations in the Fox River. While this does not demonstrate attainment with the wildlife criterion of 1.3 ng/L, it demonstrates that Burlington is reducing ambient mercury concentrations in the river and thereby making progress toward the goal of attainment with the wildlife criterion.

Given the lack of wastewater treatment technologies capable of reducing mercury effluent concentrations to achieve a 1.3 ng/L effluent limitation, together with the fact that aquatic life and drinking water standards will be met and ambient mercury concentrations will likely be reduced by the wastewater treatment process at Burlington, granting a variance in this situation is consistent with the protection of all applicable designated uses. Forcing Burlington to comply, even if it were possible, would have little or no effect on ambient water quality.

**CWA Section 303(c)/40 CFR131 Review**

<b>Regulatory Requirement:</b>	<b>Burlington Variance submittal:</b>
Use designations consistent with the provisions of section 101(a)(2) and 303(c)(2) of the Act <b>(40 CFR 131.6(a))</b>	The designated use for the Southeastern Fox River is Warm Water Sport Fishery; waterbody is not designated as a public water supply.
Methods used and analyses conducted to support WQS revisions <b>(40 CFR 131.6(b))</b>	Documents submitted by WDNR in support of this variance include all items listed above under submittal history.
Water quality criteria sufficient to protect the designated use “warm-water sport fish community” <b>(40 CFR 131.6(c))</b>	The applicable criteria to protect aquatic life are 830 ng/L acute and 440 ng/L chronic. Under the conditions of the variance, the achievable concentration of mercury will be 5.8 ng/L, which is well within the applicable aquatic life criteria.
An antidegradation policy consistent with §131.12 <b>(40 CFR 131.6(d))</b>	Not applicable. This variance does not affect Wisconsin’s existing antidegradation policy.
Certification by the State Attorney General or other appropriate legal authority within the State that the WQS were duly adopted pursuant to State law. <b>(40 CFR 131.6(e))</b>	WDNR’s General Counsel certified the variance in a letter from Michael Lutz to Tinka Hyde, dated April 2, 2009.
General information which will aid the Agency in determining the adequacy of the scientific basis of the standards which do not include uses specified in section 101(a)(2) of the Act as well as information on general policies applicable to State standards which their application and implementation. <b>(40 CFR 131.6(f))</b>	The information submitted by WDNR and Burlington is described above. Burlington operates a secondary wastewater treatment facility with an annual average design flow of 3.55 MGD. As a condition of the variance, Burlington is required to continue to implement a pollutant minimization program (PMP). The effect of this requirement will be to reduce levels of mercury in the influent to the treatment plant, which is expected to improve the quality of the effluent as well as that of the sludge, which contain approximately 97% of the mercury contained in the influent.
Variance not applicable to new/recommencing discharges <b>(40 CFR 132, Appendix F, Procedure 2.A.1)</b>	The Burlington wastewater treatment facility is an existing facility.
Variance does not jeopardize federally-listed threatened/endangered species <b>(40 CFR 132, Appendix F, Procedure 2.A.2)</b>	According to the USFWS, there are no aquatic federally-listed species in Racine County.
WQS cannot be attained by implementing treatment requirements of sections 301 and 306 of the CWA <b>(40 CFR 132, Appendix F, Procedure 2.A.3)</b>	There are no applicable treatment requirements for mercury from wastewater treatment facilities under section 301 and/or 306 of the CWA. The facility is currently meeting its secondary treatment requirements. Regarding non-point source control, there are no cost-effective and reasonable best management practices applicable to mercury, as mercury is not a constituent of agricultural run-off.
Duration of the variance is five years or the life of the permit, whichever is less <b>(40 CFR 132, Appendix F, Procedure 2.B.)</b>	As proposed the variance duration is the life of the permit. The life of the permit is five years.

<b>Regulatory Requirement:</b>	<b>Burlington Variance submittal:</b>
<p>Variance is based on one of the six conditions. <b>(40 CFR 132, Appendix F, Procedure 2.C.)</b></p>	<p>The variance is based on substantial and widespread social and economic impacts that would occur if the facility were required to comply with WQS. In particular, there are no available treatment technologies Burlington could construct to reduce mercury in the discharge to 1.3 ng/L. Wisconsin’s administrative rules at Wis. Admin. Code § NR 106.145(1)(a) provide for “alternative mercury effluent limits” based on a determination by WDNR that, “Requiring all dischargers of mercury to remove mercury using wastewater treatment technology to achieve discharge concentrations necessary to meet WQS would result in substantial and widespread adverse social and economic impacts.” This finding is based on “Assessing the Economic Impacts of the Proposed Ohio EPA Water Rules on the Ohio Economy,” prepared in 1997 by the Ohio Environmental Protection Agency, Foster Wheeler Environmental Corporation and DRI/McGraw-Hill in support of the multiple discharger variance adopted by the State of Ohio. The primary conclusion of this study was that the treatment technology that is necessary to remove mercury to the level of the WQS are either not available or are prohibitively expensive and would have a widespread economic and social impact.</p>
<p>Variance conforms with State antidegradation policy. <b>(40 CFR 132, Appendix F, Procedure 2.C.2.a.)</b></p>	<p>Granting this variance does not remove an existing use.</p>
<p>Any increased risk to human health or the environment is consistent with the protection of public health, safety and welfare. <b>(40 CFR 132, Appendix F, Procedure 2.C.2.b.)</b></p>	<p>Wisconsin is not aware of ambient mercury data for the Southeastern Fox River, however the agency expressed its belief that ambient mercury levels in the Fox may be similar to measured levels in Starkweather Creek in Dane County or the Rock River in Fond du Lac County, where levels range from 5.75 to 15.71 ng/L. Thus, the mercury levels in the Southeastern Fox River upstream of the Burlington facility likely already exceed the 1.3 ng/L criterion to prevent bioaccumulation of mercury in wildlife. A condition of the variance is for Burlington to continue to implement a pollutant minimization program (PMP). The PMP plan was submitted in July 28, 2008. The effect of the PMP requirement will be to reduce levels of mercury in the influent to the treatment plant, which is expected to improve the quality of the plant effluent and, more significantly, the biosolids where more than approximately 97% of the mercury currently ends up. Biosolids from the facility are land applied on area farm land. Because of potential release of mercury from land on which biosolids is applied, lowering levels of mercury in the biosolids will likely have a beneficial effect on concentrations of mercury in the Fox River and regionally. Mercury levels in the sludge average 0.97 mg/kg, well below the “clean sludge” level of 17 mg/Kg and the ceiling concentration for land spreading of 57 mg/kg. If not for the PMP requirement, there would be no regulatory incentive for Burlington to reduce mercury levels in the biosolids.</p>

Regulatory Requirement:	Burlington Variance submittal:
	In addition, under the proposed variance, the discharge concentration is limited in the permit to 5.8 ng/L as a daily maximum effluent concentration. This concentration is substantially less than EPA's current maximum contaminant level of 2 µg/L for mercury in drinking water. Also, the river is not designated as a public water supply. Thus, the proposed variance will not adversely affect human health directly via drinking water. Thus, granting a variance in this situation is consistent with the protection of public health, safety, and welfare.
Submittal of a variance application by the permittee demonstrating that attaining WQS is not feasible and showing compliance with the requirements of section C.2. of procedure 2. (40 CFR 132, Appendix F, Procedure 2.D.)	The Burlington application submitted makes the demonstrations and showings specified.
Submittal to EPA, including permittee's application, public comments and hearing records (if held), final decision, NPDES permit with conditions consistent with 2.F. (40 CFR 132, Appendix F, Procedure 2.I.)	WDNR provided all the required information, including the establishment of an alternative mercury effluent limitation, that represents the level currently achievable by the permittee, and which is no less stringent than that achieved under the previous permit. WDNR public noticed the permit and variance on February 26, 2009. No comments were received from the public.

The information provided by WDNR meets the substantive requirements for a WQS submittal of 40 CFR 131.6. In addition, the information provided by WDNR demonstrates that the Wisconsin mercury criteria for the protection of wildlife is neither attained nor attainable in the Southeastern Fox River at Burlington, consistent with 40 CFR 131.10(g). This is not to say that wildlife uses are not occurring on the Southeastern Fox River. Wildlife are able to use the Southeastern Fox River for forage and drinking water, however, there may be exposure to marginally higher levels of mercury than would occur if the wildlife criterion was attained.

**Endangered Species Act (ESA) Section 7 Evaluation**

Consistent with section 7 of the ESA and federal regulations at 50 CFR Part 402, EPA is required to consult with U.S. Fish and Wildlife Service (FWS) on any action taken by EPA that may affect federally-listed threatened and endangered species or their designated critical habitat. Actions are considered to have the potential to affect listed species if listed species are present in the action area. In the case of this action, there are no aquatic or aquatic-dependent species present in Racine County based on FWS's Section 7 Consultation Technical Assistance website that was accessed on June 2, 2009. Therefore, EPA concludes that approval of this variance will have no effect on listed species or designated critical habitat and consultation under section 7 of the ESA is not required.