

3.4 Mercury

3.4.1 Applicability

The provisions of this source category are applicable to those stationary sources which process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge.

3.4.2 Stack Sampling

(a) [Reserved]

(b) Mercury chlor-alkali plant-hydrogen and end-box ventilation gas streams.

(1) Unless a waiver of emission testing is obtained, each owner or operator employing mercury chlor-alkali cell(s) shall test emissions from his source,

(i) Within 90 days of the effective date in the case of an existing source or a new source which has an initial start-up date preceding the effective date; or

(ii) Within 90 days of startup in the case of a new source which did not have an initial start-up date preceding the effective date.

(2) The Director shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.

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

(4) All samples shall be analyzed and mercury emissions shall be determined within 30 days after the source test. All the determinations will be reported to the Director by a registered letter dispatched within 15 calendar days following the data such determination is completed.

(5) 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 the Director, for a minimum of 2 years.

(c) Mercury chlor-alkali plants--cell room ventilation system.

(1) Stationary sources using mercury chlor-alkali cells may test cell room emissions in accordance with paragraph (c)(2) of this section or demonstrate compliance with paragraph (c)(4) of this section and assume ventilation emissions of 1,300 gms/day of mercury.

(2) Unless a waiver of emission testing is obtained, each owner or operator shall pass all cell room air in forced gas streams through stacks suitable for testing and shall test emissions from the source according to Method 101 in Appendix A to this text. The emission test shall be performed.

- (i) Within 90 days of the effective date in the case of an existing source or a new source which has an initial start-up date preceding the effective date; or
 - (ii) Within 90 days of start-up in the case of a new source which did not have an initial start-up date preceding the effective date.
 - (3) The Director shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.
 - (4) An owner or operator may carry out approved design, maintenance, and housekeeping practices. A list of approved design, maintenance, and housekeeping practices may be obtained from the Director.
- (d) Sludge incineration and drying processes.
- (1) Unless a waiver of emission testing is obtained, each owner or operator of a source subject to applicable regulations shall test emissions from his source. Such tests shall be conducted in accordance with the procedures set forth either in paragraph (d) of this section or in Section 3.4.3.
 - (2) Method 101A in Appendix A of this text shall be used to test emissions as follows:
 - (i) The tests shall be performed within 90 days of the effective date in the case of an existing source or a new source which has an initial start-up date preceding the effective date; or
 - (ii) The tests shall be performed within 90 days of start-up in the case of a new source which did not have an initial start-up date preceding the effective date.
 - (3) The Director shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.
 - (4) Samples shall be taken over such a period or periods as are necessary to accurately determine the maximum emissions which will occur in a 24-hour period. No changes in the operation shall be made, which would potentially increase emissions above that determined by the most recent source test, until the new emission has been estimated by calculation and the results reported to the Director.
 - (5) 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 Director by a registered letter dispatched within 15 calendar days following the date such determination is completed.
 - (6) 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 the Director, for a minimum of 2 years.

3.4.3 Sludge Sampling

- (a) As an alternative means for demonstrating compliance, an owner or operator may use Method 105 of Appendix A and the procedures specified in this section.
 - (1) A sludge test shall be conducted within 90 days of the effective date of applicable

regulations in the case of an existing source or a new source which has an initial start-up date preceding the effective date; or

- (2) A sludge test shall be conducted within 90 days of start-up in the case of a new source which did not have an initial start-up date preceding the effective date.
- (b) The Director shall be notified at least 30 days prior to a sludge sampling test, so that he may at his option observe the test.
- (c) Sludge shall be sampled according to paragraph (c)(1) of this section, sludge charging rate for the plant shall be determined according to paragraph (c)(2) of this section, and the sludge analysis shall be performed according to paragraph (c)(3) of this section.
- (1) The sludge shall be sampled according to Method 105--Determination of Mercury in Wastewater Treatment Plant Sewage Sludges. A total of three 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 shall not exceed 72 hours after the first grab sample is obtained. Samples shall 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 ± 5 percent over its operating range. Other methods of measuring sludge mass charging rates may be used in they have received prior approval by the Director.
- (3) The sampling, handling, preparation, and analysis of sludge samples shall be accomplished according to Method 105 in Appendix A of this text.
- (d) The mercury emissions shall be determined by use of the following equation:

$$E_{Hg} = \frac{M Q F_{sm(avg)}}{1000}$$

where:

E_{Hg} = Mercury emissions, g/day.

M = Mercury concentration of sludge on a dry solids basis, $\mu\text{g/g}$.

Q = Sludge charging rate, kg/day.

F_{sm} = Weight fraction of solids in the collected sludge after mixing.

1000 = Conversion factor, $\text{kg } \mu\text{g/g}^2$.

- (e) No changes in the operation of a plant shall 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 emission level has been estimated by calculation and the results reported to the Director.
- (f) 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 Director by a registered letter dispatched within 15 calendar days following the date such determination is completed.

- (g) 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 the Director, for a minimum of 2 years.

3.4.4

Emission Monitoring

- (a) Wastewater treatment plant sludge incineration and drying plants. All such sources for which mercury emissions exceed 1600 g/day, demonstrated either by stack sampling according to 3.4.2 above, or sludge sampling according to 3.4.3 above shall monitor mercury emissions at intervals of at least once per year by use of Method 105 of Appendix A, or the procedures specified in 3.4.3(c) or (d). The results of the monitoring shall be reported and retained according to 3.4.2(d) (4) and (5), or 3.4.3(f) and (g).
- (b) Mercury cell chlor-alkali plants--hydrogen and end-box ventilation gas streams.
 - (1) The owner or operator of each mercury cell chlor-alkali shall, when required by the Director, perform a mercury emission test that demonstrates compliance with applicable regulations, on the hydrogen stream by Method 102 and on the end-box stream by Method 101 for the purpose of establishing limits for parameters to be monitored.
 - (2) During tests specified in paragraph (b)(1) of this section, the following control device parameters shall be monitored, except as provided in paragraph (c) of this section, and recorded manually or automatically at least once every 15 minutes:
 - (i) The exit gas temperature from uncontrolled streams;
 - (ii) The outlet temperature of the gas stream for the final (i.e., the farthest downstream) cooling system when no control devices other than coolers and demisters are used;
 - (iii) The outlet temperature of the gas stream from the final cooling system when the cooling system is followed by a molecular sieve or carbon adsorber;
 - (iv) Outlet concentration of available chlorine, pH, liquid flow rate, and inlet gas temperature of chlorinated brine scrubbers and hypochlorite scrubbers;
 - (v) The liquid flow rate and exit gas temperature for water scrubbers;
 - (vi) The inlet gas temperature of carbon adsorption systems; and
 - (vii) The temperature during the heating phase of the regeneration cycle for carbon adsorbers or molecular sieves.
 - (3) The recorded parameters in paragraphs (b)(2)(i) through (b)(2)(vi) of this section shall be averaged over the test period (a minimum of 6 hours) to provide an average number. The highest temperature reading that is measured in paragraph (b)(2)(vii) of this section is to be identified as the reference temperature for use in paragraph (b)(6)(ii) of this section.
 - (4) (i) Immediately following completion of the emission tests specified in paragraph (b)(1) of this section, the owner or operator of a mercury cell chlor-alkali plant shall monitor and record manually or automatically at least once per hour the

same parameters specified in paragraphs (b)(2)(i) through (b)(2)(vi) of this section.

- (ii) Immediately following completion of the emission tests specified in paragraph (b)(1) of this section, the owner or operator shall monitor and record manually or automatically, during each heating phase of the regeneration cycle, the temperature specified in paragraph (b)(2)(vii) of this section.
 - (5) Monitoring devices used in accordance with paragraphs (b)(2) and (b)(4) of this section shall be certified by their manufacturer to be accurate to within 10 percent, and shall be operated, maintained, and calibrated according to the manufacturer's instructions. Records of the certifications and calibrations shall be retained at the chlor-alkali plant and made available for inspection by the Director as follows: Certification, for as long as the device is used for this purpose; calibration for a minimum of 2 years.
 - (6)
 - (i) When the hourly value of a parameter monitored in accordance with paragraph (b)(4)(i) of this section exceeds, or in the case of liquid flow rate and available chlorine falls below the value of that same parameter determined in paragraph (b)(2) of this section for 24 consecutive hours, the Director is to be notified within the next 10 days.
 - (ii) When the maximum hourly value of the temperature measured in accordance with paragraph (b)(4)(ii) of this section is below the reference temperature recorded according to paragraph (b)(3) of this section for three consecutive regeneration cycles, the Director is to be notified within the next 10 days.
 - (7) Semiannual reports shall be submitted to the Director indicating the time and date on which the hourly value of each parameter monitored according to paragraphs (b)(4)(i) and (b)(4)(ii) of this section fell outside the value of that same parameter determined under paragraph (b)(3) of this section; and corrective action taken and the time and date of the corrective action. Parameter excursions will be considered unacceptable operation and maintenance of the emission control system. In addition, while compliance with the emission limits is determined primarily by conducting a performance test according to the procedures in 3.4.2(b), reports of parameter excursions may be used as evidence in judging the duration of a violation that is determined by a performance test.
- (c) As an alternative to the monitoring, recordkeeping, and reporting requirements in paragraphs (b)(2) through (7) of this section, an owner or operator may develop and submit for the Director's review and approval a plant-specific monitoring plan. To be approved, such a plan must ensure not only compliance with the applicable emission limits, but also proper operation and maintenance of emissions control systems. Any site-specific monitoring plan submitted must, at a minimum, include the following:
- (1) Identification of the critical parameter or parameters for the hydrogen stream and for the end-box ventilation stream that are to be monitored and an explanation of why the critical parameter(s) selected is the best indicator of proper control system performance and of mercury emission rates.
 - (2) Identification of the maximum or minimum value of each parameter (e.g., degrees temperature, concentration of mercury) that is not to be exceeded. The level(s) is to be directly correlated to the results of a performance test, conducted no more than 180

days prior to submittal of the plan, when the facility was in compliance with the emission limits.

- (3) Designation of the frequency for recording the parameter measurements, with justification if the frequency is less than hourly. A longer recording frequency must be justified on the basis of the amount of time that could elapse during periods of process or control system upsets before the emission limits would be exceeded, and consideration is to be given to the time that would be necessary to repair the failure.
 - (4) Designation of the immediate actions to be taken in the event of an excursion beyond the value of the parameter established in 2.
 - (5) Provisions for reporting, semiannually, parameter excursions and the corrective actions taken, and provisions for reporting within 10 days any significant excursion.
 - (6) Identification of the accuracy of the monitoring device(s) or of the readings obtained.
 - (7) Recordkeeping requirements for certifications and calibrations.
- (d) Mercury cell chlor-alkali plants--cell room ventilation system.
- (1) Stationary sources determining cell room emissions in accordance with 3.4.2(c)(4) shall maintain daily records of all leaks or spills of mercury. The records shall indicate the amount, location, time, and date the leaks or spills occurred, identify the cause of the leak or spill, state the immediate steps taken to minimize mercury emissions and steps taken to prevent future occurrences, and provide the time and date on which corrective steps were taken.
 - (2) The results of monitoring shall be recorded, retained at the source, and made available for inspection by the Director for a minimum of 2 years.