

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD
AMENDING AND CREATING RULES

The Wisconsin Natural Resources Board proposes an order to amend NR 106.04(5) and NR 211 subch. IV (title) and to create NR 106.145, 211.41 and NR 219, Table B, item 35f. relating to regulating mercury in wastewater discharge permits.

WT-12-02

Analysis Prepared by the Department of Natural Resources

Statutory authority: chs. 281 and 283, Stats.

Statutes interpreted: ss. 283.15, 283.31, Stats.

This action provides a common-sense approach to regulating mercury in wastewater effluents. It adds a new high-sensitivity analytical method to NR 219 that allows mercury to be accurately measured in surface waters and wastewater effluents. A new section in NR 106 makes a finding that wastewater treatment technology for mercury is impractical and requires wastewater permittees to implement pollution prevention programs in exchange for water quality standards variances. A new section in NR 211 requires municipal entities to impose source reduction measures on users of their sewer systems.

SECTION 1. NR 106.04(5) is amended to read:

NR 106.04(5) For purposes of this chapter, a cost-effective pollutant minimization program is an activity which has as its goal the reduction of all potential sources of the pollutant for the purpose of maintaining the effluent at or below the water quality based effluent limitation. The pollutant minimization programs specified in ss. NR 106.05 (8), 106.06(6) (d), ~~and 106.07(6) (f)~~ and 106.145(7) shall include investigation of treatment technologies and efficiencies, process changes, wastewater reuse or other pollution prevention techniques that are appropriate for that facility, taking account of the permittee's overall treatment strategies, facilities plans and operational circumstances. Past documented pollution prevention or treatment efforts may be used to satisfy all or part of a pollution minimization program requirement. The permittee shall submit to the department an annual status report on the progress of a pollutant minimization program.

SECTION 2. NR 106.145 is created to read:

NR 106.145 Mercury regulation. This section provides an alternative means of regulating mercury in WPDES permits through the establishment of alternative mercury effluent limitations and other requirements and is intended as a supplement to the authority and procedures contained in other sections of this chapter. For purposes of this section, an alternative mercury effluent limitation represents a variance to water quality standards specified in chs. NR 102 to 105.

(1) FINDINGS. On the effective date of this rule ... [revisor inserts date], the department finds all of the following:

(a) Requiring all dischargers of mercury to remove mercury using wastewater treatment technology to achieve discharge concentrations necessary to meet water quality standards would result in substantial and widespread adverse social and economic impacts.

(b) Representative data on the relatively low concentrations of mercury in wastewater are rare and methods for collecting that data have only recently been developed.

(c) Appropriate mercury source reduction activities are environmentally preferable to wastewater treatment technology in many cases because wastewater treatment for mercury produces a sludge or other resultant wastewater stream that can be as much or more of an environmental liability than the untreated effluent.

(2) DETERMINING THE NECESSITY OF MERCURY EFFLUENT LIMITATIONS. (a) The department shall determine whether a mercury effluent limitation is necessary using the procedures in s. NR 106.05.

(b) For the determination under par. (a), the department shall use representative data that comply with all of the following:

1. Data shall meet the sampling and analysis requirements of subs. (9) and (10).
2. Data shall consist of at least 12 monitoring results spaced out over a period of at least 2 years.

(3) DATA GENERATION. (a) In this paragraph, "major municipal discharge" and "minor municipal discharge" have the meanings specified in s. NR 200.02(7) and (8). If an applicant in any of the categories specified in this subsection does not have sufficient discharge data that meet the criteria of sub. (2) at the time of application for permit reissuance, the reissued permit shall require the permittee to monitor and report mercury at the following frequency and location:

1. Monthly influent and effluent for a major municipal discharge with an average flow rate greater than or equal to 5 million gallons per day.

2. Once every 3 months influent and effluent for a major municipal discharge with an average flow rate greater than or equal to one million gallons per day but less than 5 million gallons per day.

3. Once every 3 months influent and effluent for a minor municipal discharge if there are 2 or more exceedances in the last 5 years of the high quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5).

4. Monthly effluent for an industrial discharge that the department determines is likely to contribute net discharges of mercury to the environment or if sludge or biosolids mercury concentrations indicate a source of mercury.

5. Once every 3 months effluent for an industrial discharge with an average flow rate, excluding noncontact cooling water as defined in s. NR 205.03(21), of more than 100,000 gallons per day and the department has no information on mercury concentrations in similar discharges. The department may exempt discharges in this category if the department determines that there is little risk that the effluent will contain mercury.

Note: Any permittee who believes that a significant portion of the mercury in its effluent originates from its intake of surface water is encouraged to provide results of intake monitoring.

6. The department may reduce monitoring frequency from monthly to once every 3 months for discharges described in subds. 1. and 4. after at least 12 representative results have been generated.

(b) The department may require mercury monitoring for other discharges not included in one of the categories specified in par. (a) if the department has a reasonable expectation that the discharge includes significant quantities of mercury.

(c) Permittees shall collect and analyze samples according to the requirements in subs. (9) and (10).

(4) ALTERNATIVE MERCURY EFFLUENT LIMITATION ELIGIBILITY. (a) When the department makes a determination of the necessity for a water quality based effluent limitation for mercury under sub. (2), the department shall determine if an alternative mercury effluent limitation is justified based on information submitted by the permittee in an alternative mercury effluent limitation application.

(b) The department may not establish an alternative mercury effluent limitation for a new discharge to waters in the Great Lakes system, as defined in s. NR 102.12(1), unless the proposed discharge is necessary to alleviate an imminent and substantial danger to the public health or welfare. For the purposes of this section, a new discharger is any building, structure, facility or installation from which there is or may be a discharge of pollutants, as defined in s. NR 200.02(4), the construction of which commenced after the effective date of this rule ...[revisor inserts date]. An existing discharger that relocates its outfall after the effective date of this rule ...[revisor inserts date] may not be considered a new discharger for purposes of this paragraph. Relocation includes the diversion of a discharge from a land treatment system or systems to a surface water.

(c) The term of an alternative mercury effluent limitation may not extend beyond the term of the permit.

(d) An alternative mercury effluent limitation may be renewed using the procedures and requirements in subs. (5) to (8). An alternative mercury effluent limitation may not be renewed if the permittee did not substantially comply with all of the mercury-regulation conditions of the previous permit.

(5) CALCULATION OF AN ALTERNATIVE MERCURY EFFLUENT LIMITATION. (a) An alternative mercury effluent limitation shall equal the upper 99th percentile of representative daily discharge concentrations as calculated under s. NR 106.05(4)(a), except as provided in par. (c).

(b) The alternative mercury effluent limitation shall be expressed as a daily maximum concentration.

(c) An alternative mercury effluent limitation may not be greater than the alternative mercury effluent limitation contained in the previous permit, unless the permittee demonstrates that the previous alternative mercury effluent limitation was based on monitoring that did not represent actual discharge concentrations.

(6) DEPARTMENT ACTION ON ALTERNATIVE MERCURY EFFLUENT LIMITATION APPLICATIONS. (a) The department shall establish an alternative mercury effluent limitation for a discharger when all of the following have been met:

1. The information provided in the alternative mercury effluent limitation application described in sub. (8) supports establishing the alternative mercury effluent limitation.

2. The permittee and the department agree upon the alternative mercury effluent limitation and the specific permit language requiring implementation of the pollution minimization program described in sub. (7).

(b) If the information provided in the alternative mercury effluent limitation application does not support establishing an alternative mercury effluent limitation or if the department and the permittee cannot agree on the alternative mercury effluent limitation and the specific permit language incorporating the pollutant minimization program, the department shall include the water quality based effluent limitation or limitations in the permit. This paragraph does not prohibit the department from seeking and the applicant providing supplemental information after the initial application is submitted.

(c) If the department grants an alternative mercury effluent limitation, the permit shall require monitoring subject to the data quality requirements of subs. (9) and (10), at the following locations:

1. Effluent for both municipal and industrial discharges.

2. Influent and sludge or biosolids for major and minor municipal discharges.

(7) POLLUTANT MINIMIZATION PROGRAMS. (a) If the department grants an alternative mercury effluent limitation under sub. (6), the reissued permit shall require the permittee to implement a pollutant minimization program as defined in s. NR 106.04(5) and detailed for mercury in this subsection.

(b) If the reissued permit requires monthly data generation under sub. (3)(a) 1. or 4., the permit shall contain a special condition that triggers a pollutant minimization program if the first 24 months of data demonstrate that a limit will be necessary under sub. (2). The permit shall also require that the permittee do all of the following:

1. Submit to the department within 36 months of permit reissuance a pollutant minimization program plan meeting the requirements specified in this subsection.
2. Implement the pollutant minimization program following submittal of the plan.
3. Submit the first annual status report required in par. (g) within 48 months of permit reissuance.

(c) For municipal permittees, a pollutant minimization program shall consist of all of the following elements:

1. Source identification.
2. Activities to help educate the general public, health professionals, school teachers, laboratory personnel or other professionals about ways to reduce use of mercury-containing products, recycle mercury-containing products and prevent spills.
3. A program for collecting mercury from the permittee's sewer system users. This program may be independently operated by the permittee, jointly by the permittee and others or by another governmental unit.
4. Other activities that the department, in consultation with the permittee, deems appropriate for the individual permittee's circumstances.

(d) For industrial permittees, a pollutant minimization program may consist of any of the following elements:

1. Source identification and inventory.
2. Improvement of operational, maintenance or management practices.
3. Substitution of raw materials or chemical additives with low-mercury alternatives.
4. Institution of alternative processes.

(e) In assessing the appropriate elements for a pollutant minimization program, the department may consider any of the following:

1. The type of discharger.
2. The operations that generate the wastewater.
3. The level of mercury in the effluent, influent and biosolids or sludge.
4. The costs of potential source reduction measures.

5. The environmental costs and benefits of the pollutant minimization program elements.
6. The characteristics of the community in which the discharger is located.
7. The opportunities for material substitution.
8. The opportunities available for support from or cooperation with other organizations.
9. The actions the discharger has taken in the past to reduce mercury use or discharges.
10. Any other relevant information.

(f) The pollutant minimization program plan shall include all of the following:

1. Identify specific activities to be undertaken and a relative timeline to implement those activities.

2. State which, if any, activities have already been implemented and how effective they were in reducing potential and actual mercury discharges.

3. Commit the permittee to document how the pollutant minimization program plan was implemented including measures such as the number of contacts of various types made, programs implemented and other activities.

4. Provide for steps to measure the effectiveness of the pollution minimization program elements in reducing potential and actual mercury discharges. Where the permittee regularly monitors influent, effluent, sludge or biosolids for mercury, measures shall include any changes in mercury concentrations over comparable historic data. Where practicable, other measures or estimates of mercury reductions from programs such as mercury recycling, collection or disposal may also be included.

(g) Within 12 months of the beginning of implementation of the pollutant minimization program and annually thereafter, the permittee shall report to the department on the progress of the pollutant minimization program as required in s. NR 106.04(5). This annual report shall include all of the following:

1. An evaluation of the effectiveness of the program in accordance with the plan.

2. Identification of barriers that have limited program effectiveness and adjustments to the program that will be implemented during the next year to help address these barriers.

(h) Permittees may collaborate with one another or other parties to plan and implement a pollutant minimization program.

Note: Permittees that do not prepare or effectively implement a pollutant minimization program are subject to regulatory requirements for mercury, without alternative mercury effluent limitations to water quality standards. For municipal permittees this may mean development and enforcement of mercury discharge standards for users of the public sewerage system pursuant to s. NR 211.10(3). For users of the municipal sewerage system this may mean changes in processes, installation of treatment technology, or other means to comply with the municipal mercury discharge standards pursuant to s. NR 211.10 (1). Implementation of the municipal mercury discharge standards may require a program of user discharge permits and wastewater discharge monitoring.

(8) ALTERNATIVE MERCURY EFFLUENT LIMITATION APPLICATIONS. (a) To apply for an alternative mercury effluent limitation under this section, a permittee shall do all of the following:

1. Submit an alternative mercury effluent limitation application at the same time as the application for permit reissuance following data generation.
2. State the basis for concluding that wastewater treatment technology for mercury is impractical.
3. Supply representative effluent monitoring results of sufficient number and analytical sensitivity to quantify with reasonable certainty the concentration and mass of mercury discharged. Representative sample results shall meet all of the following requirements:
 - a. Be of sufficient quantity to allow calculation of the upper 99th percentile values pursuant to s. NR 106.05(5).
 - b. Reasonably represent current conditions.
 - c. Meet the data quality requirements of subs. (9) and (10).
 - d. Represent a time period of at least 2 years.
4. Submit a pollution minimization program plan described in sub. (7)(f).

(b) A permittee applying for renewal of an alternative mercury effluent limitation previously granted shall follow the procedures in par. (a) except for all of the following:

1. The permittee shall submit information indicating whether the permittee substantially complied with mercury regulation conditions of the existing permit.
2. A new pollutant minimization program plan shall re-evaluate the plan required under the previous permit.

(9) SAMPLING REQUIREMENTS. (a) Sample types may be grab or 24-hour composite. "Grab sample" and "24-hour composite sample" have the meanings specified in s. NR 218.04.

(b) Sample collection methods shall be consistent with *EPA Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*, EPA-821-R-96-011.

Note: This method provides flexible procedures for collecting samples under clean conditions. Sample collection personnel may modify this procedure or eliminate steps if the modification does not lead to unacceptable contamination of the samples. This method may be accessed on the department's website at <http://www.dnr.state.wi.us/org/water/wm/ww/mercury/1669.pdf>.

(c) Requirements for field blanks are as follows. A field blank means an aliquot of mercury-free reagent water that is placed in a sample container, shipped to the field and treated as a sample in all respects, including contact with the sampling devices and exposure to sampling site conditions, filtration, storage, preservation, and all analytical procedures. The purpose of the field blank is to determine whether the field or sample transporting procedures and environments have contaminated the sample:

1. At least one field blank shall be collected at each site for each day a sample is collected. If more than one sample is collected in a day, at least one field blank for each 10 samples collected on that day shall be collected.
2. If mercury or any potentially interfering substance is found in the field blank at a concentration equal to or greater than 0.5 ng/L, the limit of detection or one-fifth the level in the associated sample, whichever is greater, results for associated samples may not be used for regulatory compliance purposes unless the conditions in subd. 3. are met.

3. If at least 3 field blanks are collected on a day when samples are collected and the average mercury concentration of the field blanks plus 2 standard deviations is less than or equal to one-half of the level in the associated sample or less than the lowest water quality criterion for mercury found in ch. NR 105, whichever is greater, results may be used.

Note: As of the effective date of this rule ... [revisor inserts date] the lowest water quality criterion listed in the ch. NR 105 is 1.3 ng/L.

4. Once a permittee demonstrates the ability to collect samples from a given site using an established procedure that meet the use-criteria of subd. 2., the permittee may decrease the number of field blanks to no fewer than one field blank for each 4 sampling days.

a. The initial demonstration shall consist of at least 6 consecutive sampling days.

b. If the permittee makes significant changes to the sampling procedure or sampling personnel, the 6-day demonstration shall be repeated.

c. If after reducing the field blank frequency, a field blank fails to meet the use-criteria, the permittee shall take corrective action and return to collecting field blanks on each sampling day until it can meet the use-criteria for at least 3 consecutive sampling days.

d. In no case may the permittee decrease field blanks to fewer than one for each 10 samples.

5. The permittee shall report, but may not subtract, field blank concentrations when reporting sample results.

Note: When using the data, the department may subtract field blanks from sample concentrations on a case-by-case basis.

(10) LABORATORY ANALYSIS REQUIREMENTS. (a) In this subsection, "method blank", "matrix spike" and "limit of detection" have the meanings specified in s. NR 149.03.

(b) The analytical method used shall be sensitive enough to quantify mercury concentrations in the sample or mercury concentrations down to the lowest water quality criterion found in ch. NR 105, whichever is greater.

(c) The department may exempt a permittee from the sensitivity requirement in par. (b) if the permittee can demonstrate to the department's satisfaction that the specific effluent matrix does not allow this level of sensitivity using the most sensitive approved method with all reasonable precautions.

(d) The laboratory performing the analyses shall be certified under ch. NR 149 for low-level mercury analyses. Until low-level mercury certification is available, the lab shall be certified under ch. NR 149 for mercury and recognized by the department as having demonstrated its low-level mercury capabilities under the emerging technology provision contained in s. NR 149.12(2).

(e) Method blanks analyzed concurrently with samples shall be reported with sample results. Method blanks may be subtracted from sample results unless concentrations of mercury in the method blank exceed the laboratory's limit of detection, 0.5 ng/L or 5% of the sample concentration, whichever is greater.

(f) Matrix spikes analyzed concurrently with samples shall have recoveries between 71 and 125 percent.

(11) DATA REJECTION. The department may reject any sample results if data quality requirements specified in subs. (9) and (10) are not met or if results are produced by a laboratory that is not in compliance with certification requirements specified in ch. NR 149.

(12) APPLICABILITY OF THE VARIANCE PROCESS UNDER S. 283.15, STATS. If a water quality based effluent limitation is included in a permit under sub. (6)(b), a permittee may apply to the department for a variance from the water quality standard used to derive the limitation following the procedure specified in s. 283.15, Stats. Where a permittee has been granted an alternative mercury effluent limitation under this section, the procedures of s. 283.15, Stats. are not applicable.

SECTION 3. Subchapter IV of ch. NR 211 (title) is amended to read:

Subchapter IV—Regulation of chloride and mercury sources

SECTION 4. NR 211.41 is created to read:

NR 211.41 POTW action to reduce mercury discharges from all sources. Notwithstanding all other provisions of this chapter, a POTW shall develop and enforce any specific standards or requirements and implement any source reduction activities that are necessary to assure compliance with requirements established in s. NR 106.145. These standards, requirements and source reduction activities apply to mercury discharges to the POTW from all relevant sources, including but not limited to industrial, commercial and residential sources.

SECTION 5. NR 219 TABLE B, Item 35f. is created to read:

TABLE B						
LIST OF APPROVED INORGANIC TEST PROCEDURES FOR WASTEWATER						
Parameter, Units & Methods	EPA ¹	SW-846 ^{11,7}	Standard Methods ^{2,2m}	ASTM ³	USGS ⁴	Other
35f. Mercury, Total - Low Level, ng/L ⁴⁰						
Cold vapor atomic fluorescence (CVAf) with purge and trap concentration	1631D					
CVAf without purge and trap concentration	245.7					

⁴⁰ Quality control requirements for low level mercury are found in s. NR 106.145 (9) and (10). Low-level mercury methods are performance-based so some method modifications are allowable, provided quality control requirements are met. If an atomic absorption detector is substituted for the atomic fluorescence detector, the appropriate method citation is 245.1 (manual) or 245.2 (automated). If method 1631 is modified to eliminate the purge and trap step, the appropriate method citation is 245.7.

The foregoing rules were approved and adopted by the State of Wisconsin Natural Resources Board on June 26, 2002

The rules shall take effect on the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

Dated at Madison, Wisconsin August 26, 2002

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

By /s/ Darrell Bazzell
Darrell Bazzell, Secretary

(SEAL)