

## 303(c) Review, City of Rice Lake Mercury Variance, WQSTS WI2009-301

Date: **JUN 23 2009**

### **Submittal Review for the Wisconsin Department of Natural Resources (WDNR) Request for Approval of a Variance from Water Quality Standards for the City of Rice Lake Wastewater Treatment Plant, WPDES Permit Number WI-0021865-08**

#### **Summary**

#### **Submittal History:**

On May 20, 2009, WDNR submitted a request to EPA for approval of a water quality standards (WQS) variance for discharge by the City of Rice Lake Wastewater Treatment Plant (RLWTP) (WPDES Permit Number WI-0021865-08). Documents included in this submittal:

- Transmittal letter from WDNR to EPA, dated May 20, 2009;
- Certification Statement of Approval of a Variance to Water Quality Standards, WPDES Permit No. WI-0026085-08, dated May 20, 2009;
- Environmental Impacts Evaluation, dated March 12, 2009;
- Justification of Alternative Mercury Effluent Limitation under S. NR 106.145, Wisconsin Administrative Code, dated March 12, 2009;
- Public Notice of Intent to Reissue the Permit;
- Notice of Final Determination to Reissue a WPDES Permit;
- Draft WPDES Permit submitted February 9, 2009;
- Permit Fact Sheet;
- Substantial Compliance Determination;
- Water Quality Based Effluent Limitation Evaluation Document, dated January 13, 2009.

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

WDNR proposes to grant RLWTP a variance from Wisconsin's water quality criteria for mercury applicable to the Red Cedar River of the Lower Chippewa River Basin of up to 7.0 ng/L as a daily maximum discharge concentration. Under the conditions of the proposed variance, the limit in the permit is set equal to 7.0 ng/L as a daily maximum. The permit limit equals the 99<sup>th</sup> percentile of the available effluent monitoring data generated using EPA method 1631 for mercury. In addition to the limit, the permittee must also implement a pollutant minimization plan to identify and eliminate sources of mercury to its wastewater treatment facility.

#### **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 RLWTP. The available data show that the mercury concentration in the effluent from the RLWTP is greater than the level needed to comply with the WQS and that the facility achieves approximately 95 % removal in the liquid stream.

Based on this information, WDNR concluded that:

- The RLWTP does not comply currently with a 1.3 ng/L monthly average permit limit for mercury;
- The RLWTP is well-operated and achieving mercury removal rates appropriate for such a facility;
- Additional end-of-pipe treatment would be necessary to comply with a 1.3 ng/L water quality-based effluent limit; and,
- The expense of building and operating additional treatment to comply with a 1.3 ng/L water quality-based effluent limit (WQBEL) 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 Red Cedar River of the Lower Chippewa River Basin in Barron County, Wisconsin. The Chippewa River eventually discharges to the Mississippi River. The annual average design flow of the discharge is 2.2 million gallons (MGD). The 7-day, 10-year low flow (7Q10) for the Red Cedar River at this location is 84 cubic feet per second (cfs).

#### **Environmental Impacts:**

##### **Effluent Levels**

The average effluent mercury concentration of 14 samples collected from April 2007 through November 2008 is 2.62 ng/L. The 1-day P99 value of the sample results is 7.0 ng/L and suggests a 99% probability that a sample collected at this facility will have a mercury concentration of 7.0 ng/L or below.

## **Aquatic Life**

The variance will have no effect on exposed aquatic life. The proposed effluent limitation of 7.0 ng/l, if the variance is granted, is significantly less than both the acute and chronic criteria to protect 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. Because the discharge concentration of mercury in the effluent will be limited by the variance to 7.0 ng/l, both the acute and chronic aquatic life criteria will be met at the point where the effluent enters the Red Cedar River.

## **Human Health & Wildlife**

As a condition of the proposed variance, the discharge concentration is limited in the permit to 7.0 ng/L as a daily maximum effluent concentration. This concentration is substantially less than EPA's current maximum contaminant level of 2 µ g/L for mercury in drinking water.

The background mercury concentration of two samples collected from the Red Cedar River at Rice Lake averaged 1.35 ng/L, above the 1.3 ng/L water quality criterion for protection of wildlife. The background mercury level is similar to data gathered from other inland surface waters in the state that are typically above 1.30 ng/L and the human threshold of 1.5 ng/L. In addition, other studies have measured average mercury concentrations in Wisconsin rainwater at 10.0 ng/L.

Given the lack of wastewater treatment technologies capable of reducing mercury effluent concentrations to achieve a 1.3 ng/L effluent limitation, granting a variance in this situation is consistent with the protection of the public health, safety and welfare because of the substantial public health and safety benefits of providing wastewater treatment and the limited impact of the elevated effluent concentrations given the background mercury concentrations. Forcing RLWTP 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>RLWTP 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 uses for the receiving Red Cedar River are warm water sport fishery and non-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>	Under the conditions of the variance, the applicable water quality criterion is the mercury effluent concentration currently achievable, 7.0 ng/L. The criteria to protect aquatic life are 830 ng/L acute and 440 ng/L chronic.
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.

<b>Regulatory Requirement:</b>	<b>RLWTP Variance submittal:</b>
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 May 20, 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 RLWTP is described above. RLWTP operates a secondary wastewater treatment facility with an average design flow of 2.2 MGD. As a condition of the variance, RLWTP 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 and the biosolids.
Variance not applicable to new/recommencing discharges <b>(40 CFR 132, Appendix F, Procedure 2.A.1)</b>	RLWTP 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 FWS, there are no aquatic federally-listed species in Barron 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 of 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.
Variance is based on one of the six conditions. <b>(40 CFR 132, Appendix F, Procedure 2.C.)</b>	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 the RLWTP could construct to reduce mercury in the discharge to 1.3 ng/L. 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.

<b>Regulatory Requirement:</b>	<b>RLWTP Variance submittal:</b>
Variance conforms with State antidegradation policy. (40 CFR 132, Appendix F, Procedure 2.C.2.a.)	Granting this variance does not remove an existing use.
Any increased risk to human health or the environment is consistent with the protection of public health, safety and welfare. (40 CFR 132, Appendix F, Procedure 2.C.2.b.)	The mercury levels in the Red Cedar River upstream of RLWTP likely already exceed the 1.3 ng/L criterion to prevent bioaccumulation of mercury in fish. EPA is aware of only two ambient mercury sampling results for the Red Cedar River at Rice Lake with an average of 1.35 ng/L. A condition of the variance is to continue to implement a PMP. 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. The PMP plan was approved by WDNR on August 25, 2008. Most of the best management practices for the various mercury user categories have been completely implemented. Since a facility upgrade in 1997 mercury levels in the biosolids averaged 0.65 mg/Kg (40 sample results) with a maximum value of 2.1 mg/Kg, below the "high quality sludge" threshold level of 17 mg/Kg and well below the concentration level of 57 mg/Kg that allows for landspreading. 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 Red Cedar River and regionally. 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.)	RLWTP application was submitted.
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 April 15, 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 and human health are neither attained nor attainable in the Red Cedar River, consistent with 40 CFR 131.10(g). This is not to say that wildlife uses are not occurring on the Red Cedar River. Wildlife are able to use the Red Cedar River for forage and drinking water, however, there may be exposure to marginally higher levels of mercury than would occur if the criterion were 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 Barron County or in the nearby area based on FWS's Section 7 Consultation Technical Assistance website that was accessed on June 4, 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.