

## Chapter NR 446

## CONTROL OF MERCURY EMISSIONS

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**NR 446.01 Applicability; purpose.** (1) **APPLICABILITY.** This chapter applies to all air contaminant sources which may emit mercury and to their owners and operators.

(2) **PURPOSE.** This chapter is adopted under ss. 144.31, 144.375 and 144.38, Stats., to establish emission limitations, stack sampling procedures and emission monitoring requirements for mercury emissions from air contaminant sources in order to protect air quality.

**History:** Cr. Register, September, 1986, No. 369, eff. 10-1-86; am. (1), Register, May, 1992, No. 437, eff. 6-1-92.

**NR 446.02 Definitions.** In addition to the definitions in this section, the definitions contained in chs. NR 400 and 445 apply to the terms used in this chapter.

(1) "Cell room" means a structure housing one or more mercury chlor-alkali cells.

(2) "Condenser stack gases" mean the gaseous effluent evolved from the stack of processes utilizing heat to extract mercury ore.

(3) "Denuder" means a horizontal or vertical container which is part of a mercury chlor-alkali cell and in which water and alkali metal amalgam are converted to alkali metal hydroxide, mercury, and hydrogen gas in a short-circuited, electrolytic reaction.

(4) "End box" means one or more containers located on one or both ends of a mercury chlor-alkali electrolyzer which serves as a connection between the electrolyzer and denuder for rich and stripped amalgam.

(5) "End box ventilation system" means a ventilation system which collects mercury emissions from the end boxes, the mercury pump sumps, and their water collection systems.

(6) "Hydrogen gas stream" means a hydrogen stream formed in the chlor-alkali cell denuder.

(7) "Mercury chlor-alkali cell" means a device which is basically composed of an electrolyzer section and a denuder or decomposer section and utilizes mercury to produce chlorine gas, hydrogen gas, and alkali metal hydroxide.

(8) "Mercury chlor-alkali electrolyzer" means an electrolytic device which is part of a mercury chlor-alkali cell and utilizes a flowing mercury cathode to produce chlorine gas and alkali metal amalgam.

(9) "Mercury ore" means a mineral mined specifically for its mercury content.

(10) "Mercury ore processing facility" means a facility processing mercury ore to obtain mercury.

(11) "Sludge" means sludge produced by a treatment plant that processes municipal or industrial wastewater.

(12) "Sludge dryer" means a device used to reduce the moisture content of sludge by heating to temperatures above 65°C (ca. 150°F) directly with combustion gases.

History: Renum. from NR 154.01, Register, September, 1986, No. 369, eff. 10-1-86.

**NR 446.03 Mercury emission limits.** No person may cause, allow or permit emissions of mercury:

(1) In such quantity and duration as to cause the ambient air concentration to exceed 1  $\mu\text{g}/\text{m}^3$ , averaged over a 30-day period;

(2) In quantities greater than 2,300 grams (5.07 pounds) per 24-hour period from mercury cell chlor-alkali plants, or mercury ore processing facilities.

(3) In quantities greater than 3,200 grams of mercury per 24-hour period from sludge incineration plants, sludge drying plants, or a combination of these that process wastewater treatment plant sludges.

History: Renum. from NR 154.19 (3) (a), Register, September, 1986, No. 369, eff. 10-1-86; am. (Intro.), Register, May, 1992, No. 437, eff. 6-1-92.

**NR 446.04 Stack sampling.** (1) **MERCURY ORE PROCESSING FACILITIES.** (a) Unless a waiver of emission testing is requested and obtained from the department, each owner or operator of a facility processing mercury ore on which construction or modification commenced after February 1, 1984 shall test emissions from the source within 90 days after startup.

(b) The department shall be notified at least 30 days prior to a stack or performance test to afford it the opportunity to have a representative present to witness the testing procedures. The notice shall include a test plan in accordance with s. NR 439.07.

(c) Samples shall be taken over such a period as is necessary to accurately determine the maximum emissions which will occur in a 24-hour period. No changes in the operation may be made which would potentially increase emissions above that determined by the most recent source test until the new emission level has been estimated by calculation and the results reported to the department.

(d) All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the source test. Each determination shall be reported to the department by registered letter dispatched before the close of the next business day following the determination.

(e) Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by a department representative for a minimum of 2 years.

(2) **MERCURY CHLOR-ALKALI PLANTS — HYDROGEN AND END BOX VENTILATION GAS STREAMS.** (a) Unless a waiver of emission test is requested and obtained from the department, each owner or operator of a mercury chlor-alkali cell on which construction or modification commenced after February 1, 1984 shall test emissions from the source within 90 days after startup.

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(b) The department shall be notified at least 30 days in advance of stack or performance tests to afford it the opportunity to have a representative present to witness the testing procedures. The notice shall include a test plan in accordance with s. NR 439.07.

(c) Samples shall be taken over such a period as is necessary to accurately determine the maximum emissions which will occur in a 24-hour period. No changes in the operation may be made which would potentially increase emissions above that determined by the most recent source test until the new emission level has been estimated by calculation and the results reported to the department.

(d) All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the source test. All determinations shall be reported to the department by registered letter dispatched before the close of the next business day following the determination.

(e) Records of emissions test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by a department representative for a minimum of 2 years.

(3) **MERCURY CHLOR-ALKALI PLANTS — CELL ROOM VENTILATION SYSTEM.** (a) Stationary sources using mercury chlor-alkali cells may test cell room emissions in accordance with par. (b), or demonstrate compliance with par. (d) and assume ventilation emissions of 1,300 grams per day of mercury.

(b) Unless a waiver of emission test is requested and obtained from the department, each owner or operator of a new or modified chlor-alkali plant shall pass all cell room air in forced gas streams through stacks suitable for testing and shall test emissions from the cell room within 90 days after startup.

(c) The department shall be notified at least 30 days in advance of stack or performance tests to afford it the opportunity to have a representative present to witness the testing procedures. The notice shall provide a test plan in accordance with s. NR 439.07.

(d) An owner or operator may carry out design, maintenance and housekeeping practices approved by the department.

(4) **SLUDGE INCINERATION AND DRYING PLANTS.** (a) Unless a waiver of emission testing is requested and obtained from the department, each owner or operator of sludge incineration plants and drying plants on which construction or modification commenced after February 1, 1984 shall test emissions from the source within 90 days of startup. The tests shall be conducted in accordance with Method 101A or Method 105 in 40 CFR part 61, Appendix B, incorporated by reference in ch. NR 484, using the procedures in par. (f).

(b) The department shall be notified at least 30 days in advance of stack or performance tests to afford it the opportunity to have a representative present to witness the testing procedures. The notice shall include a test plan in accordance with s. NR 439.07.

(c) Samples shall be taken over such a period as is necessary to determine accurately the maximum emissions which will occur in a 24-hour period. No changes may be made in the operation which would potentially increase emissions above the level determined by the most recent

stack tests until the new emission level has been estimated by calculation and the results reported to the department.

(d) All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the stack test. All determinations shall be reported to the department by registered letter dispatched before the close of the next business day following the determination.

(e) Records of emission test results and other data needed to determine total emissions shall be retained at the source and shall be made available for inspection by a department representative for a minimum of 2 years.

(f) If an owner or operator uses Method 105 of 40 CFR part 61, Appendix B, incorporated by reference in ch. NR 484, the following procedures shall be adhered to, in addition to Method 105:

1. The sludge shall be sampled after dewatering and before incineration or drying, at a location that provides a representative sample of the sludge that is charged to the incinerator or dryer. Eight consecutive grab samples shall be obtained at intervals of between 45 and 60 minutes and thoroughly mixed into one sample. Each of the 8 grab samples shall have a volume of at least 200 milliliters but not more than 400 milliliters. A total of 3 composite samples shall be obtained within an operating period of 24 hours. When the 24-hour operating period is not continuous, the total sampling period may not exceed 72 hours after the first grab sample is obtained. Samples may not be exposed to any condition that may result in mercury contamination or loss.

2. The maximum 24-hour period sludge incineration or drying rate shall be determined by use of a flow rate measurement device that can measure the mass rate of sludge charged to the incinerator or dryer with an accuracy of plus or minus 5% over its operating range. Other methods of measuring sludge mass charging rates may be used if they have received prior approval by the department.

3. The handling, preparation and analysis of sludge samples shall be accomplished according to Method 105.

4. The mercury emissions shall be determined by use of the following equation:

$$E_{Hg} = 1 \times 10^{-3} cQ$$

where:

$E_{Hg}$  is the mercury emissions, grams/day

$c$  is the mercury concentration of sludge on a dry solids basis, microgram/gram (parts per million)

$Q$  is the sludge charging rate, kilogram/day

5. No changes in the operation of a plant may be made after a sludge test has been conducted which would potentially increase emissions above the level determined by the most recent sludge test, until the new emissions level has been estimated by calculation and the results reported to the department.

6. All sludge samples shall be analyzed for mercury content within 30 days after the sludge sample is collected. Each determination shall be

reported to the department by registered letter dispatched before the close of the next business day following the determination.

7. Records of sludge sampling, charging rate determination and other data needed to determine mercury content of wastewater treatment plant sludges shall be retained at the source and made available for inspection by a department representative for a minimum of 2 years.

History: Renum. from NR 154.19 (3) (b), and am., Register, September, 1986, No. 369, eff. 10-1-86; am. (1) (b), (2) (b), (3) (c) and (4) (b), Register, May, 1992, No. 437, eff. 6-1-92.

**NR 446.05 Emission monitoring.** All wastewater treatment plant sludge incineration and drying plants for which mercury emissions exceed 1600 grams/day, demonstrated either by stack sampling or sludge sampling according to s. NR 446.04 (4), shall monitor mercury emissions at intervals of at least once per year by use of Method 105 of 40 CFR part 61, Appendix B, incorporated by reference in ch. NR 484, or the procedures specified in s. NR 446.04 (4) (f). The results of monitoring shall be reported to the department by registered letter dispatched before the close of the next business day following the monitoring. The results shall be retained at the source and shall be made available for inspection by a department representative for a minimum of 2 years.

History: Renum. from NR 154.19 (3) (c), and am., Register, September, 1986, No. 369, eff. 10-1-86.