Indiana Department of Environmental Management
*We Protect Hoosiers and Our Environment.*
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

**Michael R. Pence**
*Governor*

**Carol S. Comer**
*Commissioner*

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| To: | Interested Parties |
| Date: | September 27, 2016 |
| From: | Matthew Stuckey, Chief<br>Permits Branch<br>Office of Air Quality |
| Source Name: | Indiana-Kentucky Electric Corporation - Clifty Creek |
| Permit Level: | Title V Operation Permit Renewal |
| Permit Number: | 077-36338-00001 |
| Source Location: | 1335 Clifty Hollow Rd Madison IN 47250 |
| Type of Action Taken: | Permit Renewal |

## Notice of Decision: Approval - Effective Immediately

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the matter referenced above.

The final decision is available on the IDEM website at: http://www.in.gov/apps/idem/caats/
To view the document, select Search option 3, then enter permit 36338.

If you would like to request a paper copy of the permit document, please contact IDEM's central file room:

> Indiana Government Center North, Room 1201
> 100 North Senate Avenue, MC 50-07
> Indianapolis, IN 46204
> Phone: 1-800-451-6027 (ext. 4-0965)
> Fax (317) 232-8659

Pursuant to IC 13-15-5-3, this permit is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

*(continues on next page)*

If you wish to challenge this decision, IC 4-21.5-3-7 and IC 13-15-6-1(b) or IC 13-15-6-1(a) require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204.

For an **initial Title V Operating Permit**, a petition for administrative review must be submitted to the Office of Environmental Adjudication within **thirty (30)** days from the receipt of this notice provided under IC 13-15-5-3, pursuant to IC 13-15-6-1(b).

For a **Title V Operating Permit renewal**, a petition for administrative review must be submitted to the Office of Environmental Adjudication within **fifteen (15)** days from the receipt of this notice provided under IC 13-15-5-3, pursuant to IC 13-15-6-1(a).

The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

(1) the date the document is delivered to the Office of Environmental Adjudication (OEA);
(2) the date of the postmark on the envelope containing the document, if the document is mailed to OEA by U.S. mail; or
(3) The date on which the document is deposited with a private carrier, as shown by receipt issued by the carrier, if the document is sent to the OEA by private carrier.

The petition must include facts demonstrating that you are either the applicant, a person aggrieved or adversely affected by the decision or otherwise entitled to review by law. Please identify the permit, decision, or other order for which you seek review by permit number, name of the applicant, location, date of this notice and all of the following:

(1) the name and address of the person making the request;
(2) the interest of the person making the request;
(3) identification of any persons represented by the person making the request;
(4) the reasons, with particularity, for the request;
(5) the issues, with particularity, proposed for considerations at any hearing; and
(6) identification of the terms and conditions which, in the judgment of the person making the request, would be appropriate in the case in question to satisfy the requirements of the law governing documents of the type issued by the Commissioner.

Pursuant to 326 IAC 2-7-18(d), any person may petition the U.S. EPA to object to the issuance of an initial Title V operating permit, permit renewal, or modification within sixty (60) days of the end of the forty-five (45) day EPA review period. Such an objection must be based only on issues that were raised with reasonable specificity during the public comment period, unless the petitioner demonstrates that it was impractible to raise such issues, or if the grounds for such objection arose after the comment period.

To petition the U.S. EPA to object to the issuance of a Title V operating permit, contact:

U.S. Environmental Protection Agency
401 M Street
Washington, D.C. 20406

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178. Callers from within Indiana may call toll-free at 1-800-451-6027, ext. 3-0178.

Enclosures

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# Part 70 Operating Permit Renewal
# OFFICE OF AIR QUALITY

## Indiana-Kentucky Electric Corporation Clifty Creek Station
## 1335 Clifty Hollow Road
## Madison, Indiana 47250

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

**The Permittee must comply with all conditions of this permit. Noncompliance with any provisions of this permit is grounds for enforcement action; permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Noncompliance with any provision of this permit, except any provision specifically designated as not federally enforceable, constitutes a violation of the Clean Air Act. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. An emergency does constitute an affirmative defense in an enforcement action provided the Permittee complies with the applicable requirements set forth in Section B, Emergency Provisions.**

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

| Operation Permit No.: T077-36338-00001 | |
|---|---|
| Issued by:<br>Tripurari Sinha<br>Tripurari P. Sinha, Ph. D., Section Chief<br>Permits Branch<br>Office of Air Quality | Issuance Date: September 27,2016<br>Expiration Date: September 27,2021 |

# TABLE OF CONTENTS

## SECTION A SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

### A.1 General Information [326 IAC 2-7-4(c)][326 IAC 2-7-5(14)][326 IAC 2-7-1(22)]

The Permittee owns and operates a stationary electric power generating facility.

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| Source Address: | 1335 Clifty Hollow Road, Madison, Indiana 47250 |
| General Source Phone Number: | 740-289-7299 |
| SIC Code: | 4911 |
| County Location: | Jefferson County (Madison Township) |
| Source Location Status: | Nonattainment for $PM_{2.5}$ standard<br>Attainment for all other criteria pollutants |
| Source Status: | Part 70 Operating Permit Program<br>Major Source, under PSD and Emission Offset Rules<br>Major Source, Section 112 of the Clean Air Act<br>1 of 28 Source Categories |

### A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)][326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

(a) Five (5) wet-bottom pulverized coal-fired boilers identified as Units 1 through 5, with construction completed in 1955, each with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Units 1 through 5 have the following emission controls:

- over-fire air system ($NO_X$ control)
- selective catalytic reduction (SCR) system ($NO_X$ control)
- “cold-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 1, 2, and 3 exhaust to Flue 13 of Stack 14. Units 4 and 5 exhaust to Flue 46 of Stack 14. Both Flue 13 and Flue 46 of Stack 14 have continuous emissions monitoring systems (CEMS) for particulate matter (PM). They also have flow, sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

(b) One (1) wet-bottom pulverized coal-fired boiler identified as Unit 6, with construction completed in 1956, with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Unit 6 has the following emission controls:

- over-fire air system ($NO_X$ control)
- "hot-side" electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 6 exhausts to Flue 46 of Stack 14. Flue 46 of Stack 14 has continuous emissions monitoring systems (CEMS) for particulate matter (PM). They also have flow, sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

The Flue Gas Desulfurization (FGD) System for Units 1 through 6, permitted in 2008, consists of one (1) stack (Stack 14) with two flues (Flues 13 and 46), two (2) jet bubbling reactor (JBR) absorbers (JBRs 13 and 46), and associated limestone and gypsum material handling systems.

(c) Coal handling facilities with a maximum design transfer rate of 2400 tons per hour, and coal storage systems, utilizing baghouses as control, including the following:

(1) facilities installed in the 1950's, including coal conveyors and transfer house facilities, coal unloading stations 1 and 4 using clamshell barge unloaders, coal pile unloading, and coal piles, using baghouses at the following transfer points: Station 2 and 5, the Tripper Room Units 1 through 6, and Station 7; and

(2) facilities installed in 1993 to allow increased use of subbituminous coal to reduce $SO_2$ emissions, including transfer stations B1, B2, B3 and B4, and conveyors 5B1, B12, B23, B34 E, and B34 W, using baghouses at the following transfer points: B1, B2, B3, and B4.

(d) Dry fly ash handling and disposal facilities, using a baghouse as control, including the following:

(1) Dry fly ash handling system installed in 1990 and 1991, including pneumatic conveyance to two (2) main silos with a maximum design transfer rate of 40 tons per hour, rotary and dry unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area or for transportation offsite. Particulate emissions are controlled on the plant paved and plant unpaved haul roads by wet material, watering, sweeping, and speed reduction.

(2) Two (2) additional dry fly ash storage silos (a.k.a truck bins) installed in 1994 and 1995 for unmarketable fly ash, including pneumatic conveyance to silos with a maximum design transfer rate of 40 tons per hour, rotary unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area.

(e) One (1) Limestone Handling (LH) System, permitted in 2008, with a maximum capacity of 1,000 tons per hour, consisting of one (1) barge unloader, one (1) barge unloading hopper and feeder, three (3) conveyors, two (2) transfer stations, and one (1) stacking tube and storage pile. Particulate emissions are controlled by partial to full enclosure and wet dust suppression.

(f) One (1) Limestone Processing (LP) System, permitted in 2008, with a maximum transfer rate of 300 tons per hour, consisting of two (2) reclaim hoppers and feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) ball mill feeders, two (2) wet ball mills, and one (1) emergency reclaim hopper. Particulate emissions are controlled by material wetting, partial to full enclosure and two (2) storage silo baghouses.

[The Limestone Processing (LP) System is an affected source under the Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60, Subpart OOO).]

(g) One (1) Gypsum Handling (GH) System, permitted in 2008, with a maximum capacity of 150 tons per hour, consisting of one (1) collecting conveyor, one (1) transfer conveyor, two (2) transfer stations, one (1) radial stackout conveyor, one (1) emergency collecting conveyor, one (1) emergency transfer station, one (1) emergency stackout, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area or for transportation offsite. Particulate emissions are controlled on the conveyors and transfer points by wet material and partial to full enclosure. Particulate emissions are controlled on the plant paved and plant unpaved haul roads by wet material, watering, sweeping, and speed reduction. Particulate emissions from handling and placement of Gypsum in onsite disposal area or for transportation offsite are controlled by wet material, watering, compacting, covering, and other precautionary measures.

(h) One (1) Chloride Purge Stream (CPS) Wastewater Treatment Plant (WWTP) Filter Cake Handling System, permitted in 2008, consisting of filter cake being loaded into trucks by a wheel loader, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area. Particulate emissions are controlled during loading of the filter cake into trucks by wet material and other precautionary measures. Particulate emissions are controlled on the paved and unpaved haul roads by wet material, watering, sweeping, and speed reduction.

Particulate emissions from handling and placement of CPS WWTP Filter Cake in onsite disposal area are controlled by wet material, watering, compacting, covering, and other precautionary measures.

(i) One (1) Dry Sorbent Injection System, permitted in 2008, consisting of two (2) silos to store dry sorbent material, identified as East Trona Silo 13 and West Trona Silo 45. Each silo has a usable storage capacity of approximately 600 tons. The dry sorbent material is delivered to the plant by totally enclosed dry-cement type trucks on an as-needed basis. The dry sorbent material is pneumatically transferred from the trucks into the silos through a totally enclosed system. The unloading rate for each truck is approximately 26 tons per hour. Both silos are fitted with baghouses designed to remove the particulate in the exhaust air from the truck unloading process. A totally enclosed pneumatic system is also used to transfer the dry sorbent material from the silos for injection into the Units 1 through 5 flue gas ducts between the existing SCRs and ESPs.

A.3 Specifically Regulated Insignificant Activities
[326 IAC 2-7-1(21)][326 IAC 2-7-4(c)][326 IAC 2-7-5(14)]

This stationary source also includes the following insignificant activities which are specifically regulated, as defined in 326 IAC 2-7-1(21):

(a) Coal bunker and coal scale exhausts and associated dust collector vents. [326 IAC 6-3]

(b) Other activities or categories not previously identified with potential, uncontrolled emissions equal to or less than thresholds require listing only: Pb 0.6 ton per year or 3.29 pounds per day, $SO_2$ 5 pounds per hour or 25 pounds per day, $NO_X$ 5 pounds per hour or 25 pounds per day, CO 25 pounds per day, PM 5 pounds per hour or 25 pounds per day, VOC 3 pounds per hour or 15 pounds per day:

(1) Four (4) No. 2 fuel oil fired or distillate fuel fired coal transfer station heaters, installed in 1993 (that burn distillate fuel as defined under 40 CFR Part 60.41c):
(A) One (1) with 1.25 MMBtu/hr heat input capacity for Station 2;

(B) One (1) with 1.75 MMBtu/hr heat input capacity for Station 5; and

(C) Two (2) with 2.75 MMBtu/hr heat input capacity for Stations B3 and B4.

(2) Limestone/iron ore flux handling facility, including limestone storage area, dump hopper, conveyor, and enclosed surge bin, installed in 1994, with a maximum design throughput rate of 4566.2 lb/hr. [326 IAC 6-3][326 IAC 5].

(c) Five (5) emergency stationary reciprocating internal combustion engines, consisting of the following:

(1) One (1) propane fired stationary RICE, identified as CEMG-01, installed in 1992, with a heat input capacity of 10.05 HP, using no controls, and exhausting outdoors.

(2) One (1) propane fired stationary RICE, identified as CESG-1, installed in 2008, with a heat input capacity of 107.24 HP, using no controls, and exhausting outdoors.

(3) One (1) diesel fired stationary RICE, identified as CEQP-01, installed in 2007, with a heat input capacity of 207 HP, using no controls, and exhausting outdoors.

(4) Two (2) diesel fired stationary RICE fire pumps, identified as CEFP-01 and CEFP-02, each installed prior to 2006, each with a heat input capacity of 250 HP, each using no controls, and each exhausting outdoors.

A.4 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability) because:

(a) It is a major source, as defined in 326 IAC 2-7-1(22);

(b) It is a source in a source category designated by the United States Environmental Protection Agency (U.S. EPA) under 40 CFR 70.3 (Part 70 - Applicability).

(c) It is an affected source under Title IV (Acid Deposition Control) of the Clean Air Act, as defined in 326 IAC 2-7-1(3);

## SECTION B GENERAL CONDITIONS

B.1 Definitions [326 IAC 2-7-1]

Terms in this permit shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-7) shall prevail.

B.2 Permit Term [326 IAC 2-7-5(2)][326 IAC 2-1.1-9.5][326 IAC 2-7-4(a)(1)(D)][IC 13-15-3-6(a)]

(a) This permit, T077-36338-00001, is issued for a fixed term of five (5) years from the issuance date of this permit, as determined in accordance with IC 4-21.5-3-5(f) and IC 13-15-5-3. Subsequent revisions, modifications, or amendments of this permit do not affect the expiration date of this permit or of permits issued pursuant to Title IV of the Clean Air Act and 326 IAC 21 (Acid Deposition Control).

(b) If IDEM, OAQ, upon receiving a timely and complete renewal permit application, fails to issue or deny the permit renewal prior to the expiration date of this permit, this existing permit shall not expire and all terms and conditions shall continue in effect, including any permit shield provided in 326 IAC 2-7-15, until the renewal permit has been issued or denied.

B.3 Term of Conditions [326 IAC 2-1.1-9.5]

Notwithstanding the permit term of a permit to construct, a permit to operate, or a permit modification, any condition established in a permit issued pursuant to a permitting program approved in the state implementation plan shall remain in effect until:

(a) the condition is modified in a subsequent permit action pursuant to Title I of the Clean Air Act; or

(b) the emission unit to which the condition pertains permanently ceases operation.

B.4 Enforceability [326 IAC 2-7-7] [IC 13-17-12]

Unless otherwise stated, all terms and conditions in this permit, including any provisions designed to limit the source's potential to emit, are enforceable by IDEM, the United States Environmental Protection Agency (U.S. EPA) and by citizens in accordance with the Clean Air Act.

B.5 Severability [326 IAC 2-7-5(5)]

The provisions of this permit are severable; a determination that any portion of this permit is invalid shall not affect the validity of the remainder of the permit.

B.6 Property Rights or Exclusive Privilege [326 IAC 2-7-5(6)(D)]

This permit does not convey any property rights of any sort or any exclusive privilege.

B.7 Duty to Provide Information [326 IAC 2-7-5(6)(E)]

(a) The Permittee shall furnish to IDEM, OAQ, within a reasonable time, any information that IDEM, OAQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. Upon request, the Permittee shall also furnish to IDEM, OAQ copies of records required to be kept by this permit.

(b) For information furnished by the Permittee to IDEM, OAQ, the Permittee may include a claim of confidentiality in accordance with 326 IAC 17.1. When furnishing copies of requested records directly to U. S. EPA, the Permittee may assert a claim of confidentiality in accordance with 40 CFR 2, Subpart B.

B.8 Certification [326 IAC 2-7-4(f)][326 IAC 2-7-6(1)][326 IAC 2-7-5(3)(C)]

(a) A certification required by this permit meets the requirements of 326 IAC 2-7-6(1) if:

(1) it contains a certification by a "responsible official" as defined by 326 IAC 2-7-1(35), and

(2) the certification states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

(b) The Permittee may use the attached Certification Form, or its equivalent with each submittal requiring certification. One (1) certification may cover multiple forms in one (1) submittal.

(c) A "responsible official" is defined at 326 IAC 2-7-1(35).

B.9 Annual Compliance Certification [326 IAC 2-7-6(5)]

(a) The Permittee shall annually submit a compliance certification report which addresses the status of the source's compliance with the terms and conditions contained in this permit, including emission limitations, standards, or work practices. All certifications shall cover the time period from January 1 to December 31 of the previous year, and shall be submitted no later than July 1 of each year to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

and

United States Environmental Protection Agency, Region V
Air and Radiation Division, Air Enforcement Branch - Indiana (AE-17J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

(b) The annual compliance certification report required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) The annual compliance certification report shall include the following:

(1) The appropriate identification of each term or condition of this permit that is the basis of the certification;

(2) The compliance status;

(3) Whether compliance was continuous or intermittent;

(4) The methods used for determining the compliance status of the source, currently and over the reporting period consistent with 326 IAC 2-7-5(3); and

(5) Such other facts, as specified in Sections D of this permit, as IDEM, OAQ may require to determine the compliance status of the source.

The submittal by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

B.10 Preventive Maintenance Plan [326 IAC 2-7-5(12)][326 IAC 1-6-3]

(a) A Preventive Maintenance Plan meets the requirements of 326 IAC 1-6-3 if it includes, at a minimum:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

The Permittee shall implement the PMPs.

(b) If required by specific condition(s) in Section D of this permit where no PMP was previously required, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) no later than ninety (90) days after issuance of this permit or ninety (90) days after initial start-up, whichever is later, including the following information on each facility:

(1) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices;

(2) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions; and

(3) Identification and quantification of the replacement parts that will be maintained in inventory for quick replacement.

If, due to circumstances beyond the Permittee’s control, the PMPs cannot be prepared and maintained within the above time frame, the Permittee may extend the date an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

The PMP extension notification does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

The Permittee shall implement the PMPs.

(c) A copy of the PMPs shall be submitted to IDEM, OAQ upon request and within a reasonable time, and shall be subject to review and approval by IDEM, OAQ. IDEM, OAQ may require the Permittee to revise its PMPs whenever lack of proper maintenance causes or is the primary contributor to an exceedance of any limitation on emissions. The PMPs and their submittal do not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(d) To the extent the Permittee is required by 40 CFR Part 60/63 to have an Operation Maintenance, and Monitoring (OMM) Plan for a unit, such Plan is deemed to satisfy the PMP requirements of 326 IAC 1-6-3 for that unit.

B.11 Emergency Provisions [326 IAC 2-7-16]

(a) An emergency, as defined in 326 IAC 2-7-1(12), is not an affirmative defense for an action brought for noncompliance with a federal or state health-based emission limitation.

(b) An emergency, as defined in 326 IAC 2-7-1(12), constitutes an affirmative defense to an action brought for noncompliance with a technology-based emission limitation if the affirmative defense of an emergency is demonstrated through properly signed, contemporaneous operating logs or other relevant evidence that describe the following:

(1) An emergency occurred and the Permittee can, to the extent possible, identify the causes of the emergency;

(2) The permitted facility was at the time being properly operated;

(3) During the period of an emergency, the Permittee took all reasonable steps to minimize levels of emissions that exceeded the emission standards or other requirements in this permit;

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ or Southeast Regional Office within four (4) daytime business hours after the beginning of the emergency, or after the emergency was discovered or reasonably should have been discovered;

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance and Enforcement Branch), or
Telephone Number: 317-233-0178 (ask for Office of Air Quality, Compliance and Enforcement Branch)
Facsimile Number: 317-233-6865
Southeast Regional Office phone: (812) 358-2027; fax: (812) 358-2058**.**

(5) For each emergency lasting one (1) hour or more, the Permittee submitted the attached Emergency Occurrence Report Form or its equivalent, either by mail or facsimile to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

within two (2) working days of the time when emission limitations were exceeded due to the emergency.

The notice fulfills the requirement of 326 IAC 2-7-5(3)(C)(ii) and must contain the following:

(A) A description of the emergency;

(B) Any steps taken to mitigate the emissions; and

(C) Corrective actions taken.

The notification which shall be submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(6) The Permittee immediately took all reasonable steps to correct the emergency.

(c) In any enforcement proceeding, the Permittee seeking to establish the occurrence of an emergency has the burden of proof.

(d) This emergency provision supersedes 326 IAC 1-6 (Malfunctions). This permit condition is in addition to any emergency or upset provision contained in any applicable requirement.

(e) The Permittee seeking to establish the occurrence of an emergency shall make records available upon request to ensure that failure to implement a PMP did not cause or contribute to an exceedance of any limitations on emissions. However, IDEM, OAQ may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4(c)(8) be revised in response to an emergency.

(f) Failure to notify IDEM, OAQ by telephone or facsimile of an emergency lasting more than one (1) hour in accordance with (b)(4) and (5) of this condition shall constitute a violation of 326 IAC 2-7 and any other applicable rules.

(g) If the emergency situation causes a deviation from a technology-based limit, the Permittee may continue to operate the affected emitting facilities during the emergency provided the Permittee immediately takes all reasonable steps to correct the emergency and minimize emissions.

B.12 Permit Shield [326 IAC 2-7-15][326 IAC 2-7-20][326 IAC 2-7-12]

(a) Pursuant to 326 IAC 2-7-15, the Permittee has been granted a permit shield. The permit shield provides that compliance with the conditions of this permit shall be deemed compliance with any applicable requirements as of the date of permit issuance, provided that either the applicable requirements are included and specifically identified in this permit or the permit contains an explicit determination or concise summary of a determination that other specifically identified requirements are not applicable. The Indiana statutes from IC 13 and rules from 326 IAC, referenced in conditions in this permit, are those applicable at the time the permit was issued. The issuance or possession of this permit shall not alone constitute a defense against an alleged violation of any law, regulation or standard, except for the requirement to obtain a Part 70 permit under 326 IAC 2-7 or for applicable requirements for which a permit shield has been granted.

This permit shield does not extend to applicable requirements which are promulgated after the date of issuance of this permit unless this permit has been modified to reflect such new requirements.

(b) If, after issuance of this permit, it is determined that the permit is in nonconformance with an applicable requirement that applied to the source on the date of permit issuance, IDEM, OAQ shall immediately take steps to reopen and revise this permit and issue a compliance order to the Permittee to ensure expeditious compliance with the applicable requirement until the permit is reissued. The permit shield shall continue in effect so long as the Permittee is in compliance with the compliance order.

(c) No permit shield shall apply to any permit term or condition that is determined after issuance of this permit to have been based on erroneous information supplied in the permit application. Erroneous information means information that the Permittee knew to be false, or in the exercise of reasonable care should have been known to be false, at the time the information was submitted.

(d) Nothing in 326 IAC 2-7-15 or in this permit shall alter or affect the following:

(1) The provisions of Section 303 of the Clean Air Act (emergency orders), including the authority of the U.S. EPA under Section 303 of the Clean Air Act;

(2) The liability of the Permittee for any violation of applicable requirements prior to or at the time of this permit's issuance;

(3) The applicable requirements of the acid rain program, consistent with Section 408(a) of the Clean Air Act; and

(4) The ability of U.S. EPA to obtain information from the Permittee under Section 114 of the Clean Air Act.

(e) This permit shield is not applicable to any change made under 326 IAC 2-7-20(b)(2) (Sections 502(b)(10) of the Clean Air Act changes) and 326 IAC 2-7-20(c)(2) (trading based on State Implementation Plan (SIP) provisions).

(f) This permit shield is not applicable to modifications eligible for group processing until after IDEM, OAQ, has issued the modifications. [326 IAC 2-7-12(c)(7)]

(g) This permit shield is not applicable to minor Part 70 permit modifications until after IDEM, OAQ, has issued the modification. [326 IAC 2-7-12(b)(8)]

B.13 Prior Permits Superseded [326 IAC 2-1.1-9.5][326 IAC 2-7-10.5]

(a) All terms and conditions of permits established prior to T077-36338-00001 and issued pursuant to permitting programs approved into the state implementation plan have been either:

(1) incorporated as originally stated,

(2) revised under 326 IAC 2-7-10.5, or

(3) deleted under 326 IAC 2-7-10.5.

(b) Provided that all terms and conditions are accurately reflected in this permit, all previous registrations and permits are superseded by this Part 70 operating permit, except for permits issued pursuant to Title IV of the Clean Air Act and 326 IAC 21 (Acid Deposition Control)

B.14 Termination of Right to Operate [326 IAC 2-7-10][326 IAC 2-7-4(a)]

The Permittee's right to operate this source terminates with the expiration of this permit unless a timely and complete renewal application is submitted at least nine (9) months prior to the date of expiration of the source’s existing permit, consistent with 326 IAC 2-7-3 and 326 IAC 2-7-4(a).

B.15 Permit Modification, Reopening, Revocation and Reissuance, or Termination [326 IAC 2-7-5(6)(C)][326 IAC 2-7-8(a)][326 IAC 2-7-9]

(a) This permit may be modified, reopened, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Part 70 Operating Permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any condition of this permit. [326 IAC 2-7-5(6)(C)] The notification by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(b) This permit shall be reopened and revised under any of the circumstances listed in IC 13-15-7-2 or if IDEM, OAQ determines any of the following:

(1) That this permit contains a material mistake.

(2) That inaccurate statements were made in establishing the emissions standards or other terms or conditions.

(3) That this permit must be revised or revoked to assure compliance with an applicable requirement. [326 IAC 2-7-9(a)(3)]

(c) Proceedings by IDEM, OAQ to reopen and revise this permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of this permit for which cause to reopen exists. Such reopening and revision shall be made as expeditiously as practicable. [326 IAC 2-7-9(b)]

(d) The reopening and revision of this permit, under 326 IAC 2-7-9(a), shall not be initiated before notice of such intent is provided to the Permittee by IDEM, OAQ at least thirty (30) days in advance of the date this permit is to be reopened, except that IDEM, OAQ may provide a shorter time period in the case of an emergency. [326 IAC 2-7-9(c)]

B.16 Permit Renewal [326 IAC 2-7-3][326 IAC 2-7-4][326 IAC 2-7-8(e)]

(a) The application for renewal shall be submitted using the application form or forms prescribed by IDEM, OAQ and shall include the information specified in 326 IAC 2-7-4. Such information shall be included in the application for each emission unit at this source, except those emission units included on the trivial or insignificant activities list contained in 326 IAC 2-7-1(21) and 326 IAC 2-7-1(42). The renewal application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

Request for renewal shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(b) A timely renewal application is one that is:

(1) Submitted at least nine (9) months prior to the date of the expiration of this permit; and

(2) If the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the

document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(c) If the Permittee submits a timely and complete application for renewal of this permit, the source's failure to have a permit is not a violation of 326 IAC 2-7 until IDEM, OAQ takes final action on the renewal application, except that this protection shall cease to apply if, subsequent to the completeness determination, the Permittee fails to submit by the deadline specified, pursuant to 326 IAC 2-7-4(a)(2)(D), in writing by IDEM, OAQ any additional information identified as being needed to process the application.

B.17 Permit Amendment or Modification [326 IAC 2-7-11][326 IAC 2-7-12] [40 CFR 72]

(a) Permit amendments and modifications are governed by the requirements of 326 IAC 2-7-11 or 326 IAC 2-7-12 whenever the Permittee seeks to amend or modify this permit.

(b) Pursuant to 326 IAC 2-7-11(b) and 326 IAC 2-7-12(a), administrative Part 70 operating permit amendments and permit modifications for purposes of the acid rain portion of a Part 70 permit shall be governed by regulations promulgated under Title IV of the Clean Air Act. [40 CFR 72]

(c) Any application requesting an amendment or modification of this permit shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(d) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

B.18 Permit Revision Under Economic Incentives and Other Programs [326 IAC 2-7-5(8)][326 IAC 2-7-12(b)(2)]

(a) No Part 70 permit revision or notice shall be required under any approved economic incentives, marketable Part 70 permits, emissions trading, and other similar programs or processes for changes that are provided for in a Part 70 permit.

(b) Notwithstanding 326 IAC 2-7-12(b)(1) and 326 IAC 2-7-12(c)(1), minor Part 70 permit modification procedures may be used for Part 70 modifications involving the use of economic incentives, marketable Part 70 permits, emissions trading, and other similar approaches to the extent that such minor Part 70 permit modification procedures are explicitly provided for in the applicable State Implementation Plan (SIP) or in applicable requirements promulgated or approved by the U.S. EPA.

B.19 Operational Flexibility [326 IAC 2-7-20][326 IAC 2-7-10.5]

(a) The Permittee may make any change or changes at the source that are described in 326 IAC 2-7-20(b) or (c) without a prior permit revision, if each of the following conditions is met:

(1) The changes are not modifications under any provision of Title I of the Clean Air Act;

(2) Any preconstruction approval required by 326 IAC 2-7-10.5 has been obtained;

(3) The changes do not result in emissions which exceed the limitations provided in this permit (whether expressed herein as a rate of emissions or in terms of total emissions);

(4) The Permittee notifies the:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

and

United States Environmental Protection Agency, Region V
Air and Radiation Division, Regulation Development Branch - Indiana (AR-18J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

in advance of the change by written notification at least ten (10) days in advance of the proposed change. The Permittee shall attach every such notice to the Permittee's copy of this permit; and

(5) The Permittee maintains records on-site, on a rolling five (5) year basis, which document all such changes and emission trades that are subject to 326 IAC 2-7-20(b)(1) and (c)(1). The Permittee shall make such records available, upon reasonable request, for public review.

Such records shall consist of all information required to be submitted to IDEM, OAQ in the notices specified in 326 IAC 2-7-20(b)(1) and (c)(1).

(b) The Permittee may make Section 502(b)(10) of the Clean Air Act changes (this term is defined at 326 IAC 2-7-1(37)) without a permit revision, subject to the constraint of 326 IAC 2-7-20(a). For each such Section 502(b)(10) of the Clean Air Act change, the required written notification shall include the following:

(1) A brief description of the change within the source;

(2) The date on which the change will occur;

(3) Any change in emissions; and

(4) Any permit term or condition that is no longer applicable as a result of the change.

The notification which shall be submitted is not considered an application form, report or compliance certification. Therefore, the notification by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) Emission Trades [326 IAC 2-7-20(c)]
The Permittee may trade emissions increases and decreases at the source, where the applicable SIP provides for such emission trades without requiring a permit revision, subject to the constraints of Section (a) of this condition and those in 326 IAC 2-7-20(c).

(d) Alternative Operating Scenarios [326 IAC 2-7-20(d)]
The Permittee may make changes at the source within the range of alternative operating scenarios that are described in the terms and conditions of this permit in accordance with 326 IAC 2-7-5(9). No prior notification of IDEM, OAQ or U.S. EPA is required.

(e) Backup fuel switches specifically addressed in, and limited under, Section D of this permit shall not be considered alternative operating scenarios. Therefore, the notification requirements of part (a) of this condition do not apply.

(f) This condition does not apply to emission trades of $SO_2$ or $NO_X$ under 326 IAC 21 or 326 IAC 10-4.

B.20 Source Modification Requirement [326 IAC 2-7-10.5]

A modification, construction, or reconstruction is governed by the requirements of 326 IAC 2.

B.21 Inspection and Entry [326 IAC 2-7-6][IC 13-14-2-2][IC 13-30-3-1][IC 13-17-3-2]

Upon presentation of proper identification cards, credentials, and other documents as may be required by law, and subject to the Permittee's right under all applicable laws and regulations to assert that the information collected by the agency is confidential and entitled to be treated as such, the Permittee shall allow IDEM, OAQ, U.S. EPA, or an authorized representative to perform the following:

(a) Enter upon the Permittee's premises where a Part 70 source is located, or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

(b) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, have access to and copy any records that must be kept under the conditions of this permit;

(c) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, inspect any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit;

(d) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, sample or monitor substances or parameters for the purpose of assuring compliance with this permit or applicable requirements; and

(e) As authorized by the Clean Air Act, IC 13-14-2-2, IC 13-17-3-2, and IC 13-30-3-1, utilize any photographic, recording, testing, monitoring, or other equipment for the purpose of assuring compliance with this permit or applicable requirements.

B.22 Transfer of Ownership or Operational Control [326 IAC 2-7-11]

(a) The Permittee must comply with the requirements of 326 IAC 2-7-11 whenever the Permittee seeks to change the ownership or operational control of the source and no other change in the permit is necessary.

(b) Any application requesting a change in the ownership or operational control of the source shall contain a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new Permittee. The application shall be submitted to:

Indiana Department of Environmental Management
Permit Administration and Support Section, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

Any such application does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) The Permittee may implement administrative amendment changes addressed in the request for an administrative amendment immediately upon submittal of the request. [326 IAC 2-7-11(c)(3)]

B.23 Annual Fee Payment [326 IAC 2-7-19] [326 IAC 2-7-5(7)][326 IAC 2-1.1-7]

(a) The Permittee shall pay annual fees to IDEM, OAQ within thirty (30) calendar days of receipt of a billing. Pursuant to 326 IAC 2-7-19(b), if the Permittee does not receive a bill from IDEM, OAQ the applicable fee is due April 1 of each year.

(b) Except as provided in 326 IAC 2-7-19(e), failure to pay may result in administrative enforcement action or revocation of this permit.

(c) The Permittee may call the following telephone numbers: 1-800-451-6027 or 317-233-4230 (ask for OAQ, Billing, Licensing, and Training Section), to determine the appropriate permit fee.

B.24 Credible Evidence [326 IAC 2-7-5(3)][326 IAC 2-7-6][62 FR 8314] [326 IAC 1-1-6]

For the purpose of submitting compliance certifications or establishing whether or not the Permittee has violated or is in violation of any condition of this permit, nothing in this permit shall preclude the use, including the exclusive use, of any credible evidence or information relevant to whether the Permittee would have been in compliance with the condition of this permit if the appropriate performance or compliance test or procedure had been performed.

## SECTION C SOURCE OPERATION CONDITIONS

| Entire Source |
|---|

### Emission Limitations and Standards [326 IAC 2-7-5(1)]

C.1 Particulate Emission Limitations For Processes with Process Weight Rates Less Than One Hundred (100) Pounds per Hour [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2(e)(2), particulate emissions from any process not exempt under 326 IAC 6-3-1(b) or (c) which has a maximum process weight rate less than 100 pounds per hour and the methods in 326 IAC 6-3-2(b) through (d) do not apply shall not exceed 0.551 pounds per hour.

C.2 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-1 (Applicability) and 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

(a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.

(b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

C.3 Open Burning [326 IAC 4-1] [IC 13-17-9]

The Permittee shall not open burn any material except as provided in 326 IAC 4-1-3, 326 IAC 4-1-4 or 326 IAC 4-1-6. The previous sentence notwithstanding, the Permittee may open burn in accordance with an open burning approval issued by the Commissioner under 326 IAC 4-1-4.1.

C.4 Incineration [326 IAC 4-2] [326 IAC 9-1-2]

The Permittee shall not operate an incinerator except as provided in 326 IAC 4-2 or in this permit. The Permittee shall not operate a refuse incinerator or refuse burning equipment except as provided in 326 IAC 9-1-2 or in this permit.

C.5 Fugitive Dust Emissions [326 IAC 6-4]

The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions). 326 IAC 6-4-2(4) is not federally enforceable.

C.6 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5]

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive particulate matter emissions shall be controlled according to the attached plan as in Attachment A. The provisions of 326 IAC 6-5 are not federally enforceable.

C.7 Asbestos Abatement Projects [326 IAC 14-10] [326 IAC 18] [40 CFR 61, Subpart M]

The Permittee shall comply with the applicable requirements of 326 IAC 14-10, 326 IAC 18, and 40 CFR 61.140.

**Testing Requirements [326 IAC 2-7-6(1)]**

C.8 Performance Testing [326 IAC 3-6]

(a) For performance testing required by this permit, a test protocol, except as provided elsewhere in this permit, shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(b) The Permittee shall notify IDEM, OAQ of the actual test date at least fourteen (14) days prior to the actual test date. The notification submitted by the Permittee does not require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ not later than forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ if the Permittee submits to IDEM, OAQ a reasonable written explanation not later than five (5) days prior to the end of the initial forty-five (45) day period.

**Compliance Requirements [326 IAC 2-1.1-11]**

C.9 Compliance Requirements [326 IAC 2-1.1-11]

The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements by issuing an order under 326 IAC 2-1.1-11. Any monitoring or testing shall be performed in accordance with 326 IAC 3 or other methods approved by the commissioner or the U. S. EPA.

**Compliance Monitoring Requirements [326 IAC 2-7-5(1)][326 IAC 2-7-6(1)]**

C.10 Compliance Monitoring [326 IAC 2-7-5(3)][326 IAC 2-7-6(1)][40 CFR 64][326 IAC 3-8]

(a) For new units:
Unless otherwise specified in the approval for the new emission unit(s), compliance monitoring for new emission units shall be implemented on and after the date of initial start-up.

(b) For existing units:
Unless otherwise specified in this permit, for all monitoring requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance to begin such monitoring. If, due to circumstances beyond the Permittee's control, any monitoring equipment required by this permit cannot be installed and operated no later than ninety (90) days after permit issuance, the Permittee may extend the compliance schedule related to the equipment for an additional ninety (90) days provided the Permittee notifies:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

in writing, prior to the end of the initial ninety (90) day compliance schedule, with full justification of the reasons for the inability to meet this date.

The notification which shall be submitted by the Permittee does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

(c) For monitoring required by CAM, at all times, the Permittee shall maintain the monitoring, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment.

(d) For monitoring required by CAM, except for, as applicable, monitoring malfunctions, associated repairs, and required quality assurance or control activities (including, as applicable, calibration checks and required zero and span adjustments), the Permittee shall conduct all monitoring in continuous operation (or shall collect data at all required intervals) at all times that the pollutant-specific emissions unit is operating. Data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities shall not be used for purposes of this part, including data averages and calculations, or fulfilling a minimum data availability requirement, if applicable. The owner or operator shall use all the data collected during all other periods in assessing the operation of the control device and associated control system. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

C.11 Instrument Specifications [326 IAC 2-1.1-11] [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]

(a) When required by any condition of this permit, an analog instrument used to measure a parameter related to the operation of an air pollution control device shall have a scale such that the expected maximum reading for the normal range shall be no less than twenty percent (20%) of full scale. The analog instrument shall be capable of measuring values outside of the normal range.

(b) The Permittee may request that the IDEM, OAQ approve the use of an instrument that does not meet the above specifications provided the Permittee can demonstrate that an alternative instrument specification will adequately ensure compliance with permit conditions requiring the measurement of the parameters.

**Corrective Actions and Response Steps [326 IAC 2-7-5][326 IAC 2-7-6]**

C.12 Emergency Reduction Plans [326 IAC 1-5-2] [326 IAC 1-5-3]

Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):

(a) The Permittee shall maintain the most recently submitted written emergency reduction plans (ERPs) consistent with safe operating procedures.

(b) Upon direct notification by IDEM, OAQ that a specific air pollution episode level is in effect, the Permittee shall immediately put into effect the actions stipulated in the approved ERP for the appropriate episode level. [326 IAC 1-5-3]

C.13 Risk Management Plan [326 IAC 2-7-5(11)] [40 CFR 68]

If a regulated substance, as defined in 40 CFR 68, is present at a source in more than a threshold quantity, the Permittee must comply with the applicable requirements of 40 CFR 68.

C.14 Response to Excursions or Exceedances [40 CFR 64][326 IAC 3-8][326 IAC 2-7-5] [326 IAC 2-7-6]

(I) Upon detecting an excursion where a response step is required by the D Section, or an exceedance of a limitation, not subject to CAM, in this permit:

(a) The Permittee shall take reasonable response steps to restore operation of the emissions unit (including any control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing excess emissions.

(b) The response shall include minimizing the period of any startup, shutdown or malfunction. The response may include, but is not limited to, the following:

(1) initial inspection and evaluation;

(2) recording that operations returned or are returning to normal without operator action (such as through response by a computerized distribution control system); or

(3) any necessary follow-up actions to return operation to normal or usual manner of operation.

(c) A determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include, but is not limited to, the following:

(1) monitoring results;

(2) review of operation and maintenance procedures and records; and/or

(3) inspection of the control device, associated capture system, and the process.

(d) Failure to take reasonable response steps shall be considered a deviation from the permit.

(e) The Permittee shall record the reasonable response steps taken.

(II)

(a) CAM *Response to excursions or exceedances.*

(1) Upon detecting an excursion or exceedance, subject to CAM, the Permittee shall restore operation of the pollutant-specific emissions unit (including the control device and associated capture system) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown or malfunction and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions). Such actions may include initial inspection and evaluation, recording that operations returned to normal

without operator action (such as through response by a computerized distribution control system), or any necessary follow-up actions to return operation to within the indicator range, designated condition, or below the applicable emission limitation or standard, as applicable.

(2) Determination of whether the Permittee has used acceptable procedures in response to an excursion or exceedance will be based on information available, which may include but is not limited to, monitoring results, review of operation and maintenance procedures and records, and inspection of the control device, associated capture system, and the process.

(b) If the Permittee identifies a failure to achieve compliance with an emission limitation, subject to CAM, or standard, subject to CAM, for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the Permittee shall promptly notify the IDEM, OAQ and, if necessary, submit a proposed significant permit modification to this permit to address the necessary monitoring changes. Such a modification may include, but is not limited to, reestablishing indicator ranges or designated conditions, modifying the frequency of conducting monitoring and collecting data, or the monitoring of additional parameters.

(c) Based on the results of a determination made under paragraph (II)(a)(2) of this condition, the EPA or IDEM, OAQ may require the Permittee to develop and implement a Quality Improvement Plan (QIP). The Permittee shall develop and implement a QIP if notified to in writing by the EPA or IDEM, OAQ.

(d) Elements of a QIP:
The Permittee shall maintain a written QIP, if required, and have it available for inspection. The plan shall conform to 40 CFR 64.8 b (2).

(e) If a QIP is required, the Permittee shall develop and implement a QIP as expeditiously as practicable and shall notify the IDEM, OAQ if the period for completing the improvements contained in the QIP exceeds 180 days from the date on which the need to implement the QIP was determined.

(f) Following implementation of a QIP, upon any subsequent determination pursuant to paragraph (II)(c) of this condition the EPA or the IDEM, OAQ may require that the Permittee make reasonable changes to the QIP if the QIP is found to have:

(1) Failed to address the cause of the control device performance problems; or

(2) Failed to provide adequate procedures for correcting control device performance problems as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions.

(g) Implementation of a QIP shall not excuse the Permittee from compliance with any existing emission limitation or standard, or any existing monitoring, testing, reporting or recordkeeping requirement that may apply under federal, state, or local law, or any other applicable requirements under the Act.

(h) *CAM recordkeeping requirements.*

(1) The Permittee shall maintain records of monitoring data, monitor performance data, corrective actions taken, any written quality

improvement plan required pursuant to paragraph (II)(c) of this condition and any activities undertaken to implement a quality improvement plan, and other supporting information required to be maintained under this condition (such as data used to document the adequacy of monitoring, or records of monitoring maintenance or corrective actions). Section C - General Record Keeping Requirements of this permit contains the Permittee's obligations with regard to the records required by this condition.

(2) Instead of paper records, the owner or operator may maintain records on alternative media, such as microfilm, computer files, magnetic tape disks, or microfiche, provided that the use of such alternative media allows for expeditious inspection and review, and does not conflict with other applicable recordkeeping requirements

C.15 Actions Related to Noncompliance Demonstrated by a Stack Test [326 IAC 2-7-5][326 IAC 2-7-6]

(a) When the results of a stack test performed in conformance with Section C - Performance Testing, of this permit exceed the level specified in any condition of this permit, the Permittee shall submit a description of its response actions to IDEM, OAQ no later than seventy-five (75) days after the date of the test.

(b) A retest to demonstrate compliance shall be performed no later than one hundred eighty (180) days after the date of the test. Should the Permittee demonstrate to IDEM, OAQ that retesting in one hundred eighty (180) days is not practicable, IDEM, OAQ may extend the retesting deadline.

(c) IDEM, OAQ reserves the authority to take any actions allowed under law in response to noncompliant stack tests.

The response action documents submitted pursuant to this condition do require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

C.16 Emission Statement [326 IAC 2-7-5(3)(C)(iii)][326 IAC 2-7-5(7)][326 IAC 2-7-19(c)][326 IAC 2-6]

Pursuant to 326 IAC 2-6-3(a)(1), the Permittee shall submit by July 1 of each year an emission statement covering the previous calendar year. The emission statement shall contain, at a minimum, the information specified in 326 IAC 2-6-4(c) and shall meet the following requirements:

(1) Indicate estimated actual emissions of all pollutants listed in 326 IAC 2-6-4(a);

(2) Indicate estimated actual emissions of regulated pollutants as defined by 326 IAC 2-7-1(33) (“Regulated pollutant, which is used only for purposes of Section 19 of this rule”) from the source, for purpose of fee assessment.

The statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Quality
100 North Senate Avenue
MC 61-50 IGCN 1003
Indianapolis, Indiana 46204-2251

The emission statement does require a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35).

C.17 General Record Keeping Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-6] [326 IAC 2-2][326 IAC 2-3]

(a) Records of all required monitoring data, reports and support information required by this permit shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. Support information includes the following, where applicable:

(AA) All calibration and maintenance records.

(BB) All original strip chart recordings for continuous monitoring instrumentation.

(CC) Copies of all reports required by the Part 70 permit.

Records of required monitoring information include the following, where applicable:

(AA) The date, place, as defined in this permit, and time of sampling or measurements.

(BB) The dates analyses were performed.

(CC) The company or entity that performed the analyses.

(DD) The analytical techniques or methods used.

(EE) The results of such analyses.

(FF) The operating conditions as existing at the time of sampling or measurement.

These records shall be physically present or electronically accessible at the source location for a minimum of three (3) years. The records may be stored elsewhere for the remaining two (2) years as long as they are available upon request. If the Commissioner makes a request for records to the Permittee, the Permittee shall furnish the records to the Commissioner within a reasonable time.

(b) Unless otherwise specified in this permit, for all record keeping requirements not already legally required, the Permittee shall be allowed up to ninety (90) days from the date of permit issuance or the date of initial start-up, whichever is later, to begin such record keeping.

(c) If there is a reasonable possibility (as defined in 326 IAC 2-2-8 (b)(6)(A), 326 IAC 2-2-8 (b)(6)(B), 326 IAC 2-3-2 (l)(6)(A), and/or 326 IAC 2-3-2 (l)(6)(B)) that a “project” (as defined in 326 IAC 2-2-1(oo) and/or 326 IAC 2-3-1(jj)) at an existing emissions unit, other than projects at a source with a Plantwide Applicability Limitation (PAL), which is not part of a “major modification” (as defined in 326 IAC 2-2-1(dd) and/or 326 IAC 2-3-1(y)) may result in significant emissions increase and the Permittee elects to utilize the “projected actual emissions” (as defined in 326 IAC 2-2-1(pp) and/or 326 IAC 2-3-1(kk)), the Permittee shall comply with following:

(1) Before beginning actual construction of the “project” (as defined in 326 IAC 2-2-1(oo) and/or 326 IAC 2-3-1(jj)) at an existing emissions unit, document and maintain the following records:

(A) A description of the project.

(B) Identification of any emissions unit whose emissions of a regulated new source review pollutant could be affected by the project.

(C) A description of the applicability test used to determine that the project is not a major modification for any regulated NSR pollutant, including:

(i) Baseline actual emissions;

(ii) Projected actual emissions;

(iii) Amount of emissions excluded under section 326 IAC 2-2-1(pp)(2)(A)(iii) and/or 326 IAC 2-3-1 (kk)(2)(A)(iii); and

(iv) An explanation for why the amount was excluded, and any netting calculations, if applicable.

(d) If there is a reasonable possibility (as defined in 326 IAC 2-2-8 (b)(6)(A) and/or 326 IAC 2-3-2 (l)(6)(A)) that a “project” (as defined in 326 IAC 2-2-1(oo) and/or 326 IAC 2-3-1(jj)) at an existing emissions unit, other than projects at a source with a Plantwide Applicability Limitation (PAL), which is not part of a “major modification” (as defined in 326 IAC 2-2-1(dd) and/or 326 IAC 2-3-1(y)) may result in significant emissions increase and the Permittee elects to utilize the “projected actual emissions” (as defined in 326 IAC 2-2-1(pp) and/or 326 IAC 2-3-1(kk)), the Permittee shall comply with following:

(1) Monitor the emissions of any regulated NSR pollutant that could increase as a result of the project and that is emitted by any existing emissions unit identified in (1)(B) above; and

(2) Calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of five (5) years following resumption of regular operations after the change, or for a period of ten (10) years following resumption of regular operations after the change if the project increases the design capacity of or the potential to emit that regulated NSR pollutant at the emissions unit.

C.18 General Reporting Requirements [326 IAC 2-7-5(3)(C)] [326 IAC 2-1.1-11] [326 IAC 2-2][326 IAC 2-3] [40 CFR 64][326 IAC 3-8]

(a) The Permittee shall submit the attached Quarterly Deviation and Compliance Monitoring Report or its equivalent. Proper notice submittal under Section B –Emergency Provisions satisfies the reporting requirements of this paragraph. Any deviation from permit requirements, the date(s) of each deviation, the cause of the deviation, and the response steps taken must be reported except that a deviation required to be reported pursuant to an applicable requirement that exists independent of this permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. This report shall be submitted not later than thirty (30) days after the end of the reporting period. The Quarterly Deviation and Compliance Monitoring Report shall include a certification that meets the requirements of 326 IAC 2-7-6(1) by a "responsible official" as defined by 326 IAC 2-7-1(35). A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit.

On and after the date by which the Permittee must use monitoring that meets the requirements of 40 CFR Part 64 and 326 IAC 3-8, the Permittee shall submit CAM reports to the IDEM, OAQ.

A report for monitoring under 40 CFR Part 64 and 326 IAC 3-8 shall include, at a minimum, the information required under paragraph (a) of this condition and the following information, as applicable:

(1) Summary information on the number, duration and cause (including unknown cause, if applicable) of excursions or exceedances, as applicable, and the corrective actions taken;

(2) Summary information on the number, duration and cause (including unknown cause, if applicable) for monitor downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable); and

(3) A description of the actions taken to implement a QIP during the reporting period as specified in Section C-Response to Excursions or Exceedances. Upon completion of a QIP, the owner or operator shall include in the next summary report documentation that the implementation of the plan has been completed and reduced the likelihood of similar levels of excursions or exceedances occurring.

The Permittee may combine the Quarterly Deviation and Compliance Monitoring Report and a report pursuant to 40 CFR 64 and 326 IAC 3-8.

(b) The address for report submittal is:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(c) Unless otherwise specified in this permit, any notice, report, or other submission required by this permit shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

(d) Reporting periods are based on calendar years, unless otherwise specified in this permit. For the purpose of this permit "calendar year" means the twelve (12) month period from January 1 to December 31 inclusive.

(e) If the Permittee is required to comply with the recordkeeping provisions of (d) in Section C - General Record Keeping Requirements for any "project" (as defined in 326 IAC 2-2-1 (oo) and/or 326 IAC 2-3-1 (jj)) at an existing emissions unit, and the project meets the following criteria, then the Permittee shall submit a report to IDEM, OAQ:

(1) The annual emissions, in tons per year, from the project identified in (c)(1) in Section C- General Record Keeping Requirements exceed the baseline actual emissions, as documented and maintained under Section C- General Record Keeping Requirements (c)(1)(C)(i), by a significant amount, as defined in 326 IAC 2-2-1 (ww) and/or 326 IAC 2-3-1 (pp), for that regulated NSR pollutant, and

(2) The emissions differ from the preconstruction projection as documented and maintained under Section C - General Record Keeping Requirements (c)(1)(C)(ii).

(f) The report for project at an existing emissions unit shall be submitted no later than sixty (60) days after the end of the year and contain the following:

(1) The name, address, and telephone number of the major stationary source.

(2) The annual emissions calculated in accordance with (d)(1) and (2) in Section C - General Record Keeping Requirements.

(3) The emissions calculated under the actual-to-projected actual test stated in 326 IAC 2-2-2(d)(3) and/or 326 IAC 2-3-2(c)(3).

(4) Any other information that the Permittee wishes to include in this report such as an explanation as to why the emissions differ from the preconstruction projection.

Reports required in this part shall be submitted to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

(g) The Permittee shall make the information required to be documented and maintained in accordance with (c) in Section C- General Record Keeping Requirements available for review upon a request for inspection by IDEM, OAQ. The general public may request this information from the IDEM, OAQ under 326 IAC 17.1.

**Stratospheric Ozone Protection**

C.19 Compliance with 40 CFR 82 and 326 IAC 22-1

Pursuant to 40 CFR 82 (Protection of Stratospheric Ozone), Subpart F, except as provided for motor vehicle air conditioners in Subpart B, the Permittee shall comply with applicable standards for recycling and emissions reduction.

## SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

**Emissions Unit Description:**

(a) Five (5) wet-bottom pulverized coal-fired boilers identified as Units 1 through 5, with construction completed in 1955, each with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Units 1 through 5 have the following emission controls:

- over-fire air system ($NO_X$ control)
- selective catalytic reduction (SCR) system ($NO_X$ control)
- “cold-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 1, 2, and 3 exhaust to Flue 13 of Stack 14. Units 4 and 5 exhaust to Flue 46 of Stack 14. Both Flue 13 and Flue 46 of Stack 14 have continuous emissions monitoring systems (CEMS) for particulate matter (PM). They also have flow, sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

(b) One (1) wet-bottom pulverized coal-fired boiler identified as Unit 6, with construction completed in 1956, with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Unit 6 has the following emission controls:

- over-fire air system ($NO_X$ control)
- “hot-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 6 exhausts to Flue 46 of Stack 14. Flue 46 of Stack 14 has continuous emissions monitoring systems (CEMS) for particulate matter (PM). They also have flow, sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

The Flue Gas Desulfurization (FGD) System for Units 1 through 6, permitted in 2008, consists of one (1) stack (Stack 14) with two flues (Flues 13 and 46), two (2) jet bubbling reactor (JBR) absorbers (JBRs 13 and 46), and associated limestone and gypsum material handling systems.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**Emission Limitations and Standards [326 IAC 2-7-5(1)]**

D.1.1 Particulate Emission Limitations for Sources of Indirect Heating [326 IAC 6-2-3][Agreed Order of APC Cause No. A-26 October 26, 1973]

Pursuant to Amendment No. 2 to the Agreed Order (Cause No. A-26), entered October 26, 1973, Air Pollution Control Board vs. Indiana-Kentucky Electric Corporation (IKEC), and dated September 26, 1975, the particulate matter (PM) emissions from each boiler (Units 1 through 6) shall not exceed 0.236 pound per million Btu heat input (lb/MMBtu).

This limit is more stringent than the value that would be derived using the stack configuration information for the stacks in use on June 8, 1972 and the equation in 326 IAC 6-2-3(a); therefore, compliance with this limit is deemed compliance with 326 IAC 6-2.

D.1.2 Commissioner's Order [IC 13-14-2-1(b)][IC 13-14-2-7(1)]

Pursuant to the Commissioner's Order issued pursuant to IC 13-14-2-1(b) and IC 13-14-2-7(1), dated Feburary 1, 2016 and in order to secure compliance with the one (1) hour $SO_2$ NAAQS in the area surrounding the Permittee:

(a) This Order approves the Petition submitted by the Petitioner according to the terms specified below. This Order imposes on the Petitioner the SO2 mass emission rate described below.

(b) When any of Unit No. 1 through Unit No.6, or any combination thereof, is operating, the combined SO2 mass emisssion rate shall not exceed 2,624.5 lb/hour, as a 720 operating hour rolling average.

(c) The Petitioner shall comply with the 720 operating hour rolling average SO2 mass emission rate beginning April 19, 2016.

(d) As required by 326 IAC 2-7-2(d)(1) and 326 IAC 2-7-5, the Petitioner shall apply to incorporate these Order requirements, including reporting and recordkeeping requirements and methods to determine compliance, into its Part 70 Operating Permit within ninety (90) days of U.S. EPA's approval of the Commissioner's Order as part of the Indiana SIP.

(e) This Order shally apply to and be binding upon the Petitioner, its successors and assigns. No change in ownership, corporate, or partnership status of the petitioner shall in any way alter its status or responsibilities under this Order.

(f) The requirements of this Order supersede any less stringent requirements applicable to the Petitioner.

D.1.3 Electrostatic Precipitator Operation [326 IAC 2-7-6(6)]

(a) When building a new fire in a boiler, operation of the electrostatic precipitator is not required for the first thirty (30) minutes or until the flue gas temperatures reaches two hundred fifty (250) degrees Fahrenheit at the inlet of the electrostatic precipitator, whichever occurs first.

(b) The following operations are considered "startup conditions" pursuant to 326 IAC 1-2-76:

    (1) Startup and firing of a boiler as part of a chemical cleaning operation; and

    (2) Startup and firing of a boiler as part of a boiler floor refractory curing operation.

**Compliance Determination Requirements [326 IAC 2-7-5(1)]**

D.1.4 Particulate Control [326 IAC 2-7-6(6)]

Except, as otherwise provided by statute or rule in this permit, each electrostatic precipitator (ESP) shall be operated and control particulates at all times that a boiler is operated and vented to the ESP.

D.1.5 Flue Gas Desulfurization (FGD) System [326 IAC 2-7-6(1)][326 IAC 2-7-5(1)]

The Permittee shall comply with the following, except as otherwise provided by statute or rule or in this permit, the flue gas desulfurization (FGD) system shall be operated at all times the boilers are in operation to maintain compliance with all applicable $SO_2$ and particulate emission limits.

D.1.6 Maintenance of Continuous Emissions Monitoring System [326 IAC 3-5]

(a) Pursuant to 326 IAC 3-5 (Continuous Monitoring of Emissions), continuous emission monitoring systems for Boilers 1 through 6 shall be calibrated, maintained, and operated for measuring $SO_2$, which meet all applicable performance specifications of 326 IAC 3-5-2.

(b) All continuous emission monitoring systems are subject to monitor system certification requirements pursuant to 326 IAC 3-5-3.

(c) Pursuant to 326 IAC 3-5-4, if revisions are made to the continuous monitoring standard operating procedures (SOP), the Permittee shall submit updates to the department biennially.

(d) In the event that a breakdown of a continuous emission monitoring system occurs, a record shall be made of the times and reasons of the breakdown and efforts made to correct the problem.

(e) Whenever a continuous emission monitor is malfunctioning or is down for maintenance or repairs, the following shall be used as an alternative to continuous data collection:

(1) If the CEMS is required for monitoring $SO_2$ emissions pursuant to 40 CFR 75 (Title IV Acid Rain program), the Permittee shall comply with the relevant requirements of 40 CFR 75 Subpart D - Missing Data Substitution Procedures.

(2) If the CEMS is not used to monitor $SO_2$ emissions from a unit subject to requirements of the Title IV Acid Rain program and is down for a period of twenty four (24) hours or more, then supplemental or intermittent monitoring of the parameter shall be implemented as specified in Section D.1.9 of this permit until such time as the emission monitor system is back in operation

(f) Nothing in this permit shall excuse the Permittee from complying with the requirements to operate a continuous emission monitoring system pursuant to 326 IAC 3-5, or 40 CFR 75.

D.1.7 Particulate Matter (PM) Continuous Emissions Monitoring (CEMs) [326 IAC 3-5]

(a) The Permittee shall install, certify, maintain, and operate a CEMS measuring PM emissions from flue 13 and flue 46 in accordance with the Commissioner's Order and Variance #2013-01, and shall record the output of the CEMS as specified in paragraphs (a)(1) and (a)(2).

(1) The PM CEMS shall be installed and certified in accordance with 40 CFR Part 60, Appendix B, PS-11 and operated in accordance with Procedure 2 of Appendix F to 40 CFR 60.

(2) Compliance with the applicable particulate emission limit shall be determined

based on a 30-day rolling weighted average using the CEMS data.

Nothing in this permit shall alter the time allowed for the Permittee under the Commissioner’s Order and Variance #2013-01 to install and certify the PM CEMs.

(b) All continuous emission monitoring systems are subject to monitor system certification requirements pursuant to 326 IAC 3-5-3.

(c) Pursuant to 326 IAC 3-5-1(b)(2)(A), the Permittee shall comply with the following:

Compliance with the PM limitation in Condition D.1.1 shall be demonstrated using a certified PM CEMS installed and certified in accordance with US EPA Performance Specification 11 (PS-11) and operated in accordance with Procedure 2 of Appendix F to 40 CFR 60.

D.1.8 Commissioner's Order [IC 13-14-2-1(b)][IC 13-14-2-7-(1)]

Pursuant to the Commissioner's Order issued under IC 13-14-2-1(b) and IC 13-14-2-7(1), dated Feburary 1, 2016 and in order to secure compliance with the one (1) hour $SO_2$ NAAQS in the area surrounding the Permittee from April 19, 2016 until IDEM issues a Permit incorporating these Order requirements, the Petitioner shall comply with the methods to determine compliance specified in this paragraph.

(1) Compliance shall be determined by a continuous emission monitoring system (CEMS) in accordance with 326 IAC 3-5; except that data substituted in accordance with 40 Code of Federal Regulations ("CFR") Part 75 will not be considered in this evaluation. The Petitioner may use the existing certified CEMS to meet this requirement.

**Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]**

D.1.9 $SO_2$ Monitoring System Downtime [326 IAC 2-7-6] [326 IAC 2-7-5(3)]

At any time the flue gas desulfurization (FGD) system is operating, if the SO2 continuous emission monitoring system (CEMS) is malfunctioning or down for repairs or adjustments for twenty-four (24) hours or more, the Permittee shall monitor and record boiler load, pH, slurry feed rate, and number of oxidation air pumps in service, to demonstrate that the operation of the flue gas desulfurization (FGD) continues in a manner typical for the boiler load and sulfur content of the coal fired. Flue gas desulfurization (FGD) parametric monitoring readings shall be recorded at least twice per day until the primary CEMS or a backup CEMS is brought online.

D.1.10 PM Monitoring System Downtime [326 IAC 2-7-6] [326 IAC 2-7-5(3)]

Whenever the PM CEMS is malfunctioning or down for maintenance, repair or adjustments for 24 hours or more, the Permittee shall monitor particulate emissions in accordance with the following:

(1) The ability of the FGD system to control PM emissions shall be monitored once per day when in operation by measuring and recording the following:

(a) JBR reactor slurry level;

(2) Normal operation of the JBR reactor shall be deemed to be the following for purposes of Condition D.1.6(c):

(a) Slurry level at or between the range of 19.33 to 21.06 feet;

(3) As long as the JBR reactor slurry level indicates normal operation of the FGD system, no

further action is necessary. However, reasonable response steps shall be taken whenever the JBR reactor slurry level indicates abnormal operation of the FGD system.

**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

D.1.11 Record Keeping Requirements

(a) To document the compliance status with requirements in Conditions D.1.1, D.1.4, D.1.6, D.1.7, and D.1.10, the Permittee shall maintain records in accordance with (1) and (2) below. Records shall be complete and sufficient to establish compliance with the limits established in Condition D.1.1.

(1) PM CEMs data associated with the flue gases as required in Condition D.1.7;

(2) The Permittee shall maintain a record of the slurry level of JBR reactor, when a PM CEMS is malfunctioning or down for maintenance, repair or adjustments for 24 hours or more, the Permittee shall include in its record when readings are not taken and the reason for the lack of readings (e.g., the JBR and associated units did not operate).

(b) To document the compliance status with Condition D.1.2 and pursuant to the Commissioner's Order issued under IC 13-14-2-1(b) and IC 13-14-2-7(1), dated Feburary 1, 2016 and in order to secure compliance with the one (1) hour $SO_2$ NAAQS in the area surrounding the Permittee from April 19, 2016 until IDEM issues a Permit incorporating these Order requirements, the Petitioner shall comply with the recordkeeping requirements specified in this paragraph.

(1) The Petitioner shall maintain records adequate to document compliance with the 720 operating hour rolling average SO2 mass emission rate.

(c) To document the compliance status Conditions D.1.8, and D.1.9, the Permittee shall maintain records in accordance with (1) and (2) below. Records shall be complete and sufficient to establish compliance with the $SO_2$ limits as required in conditions D.1.8.

(1) All $SO_2$ continuous emissions monitoring data, pursuant to 326 IAC 3-5-6 and 326 IAC 7-2-1(g).

(2) To document the compliance status with Condition D.1.9, the Permittee shall maintain a record of the boiler load, recirculation pH, slurry feed rate, and number of oxidation air blowers in service for the FGD.

(d) Section C - General Record Keeping Requirements contains the Permittee's obligations with regard to the record keeping required by this condition.

D.1.12 Reporting Requirements

(a) Pursuant to the Commissioner's Order issued under IC 13-14-2-1(b) and IC 13-14-2-7(1), dated Feburary 1, 2016 and in order to secure compliance with the one (1) hour $SO_2$ NAAQS in the area surrounding the Permittee from April 19, 2016 until IDEM issues a Permit incorporating these Order requirements, the Petitioner shall comply with the reporting requirements specified in this paragraph.

(1) The Petitioner shall submit to IDEM, on a quarterly basis, a report of the facility-wide maximum 720 operating hour SO2 rolling average mass emission rate for each day that any of Unit No. 1 through Unit No. 6, or any combination thereof, operates, beginning the second quarter reporting period, which is July 2016.

(b) Pursuant to 326 IAC 3-5-7(c)(4), reporting of continuous monitoring system instrument downtime, except for zero (0) and span checks, shall include the following:

(A) Date of downtime.

(B) Time of commencement.

(C) Duration of each downtime.

(D) Reasons for each downtime.

(E) Nature of system repairs and adjustments.

The report submitted by the Permittee does require a certification by a "responsible official" as defined by 326 IAC 2-7-1(34). Section C - General Reporting Requirements contains the Permittee's obligations with regard to the reporting required by this condition.

## SECTION D.2 EMISSIONS UNIT OPERATION CONDITIONS

**Emissions Unit Description:**

(c) Coal handling facilities with a maximum design transfer rate of 2400 tons per hour, and coal storage systems, utilizing baghouses as control, including the following:

(1) facilities installed in the 1950's, including coal conveyors and transfer house facilities, coal unloading stations 1 and 4 using clamshell barge unloaders, coal pile unloading, and coal piles, using baghouses at the following transfer points: Station 2 and 5, the Tripper Room Units 1 through 6, and Station 7; and

(2) facilities installed in 1993 to allow increased use of subbituminous coal to reduce $SO_2$ emissions, including transfer stations B1, B2, B3 and B4, and conveyors 5B1, B12, B23, B34 E, and B34 W, using baghouses at the following transfer points: B1, B2, B3, and B4.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**Emission Limitations and Standards [326 IAC 2-7-5(1)]**

D.2.1 Particulate Emission Limitations for Manufacturing Processes [326 IAC 6-3-2]

(a) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the coal handling facilities shall not exceed 89.475 pounds per hour when operating at a maximum process weight rate of 2400 tons per hour.

The pounds per hour limitation was calculated with the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 55.0\ P^{0.11} - 40$$

where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

(b) Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emissions may exceed the emission limits shown paragraph (a), provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

D.2.2 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5]

Pursuant to CP 077-2716, issued March 16, 1993, and 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissions from the coal handling shall comply with the fugitive plan. This plan requires that:

(a) For the unloading stations, the hoppers at stations 1 and 4 shall be enclosed on three sides. Water and/or dust suppressant chemicals shall be applied as needed to minimize visible emissions.

(b) For the conveyors, the top and at least one side shall be enclosed.

(c) For the transfer stations, the foam and wetting systems will promote a reduction in emissions. Modified chutes will be provided at coal drop points.

**Compliance Determination Requirements [326 IAC 2-7-5(1)]**

D.2.3 Particulate Control [326 IAC 2-7-6(6)]

In order to ensure compliance with Condition D.2.1, the baghouse for particulate control shall be in operation and control emissions from the associated coal processing points or drop point conveyors at all times the associated coal processing points or drop point conveyors is in operation.

**Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]**

D.2.4 Visible Emission Inspections

(a) Visible emission inspections of baghouse stack exhausts shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take a reasonable response. Section C – Response to Excursions and Exceedances contains the Permittee's obligation with regard to the reasonable response steps required by this condition. Failure to take response steps shall be considered a deviation from this permit.

D.2.5 Broken or Failed Bag Detection

For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

A baghouse is considered to have failed when the bag filtering material has been physically breeched or the exhaust fan is not operating at full capacity.

Bag failure can be indicated by a significant drop in the baghouse's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

D.2.6 Record Keeping Requirements

(a) To document the compliance status with Condition D.2.4 (Visible Emissions Inspections), the Permittee shall maintain records of daily visible emission inspections of the baghouse(s) stack exhausts. The Permittee shall include in its daily record when a visible emission inspection is not taken and the reason for the lack of visible emission inspection (e.g. the process did not operate that day).

(b) Section C - General Record Keeping Requirements contains the Permittee's obligation with regard to the records required by this condition.

D.2.7 Reporting Requirements

The Permittee shall report all incidents of smoldering coal observed on a barge docked at a coal unloading station within four (4) daytime business hours after the initial observation. Notification shall be made to one of the following:

Telephone Number: 1-800-451-6027 (ask for Office of Air Quality, Compliance Section), or
Telephone Number: 317-233-0178 (ask for Compliance Section); or
Facsimile Number: 317-233-6865.

## SECTION D.3 EMISSIONS UNIT OPERATION CONDITIONS

**Emissions Unit Description:**

(d) Dry fly ash handling and disposal facilities, using a baghouse as control, including the following:

(1) Dry fly ash handling system installed in 1990 and 1991, including pneumatic conveyance to two (2) main silos with a maximum design transfer rate of 40 tons per hour, rotary and dry unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area or for transportation offsite.

(2) Two (2) additional dry fly ash storage silos (a.k.a truck bins) installed in 1994 and 1995 for unmarketable fly ash, including pneumatic conveyance to silos with a maximum design transfer rate of 40 tons per hour, rotary unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

### Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.3.1 Particulate Emission Limitations for Manufacturing Processes [326 IAC 6-3-2]

(a) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the fly ash pneumatic conveying system shall not exceed 42.52 pounds per hour when operating at a maximum process weight of 40 tons per hour.

The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0\ P^{0.11} - 40$

where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

(b) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the Rotary and Dry Unloaders shall not exceed 60.96 pounds per hour when operating at a maximum process weight of 250 tons per hour.

The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$E = 55.0\ P^{0.11} - 40$

where E = rate of emission in pounds per hour; and

P = process weight rate in tons per hour

D.3.2 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5][40 CFR 64]

Pursuant to the Registration issued April 18, 1989, and 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissions from the fly ash handling shall comply with the fugitive dust control plan. This plan requires that:

(a) For intermediate storage, use of pneumatic conveyance to silos equipped with separators to collect the fly ash, ash fluidizing system to help unload the ash, and bag filter systems for dust control.

(b) For unloading from silos into trucks:

(1) Area under the silos where the unloaders are located is totally enclosed, except for the openings for the vehicles to enter and exit. The truck entrance and exit points are equipped with spray curtains.

(2) For on-site fly ash disposal: Use of rotary unloaders that condition fly ash with water and use flexible chute extensions to load ash into open-type trucks for transport to disposal area.

(3) For fly ash sold for offsite use: Use of dry unloaders equipped with telescoping chutes with bellows-type shrouds which are connected to vent fans and piping to pull displaced air and fugitive fly ash emissions from the receiving vessel back into the silos.

(c) For transportation from silo area:

(1) To on-site disposal: Use of trucks which are covered while in motion and which go through a truck wash and hose down area as they exit the silo area. In-plant haul roads in silo area and to onsite disposal area are paved and are swept/vacuumed as needed. Truck routes on the surface of the disposal area are treated as needed with a combination of water and/or dust-suppressant chemicals.

(2) For ash sold for use off site: The majority of fly ash hauled off-site is in closed, dry bulk container trucks. If conditioned fly ash is purchased for off site use, it is hauled in covered dump trucks which are washed prior to leaving site.

(d) At on-site disposal area:

(1) Dumping, placement and compaction of conditioned (moistened) fly ash, with a combination of watering, dust-suppressant chemicals and/or temporary cover used to further control fugitive dust if necessary.

(2) Size of the open (uncovered) or working face of each phase of the disposal area will be limited as much as possible.

**Compliance Determination Requirements [326 IAC 2-7-5(1)][40 CFR 64]**

D.3.3 Particulate Control [326 IAC 2-7-6(6)][40 CFR 64]

In order to ensure compliance with Condition D.3.1, the baghouse for particulate control shall be in operation and control emissions from the associated dry ash handling system at all times the associated dry ash handling system is in operation.

**Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)][40 CFR 64]**

D.3.4 Visible Emission Inspections

(a) Visible emission inspections of baghouse stack exhausts shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take a reasonable response. Section C – Response to Excursions and Exceedances contains the Permittee's obligation with regard to the reasonable response steps required by this condition. Failure to take response steps shall be considered a deviation from this permit.

D.3.5 Broken or Failed Bag Detection [40 CFR 64]

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

A baghouse is considered to have failed when the bag filtering material has been physically breeched or the exhaust fan is not operating at full capacity.

Bag failure can be indicated by a significant drop in the baghouse’s pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

D.3.6 Record Keeping Requirements [40 CFR 64]

(a) To document the compliance status with Condition D.3.4 (Visible Emissions Inspections), the Permittee shall maintain records of daily visible emission inspections of the baghouse(s) stack exhausts. The Permittee shall include in its daily record when a visible emission inspection is not taken and the reason for the lack of visible emission inspection (e.g. the process did not operate that day).

(b) Section C - General Record Keeping Requirements contains the Permittee's obligation with regard to the records required by this condition.

## SECTION D.4 EMISSIONS UNIT OPERATION CONDITIONS

**Emissions Unit Description:**

(e) One (1) Limestone Handling (LH) System, permitted in 2008, with a maximum capacity of 1,000 tons per hour, consisting of one (1) barge unloader, one (1) barge unloading hopper and feeder, three (3) conveyors, two (2) transfer stations, and one (1) stacking tube and storage pile. Particulate emissions are controlled by partial to full enclosure and wet dust suppression.

(f) One (1) Limestone Processing (LP) System, permitted in 2008, with a maximum transfer rate of 300 tons per hour, consisting of two (2) reclaim hoppers and feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) ball mill feeders, two (2) wet ball mills, and one (1) emergency reclaim hopper. Particulate emissions are controlled by partial to full enclosure and two (2) storage silo baghouses. The Limestone Processing (LP) System is an affected source under the Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60, Subpart OOO).

(g) One (1) Gypsum Handling (GH) System, permitted in 2008, with a maximum capacity of 150 tons per hour, consisting of one (1) collecting conveyor, one (1) transfer conveyor, two (2) transfer stations, one (1) radial stackout conveyor, one (1) emergency collecting conveyor, one (1) emergency transfer station, one (1) emergency stackout, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area or for transportation offsite. Particulate emissions are controlled on the conveyors and transfer points by wet material and partial to full enclosure. Particulate emissions are controlled on the paved and unpaved haul roads by wet material, watering, sweeping, and speed reduction.

(h) One (1) Chloride Purge Stream (CPS) Wastewater Treatment Plant (WWTP) Filter Cake Handling System, permitted in 2008, consisting of filter cake being loaded into trucks by a wheel loader, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area. Particulate emissions are controlled during loading of the filter cake into trucks by wet material and other precautionary measures. Particulate emissions are controlled on the paved and unpaved haul roads by wet material, watering, sweeping, and speed reduction.

Particulate emissions from handling and placement of CPS WWTP Filter Cake in onsite disposal area are controlled by wet material, watering, compacting, covering, and other precautionary measures. Particulate emissions from handling and placement of Gypsum in onsite disposal area or for transportation offsite are controlled by wet material, watering, compacting, covering, and other precautionary measures.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**Emission Limitations and Standards [326 IAC 2-7-5(1)]**

D.4.1 PSD Minor Limits [326 IAC 2-2]

(a) Particulate emissions from the Limestone Handling (LH) System shall be controlled by partial to full enclosure and wet dust suppression as specified in the Fugitive Dust Control Plan in Attachment A.

(b) Particulate emissions from the Limestone Processing (LP) System shall be controlled by material wetting, partial to full enclosure and two (2) storage silo bin vent filter dust collectors as specified in the Fugitive Dust Control Plan in Attachment A.

(c) Particulate emissions on the conveyors and transfer points for the Gypsum Handling (GH) System shall be controlled by wet material and partial to full enclosure as specified in the Fugitive Dust Control Plan in Attachment A.

(d) Particulate emissions from loading of the filter cake into trucks for the Chloride Purge Stream (CPS) Wastewater Treatment Plant (WWTP) Filter Cake Handling System shall be controlled by wet material and other precautionary measures as specified in the Fugitive Dust Control Plan in Attachment A.

(e) Particulate emissions on the paved and unpaved haul roads shall be controlled by wet material, watering, sweeping, and speed reduction as specified in the Fugitive Dust Control Plan in Attachment A.

(f) Fugitive particulate emissions from handling and placement of Gypsum and CPS WWTP Filter Cake in onsite disposal area shall be controlled by wet material, watering, compacting, covering, and other precautionary measures as specified in the Fugitive Dust Control Plan in Attachment A. Fugitive particulate emissions from handling and placement of Gypsum in onsite disposal area or for offsite transportation shall be controlled by wet material, watering, compacting, covering, and other precautionary measures as specified in the Fugitive Dust Control Plan in Attachment A.

(g) The Permittee must comply with all requirements of the Fugitive Dust Control Plan in Attachment A.

Compliance with these requirements will ensure that the potential to emit from this modification is less than twenty-five (25) tons of PM per year and less than fifteen (15) tons of $PM_{10}$ per year and therefore will render the requirements of 326 IAC 2-2 (PSD) not applicable to the 2008 Modification.

D.4.2 Particulate Emission Limitations [326 IAC 6-3-2]

(a) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the limestone handling operation shall not exceed 77.59 pounds per hour when operating at a maximum process weight of 1,000 tons per hour.

(b) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the limestone processing operation shall not exceed 63.00 pounds per hour when operating at a maximum process weight of 300 tons per hour.

(c) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the gypsum waste handling operations shall not exceed 55.44 pounds per hour when operating at a maximum process weight of 150 tons per hour.

(d) The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 55.0\ P^{0.11} - 40$$

where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

(e) Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emissions may exceed the emission limits shown paragraph (a), provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

D.4.3 Fugitive Particulate Limitations [326 IAC 6-5]

Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissions from the limestone handling, limestone processing, and gypsum waste handling operations shall comply with the Fugitive Dust Control Plan in Attachment A.

**Compliance Determination Requirements [326 IAC 2-7-5(1)]**

D.4.4 Particulate Control [326 IAC 2-7-6(6)]

In order to ensure compliance with Condition D.4.1, D.4.2, and D.4.3, the enclosures, wet suppression, conveyor covers, and bin vent filters for particulate control shall be in operation and control emissions from the associated limestone handling, limestone processing, and/or gypsum waste handling operations at all times the associated limestone handling, limestone processing, and/or gypsum waste handling operations are in operation.

The Implementation of any wet dust suppression system(s) for the Limestone Handling System or Limestone Processing System shall not be necessary when precipitation has occurred that is sufficient to ensure compliance with the applicable requirements. Implementation may also be suspended if unsafe or hazardous conditions would be created by its use (e.g., temperature is below freezing and icing is causing an unsafe work condition).

**Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]**

D.4.5 Visible Emission Inspections

(a) Visible emission inspections from the limestone handling, limestone processing, and gypsum waste handling operations shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take a reasonable response. Section C – Response to Excursions and Exceedances contains the Permittee's obligation with regard to the reasonable response steps required by this condition. Failure to take response steps shall be considered a deviation from this permit.

D.4.6 Broken or Failed Bag Detection

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

A baghouse is considered to have failed when the bag filtering material has been physically breeched or the exhaust fan is not operating at full capacity.

Bag failure can be indicated by a significant drop in the baghouse's pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

D.4.7 Record Keeping Requirements

(a) To document the compliance status with Condition D.4.5 (Visible Emissions Inspections), the Permittee shall maintain records of daily visible emission inspection of the limestone handling, limestone processing, and/or gypsum waste handling operations and control device exhausts. The Permittee shall include in its daily record when a visible emission inspection is not taken and the reason for the lack of visible emission inspection (e.g. the process did not operate that day).

(b) Section C - General Record Keeping Requirements contains the Permittee's obligation with regard to the records required by this condition.

## SECTION D.5 EMISSIONS UNIT OPERATION CONDITIONS

**Emissions Unit Description:**

(i) One (1) Dry Sorbent Injection System, permitted in 2008, consisting of two (2) silos to store dry sorbent material, identified as East Trona Silo 13 and West Trona Silo 45. Each silo has a usable storage capacity of approximately 600 tons. The dry sorbent material is delivered to the plant by totally enclosed dry-cement type trucks on an as-needed basis. The dry sorbent material is pneumatically transferred from the trucks into the silos through a totally enclosed system. The unloading rate for each truck is approximately 26 tons per hour. Both silos are fitted with baghouses designed to remove the particulate in the exhaust air from the truck unloading process. A totally enclosed pneumatic system is also used to transfer the dry sorbent material from the silos for injection into the Units 1 through 5 flue gas ducts between the existing SCRs and ESPs.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

### Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.5.1 Particulate Emission Limitations [326 IAC 6-3-2]

Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the Dry Sorbent Injection System shall not exceed 36.38 pounds per hour when operating at a process weight rate of 26 tons per hour.

The pounds per hour limitation was calculated with the following equation:

Interpolation of the data for the process weight rate up to 60,000 pounds per hour shall be accomplished by use of the equation:

$$E = 4.10\ P^{0.67}$$

Where $E$ = rate of emission in pounds per hour; and
$P$ = process weight rate in tons per hour

### Compliance Determination Requirements [326 IAC 2-7-5(1)]

D.5.2 Particulate Control [326 IAC 2-7-6(6)]

In order to ensure compliance with Condition D.5.1, the bin vent filters for particulate control shall be in operation and control emissions from the Dry Sorbent Injection System during unloading operations.

### Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.5.3 Visible Emission Inspections

(a) Visible emission inspections from the bin vent filters shall be performed once per day during normal daylight operations. A trained employee shall record whether emissions are normal or abnormal.

(b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.

(c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.

(d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions for that specific process.

(e) If abnormal emissions are observed, the Permittee shall take a reasonable response. Section C – Response to Excursions and Exceedances contains the Permittee's obligation with regard to the reasonable response steps required by this condition. Failure to take response steps shall be considered a deviation from this permit.

D.5.4 Broken or Failed Bag Detection

(a) For a single compartment baghouse controlling emissions from a process operated continuously, a failed unit and the associated process shall be shut down immediately until the failed unit has been repaired or replaced. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

(b) For a single compartment baghouse controlling emissions from a batch process, the feed to the process shall be shut down immediately until the failed unit has been repaired or replaced. The emissions unit shall be shut down no later than the completion of the processing of the material in the line. Operations may continue only if the event qualifies as an emergency and the Permittee satisfies the requirements of the emergency provisions of this permit (Section B - Emergency Provisions).

A baghouse is considered to have failed when the bag filtering material has been physically breeched or the exhaust fan is not operating at full capacity.

Bag failure can be indicated by a significant drop in the baghouse’s pressure reading with abnormal visible emissions, by an opacity violation, or by other means such as gas temperature, flow rate, air infiltration, leaks, dust traces or triboflows.

**Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]**

D.5.5 Record Keeping Requirements

(a) To document the compliance status with Condition D.5.3 (Visible Emissions Inspections), the Permittee shall maintain records of daily visible emission inspections of the bin vent filters. The Permittee shall include in its daily record when a visible emission inspection is not taken and the reason for the lack of visible emission inspection (e.g. the process did not operate that day).

(b) Section C - General Record Keeping Requirements contains the Permittee's obligation with regard to the records required by this condition.

## SECTION E.1 ACID RAIN

**Emissions Unit Description:**

(a) Five (5) wet-bottom pulverized coal-fired boilers identified as Units 1 through 5, with construction completed in 1955, each with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Units 1 through 5 have the following emission controls:

- over-fire air system ($NO_X$ control)
- selective catalytic reduction (SCR) system ($NO_X$ control)
- “cold-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 1, 2, and 3 exhaust to Flue 13 of Stack 14. Units 4 and 5 exhaust to Flue 46 of Stack 14. Both Flue 13 and Flue 46 of Stack 14 have continuous emissions monitoring systems (CEMS) for particulate matter (PM). They also have flow sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

(b) One (1) wet-bottom pulverized coal-fired boiler identified as Unit 6, with construction completed in 1956, with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Unit 6 has the following emission controls:

- over-fire air system ($NO_X$ control)
- “hot-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 6 exhausts to Flue 46 of Stack 14. Flue 46 of Stack 14 has continuous emissions monitoring systems (CEMS). They also have flow sulfur dioxide (SO2) and nitrogen oxides ($NO_X$) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

The Flue Gas Desulfurization (FGD) System for Units 1 through 6, permitted in 2008, consists of one (1) stack (Stack 14) with two flues (Flues 13 and 46), two (2) jet bubbling reactor (JBR) absorbers (JBRs 13 and 46), and associated limestone and gypsum material handling systems.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**Acid Rain Program**

E.1.1 Acid Rain Permit [326 IAC 2-7-5(1)(C)] [326 IAC 21] [40 CFR 72 through 40 CFR 78]

Pursuant to 326 IAC 21 (Acid Deposition Control), the Permittee shall comply with all provisions of the Acid Rain permit issued for this source, and any other applicable requirements contained in 40 CFR 72 through 40 CFR 78. The Acid Rain permit for this source is incorporated by reference.

E.1.2 Title IV Emissions Allowances [326 IAC 2-7-5(4)] [326 IAC 21]

Emissions exceeding any allowances that the Permittee lawfully holds under the Title IV Acid Rain Program of the Clean Air Act are prohibited, subject to the following limitations:

(a) No revision of this permit shall be required for increases in emissions that are authorized by allowances acquired under the Title IV Acid Rain Program, provided that such increases do not require a permit revision under any other applicable requirement.

(b) No limit shall be placed on the number of allowances held by the Permittee. The Permittee may not use allowances as a defense to noncompliance with any other applicable requirement.

(c) Any such allowance shall be accounted for according to the procedures established in regulations promulgated under Title IV of the Clean Air Act.

## SECTION E.2 NSPS

**Emissions Unit Description:**

(f) One (1) Limestone Processing (LP) System, permitted in 2008, with a maximum transfer rate of 300 tons per hour, consisting of two (2) reclaim hoppers and feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) ball mill feeders, two (2) wet ball mills, and one (1) emergency reclaim hopper. Particulate emissions are controlled by partial to full enclosure and two (2) storage silo baghouses.

[The Limestone Processing (LP) System is an affected source under the Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60, Subpart OOO).]

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**New Source Performance Standards (NSPS) Requirements [326 IAC 2-7-5(1)]**

E.2.1 General Provisions Relating to New Source Performance Standards [326 IAC 12-1] [40 CFR Part 60, Subpart A]

(a) Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 12-1, for the emission unit(s) listed above, except as otherwise specified in 40 CFR Part 60, Subpart OOO.

(b) Pursuant to 40 CFR 60.4, the Permittee shall submit all required notifications and reports to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

E.2.2 New Source Performance Standard for Nonmetallic Mineral Processing Plants NSPS [326 IAC 12] [40 CFR Part 60, Subpart OOO]

The Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart OOO (included as Attachment B to the operating permit), which are incorporated by reference as 326 IAC 12, for the emission unit(s) listed above:

(1) 40 CFR 60.670(a)(1) and (d)(1-3) through (f)
(2) 40 CFR 60.671
(3) 40 CFR 60.672(a), (b), and (d) through (f)
(4) 40 CFR 60.673(a) and (b)
(5) 40 CFR 60.674(b)(1)(i), (ii), (b)(2), (c), (d), and (e)
(6) 40 CFR 60.676(a)(1)(i) and (ii), (a)(3)(i) and (ii), (a)(4)(i) and (ii), (b)(1), (f) through (h), (i)(1), (j), and (k).
(7) 40 CFR 60, Subpart OOO, Table 1
(8) 40 CFR 60, Subpart OOO, Table 2
(9) 40 CFR 60, Subpart OOO, Table 3

**SECTION E.3 NESHAP**

**Emissions Unit Description:**

(a) Five (5) wet-bottom pulverized coal-fired boilers identified as Units 1 through 5, with construction completed in 1955, each with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Units 1 through 5 have the following emission controls:

- over-fire air system ($NO_X$ control)
- selective catalytic reduction (SCR) system ($NO_X$ control)
- “cold-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 1, 2, and 3 exhaust to Flue 13 of Stack 14. Units 4 and 5 exhaust to Flue 46 of Stack 14. Both Flue 13 and Flue 46 of Stack 14 have continuous emissions monitoring systems (CEMS) for particulate matter (PM). They also have flow sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

(b) One (1) wet-bottom pulverized coal-fired boiler identified as Unit 6, with construction completed in 1956, with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Unit 6 has the following emission controls:

- over-fire air system ($NO_X$ control)
- “hot-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 6 exhausts to Flue 46 of Stack 14. Flue 46 of Stack 14 has continuous emissions monitoring systems (CEMS) for particulate matter (PM). They also have flow sulfur dioxide (SO2) and nitrogen oxides ($NO_X$) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

The Flue Gas Desulfurization (FGD) System for Units 1 through 6, permitted in 2008, consists of one (1) stack (Stack 14) with two flues (Flues 13 and 46), two (2) jet bubbling reactor (JBR) absorbers (JBRs 13 and 46), and associated limestone and gypsum material handling systems.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**National Emission Standards for Hazardous Air Pollutants (NESHAP) Requirements [326 IAC 2-7-5(1)]**

E.3.1 General Provisions Relating to National Emission Standards for Hazardous Air Pollutants under 40 CFR Part 63 [326 IAC 20-1] [40 CFR Part 63, Subpart A]

(a) Pursuant to 40 CFR 63.1 the Permittee shall comply with the provisions of 40 CFR Part 63, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 20-1, for the emission unit(s) listed above, except as otherwise specified in 40 CFR Part 63, Subpart UUUUU.

(b) Pursuant to 40 CFR 63.10, the Permittee shall submit all required notifications and reports to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

E.3.2 National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units NESHAP [40 CFR Part 63, Subpart UUUUU] [326 IAC 20-89]

The Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart UUUUU (included as Attachment C to the operating permit), which are incorporated by reference as 326 IAC 20-89, for the emission unit(s) listed above:

(1) 40 CFR 63.9980
(2) 40 CFR 63.9981
(3) 40 CFR 63.9982(a)(1) and (d)
(4) 40 CFR 63.9984(b), (c), and (f)
(5) 40 CFR 63.9990(a)(1)
(6) 40 CFR 63.9991(a) and (c)
(7) 40 CFR 63.10000(a), (b), (c), (d), and (e)
(8) 40 CFR 63.10001
(9) 40 CFR 63.10005(a), (b), (d), (e), (f), (j), and (k)
(10) 40 CFR 63.10006(c), (g), (i)(1), and (j)
(11) 40 CFR 63.10007(a), (b), (d), (e), (f), and (g)
(12) 40 CFR 63.10009(a) through (e), (h), (k), (m), and (n)
(13) 40 CFR 63.10010(a)(2), (f), (i), and (l)
(14) 40 CFR 63.10011(a), (c)(2), (e), (f), and (g)
(15) 40 CFR 63.10020(a), (b), (c), and (d)
(16) 40 CFR 63.10021(a), (b), (e), (f), (g), (h), and (i)
(17) 40 CFR 63.10030(a), (b), (d), and (e)
(18) 40 CFR 63.10031
(19) 40 CFR 63.10032(a), (b), (c), (d), (f), and (g)
(20) 40 CFR 63.10033
(21) 40 CFR 63.10040
(22) 40 CFR 63.10041(a) and (b)
(23) 40 CFR 63.10042
(24) Table 2 to Subpart UUUUU of Part 63
(25) Table 3 to Subpart UUUUU of Part 63
(26) Table 5 to Subpart UUUUU of Part 63
(27) Table 7 to Subpart UUUUU of Part 63
(28) Table 8 to Subpart UUUUU of Part 63
(29) Table 9 to Subpart UUUUU of Part 63
(30) Appendix A to Subpart UUUUU of Part 63

## SECTION E.4 NESHAP

**Emissions Unit Description:**

(c) Five (5) emergency stationary reciprocating internal combustion engines, consisting of the following:

(1) One (1) propane fired stationary RICE, identified as CEMG-01, installed in 1992, with a heat input capacity of 10.05 HP, using no controls, and exhausting outdoors.

(2) One (1) propane fired stationary RICE, identified as CESG-1, installed in 2008, with a heat input capacity of 107.24 HP, using no controls, and exhausting outdoors.

(3) One (1) diesel fired stationary RICE, identified as CEQP-01, installed in 2007, with a heat input capacity of 207 HP, using no controls, and exhausting outdoors.

(4) Two (2) diesel fired stationary RICE fire pumps, identified as CEFP-01 and CEFP-02, each installed prior to 2006, each with a heat input capacity of 250 HP, each using no controls, and each exhausting outdoors.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**National Emission Standards for Hazardous Air Pollutants (NESHAP) Requirements [326 IAC 2-7-5(1)]**

E.4.1 General Provisions Relating to National Emission Standards for Hazardous Air Pollutants under 40 CFR Part 63 [326 IAC 20-1] [40 CFR Part 63, Subpart A]

(a) Pursuant to 40 CFR 63.1 the Permittee shall comply with the provisions of 40 CFR Part 63, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 20-1, for the emission unit(s) listed above, except as otherwise specified in 40 CFR Part 63, Subpart ZZZZ.

(b) Pursuant to 40 CFR 63.10, the Permittee shall submit all required notifications and reports to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

E.4.2 National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines [40 CFR Part 63, Subpart ZZZZ] [326 IAC 20-82]

The Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart ZZZZ (included as Attachment D to the operating permit), which are incorporated by reference as 326 IAC 20-82, for the emission unit(s) listed above:

The Clifty Quench Pump is subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(2)(ii) and (c)(6)

The two (2) propane fired engines are subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(1)(ii)
(4) 40 CFR 63.6595(a)(1) and (c)
(5) 40 CFR 63.6602
(6) 40 CFR 63.6605
(7) 40 CFR 63.6625(e)(2) and (f)
(8) 40 CFR 63.6640(f)
(9) 40 CFR 63.6645(a)(5)
(10) 40 CFR 63.6655(e)(2) and (f)(1)
(11) 40 CFR 63.6660
(12) 40 CFR 63.6665
(13) 40 CFR 63.6670
(14) 40 CFR 63.6675
(15) Item 6 Table 2c to Subpart ZZZZ of Part 63
(16) Item 9 Table 6 to Subpart ZZZZ of Part 63
(17) Table 8 to Subpart ZZZZ of Part 63

The two (2) Clifty Diesel Fire Pumps are subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(1)(ii)
(4) 40 CFR 63.6595(a)(1) and (c)
(5) 40 CFR 63.6602
(6) 40 CFR 63.6604(b)
(7) 40 CFR 63.6605
(8) 40 CFR 63.6625(e)(2) and (f)
(9) 40 CFR 63.6640(f)
(10) 40 CFR 63.6645(a)(1), (d), (g), and (h)
(11) 40 CFR 63.6655(a), (d), (e), and (f)(1)
(12) 40 CFR 63.6660
(13) 40 CFR 63.6665
(14) 40 CFR 63.6670
(15) 40 CFR 63.6675
(16) Item 1 Table 2c to Subpart ZZZZ of Part 63
(17) Item 9 Table 6 to Subpart ZZZZ of Part 63
(18) Table 8 to Subpart ZZZZ of Part 63

**SECTION E.5 NSPS**

**Emissions Unit Description:**

(c) Five (5) emergency stationary reciprocating internal combustion engines, consisting of the following:

***

(3) One (1) diesel fired stationary RICE, identified as CEQP-01, installed in 2007, with a heat input capacity of 207 HP, using no controls, and exhausting outdoors.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**New Source Performance Standards (NSPS) Requirements [326 IAC 2-7-5(1)]**

E.5.1 General Provisions Relating to New Source Performance Standards [326 IAC 12-1] [40 CFR Part 60, Subpart A]

(a) Pursuant to 40 CFR 60.1, the Permittee shall comply with the provisions of 40 CFR Part 60, Subpart A – General Provisions, which are incorporated by reference as 326 IAC 12-1, for the emission unit(s) listed above, except as otherwise specified in 40 CFR Part 60, Subpart IIII.

(b) Pursuant to 40 CFR 60.4, the Permittee shall submit all required notifications and reports to:

Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

E.5.2 New Source Performance Standard for Stationary Compression Ignition Internal Combustion Engines [326 IAC 12] [40 CFR Part 60, Subpart IIII]

The Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart IIII (included as Attachment E to the operating permit), which are incorporated by reference as 326 IAC 12, for the emission unit(s) listed above:

(1) 40 CFR 60.4200(a)(2)(i)
(2) 40 CFR 60.4205(b)
(3) 40 CFR 60.4206
(4) 40 CFR 60.4207(a) and (b)
(5) 40 CFR 60.4208
(6) 40 CFR 60.4209
(7) 40 CFR 60.4211(f) and (g)
(8) 40 CFR 60.4214(b)
(9) 40 CFR 60.4218
(10) 40 CFR 60.4219
(11) Table 8 to Subpart IIII of Part 60

**SECTION F Clean Air Interstate Rule (CAIR) Nitrogen Oxides Annual, Sulfur Dioxide, and Nitrogen Oxides Ozone Season Trading Program - CAIR Permit for CAIR Units Under 326 IAC 24-1-1(a), 326 IAC 24-2-1(a), and 326 IAC 24-3-1(a)**

**ORIS Code: 983**

**CAIR Permit for CAIR Units Under 326 IAC 24-1-1(a), 326 IAC 24-2-1(a), and 326 IAC 24-3-1(a)**

(a) Five (5) wet-bottom pulverized coal-fired boilers identified as Units 1 through 5, with construction completed in 1955, each with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Units 1 through 5 have the following emission controls:

- over-fire air system ($NO_X$ control)
- selective catalytic reduction (SCR) system ($NO_X$ control)
- "cold-side" electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 1, 2, and 3 exhaust to Flue 13 of Stack 14. Units 4 and 5 exhaust to Flue 46 of Stack 14. Both Flue 13 and Flue 46 of Stack 14 have continuous emissions monitoring systems (CEMS) for particulate matter (PM) for 40 CFR Part 60 and Part 63 compliance. They also have flow sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

(b) One (1) wet-bottom pulverized coal-fired boiler identified as Unit 6, with construction completed in 1956, with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Unit 6 has the following emission controls:

- over-fire air system ($NO_X$ control)
- "hot-side" electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 6 exhausts to Flue 46 of Stack 14. Flue 46 of Stack 14 has continuous emissions monitoring systems (CEMS) for particulate matter (PM) for 40 CFR Part 60 and Part 63 compliance. They also have flow sulfur dioxide (SO2) and nitrogen oxides ($NO_X$) monitors for 40 CFR Part 75 compliance. The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

The Flue Gas Desulfurization (FGD) System for Units 1 through 6, permitted in 2008, consists of one (1) stack (Stack 14) with two flues (Flues 13 and 46), two (2) jet bubbling reactor (JBR) absorbers (JBRs 13 and 46), and associated limestone and gypsum material handling systems.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

F.1 Automatic Incorporation of Definitions [326 IAC 24-1-7(e)] [326 IAC 24-2-7(e)] [326 IAC 24-3-7(e)] [40 CFR 97.123(b)] [40 CFR 97.223(b)] [40 CFR 97.323(b)]

This CAIR permit is deemed to incorporate automatically the definitions of terms under 326 IAC 24-1-2, 326 IAC 24-2-2, and 326 IAC 24-3-2.

F.2 Standard Permit Requirements [326 IAC 24-1-4(a)] [326 IAC 24-2-4(a)] [326 IAC 24-3-4(a)] [40 CFR 97.106(a)] [40 CFR 97.206(a)] [40 CFR 97.306(a)]

(a) The owners and operators of each CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source and CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit shall operate each source and unit in compliance with this CAIR permit.

(b) The CAIR $NO_X$ unit(s), CAIR $SO_2$ unit(s), and CAIR $NO_X$ ozone season units subject to this CAIR permit are Unit 1 boiler, Unit 2 boiler, Unit 3 boiler, Unit 4 boiler, Unit 5 boiler and Unit 6 boiler.

F.3 Monitoring, Reporting, and Record Keeping Requirements [326 IAC 24-1-4(b)] [326 IAC 24-2-4(b)] [326 IAC 24-3-4(b)] [40 CFR 97.106(b)] [40 CFR 97.206(b)] [40 CFR 97.306(b)]

(a) The owners and operators, and the CAIR designated representative, of each CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source and CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit at the source shall comply with the applicable monitoring, reporting, and record keeping requirements of 326 IAC 24-1-11, 326 IAC 24-2-10, and 326 IAC 24-3-11.

(b) The emissions measurements recorded and reported in accordance with 326 IAC 24-1-11, 326 IAC 24-2-10, and 326 IAC 24-3-11 shall be used to determine compliance by each CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source with the CAIR $NO_X$ emissions limitation under 326 IAC 24-1-4(c), CAIR $SO_2$ emissions limitation under 326 IAC 24-2-4(c), and CAIR $NO_X$ ozone season emissions limitation under 326 IAC 24-3-4(c) and Condition F.4.1, Nitrogen Oxides Emission Requirements, Condition F.4.2, Sulfur Dioxide Emission Requirements, and Condition F.4.3, Nitrogen Oxides Ozone Season Emission Requirements.

F.4.1 Nitrogen Oxides Emission Requirements [326 IAC 24-1-4(c)] [40 CFR 97.106(c)]

(a) As of the allowance transfer deadline for a control period, the owners and operators of each CAIR $NO_X$ source and each CAIR $NO_X$ unit at the source shall hold, in the source's compliance account, CAIR $NO_X$ allowances available for compliance deductions for the control period under 326 IAC 24-1-9(i) in an amount not less than the tons of total nitrogen oxides emissions for the control period from all CAIR $NO_X$ units at the source, as determined in accordance with 326 IAC 24-1-11.

(b) A CAIR $NO_X$ unit shall be subject to the requirements under 326 IAC 24-1-4(c)(1) for the control period starting on the applicable date, as determined under 326 IAC 24-1-4(c)(2), and for each control period thereafter.

(c) A CAIR $NO_X$ allowance shall not be deducted for compliance with the requirements under 326 IAC 24-1-4(c)(1), for a control period in a calendar year before the year for which the CAIR $NO_X$ allowance was allocated.

(d) CAIR $NO_X$ allowances shall be held in, deducted from, or transferred into or among CAIR $NO_X$ allowance tracking system accounts in accordance with 326 IAC 24-1-9, 326 IAC 24-1-10, and 326 IAC 24-1-12.

(e) A CAIR $NO_X$ allowance is a limited authorization to emit one (1) ton of nitrogen oxides in accordance with the CAIR $NO_X$ annual trading program. No provision of the CAIR $NO_X$

annual trading program, the CAIR permit application, the CAIR permit, or an exemption under 326 IAC 24-1-3 and no provision of law shall be construed to limit the authority of the State of Indiana or the United States to terminate or limit the authorization.

(f) A CAIR $NO_X$ allowance does not constitute a property right.

(g) Upon recordation by the U.S. EPA under 326 IAC 24-1-8, 326 IAC 24-1-9, 326 IAC 24-1-10, or 326 IAC 24-1-12, every allocation, transfer, or deduction of a CAIR $NO_X$ allowance to or from a CAIR $NO_X$ source's compliance account is incorporated automatically in this CAIR permit.

F.4.2 Sulfur Dioxide Emission Requirements [326 IAC 24-2-4(c)] [40 CFR 97.206(c)]

(a) As of the allowance transfer deadline for a control period, the owners and operators of each CAIR $SO_2$ source and each CAIR $SO_2$ unit at the source shall hold, in the source's compliance account, a tonnage equivalent of CAIR $SO_2$ allowances available for compliance deductions for the control period under 326 IAC 24-2-8(j) and 326 IAC 24-2-8(k) not less than the tons of total sulfur dioxide emissions for the control period from all CAIR $SO_2$ units at the source, as determined in accordance with 326 IAC 24-2-10.

(b) A CAIR $SO_2$ unit shall be subject to the requirements under 326 IAC 24-2-4(c)(1) for the control period starting on the applicable date, as determined under 326 IAC 24-2-4(c)(2), and for each control period thereafter.

(c) A CAIR $SO_2$ allowance shall not be deducted for compliance with the requirements under 326 IAC 24-2-4(c)(1), for a control period in a calendar year before the year for which the CAIR $SO_2$ allowance was allocated.

(d) CAIR $SO_2$ allowances shall be held in, deducted from, or transferred into or among CAIR $SO_2$ allowance tracking system accounts in accordance with 326 IAC 24-2-8, 326 IAC 24-2-9, and 326 IAC 24-2-11.

(e) A CAIR $SO_2$ allowance is a limited authorization to emit sulfur dioxide in accordance with the CAIR $SO_2$ trading program. No provision of the CAIR $SO_2$ trading program, the CAIR permit application, the CAIR permit, or an exemption under 326 IAC 24-2-3 and no provision of law shall be construed to limit the authority of the State of Indiana or the United States to terminate or limit the authorization.

(f) A CAIR $SO_2$ allowance does not constitute a property right.

(g) Upon recordation by the U.S. EPA under 326 IAC 24-2-8, 326 IAC 24-2-9, or 326 IAC 24-2-11, every allocation, transfer, or deduction of a CAIR $SO_2$ allowance to or from a CAIR $SO_2$ source's compliance account is incorporated automatically in this CAIR permit.

F.4.3 Nitrogen Oxides Ozone Season Emission Requirements [326 IAC 24-3-4(c)] [40 CFR 97.306(c)]

(a) As of the allowance transfer deadline for a control period, the owners and operators of each CAIR $NO_X$ ozone season source and each CAIR $NO_X$ ozone season unit at the source shall hold, in the source's compliance account, CAIR $NO_X$ ozone season allowances available for compliance deductions for the control period under 326 IAC 24-3-9(i) in an amount not less than the tons of total nitrogen oxides emissions for the control period from all CAIR $NO_X$ ozone season units at the source, as determined in accordance with 326 IAC 24-3-11.

(b) A CAIR $NO_X$ ozone season unit shall be subject to the requirements under

326 IAC 24-3-4(c)(1) for the control period starting on the applicable date, as determined under 326 IAC 24-3-4(c)(2), and for each control period thereafter.

(c) A CAIR $NO_X$ ozone season allowance shall not be deducted for compliance with the requirements under 326 IAC 24-3-4(c)(1), for a control period in a calendar year before the year for which the CAIR $NO_X$ ozone season allowance was allocated.

(d) CAIR $NO_X$ ozone season allowances shall be held in, deducted from, or transferred into or among CAIR $NO_X$ ozone season allowance tracking system accounts in accordance with 326 IAC 24-3-9, 326 IAC 24-3-10, and 326 IAC 24-3-12.

(e) A CAIR $NO_X$ ozone season allowance is a limited authorization to emit one (1) ton of nitrogen oxides in accordance with the CAIR $NO_X$ ozone season trading program. No provision of the CAIR $NO_X$ ozone season trading program, the CAIR permit application, the CAIR permit, or an exemption under 326 IAC 24-3-3 and no provision of law shall be construed to limit the authority of the State of Indiana or the United States to terminate or limit the authorization.

(f) A CAIR $NO_X$ ozone season allowance does not constitute a property right.

(g) Upon recordation by the U.S. EPA under 326 IAC 24-3-8, 326 IAC 24-3-9, 326 IAC 24-3-10, or 326 IAC 24-3-12, every allocation, transfer, or deduction of a CAIR $NO_X$ ozone season allowance to or from a CAIR $NO_X$ ozone season source's compliance account is incorporated automatically in this CAIR permit.

F.5 Excess Emissions Requirements [326 IAC 24-1-4(d)] [326 IAC 24-2-4(d)] [326 IAC 24-3-4(d)] [40 CFR 97.106(d)] [40 CFR 97.206(d)] [40 CFR 97.306(d)]

(a) The owners and operators of a CAIR $NO_X$ source and each CAIR $NO_X$ unit that emits nitrogen oxides during any control period in excess of the CAIR $NO_X$ emissions limitation shall do the following:

(1) Surrender the CAIR $NO_X$ allowances required for deduction under 326 IAC 24-1-9(j)(4).
(2) Pay any fine, penalty, or assessment or comply with any other remedy imposed, for the same violations, the Clean Air Act (CAA) or applicable state law.

Each ton of such excess emissions and each day of such control period shall constitute a separate violation of 326 IAC 24-1-4, the Clean Air Act (CAA), and applicable state law.

(b) The owners and operators of a CAIR $SO_2$ source and each CAIR $SO_2$ unit that emits sulfur dioxide during any control period in excess of the CAIR $SO_2$ emissions limitation shall do the following:
(1) Surrender the CAIR $SO_2$ allowances required for deduction under 326 IAC 24-2-8(k)(4).
(2) Pay any fine, penalty, or assessment or comply with any other remedy imposed, for the same violations, the Clean Air Act (CAA) or applicable state law.

Each ton of such excess emissions and each day of such control period shall constitute a separate violation of 326 IAC 24-2-4, the Clean Air Act (CAA), and applicable state law.

(c) The owners and operators of a CAIR $NO_X$ ozone season source and each CAIR $NO_X$ ozone season unit that emits nitrogen oxides during any control period in excess of the CAIR $NO_X$ ozone season emissions limitation shall do the following:
(1) Surrender the CAIR $NO_X$ ozone season allowances required for deduction under 326 IAC 24-3-9(j)(4).
(2) Pay any fine, penalty, or assessment or comply with any other remedy imposed, for the same violations, the Clean Air Act (CAA) or applicable state law.

Each ton of such excess emissions and each day of such control period shall constitute a separate violation of 326 IAC 24-3-4, the Clean Air Act (CAA), and applicable state law.

F.6 Record Keeping Requirements [326 IAC 24-1-4(e)] [326 IAC 24-2-4(e)] [326 IAC 24-3-4(e)] [326 IAC 2-7-5(3)] [40 CFR 97.106(e)] [40 CFR 97.206(e)] [40 CFR 97.306(e)]

Unless otherwise provided, the owners and operators of the CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source and each CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit at the source shall keep on site at the source or at a central location within Indiana for those owners or operators with unattended sources, each of the following documents for a period of five (5) years from the date the document was created:

(a) The certificate of representation under 326 IAC 24-1-6(h), 326 IAC 24-2-6(h), and 326 IAC 24-3-6(h) for the CAIR designated representative for the source and each CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation. The certificate and documents shall be retained on site at the source or at a central location within Indiana for those owners or operators with unattended sources beyond such five (5) year period until such documents are superseded because of the submission of a new account certificate of representation under 326 IAC 24-1-6(h), 326 IAC 24-2-6(h), and 326 IAC 24-3-6(h) changing the CAIR designated representative.

(b) All emissions monitoring information, in accordance with 326 IAC 24-1-11, 326 IAC 24-2-10, and 326 IAC 24-3-11, provided that to the extent that 326 IAC 24-1-11, 326 IAC 24-2-10, and 326 IAC 24-3-11 provides for a three (3) year period for record keeping, the three (3) year period shall apply.

(c) Copies of all reports, compliance certifications, and other submissions and all records made or required under the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program.

(d) Copies of all documents used to complete a CAIR permit application and any other submission under the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program or to demonstrate compliance with the requirements of the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program.

This period may be extended for cause, at any time before the end of five (5) years, in writing by IDEM, OAQ or the U.S. EPA. Unless otherwise provided, all records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

F.7 Reporting Requirements [326 IAC 24-1-4(e)] [326 IAC 24-2-4(e)] [326 IAC 24-3-4(e)] [40 CFR 97.106(e)] [40 CFR 97.206(e)] [40 CFR 97.306(e)]

(a) The CAIR designated representative of the CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source and each CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit at the source shall submit the reports required under the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program, including those under 326 IAC 24-1-11, 326 IAC 24-2-10, and 326 IAC 24-3-11.

(b) Pursuant to 326 IAC 24-1-4(e), 326 IAC 24-2-4(e), and 326 IAC 24-3-4(e) and 326 IAC 24-1-6(e)(1), 326 IAC 24-2-6(e)(1), and 326 IAC 24-3-6(e)(1), each submission under the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program shall include the following certification statement by the CAIR designated representative: “I am authorized to make this submission on behalf of the owners and operators of the source or units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment."

(c) Where 326 IAC 24-1, 326 IAC 24-2, and 326 IAC 24-3 requires a submission to IDEM, OAQ, the information shall be submitted to:
Indiana Department of Environmental Management
Compliance and Enforcement Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53, IGCN 1003
Indianapolis, Indiana 46204-2251

(d) Where 326 IAC 24-1, 326 IAC 24-2, and 326 IAC 24-3 requires a submission to U.S. EPA, the information shall be submitted to:
U.S. Environmental Protection Agency
Clean Air Markets Division
1200 Pennsylvania Avenue, NW
Mail Code 6204N
Washington, DC 20460

F.8 Liability [326 IAC 24-1-4(f)] [326 IAC 24-2-4(f)] [326 IAC 24-3-4(f)] [40 CFR 97.106(f)] [40 CFR 97.206(f)] [40 CFR 97.306(f)]

The owners and operators of each CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source and each CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit shall be liable as follows:

(a) Each CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source and each CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit shall meet the requirements of the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program, respectively.

(b) Any provision of the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program that applies to a CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source or the CAIR designated representative of a CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source shall also apply to the owners and operators of such source and of the CAIR $NO_X$ units, CAIR $SO_2$ units, and CAIR $NO_X$ ozone season units at the source.

(c) Any provision of the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program that applies to a CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit or the CAIR designated representative of a CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit shall also apply to the owners and operators of such unit.

F.9 Effect on Other Authorities [326 IAC 24-1-4(g)] [326 IAC 24-2-4(g)] [326 IAC 24-3-4(g)] [40 CFR 97.106(g)] [40 CFR 97.206(g)] [40 CFR 97.306(g)]

No provision of the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program, a CAIR permit application, a CAIR permit, or an exemption under 326 IAC 24-1-3, 326 IAC 24-2-3, and 326 IAC 24-3-3 shall be construed as exempting or excluding the owners and operators, and the CAIR designated representative, of a CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source or CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit from compliance with any other provision of the applicable, approved state implementation plan, a federally enforceable permit, or the Clean Air

Act (CAA).

F.10 CAIR Designated Representative and Alternate CAIR Designated Representative [326 IAC 24-1-6] [326 IAC 24-2-6] [326 IAC 24-3-6] [40 CFR 97, Subpart BB] [40 CFR 97, Subpart BBB] [40 CFR 97, Subpart BBBB]

Pursuant to 326 IAC 24-1-6, 326 IAC 24-2-6, and 326 IAC 24-3-6:

(a) Except as specified in 326 IAC 24-1-6(f)(3), 326 IAC 24-2-6(f)(3), and 326 IAC 24-3-6(f)(3), each CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source, including all CAIR $NO_X$ units, CAIR $SO_2$ units, and CAIR $NO_X$ ozone season units at the source, shall have one (1) and only one (1) CAIR designated representative, with regard to all matters under the CAIR $NO_X$ annual trading program, CAIR $SO_2$ trading program, and CAIR $NO_X$ ozone season trading program concerning the source or any CAIR $NO_X$ unit, CAIR $SO_2$ unit, and CAIR $NO_X$ ozone season unit at the source.

(b) The provisions of 326 IAC 24-1-6(f), 326 IAC 24-2-6(f), and 326 IAC 24-3-6(f) shall apply where the owners or operators of a CAIR $NO_X$ source, CAIR $SO_2$ source, and CAIR $NO_X$ ozone season source choose to designate an alternate CAIR designated representative.

Except as specified in 326 IAC 24-1-6(f)(3), 326 IAC 24-2-6(f)(3), and 326 IAC 24-3-6(f)(3), whenever the term "CAIR designated representative" is used, the term shall be construed to include the CAIR designated representative or any alternate CAIR designated representative.

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
# OFFICE OF AIR QUALITY
# COMPLIANCE AND ENFORCEMENT BRANCH
# PART 70 OPERATING PERMIT
# CERTIFICATION

| | |
|---|---|
| Source Name: | Indiana-Kentucky Electric Corporation Clifty Creek Station |
| Source Address: | 1335 Clifty Hollow Road, Madison, Indiana 47250 |
| Part 70 Permit No.: | T077-36338-00001 |

**This certification shall be included when submitting monitoring, testing reports/results or other documents as required by this permit.**

Please check what document is being certified:

☐ Annual Compliance Certification Letter

☐ Test Result (specify)

☐ Report (specify)

☐ Notification (specify)

☐ Affidavit (specify)

☐ Other (specify)

| |
|---|
| I certify that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. |
| Signature: |
| Printed Name: |
| Title/Position: |
| Phone: |
| Date: |

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

**OFFICE OF AIR QUALITY**
**COMPLIANCE AND ENFORCEMENT BRANCH**
**100 North Senate Avenue**
**MC 61-53 IGCN 1003**
**Indianapolis, Indiana 46204-2251**
**Phone: (317) 233-0178**
**Fax: (317) 233-6865**

## PART 70 OPERATING PERMIT
## EMERGENCY OCCURRENCE REPORT

Source Name: Indiana-Kentucky Electric Corporation Clifty Creek Station
Source Address: 1335 Clifty Hollow Road, Madison, Indiana 47250
Part 70 Permit No.: T077-36338-00001

**This form consists of 2 pages** **Page 1 of 2**

☐ This is an emergency as defined in 326 IAC 2-7-1(12)
- The Permittee must notify the Office of Air Quality (OAQ), within four (**4**) daytime business hours (1-800-451-6027 or 317-233-0178, ask for Compliance Section); and
- The Permittee must submit notice in writing or by facsimile within two (**2**) working days (Facsimile Number: 317-233-6865), and follow the other requirements of 326 IAC 2-7-16.

If any of the following are not applicable, mark N/A

| |
|---|
| Facility/Equipment/Operation: |
| Control Equipment: |
| Permit Condition or Operation Limitation in Permit: |
| Description of the Emergency: |
| Describe the cause of the Emergency: |

If any of the following are not applicable, mark N/A **Page 2 of 2**

| |
|---|
| Date/Time Emergency started: |
| Date/Time Emergency was corrected: |
| Was the facility being properly operated at the time of the emergency? Y N |
| Type of Pollutants Emitted: TSP, PM-10, $SO_2$, VOC, $NO_X$, CO, Pb, other: |
| Estimated amount of pollutant(s) emitted during emergency: |
| Describe the steps taken to mitigate the problem: |
| Describe the corrective actions/response steps taken: |
| Describe the measures taken to minimize emissions: |
| If applicable, describe the reasons why continued operation of the facilities are necessary to prevent imminent injury to persons, severe damage to equipment, substantial loss of capital investment, or loss of product or raw materials of substantial economic value: |

Form Completed by:_______________________________

Title / Position: ___________________________________

Date:_____________________________________________

Phone: __________________________________________

# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
## OFFICE OF AIR QUALITY
## COMPLIANCE AND ENFORCEMENT BRANCH
## PART 70 OPERATING PERMIT
## QUARTERLY DEVIATION AND COMPLIANCE MONITORING REPORT

Source Name: Indiana-Kentucky Electric Corporation Clifty Creek Station
Source Address: 1335 Clifty Hollow Road, Madison, Indiana 47250
Part 70 Permit No.: T077-36338-00001

**Months:** _____________ **to** _____________ **Year:** _______________

Page 1 of 2

| | |
|---|---|
| This report shall be submitted quarterly based on a calendar year. Proper notice submittal under Section B –Emergency Provisions satisfies the reporting requirements of paragraph (a) of Section C-General Reporting. Any deviation from the requirements of this permit, the date(s) of each deviation, the probable cause of the deviation, and the response steps taken must be reported. A deviation required to be reported pursuant to an applicable requirement that exists independent of the permit, shall be reported according to the schedule stated in the applicable requirement and does not need to be included in this report. Additional pages may be attached if necessary. If no deviations occurred, please specify in the box marked "No deviations occurred this reporting period". | |
| ◻ NO DEVIATIONS OCCURRED THIS REPORTING PERIOD. | |
| ◻ THE FOLLOWING DEVIATIONS OCCURRED THIS REPORTING PERIOD | |
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |

| | |
|---|---|
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |
| **Permit Requirement** (specify permit condition #) | |
| **Date of Deviation:** | **Duration of Deviation:** |
| **Number of Deviations:** | |
| **Probable Cause of Deviation:** | |
| **Response Steps Taken:** | |

Form Completed by:______________________________

Title / Position: _________________________________

Date:__________________________________________

Phone: ________________________________________

**Attachment A**

**Part 70 Operating Permit No. T 077-36338-00001**

Fugitive Dust Control Plan

To be implemented in conjunction with the Flue Gas Desulfurization Retrofit Project

## Introduction

The control plan, when implemented, is designed to reduce fugitive dust emissions of $PM/PM_{10}/PM_{2.5}$ from the following:

(a) Limestone Handling and Storage Facilities;

(b) Limestone Processing Facilities;

(c) Gypsum Handling and Disposal;

(d) Wastewater Treatment Facility;

(e) Paved Roadways;

(f) Unpaved Roadways; and

(g) Working Landfill Face.

The plan shall be implemented on a year-round basis until such time as another plan is approved or ordered by the Indiana Department of Environmental Management. The name, title and telephone number of the person who is responsible for implementing the plan will be supplied to the OAQ Compliance Section.

## General

Indiana-Kentucky Electric Corporation (IKEC) has installed environmental controls at the Clifty Creek Plant to meet the requirements of the Clean Air Interstate Rule (CAIR), Cross-State Air Pollution Rule (CSAPR), and the Mercury and Air Toxic Standards (MATS). IKEC has determined that the installation of the flue gas desulfurization (FGD) systems for sulfur dioxide ($SO_2$) emissions reductions on Units 1 through 6 of the Clifty Creek Plant is the best option to comply with CAIR, CSAPR, and MATS.

Operation of the FGD, requires limestone handling and storage facilities, limestone processing facilities, gypsum handling and storage facilities and a wastewater treatment facility. Design basis for the FGD and associated facilities is 98% removal of sulfur dioxide ($SO_2$) with a 5.0-lb/MMBtu coal.

## Limestone Handling and Storage Facilities

In order to supply limestone to the limestone processing facility, a barge unloader, conveyor system, and storage area was installed. The limestone barge unloader is a balanced hydraulic clamshell bucket type unloader. The unloader has a free digging rate of 1,000 tons per hour (tph) with an average unloading rate of 750 tph. The clamshell bucket unloads the limestone into a hopper with a capacity of 3.5 loads of the bucket. The hopper is equipped with a vibrating feeder that will feed the limestone onto the first of three conveyors. Each conveyor has a rated capacity of 1,000 tph. The conveying system will consist of three conveyors and two transfer stations. Limestone is added to the active limestone storage pile via a stacking tube. The active limestone storage pile has a capacity of 38,381 tons with a surface area of 3,883 $m^2$. In order to ensure a constant supply of limestone, an inactive (long-term) limestone storage pile will be maintained. The long-term storage pile will have a capacity of 44,280 tons with a surface area of 4,929 $m^2$.

| Table 1: Fugitive Dust Control Measures<br>Limestone Transfer - Conveying | | |
|---|---|---|
| **Emission Point ID** | **Transfer Description** | **Control Method** |
| 22 (LH) | Clamshell Bucket from Barge | None |
| 23 (LH) | Clamshell Bucket into Reclaim Hopper (RH1) | Fog Suppression |
| 23 (LH) | Reclaim Hopper (RH1) onto Vibrating Feeder | Partial Enclosure |
| 23 (LH) | Vibrating Feeder (VF1) onto LS Unloading Belt Conveyor (LU1) | Fog Suppression |
| 24 (LH) | LS Unloading Belt Conveyor (LU1) | 3/4 Conveyor Cover |
| 39a (LH) | Limestone Unloading Conveyor (LU1) to Limestone Transfer Conveyor (LU2) | Full Enclosure |
| 40a (LH) | Limestone Transfer Conveyor (LU2) | 3/4 Conveyor Cover |
| 39b (LH) | Limestone Transfer Conveyor (LU2) to Limestone Transfer Conveyor (LU3) | Full Enclosure |
| 40b (LH) | Limestone Transfer Conveyor (LU3) | 3/4 Conveyor Cover |
| 26 (LH) | Active Storage Pile into Reclaim Drawdown Hopper 1 or 2 | Full Enclosure |
| 26 (LP) | Vibratory Drawdown Hopper(DH-1 or DH-2) onto Vibratory Reclaim Feeder (VF-2 or VF-3) | Enclosed reclaim With Dust Suppression |
| 26 (LP) | Vibratory Reclaim Feeder (VF-2 or VF-3) onto LS Reclaim Conveyor LR-1. | Full Enclosure |
| 28 (LP) | LS Reclaim Conveyor (LR-1) | 3/4 Conveyor Cover |
| 8 (LP) | LS Reclaim Conveyor (LR-1) into LS Storage Silo B | Full Enclosure |
| 29 (LP) | LS Reclaim Conveyor (LR-1) onto Silo Transfer Conveyor (LR-3) | Full Enclosure |
| 29 (LP) | Silo Transfer Conveyor (LR-3) | Full Enclosure |
| 29 (LP) | Silo Transfer Conveyor (LR-3) into LS Storage Silo A | Full Enclosure |
| 8 (LP) | LS Storage Silo A onto Feeder A | Full Enclosure |
| 8 (LP) | Feeder A into Wet Ball A | Full Enclosure |
| 8 (LP) | LS Storage Silo B onto Feeder B | Full Enclosure |
| 8 (LP) | Feeder B into Wet Ball B | Full Enclosure |
| 27 (LH) | Front End Loader into Emergency Reclaim Hopper | None |
| 27 (LP) | Emergency Reclaim Hopper onto Emergency Reclaim Vibrating Feeder | None |
| 27 (LP) | Emergency reclaim Vibrating Feeder onto Reclaim Conveyor | None |

## Limestone Processing Facilities

Limestone is supplied to the processing facility via an under pile reclaim system. Two limestone feeders and two hoppers are located underneath the active limestone storage pile. The feeder system supplies limestone to the limestone reclaim conveyor. The limestone reclaim conveyor supplies limestone to the silo transfer conveyor at a rated capacity of 300 tph. The silo transfer conveyor will deliver the limestone at a rated capacity of 300 tph into one of two storage silos. Each storage silo has a capacity of 940 tons of limestone.

In the event that limestone cannot be supplied to the limestone processing facility via the active pile reclaim system, limestone can be loaded from the inactive storage pile into the emergency reclaim hopper using a wheel loader or bulldozer. The limestone is then fed from the emergency reclaim hopper onto the active reclaim conveyor system and eventually to one of the two silos. The emergency reclaim hopper has a rated capacity 150 tph.

From the storage silos, limestone is supplied to one of two ball mills. Reclaim water is added to aid in the crushing of the limestone. From the ball mills, the slurry is discharged into the ball mill slurry tank, where reclaim water is added to achieve the proper slurry density. The slurry is then pumped to the reagent storage tanks that are equipped with agitators to keep the limestone in suspension.

**Table 2: Fugitive Dust Control Measures Limestone Pile Transfer**

| Emission Point ID | Transfer Description | Control Method |
|---|---|---|
| 25 (LH) | Limestone Transfer Conveyor (LU3) to Active Limestone Storage Pile (Counted in Total LS Pile Emissions) | Stacking Tube |
| 25 (LH) | Active Storage Pile into Front End Loader (Pile Maintenance) | None |
| 25 (LH) | Front End Loader onto Active Storage Pile | None |
| 25 (LH) | Active Storage Pile into Front End Loader | None |
| 25 (LH) | Front End Loader onto Active Storage Pile | None |
| 25 (LH) | Active Storage Pile into Front End Loader Emergency | None |
| 30 (LH) | Front End Loader onto Long Term Storage Pile | None |
| 30 (LH) | Long Term Storage Pile into Front End Loader | None |

## Gypsum Handling and Disposal

The FGD by-product (gypsum) will be discharged from two vacuum belt filters onto the gypsum collecting conveyor. The gypsum collecting conveyor will then transfer the gypsum to the gypsum transfer conveyor at the gypsum transfer station. Gypsum is then transferred to the gypsum radial stacker. Each conveyor and the radial stacker have a rated capacity of 150 tph. The radial stacker forms a kidney-shaped storage pile. The storage pile will have the capacity to store three days of gypsum production (8,900 tons and a surface area of 2,805 $m^2$). Gypsum from the storage pile will be loaded into trucks by wheel loaders for transport to the existing landfill or for transport offsite.

In the event that the gypsum collecting conveyor fails or as needed to transfer gypsum to the covered storage area, gypsum will be collected on the emergency gypsum collecting conveyor. Inside the FGD building, gypsum is transferred to the emergency gypsum stackout conveyor. The emergency stackout conveyor discharges the gypsum onto the concrete stack out pad forming a temporary pile inside of a covered area. The conveyors will have a rated capacity of 150 tph. The pile will have a storage capacity of 2,900 tons and a surface area of 841 $m^2$. Gypsum from the storage pile will be loaded into trucks by wheel loaders for transport to the existing landfill or for transport offsite.

**Table 3: Fugitive Dust Control Measures Gypsum Transfers**

| Emission Point ID | Transfer Description | Control Method |
|---|---|---|
| 7 (GH) | Belt Filter A or B onto Gypsum Collecting Conveyor | Full Enclosure |
| 7 (GH) | Gypsum Collecting Conveyor | 3/4 Conveyor Cover |
| 7 (GH) | Gypsum Collecting Conveyor onto Gypsum Transfer Conveyor | Full Enclosure |
| 32 (GH) | Gypsum Transfer Conveyor | 3/4 Conveyor Cover |

| Table 3: Fugitive Dust Control Measures Gypsum Transfers | | |
|---|---|---|
| **Emission Point ID** | **Transfer Description** | **Control Method** |
| 32 (GH) | Gypsum Transfer Conveyor onto Gypsum Radial Stacker Conveyor | Full Enclosure |
| 33 (GH) | Gypsum Radial Stacker Conveyor | 3/4 Conveyor Cover |
| 7 (GH) | Belt Filter A or B onto Emergency Gypsum Collecting Conveyor | Full Enclosure |
| 7 (GH) | Emergency Collecting Conveyor | 3/4 Conveyor Cover |
| 31 (GH) | Emergency Collecting Conveyor onto Emergency Stock-out Conveyor | Full Enclosure |
| 31 (GH) | Emergency Stock-out Conveyor | 3/4 Conveyor Cover |

| Table 4: Fugitive Dust Control Measures Gypsum Pile Transfer | | |
|---|---|---|
| **Emission Point ID** | **Transfer Description** | **Control Method** |
| 34 (GH) | Gypsum Radial Stacker Conveyor onto Stockpile | none |
| 34 (GH) | Stockpile into Front-End loader | None |
| 34 (GH) | Front-End Loader onto Truck | None |
| 34 (GH) | Emergency Stock-out Conveyor onto Emergency Stock-out Pile | None |
| 34 (GH) | Stockpile into Front-End loader | None |
| 34 (GH) | Front-End Loader onto Truck<br>Water Cannon Dust Suppression System<br>Washing/flooding of Stack out Pad Area | Material Wetting |

**Wastewater Treatment Facility**

Sludge from the wastewater treatment facility is disposed in the existing landfill. Approximately, 40,000 tons per year is generated by the treatment facility. Sludge is loaded into trucks by wheel loaders for transport to the existing landfill.

| Table 5: Fugitive Dust Control Measures WWTP Sludge Transfer | | |
|---|---|---|
| **Emission Point ID** | **Transfer Description** | **Control Method** |
| 1 | Stockpile to Front-End Loaders | None |
| 2 | Load-In to Truck at Facility | None |

**Plant Roadways**

All plant roadways from the wastewater treatment plant sludge and gypsum loading areas to the point where trucks leave the main east-west haul road within the landfill are paved. The north-south temporary roadways from the main landfill haul road to the unloading area within the working portion of the landfill will be constructed of boiler slag.

**Fugitive Dust Control Measures for Paved Roadways**

Wet gypsum and wastewater treatment sludge is transported to the existing landfill via existing paved plant roadways in the vicinity of the FGD units and wastewater treatment plant. A paved roadway was constructed along the north edge of the landfill to allow trucking of materials from the active portion of the plant into the landfill. The road width is sufficient to allow two trucks to pass without leaving the roadway. Haul trucks are limited to 20 mph while traveling on the roadway.

A tire washing station was constructed to allow the washing of truck tires before entering the main paved haul road. All fly ash, gypsum and wastewater treatment sludge trucks will have tires washed at the station after loading.

Paved roads are watered once per hour during periods of hauling operations. Watering is conducted using “water wagon” type trucks. A flusher type truck is also available if visible deposits are observed on the roadway. Watering is conducted concurrent with hauling operations (expected to be from 7 a.m. to 7 p.m. only). Watering is not done when hauling activities are not taking place or during periods of precipitation that keep the roadways visually wet. Additionally, as a safety precaution, no use of the tire washing stations or watering of the roadways takes place when the ambient air temperature is low enough to cause icing.

**Unpaved Roadways**

Temporary unpaved haul roads will be constructed of boiler slag to allow trucks to travel from the new paved haul road on the north side of the landfill to the active working face of the landfill without traveling on the land-filled material. These north-south roads will be constructed as needed and abandoned when no longer needed.

**Fugitive Dust Control for Unpaved Roadways**

Wet gypsum and wastewater treatment sludge will be transported from the new paved landfill haul road to the working face of the landfill using temporary boiler slag roads as described above. Haul trucks are limited to 15 mph while traveling on the temporary boiler slag roads.

A tire washing station is installed at the landfill. All fly ash, gypsum, and wastewater treatment sludge trucks will have tires washed at the station before returning to the loading area on the main paved haul road.

The unpaved boiler slag roads will be watered once every three hours during periods of hauling operations. Watering will be conducted using “water wagon” type trucks. Watering will be conducted concurrent with hauling operations (expected to be during day turns only). Watering will not be done when hauling activities are not taking place or during periods of precipitation that keep the roadways visually wet. Additionally, as a safety precaution, no use of the tire washing stations or watering of the roadways will take place when the ambient air temperature is low enough to cause icing.

**Fugitive Dust Control for Material Movement in Working Landfill Face**

The working face of the landfill will be controlled by the use of water applied to the portion of the landfill being traveled by equipment (primarily bulldozers) spreading the materials to the final landfill grade and compacting the materials within the landfill. Watering will be conducted once every three hours using water monitors located on water trucks. Watering will take place only during periods when equipment is being used in the working face of the landfill. Additionally, watering will not take place during periods of precipitation and when the ambient air temperature is low enough to cause icing.

| **Table 6: Fugitive Dust Control Measures<br>Landfill Transfer to Working Face** | | |
|---|---|---|
| **Emission Point ID** | **Transfer Description** | **Control Method** |

| Table 6: Fugitive Dust Control Measures Landfill Transfer to Working Face | | |
|---|---|---|
| **Emission Point ID** | **Transfer Description** | **Control Method** |
| NA | Transfer to Working Face | None |

**Monitoring of Fugitive Dust Control Effectiveness**

The Plant's Part 70 air operating permit requires that daily visible emissions notations (VENs) of the plant roadways be performed once per day by a person familiar with normal conditions. The VENs specified in the permit will be the primary method of monitoring the effectiveness of the fugitive dust control measures. If an abnormal notation is observed, corrective action of temporarily increased watering frequency in the vicinity of the abnormal notation will be immediately implemented. In addition, water truck operators will be instructed to observe the roads during watering operations. If the water truck operators observe that areas of roadways visually appear to be completely dry prior to water application, water application frequency will be temporarily increased until residual dampness of the road surface is observed.

**Schedule of Compliance**

The above fugitive dust control measures will be implemented upon the commencement of operation of above listed facilities.

## Attachment B

## Part 70 Operating Permit No: 077-36338-00001



**Electronic Code of Federal Regulations**

**Title 40: Protection of Environment**

**PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES**

**Subpart OOO—Standards of Performance for Nonmetallic Mineral Processing Plants**

Source: 74 FR 19309, Apr. 28, 2009, unless otherwise noted.

### § 60.670 Applicability and designation of affected facility.

(a)(1) Except as provided in paragraphs (a)(2), (b), (c), and (d) of this section, the provisions of this subpart are applicable to the following affected facilities in fixed or portable nonmetallic mineral processing plants: each crusher, grinding mill, screening operation, bucket elevator, belt conveyor, bagging operation, storage bin, enclosed truck or railcar loading station. Also, crushers and grinding mills at hot mix asphalt facilities that reduce the size of nonmetallic minerals embedded in recycled asphalt pavement and subsequent affected facilities up to, but not including, the first storage silo or bin are subject to the provisions of this subpart.

(2) The provisions of this subpart do not apply to the following operations: All facilities located in underground mines; plants without crushers or grinding mills above ground; and wet material processing operations (as defined in § 60.671).

(b) An affected facility that is subject to the provisions of subparts F or I of this part or that follows in the plant process any facility subject to the provisions of subparts F or I of this part is not subject to the provisions of this subpart.

(c) Facilities at the following plants are not subject to the provisions of this subpart:

(1) Fixed sand and gravel plants and crushed stone plants with capacities, as defined in § 60.671, of 23 megagrams per hour (25 tons per hour) or less;

(2) Portable sand and gravel plants and crushed stone plants with capacities, as defined in § 60.671, of 136 megagrams per hour (150 tons per hour) or less; and

(3) Common clay plants and pumice plants with capacities, as defined in § 60.671, of 9 megagrams per hour (10 tons per hour) or less.

(d)(1) When an existing facility is replaced by a piece of equipment of equal or smaller size, as defined in § 60.671, having the same function as the existing facility, and there is no increase in the amount of emissions, the new facility is exempt from the provisions of §§ 60.672, 60.674, and 60.675 except as provided for in paragraph (d)(3) of this section.

(2) An owner or operator complying with paragraph (d)(1) of this section shall submit the information required in § 60.676(a).

(3) An owner or operator replacing all existing facilities in a production line with new facilities does not qualify for the exemption described in paragraph (d)(1) of this section and must comply with the provisions of §§ 60.672, 60.674 and 60.675.

(e) An affected facility under paragraph (a) of this section that commences construction, modification, or reconstruction after August 31, 1983, is subject to the requirements of this part.

(f) Table 1 of this subpart specifies the provisions of subpart A of this part 60 that do not apply to owners and operators of affected facilities subject to this subpart or that apply with certain exceptions.

**§ 60.671 Definitions.**

All terms used in this subpart, but not specifically defined in this section, shall have the meaning given them in the Act and in subpart A of this part.

*Bagging operation* means the mechanical process by which bags are filled with nonmetallic minerals.

*Belt conveyor* means a conveying device that transports material from one location to another by means of an endless belt that is carried on a series of idlers and routed around a pulley at each end.

*Bucket elevator* means a conveying device of nonmetallic minerals consisting of a head and foot assembly which supports and drives an endless single or double strand chain or belt to which buckets are attached.

*Building* means any frame structure with a roof.

*Capacity* means the cumulative rated capacity of all initial crushers that are part of the plant.

*Capture system* means the equipment (including enclosures, hoods, ducts, fans, dampers, etc.) used to capture and transport particulate matter generated by one or more affected facilities to a control device.

*Control device* means the air pollution control equipment used to reduce particulate matter emissions released to the atmosphere from one or more affected facilities at a nonmetallic mineral processing plant.

*Conveying system* means a device for transporting materials from one piece of equipment or location to another location within a plant. Conveying systems include but are not limited to the following: Feeders, belt conveyors, bucket elevators and pneumatic systems.

*Crush* or *Crushing* means to reduce the size of nonmetallic mineral material by means of physical impaction of the crusher or grinding mill upon the material.

*Crusher* means a machine used to crush any nonmetallic minerals, and includes, but is not limited to, the following types: Jaw, gyratory, cone, roll, rod mill, hammermill, and impactor.

*Enclosed truck or railcar loading station* means that portion of a nonmetallic mineral processing plant where nonmetallic minerals are loaded by an enclosed conveying system into enclosed trucks or railcars.

*Fixed plant* means any nonmetallic mineral processing plant at which the processing equipment specified in § 60.670(a) is attached by a cable, chain, turnbuckle, bolt or other means (except electrical connections) to any anchor, slab, or structure including bedrock.

*Fugitive emission* means particulate matter that is not collected by a capture system and is released to the atmosphere at the point of generation.

*Grinding mill* means a machine used for the wet or dry fine crushing of any nonmetallic mineral. Grinding mills include, but are not limited to, the following types: Hammer, roller, rod, pebble and ball, and fluid energy. The grinding mill includes the air conveying system, air separator, or air classifier, where such systems are used.

*Initial crusher* means any crusher into which nonmetallic minerals can be fed without prior crushing in the plant.

*Nonmetallic mineral* means any of the following minerals or any mixture of which the majority is any of the following minerals:

(1) Crushed and Broken Stone, including Limestone, Dolomite, Granite, Traprock, Sandstone, Quartz, Quartzite, Marl, Marble, Slate, Shale, Oil Shale, and Shell.

(2) Sand and Gravel.

(3) Clay including Kaolin, Fireclay, Bentonite, Fuller's Earth, Ball Clay, and Common Clay.

(4) Rock Salt.

(5) Gypsum (natural or synthetic).

(6) Sodium Compounds, including Sodium Carbonate, Sodium Chloride, and Sodium Sulfate.

(7) Pumice.

(8) Gilsonite.

(9) Talc and Pyrophyllite.

(10) Boron, including Borax, Kernite, and Colemanite.

(11) Barite.

(12) Fluorospar.

(13) Feldspar.

(14) Diatomite.

(15) Perlite.

(16) Vermiculite.

(17) Mica.

(18) Kyanite, including Andalusite, Sillimanite, Topaz, and Dumortierite.

*Nonmetallic mineral processing plant* means any combination of equipment that is used to crush or grind any nonmetallic mineral wherever located, including lime plants, power plants, steel mills, asphalt concrete plants, portland cement plants, or any other facility processing nonmetallic minerals except as provided in § 60.670 (b) and (c).

*Portable plant* means any nonmetallic mineral processing plant that is mounted on any chassis or skids and may be moved by the application of a lifting or pulling force. In addition, there shall be no cable, chain, turnbuckle, bolt or other means (except electrical connections) by which any piece of equipment is attached or clamped to any anchor, slab, or structure, including bedrock that must be removed prior to the application of a lifting or pulling force for the purpose of transporting the unit.

*Production line* means all affected facilities (crushers, grinding mills, screening operations, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck and railcar loading stations) which are directly connected or are connected together by a conveying system.

*Saturated material* means, for purposes of this subpart, mineral material with sufficient surface moisture such that particulate matter emissions are not generated from processing of the material through screening operations, bucket elevators and belt conveyors. Material that is wetted solely by wet suppression systems is not considered to be “saturated” for purposes of this definition.

*Screening operation* means a device for separating material according to size by passing undersize material through one or more mesh surfaces (screens) in series, and retaining oversize material on the mesh surfaces (screens). Grizzly feeders associated with truck dumping and static (non-moving) grizzlies used anywhere in the nonmetallic mineral processing plant are not considered to be screening operations.

*Seasonal shut down* means shut down of an affected facility for a period of at least 45 consecutive days due to weather or seasonal market conditions.

*Size* means the rated capacity in tons per hour of a crusher, grinding mill, bucket elevator, bagging operation, or enclosed truck or railcar loading station; the total surface area of the top screen of a screening operation; the width of a conveyor belt; and the rated capacity in tons of a storage bin.

*Stack emission* means the particulate matter that is released to the atmosphere from a capture system.

*Storage bin* means a facility for storage (including surge bins) of nonmetallic minerals prior to further processing or loading.

*Transfer point* means a point in a conveying operation where the nonmetallic mineral is transferred to or from a belt conveyor except where the nonmetallic mineral is being transferred to a stockpile.

*Truck dumping* means the unloading of nonmetallic minerals from movable vehicles designed to transport nonmetallic minerals from one location to another. Movable vehicles include but are not limited to: Trucks, front end loaders, skip hoists, and railcars.

*Vent* means an opening through which there is mechanically induced air flow for the purpose of exhausting from a building air carrying particulate matter emissions from one or more affected facilities.

*Wet material processing operation(s)* means any of the following:

(1) Wet screening operations (as defined in this section) and subsequent screening operations, bucket elevators and belt conveyors in the production line that process saturated materials (as defined in this section) up to the first crusher, grinding mill or storage bin in the production line; or

(2) Screening operations, bucket elevators and belt conveyors in the production line downstream of wet mining operations (as defined in this section) that process saturated materials (as defined in this section) up to the first crusher, grinding mill or storage bin in the production line.

*Wet mining operation* means a mining or dredging operation designed and operated to extract any nonmetallic mineral regulated under this subpart from deposits existing at or below the water table, where the nonmetallic mineral is saturated with water.

*Wet screening operation* means a screening operation at a nonmetallic mineral processing plant which removes unwanted material or which separates marketable fines from the product by a washing process which is designed and operated at all times such that the product is saturated with water.

**§ 60.672 Standard for particulate matter (PM).**

(a) Affected facilities must meet the stack emission limits and compliance requirements in Table 2 of this subpart within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup as required under § 60.8. The requirements in Table 2 of this subpart apply for affected facilities with capture systems used to capture and transport particulate matter to a control device.

(b) Affected facilities must meet the fugitive emission limits and compliance requirements in Table 3 of this subpart within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup as required under § 60.11. The requirements in Table 3 of this subpart apply for fugitive emissions from affected facilities without capture systems and for fugitive emissions escaping capture systems.

(c) [Reserved]

(d) Truck dumping of nonmetallic minerals into any screening operation, feed hopper, or crusher is exempt from the requirements of this section.

(e) If any transfer point on a conveyor belt or any other affected facility is enclosed in a building, then each enclosed affected facility must comply with the emission limits in paragraphs (a) and (b) of this section, or the building enclosing the affected facility or facilities must comply with the following emission limits:

(1) Fugitive emissions from the building openings (except for vents as defined in § 60.671) must not exceed 7 percent opacity; and

(2) Vents (as defined in § 60.671) in the building must meet the applicable stack emission limits and compliance requirements in Table 2 of this subpart.

(f) Any baghouse that controls emissions from only an individual, enclosed storage bin is exempt from the applicable stack PM concentration limit (and associated performance testing) in Table 2 of this subpart but must meet the applicable stack opacity limit and compliance requirements in Table 2 of this subpart. This exemption from the stack PM concentration limit does not apply for multiple storage bins with combined stack emissions.

**§ 60.673 Reconstruction.**

(a) The cost of replacement of ore-contact surfaces on processing equipment shall not be considered in calculating either the “fixed capital cost of the new components” or the “fixed capital cost that would be required to construct a comparable new facility” under § 60.15. Ore-contact surfaces are crushing surfaces; screen meshes, bars, and plates; conveyor belts; and elevator buckets.

(b) Under § 60.15, the “fixed capital cost of the new components” includes the fixed capital cost of all depreciable components (except components specified in paragraph (a) of this section) which are or will be replaced pursuant to all continuous programs of component replacement commenced within any 2-year period following August 31, 1983.

**§ 60.674 Monitoring of operations.**

(a) The owner or operator of any affected facility subject to the provisions of this subpart which uses a wet scrubber to control emissions shall install, calibrate, maintain and operate the following monitoring devices:

(1) A device for the continuous measurement of the pressure loss of the gas stream through the scrubber. The monitoring device must be certified by the manufacturer to be accurate within ±250 pascals ±1 inch water gauge pressure and must be calibrated on an annual basis in accordance with manufacturer's instructions.

(2) A device for the continuous measurement of the scrubbing liquid flow rate to the wet scrubber. The monitoring device must be certified by the manufacturer to be accurate within ±5 percent of design scrubbing liquid flow rate and must be calibrated on an annual basis in accordance with manufacturer's instructions.

(b) The owner or operator of any affected facility for which construction, modification, or reconstruction commenced on or after April 22, 2008, that uses wet suppression to control emissions from the affected facility must perform monthly periodic inspections to check that water is flowing to discharge spray nozzles in the wet suppression system. The owner or operator must initiate corrective action within 24 hours and complete corrective action as expediently as practical if the owner or operator finds that water is not flowing properly during an inspection of the water spray nozzles. The owner or operator must record each inspection of the water spray nozzles, including the date of each inspection and any corrective actions taken, in the logbook required under § 60.676(b).

(1) If an affected facility relies on water carryover from upstream water sprays to control fugitive emissions, then that affected facility is exempt from the 5-year repeat testing requirement specified in Table 3 of this subpart provided that the affected facility meets the criteria in paragraphs (b)(1)(i) and (ii) of this section:

(i) The owner or operator of the affected facility conducts periodic inspections of the upstream water spray(s) that are responsible for controlling fugitive emissions from the affected facility. These inspections are conducted according to paragraph (b) of this section and § 60.676(b), and

(ii) The owner or operator of the affected facility designates which upstream water spray(s) will be periodically inspected at the time of the initial performance test required under § 60.11 of this part and § 60.675 of this subpart.

(2) If an affected facility that routinely uses wet suppression water sprays ceases operation of the water sprays or is using a control mechanism to reduce fugitive emissions other than water sprays during the monthly inspection (for example, water from recent rainfall), the logbook entry required under § 60.676(b) must specify the control mechanism being used instead of the water sprays.

(c) Except as specified in paragraph (d) or (e) of this section, the owner or operator of any affected facility for which construction, modification, or reconstruction commenced on or after April 22, 2008, that uses a baghouse to control emissions must conduct quarterly 30-minute visible emissions inspections using EPA Method 22 (40 CFR part 60, Appendix A-7). The Method 22 (40 CFR part 60, Appendix A-7) test shall be conducted while the baghouse is operating. The test is successful if no visible emissions are observed. If any visible emissions are observed, the owner or operator of the affected facility must initiate corrective action within 24 hours to return the baghouse to normal operation. The owner or operator must record each Method 22 (40 CFR part 60, Appendix A-7) test, including the date and any corrective actions taken, in the logbook required under § 60.676(b). The owner or operator of the affected facility may establish a different baghouse-specific success level for the visible emissions test (other than no visible emissions) by conducting a PM performance test according to § 60.675(b) simultaneously with a Method 22 (40 CFR part 60, Appendix A-7) to determine what constitutes normal visible emissions from that affected facility's baghouse when it is in compliance with the applicable PM concentration limit in Table 2 of this subpart. The revised visible emissions success level must be incorporated into the permit for the affected facility.

(d) As an alternative to the periodic Method 22 (40 CFR part 60, Appendix A-7) visible emissions inspections specified in paragraph (c) of this section, the owner or operator of any affected facility for which construction, modification, or reconstruction commenced on or after April 22, 2008, that uses a baghouse to control emissions may use a bag leak detection system. The owner or operator must install, operate, and maintain the bag leak detection system according to paragraphs (d)(1) through (3) of this section.

(1) Each bag leak detection system must meet the specifications and requirements in paragraphs (d)(1)(i) through (viii) of this section.

(i) The bag leak detection system must be certified by the manufacturer to be capable of detecting PM emissions at concentrations of 1 milligram per dry standard cubic meter (0.00044 grains per actual cubic foot) or less.

(ii) The bag leak detection system sensor must provide output of relative PM loadings. The owner or operator shall continuously record the output from the bag leak detection system using electronic or other means ( *e.g.* , using a strip chart recorder or a data logger).

(iii) The bag leak detection system must be equipped with an alarm system that will sound when the system detects an increase in relative particulate loading over the alarm set point established according to paragraph (d)(1)(iv) of this section, and the alarm must be located such that it can be heard by the appropriate plant personnel.

(iv) In the initial adjustment of the bag leak detection system, the owner or operator must establish, at a minimum, the baseline output by adjusting the sensitivity (range) and the averaging period of the device, the alarm set points, and the alarm delay time.

(v) Following initial adjustment, the owner or operator shall not adjust the averaging period, alarm set point, or alarm delay time without approval from the Administrator or delegated authority except as provided in paragraph (d)(1)(vi) of this section.

(vi) Once per quarter, the owner or operator may adjust the sensitivity of the bag leak detection system to account for seasonal effects, including temperature and humidity, according to the procedures identified in the site-specific monitoring plan required by paragraph (d)(2) of this section.

(vii) The owner or operator must install the bag leak detection sensor downstream of the fabric filter.

(viii) Where multiple detectors are required, the system's instrumentation and alarm may be shared among detectors.

(2) The owner or operator of the affected facility must develop and submit to the Administrator or delegated authority for approval of a site-specific monitoring plan for each bag leak detection system. The owner or operator must operate and maintain the bag leak detection system according to the site-specific monitoring plan at all times. Each monitoring plan must describe the items in paragraphs (d)(2)(i) through (vi) of this section.

(i) Installation of the bag leak detection system;

(ii) Initial and periodic adjustment of the bag leak detection system, including how the alarm set-point will be established;

(iii) Operation of the bag leak detection system, including quality assurance procedures;

(iv) How the bag leak detection system will be maintained, including a routine maintenance schedule and spare parts inventory list;

(v) How the bag leak detection system output will be recorded and stored; and

(vi) Corrective action procedures as specified in paragraph (d)(3) of this section. In approving the site-specific monitoring plan, the Administrator or delegated authority may allow owners and operators more than 3 hours to alleviate a specific condition that causes an alarm if the owner or operator identifies in the monitoring plan this specific condition as one that could lead to an alarm, adequately explains why it is not feasible to alleviate this condition within 3 hours of the time the alarm occurs, and demonstrates that the requested time will ensure alleviation of this condition as expeditiously as practicable.

(3) For each bag leak detection system, the owner or operator must initiate procedures to determine the cause of every alarm within 1 hour of the alarm. Except as provided in paragraph (d)(2)(vi) of this section, the owner or operator must alleviate the cause of the alarm within 3 hours of the alarm by taking whatever corrective action(s) are necessary. Corrective actions may include, but are not limited to the following:

(i) Inspecting the fabric filter for air leaks, torn or broken bags or filter media, or any other condition that may cause an increase in PM emissions;

(ii) Sealing off defective bags or filter media;

(iii) Replacing defective bags or filter media or otherwise repairing the control device;

(iv) Sealing off a defective fabric filter compartment;

(v) Cleaning the bag leak detection system probe or otherwise repairing the bag leak detection system; or

(vi) Shutting down the process producing the PM emissions.

(e) As an alternative to the periodic Method 22 (40 CFR part 60, Appendix A-7) visible emissions inspections specified in paragraph (c) of this section, the owner or operator of any affected facility that is subject to the requirements for processed stone handling operations in the Lime Manufacturing NESHAP (40 CFR part 63, subpart AAAAA) may follow the continuous compliance requirements in row 1 items (i) through (iii) of Table 6 to Subpart AAAAA of 40 CFR part 63.

**§ 60.675 Test methods and procedures.**

(a) In conducting the performance tests required in § 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendices A-1 through A-7 of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b). Acceptable alternative methods and procedures are given in paragraph (e) of this section.

(b) The owner or operator shall determine compliance with the PM standards in § 60.672(a) as follows:

(1) Except as specified in paragraphs (e)(3) and (4) of this section, Method 5 of Appendix A-3 of this part or Method 17 of Appendix A-6 of this part shall be used to determine the particulate matter concentration. The sample volume shall be at least 1.70 dscm (60 dscf). For Method 5 (40 CFR part 60, Appendix A-3), if the gas stream being sampled is at ambient temperature, the sampling probe and filter may be operated without heaters. If the gas stream is above ambient temperature, the sampling probe and filter may be operated at a temperature high enough, but no higher than 121 °C (250 °F), to prevent water condensation on the filter.

(2) Method 9 of Appendix A-4 of this part and the procedures in § 60.11 shall be used to determine opacity.

(c)(1) In determining compliance with the particulate matter standards in § 60.672(b) or § 60.672(e)(1), the owner or operator shall use Method 9 of Appendix A-4 of this part and the procedures in § 60.11, with the following additions:

(i) The minimum distance between the observer and the emission source shall be 4.57 meters (15 feet).

(ii) The observer shall, when possible, select a position that minimizes interference from other fugitive emission sources ( *e.g.,* road dust). The required observer position relative to the sun (Method 9 of Appendix A-4 of this part, Section 2.1) must be followed.

(iii) For affected facilities using wet dust suppression for particulate matter control, a visible mist is sometimes generated by the spray. The water mist must not be confused with particulate matter emissions and is not to be considered a visible emission. When a water mist of this nature is present, the observation of emissions is to be made at a point in the plume where the mist is no longer visible.

(2)(i) In determining compliance with the opacity of stack emissions from any baghouse that controls emissions only from an individual enclosed storage bin under § 60.672(f) of this subpart, using Method 9 (40 CFR part 60, Appendix A-4), the duration of the Method 9 (40 CFR part 60, Appendix A-4) observations shall be 1 hour (ten 6-minute averages).

(ii) The duration of the Method 9 (40 CFR part 60, Appendix A-4) observations may be reduced to the duration the affected facility operates (but not less than 30 minutes) for baghouses that control storage bins or enclosed truck or railcar loading stations that operate for less than 1 hour at a time.

(3) When determining compliance with the fugitive emissions standard for any affected facility described under § 60.672(b) or § 60.672(e)(1) of this subpart, the duration of the Method 9 (40 CFR part 60, Appendix A-4) observations must be 30 minutes (five 6-minute averages). Compliance with the applicable fugitive emission limits in Table 3 of this subpart must be based on the average of the five 6-minute averages.

(d) To demonstrate compliance with the fugitive emission limits for buildings specified in § 60.672(e)(1), the owner or operator must complete the testing specified in paragraph (d)(1) and (2) of this section. Performance tests must be conducted while all affected facilities inside the building are operating.

(1) If the building encloses any affected facility that commences construction, modification, or reconstruction on or after April 22, 2008, the owner or operator of the affected facility must conduct an initial Method 9 (40 CFR part 60, Appendix A-4) performance test according to this section and § 60.11.

(2) If the building encloses only affected facilities that commenced construction, modification, or reconstruction before April 22, 2008, and the owner or operator has previously conducted an initial Method 22 (40 CFR part 60, Appendix A-7) performance test showing zero visible emissions, then the owner or operator has demonstrated compliance with

the opacity limit in § 60.672(e)(1). If the owner or operator has not conducted an initial performance test for the building before April 22, 2008, then the owner or operator must conduct an initial Method 9 (40 CFR part 60, Appendix A-4) performance test according to this section and § 60.11 to show compliance with the opacity limit in § 60.672(e)(1).

(e) The owner or operator may use the following as alternatives to the reference methods and procedures specified in this section:

(1) For the method and procedure of paragraph (c) of this section, if emissions from two or more facilities continuously interfere so that the opacity of fugitive emissions from an individual affected facility cannot be read, either of the following procedures may be used:

(i) Use for the combined emission stream the highest fugitive opacity standard applicable to any of the individual affected facilities contributing to the emissions stream.

(ii) Separate the emissions so that the opacity of emissions from each affected facility can be read.

(2) A single visible emission observer may conduct visible emission observations for up to three fugitive, stack, or vent emission points within a 15-second interval if the following conditions are met:

(i) No more than three emission points may be read concurrently.

(ii) All three emission points must be within a 70 degree viewing sector or angle in front of the observer such that the proper sun position can be maintained for all three points.

(iii) If an opacity reading for any one of the three emission points equals or exceeds the applicable standard, then the observer must stop taking readings for the other two points and continue reading just that single point.

(3) Method 5I of Appendix A-3 of this part may be used to determine the PM concentration as an alternative to the methods specified in paragraph (b)(1) of this section. Method 5I (40 CFR part 60, Appendix A-3) may be useful for affected facilities that operate for less than 1 hour at a time such as (but not limited to) storage bins or enclosed truck or railcar loading stations.

(4) In some cases, velocities of exhaust gases from building vents may be too low to measure accurately with the type S pitot tube specified in EPA Method 2 of Appendix A-1 of this part [ *i.e.,* velocity head <1.3 mm $H_2O$ (0.05 in. $H_2O$)] and referred to in EPA Method 5 of Appendix A-3 of this part. For these conditions, the owner or operator may determine the average gas flow rate produced by the power fans ( *e.g.,* from vendor-supplied fan curves) to the building vent. The owner or operator may calculate the average gas velocity at the building vent measurement site using Equation 1 of this section and use this average velocity in determining and maintaining isokinetic sampling rates.

$$v_e = \frac{Q_f}{A_e} \qquad \text{(Eq. 1)}$$

Where:

$V_e$ = average building vent velocity (feet per minute);

$Q_f$ = average fan flow rate (cubic feet per minute); and

$A_e$ = area of building vent and measurement location (square feet).

(f) To comply with § 60.676(d), the owner or operator shall record the measurements as required in § 60.676(c) using the monitoring devices in § 60.674 (a)(1) and (2) during each particulate matter run and shall determine the averages.

(g) For performance tests involving only Method 9 (40 CFR part 60 Appendix A-4) testing, the owner or operator may reduce the 30-day advance notification of performance test in § 60.7(a)(6) and 60.8(d) to a 7-day advance notification.

(h) [Reserved]

(i) If the initial performance test date for an affected facility falls during a seasonal shut down (as defined in § 60.671 of this subpart) of the affected facility, then with approval from the permitting authority, the owner or operator may postpone the initial performance test until no later than 60 calendar days after resuming operation of the affected facility.

**§ 60.676 Reporting and recordkeeping.**

(a) Each owner or operator seeking to comply with § 60.670(d) shall submit to the Administrator the following information about the existing facility being replaced and the replacement piece of equipment.

(1) For a crusher, grinding mill, bucket elevator, bagging operation, or enclosed truck or railcar loading station:

(i) The rated capacity in megagrams or tons per hour of the existing facility being replaced and

(ii) The rated capacity in tons per hour of the replacement equipment.

(2) For a screening operation:

(i) The total surface area of the top screen of the existing screening operation being replaced and

(ii) The total surface area of the top screen of the replacement screening operation.

(3) For a conveyor belt:

(i) The width of the existing belt being replaced and

(ii) The width of the replacement conveyor belt.

(4) For a storage bin:

(i) The rated capacity in megagrams or tons of the existing storage bin being replaced and

(ii) The rated capacity in megagrams or tons of replacement storage bins.

(b)(1) Owners or operators of affected facilities (as defined in §§ 60.670 and 60.671) for which construction, modification, or reconstruction commenced on or after April 22, 2008, must record each periodic inspection required under § 60.674(b) or (c), including dates and any corrective actions taken, in a logbook (in written or electronic format). The owner or operator must keep the logbook onsite and make hard or electronic copies (whichever is requested) of the logbook available to the Administrator upon request.

(2) For each bag leak detection system installed and operated according to § 60.674(d), the owner or operator must keep the records specified in paragraphs (b)(2)(i) through (iii) of this section.

(i) Records of the bag leak detection system output;

(ii) Records of bag leak detection system adjustments, including the date and time of the adjustment, the initial bag leak detection system settings, and the final bag leak detection system settings; and

(iii) The date and time of all bag leak detection system alarms, the time that procedures to determine the cause of the alarm were initiated, the cause of the alarm, an explanation of the actions taken, the date and time the cause of the alarm was alleviated, and whether the cause of the alarm was alleviated within 3 hours of the alarm.

(3) The owner or operator of each affected facility demonstrating compliance according to § 60.674(e) by following the requirements for processed stone handling operations in the Lime Manufacturing NESHAP (40 CFR part 63, subpart AAAAA) must maintain records of visible emissions observations required by § 63.7132(a)(3) and (b) of 40 CFR part 63, subpart AAAAA.

(c) During the initial performance test of a wet scrubber, and daily thereafter, the owner or operator shall record the measurements of both the change in pressure of the gas stream across the scrubber and the scrubbing liquid flow rate.

(d) After the initial performance test of a wet scrubber, the owner or operator shall submit semiannual reports to the Administrator of occurrences when the measurements of the scrubber pressure loss and liquid flow rate decrease by more than 30 percent from the average determined during the most recent performance test.

(e) The reports required under paragraph (d) of this section shall be postmarked within 30 days following end of the second and fourth calendar quarters.

(f) The owner or operator of any affected facility shall submit written reports of the results of all performance tests conducted to demonstrate compliance with the standards set forth in § 60.672 of this subpart, including reports of opacity observations made using Method 9 (40 CFR part 60, Appendix A-4) to demonstrate compliance with § 60.672(b), (e) and (f).

(g) The owner or operator of any wet material processing operation that processes saturated and subsequently processes unsaturated materials, shall submit a report of this change within 30 days following such change. At the time of such change, this screening operation, bucket elevator, or belt conveyor becomes subject to the applicable opacity limit in § 60.672(b) and the emission test requirements of § 60.11.

(h) The subpart A requirement under § 60.7(a)(1) for notification of the date construction or reconstruction commenced is waived for affected facilities under this subpart.

(i) A notification of the actual date of initial startup of each affected facility shall be submitted to the Administrator.

(1) For a combination of affected facilities in a production line that begin actual initial startup on the same day, a single notification of startup may be submitted by the owner or operator to the Administrator. The notification shall be postmarked within 15 days after such date and shall include a description of each affected facility, equipment manufacturer, and serial number of the equipment, if available.

(2) For portable aggregate processing plants, the notification of the actual date of initial startup shall include both the home office and the current address or location of the portable plant.

(j) The requirements of this section remain in force until and unless the Agency, in delegating enforcement authority to a State under section 111(c) of the Act, approves reporting requirements or an alternative means of compliance surveillance adopted by such States. In that event, affected facilities within the State will be relieved of the obligation to comply with the reporting requirements of this section, provided that they comply with requirements established by the State.

(k) Notifications and reports required under this subpart and under subpart A of this part to demonstrate compliance with this subpart need only to be sent to the EPA Region or the State which has been delegated authority according to § 60.4(b).

**Table 1 to Subpart OOO of Part 60—Exceptions to Applicability of Subpart A to Subpart OOO**

| Subpart A reference | Applies to subpart OOO | Explanation |
|---|---|---|
| 60.4, Address | Yes | Except in § 60.4(a) and (b) submittals need not be submitted to both the EPA Region and delegated State authority (§ 60.676(k)). |
| 60.7, Notification and recordkeeping | Yes | Except in (a)(1) notification of the date construction or reconstruction commenced (§ 60.676(h)). |
| | | Also, except in (a)(6) performance tests involving only Method 9 (40 CFR part 60, Appendix A-4) require a 7-day advance notification instead of 30 days (§ 60.675(g)). |
| 60.8, Performance tests | Yes | Except in (d) performance tests involving only Method 9 (40 CFR part 60, Appendix A-4) require a 7-day advance notification instead of 30 days (§ 60.675(g)). |
| 60.11, Compliance with standards and maintenance requirements | Yes | Except in (b) under certain conditions (§§ 60.675(c)), Method 9 (40 CFR part 60, Appendix A-4) observation is reduced from 3 hours to 30 minutes for fugitive emissions. |
| 60.18, General control device | No | Flares will not be used to comply with the emission limits. |

**Table 2 to Subpart OOO of Part 60—Stack Emission Limits for Affected Facilities With Capture Systems**

| For * * * | The owner or operator must meet a PM limit of * * * | And the owner or operator must meet an opacity limit of * * * | The owner or operator must demonstrate compliance with these limits by conducting * * * |
|---|---|---|---|
| Affected facilities (as defined in §§ 60.670 and 60.671) that commenced construction, modification, or reconstruction after August 31, 1983 but before April 22, 2008 | 0.05 g/dscm (0.022 gr/dscf) [a] | 7 percent for dry control devices [b] | An initial performance test according to § 60.8 of this part and § 60.675 of this subpart; and<br>Monitoring of wet scrubber parameters according to § 60.674(a) and § 60.676(c), (d), and (e). |
| Affected facilities (as defined in §§ 60.670 and 60.671) that commence construction, modification, or reconstruction on or after April 22, 2008 | 0.032 g/dscm (0.014 gr/dscf) [a] | Not applicable (except for individual enclosed storage bins)<br>7 percent for dry control devices on individual enclosed storage bins | An initial performance test according to § 60.8 of this part and § 60.675 of this subpart; and<br>Monitoring of wet scrubber parameters according to § 60.674(a) and § 60.676(c), (d), and (e); and |
| | | | Monitoring of baghouses according to § 60.674(c), (d), or (e) and § 60.676(b). |

[a] Exceptions to the PM limit apply for individual enclosed storage bins and other equipment. See § 60.672(d) through (f).

[b] The stack opacity limit and associated opacity testing requirements do not apply for affected facilities using wet scrubbers.

**Table 3 to Subpart OOO of Part 60—Fugitive Emission Limits**

| For * * * | The owner or operator must meet the following fugitive emissions limit for grinding mills, screening operations, bucket elevators, transfer points on belt conveyors, bagging operations, storage bins, enclosed truck or railcar loading stations or from any other affected facility (as defined in §§ 60.670 and 60.671) * * * | The owner or operator must meet the following fugitive emissions limit for crushers at which a capture system is not used * * * | The owner or operator must demonstrate compliance with these limits by conducting * * * |
|---|---|---|---|
| Affected facilities (as defined in §§ 60.670 and 60.671) that commenced construction, modification, or reconstruction after August 31, 1983 but before April 22, 2008 | 10 percent opacity | 15 percent opacity | An initial performance test according to § 60.11 of this part and § 60.675 of this subpart. |
| Affected facilities (as defined in §§ 60.670 and 60.671) that commence construction, modification, or reconstruction on or after April 22, 2008 | 7 percent opacity | 12 percent opacity | An initial performance test according to § 60.11 of this part and § 60.675 of this subpart; and<br>Periodic inspections of water sprays according to § 60.674(b) and § 60.676(b); and |
| | | | A repeat performance test according to § 60.11 of this part and § 60.675 of this subpart within 5 years from the previous performance test for fugitive emissions from affected facilities without water sprays. Affected facilities controlled by water carryover from upstream water sprays that are inspected according to the requirements in § 60.674(b) and § 60.676(b) are exempt from this 5-year repeat testing requirement. |

## Attachment C

## Part 70 Operating Permit No: 077-36338-00001



**Electronic Code of Federal Regulations**

**Title 40: Protection of Environment +**

**PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES**

**Subpart UUUUU—National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units**

SOURCE: 77 FR 9464, Feb. 16, 2012, unless otherwise noted.

**What This Subpart Covers**

**§63.9980 What is the purpose of this subpart?**

This subpart establishes national emission limitations and work practice standards for hazardous air pollutants (HAP) emitted from coal- and oil-fired electric utility steam generating units (EGUs) as defined in §63.10042 of this subpart. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations.

**§63.9981 Am I subject to this subpart?**

You are subject to this subpart if you own or operate a coal-fired EGU or an oil-fired EGU as defined in §63.10042 of this subpart.

**§63.9982 What is the affected source of this subpart?**

(a) This subpart applies to each individual or group of two or more new, reconstructed, or existing affected source(s) as described in paragraphs (a)(1) and (2) of this section within a contiguous area and under common control.

(1) The affected source of this subpart is the collection of all existing coal- or oil-fired EGUs, as defined in §63.10042, within a subcategory.

(2) The affected source of this subpart is each new or reconstructed coal- or oil-fired EGU as defined in §63.10042.

(b) An EGU is new if you commence construction of the coal- or oil-fired EGU after May 3, 2011.

(c) An EGU is reconstructed if you meet the reconstruction criteria as defined in §63.2, and if you commence reconstruction after May 3, 2011.

(d) An EGU is existing if it is not new or reconstructed. An existing electric steam generating unit that meets the applicability requirements after the effective date of this final rule due to a change in process (e.g., fuel or utilization) is considered to be an existing source under this subpart.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23402, Apr. 19, 2012; 78 FR 24084, Apr. 24, 2013]

§63.9983 Are any EGUs not subject to this subpart?

The types of electric steam generating units listed in paragraphs (a) through (d) of this section are not subject to this subpart.

(a) Any unit designated as a stationary combustion turbine, other than an integrated gasification combined cycle (IGCC) unit, covered by 40 CFR part 63, subpart YYYY.

(b) Any electric utility steam generating unit that is not a coal- or oil-fired EGU and combusts natural gas for more than 10.0 percent of the average annual heat input during any 3 calendar years or for more than 15.0 percent of the annual heat input during any calendar year.

(c) Any electric utility steam generating unit that has the capability of combusting more than 25 MW of coal or oil but did not fire coal or oil for more than 10.0 percent of the average annual heat input during any 3 calendar years or for more than 15.0 percent of the annual heat input during any calendar year. Heat input means heat derived from combustion of fuel in an EGU and does not include the heat derived from preheated combustion air, recirculated flue gases or exhaust gases from other sources (such as stationary gas turbines, internal combustion engines, and industrial boilers).

(d) Any electric steam generating unit combusting solid waste is a solid waste incineration unit subject to standards established under sections 129 and 111 of the Clean Air Act.

**§63.9984 When do I have to comply with this subpart?**

(a) If you have a new or reconstructed EGU, you must comply with this subpart by April 16, 2012 or upon startup of your EGU, whichever is later, and as further provided for in §63.10005(g).

(b) If you have an existing EGU, you must comply with this subpart no later than April 16, 2015.

(c) You must meet the notification requirements in §63.10030 according to the schedule in §63.10030 and in subpart A of this part. Some of the notifications must be submitted before you are required to comply with the emission limits and work practice standards in this subpart.

(d) An electric steam generating unit that does not meet the definition of an EGU subject to this subpart on April 16, 2012 for new sources or April 16, 2015 for existing sources must comply with the applicable existing source provisions of this subpart on the date such unit meets the definition of an EGU subject to this subpart.

(e) If you own or operate an electric steam generating unit that is exempted from this subpart under §63.9983(d), if the manner of operating the unit changes such that the combustion of waste is discontinued and the unit becomes a coal-fired or oil-fired EGU (as defined in §63.10042), you must be in compliance with this subpart on April 16, 2015 or on the effective date of the switch from waste combustion to coal or oil combustion, whichever is later.

(f) You must demonstrate that compliance has been achieved, by conducting the required performance tests and other activities, no later than 180 days after the applicable date in paragraph (a), (b), (c), (d), or (e) of this section.

**§63.9985 What is a new EGU?**

(a) A new EGU is an EGU that meets any of the criteria specified in paragraph (a)(1) through (a)(2) of this section.

(1) An EGU that commenced construction after May 3, 2011.

(2) An EGU that commenced reconstruction after May 3, 2011.

(b) [Reserved]

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23402, Apr. 19, 2012]

**Emission Limitations and Work Practice Standards**

**§63.9990 What are the subcategories of EGUs?**

(a) Coal-fired EGUs are subcategorized as defined in paragraphs (a)(1) through (a)(2) of this section and as defined in §63.10042.

(1) EGUs designed for coal with a heating value greater than or equal to 8,300 Btu/lb, and

(2) EGUs designed for low rank virgin coal.

(b) Oil-fired EGUs are subcategorized as noted in paragraphs (b)(1) through (b)(4) of this section and as defined in §63.10042.

(1) Continental liquid oil-fired EGUs

(2) Non-continental liquid oil-fired EGUs,

(3) Limited-use liquid oil-fired EGUs, and

(4) EGUs designed to burn solid oil-derived fuel.

(c) IGCC units combusting either gasified coal or gasified solid oil-derived fuel. For purposes of compliance, monitoring, recordkeeping, and reporting requirements in this subpart, IGCC units are subject in the same manner as coal-fired units and solid oil-derived fuel-fired units, unless otherwise indicated.

**§63.9991 What emission limitations, work practice standards, and operating limits must I meet?**

(a) You must meet the requirements in paragraphs (a)(1) and (2) of this section. You must meet these requirements at all times.

(1) You must meet each emission limit and work practice standard in Table 1 through 3 to this subpart that applies to your EGU, for each EGU at your source, except as provided under §63.10009.

(2) You must meet each operating limit in Table 4 to this subpart that applies to your EGU.

(b) As provided in §63.6(g), the Administrator may approve use of an alternative to the work practice standards in this section.

(c) You may use the alternate $SO_2$ limit in Tables 1 and 2 to this subpart only if your EGU:

(1) Has a system using wet or dry flue gas desulfurization technology and $SO_2$ continuous emissions monitoring system (CEMS) installed on the unit; and

(2) At all times, you operate the wet or dry flue gas desulfurization technology installed on the unit consistent with §63.10000(b).

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23402, Apr. 19, 2012]

**General Compliance Requirements**

**§63.10000 What are my general requirements for complying with this subpart?**

(a) You must be in compliance with the emission limits and operating limits in this subpart. These limits apply to you at all times except during periods of startup and shutdown; however, for coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGUs, you are required to meet the work practice requirements in Table 3 to this subpart during periods of startup or shutdown.

(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the EPA Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

(c)(1) For coal-fired units, IGCC units, and solid oil-derived fuel-fired units, initial performance testing is required for all pollutants, to demonstrate compliance with the applicable emission limits.

(i) For a coal-fired or solid oil-derived fuel-fired EGU or IGCC EGU, you may conduct the initial performance testing in accordance with §63.10005(h), to determine whether the unit qualifies as a low emitting EGU (LEE) for one or more applicable emissions limits, with two exceptions:

(A) You may not pursue the LEE option if your coal-fired, IGCC, or solid oil-derived fuel-fired EGU is equipped with an acid gas scrubber and has a main stack and bypass stack exhaust configuration, and

(B) You may not pursue the LEE option for Hg if your coal-fired, solid oil-derived fuel-fired EGU or IGCC EGU is new.

(ii) For a qualifying LEE for Hg emissions limits, you must conduct a 30-day performance test using Method 30B at least once every 12 calendar months to demonstrate continued LEE status.

(iii) For a qualifying LEE of any other applicable emissions limits, you must conduct a performance test at least once every 36 calendar months to demonstrate continued LEE status.

(iv) If your coal-fired or solid oil derived fuel-fired EGU or IGCC EGU does not qualify as a LEE for total non-mercury HAP metals, individual non-mercury HAP metals, or filterable particulate matter (PM), you must demonstrate compliance through an initial performance test and you must monitor continuous performance through either use of a particulate matter continuous parametric monitoring system (PM CPMS), a PM CEMS, or, for an existing EGU, compliance performance testing repeated quarterly.

(v) If your coal-fired or solid oil-derived fuel-fired EGU does not qualify as a LEE for hydrogen chloride (HCl), you may demonstrate initial and continuous compliance through use of an HCl CEMS, installed and operated in accordance with Appendix B to this subpart. As an alternative to HCl CEMS, you may demonstrate initial and continuous compliance by conducting an initial and periodic quarterly performance stack test for HCl. If your EGU uses wet or dry flue gas desulfurization technology (this includes limestone injection into a fluidized bed combustion unit), you may apply a second alternative to HCl CEMS by installing and operating a sulfur dioxide ($SO_2$) CEMS installed and operated in accordance with part 75 of this chapter to demonstrate compliance with the applicable $SO_2$ emissions limit.

(vi) If your coal-fired or solid oil-derived fuel-fired EGU does not qualify as a LEE for Hg, you must demonstrate initial and continuous compliance through use of a Hg CEMS or a sorbent trap monitoring system, in accordance with appendix A to this subpart.

(A) You may choose to use separate sorbent trap monitoring systems to comply with this subpart: One sorbent trap monitoring system to demonstrate compliance with the numeric mercury emissions limit during periods other than startup or shutdown and the other sorbent trap monitoring system to report average mercury concentration during startup periods or shutdown periods.

(B) You may choose to use one sorbent trap monitoring system to demonstrate compliance with the mercury emissions limit at all times (including startup periods and shutdown periods) and to report average mercury concentration. You must follow the startup or shutdown requirements that follow and as given in Table 3 to this subpart for each coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGU.

(2) For liquid oil-fired EGUs, except limited use liquid oil-fired EGUs, initial performance testing is required for all pollutants, to demonstrate compliance with the applicable emission limits.

(i) For an existing liquid oil-fired unit, you may conduct the performance testing in accordance with §63.10005(h), to determine whether the unit qualifies as a LEE for one or more pollutants. For a qualifying LEE for Hg emissions limits, you must conduct a 30-day performance test using Method 30B at least once every 12 calendar months to demonstrate continued LEE status. For a qualifying LEE of any other applicable emissions limits, you must conduct a performance test at least once every 36 calendar months to demonstrate continued LEE status.

(ii) If your liquid oil-fired unit does not qualify as a LEE for total HAP metals (including mercury), individual metals (including mercury), or filterable PM you must demonstrate compliance through an initial performance test and you must monitor continuous performance through either use of a PM CPMS, a PM CEMS, or, for an existing EGU, performance testing conducted quarterly.

(iii) If your existing liquid oil-fired unit does not qualify as a LEE for hydrogen chloride (HCl) or for hydrogen fluoride (HF), you may demonstrate initial and continuous compliance through use of an HCl CEMS, an HF CEMS, or an HCl and HF CEMS, installed and operated in accordance with Appendix B to this rule. As an alternative to HCl CEMS, HF CEMS, or HCl and HF CEMS, you may demonstrate initial and continuous compliance by conducting periodic quarterly performance stack tests for HCl and HF. If you elect to demonstrate compliance through quarterly performance testing, then you must also develop a site-specific monitoring plan to ensure that the operations of the unit remain consistent with those during the performance test. As another alternative, you may measure or obtain, and keep records of, fuel moisture content; as long as fuel moisture does not exceed 1.0 percent by weight, you need not conduct other HCl or HF monitoring or testing.

(iv) If your unit qualifies as a limited-use liquid oil-fired as defined in §63.10042, then you are not subject to the emission limits in Tables 1 and 2, but you must comply with the performance tune-up work practice requirements in Table 3.

(d)(1) If you demonstrate compliance with any applicable emissions limit through use of a continuous monitoring system (CMS), where a CMS includes a continuous parameter monitoring system (CPMS) as well as a continuous emissions monitoring system (CEMS), you must develop a site-specific monitoring plan and submit this site-specific monitoring plan, if requested, at least 60 days before your initial performance evaluation (where applicable) of your CMS. This requirement also applies to you if you petition the Administrator for alternative monitoring parameters under §63.8(f). This requirement to develop and submit a site-specific monitoring plan does not apply to affected sources with existing monitoring plans that apply to CEMS and CPMS prepared under appendix B to part 60 or part 75 of this chapter, and that meet the requirements of §63.10010. Using the process described in §63.8(f)(4), you may request approval of monitoring system quality assurance and quality control procedures alternative to those specified in this paragraph of this section and, if approved, include those in your site-specific monitoring plan. The monitoring plan must address the provisions in paragraphs (d)(2) through (5) of this section.

(2) The site-specific monitoring plan shall include the information specified in paragraphs (d)(5)(i) through (d)(5)(vii) of this section. Alternatively, the requirements of paragraphs (d)(5)(i) through (d)(5)(vii) are considered to be met for a particular CMS or sorbent trap monitoring system if:

(i) The CMS or sorbent trap monitoring system is installed, certified, maintained, operated, and quality-assured either according to part 75 of this chapter, or appendix A or B to this subpart; and

(ii) The recordkeeping and reporting requirements of part 75 of this chapter, or appendix A or B to this subpart, that pertain to the CMS are met.

(3) If requested by the Administrator, you must submit the monitoring plan (or relevant portion of the plan) at least 60 days before the initial performance evaluation of a particular CMS, except where the CMS has already undergone a performance evaluation that meets the requirements of §63.10010 (e.g., if the CMS was previously certified under another program).

(4) You must operate and maintain the CMS according to the site-specific monitoring plan.

(5) The provisions of the site-specific monitoring plan must address the following items:

(i) Installation of the CMS or sorbent trap monitoring system sampling probe or other interface at a measurement location relative to each affected process unit such that the measurement is representative of control of the exhaust emissions (e.g., on or downstream of the last control device). See §63.10010(a) for further details. For PM CPMS installations, follow the procedures in §63.10010(h).

(ii) Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems.

(iii) Schedule for conducting initial and periodic performance evaluations.

(iv) Performance evaluation procedures and acceptance criteria (e.g., calibrations), including the quality control program in accordance with the general requirements of §63.8(d).

(v) On-going operation and maintenance procedures, in accordance with the general requirements of §§63.8(c)(1)(ii), (c)(3), and (c)(4)(ii).

(vi) Conditions that define a CMS that is out of control consistent with §63.8(c)(7)(i) and for responding to out of control periods consistent with §§63.8(c)(7)(ii) and (c)(8).

(vii) On-going recordkeeping and reporting procedures, in accordance with the general requirements of §§63.10(c), (e)(1), and (e)(2)(i), or as specifically required under this subpart.

(e) As part of your demonstration of continuous compliance, you must perform periodic tune-ups of your EGU(s), according to §63.10021(e).

(f) You are subject to the requirements of this subpart for at least 6 months following the last date you met the definition of an EGU subject to this subpart (e.g., 6 months after a cogeneration unit provided more than one third of its potential electrical output capacity and more than 25 megawatts electrical output to any power distribution system for sale). You may opt to remain subject to the provisions of this subpart beyond 6 months after the last date you met the definition of an EGU subject to this subpart, unless you are a solid waste incineration unit subject to standards under CAA section 129 (e.g., 40 CFR Part 60, Subpart CCCC (New Source Performance Standards (NSPS) for Commercial and Industrial Solid Waste Incineration Units, or Subpart DDDD (Emissions Guidelines (EG) for Existing Commercial and Industrial Solid Waste Incineration Units). Notwithstanding the provisions of this subpart, an EGU that starts combusting solid waste is immediately subject to standards under CAA section 129 and the EGU remains subject to those standards until the EGU no longer meets the definition of a solid waste incineration unit consistent with the provisions of the applicable CAA section 129 standards.

(g) If you no longer meet the definition of an EGU subject to this subpart you must be in compliance with any newly applicable standards on the date you are no longer subject to this subpart. The date you are no longer subject to this subpart is a date selected by you, that must be at least 6 months from the date that you last met the definition of an EGU subject to this subpart or the date you begin combusting solid waste, consistent with §63.9983(d). Your source must remain in compliance with this subpart until the date you select to cease complying with this subpart or the date you begin combusting solid waste, whichever is earlier.

(h)(1) If you own or operate an EGU that does not meet the definition of an EGU subject to this subpart on April 16, 2015, and you commence or recommence operations that cause you to meet the definition of an EGU subject to this subpart, you are subject to the provisions of this subpart, including, but not limited to, the emission limitations and the monitoring requirements, as of the first day you meet the definition of an EGU subject to this subpart. You must complete all initial compliance demonstrations for this subpart applicable to your EGU within 180 days after you commence or recommence operations that cause you to meet the definition of an EGU subject to this subpart.

(2) You must provide 30 days prior notice of the date you intend to commence or recommence operations that cause you to meet the definition of an EGU subject to this subpart. The notification must identify:

(i) The name of the owner or operator of the EGU, the location of the facility, the unit(s) that will commence or recommence operations that will cause the unit(s) to meet the definition of an EGU subject to this subpart, and the date of the notice;

(ii) The 40 CFR part 60, part 62, or part 63 subpart and subcategory currently applicable to your unit(s), and the subcategory of this subpart that will be applicable after you commence or recommence operation that will cause the unit(s) to meet the definition of an EGU subject to this subpart;

(iii) The date on which you became subject to the currently applicable emission limits;

(iv) The date upon which you will commence or recommence operations that will cause your unit to meet the definition of an EGU subject to this subpart, consistent with paragraph (f) of this section.

(i)(1) If you own or operate an EGU subject to this subpart, and it has been at least 6 months since you operated in a manner that caused you to meet the definition of an EGU subject to this subpart, you may, consistent with paragraph (g) of this section, select the date on which your EGU will no longer be subject to this subpart. You must be in compliance with any newly applicable section 112 or 129 standards on the date you selected.

(2) You must provide 30 days prior notice of the date your EGU will cease complying with this subpart. The notification must identify:

(i) The name of the owner or operator of the EGU(s), the location of the facility, the EGU(s) that will cease complying with this subpart, and the date of the notice;

(ii) The currently applicable subcategory under this subpart, and any 40 CFR part 60, part 62, or part 63 subpart and subcategory that will be applicable after you cease complying with this subpart;

(iii) The date on which you became subject to this subpart;

(iv) The date upon which you will cease complying with this subpart, consistent with paragraph (g) of this section.

(j) All air pollution control equipment necessary for compliance with any newly applicable emissions limits which apply as a result of the cessation or commencement or recommencement of operations that cause your EGU to meet the definition of an EGU subject to this subpart must be installed and operational as of the date your source ceases to be or becomes subject to this subpart.

(k) All monitoring systems necessary for compliance with any newly applicable monitoring requirements which apply as a result of the cessation or commencement or recommencement of operations that cause your EGU to meet the definition of an EGU subject to this subpart must be installed and operational as of the date your source ceases to be or becomes subject to this subpart. All calibration and drift checks must be performed as of the date your source ceases to be or becomes subject to this subpart. You must also comply with provisions of §§63.10010, 63.10020, and 63.10021 of this subpart. Relative accuracy tests must be performed as of the performance test deadline for PM CEMS, if applicable. Relative accuracy testing for other CEMS need not be repeated if that testing was previously performed consistent with CAA section 112 monitoring requirements or monitoring requirements under this subpart.

(l) On or before the date an EGU is subject to this subpart, you must install, certify, operate, maintain, and quality assure each monitoring system necessary for demonstrating compliance with the work practice standards for PM or non-mercury HAP metals during startup periods and shutdown periods. You must collect, record, report, and maintain data obtained from these monitoring systems during startup periods and shutdown periods.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23402, Apr. 19, 2012; 78 FR 24084, Apr. 24, 2013; 79 FR 68788, Nov. 19, 2014]

**§63.10001 Affirmative defense for exceedence of emission limit during malfunction.**

In response to an action to enforce the standards set forth in §63.9991 you may assert an affirmative defense to a claim for civil penalties for exceedances of such standards that are caused by malfunction, as defined at 40 CFR

63.2. Appropriate penalties may be assessed, however, if you fail to meet your burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

(a) To establish the affirmative defense in any action to enforce such a limit, you must timely meet the notification requirements in paragraph (b) of this section, and must prove by a preponderance of evidence that:

(1) The excess emissions:

(i) Were caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner, and

(ii) Could not have been prevented through careful planning, proper design or better operation and maintenance practices; and

(iii) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and

(iv) Were not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and

(2) Repairs were made as expeditiously as possible when the applicable emission limitations were being exceeded. Off-shift and overtime labor were used, to the extent practicable to make these repairs; and

(3) The frequency, amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions; and

(4) If the excess emissions resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

(5) All possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health; and

(6) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and

(7) All of the actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs; and

(8) At all times, the affected source was operated in a manner consistent with good practices for minimizing emissions; and

(9) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue. The analysis shall also specify, using best monitoring methods and engineering judgment, the amount of excess emissions that were the result of the malfunction.

(b) *Notification.* The owner or operator of the affected source experiencing an exceedance of its emission limit(s) during a malfunction shall notify the Administrator by telephone or facsimile (FAX) transmission as soon as possible, but no later than two business days after the initial occurrence of the malfunction or, if it is not possible to determine within two business days whether the malfunction caused or contributed to an exceedance, no later than two business days after the owner or operator knew or should have known that the malfunction caused or contributed to an exceedance, but, in no event later than two business days after the end of the averaging period, if it wishes to avail itself of an affirmative defense to civil penalties for that malfunction. The owner or operator seeking to assert an affirmative defense shall also submit a written report to the Administrator within 45 days of the initial occurrence of the exceedance of the standard in §63.9991 to demonstrate, with all necessary supporting documentation, that it has met the requirements set forth in paragraph (a) of this section. The owner or operator may seek an extension of this deadline for up to 30 additional days by submitting a written request to the Administrator before the expiration of the 45 day period. Until a request for an extension has been approved by the Administrator, the owner or operator is subject to the requirement to submit such report within 45 days of the initial occurrence of the exceedance.

**Testing and Initial Compliance Requirements**

**§63.10005 What are my initial compliance requirements and by what date must I conduct them?**

(a) *General requirements.* For each of your affected EGUs, you must demonstrate initial compliance with each applicable emissions limit in Table 1 or 2 of this subpart through performance testing. Where two emissions limits are specified for a particular pollutant (e.g., a heat input-based limit in lb/MMBtu and an electrical output-based limit in lb/MWh), you may demonstrate compliance with either emission limit. For a particular compliance demonstration, you may be required to conduct one or more of the following activities in conjunction with performance testing: collection of hourly electrical load data (megawatts); establishment of operating limits according to §63.10011 and Tables 4 and 7 to this subpart; and CMS performance evaluations. In all cases, you must demonstrate initial compliance no later than the applicable date in paragraph (f) of this section for tune-up work practices for existing EGUs, in §63.9984 for other requirements for existing EGUs, and in paragraph (g) of this section for all requirements for new EGUs.

(1) To demonstrate initial compliance with an applicable emissions limit in Table 1 or 2 to this subpart using stack testing, the initial performance test generally consists of three runs at specified process operating conditions using approved methods. If you are required to establish operating limits (see paragraph (d) of this section and Table 4 to this subpart), you must collect all applicable parametric data during the performance test period. Also, if you choose to comply with an electrical output-based emission limit, you must collect hourly electrical load data during the test period.

(2) To demonstrate initial compliance using either a CMS that measures HAP concentrations directly (*i.e.,* an Hg, HCl, or HF CEMS, or a sorbent trap monitoring system) or an $SO_2$ or PM CEMS, the initial performance test consists of 30- (or, if emissions averaging for Hg is used, 90-) boiler operating days of data collected by the initial compliance demonstration date specified in §63.9984(f) with the certified monitoring system. Pollutant emission rates measured during startup periods and shutdown period (as defined in §63.10042) are not to be included in the compliance demonstration, except as otherwise provided in §63.10000(c)(1)(vi)(B) and paragraph (a)(2)(iii) of this section.

(i) The 30- (or, if applicable, 90-) boiler operating day CMS performance test must demonstrate compliance with the applicable Hg, HCl, HF, PM, or $SO_2$ emissions limit in Table 1 or 2 to this subpart.

(ii) You must collect hourly data from auxiliary monitoring systems (i.e., stack gas flow rate, $CO_2$, $O_2$, or moisture, as applicable) during the performance test period, in order to convert the pollutant concentrations to units of the standard. If you choose to comply with an electrical output-based emission limit, you must also collect hourly electrical load data during the performance test period.

(iii) For a group of affected units that are in the same subcategory, are subject to the same emission standards, and share a common stack, if you elect to demonstrate compliance by monitoring emissions at the common stack, startup and shutdown emissions (if any) that occur during the 30-(or, if applicable, 90-) boiler operating day performance test must either be excluded from or included in the compliance demonstration as follows:

(A) If one of the units that shares the stack either starts up or shuts down at a time when none of the other units is operating, you must exclude all pollutant emission rates measured during the startup or shutdown period, unless you are using a sorbent trap monitoring system to measure Hg emissions and have elected to include startup and shutdown emissions in the compliance demonstrations;

(B) If all units that are currently operating are in the startup or shutdown mode, you must exclude all pollutant emission rates measured during the startup or shutdown period, unless you are using a sorbent trap monitoring system to measure Hg emissions and have elected to include startup and shutdown emissions in the compliance demonstrations; or

(C) If any unit starts up or shuts down at a time when another unit is operating, and the other unit is not in the startup or shutdown mode, you must include all pollutant emission rates measured during the startup or shutdown period in the compliance demonstrations.

(b) *Performance testing requirements.* If you choose to use performance testing to demonstrate initial compliance with the applicable emissions limits in Tables 1 and 2 to this subpart for your EGUs, you must conduct the tests according to §63.10007 and Table 5 to this subpart. For the purposes of the initial compliance demonstration, you may use test data and results from a performance test conducted prior to the date on which compliance is required as specified in §63.9984, provided that the following conditions are fully met:

(1) For a performance test based on stack test data, the test was conducted no more than 12 calendar months prior to the date on which compliance is required as specified in §63.9984;

(2) For a performance test based on data from a certified CEMS or sorbent trap monitoring system, the test consists of all valid CMS data recorded in the 30 boiler operating days immediately preceding that date;

(3) The performance test was conducted in accordance with all applicable requirements in §63.10007 and Table 5 to this subpart;

(4) A record of all parameters needed to convert pollutant concentrations to units of the emission standard (e.g., stack flow rate, diluent gas concentrations, hourly electrical loads) is available for the entire performance test period; and

(5) For each performance test based on stack test data, you certify, and keep documentation demonstrating, that the EGU configuration, control devices, and fuel(s) have remained consistent with conditions since the prior performance test was conducted.

(c) *Operating limits.* In accordance with §63.10010 and Table 4 to this subpart, you may be required to establish operating limits using PM CPMS and using site-specific monitoring for certain liquid oil-fired units as part of your initial compliance demonstration.

(d) *CMS requirements.* If, for a particular emission or operating limit, you are required to (or elect to) demonstrate initial compliance using a continuous monitoring system, the CMS must pass a performance evaluation prior to the initial compliance demonstration. If a CMS has been previously certified under another state or federal program and is continuing to meet the on-going quality-assurance (QA) requirements of that program, then, provided that the certification and QA provisions of that program meet the applicable requirements of §§63.10010(b) through (h), an additional performance evaluation of the CMS is not required under this subpart.

(1) For an affected coal-fired, solid oil-derived fuel-fired, or liquid oil-fired EGU, you may demonstrate initial compliance with the applicable $SO_2$, HCl, or HF emissions limit in Table 1 or 2 to this subpart through use of an $SO_2$, HCl, or HF CEMS installed and operated in accordance with part 75 of this chapter or appendix B to this subpart, as applicable. You may also demonstrate compliance with a filterable PM emission limit in Table 1 or 2 to this subpart through use of a PM CEMS installed, certified, and operated in accordance with §63.10010(i). Initial compliance is achieved if the arithmetic average of 30-boiler operating days of quality-assured CEMS data, expressed in units of the standard (see §63.10007(e)), meets the applicable $SO_2$, PM, HCl, or HF emissions limit in Table 1 or 2 to this subpart. Use Equation 19-19 of Method 19 in appendix A-7 to part 60 of this chapter to calculate the 30-boiler operating day average emissions rate. (NOTE: For this calculation, the term $E_{hj}$ in Equation 19-19 must be in the same units of measure as the applicable HCl or HF emission limit in Table 1 or 2 to this subpart).

(2) For affected coal-fired or solid oil-derived fuel-fired EGUs that demonstrate compliance with the applicable emission limits for total non-mercury HAP metals, individual non-mercury HAP metals, total HAP metals, individual HAP metals, or filterable PM listed in Table 1 or 2 to this subpart using initial performance testing and continuous monitoring with PM CPMS:

(i) You must demonstrate initial compliance no later than the applicable date specified in §63.9984(f) for existing EGUs and in paragraph (g) of this section for new EGUs.

(ii) You must demonstrate continuous compliance with the PM CPMS site-specific operating limit that corresponds to the results of the performance test demonstrating compliance with the emission limit with which you choose to comply.

(iii) You must repeat the performance test annually for the selected pollutant emissions limit and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(3) For affected EGUs that are either required to or elect to demonstrate initial compliance with the applicable Hg emission limit in Table 1 or 2 of this subpart using Hg CEMS or sorbent trap monitoring systems, initial compliance

must be demonstrated no later than the applicable date specified in §63.9984(f) for existing EGUs and in paragraph (g) of this section for new EGUs. Initial compliance is achieved if the arithmetic average of 30-boiler operating days of quality-assured CEMS (or sorbent trap monitoring system) data, expressed in units of the standard (see section 6.2 of appendix A to this subpart), meets the applicable Hg emission limit in Table 1 or 2 to this subpart.

(4) For affected liquid oil-fired EGUs that demonstrate compliance with the applicable emission limits for HCl or HF listed in Table 1 or 2 to this subpart using quarterly testing and continuous monitoring with a CMS:

(i) You must demonstrate initial compliance no later than the applicable date specified in §63.9984 for existing EGUs and in paragraph (g) of this section for new EGUs.

(ii) You must demonstrate continuous compliance with the CMS site-specific operating limit that corresponds to the results of the performance test demonstrating compliance with the HCl or HF emissions limit.

(iii) You must repeat the performance test annually for the HCl or HF emissions limit and reassess and adjust the site-specific operating limit in accordance with the results of the performance test.

(e) *Tune-ups.* All affected EGUs are subject to the work practice standards in Table 3 of this subpart. As part of your initial compliance demonstration, you must conduct a performance tune-up of your EGU according to §63.10021(e).

(f) For existing affected sources a tune-up may occur prior to April 16, 2012, so that existing sources without neural networks have up to 42 calendar months (3 years from promulgation plus 180 days) or, in the case of units employing neural network combustion controls, up to 54 calendar months (48 months from promulgation plus 180 days) after the date that is specified for your source in §63.9984 and according to the applicable provisions in §63.7(a)(2) as cited in Table 9 to this subpart to demonstrate compliance with this requirement. If a tune-up occurs prior to such date, the source must maintain adequate records to show that the tune-up met the requirements of this standard.

(g) If your new or reconstructed affected source commenced construction or reconstruction between May 3, 2011, and July 2, 2011, you must demonstrate initial compliance with either the proposed emission limits or the promulgated emission limits no later than 180 days after April 16, 2012 or within 180 days after startup of the source, whichever is later, according to §63.7(a)(2)(ix).

(1) For the new or reconstructed affected source described in this paragraph (g), if you choose to comply with the proposed emission limits when demonstrating initial compliance, you must conduct a second compliance demonstration for the promulgated emission limits within 3 years after April 16, 2012 or within 3 years after startup of the affected source, whichever is later.

(2) If your new or reconstructed affected source commences construction or reconstruction after April 16, 2012, you must demonstrate initial compliance with the promulgated emission limits no later than 180 days after startup of the source.

(h) *Low emitting EGUs.* The provisions of this paragraph (h) apply to pollutants with emissions limits from new EGUs except Hg and to all pollutants with emissions limits from existing EGUs. You may not pursue this compliance option if your existing EGU is equipped with an acid gas scrubber and has a main stack and bypass stack exhaust configuration.

(1) An EGU may qualify for low emitting EGU (LEE) status for Hg, HCl, HF, filterable PM, total non-Hg HAP metals, or individual non-Hg HAP metals (or total HAP metals or individual HAP metals, for liquid oil-fired EGUs) if you collect performance test data that meet the requirements of this paragraph (h), and if those data demonstrate:

(i) For all pollutants except Hg, performance test emissions results less than 50 percent of the applicable emissions limits in Table 1 or 2 to this subpart for all required testing for 3 consecutive years; or

(ii) For Hg emissions from an existing EGU, either:

(A) Average emissions less than 10 percent of the applicable Hg emissions limit in Table 2 to this subpart (expressed either in units of lb/TBtu or lb/GWh); or

(B) Potential Hg mass emissions of 29.0 or fewer pounds per year and compliance with the applicable Hg emission limit in Table 2 to this subpart (expressed either in units of lb/TBtu or lb/GWh).

(2) For all pollutants except Hg, you must conduct all required performance tests described in §63.10007 to demonstrate that a unit qualifies for LEE status.

(i) When conducting emissions testing to demonstrate LEE status, you must increase the minimum sample volume specified in Table 1 or 2 nominally by a factor of two.

(ii) Follow the instructions in §63.10007(e) and Table 5 to this subpart to convert the test data to the units of the applicable standard.

(3) For Hg, you must conduct a 30-boiler operating day performance test using Method 30B in appendix A-8 to part 60 of this chapter to determine whether a unit qualifies for LEE status. Locate the Method 30B sampling probe tip at a point within the 10 percent centroidal area of the duct at a location that meets Method 1 in appendix A-1 to part 60 of this chapter and conduct at least three nominally equal length test runs over the 30-boiler operating day test period. Collect Hg emissions data continuously over the entire test period (except when changing sorbent traps or performing required reference method QA procedures), under all process operating conditions. You may use a pair of sorbent traps to sample the stack gas for no more than 10 days.

(i) Depending on whether you intend to assess LEE status for Hg in terms of the lb/TBtu or lb/GWh emission limit in Table 2 to this subpart or in terms of the annual Hg mass emissions limit of 29.0 lb/year, you will have to collect some or all of the following data during the 30-boiler operating day test period (see paragraph (h)(3)(iii) of this section):

(A) Diluent gas ($CO_2$ or $O_2$) data, using either Method 3A in appendix A-3 to part 60 of this chapter or a diluent gas monitor that has been certified according to part 75 of this chapter.

(B) Stack gas flow rate data, using either Method 2, 2F, or 2G in appendices A-1 and A-2 to part 60 of this chapter, or a flow rate monitor that has been certified according to part 75 of this chapter.

(C) Stack gas moisture content data, using either Method 4 in appendix A-1 to part 60 of this chapter, or a moisture monitoring system that has been certified according to part 75 of this chapter. Alternatively, an appropriate fuel-specific default moisture value from §75.11(b) of this chapter may be used in the calculations or you may petition the Administrator under §75.66 of this chapter for use of a default moisture value for non-coal-fired units.

(D) Hourly electrical load data (megawatts), from facility records.

(ii) If you use CEMS to measure $CO_2$ (or $O_2$) concentration, and/or flow rate, and/or moisture, record hourly average values of each parameter throughout the 30-boiler operating day test period. If you opt to use EPA reference methods rather than CEMS for any parameter, you must perform at least one representative test run on each operating day of the test period, using the applicable reference method.

(iii) Calculate the average Hg concentration, in $\mu g/m^3$ (dry basis), for the 30-boiler operating day performance test, as the arithmetic average of all Method 30B sorbent trap results. Also calculate, as applicable, the average values of $CO_2$ or $O_2$ concentration, stack gas flow rate, stack gas moisture content, and electrical load for the test period. Then:

(A) To express the test results in units of lb/TBtu, follow the procedures in §63.10007(e). Use the average Hg concentration and diluent gas values in the calculations.

(B) To express the test results in units of lb/GWh, use Equations A-3 and A-4 in section 6.2.2 of appendix A to this subpart, replacing the hourly values "$C_h$", "$Q_h$", "$B_{ws}$" and "$(MW)_h$" with the average values of these parameters from the performance test.

(C) To calculate pounds of Hg per year, use one of the following methods:

(*1*) Multiply the average lb/TBtu Hg emission rate (determined according to paragraph (h)(3)(iii)(A) of this section) by the maximum potential annual heat input to the unit (TBtu), which is equal to the maximum rated unit heat input (TBtu/hr) times 8,760 hours. If the maximum rated heat input value is expressed in units of MMBtu/hr, multiply it by $10^{-6}$ to convert it to TBtu/hr; or

(*2*) Multiply the average lb/GWh Hg emission rate (determined according to paragraph (h)(3)(iii)(B) of this section) by the maximum potential annual electricity generation (GWh), which is equal to the maximum rated electrical output of the unit (GW) times 8,760 hours. If the maximum rated electrical output value is expressed in units of MW, multiply it by $10^{-3}$ to convert it to GW; or

(*3*) If an EGU has a federally-enforceable permit limit on either the annual heat input or the number of annual operating hours, you may modify the calculations in paragraph (h)(3)(iii)(C)(1) of this section by replacing the maximum potential annual heat input or 8,760 unit operating hours with the permit limit on annual heat input or operating hours (as applicable).

(4) For a group of affected units that vent to a common stack, you may either assess LEE status for the units individually by performing a separate emission test of each unit in the duct leading from the unit to the common stack, or you may perform a single emission test in the common stack. If you choose the common stack testing option, the units in the configuration qualify for LEE status if:

(i) The emission rate measured at the common stack is less than 50 percent (10 percent for Hg) of the applicable emission limit in Table 1 or 2 to this subpart; or

(ii) For Hg from an existing EGU, the applicable Hg emission limit in Table 2 to this subpart is met and the potential annual mass emissions, calculated according to paragraph (h)(3)(iii) of this section (with some modifications), are less than or equal to 29.0 pounds times the number of units sharing the common stack. Base your calculations on the combined heat input capacity of all units sharing the stack (*i.e.*, either the combined maximum rated value or, if applicable, a lower combined value restricted by permit conditions or operating hours).

(5) For an affected unit with a multiple stack or duct configuration in which the exhaust stacks or ducts are downstream of all emission control devices, you must perform a separate emission test in each stack or duct. The unit qualifies for LEE status if:

(i) The emission rate, based on all test runs performed at all of the stacks or ducts, is less than 50 percent (10 percent for Hg) of the applicable emission limit in Table 1 or 2 to this subpart; or

(ii) For Hg from an existing EGU, the applicable Hg emission limit in Table 2 to this subpart is met and the potential annual mass emissions, calculated according to paragraph (h)(3)(iii) of this section, are less than or equal to 29.0 pounds. Use the average Hg emission rate from paragraph (h)(5)(i) of this section in your calculations.

(i) *Liquid-oil fuel moisture measurement.* If your EGU combusts liquid fuels, if your fuel moisture content is no greater than 1.0 percent by weight, and if you would like to demonstrate initial and ongoing compliance with HCl and HF emissions limits, you must meet the requirements of paragraphs (i)(1) through (5) of this section.

(1) Measure fuel moisture content of each shipment of fuel if your fuel arrives on a batch basis; or

(2) Measure fuel moisture content daily if your fuel arrives on a continuous basis; or

(3) Obtain and maintain a fuel moisture certification from your fuel supplier.

(4) Use one of the following methods to determine fuel moisture content:

(i) ASTM D95-05 (Reapproved 2010), “Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation,” or

(ii) ASTM D4006-11, “Standard Test Method for Water in Crude Oil by Distillation,” including Annex A1 and Appendix A1.

(iii) ASTM D4177-95 (Reapproved 2010), “Standard Practice for Automatic Sampling of Petroleum and Petroleum Products,” including Annexes A1 through A6 and Appendices X1 and X2, or

(iv) ASTM D4057-06 (Reapproved 2011), “Standard Practice for Manual Sampling of Petroleum and Petroleum Products,” including Annex A1.

(5) Use one of the following methods to obtain fuel moisture samples:

(i) ASTM D4177-95 (Reapproved 2010), “Standard Practice for Automatic Sampling of Petroleum and Petroleum Products,” including Annexes A1 through A6 and Appendices X1 and X2, or

(ii) ASTM D4057-06 (Reapproved 2011), “Standard Practice for Manual Sampling of Petroleum and Petroleum Products,” including Annex A1.

(6) Should the moisture in your liquid fuel be more than 1.0 percent by weight, you must

(i) Conduct HCl and HF emissions testing quarterly (and monitor site-specific operating parameters as provided in §63.10000(c)(2)(iii) or

(ii) Use an HCl CEMS and/or HF CEMS.

(j) Startup and shutdown for coal-fired or solid oil derived-fired units. You must follow the requirements given in Table 3 to this subpart.

(k) You must submit a Notification of Compliance Status summarizing the results of your initial compliance demonstration, as provided in §63.10030.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23403, Apr. 19, 2012; 78 FR 24084, Apr. 24, 2013; 79 FR 68789, Nov. 19, 2014]

**§63.10006 When must I conduct subsequent performance tests or tune-ups?**

(a) For liquid oil-fired, solid oil-derived fuel-fired and coal-fired EGUs and IGCC units using PM CPMS to monitor continuous performance with an applicable emission limit as provided for under §63.10000(c), you must conduct all applicable performance tests according to Table 5 to this subpart and §63.10007 at least every year.

(b) For affected units meeting the LEE requirements of §63.10005(h), you must repeat the performance test once every 3 years (once every year for Hg) according to Table 5 and §63.10007. Should subsequent emissions testing results show the unit does not meet the LEE eligibility requirements, LEE status is lost. If this should occur:

(1) For all pollutant emission limits except for Hg, you must conduct emissions testing quarterly, except as otherwise provided in §63.10021(d)(1).

(2) For Hg, you must install, certify, maintain, and operate a Hg CEMS or a sorbent trap monitoring system in accordance with appendix A to this subpart, within 6 calendar months of losing LEE eligibility. Until the Hg CEMS or sorbent trap monitoring system is installed, certified, and operating, you must conduct Hg emissions testing quarterly, except as otherwise provided in §63.10021(d)(1). You must have 3 calendar years of testing and CEMS or sorbent trap monitoring system data that satisfy the LEE emissions criteria to reestablish LEE status.

(c) Except where paragraphs (a) or (b) of this section apply, or where you install, certify, and operate a PM CEMS to demonstrate compliance with a filterable PM emissions limit, for liquid oil-, solid oil-derived fuel-, coal-fired and IGCC EGUs, you must conduct all applicable periodic emissions tests for filterable PM, individual, or total HAP metals emissions according to Table 5 to this subpart, §63.10007, and §63.10000(c), except as otherwise provided in §63.10021(d)(1).

(d) Except where paragraph (b) of this section applies, for solid oil-derived fuel- and coal-fired EGUs that do not use either an HCl CEMS to monitor compliance with the HCl limit or an $SO_2$ CEMS to monitor compliance with the alternate equivalent $SO_2$ emission limit, you must conduct all applicable periodic HCl emissions tests according to Table 5 to this subpart and §63.10007 at least quarterly, except as otherwise provided in §63.10021(d)(1).

(e) Except where paragraph (b) of this section applies, for liquid oil-fired EGUs without HCl CEMS, HF CEMS, or HCl and HF CEMS, you must conduct all applicable emissions tests for HCl, HF, or HCl and HF emissions according to Table 5 to this subpart and §63.10007 at least quarterly, except as otherwise provided in §63.10021(d)(1), and conduct site-specific monitoring under a plan as provided for in §63.10000(c)(2)(iii).

(f) Unless you follow the requirements listed in paragraphs (g) and (h) of this section, performance tests required at least every 3 calendar years must be completed within 35 to 37 calendar months after the previous performance test; performance tests required at least every year must be completed within 11 to 13 calendar months after the previous performance test; and performance tests required at least quarterly must be completed within 80 to 100 calendar days after the previous performance test, except as otherwise provided in §63.10021(d)(1).

(g) If you elect to demonstrate compliance using emissions averaging under §63.10009, you must continue to conduct performance stack tests at the appropriate frequency given in section (c) through (f) of this section.

(h) If a performance test on a non-mercury LEE shows emissions in excess of 50 percent of the emission limit and if you choose to reapply for LEE status, you must conduct performance tests at the appropriate frequency given in section (c) through (e) of this section for that pollutant until all performance tests over a consecutive 3-year period show compliance with the LEE criteria.

(i) If you are required to meet an applicable tune-up work practice standard, you must conduct a performance tune-up according to §63.10021(e).

(1) For EGUs not employing neural network combustion optimization during normal operation, each performance tune-up specified in §63.10021(e) must be no more than 36 calendar months after the previous performance tune-up.

(2) For EGUs employing neural network combustion optimization systems during normal operation, each performance tune-up specified in §63.10021(e) must be no more than 48 calendar months after the previous performance tune-up.

(j) You must report the results of performance tests and performance tune-ups within 60 days after the completion of the performance tests and performance tune-ups. The reports for all subsequent performance tests must include all applicable information required in §63.10031.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23403, Apr. 19, 2012; 78 FR 24085, Apr. 24, 2013]

**§63.10007 What methods and other procedures must I use for the performance tests?**

(a) Except as otherwise provided in this section, you must conduct all required performance tests according to §63.7(d), (e), (f), and (h). You must also develop a site-specific test plan according to the requirements in §63.7(c).

(1) If you use CEMS (Hg, HCl, $SO_2$, or other) to determine compliance with a 30- (or, if applicable, 90-) boiler operating day rolling average emission limit, you must collect quality- assured CEMS data for all unit operating conditions, including startup and shutdown (see §63.10011(g) and Table 3 to this subpart), except as otherwise provided in §63.10020(b). Emission rates determined during startup periods and shutdown periods (as defined in §63.10042) are not to be included in the compliance determinations, except as otherwise provided in §§63.10000(c)(1)(vi)(B) and 63.10005(a)(2)(iii).

(2) If you conduct performance testing with test methods in lieu of continuous monitoring, operate the unit at maximum normal operating load conditions during each periodic (e.g., quarterly) performance test. Maximum normal operating load will be generally between 90 and 110 percent of design capacity but should be representative of site specific normal operations during each test run.

(3) For establishing operating limits with particulate matter continuous parametric monitoring system (PM CPMS) to demonstrate compliance with a PM or non Hg metals emissions limit, operate the unit at maximum normal operating load conditions during the performance test period. Maximum normal operating load will be generally between 90 and 110 percent of design capacity but should be representative of site specific normal operations during each test run.

(b) You must conduct each performance test (including traditional 3-run stack tests, 30-boiler operating day tests based on CEMS data (or sorbent trap monitoring system data), and 30-boiler operating day Hg emission tests for LEE qualification) according to the requirements in Table 5 to this subpart.

(c) If you choose the filterable PM method to comply with the PM emission limit and demonstrate continuous performance using a PM CPMS as provided for in §63.10000(c), you must also establish an operating limit according to §63.10011(b), §63.10023, and Tables 4 and 6 to this subpart. Should you desire to have operating limits that correspond to loads other than maximum normal operating load, you must conduct testing at those other loads to determine the additional operating limits.

(d) Except for a 30-boiler operating day performance test based on CEMS (or sorbent trap monitoring system) data, where the concept of test runs does not apply, you must conduct a minimum of three separate test runs for each performance test, as specified in §63.7(e)(3). Each test run must comply with the minimum applicable sampling time or volume specified in Table 1 or 2 to this subpart. Sections 63.10005(d) and (h), respectively, provide special instructions for conducting performance tests based on CEMS or sorbent trap monitoring systems, and for conducting emission tests for LEE qualification.

(e) To use the results of performance testing to determine compliance with the applicable emission limits in Table 1 or 2 to this subpart, proceed as follows:

(1) Except for a 30-boiler operating day performance test based on CEMS (or sorbent trap monitoring system) data, if measurement results for any pollutant are reported as below the method detection level (e.g., laboratory analytical results for one or more sample components are below the method defined analytical detection level), you must use the method detection level as the measured emissions level for that pollutant in calculating compliance. The measured result for a multiple component analysis (e.g., analytical values for multiple Method 29 fractions both for individual HAP metals and for total HAP metals) may include a combination of method detection level data and analytical data reported above the method detection level.

(2) If the limits are expressed in lb/MMBtu or lb/TBtu, you must use the F-factor methodology and equations in sections 12.2 and 12.3 of EPA Method 19 in appendix A-7 to part 60 of this chapter. In cases where an appropriate F-factor is not listed in Table 19-2 of Method 19, you may use F-factors from Table 1 in section 3.3.5 of appendix F to part 75 of this chapter, or F-factors derived using the procedures in section 3.3.6 of appendix to part 75 of this chapter. Use the following factors to convert the pollutant concentrations measured during the initial performance tests to units of lb/scf, for use in the applicable Method 19 equations:

(i) Multiply $SO_2$ ppm by $1.66 \times 10^{-7}$;

(ii) Multiply HCl ppm by $9.43 \times 10^{-8}$;

(iii) Multiply HF ppm by $5.18 \times 10^{-8}$;

(iv) Multiply HAP metals concentrations (mg/dscm) by $6.24 \times 10^{-8}$; and

(v) Multiply Hg concentrations (µg/scm) by $6.24 \times 10^{-11}$.

(3) To determine compliance with emission limits expressed in lb/MWh or lb/GWh, you must first calculate the pollutant mass emission rate during the performance test, in units of lb/h. For Hg, if a CEMS or sorbent trap monitoring system is used, use Equation A-2 or A-3 in appendix A to this subpart (as applicable). In all other cases, use an equation that has the general form of Equation A-2 or A-3, replacing the value of K with $1.66 \times 10^{-7}$ lb/scf-ppm for $SO_2$, $9.43 \times 10^{-8}$ lb/scf-ppm for HCl (if an HCl CEMS is used), $5.18 \times 10^{-8}$ lb/scf-ppm for HF (if an HF CEMS is used), or $6.24 \times 10^{-8}$ lb-scm/mg-scf for HAP metals and for HCl and HF (when performance stack testing is used), and defining $C_h$ as the average $SO_2$, HCl, or HF concentration in ppm, or the average HAP metals concentration in mg/dscm. This calculation requires stack gas volumetric flow rate (scfh) and (in some cases) moisture content data

(see §§63.10005(h)(3) and 63.10010). Then, if the applicable emission limit is in units of lb/GWh, use Equation A-4 in appendix A to this subpart to calculate the pollutant emission rate in lb/GWh. In this calculation, define $(M)_h$ as the calculated pollutant mass emission rate for the performance test (lb/h), and define $(MW)_h$ as the average electrical load during the performance test (megawatts). If the applicable emission limit is in lb/MWh rather than lb/GWh, omit the $10^3$ term from Equation A-4 to determine the pollutant emission rate in lb/MWh.

(f) If you elect to (or are required to) use CEMS to continuously monitor Hg, HCl, HF, $SO_2$, or PM emissions (or, if applicable, sorbent trap monitoring systems to continuously collect Hg emissions data), the following default values are available for use in the emission rate calculations during startup periods or shutdown periods (as defined in §63.10042). For the purposes of this subpart, these default values are not considered to be substitute data.

(1) *Diluent cap values.* If you use CEMS (or, if applicable, sorbent trap monitoring systems) to comply with a heat input-based emission rate limit, you may use the following diluent cap values for a startup or shutdown hour in which the measured $CO_2$ concentration is below the cap value or the measured $O_2$ concentration is above the cap value:

(i) For an IGCC EGU, you may use 1% for $CO_2$ or 19% for $O_2$.

(ii) For all other EGUs, you may use 5% for $CO_2$ or 14% for $O_2$.

(2) *Default electrical load.* If you use CEMS to continuously monitor Hg, HCl, HF, $SO_2$, or PM emissions (or, if applicable, sorbent trap monitoring systems to continuously collect Hg emissions data), the following default value is available for use in the emission rate calculations during startup periods or shutdown periods (as defined in §63.10042). For the purposes of this subpart, this default value is not considered to be substitute data. For a startup or shutdown hour in which there is heat input to an affected EGU but zero electrical load, you must calculate the pollutant emission rate using a value equivalent to 5% of the maximum sustainable electrical output, expressed in megawatts, as defined in section 6.5.2.1(a)(1) of Appendix A to part 75 of this chapter. This default electrical load is either the nameplate capacity of the EGU or the highest electrical load observed in at least four representative quarters of EGU operation. For a monitored common stack, the default electrical load is used only when all EGUs are operating (i.e., combusting fuel) are in startup or shutdown mode, and have zero electrical generation. Under those conditions, a default electrical load equal to 5% of the combined maximum sustainable electrical load of the EGUs that are operating but have a total of zero electrical load must be used to calculate the hourly electrical output-based pollutant emissions rate.

(g) Upon request, you shall make available to the EPA Administrator such records as may be necessary to determine whether the performance tests have been done according to the requirements of this section.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23403, Apr. 19, 2012; 78 FR 24085, Apr. 24, 2013; 79 FR 68789, Nov. 19, 2014]

**§63.10008 [Reserved]**

**§63.10009 May I use emissions averaging to comply with this subpart?**

(a) *General eligibility.* (1) You may use emissions averaging as described in paragraph (a)(2) of this section as an alternative to meeting the requirements of §63.9991 for filterable PM, $SO_2$, HF, HCl, non-Hg HAP metals, or Hg on an EGU-specific basis if:

(i) You have more than one existing EGU in the same subcategory located at one or more contiguous properties, belonging to a single major industrial grouping, which are under common control of the same person (or persons under common control); and

(ii) You use CEMS (or sorbent trap monitoring systems for determining Hg emissions) or quarterly emissions testing for demonstrating compliance.

(2) You may demonstrate compliance by emissions averaging among the existing EGUs in the same subcategory, if your averaged Hg emissions for EGUs in the “unit designed for coal ≥8,300 Btu/lb” subcategory are equal to or less than 1.0 lb/TBtu or 1.1E-2 lb/GWh or if your averaged emissions of individual, other pollutants from other subcategories of such EGUs are equal to or less than the applicable emissions limit in Table 2, according to the

procedures in this section. Note that except for Hg emissions from EGUs in the “unit designed for coal ≥8,300 Btu/lb” subcategory, the averaging time for emissions averaging for pollutants is 30 days (rolling daily) using data from CEMS or a combination of data from CEMS and manual performance testing. The averaging time for emissions averaging for Hg from EGUs in the “unit designed for coal ≥8,300 Btu/lb” subcategory is 90 days (rolling daily) using data from CEMS, sorbent trap monitoring, or a combination of monitoring data and data from manual performance testing. For the purposes of this paragraph, 30- (or 90-day) group boiler operating days is defined as a period during which at least one unit in the emissions averaging group has operated 30 (or 90) days. You must calculate the weighted average emissions rate for the group in accordance with the procedures in this paragraph using the data from all units in the group including any that operate fewer than 30 (or 90) days during the preceding 30 (or 90) group boiler days.

(i) You may choose to have your EGU emissions averaging group meet either the heat input basis (MMBtu or TBtu, as appropriate for the pollutant) or gross electrical output basis (MWh or GWh, as appropriate for the pollutant).

(ii) You may not mix bases within your EGU emissions averaging group.

(iii) You may use emissions averaging for affected units in different subcategories if the units vent to the atmosphere through a common stack (see paragraph (m) of this section).

(b) *Equations.* Use the following equations when performing calculations for your EGU emissions averaging group:

(1) *Group eligibility equations.*

$$WAERm = \frac{\left[\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Herm_i \times Rmm_i)\right]_p\right] + \sum_{i=1}^{m}(Ter_i \times Rmt_i)}{\left[\sum_{i=1}^{p}\left[\sum_{i=1}^{n}Rmm_i\right]_p\right] + \sum_{i=1}^{m}Rmt_i} \quad (Eq. 1a)$$

Where:

WAERm = Weighted average emissions rate maximum in terms of lb/heat input or lb/gross electrical output,

$Herm_i$ = Hourly emissions rate (e.g., lb/MMBtu, lb/MWh) from CEMS or sorbent trap monitoring for hour i,

$Rmm_i$ = Maximum rated heat input or gross electrical output of unit i in terms of heat input or gross electrical output,

p = number of EGUs in emissions averaging group that rely on CEMS,

n = number of hourly rates collected over 30-group boiler operating days,

$Ter_i$ = Emissions rate from most recent test of unit i in terms of lb/heat input or lb/gross electrical output,

$Rmt_i$ = Maximum rated heat input or gross electrical output of unit i in terms of lb/heat input or lb/gross electrical output, and

m = number of EGUs in emissions averaging group that rely on emissions testing.

$$WAERm = \frac{\left[\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Herm_i \times Smm_i \times Cfm_i)\right]_p\right] + \sum_{i=1}^{m}(Ter_i \times Smt_i \times Cft_i)}{\left[\sum_{i=1}^{p}\left[\sum_{i=1}^{m}Smm_i \times Cfm_i\right]_p\right] + \sum_{i=1}^{m}Smt_i \times Cft_i} \quad (Eq. 1b)$$

Where:

variables with similar names share the descriptions for Equation 1a,

$Smm_i$ = maximum steam generation in units of pounds from unit i that uses CEMS or sorbent trap monitoring,

$Cfm_i$ = conversion factor, calculated from the most recent emissions test results, in units of heat input per pound of steam generated or gross electrical output per pound of steam generated, from unit i that uses CEMS or sorbent trap monitoring,

$Smt_i$ = maximum steam generation in units of pounds from unit i that uses emissions testing, and

$Cft_i$ = conversion factor, calculated from the most recent emissions test results, in units of heat input per pound of steam generated or gross electrical output per pound of steam generated, from unit i that uses emissions testing.

(2) Weighted 30-boiler operating day rolling average emissions rate equations for pollutants other than Hg. Use equation 2a or 2b to calculate the 30 day rolling average emissions daily.

$$WAER = \frac{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Her_i \times Rm_i)\right]_p + \sum_{i=1}^{m}(Ter_i \times Rt_i)}{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Rm_i)\right]_p + \sum_{i=1}^{m} Rt_i} \quad (Eq.\,2a)$$

Where:

$Her_i$ = hourly emission rate (e.g., lb/MMBtu, lb/MWh) from unit i's CEMS for the preceding 30-group boiler operating days,

$Rm_i$ = hourly heat input or gross electrical output from unit i for the preceding 30-group boiler operating days,

p = number of EGUs in emissions averaging group that rely on CEMS or sorbent trap monitoring,

n = number of hourly rates collected over 30-group boiler operating days,

$Ter_i$ = Emissions rate from most recent emissions test of unit i in terms of lb/heat input or lb/gross electrical output,

$Rt_i$ = Total heat input or gross electrical output of unit i for the preceding 30-boiler operating days, and

m = number of EGUs in emissions averaging group that rely on emissions testing.

$$WAER = \frac{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Her_i \times Sm_i \times Cfm_i)\right]_p + \sum_{i=1}^{m}(Ter_i \times St_i \times Cft_i)}{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Sm_i \times Cfm_i)\right]_p + \sum_{i=1}^{m} St_i \times Cft_i} \quad (Eq.\,2b)$$

Where:

variables with similar names share the descriptions for Equation 2a,

$Sm_i$ = steam generation in units of pounds from unit i that uses CEMS for the preceding 30-group boiler operating days,

$Cfm_i$ = conversion factor, calculated from the most recent compliance test results, in units of heat input per pound of steam generated or gross electrical output per pound of steam generated, from unit i that uses CEMS from the preceding 30 group boiler operating days,

$St_i$ = steam generation in units of pounds from unit i that uses emissions testing, and

$Cft_i$ = conversion factor, calculated from the most recent compliance test results, in units of heat input per pound of steam generated or gross electrical output per pound of steam generated, from unit i that uses emissions testing.

(3) Weighted 90-boiler operating day rolling average emissions rate equations for Hg emissions from EGUs in the “coal-fired unit not low rank virgin coal” subcategory. Use equation 3a or 3b to calculate the 90-day rolling average emissions daily.

$$WAER = \frac{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Her_i \times Rm_i)\right]_p + \sum_{i=1}^{m}(Ter_i \times Rt_i)}{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Rm_i)\right]_p + \sum_{i=1}^{m} Rt_i} \quad (Eq. 3a)$$

Where:

$Her_i$ = hourly emission rate from unit i's CEMS or Hg sorbent trap monitoring system for the preceding 90-group boiler operating days,

$Rm_i$ = hourly heat input or gross electrical output from unit i for the preceding 90-group boiler operating days,

p = number of EGUs in emissions averaging group that rely on CEMS,

n = number of hourly rates collected over the 90-group boiler operating days,

$Ter_i$ = Emissions rate from most recent emissions test of unit i in terms of lb/heat input or lb/gross electrical output,

$Rt_i$ = Total heat input or gross electrical output of unit i for the preceding 90-boiler operating days, and

m = number of EGUs in emissions averaging group that rely on emissions testing.

$$WAER = \frac{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Her_i \times Sm_i \times Cfm_i)\right]_p + \sum_{i=1}^{m}(Ter_i \times St_i \times Cft_i)}{\sum_{i=1}^{p}\left[\sum_{i=1}^{n}(Sm_i \times Cfm_i)\right]_p + \sum_{i=1}^{m} St_i \times Cft_i} \quad (Eq. 3b)$$

Where:

variables with similar names share the descriptions for Equation 2a,

$Sm_i$ = steam generation in units of pounds from unit i that uses CEMS or a Hg sorbent trap monitoring for the preceding 90-group boiler operating days,

$Cfm_i$ = conversion factor, calculated from the most recent compliance test results, in units of heat input per pound of steam generated or gross electrical output per pound of steam generated, from unit i that uses CEMS or sorbent trap monitoring from the preceding 90-group boiler operating days,

$St_i$ = steam generation in units of pounds from unit i that uses emissions testing, and

$Cft_i$ = conversion factor, calculated from the most recent emissions test results, in units of heat input per pound of steam generated or gross electrical output per pound of steam generated, from unit i that uses emissions testing.

(c) *Separate stack requirements.* For a group of two or more existing EGUs in the same subcategory that each vent to a separate stack, you may average filterable PM, $SO_2$, HF, HCl, non-Hg HAP metals, or Hg emissions to demonstrate compliance with the limits in Table 2 to this subpart if you satisfy the requirements in paragraphs (d) through (j) of this section.

(d) For each existing EGU in the averaging group:

(1) The emissions rate achieved during the initial performance test for the HAP being averaged must not exceed the emissions level that was being achieved 180 days after April 16, 2015, or the date on which emissions testing done to support your emissions averaging plan is complete (if the Administrator does not require submission and approval of your emissions averaging plan), or the date that you begin emissions averaging, whichever is earlier; or

(2) The control technology employed during the initial performance test must not be less than the design efficiency of the emissions control technology employed 180 days after April 16, 2015 or the date that you begin emissions averaging, whichever is earlier.

(e) The weighted-average emissions rate from the existing EGUs participating in the emissions averaging option must be in compliance with the limits in Table 2 to this subpart at all times following the compliance date specified 180 days after April 16, 2015, or the date on which you complete the emissions measurements used to support your emissions averaging plan (if the Administrator does not require submission and approval of your emissions averaging plan), or the date that you begin emissions averaging, whichever is earlier.

(f) Emissions averaging group eligibility demonstration. You must demonstrate the ability for the EGUs included in the emissions averaging group to demonstrate initial compliance according to paragraph (f)(1) or (2) of this section using the maximum normal operating load of each EGU and the results of the initial performance tests. For this demonstration and prior to submitting your emissions averaging plan, if requested, you must conduct required emissions monitoring for 30 days of boiler operation and any required manual performance testing to calculate an initial weighted average emissions rate in accordance with this section. Should the Administrator require approval, you must submit your proposed emissions averaging plan and supporting data at least 120 days before April 16, 2015. If the Administrator requires approval of your plan, you may not begin using emissions averaging until the Administrator approves your plan.

(1) You must use Equation 1a in paragraph (b) of this section to demonstrate that the maximum weighted average emissions rates of filterable PM, HF, $SO_2$, HCl, non-Hg HAP metals, or Hg emissions from the existing units participating in the emissions averaging option do not exceed the emissions limits in Table 2 to this subpart.

(2) If you are not capable of monitoring heat input or gross electrical output, and the EGU generates steam for purposes other than generating electricity, you may use Equation 1b of this section as an alternative to using Equation 1a of this section to demonstrate that the maximum weighted average emissions rates of filterable PM, HF, $SO_2$, HCl, non-Hg HAP metals, or Hg emissions from the existing units participating in the emissions averaging group do not exceed the emission limits in Table 2 to this subpart.

(g) You must determine the weighted average emissions rate in units of the applicable emissions limit on a 30 day rolling average (90 day rolling average for Hg) basis according to paragraphs (g)(1) through (2) of this section. The first averaging period begins on 30 (or 90 for Hg) days after February 16, 2015 or the date that you begin emissions averaging, whichever is earlier.

(1) You must use Equation 2a or 3a of paragraph (b) of this section to calculate the weighted average emissions rate using the actual heat input or gross electrical output for each existing unit participating in the emissions averaging option.

(2) If you are not capable of monitoring heat input or gross electrical output, you may use Equation 2b or 3b of paragraph (b) of this section as an alternative to using Equation 2a of paragraph (b) of this section to calculate the average weighted emission rate using the actual steam generation from the units participating in the emissions averaging option.

(h) *CEMS (or sorbent trap monitoring) use.* If an EGU in your emissions averaging group uses CEMS (or a sorbent trap monitor for Hg emissions) to demonstrate compliance, you must use those data to determine the 30 (or 90) group boiler operating day rolling average emissions rate.

(i) *Emissions testing.* If you use manual emissions testing to demonstrate compliance for one or more EGUs in your emissions averaging group, you must use the results from the most recent performance test to determine the 30 (or 90) day rolling average. You may use CEMS or sorbent trap data in combination with data from the most recent manual performance test in calculating the 30 (or 90) group boiler operating day rolling average emissions rate.

(j) *Emissions averaging plan.* You must develop an implementation plan for emissions averaging according to the following procedures and requirements in paragraphs (j)(1) and (2) of this section.

(1) You must include the information contained in paragraphs (j)(1)(i) through (v) of this section in your implementation plan for all the emissions units included in an emissions averaging:

(i) The identification of all existing EGUs in the emissions averaging group, including for each either the applicable HAP emission level or the control technology installed as of 180 days after February 16, 2015, or the date on which you complete the emissions measurements used to support your emissions averaging plan (if the Administrator does not require submission and approval of your emissions averaging plan), or the date that you begin emissions averaging, whichever is earlier; and the date on which you are requesting emissions averaging to commence;

(ii) The process weighting parameter (heat input, gross electrical output, or steam generated) that will be monitored for each averaging group;

(iii) The specific control technology or pollution prevention measure to be used for each emission EGU in the averaging group and the date of its installation or application. If the pollution prevention measure reduces or eliminates emissions from multiple EGUs, you must identify each EGU;

(iv) The means of measurement (e.g., CEMS, sorbent trap monitoring, manual performance test) of filterable PM, $SO_2$, HF, HCl, individual or total non-Hg HAP metals, or Hg emissions in accordance with the requirements in §63.10007 and to be used in the emissions averaging calculations; and

(v) A demonstration that emissions averaging can produce compliance with each of the applicable emission limit(s) in accordance with paragraph (b)(1) of this section.

(2) If the Administrator requests you to submit the plan for review and approval, you must submit a complete implementation plan at least 120 days before April 16, 2015. If the Administrator requests you to submit the plan for review and approval, you must receive approval before initiating emissions averaging.

(i) The Administrator shall use following criteria in reviewing and approving or disapproving the plan:

(A) Whether the content of the plan includes all of the information specified in paragraph (j)(1) of this section; and

(B) Whether the plan presents information sufficient to determine that compliance will be achieved and maintained.

(ii) The Administrator shall not approve an emissions averaging implementation plan containing any of the following provisions:

(A) Any averaging between emissions of different pollutants or between units located at different facilities; or

(B) The inclusion of any emissions unit other than an existing unit in the same subcategory.

(k) *Common stack requirements.* For a group of two or more existing affected units, each of which vents through a single common stack, you may average emissions to demonstrate compliance with the limits in Table 2 to this subpart if you satisfy the requirements in paragraph (l) or (m) of this section.

(l) For a group of two or more existing units in the same subcategory and which vent through a common emissions control system to a common stack that does not receive emissions from units in other subcategories or categories, you may treat such averaging group as a single existing unit for purposes of this subpart and comply with the requirements of this subpart as if the group were a single unit.

(m) For all other groups of units subject to paragraph (k) of this section, you may elect to conduct manual performance tests according to procedures specified in §63.10007 in the common stack. If emissions from affected units included in the emissions averaging and from other units not included in the emissions averaging (e.g., in a different subcategory) or other nonaffected units all vent to the common stack, you must shut down the units not included in the emissions averaging and the nonaffected units or vent their emissions to a different stack during the performance test. Alternatively, you may conduct a performance test of the combined emissions in the common stack with all units operating and show that the combined emissions meet the most stringent emissions limit. You may also use a CEMS or sorbent trap monitoring to apply this latter alternative to demonstrate that the combined emissions comply with the most stringent emissions limit on a continuous basis.

(n) Combination requirements. The common stack of a group of two or more existing EGUs in the same subcategory subject to paragraph (k) of this section may be treated as a single stack for purposes of paragraph (c) of this section and included in an emissions averaging group subject to paragraph (c) of this section.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23403, Apr. 19, 2012; 78 FR 24085, Apr. 24, 2013]

**§63.10010 What are my monitoring, installation, operation, and maintenance requirements?**

(a) Flue gases from the affected units under this subpart exhaust to the atmosphere through a variety of different configurations, including but not limited to individual stacks, a common stack configuration or a main stack plus a bypass stack. For the CEMS, PM CPMS, and sorbent trap monitoring systems used to provide data under this subpart, the continuous monitoring system installation requirements for these exhaust configurations are as follows:

(1) *Single unit-single stack configurations.* For an affected unit that exhausts to the atmosphere through a single, dedicated stack, you shall either install the required CEMS, PM CPMS, and sorbent trap monitoring systems in the stack or at a location in the ductwork downstream of all emissions control devices, where the pollutant and diluents concentrations are representative of the emissions that exit to the atmosphere.

(2) *Unit utilizing common stack with other affected unit(s).* When an affected unit utilizes a common stack with one or more other affected units, but no non-affected units, you shall either:

(i) Install the required CEMS, PM CPMS, and sorbent trap monitoring systems in the duct leading to the common stack from each unit; or

(ii) Install the required CEMS, PM CPMS, and sorbent trap monitoring systems in the common stack.

(3) *Unit(s) utilizing common stack with non-affected unit(s).* (i) When one or more affected units shares a common stack with one or more non-affected units, you shall either:

(A) Install the required CEMS, PM CPMS, and sorbent trap monitoring systems in the ducts leading to the common stack from each affected unit; or

(B) Install the required CEMS, PM CPMS, and sorbent trap monitoring systems described in this section in the common stack and attribute all of the emissions measured at the common stack to the affected unit(s).

(ii) If you choose the common stack monitoring option:

(A) For each hour in which valid data are obtained for all parameters, you must calculate the pollutant emission rate and

(B) You must assign the calculated pollutant emission rate to each unit that shares the common stack.

(4) *Unit with a main stack and a bypass stack.* If the exhaust configuration of an affected unit consists of a main stack and a bypass stack, you shall install CEMS on both the main stack and the bypass stack, or, if it is not feasible to certify and quality-assure the data from a monitoring system on the bypass stack, you shall install a CEMS only on the main stack and count bypass hours of deviation from the monitoring requirements.

(5) *Unit with a common control device with multiple stack or duct configuration.* If the flue gases from an affected unit, which is configured such that emissions are controlled with a common control device or series of control devices, are discharged to the atmosphere through more than one stack or are fed into a single stack through two or more ducts, you may:

(i) Install required CEMS, PM CPMS, and sorbent trap monitoring systems in each of the multiple stacks;

(ii) Install required CEMS, PM CPMS, and sorbent trap monitoring systems in each of the ducts that feed into the stack;

(iii) Install required CEMS, PM CPMS, and sorbent trap monitoring systems in one of the multiple stacks or ducts and monitor the flows and dilution rates in all multiple stacks or ducts in order to determine total exhaust gas flow rate and pollutant mass emissions rate in accordance with the applicable limit; or

(iv) In the case of multiple ducts feeding into a single stack, install CEMS, PM CPMS, and sorbent trap monitoring systems in the single stack as described in paragraph (a)(1) of this section.

(6) *Unit with multiple parallel control devices with multiple stacks.* If the flue gases from an affected unit, which is configured such that emissions are controlled with multiple parallel control devices or multiple series of control devices are discharged to the atmosphere through more than one stack, you shall install the required CEMS, PM CPMS, and sorbent trap monitoring systems described in each of the multiple stacks. You shall calculate hourly flow-weighted average pollutant emission rates for the unit as follows:

(i) Calculate the pollutant emission rate at each stack or duct for each hour in which valid data are obtained for all parameters;

(ii) Multiply each calculated hourly pollutant emission rate at each stack or duct by the corresponding hourly stack gas flow rate at that stack or duct;

(iii) Sum the products determined under paragraph (a)(6)(ii) of this section; and

(iv) Divide the result obtained in paragraph (a)(6)(iii) of this section by the total hourly stack gas flow rate for the unit, summed across all of the stacks or ducts.

(b) If you use an oxygen ($O_2$) or carbon dioxide ($CO_2$) CEMS to convert measured pollutant concentrations to the units of the applicable emissions limit, the $O_2$ or $CO_2$ concentrations shall be monitored at a location that represents emissions to the atmosphere, *i.e.,* at the outlet of the EGU, downstream of all emission control devices. You must install, certify, maintain, and operate the CEMS according to part 75 of this chapter. Use only quality-assured $O_2$ or $CO_2$ data in the emissions calculations; do not use part 75 substitute data values.

(c) If you are required to use a stack gas flow rate monitor, either for routine operation of a sorbent trap monitoring system or to convert pollutant concentrations to units of an electrical output-based emission standard in Table 1 or 2 to this subpart, you must install, certify, operate, and maintain the monitoring system and conduct on-going quality-assurance testing of the system according to part 75 of this chapter. Use only unadjusted, quality-assured flow rate data in the emissions calculations. Do not apply bias adjustment factors to the flow rate data and do not use substitute flow rate data in the calculations.

(d) If you are required to make corrections for stack gas moisture content when converting pollutant concentrations to the units of an emission standard in Table 1 of 2 to this subpart, you must install, certify, operate, and maintain a moisture monitoring system in accordance with part 75 of this chapter. Alternatively, for coal-fired units, you may use appropriate fuel-specific default moisture values from §75.11(b) of this chapter to estimate the moisture content of the stack gas or you may petition the Administrator under §75.66 of this chapter for use of a default moisture value for non-coal-fired units. If you install and operate a moisture monitoring system, do not use substitute moisture data in the emissions calculations.

(e) If you use an HCl and/or HF CEMS, you must install, certify, operate, maintain, and quality-assure the data from the monitoring system in accordance with appendix B to this subpart. Calculate and record a 30-boiler operating day rolling average HCl or HF emission rate in the units of the standard, updated after each new boiler operating day. Each 30-boiler operating day rolling average emission rate is the average of all the valid hourly HCl or HF emission rates in the preceding 30 boiler operating days (see section 9.4 of appendix B to this subpart).

(f)(1) If you use an $SO_2$ CEMS, you must install the monitor at the outlet of the EGU, downstream of all emission control devices, and you must certify, operate, and maintain the CEMS according to part 75 of this chapter.

(2) For on-going QA, the $SO_2$ CEMS must meet the applicable daily, quarterly, and semiannual or annual requirements in sections 2.1 through 2.3 of appendix B to part 75 of this chapter, with the following addition: You must perform the linearity checks required in section 2.2 of appendix B to part 75 of this chapter if the $SO_2$ CEMS has a span value of 30 ppm or less.

(3) Calculate and record a 30-boiler operating day rolling average $SO_2$ emission rate in the units of the standard, updated after each new boiler operating day. Each 30-boiler operating day rolling average emission rate is the average of all of the valid $SO_2$ emission rates in the preceding 30 boiler operating days.

(4) Use only unadjusted, quality-assured $SO_2$ concentration values in the emissions calculations; do not apply bias adjustment factors to the part 75 $SO_2$ data and do not use part 75 substitute data values. For startup or shutdown hours (as defined in §63.10042) the default electrical load and the diluent cap are available for use in the hourly $SO_2$ emission rate calculations, as described in §63.10007(f). Use a flag to identify each startup or shutdown hour and report a special code if the diluent cap or default electrical load is used to calculate the $SO_2$ emission rate for any of these hours.

(g) If you use a Hg CEMS or a sorbent trap monitoring system, you must install, certify, operate, maintain and quality-assure the data from the monitoring system in accordance with appendix A to this subpart. You must calculate and record a 30- (or, if alternate emissions averaging is used, 90-) boiler operating day rolling average Hg emission rate, in units of the standard, updated after each new boiler operating day. Each 30- (or, if alternate emissions averaging is used, 90-) boiler operating day rolling average emission rate, calculated according to section 6.2 of appendix A to the subpart, is the average of all of the valid hourly Hg emission rates in the preceding 30- (or, if alternate emissions averaging is used, a 90-) boiler operating days. Section 7.1.4.3 of appendix A to this subpart explains how to reduce sorbent trap monitoring system data to an hourly basis.

(h) If you use a PM CPMS to demonstrate continuous compliance with an operating limit, you must install, calibrate, maintain, and operate the PM CPMS and record the output of the system as specified in paragraphs (h)(1) through (5) of this section.

(1) Install, calibrate, operate, and maintain your PM CPMS according to the procedures in your approved site-specific monitoring plan developed in accordance with §63.10000(d), and meet the requirements in paragraphs (h)(1)(i) through (iii) of this section.

(i) The operating principle of the PM CPMS must be based on in-stack or extractive light scatter, light scintillation, beta attenuation, or mass accumulation detection of the exhaust gas or representative sample. The reportable measurement output from the PM CPMS may be expressed as milliamps, stack concentration, or other raw data signal.

(ii) The PM CPMS must have a cycle time (*i.e.*, period required to complete sampling, measurement, and reporting for each measurement) no longer than 60 minutes.

(iii) The PM CPMS must be capable, at a minimum, of detecting and responding to particulate matter concentrations of 0.5 mg/acm.

(2) For a new unit, complete the initial PM CPMS performance evaluation no later than October 13, 2012 or 180 days after the date of initial startup, whichever is later. For an existing unit, complete the initial performance evaluation no later than October 13, 2015.

(3) Collect PM CPMS hourly average output data for all boiler operating hours except as indicated in paragraph (h)(5) of this section. Express the PM CPMS output as milliamps, PM concentration, or other raw data signal value.

(4) Calculate the arithmetic 30-boiler operating day rolling average of all of the hourly average PM CPMS output collected during all nonexempt boiler operating hours data (e.g., milliamps, PM concentration, raw data signal).

(5) You must collect data using the PM CPMS at all times the process unit is operating and at the intervals specified in paragraph (h)(1)(ii) of this section, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, required monitoring system quality assurance or quality control activities (including, as applicable, calibration checks and required zero and span adjustments), and any scheduled maintenance as defined in your site-specific monitoring plan.

(6) You must use all the data collected during all boiler operating hours in assessing the compliance with your operating limit except:

(i) Any data collected during monitoring system malfunctions, repairs associated with monitoring system malfunctions, or required monitoring system quality assurance or quality control activities conducted during monitoring system malfunctions are not used in calculations (report any such periods in your annual deviation report);

(ii) Any data collected during periods when the monitoring system is out of control as specified in your site-specific monitoring plan, repairs associated with periods when the monitoring system is out of control, or required monitoring system quality assurance or quality control activities conducted during out-of-control periods are not used in calculations (report emissions or operating levels and report any such periods in your annual deviation report);

(iii) Any data recorded during periods of startup or shutdown.

(7) You must record and make available upon request results of PM CPMS system performance audits, as well as the dates and duration of periods from when the PM CPMS is out of control until completion of the corrective actions necessary to return the PM CPMS to operation consistent with your site-specific monitoring plan.

(i) If you choose to comply with the PM filterable emissions limit in lieu of metal HAP limits, you may choose to install, certify, operate, and maintain a PM CEMS and record the output of the PM CEMS as specified in paragraphs (i)(1) through (5) of this section. The compliance limit will be expressed as a 30-boiler operating day rolling average of the numerical emissions limit value applicable for your unit in tables 1 or 2 to this subpart.

(1) Install and certify your PM CEMS according to the procedures and requirements in Performance Specification 11—Specifications and Test Procedures for Particulate Matter Continuous Emission Monitoring Systems at Stationary Sources in Appendix B to part 60 of this chapter, using Method 5 at Appendix A-3 to part 60 of this chapter and ensuring that the front half filter temperature shall be 160° ±14 °C (320° ±25 °F). The reportable measurement output from the PM CEMS must be expressed in units of the applicable emissions limit (e.g., lb/MMBtu, lb/MWh).

(2) Operate and maintain your PM CEMS according to the procedures and requirements in Procedure 2—Quality Assurance Requirements for Particulate Matter Continuous Emission Monitoring Systems at Stationary Sources in Appendix F to part 60 of this chapter.

(i) You must conduct the relative response audit (RRA) for your PM CEMS at least once annually.

(ii) You must conduct the relative correlation audit (RCA) for your PM CEMS at least once every 3 years.

(3) Collect PM CEMS hourly average output data for all boiler operating hours except as indicated in paragraph (i) of this section.

(4) Calculate the arithmetic 30-boiler operating day rolling average of all of the hourly average PM CEMS output data collected during all nonexempt boiler operating hours.

(5) You must collect data using the PM CEMS at all times the process unit is operating and at the intervals specified in paragraph (a) of this section, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities.

(i) You must use all the data collected during all boiler operating hours in assessing the compliance with your operating limit except:

(A) Any data collected during monitoring system malfunctions, repairs associated with monitoring system malfunctions, or required monitoring system quality assurance or control activities conducted during monitoring system malfunctions in calculations and report any such periods in your annual deviation report;

(B) Any data collected during periods when the monitoring system is out of control as specified in your site-specific monitoring plan, repairs associated with periods when the monitoring system is out of control, or required monitoring system quality assurance or control activities conducted during out of control periods in calculations used to report emissions or operating levels and report any such periods in your annual deviation report;

(C) Any data recorded during periods of startup or shutdown.

(ii) You must record and make available upon request results of PM CEMS system performance audits, dates and duration of periods when the PM CEMS is out of control to completion of the corrective actions necessary to return the PM CEMS to operation consistent with your site-specific monitoring plan.

(j) You may choose to comply with the metal HAP emissions limits using CEMS approved in accordance with §63.7(f) as an alternative to the performance test method specified in this rule. If approved to use a HAP metals CEMS, the compliance limit will be expressed as a 30-boiler operating day rolling average of the numerical emissions limit value applicable for your unit in tables 1 or 2. If approved, you may choose to install, certify, operate, and maintain a HAP metals CEMS and record the output of the HAP metals CEMS as specified in paragraphs (j)(1) through (5) of this section.

(1)(i) Install and certify your HAP metals CEMS according to the procedures and requirements in your approved site-specific test plan as required in §63.7(e). The reportable measurement output from the HAP metals CEMS must be expressed in units of the applicable emissions limit (*e.g.,* lb/MMBtu, lb/MWh) and in the form of a 30-boiler operating day rolling average.

(ii) Operate and maintain your HAP metals CEMS according to the procedures and criteria in your site specific performance evaluation and quality control program plan required in §63.8(d).

(2) Collect HAP metals CEMS hourly average output data for all boiler operating hours except as indicated in section (j)(4) of this section.

(3) Calculate the arithmetic 30-boiler operating day rolling average of all of the hourly average HAP metals CEMS output data collected during all nonexempt boiler operating hours data.

(4) You must collect data using the HAP metals CEMS at all times the process unit is operating and at the intervals specified in paragraph (a) of this section, except for periods of monitoring system malfunctions, repairs associated with monitoring system malfunctions, and required monitoring system quality assurance or quality control activities.

(i) You must use all the data collected during all boiler operating hours in assessing the compliance with your emission limit except:

(A) Any data collected during monitoring system malfunctions, repairs associated with monitoring system malfunctions, or required monitoring system quality assurance or control activities conducted during monitoring system malfunctions in calculations and report any such periods in your annual deviation report;

(B) Any data collected during periods when the monitoring system is out of control as specified in your site-specific monitoring plan, repairs associated with periods when the monitoring system is out of control, or required monitoring system quality assurance or control activities conducted during out of control periods in calculations used to report emissions or operating levels and report any such periods in your annual deviation report;

(C) Any data recorded during periods of startup or shutdown.

(ii) You must record and make available upon request results of HAP metals CEMS system performance audits, dates and duration of periods when the HAP metals CEMS is out of control to completion of the corrective actions necessary to return the HAP metals CEMS to operation consistent with your site-specific performance evaluation and quality control program plan.

(k) If you demonstrate compliance with the HCl and HF emission limits for a liquid oil-fired EGU by conducting quarterly testing, you must also develop a site-specific monitoring plan as provided for in §63.10000(c)(2)(iii) and Table 7 to this subpart.

(l) You must install, certify, operate, maintain, and quality assure each monitoring system necessary for demonstrating compliance with the PM or non-mercury metals work practice standards for startup periods.

(1) You shall develop a site-specific monitoring plan for PM or non-mercury metals work practice monitoring during startup periods.

(2) You shall submit the site-specific monitoring plan upon request by the Administrator.

(3) The provisions of the monitoring plan must address the following items:

(i) Monitoring system installation;

(ii) Performance and equipment specifications;

(iii) Schedule for initial and periodic performance evaluations;

(iv) Performance evaluation procedures and acceptance criteria;

(v) On-going operation and maintenance procedures; and

(vi) On-going recordkeeping and reporting procedures.

(4) You may rely on monitoring system specifications or instructions to address paragraphs (l)(3)(i) through (vi) of this section.

(5) You must operate and maintain the monitoring system according to the site-specific monitoring plan.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23404, Apr. 19, 2012; 78 FR 24086, Apr. 24, 2013; 79 FR 68789, Nov. 19, 2014]

**§63.10011 How do I demonstrate initial compliance with the emissions limits and work practice standards?**

(a) You must demonstrate initial compliance with each emissions limit that applies to you by conducting performance testing.

(b) If you are subject to an operating limit in Table 4 to this subpart, you demonstrate initial compliance with HAP metals or filterable PM emission limit(s) through performance stack tests and you elect to use a PM CPMS to demonstrate continuous performance, or if, for a liquid oil-fired unit, and you use quarterly stack testing for HCl and HF plus site-specific parameter monitoring to demonstrate continuous performance, you must also establish a site-specific operating limit, in accordance with Table 4 to this subpart, §63.10007, and Table 6 to this subpart. You may use only the parametric data recorded during successful performance tests (*i.e.*, tests that demonstrate compliance with the applicable emissions limits) to establish an operating limit.

(c)(1) If you use CEMS or sorbent trap monitoring systems to measure a HAP (e.g., Hg or HCl) directly, the first 30-boiler operating day (or, if alternate emissions averaging is used for Hg, the 90-boiler operating day) rolling average emission rate obtained with certified CEMS after the applicable date in §63.9984 (or, if applicable, prior to that date, as described in §63.10005(b)(2)), expressed in units of the standard, is the initial performance test. Initial compliance is demonstrated if the results of the performance test meet the applicable emission limit in Table 1 or 2 to this subpart.

(2) For a unit that uses a CEMS to measure $SO_2$ or PM emissions for initial compliance, the first 30 boiler operating day average emission rate obtained with certified CEMS after the applicable date in §63.9984 (or, if applicable, prior to that date, as described in §63.10005(b)(2)), expressed in units of the standard, is the initial performance test. Initial compliance is demonstrated if the results of the performance test meet the applicable $SO_2$ or filterable PM emission limit in Table 1 or 2 to this subpart.

(d) For candidate LEE units, use the results of the performance testing described in §63.10005(h) to determine initial compliance with the applicable emission limit(s) in Table 1 or 2 to this subpart and to determine whether the unit qualifies for LEE status.

(e) You must submit a Notification of Compliance Status containing the results of the initial compliance demonstration, according to §63.10030(e).

(f)(1) You must determine the fuel whose combustion produces the least uncontrolled emissions, *i.e.*, the cleanest fuel, either natural gas or distillate oil, that is available on site or accessible nearby for use during periods of startup or shutdown.

(2) Your cleanest fuel, either natural gas or distillate oil, for use during periods of startup or shutdown determination may take safety considerations into account.

(g) You must follow the startup or shutdown requirements as given in Table 3 to this subpart for each coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGU.

(1) You may use the diluent cap and default electrical load values, as described in §63.10007(f), during startup periods or shutdown periods.

(2) You must operate all CMS, collect data, calculate pollutant emission rates, and record data during startup periods or shutdown periods.

(3) You must report the information as required in §63.10031.

(4) If you choose to use paragraph (2) of the definition of "startup" in §63.10042 and you find that you are unable to safely engage and operate your particulate matter (PM) control(s) within 1 hour of first firing of coal, residual oil, or solid oil-derived fuel, you may choose to rely on paragraph (1) of definition of "startup" in §63.10042 or you may submit a request to use an alternative non-opacity emissions standard, as described below.

(i) As mentioned in §63.6(g)(1), the request will be published in the Federal Register for notice and comment rulemaking. Until promulgation in the Federal Register of the final alternative non-opacity emission standard, you shall comply with paragraph (1) of the definition of "startup" in §63.10042. You shall not implement the alternative non-opacity emissions standard until promulgation in the Federal Register of the final alternative non-opacity emission standard.

(ii) The request need not address the items contained in §63.6(g)(2).

(iii) The request shall provide evidence of a documented manufacturer-identified safely issue.

(iv) The request shall provide information to document that the PM control device is adequately designed and sized to meet the PM emission limit applicable to the EGU.

(v) In addition, the request shall contain documentation that:

(A) The EGU is using clean fuels to the maximum extent possible to bring the EGU and PM control device up to the temperature necessary to alleviate or prevent the identified safety issues prior to the combustion of primary fuel in the EGU;

(B) The EGU has explicitly followed the manufacturer's procedures to alleviate or prevent the identified safety issue; and

(C) Identifies with specificity the details of the manufacturer's statement of concern.

(vi) The request shall specify the other work practice standards the EGU owner or operator will take to limit HAP emissions during startup periods and shutdown periods to ensure a control level consistent with the work practice standards of the final rule.

(vii) You must comply with all other work practice requirements, including but not limited to data collection, recordkeeping, and reporting requirements.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23404, Apr. 19, 2012; 79 FR 68790, Nov. 19, 2014]

**Continuous Compliance Requirements**

**§63.10020 How do I monitor and collect data to demonstrate continuous compliance?**

(a) You must monitor and collect data according to this section and the site-specific monitoring plan required by §63.10000(d).

(b) You must operate the monitoring system and collect data at all required intervals at all times that the affected EGU is operating, except for periods of monitoring system malfunctions or out-of-control periods (see §63.8(c)(7) of this part), and required monitoring system quality assurance or quality control activities, including, as applicable, calibration checks and required zero and span adjustments. You are required to affect monitoring system repairs in response to monitoring system malfunctions and to return the monitoring system to operation as expeditiously as practicable.

(c) You may not use data recorded during EGU startup or shutdown in calculations used to report emissions, except as otherwise provided in §§63.10000(c)(1)(vi)(B) and 63.10005(a)(2)(iii). In addition, data recorded during monitoring system malfunctions or monitoring system out-of-control periods, repairs associated with monitoring system malfunctions or monitoring system out-of-control periods, or required monitoring system quality assurance or control activities may not be used in calculations used to report emissions or operating levels. You must use all of the quality-assured data collected during all other periods in assessing the operation of the control device and associated control system.

(d) Except for periods of monitoring system malfunctions or monitoring system out-of-control periods, repairs associated with monitoring system malfunctions or monitoring system out-of-control periods, and required monitoring system quality assurance or quality control activities including, as applicable, calibration checks and required zero and span adjustments), failure to collect required data is a deviation from the monitoring requirements.

(e) Additional requirements during startup periods or shutdown periods.

(1) During each period of startup, you must record for each EGU:

(i) The date and time that clean fuels being combusted for the purpose of startup begins;

(ii) The quantity and heat input of clean fuel for each hour of startup;

(iii) The electrical load for each hour of startup;

(iv) The date and time that non-clean fuel combustion begins; and

(v) The date and time that clean fuels being combusted for the purpose of startup ends.

(2) During each period of shutdown, you must record for each EGU:

(i) The date and time that clean fuels being combusted for the purpose of shutdown begins;

(ii) The quantity and heat input of clean fuel for each hour of shutdown;

(iii) The electrical load for each hour of shutdown;

(iv) The date and time that non-clean fuel combustion ends; and

(v) The date and time that clean fuels being combusted for the purpose of shutdown ends.

(3) For PM or non-mercury HAP metals work practice monitoring during startup periods, you must monitor and collect data according to this section and the site-specific monitoring plan required by §63.10011(l).

(i) Except for an EGU that uses PM CEMS or PM CPMS to demonstrate compliance with the PM emissions limit or that has LEE status for filterable PM or total non-Hg HAP metals for non-liquid oil-fired EGUs (or HAP metals emissions for liquid oil-fired EGUs), or individual non-mercury metals CEMS you must:

(A) Record temperature and flow rate of post-combustion (exhaust) gas and amperage of forced draft fan(s) upstream of each filterable PM control device during each hour of startup.

(B) Record temperature and flow rate of exhaust gas and amperage of induced draft fan(s) downstream of each filterable control device during each hour of startup.

(C) For an EGU with an electrostatic precipitator, record the number of fields in service, as well as each field's secondary voltage and secondary current during each hour of startup.

(D) For an EGU with a fabric filter, record the number of compartments in service, as well as the differential pressure across the baghouse during each hour of startup.

(E) For an EGU with a wet scrubber needed for filterable PM control, record the scrubber liquid to fuel ratio and the differential pressure of the liquid during each hour of startup.

(ii) [Reserved]

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23404, Apr. 19, 2012; 79 FR 68790, Nov. 19, 2014]

**§63.10021 How do I demonstrate continuous compliance with the emission limitations, operating limits, and work practice standards?**

(a) You must demonstrate continuous compliance with each emissions limit, operating limit, and work practice standard in Tables 1 through 4 to this subpart that applies to you, according to the monitoring specified in Tables 6 and 7 to this subpart and paragraphs (b) through (g) of this section.

(b) Except as otherwise provided in §63.10020(c), if you use a CEMS to measure $SO_2$, PM, HCl, HF, or Hg emissions, or using a sorbent trap monitoring system to measure Hg emissions, you must demonstrate continuous compliance by using all quality-assured hourly data recorded by the CEMS (or sorbent trap monitoring system) and the other required monitoring systems (e.g., flow rate, $CO_2$, $O_2$, or moisture systems) to calculate the arithmetic average emissions rate in units of the standard on a continuous 30-boiler operating day (or, if alternate emissions averaging is used for Hg, 90-boiler operating day) rolling average basis, updated at the end of each new boiler operating day. Use Equation 8 to determine the 30- (or, if applicable, 90-) boiler operating day rolling average.

$$Boiler\ operating\ day\ average = \frac{\sum_{i=1}^{n} Her_i}{n} \quad (Eq.\ 8)$$

Where:

$Her_i$ is the hourly emissions rate for hour i and n is the number of hourly emissions rate values collected over 30- (or, if applicable, 90-) boiler operating days.

(c) If you use a PM CPMS data to measure compliance with an operating limit in Table 4 to this subpart, you must record the PM CPMS output data for all periods when the process is operating and the PM CPMS is not out-of-control. You must demonstrate continuous compliance by using all quality-assured hourly average data collected by the PM CPMS for all operating hours to calculate the arithmetic average operating parameter in units of the operating limit (e.g., milliamps, PM concentration, raw data signal) on a 30 operating day rolling average basis, updated at the end of each new boiler operating day. Use Equation 9 to determine the 30 boiler operating day average.

$$30\ boiler\ operating\ day\ average = \frac{\sum_{i=1}^{n} Hpv_i}{n} \quad (Eq.\ 9)$$

Where:

$Hpv_i$ is the hourly parameter value for hour i and n is the number of valid hourly parameter values collected over 30 boiler operating days.

(1) For any exceedance of the 30-boiler operating day PM CPMS average value from the established operating parameter limit for an EGU subject to the emissions limits in Table 1 to this subpart, you must:

(i) Within 48 hours of the exceedance, visually inspect the air pollution control device (APCD);

(ii) If the inspection of the APCD identifies the cause of the exceedance, take corrective action as soon as possible, and return the PM CPMS measurement to within the established value; and

(iii) Within 45 days of the exceedance or at the time of the annual compliance test, whichever comes first, conduct a PM emissions compliance test to determine compliance with the PM emissions limit and to verify or re-establish the CPMS operating limit. You are not required to conduct any additional testing for any exceedances that occur between the time of the original exceedance and the PM emissions compliance test required under this paragraph.

(2) PM CPMS exceedances of the operating limit for an EGU subject to the emissions limits in Table 1 of this subpart leading to more than four required performance tests in a 12-month period (rolling monthly) constitute a separate violation of this subpart.

(d) If you use quarterly performance testing to demonstrate compliance with one or more applicable emissions limits in Table 1 or 2 to this subpart, you

(1) May skip performance testing in those quarters during which less than 168 boiler operating hours occur, except that a performance test must be conducted at least once every calendar year.

(2) Must conduct the performance test as defined in Table 5 to this subpart and calculate the results of the testing in units of the applicable emissions standard; and

(3) Must conduct site-specific monitoring for a liquid oil-fired unit to ensure compliance with the HCl and HF emission limits in Tables 1 and 2 to this subpart, in accordance with the requirements of §63.10000(c)(2)(iii). The monitoring must meet the general operating requirements provided in §63.10020(a).

(e) If you must conduct periodic performance tune-ups of your EGU(s), as specified in paragraphs (e)(1) through (9) of this section, perform the first tune-up as part of your initial compliance demonstration. Notwithstanding this requirement, you may delay the first burner inspection until the next scheduled unit outage provided you meet the requirements of §63.10005. Subsequently, you must perform an inspection of the burner at least once every 36 calendar months unless your EGU employs neural network combustion optimization during normal operations in which case you must perform an inspection of the burner and combustion controls at least once every 48 calendar months.

(1) As applicable, inspect the burner and combustion controls, and clean or replace any components of the burner or combustion controls as necessary upon initiation of the work practice program and at least once every required inspection period. Repair of a burner or combustion control component requiring special order parts may be scheduled as follows:

(i) Burner or combustion control component parts needing replacement that affect the ability to optimize $NO_X$ and CO must be installed within 3 calendar months after the burner inspection,

(ii) Burner or combustion control component parts that do not affect the ability to optimize $NO_X$ and CO may be installed on a schedule determined by the operator;

(2) As applicable, inspect the flame pattern and make any adjustments to the burner or combustion controls necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available, or in accordance with best combustion engineering practice for that burner type;

(3) As applicable, observe the damper operations as a function of mill and/or cyclone loadings, cyclone and pulverizer coal feeder loadings, or other pulverizer and coal mill performance parameters, making adjustments and effecting repair to dampers, controls, mills, pulverizers, cyclones, and sensors;

(4) As applicable, evaluate windbox pressures and air proportions, making adjustments and effecting repair to dampers, actuators, controls, and sensors;

(5) Inspect the system controlling the air-to-fuel ratio and ensure that it is correctly calibrated and functioning properly. Such inspection may include calibrating excess $O_2$ probes and/or sensors, adjusting overfire air systems, changing software parameters, and calibrating associated actuators and dampers to ensure that the systems are operated as designed. Any component out of calibration, in or near failure, or in a state that is likely to negate combustion optimization efforts prior to the next tune-up, should be corrected or repaired as necessary;

(6) Optimize combustion to minimize generation of CO and $NO_X$. This optimization should be consistent with the manufacturer's specifications, if available, or best combustion engineering practice for the applicable burner type. $NO_X$ optimization includes burners, overfire air controls, concentric firing system improvements, neural network or combustion efficiency software, control systems calibrations, adjusting combustion zone temperature profiles, and add-on controls such as SCR and SNCR; CO optimization includes burners, overfire air controls, concentric firing system improvements, neural network or combustion efficiency software, control systems calibrations, and adjusting combustion zone temperature profiles;

(7) While operating at full load or the predominantly operated load, measure the concentration in the effluent stream of CO and $NO_X$ in ppm, by volume, and oxygen in volume percent, before and after the tune-up adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made). You may use portable CO, $NO_X$ and $O_2$ monitors for this measurement. EGU's employing neural network optimization systems need only provide a single pre- and post-tune-up value rather than continual values before and after each optimization adjustment made by the system;

(8) Maintain on-site and submit, if requested by the Administrator, an annual report containing the information in paragraphs (e)(1) through (e)(9) of this section including:

(i) The concentrations of CO and $NO_X$ in the effluent stream in ppm by volume, and oxygen in volume percent, measured before and after an adjustment of the EGU combustion systems;

(ii) A description of any corrective actions taken as a part of the combustion adjustment; and

(iii) The type(s) and amount(s) of fuel used over the 12 calendar months prior to an adjustment, but only if the unit was physically and legally capable of using more than one type of fuel during that period; and

(9) Report the dates of the initial and subsequent tune-ups as follows:

(i) If the first required tune-up is performed as part of the initial compliance demonstration, report the date of the tune-up in hard copy (as specified in §63.10030) and electronically (as specified in §63.10031). Report the date of each subsequent tune-up electronically (as specified in §63.10031).

(ii) If the first tune-up is not conducted as part of the initial compliance demonstration, but is postponed until the next unit outage, report the date of that tune-up and all subsequent tune-ups electronically, in accordance with §63.10031.

(f) You must submit the reports required under §63.10031 and, if applicable, the reports required under appendices A and B to this subpart. The electronic reports required by appendices A and B to this subpart must be sent to the Administrator electronically in a format prescribed by the Administrator, as provided in §63.10031. CEMS data (except for PM CEMS and any approved alternative monitoring using a HAP metals CEMS) shall be submitted using EPA's Emissions Collection and Monitoring Plan System (ECMPS) Client Tool. Other data, including PM CEMS data, HAP metals CEMS data, and CEMS performance test detail reports, shall be submitted in the file format generated through use of EPA's Electronic Reporting Tool, the Compliance and Emissions Data Reporting Interface, or alternate electronic file format, all as provided for under §63.10031.

(g) You must report each instance in which you did not meet an applicable emissions limit or operating limit in Tables 1 through 4 to this subpart or failed to conduct a required tune-up. These instances are deviations from the requirements of this subpart. These deviations must be reported according to §63.10031.

(h) You must follow the startup or shutdown requirements as given in Table 3 to this subpart for each coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGU.

(1) You may use the diluent cap and default electrical load values, as described in §63.10007(f), during startup periods or shutdown periods.

(2) You must operate all CMS, collect data, calculate pollutant emission rates, and record data during startup periods or shutdown periods.

(3) You must report the information as required in §63.10031.

(4) You may choose to submit an alternative non-opacity emission standard, in accordance with the requirements contained in §63.10011(g)(4). Until promulgation in the FEDERAL REGISTER of the final alternative non-opacity emission standard, you shall comply with paragraph (1) of the definition of “startup” in §63.10042.

(i) You must provide reports as specified in §63.10031 concerning activities and periods of startup and shutdown.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23404, Apr. 19, 2012; 78 FR 24086, Apr. 24, 2013; 79 FR 68791, Nov. 19, 2014]

**§63.10022 How do I demonstrate continuous compliance under the emissions averaging provision?**

(a) Following the compliance date, the owner or operator must demonstrate compliance with this subpart on a continuous basis by meeting the requirements of paragraphs (a)(1) through (4) of this section.

(1) For each 30- (or 90-) day rolling average period, demonstrate compliance with the average weighted emissions limit for the existing units participating in the emissions averaging option as determined in §63.10009(f) and (g);

(2) For each existing unit participating in the emissions averaging option that is equipped with PM CPMS, maintain the average parameter value at or below the operating limit established during the most recent performance test;

(3) For each existing unit participating in the emissions averaging option venting to a common stack configuration containing affected units from other subcategories, maintain the appropriate operating limit for each unit as specified in Table 4 to this subpart that applies.

(4) For each existing EGU participating in the emissions averaging option, operate in accordance with the startup or shutdown work practice requirements given in Table 3 to this subpart.

(b) Any instance where the owner or operator fails to comply with the continuous monitoring requirements in paragraphs (a)(1) through (3) of this section is a deviation.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23404, Apr. 19, 2012; 79 FR 68791, Nov. 19, 2014]

**§63.10023 How do I establish my PM CPMS operating limit and determine compliance with it?**

(a) During the initial performance test or any such subsequent performance test that demonstrates compliance with the filterable PM, individual non-mercury HAP metals, or total non-mercury HAP metals limit (or for liquid oil-fired units, individual HAP metals or total HAP metals limit, including Hg) in Table 1 or 2, record all hourly average output values (e.g., milliamps, stack concentration, or other raw data signal) from the PM CPMS for the periods corresponding to the test runs (e.g., nine 1-hour average PM CPMS output values for three 3-hour test runs).

(b) Determine your operating limit as provided in paragraph (b)(1) or (b)(2) of this section. You must verify an existing or establish a new operating limit after each repeated performance test.

(1) For an existing EGU, determine your operating limit based on the highest 1-hour average PM CPMS output value recorded during the performance test.

(2) For a new EGU, determine your operating limit as follows.

(i) If your PM performance test demonstrates your PM emissions do not exceed 75 percent of your emissions limit, you will use the average PM CPMS value recorded during the PM compliance test, the milliamp equivalent of zero output from your PM CPMS, and the average PM result of your compliance test to establish your operating limit. Calculate the operating limit by establishing a relationship of PM CPMS signal to PM concentration using the PM CPMS instrument zero, the average PM CPMS values corresponding to the three compliance test runs, and the average PM concentration from the Method 5 compliance test with the procedures in (b)(2)(i)(A) through (D) of this section.

(A) Determine your PM CPMS instrument zero output with one of the following procedures.

(*1*) Zero point data for in-situ instruments should be obtained by removing the instrument from the stack and monitoring ambient air on a test bench.

(*2*) Zero point data for extractive instruments should be obtained by removing the extractive probe from the stack and drawing in clean ambient air.

(*3*) The zero point can also can be obtained by performing manual reference method measurements when the flue gas is free of PM emissions or contains very low PM concentrations (e.g., when your process is not operating, but the fans are operating or your source is combusting only natural gas) and plotting these with the compliance data to find the zero intercept.

(*4*) If none of the steps in paragraphs (A)(*1*) through (*3*) of this section are possible, you must use a zero output value provided by the manufacturer.

(B) Determine your PM CPMS instrument average (*x*) in milliamps, and the average of your corresponding three PM compliance test runs (*y*), using equation 10.

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} X_i, \bar{y} = \frac{1}{n}\sum_{i=1}^{n} Y_i \qquad \text{(Eq. 10)}$$

Where:

$X_i$ = the PM CPMS data points for run i of the performance test,

$Y_i$ = the PM emissions value (in lb/MWh) for run i of the performance test, and

n = the number of data points.

(C) With your PM CPMS instrument zero expressed in milliamps, your three run average PM CPMS milliamp value, and your three run average PM emissions value (in lb/MWh) from your compliance runs, determine a relationship of PM lb/MWh per milliamp with equation 11.

$$R = \frac{y}{(x - z)} \qquad \text{(Eq. 11)}$$

Where:

R = the relative PM lb/MWh per milliamp for your PM CPMS,

$\bar{y}$ = the three run average PM lb/MWh,

$\bar{y}x$ = the three run average milliamp output from your PM CPMS, and

z = the milliamp equivalent of your instrument zero determined from (b)(2)(i)(A) of this section.

(D) Determine your source specific 30-day rolling average operating limit using the PM lb/MWh per milliamp value from equation 11 in equation 12, below. This sets your operating limit at the PM CPMS output value corresponding to 75 percent of your emission limit.

$$O_L = z + \frac{(0.75 \times L)}{R} \quad \text{(Eq. 12)}$$

Where:

$O_L$ = the operating limit for your PM CPMS on a 30-day rolling average, in milliamps,

L = your source PM emissions limit in lb/MWh,

z = your instrument zero in milliamps, determined from (b)(2)(i)(A) of this section, and

R = the relative PM lb/MWh per milliamp for your PM CPMS, from equation 11.

(ii) If your PM compliance test demonstrates your PM emissions exceed 75 percent of your emissions limit, you will use the average PM CPMS value recorded during the PM compliance test demonstrating compliance with the PM limit to establish your operating limit.

(A) Determine your operating limit by averaging the PM CPMS milliamp output corresponding to your three PM performance test runs that demonstrate compliance with the emission limit using equation 13.

$$O_h = \frac{1}{n}\sum_{i=1}^{n} X_i \quad \text{(Eq. 13)}$$

Where:

$X_i$ = the PM CPMS data points for all runs i,

n = the number of data points, and

$O_h$ = your site specific operating limit, in milliamps.

(iii) Your PM CPMS must provide a 4-20 milliamp output and the establishment of its relationship to manual reference method measurements must be determined in units of milliamps.

(iv) Your PM CPMS operating range must be capable of reading PM concentrations from zero to a level equivalent to two times your allowable emission limit. If your PM CPMS is an auto-ranging instrument capable of multiple scales, the primary range of the instrument must be capable of reading PM concentration from zero to a level equivalent to two times your allowable emission limit.

(v) During the initial performance test or any such subsequent performance test that demonstrates compliance with the PM limit, record and average all milliamp output values from the PM CPMS for the periods corresponding to the compliance test runs.

(vi) For PM performance test reports used to set a PM CPMS operating limit, the electronic submission of the test report must also include the make and model of the PM CPMS instrument, serial number of the instrument, analytical principle of the instrument (e.g. beta attenuation), span of the instruments primary analytical range, milliamp value equivalent to the instrument zero output, technique by which this zero value was determined, and the average milliamp signal corresponding to each PM compliance test run.

(c) You must operate and maintain your process and control equipment such that the 30 operating day average PM CPMS output does not exceed the operating limit determined in paragraphs (a) and (b) of this section.

[77 FR 9464, Feb. 16, 2012, as amended at 78 FR 24086, Apr. 24, 2013]

**Notification, Reports, and Records**

**§63.10030   What notifications must I submit and when?**

(a) You must submit all of the notifications in §§63.7(b) and (c), 63.8 (e), (f)(4) and (6), and 63.9 (b) through (h) that apply to you by the dates specified.

(b) As specified in §63.9(b)(2), if you startup your EGU that is an affected source before April 16, 2012, you must submit an Initial Notification not later than 120 days after April 16, 2012.

(c) As specified in §63.9(b)(4) and (b)(5), if you startup your new or reconstructed EGU that is an affected source on or after April 16, 2012, you must submit an Initial Notification not later than 15 days after the actual date of startup of the EGU that is an affected source.

(d) When you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 30 days before the performance test is scheduled to begin.

(e) When you are required to conduct an initial compliance demonstration as specified in §63.10011(a), you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii). The Notification of Compliance Status report must contain all the information specified in paragraphs (e)(1) through (8) of this section, as applicable.

(1) A description of the affected source(s) including identification of which subcategory the source is in, the design capacity of the source, a description of the add-on controls used on the source, description of the fuel(s) burned, including whether the fuel(s) were determined by you or EPA through a petition process to be a non-waste under 40 CFR 241.3, whether the fuel(s) were processed from discarded non-hazardous secondary materials within the meaning of 40 CFR 241.3, and justification for the selection of fuel(s) burned during the performance test.

(2) Summary of the results of all performance tests and fuel analyses and calculations conducted to demonstrate initial compliance including all established operating limits.

(3) Identification of whether you plan to demonstrate compliance with each applicable emission limit through performance testing; fuel moisture analyses; performance testing with operating limits (e.g., use of PM CPMS); CEMS; or a sorbent trap monitoring system.

(4) Identification of whether you plan to demonstrate compliance by emissions averaging.

(5) A signed certification that you have met all applicable emission limits and work practice standards.

(6) If you had a deviation from any emission limit, work practice standard, or operating limit, you must also submit a brief description of the deviation, the duration of the deviation, emissions point identification, and the cause of the deviation in the Notification of Compliance Status report.

(7) In addition to the information required in §63.9(h)(2), your notification of compliance status must include the following:

(i) A summary of the results of the annual performance tests and documentation of any operating limits that were reestablished during this test, if applicable. If you are conducting stack tests once every 3 years consistent with §63.10006(b), the date of the last three stack tests, a comparison of the emission level you achieved in the last three stack tests to the 50 percent emission limit threshold required in §63.10006(i), and a statement as to whether there have been any operational changes since the last stack test that could increase emissions.

(ii) Certifications of compliance, as applicable, and must be signed by a responsible official stating:

(A) "This EGU complies with the requirements in §63.10021(a) to demonstrate continuous compliance." and

(B) "No secondary materials that are solid waste were combusted in any affected unit."

(8) Identification of whether you plan to rely on paragraph (1) or (2) of the definition of "startup" in §63.10042.

(i) Should you choose to rely on paragraph (2) of the definition of "startup" in §63.10042 for your EGU, you shall include a report that identifies:

(A) The original EGU installation date;

(B) The original EGU design characteristics, including, but not limited to, fuel and PM controls;

(C) Each design PM control device efficiency;

(D) The design PM emission rate from the EGU in terms of pounds PM per MMBtu and pounds PM per hour;

(E) The design time from start of fuel combustion to necessary conditions for each PM control device startup;

(F) Each design PM control device efficiency upon startup of the PM control device;

(G) The design EGU uncontrolled PM emission rate in terms of pounds PM per hour;

(H) Each change from the original design that did or could have changed PM emissions, including, but not limited to, each different fuel mix, each revision to each PM control device, and each EGU revision, along with the month and year that the change occurred;

(I) Current EGU PM producing characteristics, including, but not limited to, fuel mix and PM controls;

(J) Current PM emission rate from the EGU in terms of pounds PM per MMBtu and pounds per hour;

(K) Current PM control device efficiency from each PM control device;

(L) Current time from start of fuel combustion to conditions necessary for each PM control device startup;

(M) Current PM control device efficiency upon startup of each PM control device; and

(N) Current EGU uncontrolled PM emission rate in terms of pounds PM per hour.

(ii) The report shall be prepared, signed, and sealed by a professional engineer licensed in the state where your EGU is located. Apart from preparing, signing, and sealing this report, the professional engineer shall be independent and not otherwise employed by your company, any parent company of your company, or any subsidiary of your company.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23404, Apr. 19, 2012; 78 FR 24087, Apr. 24, 2013; 79 FR 68791, Nov. 19, 2014]

**§63.10031 What reports must I submit and when?**

(a) You must submit each report in Table 8 to this subpart that applies to you. If you are required to (or elect to) continuously monitor Hg and/or HCl and/or HF emissions, you must also submit the electronic reports required under appendix A and/or appendix B to the subpart, at the specified frequency.

(b) Unless the Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report by the date in Table 8 to this subpart and according to the requirements in paragraphs (b)(1) through (5) of this section.

(1) The first compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.9984 and ending on June 30 or December 31, whichever date is the first date that occurs at least 180 days after the compliance date that is specified for your source in §63.9984.

(2) The first compliance report must be postmarked or submitted electronically no later than July 31 or January 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for your source in §63.9984.

(3) Each subsequent compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) Each subsequent compliance report must be postmarked or submitted electronically no later than July 31 or January 31, whichever date is the first date following the end of the semiannual reporting period.

(5) For each affected source that is subject to permitting regulations pursuant to part 70 or part 71 of this chapter, and if the permitting authority has established dates for submitting semiannual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), you may submit the first and subsequent compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (b)(1) through (4) of this section.

(c) The compliance report must contain the information required in paragraphs (c)(1) through (5) of this section.

(1) The information required by the summary report located in 63.10(e)(3)(vi).

(2) The total fuel use by each affected source subject to an emission limit, for each calendar month within the semiannual reporting period, including, but not limited to, a description of the fuel, whether the fuel has received a non-waste determination by EPA or your basis for concluding that the fuel is not a waste, and the total fuel usage amount with units of measure.

(3) Indicate whether you burned new types of fuel during the reporting period. If you did burn new types of fuel you must include the date of the performance test where that fuel was in use.

(4) Include the date of the most recent tune-up for each unit subject to the requirement to conduct a performance tune-up according to §63.10021(e). Include the date of the most recent burner inspection if it was not done every 36 (or 48) months and was delayed until the next scheduled unit shutdown.

(5) For each instance of startup or shutdown:

(i) Include the maximum clean fuel storage capacity and the maximum hourly heat input that can be provided for each clean fuel determined according to the requirements of §63.10032(f).

(ii) Include the information required to be monitored, collected, or recorded according to the requirements of §63.10020(e).

(iii) If you choose to use CEMS for compliance purposes, include hourly average CEMS values and hourly average flow rates. Use units of milligrams per cubic meter for PM CEMS, micrograms per cubic meter for Hg CEMS, and ppmv for HCl, HF, or $SO_2$ CEMS. Use units of standard cubic meters per hour on a wet basis for flow rates.

(iv) If you choose to use a separate sorbent trap measurement system for startup or shutdown reporting periods, include hourly average mercury concentration in terms of micrograms per cubic meter.

(v) If you choose to use a PM CPMS, include hourly average operating parameter values in terms of the operating limit, as well as the operating parameter to PM correlation equation.

(d) For each excess emissions occurring at an affected source where you are using a CMS to comply with that emission limit or operating limit, you must include the information required in §63.10(e)(3)(v) in the compliance report specified in section (c).

(e) Each affected source that has obtained a Title V operating permit pursuant to part 70 or part 71 of this chapter must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A). If an affected source submits a compliance report pursuant to Table 8 to this subpart along with, or as part of, the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), and the compliance report includes all required information concerning deviations from any emission limit, operating limit, or work practice requirement in this subpart, submission of the compliance report satisfies any obligation to report the same deviations in the semiannual monitoring report. Submission of a compliance report does not otherwise affect any obligation the affected source may have to report deviations from permit requirements to the permit authority.

(f) On or after April 16, 2017, within 60 days after the date of completing each performance test, you must submit the performance test reports required by this subpart to EPA's WebFIRE database by using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (*www.epa.gov/cdx*). Performance test data must be submitted in the file format generated through use of EPA's Electronic Reporting Tool (ERT) (see *http://www.epa.gov/ttn/chief/ert/index.html*). Only data collected using those test methods on the ERT Web site are subject to this requirement for submitting reports electronically to WebFIRE. Owners or operators who claim that some of the information being submitted for performance tests is confidential business information (CBI) must submit a complete ERT file including information claimed to be CBI on a compact disk or other commonly used electronic storage media (including, but not limited to, flash drives) to EPA. The electronic media must be clearly marked as CBI and mailed to U.S. EPA/OAPQS/CORE CBI Office, Attention: WebFIRE Administrator, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. The same ERT file with the CBI omitted must be submitted to EPA via CDX as described earlier in this paragraph. At the discretion of the delegated authority, you must also submit these reports, including the confidential business information, to the delegated authority in the format specified by the delegated authority.

(1) On or after April 16, 2017, within 60 days after the date of completing each CEMS ($SO_2$, PM, HCl, HF, and Hg) performance evaluation test, as defined in §63.2 and required by this subpart, you must submit the relative accuracy test audit (RATA) data (or, for PM CEMS, RCA and RRA data) required by this subpart to EPA's WebFIRE database by using CEDRI that is accessed through EPA's CDX (*www.epa.gov/cdx*). The RATA data shall be submitted in the file format generated through use of EPA's Electronic Reporting Tool (ERT) (*http://www.epa.gov/ttn/chief/ert/index.html*). Only RATA data compounds listed on the ERT Web site are subject to this requirement. Owners or operators who claim that some of the information being submitted for RATAs is confidential business information (CBI) shall submit a complete ERT file including information claimed to be CBI on a compact disk or other commonly used electronic storage media (including, but not limited to, flash drives) by registered letter to EPA and the same ERT file with the CBI omitted to EPA via CDX as described earlier in this paragraph. The compact disk or other commonly used electronic storage media shall be clearly marked as CBI and mailed to U.S. EPA/OAPQS/CORE CBI Office, Attention: WebFIRE Administrator, MD C404-02, 4930 Old Page Rd., Durham, NC 27703. At the discretion of the delegated authority, owners or operators shall also submit these RATAs to the delegated authority in the format specified by the delegated authority. Owners or operators shall submit calibration error testing, drift checks, and other information required in the performance evaluation as described in §63.2 and as required in this chapter.

(2) On or after April 16, 2017, for a PM CEMS, PM CPMS, or approved alternative monitoring using a HAP metals CEMS, within 60 days after the reporting periods ending on March 31st, June 30th, September 30th, and December 31st, you must submit quarterly reports to EPA's WebFIRE database by using the CEDRI that is accessed through EPA's CDX (*www.epa.gov/cdx*). You must use the appropriate electronic reporting form in CEDRI or provide an

alternate electronic file consistent with EPA's reporting form output format. For each reporting period, the quarterly reports must include all of the calculated 30-boiler operating day rolling average values derived from the CEMS and PM CPMS.

(3) Reports for an $SO_2$ CEMS, a Hg CEMS or sorbent trap monitoring system, an HCl or HF CEMS, and any supporting monitors for such systems (such as a diluent or moisture monitor) shall be submitted using the ECMPS Client Tool, as provided for in Appendices A and B to this subpart and §63.10021(f).

(4) On or after April 16, 2017, submit the compliance reports required under paragraphs (c) and (d) of this section and the notification of compliance status required under §63.10030(e) to EPA's WebFIRE database by using the CEDRI that is accessed through EPA's CDX (*www.epa.gov/cdx*). You must use the appropriate electronic reporting form in CEDRI or provide an alternate electronic file consistent with EPA's reporting form output format.

(5) All reports required by this subpart not subject to the requirements in paragraphs (f) introductory text and (f)(1) through (4) of this section must be sent to the Administrator at the appropriate address listed in §63.13. If acceptable to both the Administrator and the owner or operator of an EGU, these reports may be submitted on electronic media. The Administrator retains the right to require submittal of reports subject to paragraphs (f) introductory text and (f)(1) through (4) of this section in paper format.

(6) Prior to April 16, 2017, all reports subject to electronic submittal in paragraphs (f) introductory text, (f)(1), (2), and (4) shall be submitted to the EPA at the frequency specified in those paragraphs in electronic portable document format (PDF) using the ECMPS Client Tool. Each PDF version of a submitted report must include sufficient information to assess compliance and to demonstrate that the testing was done properly. The following data elements must be entered into the ECMPS Client Tool at the time of submission of each PDF file:

(i) The facility name, physical address, mailing address (if different from the physical address), and county;

(ii) The ORIS code (or equivalent ID number assigned by EPA's Clean Air Markets Division (CAMD)) and the Facility Registry System (FRS) ID;

(iii) The EGU (or EGUs) to which the report applies. Report the EGU IDs as they appear in the CAMD Business System;

(iv) If any of the EGUs in paragraph (f)(6)(iii) of this section share a common stack, indicate which EGUs share the stack. If emissions data are monitored and reported at the common stack according to part 75 of this chapter, report the ID number of the common stack as it is represented in the electronic monitoring plan required under §75.53 of this chapter;

(v) If any of the EGUs described in paragraph (f)(6)(iii) of this section are in an averaging plan under §63.10009, indicate which EGUs are in the plan and whether it is a 30- or 90-day averaging plan;

(vi) The identification of each emission point to which the report applies. An “emission point” is a point at which source effluent is released to the atmosphere, and is either a dedicated stack that serves one of the EGUs identified in paragraph (f)(6)(iii) of this section or a common stack that serves two or more of those EGUs. To identify an emission point, associate it with the EGU or stack ID in the CAMD Business system or the electronic monitoring plan (*e.g.,* “Unit 2 stack,” “common stack CS001,” or “multiple stack MS001”);

(vii) The rule citation (*e.g.,* §63.10031(f)(1), §63.10031(f)(2), etc.) for which the report is showing compliance;

(viii) The pollutant(s) being addressed in the report;

(ix) The reporting period being covered by the report (if applicable);

(x) The relevant test method that was performed for a performance test (if applicable);

(xi) The date the performance test was conducted (if applicable); and

(xii) The responsible official's name, title, and phone number.

(g) If you had a malfunction during the reporting period, the compliance report must include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23404, Apr. 19, 2012; 79 FR 68791, Nov. 19, 2014; 79 FR 68799, Nov. 19, 2014; 80 FR 15514, Mar. 24, 2015]

**§63.10032 What records must I keep?**

(a) You must keep records according to paragraphs (a)(1) and (2) of this section. If you are required to (or elect to) continuously monitor Hg and/or HCl and/or HF emissions, you must also keep the records required under appendix A and/or appendix B to this subpart.

(1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status or semiannual compliance report that you submitted, according to the requirements in §63.10(b)(2)(xiv).

(2) Records of performance stack tests, fuel analyses, or other compliance demonstrations and performance evaluations, as required in §63.10(b)(2)(viii).

(b) For each CEMS and CPMS, you must keep records according to paragraphs (b)(1) through (4) of this section.

(1) Records described in §63.10(b)(2)(vi) through (xi).

(2) Previous (*i.e.*, superseded) versions of the performance evaluation plan as required in §63.8(d)(3).

(3) Request for alternatives to relative accuracy test for CEMS as required in §63.8(f)(6)(i).

(4) Records of the date and time that each deviation started and stopped, and whether the deviation occurred during a period of startup, shutdown, or malfunction or during another period.

(c) You must keep the records required in Table 7 to this subpart including records of all monitoring data and calculated averages for applicable PM CPMS operating limits to show continuous compliance with each emission limit and operating limit that applies to you.

(d) For each EGU subject to an emission limit, you must also keep the records in paragraphs (d)(1) through (3) of this section.

(1) You must keep records of monthly fuel use by each EGU, including the type(s) of fuel and amount(s) used.

(2) If you combust non-hazardous secondary materials that have been determined not to be solid waste pursuant to 40 CFR 241.3(b)(1), you must keep a record which documents how the secondary material meets each of the legitimacy criteria. If you combust a fuel that has been processed from a discarded non-hazardous secondary material pursuant to 40 CFR 241.3(b)(2), you must keep records as to how the operations that produced the fuel satisfies the definition of processing in 40 CFR 241.2. If the fuel received a non-waste determination pursuant to the petition process submitted under 40 CFR 241.3(c), you must keep a record which documents how the fuel satisfies the requirements of the petition process.

(3) For an EGU that qualifies as an LEE under §63.10005(h), you must keep annual records that document that your emissions in the previous stack test(s) continue to qualify the unit for LEE status for an applicable pollutant, and document that there was no change in source operations including fuel composition and operation of air pollution control equipment that would cause emissions of the pollutant to increase within the past year.

(e) If you elect to average emissions consistent with §63.10009, you must additionally keep a copy of the emissions averaging implementation plan required in §63.10009(g), all calculations required under §63.10009, including daily records of heat input or steam generation, as applicable, and monitoring records consistent with §63.10022.

(f) Regarding startup periods or shutdown periods:

(1) You must keep records of the occurrence and duration of each startup or shutdown;

(2) You must keep records of the determination of the maximum clean fuel capacity for each EGU;

(3) You must keep records of the determination of the maximum hourly clean fuel heat input and of the hourly clean fuel heat input for each EGU; and

(4) You must keep records of the information required in §63.10020(e).

(g) You must keep records of the occurrence and duration of each malfunction of an operation (*i.e.*, process equipment) or the air pollution control and monitoring equipment.

(h) You must keep records of actions taken during periods of malfunction to minimize emissions in accordance with §63.10000(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(i) You must keep records of the type(s) and amount(s) of fuel used during each startup or shutdown.

(j) If you elect to establish that an EGU qualifies as a limited-use liquid oil-fired EGU, you must keep records of the type(s) and amount(s) of fuel use in each calendar quarter to document that the capacity factor limitation for that subcategory is met.

[77 FR 9464, Feb. 16, 2012, as amended at 79 FR 68792, Nov. 19, 2014]

**§63.10033 In what form and how long must I keep my records?**

(a) Your records must be in a form suitable and readily available for expeditious review, according to §63.10(b)(1).

(b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record on site for at least 2 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1). You can keep the records off site for the remaining 3 years.

**Other Requirements and Information**

**§63.10040 What parts of the General Provisions apply to me?**

Table 9 to this subpart shows which parts of the General Provisions in §§63.1 through 63.15 apply to you.

**§63.10041 Who implements and enforces this subpart?**

(a) This subpart can be implemented and enforced by U.S. EPA, or a delegated authority such as your state, local, or tribal agency. If the EPA Administrator has delegated authority to your state, local, or tribal agency, then that agency (as well as the U.S. EPA) has the authority to implement and enforce this subpart. You should contact your EPA Regional Office to find out if this subpart is delegated to your state, local, or tribal agency.

(b) In delegating implementation and enforcement authority of this subpart to a state, local, or tribal agency under 40 CFR part 63, subpart E, the authorities listed in paragraphs (b)(1) through (4) of this section are retained by the EPA Administrator and are not transferred to the state, local, or tribal agency; moreover, the U.S. EPA retains oversight of this subpart and can take enforcement actions, as appropriate, with respect to any failure by any person to comply with any provision of this subpart.

(1) Approval of alternatives to the non-opacity emission limits and work practice standards in §63.9991(a) and (b) under §63.6(g).

(2) Approval of major change to test methods in Table 5 to this subpart under §63.7(e)(2)(ii) and (f) and as defined in §63.90, approval of minor and intermediate changes to monitoring performance specifications/procedures in Table 5 where the monitoring serves as the performance test method (see definition of "test method" in §63.2.

(3) Approval of major changes to monitoring under §63.8(f) and as defined in §63.90.

(4) Approval of major change to recordkeeping and reporting under §63.10(e) and as defined in §63.90.

**§63.10042 What definitions apply to this subpart?**

Terms used in this subpart are defined in the Clean Air Act (CAA), in §63.2 (the General Provisions), and in this section as follows:

*Affirmative defense* means, in the context of an enforcement proceeding, a response or defense put forward by a defendant, regarding which the defendant has the burden of proof, and the merits of which are independently and objectively evaluated in a judicial or administrative proceeding.

*Anthracite coal* means solid fossil fuel classified as anthracite coal by American Society of Testing and Materials (ASTM) Method D388-05, "Standard Classification of Coals by Rank" (incorporated by reference, see §63.14).

*Bituminous coal* means coal that is classified as bituminous according to ASTM Method D388-05, "Standard Classification of Coals by Rank" (incorporated by reference, see §63.14).

*Boiler operating day* means a 24-hour period that begins at midnight and ends the following midnight during which any fuel is combusted at any time in the EGU, excluding startup periods or shutdown periods. It is not necessary for the fuel to be combusted the entire 24-hour period.

*Capacity factor* for a liquid oil-fired EGU means the total annual heat input from oil divided by the product of maximum hourly heat input for the EGU, regardless of fuel, multiplied by 8,760 hours.

*Clean fuel* means natural gas, synthetic natural gas that meets the specification necessary for that gas to be transported on a Federal Energy Regulatory Commission (FERC) regulated pipeline, propane, distillate oil, synthesis gas that has been processed through a gas clean-up train such that it could be used in a system's combustion turbine, or ultra-low-sulfur diesel (ULSD) oil, including those fuels meeting the requirements of 40 CFR part 80, subpart I ("Subpart I—Motor Vehicle Diesel Fuel; Nonroad, Locomotive, and Marine Diesel Fuel; and ECA Marine Fuel").

*Coal* means all solid fuels classifiable as anthracite, bituminous, sub-bituminous, or lignite by ASTM Method D388-05, "Standard Classification of Coals by Rank" (incorporated by reference, see §63.14), and coal refuse. Synthetic fuels derived from coal for the purpose of creating useful heat including but not limited to, coal derived gases (not meeting the definition of natural gas), solvent-refined coal, coal-oil mixtures, and coal-water mixtures, are considered "coal" for the purposes of this subpart.

*Coal-fired electric utility steam generating unit* means an electric utility steam generating unit meeting the definition of "fossil fuel-fired" that burns coal for more than 10.0 percent of the average annual heat input during any 3 consecutive calendar years or for more than 15.0 percent of the annual heat input during any one calendar year.

*Coal refuse* means any by-product of coal mining, physical coal cleaning, and coal preparation operations (e.g., culm, gob, etc.) containing coal, matrix material, clay, and other organic and inorganic material with an ash content greater than 50 percent (by weight) and a heating value less than 13,900 kilojoules per kilogram (6,000 Btu per pound) on a dry basis.

*Cogeneration* means a steam-generating unit that simultaneously produces both electrical and useful thermal (or mechanical) energy from the same primary energy source.

*Cogeneration unit* means a stationary, fossil fuel-fired EGU meeting the definition of “fossil fuel-fired” or stationary, integrated gasification combined cycle:

(1) Having equipment used to produce electricity and useful thermal energy for industrial, commercial, heating, or cooling purposes through the sequential use of energy; and

(2) Producing during the 12-month period starting on the date the unit first produces electricity and during any calendar year after which the unit first produces electricity:

(i) For a topping-cycle cogeneration unit,

(A) Useful thermal energy not less than 5 percent of total energy output; and

(B) Useful power that, when added to one-half of useful thermal energy produced, is not less than 42.5 percent of total energy input, if useful thermal energy produced is 15 percent or more of total energy output, or not less than 45 percent of total energy input, if useful thermal energy produced is less than 15 percent of total energy output.

(ii) For a bottoming-cycle cogeneration unit, useful power not less than 45 percent of total energy input.

(3) Provided that the total energy input under paragraphs (2)(i)(B) and (2)(ii) of this definition shall equal the unit's total energy input from all fuel except biomass if the unit is a boiler.

*Combined-cycle gas stationary combustion turbine* means a stationary combustion turbine system where heat from the turbine exhaust gases is recovered by a waste heat boiler.

*Common stack* means the exhaust of emissions from two or more affected units through a single flue.

*Continental liquid oil-fired subcategory* means any oil-fired electric utility steam generating unit that burns liquid oil and is located in the continental United States.

*Default electrical load* means an electrical load equal to 5 percent of the maximum sustainable electrical output (megawatts), as defined in section 6.5.2.1(a)(1) of Appendix A to part 75 of this chapter, of an affected EGU that is in startup or shutdown mode. For monitored common stack configurations, the default electrical load is 5 percent of the combined maximum sustainable electrical load of the EGUs that are in startup or shutdown mode during an hour in which the electrical load for all operating EGUs is zero. The default electrical load is used to calculate the electrical output-based emission rate (lb/MWh or lb/GWh, as applicable) for any startup or shutdown hour in which the actual electrical load is zero. The default electrical load is not used for EGUs required to make heat input-based emission rate (lb/MMBtu or lb/TBtu, as applicable) calculations. For the purposes of this subpart, the default electrical load is not considered to be a substitute data value.

*Deviation.* (1) *Deviation* means any instance in which an affected source subject to this subpart, or an owner or operator of such a source:

(i) Fails to meet any requirement or obligation established by this subpart including, but not limited to, any emission limit, operating limit, work practice standard, or monitoring requirement; or

(ii) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit.

(2) A deviation is not always a violation. The determination of whether a deviation constitutes a violation of the standard is up to the discretion of the entity responsible for enforcement of the standards.

*Diluent cap* means a default $CO_2$ or $O_2$ concentration that may be used to calculate the Hg, HCl, HF, or $SO_2$ emission rate (lb/MMBtu or lb/TBtu, as applicable) during a startup or shutdown hour in which the measured $CO_2$ concentration is below the cap value or the measured $O_2$ concentration is above the cap value. The appropriate diluent cap values for EGUs are presented in §63.10007(f) and in section 6.2.1.2 of Appendix A to this subpart. For the purposes of this subpart, the diluent cap is not considered to be a substitute data value.

*Distillate oil* means fuel oils, including recycled oils, that comply with the specifications for fuel oil numbers 1 and 2, as defined by ASTM Method D396-10, "Standard Specification for Fuel Oils" (incorporated by reference, see §63.14).

*Dry flue gas desulfurization technology,* or *dry FGD,* or *spray dryer absorber* (*SDA*), or *spray dryer,* or *dry scrubber* means an add-on air pollution control system located downstream of the steam generating unit that injects a dry alkaline sorbent (dry sorbent injection) or sprays an alkaline sorbent slurry (spray dryer) to react with and neutralize acid gases such as $SO_2$ and HCl in the exhaust stream forming a dry powder material. Alkaline sorbent injection systems in fluidized bed combustors (FBC) or circulating fluidized bed (CFB) boilers are included in this definition.

*Dry sorbent injection* (DSI) means an add-on air pollution control system in which sorbent (e.g., conventional activated carbon, brominated activated carbon, Trona, hydrated lime, sodium carbonate, etc.) is injected into the flue gas steam upstream of a PM control device to react with and neutralize acid gases (such as $SO_2$ and HCl) or Hg in the exhaust stream forming a dry powder material that may be removed in a primary or secondary PM control device.

*Electric Steam generating unit* means any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam (including fossil-fuel-fired steam generators associated with integrated gasification combined cycle gas turbines; nuclear steam generators are not included) for the purpose of powering a generator to produce electricity or electricity and other thermal energy.

*Electric utility steam generating unit (EGU)* means a fossil fuel-fired combustion unit of more than 25 megawatts electric (MWe) that serves a generator that produces electricity for sale. A fossil fuel-fired unit that cogenerates steam and electricity and supplies more than one-third of its potential electric output capacity and more than 25 MWe output to any utility power distribution system for sale is considered an electric utility steam generating unit.

*Emission limitation* means any emissions limit, work practice standard, or operating limit.

*Excess emissions* means, with respect to this subpart, results of any required measurements outside the applicable range (e.g., emissions limitations, parametric operating limits) that is permitted by this subpart. The values of measurements will be in the same units and averaging time as the values specified in this subpart for the limitations.

*Federally enforceable* means all limitations and conditions that are enforceable by the Administrator, including the requirements of 40 CFR parts 60, 61, and 63; requirements within any applicable state implementation plan; and any permit requirements established under 40 CFR 52.21 or under 40 CFR 51.18 and 40 CFR 51.24.

*Flue gas desulfurization system* means any add-on air pollution control system located downstream of the steam generating unit whose purpose or effect is to remove at least 50 percent of the $SO_2$ in the exhaust gas stream.

*Fossil fuel* means natural gas, oil, coal, and any form of solid, liquid, or gaseous fuel derived from such material.

*Fossil fuel-fired* means an electric utility steam generating unit (EGU) that is capable of combusting more than 25 MW of fossil fuels. To be "capable of combusting" fossil fuels, an EGU would need to have these fuels allowed in its operating permit and have the appropriate fuel handling facilities on-site or otherwise available (e.g., coal handling equipment, including coal storage area, belts and conveyers, pulverizers, etc.; oil storage facilities). In addition, fossil fuel-fired means any EGU that fired fossil fuels for more than 10.0 percent of the average annual heat input during any 3 consecutive calendar years or for more than 15.0 percent of the annual heat input during any one calendar year after the applicable compliance date.

*Fuel type* means each category of fuels that share a common name or classification. Examples include, but are not limited to, bituminous coal, subbituminous coal, lignite, anthracite, biomass, and residual oil. Individual fuel types received from different suppliers are not considered new fuel types.

*Fluidized bed boiler,* or *fluidized bed combustor,* or *circulating fluidized boiler,* or *CFB* means a boiler utilizing a fluidized bed combustion process.

*Fluidized bed combustion* means a process where a fuel is burned in a bed of granulated particles which are maintained in a mobile suspension by the upward flow of air and combustion products.

*Gaseous fuel* includes, but is not limited to, natural gas, process gas, landfill gas, coal derived gas, solid oil-derived gas, refinery gas, and biogas.

*Generator* means a device that produces electricity.

*Gross output* means the gross useful work performed by the steam generated and, for an IGCC electric utility steam generating unit, the work performed by the stationary combustion turbines. For a unit generating only electricity, the gross useful work performed is the gross electrical output from the unit's turbine/generator sets. For a cogeneration unit, the gross useful work performed is the gross electrical output, including any such electricity used in the power production process (which process includes, but is not limited to, any on-site processing or treatment of fuel combusted at the unit and any on-site emission controls), or mechanical output plus 75 percent of the useful thermal output measured relative to ISO conditions that is not used to generate additional electrical or mechanical output or to enhance the performance of the unit (*i.e.,* steam delivered to an industrial process).

*Heat input* means heat derived from combustion of fuel in an EGU (synthetic gas for an IGCC) and does not include the heat input from preheated combustion air, recirculated flue gases, or exhaust gases from other sources such as gas turbines, internal combustion engines, etc.

*Integrated gasification combined cycle electric utility steam generating unit* or *IGCC* means an electric utility steam generating unit meeting the definition of "fossil fuel-fired" that burns a synthetic gas derived from coal and/or solid oil-derived fuel for more than 10.0 percent of the average annual heat input during any 3 consecutive calendar years or for more than 15.0 percent of the annual heat input during any one calendar year in a combined-cycle gas turbine. No solid coal or solid oil-derived fuel is directly burned in the unit during operation.

*ISO conditions* means a temperature of 288 Kelvin, a relative humidity of 60 percent, and a pressure of 101.3 kilopascals.

*Lignite coal* means coal that is classified as lignite A or B according to ASTM Method D388-05, "Standard Classification of Coals by Rank" (incorporated by reference, see §63.14).

*Limited-use liquid oil-fired subcategory* means an oil-fired electric utility steam generating unit with an annual capacity factor of less than 8 percent of its maximum or nameplate heat input, whichever is greater, averaged over a 24-month block contiguous period commencing April 16, 2015.

*Liquid fuel* includes, but is not limited to, distillate oil and residual oil.

*Monitoring system malfunction or out of control period* means any sudden, infrequent, not reasonably preventable failure of the monitoring system to provide valid data. Monitoring system failures that are caused in part by poor maintenance or careless operation are not malfunctions.

*Natural gas* means a naturally occurring fluid mixture of hydrocarbons (e.g., methane, ethane, or propane) produced in geological formations beneath the Earth's surface that maintains a gaseous state at standard atmospheric temperature and pressure under ordinary conditions. Natural gas contains 20.0 grains or less of total sulfur per 100 standard cubic feet. Additionally, natural gas must either be composed of at least 70 percent methane by volume or have a gross calorific value between 950 and 1,100 Btu per standard cubic foot. Natural gas does not include the following gaseous fuels: landfill gas, digester gas, refinery gas, sour gas, blast furnace gas, coal-derived gas, producer gas, coke oven gas, or any gaseous fuel produced in a process which might result in highly variable sulfur content or heating value.

*Natural gas-fired electric utility steam generating unit* means an electric utility steam generating unit meeting the definition of “fossil fuel-fired” that is not a coal-fired, oil-fired, or IGCC electric utility steam generating unit and that burns natural gas for more than 10.0 percent of the average annual heat input during any 3 consecutive calendar years or for more than 15.0 percent of the annual heat input during any one calendar year.

*Net-electric output* means the gross electric sales to the utility power distribution system minus purchased power on a calendar year basis.

*Non-continental area* means the State of Hawaii, the Virgin Islands, Guam, American Samoa, the Commonwealth of Puerto Rico, or the Northern Mariana Islands.

*Non-continental liquid oil-fired subcategory* means any oil-fired electric utility steam generating unit that burns liquid oil and is located outside the continental United States.

*Non-mercury (Hg) HAP metals* means Antimony (Sb), Arsenic (As), Beryllium (Be), Cadmium (Cd), Chromium (Cr), Cobalt (Co), Lead (Pb), Manganese (Mn), Nickel (Ni), and Selenium (Se).

*Oil* means crude oil or petroleum or a fuel derived from crude oil or petroleum, including distillate and residual oil, solid oil-derived fuel (e.g., petroleum coke) and gases derived from solid oil-derived fuels (not meeting the definition of natural gas).

*Oil-fired electric utility steam generating unit* means an electric utility steam generating unit meeting the definition of “fossil fuel-fired” that is not a coal-fired electric utility steam generating unit and that burns oil for more than 10.0 percent of the average annual heat input during any 3 consecutive calendar years or for more than 15.0 percent of the annual heat input during any one calendar year.

*Particulate matter* or *PM* means any finely divided solid material as measured by the test methods specified under this subpart, or an alternative method.

*Pulverized coal (PC) boiler* means an EGU in which pulverized coal is introduced into an air stream that carries the coal to the combustion chamber of the EGU where it is fired in suspension.

*Residual oil* means crude oil, and all fuel oil numbers 4, 5 and 6, as defined by ASTM Method D396-10, “Standard Specification for Fuel Oils” (incorporated by reference, see §63.14).

*Responsible official* means responsible official as defined in 40 CFR 70.2.

*Shutdown* means the period in which cessation of operation of an EGU is initiated for any purpose. Shutdown begins when the EGU no longer generates electricity or makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes or when no coal, liquid oil, syngas, or solid oil-derived fuel is being fired in the EGU, whichever is earlier. Shutdown ends when the EGU no longer generates electricity or makes useful thermal energy (such as steam or heat) for industrial, commercial, heating, or cooling purposes, and no fuel is being fired in the EGU. Any fraction of an hour in which shutdown occurs constitutes a full hour of shutdown.

*Startup* means:

(1) Either the first-ever firing of fuel in a boiler for the purpose of producing electricity, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the steam from the boiler is used to generate electricity for sale over the grid or for any other purpose (including on-site use). Any fraction of an hour in which startup occurs constitutes a full hour of startup; or

(2) The period in which operation of an EGU is initiated for any purpose. Startup begins with either the firing of any fuel in an EGU for the purpose of producing electricity or useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes (other than the first-ever firing of fuel in a boiler following construction of the boiler) or for any other purpose after a shutdown event. Startup ends 4 hours after the EGU generates electricity that is sold or used for any other purpose (including on site use), or 4 hours after the EGU makes useful thermal energy

(such as heat or steam) for industrial, commercial, heating, or cooling purposes (16 U.S.C. 796(18)(A) and 18 CFR 292.202(c)), whichever is earlier. Any fraction of an hour in which startup occurs constitutes a full hour of startup.

*Stationary combustion turbine* means all equipment, including but not limited to the turbine, the fuel, air, lubrication and exhaust gas systems, control systems (except emissions control equipment), and any ancillary components and sub-components comprising any simple cycle stationary combustion turbine, any regenerative/recuperative cycle stationary combustion turbine, the combustion turbine portion of any stationary cogeneration cycle combustion system, or the combustion turbine portion of any stationary combined cycle steam/electric generating system. Stationary means that the combustion turbine is not self propelled or intended to be propelled while performing its function. Stationary combustion turbines do not include turbines located at a research or laboratory facility, if research is conducted on the turbine itself and the turbine is not being used to power other applications at the research or laboratory facility.

*Steam generating unit* means any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam (including fossil-fuel-fired steam generators associated with integrated gasification combined cycle gas turbines; nuclear steam generators are not included).

*Stoker* means a unit consisting of a mechanically operated fuel feeding mechanism, a stationary or moving grate to support the burning of fuel and admit undergrate air to the fuel, an overfire air system to complete combustion, and an ash discharge system. There are two general types of stokers: underfeed and overfeed. Overfeed stokers include mass feed and spreader stokers.

*Subbituminous coal* means coal that is classified as subbituminous A, B, or C according to ASTM Method D388-05, “Standard Classification of Coals by Rank” (incorporated by reference, see §63.14).

*Unit designed for coal ≥8,300 Btu/lb subcategory* means any coal-fired EGU that is not a coal-fired EGU in the “unit designed for low rank virgin coal” subcategory.

*Unit designed for low rank virgin coal subcategory* means any coal-fired EGU that is designed to burn and that is burning nonagglomerating virgin coal having a calorific value (moist, mineral matter-free basis) of less than 19,305 kJ/kg (8,300 Btu/lb) that is constructed and operates at or near the mine that produces such coal.

*Unit designed to burn solid oil-derived fuel subcategory* means any oil-fired EGU that burns solid oil-derived fuel.

*Voluntary consensus standards or VCS* mean technical standards (e.g., materials specifications, test methods, sampling procedures, business practices) developed or adopted by one or more voluntary consensus bodies. The EPA/OAQPS has by precedent only used VCS that are written in English. Examples of VCS bodies are: American Society of Testing and Materials (ASTM), American Society of Mechanical Engineers (ASME), International Standards Organization (ISO), Standards Australia (AS), British Standards (BS), Canadian Standards (CSA), European Standard (EN or CEN) and German Engineering Standards (VDI). The types of standards that are not considered VCS are standards developed by: the U.S. states, e.g., California (CARB) and Texas (TCEQ); industry groups, such as American Petroleum Institute (API), Gas Processors Association (GPA), and Gas Research Institute (GRI); and other branches of the U.S. government, e.g., Department of Defense (DOD) and Department of Transportation (DOT). This does not preclude EPA from using standards developed by groups that are not VCS bodies within an EPA rule. When this occurs, EPA has done searches and reviews for VCS equivalent to these non-VCS methods.

*Wet flue gas desulfurization technology,* or *wet FGD, or wet scrubber* means any add-on air pollution control device that is located downstream of the steam generating unit that mixes an aqueous stream or slurry with the exhaust gases from an EGU to control emissions of PM and/or to absorb and neutralize acid gases, such as $SO_2$ and HCl.

*Work practice standard* means any design, equipment, work practice, or operational standard, or combination thereof, which is promulgated pursuant to CAA section 112(h).

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23405, Apr. 19, 2012; 78 FR 24087, Apr. 24, 2013; 79 FR 68792, Nov. 19, 2014]

**Table 1 to Subpart UUUUU of Part 63—Emission Limits for New or Reconstructed EGUs**

As stated in §63.9991, you must comply with the following applicable emission limits:

| If your EGU is in this subcategory | For the following pollutants | You must meet the following emission limits and work practice standards | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 |
|---|---|---|---|
| 1. Coal-fired unit not low rank virgin coal | a. Filterable particulate matter (PM) | 9.0E-2 lb/MWh[1] | Collect a minimum of 4 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 6.0E-2 lb/GWh | Collect a minimum of 4 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 3 dscm per run. |
| | Antimony (Sb) | 8.0E-3 lb/GWh | |
| | Arsenic (As) | 3.0E-3 lb/GWh | |
| | Beryllium (Be) | 6.0E-4 lb/GWh | |
| | Cadmium (Cd) | 4.0E-4 lb/GWh | |
| | Chromium (Cr) | 7.0E-3 lb/GWh | |
| | Cobalt (Co) | 2.0E-3 lb/GWh | |
| | Lead (Pb) | 2.0E-2 lb/GWh | |
| | Manganese (Mn) | 4.0E-3 lb/GWh | |
| | Nickel (Ni) | 4.0E-2 lb/GWh | |
| | Selenium (Se) | 5.0E-2 lb/GWh | |
| | b. Hydrogen chloride (HCl) | 1.0E-2 lb/MWh | For Method 26A, collect a minimum of 3 dscm per run. |
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| | OR | | |
| | Sulfur dioxide ($SO_2$)[3] | 1.0 lb/MWh | $SO_2$ CEMS. |
| | c. Mercury (Hg) | 3.0E-3 lb/GWh | Hg CEMS or sorbent trap monitoring system only. |
| 2. Coal-fired units low rank virgin coal | a. Filterable particulate matter (PM) | 9.0E-2 lb/MWh[1] | Collect a minimum of 4 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 6.0E-2 lb/GWh | Collect a minimum of 4 dscm per run. |

| If your EGU is in this subcategory | For the following pollutants | You must meet the following emission limits and work practice standards | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 |
|---|---|---|---|
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 3 dscm per run. |
| | Antimony (Sb) | 8.0E-3 lb/GWh | |
| | Arsenic (As) | 3.0E-3 lb/GWh | |
| | Beryllium (Be) | 6.0E-4 lb/GWh | |
| | Cadmium (Cd) | 4.0E-4 lb/GWh | |
| | Chromium (Cr) | 7.0E-3 lb/GWh | |
| | Cobalt (Co) | 2.0E-3 lb/GWh | |
| | Lead (Pb) | 2.0E-2 lb/GWh | |
| | Manganese (Mn) | 4.0E-3 lb/GWh | |
| | Nickel (Ni) | 4.0E-2 lb/GWh | |
| | Selenium (Se) | 5.0E-2 lb/GWh | |
| | b. Hydrogen chloride (HCl) | 1.0E-2 lb/MWh | For Method 26A, collect a minimum of 3 dscm per run. |
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| | OR | | |
| | Sulfur dioxide ($SO_2$)[3] | 1.0 lb/MWh | $SO_2$ CEMS. |
| | c. Mercury (Hg) | 4.0E-2 lb/GWh | Hg CEMS or sorbent trap monitoring system only. |
| 3. IGCC unit | a. Filterable particulate matter (PM) | 7.0E-2 lb/MWh[4]<br>9.0E-2 lb/MWh[5] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 4.0E-1 lb/GWh | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 2 dscm per run. |
| | Antimony (Sb) | 2.0E-2 lb/GWh | |
| | Arsenic (As) | 2.0E-2 lb/GWh | |
| | Beryllium (Be) | 1.0E-3 lb/GWh | |
| | Cadmium (Cd) | 2.0E-3 lb/GWh | |
| | Chromium (Cr) | 4.0E-2 lb/GWh | |

| **If your EGU is in this subcategory** | **For the following pollutants** | **You must meet the following emission limits and work practice standards** | **Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5** |
|---|---|---|---|
| | Cobalt (Co) | 4.0E-3 lb/GWh | |
| | Lead (Pb) | 9.0E-3 lb/GWh | |
| | Manganese (Mn) | 2.0E-2 lb/GWh | |
| | Nickel (Ni) | 7.0E-2 lb/GWh | |
| | Selenium (Se) | 3.0E-1 lb/GWh | |
| | b. Hydrogen chloride (HCl) | 2.0E-3 lb/MWh | For Method 26A, collect a minimum of 1 dscm per run; for Method 26, collect a minimum of 120 liters per run. |
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| | OR | | |
| | Sulfur dioxide ($SO_2$)[3] | 4.0E-1 lb/MWh | $SO_2$ CEMS. |
| | c. Mercury (Hg) | 3.0E-3 lb/GWh | Hg CEMS or sorbent trap monitoring system only. |
| 4. Liquid oil-fired unit—continental (excluding limited-use liquid oil-fired subcategory units) | a. Filterable particulate matter (PM) | 3.0E-1 lb/MWh[1] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total HAP metals | 2.0E-4 lb/MWh | Collect a minimum of 2 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 2 dscm per run. |
| | Antimony (Sb) | 1.0E-2 lb/GWh | |
| | Arsenic (As) | 3.0E-3 lb/GWh | |
| | Beryllium (Be) | 5.0E-4 lb/GWh | |
| | Cadmium (Cd) | 2.0E-4 lb/GWh | |
| | Chromium (Cr) | 2.0E-2 lb/GWh | |
| | Cobalt (Co) | 3.0E-2 lb/GWh | |
| | Lead (Pb) | 8.0E-3 lb/GWh | |
| | Manganese (Mn) | 2.0E-2 lb/GWh | |
| | Nickel (Ni) | 9.0E-2 lb/GWh | |
| | Selenium (Se) | 2.0E-2 lb/GWh | |

| If your EGU is in this subcategory | For the following pollutants | You must meet the following emission limits and work practice standards | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 |
|---|---|---|---|
| | Mercury (Hg) | 1.0E-4 lb/GWh | For Method 30B sample volume determination (Section 8.2.4), the estimated Hg concentration should nominally be <$^{1/2}$ the standard. |
| | b. Hydrogen chloride (HCl) | 4.0E-4 lb/MWh | For Method 26A, collect a minimum of 3 dscm per run. |
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| | c. Hydrogen fluoride (HF) | 4.0E-4 lb/MWh | For Method 26A, collect a minimum of 3 dscm per run. |
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| 5. Liquid oil-fired unit—non-continental (excluding limited-use liquid oil-fired subcategory units) | a. Filterable particulate matter (PM) | 2.0E-1 lb/MWh[1] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total HAP metals | 7.0E-3 lb/MWh | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 3 dscm per run. |
| | Antimony (Sb) | 8.0E-3 lb/GWh | |
| | Arsenic (As) | 6.0E-2 lb/GWh | |
| | Beryllium (Be) | 2.0E-3 lb/GWh | |
| | Cadmium (Cd) | 2.0E-3 lb/GWh | |
| | Chromium (Cr) | 2.0E-2 lb/GWh | |
| | Cobalt (Co) | 3.0E-1 lb/GWh | |
| | Lead (Pb) | 3.0E-2 lb/GWh | |
| | Manganese (Mn) | 1.0E-1 lb/GWh | |
| | Nickel (Ni) | 4.1E0 lb/GWh | |
| | Selenium (Se) | 2.0E-2 lb/GWh | |
| | Mercury (Hg) | 4.0E-4 lb/GWh | For Method 30B sample volume determination (Section 8.2.4), the estimated Hg concentration should nominally be <$^{1/2}$ the standard. |
| | b. Hydrogen chloride (HCl) | 2.0E-3 lb/MWh | For Method 26A, collect a minimum of 1 dscm per run; for Method 26, collect a minimum of 120 liters per run. |

| **If your EGU is in this subcategory** | **For the following pollutants** | **You must meet the following emission limits and work practice standards** | **Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5** |
|---|---|---|---|
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| | c. Hydrogen fluoride (HF) | 5.0E-4 lb/MWh | For Method 26A, collect a minimum of 3 dscm per run. |
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| 6. Solid oil-derived fuel-fired unit | a. Filterable particulate matter (PM) | 3.0E-2 lb/MWh[1] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 6.0E-1 lb/GWh | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 3 dscm per run. |
| | Antimony (Sb) | 8.0E-3 lb/GWh | |
| | Arsenic (As) | 3.0E-3 lb/GWh | |
| | Beryllium (Be) | 6.0E-4 lb/GWh | |
| | Cadmium (Cd) | 7.0E-4 lb/GWh | |
| | Chromium (Cr) | 6.0E-3 lb/GWh | |
| | Cobalt (Co) | 2.0E-3 lb/GWh | |
| | Lead (Pb) | 2.0E-2 lb/GWh | |
| | Manganese (Mn) | 7.0E-3 lb/GWh | |
| | Nickel (Ni) | 4.0E-2 lb/GWh | |
| | Selenium (Se) | 6.0E-3 lb/GWh | |
| | b. Hydrogen chloride (HCl) | 4.0E-4 lb/MWh | For Method 26A, collect a minimum of 3 dscm per run. |
| | | | For ASTM D6348-03[2] or Method 320, sample for a minimum of 1 hour. |
| | OR | | |
| | Sulfur dioxide ($SO_2$)[3] | 1.0 lb/MWh | $SO_2$ CEMS. |
| | c. Mercury (Hg) | 2.0E-3 lb/GWh | Hg CEMS or Sorbent trap monitoring system only. |

[1]Gross electric output.

[2]Incorporated by reference, see §63.14.

[3]You may not use the alternate $SO_2$ limit if your EGU does not have some form of FGD system (or, in the case of IGCC EGUs, some other acid gas removal system either upstream or downstream of the combined cycle block) and $SO_2$ CEMS installed.

[4]Duct burners on syngas; gross electric output.

[5]Duct burners on natural gas; gross electric output.

[78 FR 24087, Apr. 24, 2013]

**Table 2 to Subpart UUUUU of Part 63—Emission Limits for Existing EGUs**

As stated in §63.9991, you must comply with the following applicable emission limits:[1]

| If your EGU is in this subcategory . . . | For the following pollutants . . . | You must meet the following emission limits and work practice standards . . . | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 . . . |
|---|---|---|---|
| 1. Coal-fired unit not low rank virgin coal | a. Filterable particulate matter (PM) | 3.0E-2 lb/MMBtu or 3.0E-1 lb/MWh.[2] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 5.0E-5 lb/MMBtu or 5.0E-1 lb/GWh. | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 3 dscm per run. |
| | Antimony (Sb) | 8.0E-1 lb/TBtu or 8.0E-3 lb/GWh. | |
| | Arsenic (As) | 1.1E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Beryllium (Be) | 2.0E-1 lb/TBtu or 2.0E-3 lb/GWh. | |
| | Cadmium (Cd) | 3.0E-1 lb/TBtu or 3.0E-3 lb/GWh. | |
| | Chromium (Cr) | 2.8E0 lb/TBtu or 3.0E-2 lb/GWh. | |
| | Cobalt (Co) | 8.0E-1 lb/TBtu or 8.0E-3 lb/GWh. | |
| | Lead (Pb) | 1.2E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Manganese (Mn) | 4.0E0 lb/TBtu or 5.0E-2 lb/GWh. | |
| | Nickel (Ni) | 3.5E0 lb/TBtu or 4.0E-2 lb/GWh. | |
| | Selenium (Se) | 5.0E0 lb/TBtu or 6.0E-2 lb/GWh. | |

| If your EGU is in this subcategory . . . | For the following pollutants . . . | You must meet the following emission limits and work practice standards . . . | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 . . . |
|---|---|---|---|
| | b. Hydrogen chloride (HCl) | 2.0E-3 lb/MMBtu or 2.0E-2 lb/MWh. | For Method 26A, collect a minimum of 0.75 dscm per run; for Method 26, collect a minimum of 120 liters per run. |
| | | | For ASTM D6348-03[3] or Method 320, sample for a minimum of 1 hour. |
| | OR | | |
| | Sulfur dioxide ($SO_2$)[4] | 2.0E-1 lb/MMBtu or 1.5E0 lb/MWh. | $SO_2$ CEMS. |
| | c. Mercury (Hg) | 1.2E0 lb/TBtu or 1.3E-2 lb/GWh | LEE Testing for 30 days with 10 days maximum per Method 30B run or Hg CEMS or sorbent trap monitoring system only. |
| 2. Coal-fired unit low rank virgin coal | a. Filterable particulate matter (PM) | 3.0E-2 lb/MMBtu or 3.0E-1 lb/MWh.[2] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 5.0E-5 lb/MMBtu or 5.0E-1 lb/GWh. | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 3 dscm per run. |
| | Antimony (Sb) | 8.0E-1 lb/TBtu or 8.0E-3 lb/GWh. | |
| | Arsenic (As) | 1.1E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Beryllium (Be) | 2.0E-1 lb/TBtu or 2.0E-3 lb/GWh. | |
| | Cadmium (Cd) | 3.0E-1 lb/TBtu or 3.0E-3 lb/GWh. | |
| | Chromium (Cr) | 2.8E0 lb/TBtu or 3.0E-2 lb/GWh. | |
| | Cobalt (Co) | 8.0E-1 lb/TBtu or 8.0E-3 lb/GWh. | |
| | Lead (Pb) | 1.2E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Manganese (Mn) | 4.0E0 lb/TBtu or 5.0E-2 lb/GWh. | |
| | Nickel (Ni) | 3.5E0 lb/TBtu or 4.0E-2 lb/GWh. | |
| | Selenium (Se) | 5.0E0 lb/TBtu or 6.0E-2 lb/GWh. | |

| If your EGU is in this subcategory . . . | For the following pollutants . . . | You must meet the following emission limits and work practice standards . . . | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 . . . |
|---|---|---|---|
| | b. Hydrogen chloride (HCl) | 2.0E-3 lb/MMBtu or 2.0E-2 lb/MWh. | For Method 26A, collect a minimum of 0.75 dscm per run; for Method 26, collect a minimum of 120 liters per run. |
| | | | For ASTM D6348-03[3] or Method 320, sample for a minimum of 1 hour. |
| | OR | | |
| | Sulfur dioxide ($SO_2$)[4] | 2.0E-1 lb/MMBtu or 1.5E0 lb/MWh. | $SO_2$ CEMS. |
| | c. Mercury (Hg) | 4.0E0 lb/TBtu or 4.0E-2 lb/GWh | LEE Testing for 30 days with 10 days maximum per Method 30B run or Hg CEMS or sorbent trap monitoring system only. |
| 3. IGCC unit | a. Filterable particulate matter (PM) | 4.0E-2 lb/MMBtu or 4.0E-1 lb/MWh.[2] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 6.0E-5 lb/MMBtu or 5.0E-1 lb/GWh. | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 2 dscm per run. |
| | Antimony (Sb) | 1.4E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Arsenic (As) | 1.5E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Beryllium (Be) | 1.0E-1 lb/TBtu or 1.0E-3 lb/GWh. | |
| | Cadmium (Cd) | 1.5E-1 lb/TBtu or 2.0E-3 lb/GWh. | |
| | Chromium (Cr) | 2.9E0 lb/TBtu or 3.0E-2 lb/GWh. | |
| | Cobalt (Co) | 1.2E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Lead (Pb) | 1.9E+2 lb/TBtu or 1.8E0 lb/GWh. | |
| | Manganese (Mn) | 2.5E0 lb/TBtu or 3.0E-2 lb/GWh. | |
| | Nickel (Ni) | 6.5E0 lb/TBtu or 7.0E-2 lb/GWh. | |
| | Selenium (Se) | 2.2E+1 lb/TBtu or 3.0E-1 lb/GWh. | |

| If your EGU is in this subcategory . . . | For the following pollutants . . . | You must meet the following emission limits and work practice standards . . . | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 . . . |
|---|---|---|---|
| | b. Hydrogen chloride (HCl) | 5.0E-4 lb/MMBtu or 5.0E-3 lb/MWh. | For Method 26A, collect a minimum of 1 dscm per run; for Method 26, collect a minimum of 120 liters per run. |
| | | | For ASTM D6348-03[3] or Method 320, sample for a minimum of 1 hour. |
| | c. Mercury (Hg) | 2.5E0 lb/TBtu or 3.0E-2 lb/GWh | LEE Testing for 30 days with 10 days maximum per Method 30B run or Hg CEMS or sorbent trap monitoring system only. |
| 4. Liquid oil-fired unit—continental (excluding limited-use liquid oil-fired subcategory units) | a. Filterable particulate matter (PM) | 3.0E-2 lb/MMBtu or 3.0E-1 lb/MWh.[2] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total HAP metals | 8.0E-4 lb/MMBtu or 8.0E-3 lb/MWh. | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 1 dscm per run. |
| | Antimony (Sb) | 1.3E+1 lb/TBtu or 2.0E-1 lb/GWh. | |
| | Arsenic (As) | 2.8E0 lb/TBtu or 3.0E-2 lb/GWh. | |
| | Beryllium (Be) | 2.0E-1 lb/TBtu or 2.0E-3 lb/GWh. | |
| | Cadmium (Cd) | 3.0E-1 lb/TBtu or 2.0E-3 lb/GWh. | |
| | Chromium (Cr) | 5.5E0 lb/TBtu or 6.0E-2 lb/GWh. | |
| | Cobalt (Co) | 2.1E+1 lb/TBtu or 3.0E-1 lb/GWh. | |
| | Lead (Pb) | 8.1E0 lb/TBtu or 8.0E-2 lb/GWh. | |
| | Manganese (Mn) | 2.2E+1 lb/TBtu or 3.0E-1 lb/GWh. | |
| | Nickel (Ni) | 1.1E+2 lb/TBtu or 1.1E0 lb/GWh. | |
| | Selenium (Se) | 3.3E0 lb/TBtu or 4.0E-2 lb/GWh. | |
| | Mercury (Hg) | 2.0E-1 lb/TBtu or 2.0E-3 lb/GWh. | For Method 30B sample volume determination (Section 8.2.4), the estimated Hg concentration should nominally be <1/2; the standard. |

| If your EGU is in this subcategory . . . | For the following pollutants . . . | You must meet the following emission limits and work practice standards . . . | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 . . . |
|---|---|---|---|
| | b. Hydrogen chloride (HCl) | 2.0E-3 lb/MMBtu or 1.0E-2 lb/MWh. | For Method 26A, collect a minimum of 1 dscm per Run; for Method 26, collect a minimum of 120 liters per run.<br>For ASTM D6348-03[3] or Method 320, sample for a minimum of 1 hour. |
| | c. Hydrogen fluoride (HF) | 4.0E-4 lb/MMBtu or 4.0E-3 lb/MWh. | For Method 26A, collect a minimum of 1 dscm per run; for Method 26, collect a minimum of 120 liters per run. |
| | | | For ASTM D6348-03[3] or Method 320, sample for a minimum of 1 hour. |
| 5. Liquid oil-fired unit—non-continental (excluding limited-use liquid oil-fired subcategory units) | a. Filterable particulate matter (PM) | 3.0E-2 lb/MMBtu or 3.0E-1 lb/MWh.[2] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total HAP metals | 6.0E-4 lb/MMBtu or 7.0E-3 lb/MWh. | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals: | | Collect a minimum of 2 dscm per run. |
| | Antimony (Sb) | 2.2E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Arsenic (As) | 4.3E0 lb/TBtu or 8.0E-2 lb/GWh. | |
| | Beryllium (Be) | 6.0E-1 lb/TBtu or 3.0E-3 lb/GWh. | |
| | Cadmium (Cd) | 3.0E-1 lb/TBtu or 3.0E-3 lb/GWh. | |
| | Chromium (Cr) | 3.1E+1 lb/TBtu or 3.0E-1 lb/GWh. | |
| | Cobalt (Co) | 1.1E+2 lb/TBtu or 1.4E0 lb/GWh. | |
| | Lead (Pb) | 4.9E0 lb/TBtu or 8.0E-2 lb/GWh. | |
| | Manganese (Mn) | 2.0E+1 lb/TBtu or 3.0E-1 lb/GWh. | |
| | Nickel (Ni) | 4.7E+2 lb/TBtu or 4.1E0 lb/GWh. | |
| | Selenium (Se) | 9.8E0 lb/TBtu or 2.0E-1 lb/GWh. | |

| **If your EGU is in this subcategory . . .** | **For the following pollutants . . .** | **You must meet the following emission limits and work practice standards . . .** | **Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 . . .** |
|---|---|---|---|
| | Mercury (Hg) | 4.0E-2 lb/TBtu or 4.0E-4 lb/GWh. | For Method 30B sample volume determination (Section 8.2.4), the estimated Hg concentration should nominally be <1/2; the standard. |
| | b. Hydrogen chloride (HCl) | 2.0E-4 lb/MMBtu or 2.0E-3 lb/MWh. | For Method 26A, collect a minimum of 1 dscm per run; for Method 26, collect a minimum of 120 liters per run.<br>For ASTM D6348-03[3] or Method 320, sample for a minimum of 2 hours. |
| | c. Hydrogen fluoride (HF) | 6.0E-5 lb/MMBtu or 5.0E-4 lb/MWh. | For Method 26A, collect a minimum of 3 dscm per run.<br>For ASTM D6348-03[3] or Method 320, sample for a minimum of 2 hours. |
| 6. Solid oil-derived fuel-fired unit | a. Filterable particulate matter (PM) | 8.0E-3 lb/MMBtu or 9.0E-2 lb/MWh.[2] | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Total non-Hg HAP metals | 4.0E-5 lb/MMBtu or 6.0E-1 lb/GWh. | Collect a minimum of 1 dscm per run. |
| | OR | OR | |
| | Individual HAP metals | Collect a minimum of 3 dscm per run. | |
| | Antimony (Sb) | 8.0E-1 lb/TBtu or 7.0E-3 lb/GWh. | |
| | Arsenic (As) | 3.0E-1 lb/TBtu or 5.0E-3 lb/GWh. | |
| | Beryllium (Be) | 6.0E-2 lb/TBtu or 5.0E-4 lb/GWh. | |
| | Cadmium (Cd) | 3.0E-1 lb/TBtu or 4.0E-3 lb/GWh. | |
| | Chromium (Cr) | 8.0E-1 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Cobalt (Co) | 1.1E0 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Lead (Pb) | 8.0E-1 lb/TBtu or 2.0E-2 lb/GWh. | |
| | Manganese (Mn) | 2.3E0 lb/TBtu or 4.0E-2 lb/GWh. | |
| | Nickel (Ni) | 9.0E0 lb/TBtu or 2.0E-1 lb/GWh. | |
| | Selenium (Se) | 1.2E0 lb/TBtu or 2.0E-2 lb/GWh. | |

| If your EGU is in this subcategory . . . | For the following pollutants . . . | You must meet the following emission limits and work practice standards . . . | Using these requirements, as appropriate (e.g., specified sampling volume or test run duration) and limitations with the test methods in Table 5 . . . |
|---|---|---|---|
| | b. Hydrogen chloride (HCl) | 5.0E-3 lb/MMBtu or 8.0E-2 lb/MWh. | For Method 26A, collect a minimum of 0.75 dscm per run; for Method 26, collect a minimum of 120 liters per run. |
| | | | For ASTM D6348-03[3] or Method 320, sample for a minimum of 1 hour. |
| | OR | | |
| | Sulfur dioxide ($SO_2$)[4] | 3.0E-1 lb/MMBtu or 2.0E0 lb/MWh. | $SO_2$ CEMS. |
| | c. Mercury (Hg) | 2.0E-1 lb/TBtu or 2.0E-3 lb/GWh. | LEE Testing for 30 days with 10 days maximum per Method 30B run or Hg CEMS or Sorbent trap monitoring system only. |

[1] For LEE emissions testing for total PM, total HAP metals, individual HAP metals, HCl, and HF, the required minimum sampling volume must be increased nominally by a factor of two.

[2] Gross electric output.

[3] Incorporated by reference, see §63.14.

[4] You may not use the alternate $SO_2$ limit if your EGU does not have some form of FGD system and $SO_2$ CEMS installed.

[77 FR 23405, Apr. 19, 2012]

**Table 3 to Subpart UUUUU of Part 63—Work Practice Standards**

As stated in §§63.9991, you must comply with the following applicable work practice standards:

| If your EGU is . . . | You must meet the following . . . |
|---|---|
| 1. An existing EGU | Conduct a tune-up of the EGU burner and combustion controls at least each 36 calendar months, or each 48 calendar months if neural network combustion optimization software is employed, as specified in §63.10021(e). |
| 2. A new or reconstructed EGU | Conduct a tune-up of the EGU burner and combustion controls at least each 36 calendar months, or each 48 calendar months if neural network combustion optimization software is employed, as specified in §63.10021(e). |

| **If your EGU is . . .** | **You must meet the following . . .** |
|---|---|
| 3. A coal-fired, liquid oil-fired (excluding limited-use liquid oil-fired subcategory units), or solid oil-derived fuel-fired EGU during startup | You have the option of complying using either of the following work practice standards.<br>(1) If you choose to comply using paragraph (1) of the definition of “startup” in §63.10042, you must operate all CMS during startup. Startup means either the first-ever firing of fuel in a boiler for the purpose of producing electricity, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the steam from the boiler is used to generate electricity for sale over the grid or for any other purpose (including on site use). For startup of a unit, you must use clean fuels as defined in §63.10042 for ignition. Once you convert to firing coal, residual oil, or solid oil-derived fuel, you must engage all of the applicable control technologies except dry scrubber and SCR. You must start your dry scrubber and SCR systems, if present, appropriately to comply with relevant standards applicable during normal operation. You must comply with all applicable emissions limits at all times except for periods that meet the applicable definitions of startup and shutdown in this subpart. You must keep records during startup periods. You must provide reports concerning activities and startup periods, as specified in §63.10011(g) and §63.10021(h) and (i). |
| | (2) If you choose to comply using paragraph (2) of the definition of “startup” in §63.10042, you must operate all CMS during startup. You must also collect appropriate data, and you must calculate the pollutant emission rate for each hour of startup. |
| | For startup of an EGU, you must use one or a combination of the clean fuels defined in §63.10042 to the maximum extent possible throughout the startup period. You must have sufficient clean fuel capacity to engage and operate your PM control device within one hour of adding coal, residual oil, or solid oil-derived fuel to the unit. You must meet the startup period work practice requirements as identified in §63.10020(e). |
| | Once you start firing coal, residual oil, or solid oil-derived fuel, you must vent emissions to the main stack(s). You must comply with the applicable emission limits within 4 hours of start of electricity generation. You must engage and operate your particulate matter control(s) within 1 hour of first firing of coal, residual oil, or solid oil-derived fuel. |
| | You must start all other applicable control devices as expeditiously as possible, considering safety and manufacturer/supplier recommendations, but, in any case, when necessary to comply with other standards made applicable to the EGU by a permit limit or a rule other than this Subpart that require operation of the control devices. |
| | Relative to the syngas not fired in the combustion turbine of an IGCC EGU during startup, you must either: (1) flare the syngas, or (2) route the syngas to duct burners, which may need to be installed, and route the flue gas from the duct burners to the heat recovery steam generator. |
| | If you choose to use just one set of sorbent traps to demonstrate compliance with Hg emission limits, you must comply with all applicable Hg emission limits at all times; otherwise, you must comply with all applicable emission limits at all times except for startup or shutdown periods conforming to this practice. You must collect monitoring data during startup periods, as specified in §63.10020(a) and (e). You must keep records during startup periods, as provided in §§63.10032 and 63.10021(h). Any fraction of an hour in which startup occurs constitutes a full hour of startup. You must provide reports concerning activities and startup periods, as specified in §§63.10011(g), 63.10021(i), and 63.10031. |

| If your EGU is . . . | You must meet the following . . . |
|---|---|
| 4. A coal-fired, liquid oil-fired (excluding limited-use liquid oil-fired subcategory units), or solid oil-derived fuel-fired EGU during shutdown | You must operate all CMS during shutdown. You must also collect appropriate data, and you must calculate the pollutant emission rate for each hour of shutdown. While firing coal, residual oil, or solid oil-derived fuel during shutdown, you must vent emissions to the main stack(s) and operate all applicable control devices and continue to operate those control devices after the cessation of coal, residual oil, or solid oil-derived fuel being fed into the EGU and for as long as possible thereafter considering operational and safety concerns. In any case, you must operate your controls when necessary to comply with other standards made applicable to the EGU by a permit limit or a rule other than this Subpart and that require operation of the control devices. |
| | If, in addition to the fuel used prior to initiation of shutdown, another fuel must be used to support the shutdown process, that additional fuel must be one or a combination of the clean fuels defined in §63.10042 and must be used to the maximum extent possible. |
| | Relative to the syngas not fired in the combustion turbine of an IGCC EGU during shutdown, you must either: (1) flare the syngas, or (2) route the syngas to duct burners, which may need to be installed, and route the flue gas from the duct burners to the heat recovery steam generator. |
| | You must comply with all applicable emission limits at all times except during startup periods and shutdown periods at which time you must meet this work practice. You must collect monitoring data during shutdown periods, as specified in §63.10020(a). You must keep records during shutdown periods, as provided in §§63.10032 and 63.10021(h). Any fraction of an hour in which shutdown occurs constitutes a full hour of shutdown. You must provide reports concerning activities and shutdown periods, as specified in §§63.10011(g), 63.10021(i), and 63.10031. |

[79 FR 68792, Nov. 19, 2014]

**Table 4 to Subpart UUUUU of Part 63—Operating Limits for EGUs**

As stated in §63.9991, you must comply with the applicable operating limits:

| If you demonstrate compliance using . . . | You must meet these operating limits . . . |
|---|---|
| 1. PM CPMS for an existing EGU | Maintain the 30-boiler operating day rolling average PM CPMS output at or below the highest 1-hour average measured during the most recent performance test demonstrating compliance with the filterable PM, total non-mercury HAP metals (total HAP metals, for liquid oil-fired units), or individual non-mercury HAP metals (individual HAP metals including Hg, for liquid oil-fired units) emissions limitation(s). |
| 2. PM CPMS for a new EGU | Maintain the 30-boiler operating day rolling average PM CPMS output determined in accordance with the requirements of §63.10023(b)(2) and obtained during the most recent performance test run demonstrating compliance with the filterable PM, total non-mercury HAP metals (total HAP metals, for liquid oil-fired units), or individual non-mercury HAP metals (individual HAP metals including Hg, for liquid oil-fired units) emissions limitation(s). |

[78 FR 24090, Apr. 24, 2013]

**Table 5 to Subpart UUUUU of Part 63—Performance Testing Requirements**

As stated in §63.10007, you must comply with the following requirements for performance testing for existing, new or reconstructed affected sources:[1]

| To conduct a performance test for the following pollutant . . . | Using . . . | You must perform the following activities, as applicable to your input- or output-based emission limit . . . | Using[2] . . . |
|---|---|---|---|
| 1. Filterable Particulate matter (PM) | Emissions Testing | a. Select sampling ports location and the number of traverse points | Method 1 at Appendix A-1 to part 60 of this chapter. |
| | | b. Determine velocity and volumetric flow-rate of the stack gas | Method 2, 2A, 2C, 2F, 2G or 2H at Appendix A-1 or A-2 to part 60 of this chapter. |
| | | c. Determine oxygen and carbon dioxide concentrations of the stack gas | Method 3A or 3B at Appendix A-2 to part 60 of this chapter, or ANSI/ASME PTC 19.10-1981.[3] |
| | | d. Measure the moisture content of the stack gas | Method 4 at Appendix A-3 to part 60 of this chapter. |
| | | e. Measure the filterable PM concentration | Method 5 at Appendix A-3 to part 60 of this chapter. |
| | | | For positive pressure fabric filters, Method 5D at Appendix A-3 to part 60 of this chapter for filterable PM emissions. |
| | | | Note that the Method 5 front half temperature shall be 160° ±14 °C (320° ±25 °F). |
| | | f. Convert emissions concentration to lb/MMBtu or lb/MWh emissions rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |
| | OR | OR | |
| | PM CEMS | a. Install, certify, operate, and maintain the PM CEMS | Performance Specification 11 at Appendix B to part 60 of this chapter and Procedure 2 at Appendix F to Part 60 of this chapter. |
| | | b. Install, certify, operate, and maintain the diluent gas, flow rate, and/or moisture monitoring systems | Part 75 of this chapter and §§63.10010(a), (b), (c), and (d). |
| | | c. Convert hourly emissions concentrations to 30 boiler operating day rolling average lb/MMBtu or lb/MWh emissions rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |
| 2. Total or individual non-Hg HAP metals | Emissions Testing | a. Select sampling ports location and the number of traverse points | Method 1 at Appendix A-1 to part 60 of this chapter. |
| | | b. Determine velocity and volumetric flow-rate of the stack gas | Method 2, 2A, 2C, 2F, 2G or 2H at Appendix A-1 or A-2 to part 60 of this chapter. |

| To conduct a performance test for the following pollutant . . . | Using . . . | You must perform the following activities, as applicable to your input- or output-based emission limit . . . | Using[2] . . . |
|---|---|---|---|
| | | c. Determine oxygen and carbon dioxide concentrations of the stack gas | Method 3A or 3B at Appendix A-2 to part 60 of this chapter, or ANSI/ASME PTC 19.10-1981.[3] |
| | | d. Measure the moisture content of the stack gas | Method 4 at Appendix A-3 to part 60 of this chapter. |
| | | e. Measure the HAP metals emissions concentrations and determine each individual HAP metals emissions concentration, as well as the total filterable HAP metals emissions concentration and total HAP metals emissions concentration | Method 29 at Appendix A-8 to part 60 of this chapter. For liquid oil-fired units, Hg is included in HAP metals and you may use Method 29, Method 30B at Appendix A-8 to part 60 of this chapter; for Method 29, you must report the front half and back half results separately. |
| | | f. Convert emissions concentrations (individual HAP metals, total filterable HAP metals, and total HAP metals) to lb/MMBtu or lb/MWh emissions rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |
| 3. Hydrogen chloride (HCl) and hydrogen fluoride (HF) | Emissions Testing | a. Select sampling ports location and the number of traverse points | Method 1 at Appendix A-1 to part 60 of this chapter. |
| | | b. Determine velocity and volumetric flow-rate of the stack gas | Method 2, 2A, 2C, 2F, 2G or 2H at Appendix A-1 or A-2 to part 60 of this chapter. |
| | | c. Determine oxygen and carbon dioxide concentrations of the stack gas | Method 3A or 3B at Appendix A-2 to part 60 of this chapter, or ANSI/ASME PTC 19.10-1981.[3] |
| | | d. Measure the moisture content of the stack gas | Method 4 at Appendix A-3 to part 60 of this chapter. |
| | | e. Measure the HCl and HF emissions concentrations | Method 26 or Method 26A at Appendix A-8 to part 60 of this chapter or Method 320 at Appendix A to part 63 of this chapter or ASTM 6348-03[3] with (1) additional quality assurance measures in footnote[4] and (2) spiking levels nominally no greater than two times the level corresponding to the applicable emission limit. Method 26A must be used if there are entrained water droplets in the exhaust stream. |
| | | f. Convert emissions concentration to lb/MMBtu or lb/MWh emissions rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |
| | OR | OR | |
| | HCl and/or HF CEMS | a. Install, certify, operate, and maintain the HCl or HF CEMS | Appendix B of this subpart. |

| To conduct a performance test for the following pollutant . . . | Using . . . | You must perform the following activities, as applicable to your input- or output-based emission limit . . . | Using[2] . . . |
|---|---|---|---|
| | | b. Install, certify, operate, and maintain the diluent gas, flow rate, and/or moisture monitoring systems | Part 75 of this chapter and §§63.10010(a), (b), (c), and (d). |
| | | c. Convert hourly emissions concentrations to 30 boiler operating day rolling average lb/MMBtu or lb/MWh emissions rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |
| 4. Mercury (Hg) | Emissions Testing | a. Select sampling ports location and the number of traverse points | Method 1 at Appendix A-1 to part 60 of this chapter or Method 30B at Appendix A-8 for Method 30B point selection. |
| | | b. Determine velocity and volumetric flow-rate of the stack gas | Method 2, 2A, 2C, 2F, 2G or 2H at Appendix A-1 or A-2 to part 60 of this chapter. |
| | | c. Determine oxygen and carbon dioxide concentrations of the stack gas | Method 3A or 3B at Appendix A-1 to part 60 of this chapter, or ANSI/ASME PTC 19.10-1981.[3] |
| | | d. Measure the moisture content of the stack gas | Method 4 at Appendix A-3 to part 60 of this chapter. |
| | | e. Measure the Hg emission concentration | Method 30B at Appendix A-8 to part 60 of this chapter, ASTM D6784[3], or Method 29 at Appendix A-8 to part 60 of this chapter; for Method 29, you must report the front half and back half results separately. |
| | | f. Convert emissions concentration to lb/TBtu or lb/GWh emission rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |
| | OR | OR | |
| | | Hg CEMS<br>a. Install, certify, operate, and maintain the CEMS | Sections 3.2.1 and 5.1 of Appendix A of this subpart. |
| | | b. Install, certify, operate, and maintain the diluent gas, flow rate, and/or moisture monitoring systems | Part 75 of this chapter and §§63.10010(a), (b), (c), and (d). |
| | | c. Convert hourly emissions concentrations to 30 boiler operating day rolling average lb/TBtu or lb/GWh emissions rates | Section 6 of Appendix A to this subpart. |
| | OR | OR | |
| | Sorbent trap monitoring system | a. Install, certify, operate, and maintain the sorbent trap monitoring system | Sections 3.2.2 and 5.2 of Appendix A to this subpart. |

| **To conduct a performance test for the following pollutant . . .** | **Using . . .** | **You must perform the following activities, as applicable to your input- or output-based emission limit . . .** | **Using[2] . . .** |
|---|---|---|---|
| | | b. Install, operate, and maintain the diluent gas, flow rate, and/or moisture monitoring systems | Part 75 of this chapter and §§63.10010(a), (b), (c), and (d). |
| | | c. Convert emissions concentrations to 30 boiler operating day rolling average lb/TBtu or lb/GWh emissions rates | Section 6 of Appendix A to this subpart. |
| | OR | OR | |
| | LEE testing | a. Select sampling ports location and the number of traverse points | Single point located at the 10% centroidal area of the duct at a port location per Method 1 at Appendix A-1 to part 60 of this chapter or Method 30B at Appendix A-8 for Method 30B point selection. |
| | | b. Determine velocity and volumetric flow-rate of the stack gas | Method 2, 2A, 2C, 2F, 2G, or 2H at Appendix A-1 or A-2 to part 60 of this chapter or flow monitoring system certified per Appendix A of this subpart. |
| | | c. Determine oxygen and carbon dioxide concentrations of the stack gas | Method 3A or 3B at Appendix A-1 to part 60 of this chapter, or ANSI/ASME PTC 19.10-1981,[3] or diluent gas monitoring systems certified according to Part 75 of this chapter. |
| | | d. Measure the moisture content of the stack gas | Method 4 at Appendix A-3 to part 60 of this chapter, or moisture monitoring systems certified according to part 75 of this chapter. |
| | | e. Measure the Hg emission concentration | Method 30B at Appendix A-8 to part 60 of this chapter; perform a 30 operating day test, with a maximum of 10 operating days per run (*i.e.,* per pair of sorbent traps) or sorbent trap monitoring system or Hg CEMS certified per Appendix A of this subpart. |
| | | f. Convert emissions concentrations from the LEE test to lb/TBtu or lb/GWh emissions rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |
| | | g. Convert average lb/TBtu or lb/GWh Hg emission rate to lb/year, if you are attempting to meet the 22.0 lb/year threshold | Potential maximum annual heat input in TBtu or potential maximum electricity generated in GWh. |
| 5. Sulfur dioxide ($SO_2$) | $SO_2$ CEMS | a. Install, certify, operate, and maintain the CEMS | Part 75 of this chapter and §§63.10010(a) and (f). |
| | | b. Install, operate, and maintain the diluent gas, flow rate, and/or moisture monitoring systems | Part 75 of this chapter and §§63.10010(a), (b), (c), and (d). |
| | | c. Convert hourly emissions concentrations to 30 boiler operating day rolling average lb/MMBtu or lb/MWh emissions rates | Method 19 F-factor methodology at Appendix A-7 to part 60 of this chapter, or calculate using mass emissions rate and electrical output data (see §63.10007(e)). |

[1]Regarding emissions data collected during periods of startup or shutdown, see §§63.10020(b) and (c) and §63.10021(h).

[2]See Tables 1 and 2 to this subpart for required sample volumes and/or sampling run times.

[3]Incorporated by reference, see §63.14.

[4]When using ASTM D6348-03, the following conditions must be met: (1) The test plan preparation and implementation in the Annexes to ASTM D6348-03, Sections A1 through A8 are mandatory; (2) For ASTM D6348-03 Annex A5 (Analyte Spiking Technique), the percent (%)R must be determined for each target analyte (see Equation A5.5); (3) For the ASTM D6348-03 test data to be acceptable for a target analyte, %R must be 70% ≤R ≤130%; and (4) The %R value for each compound must be reported in the test report and all field measurements corrected with the calculated %R value for that compound using the following equation:

$$\text{Reported Result} = \frac{(\text{Measured Concentration in Stack})}{\%R} x\, 100$$

[77 FR 9464, Feb. 16, 2012, as amended at 78 FR 24091, Apr. 24, 2013]

**Table 6 to Subpart UUUUU of Part 63—Establishing PM CPMS Operating Limits**

As stated in §63.10007, you must comply with the following requirements for establishing operating limits:

| **If you have an applicable emission limit for . . .** | **And you choose to establish PM CPMS operating limits, you must . . .** | **And . . .** | **Using . . .** | **According to the following procedures . . .** |
|---|---|---|---|---|
| 1. Filterable Particulate matter (PM), total non-mercury HAP metals, individual non-mercury HAP metals, total HAP metals, or individual HAP metals for an existing EGU | Install, certify, maintain, and operate a PM CPMS for monitoring emissions discharged to the atmosphere according to §63.10010(h)(1) | Establish a site-specific operating limit in units of PM CPMS output signal (*e.g.,* milliamps, mg/acm, or other raw signal) | Data from the PM CPMS and the PM or HAP metals performance tests | 1. Collect PM CPMS output data during the entire period of the performance tests.<br>2. Record the average hourly PM CPMS output for each test run in the three run performance test.<br>3. Determine the highest 1-hour average PM CPMS measured during the performance test demonstrating compliance with the filterable PM or HAP metals emissions limitations. |
| 2. Filterable Particulate matter (PM), total non-mercury HAP metals, individual non-mercury HAP metals, total HAP metals, or individual HAP metals for a new EGU | Install, certify, maintain, and operate a PM CPMS for monitoring emissions discharged to the atmosphere according to §63.10010(h)(1) | Establish a site-specific operating limit in units of PM CPMS output signal (*e.g.,* milliamps, mg/acm, or other raw signal) | Data from the PM CPMS and the PM or HAP metals performance tests | 1. Collect PM CPMS output data during the entire period of the performance tests.<br>2. Record the average hourly PM CPMS output for each test run in the performance test.<br>3. Determine the PM CPMS operating limit in accordance with the requirements of §63.10023(b)(2) from data obtained during the performance test demonstrating compliance with the filterable PM or HAP metals emissions limitations. |

[78 FR 24091, Apr. 24, 2013]

**Table 7 to Subpart UUUUU of Part 63—Demonstrating Continuous Compliance**

As stated in §63.10021, you must show continuous compliance with the emission limitations for affected sources according to the following:

| If you use one of the following to meet applicable emissions limits, operating limits, or work practice standards . . . | You demonstrate continuous compliance by . . . |
|---|---|
| 1. CEMS to measure filterable PM, $SO_2$, HCl, HF, or Hg emissions, or using a sorbent trap monitoring system to measure Hg | Calculating the 30- (or 90-) boiler operating day rolling arithmetic average emissions rate in units of the applicable emissions standard basis at the end of each boiler operating day using all of the quality assured hourly average CEMS or sorbent trap data for the previous 30- (or 90-) boiler operating days, excluding data recorded during periods of startup or shutdown. |
| 2. PM CPMS to measure compliance with a parametric operating limit | Calculating the 30- (or 90-) boiler operating day rolling arithmetic average of all of the quality assured hourly average PM CPMS output data (e.g., milliamps, PM concentration, raw data signal) collected for all operating hours for the previous 30- (or 90-) boiler operating days, excluding data recorded during periods of startup or shutdown. |
| 3. Site-specific monitoring using CMS for liquid oil-fired EGUs for HCl and HF emission limit monitoring | If applicable, by conducting the monitoring in accordance with an approved site-specific monitoring plan. |
| 4. Quarterly performance testing for coal-fired, solid oil derived fired, or liquid oil-fired EGUs to measure compliance with one or more non-PM (or its alternative emission limits) applicable emissions limit in Table 1 or 2, or PM (or its alternative emission limits) applicable emissions limit in Table 2 | Calculating the results of the testing in units of the applicable emissions standard. |
| 5. Conducting periodic performance tune-ups of your EGU(s) | Conducting periodic performance tune-ups of your EGU(s), as specified in §63.10021(e). |
| 6. Work practice standards for coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGUs during startup | Operating in accordance with Table 3. |
| 7. Work practice standards for coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGUs during shutdown | Operating in accordance with Table 3. |

[78 FR 24092, Apr. 24, 2013]

**Table 8 to Subpart UUUUU of Part 63—Reporting Requirements**

As stated in §63.10031, you must comply with the following requirements for reports:

| You must submit a . . . | The report must contain . . . | You must submit the report . . . |
|---|---|---|
| 1. Compliance report | a. Information required in §63.10031(c)(1) through (4); and<br>b. If there are no deviations from any emission limitation (emission limit and operating limit) that applies to you and there are no deviations from the requirements for work practice standards in Table 3 to this subpart that apply to you, a statement that there were no deviations from the emission limitations and work practice standards during the reporting period. If there were no periods during which the CMSs, including continuous emissions monitoring system, and operating parameter monitoring systems, were out-of-control as specified in §63.8(c)(7), a statement that there were no periods during which the CMSs were out-of-control during the reporting period; and | Semiannually according to the requirements in §63.10031(b). |
| | c. If you have a deviation from any emission limitation (emission limit and operating limit) or work practice standard during the reporting period, the report must contain the information in §63.10031(d). If there were periods during which the CMSs, including continuous emissions monitoring systems and continuous parameter monitoring systems, were out-of-control, as specified in §63.8(c)(7), the report must contain the information in §63.10031(e) | |

**Table 9 to Subpart UUUUU of Part 63—Applicability of General Provisions to Subpart UUUUU**

As stated in §63.10040, you must comply with the applicable General Provisions according to the following:

[As stated in §63.10040, you must comply with the applicable General Provisions according to the following]

| Citation | Subject | Applies to subpart UUUUU |
|---|---|---|
| §63.1 | Applicability | Yes. |
| §63.2 | Definitions | Yes. Additional terms defined in §63.10042. |
| §63.3 | Units and Abbreviations | Yes. |
| §63.4 | Prohibited Activities and Circumvention | Yes. |
| §63.5 | Preconstruction Review and Notification Requirements | Yes. |
| §63.6(a), (b)(1)-(5), (b)(7), (c), (f)(2)-(3), (h)(2)-(9), (i), (j) | Compliance with Standards and Maintenance Requirements | Yes. |
| §63.6(e)(1)(i) | General Duty to minimize emissions | No. See §63.10000(b) for general duty requirement. |
| §63.6(e)(1)(ii) | Requirement to correct malfunctions ASAP | No. |
| §63.6(e)(3) | SSM Plan requirements | No. |
| §63.6(f)(1) | SSM exemption | No. |
| §63.6(h)(1) | SSM exemption | No. |

| Citation | Subject | Applies to subpart UUUUU |
|---|---|---|
| §63.6(g) | Compliance with Standards and Maintenance Requirements, Use of an alternative non-opacity emission standard | Yes. See §§63.10011(g)(4) and 63.10021(h)(4) for additional requirements. |
| §63.7(e)(1) | Performance testing | No. See §63.10007. |
| §63.8 | Monitoring Requirements | Yes. |
| §63.8(c)(1)(i) | General duty to minimize emissions and CMS operation | No. See §63.10000(b) for general duty requirement. |
| §63.8(c)(1)(iii) | Requirement to develop SSM Plan for CMS | No. |
| §63.8(d)(3) | Written procedures for CMS | Yes, except for last sentence, which refers to an SSM plan. SSM plans are not required. |
| §63.9 | Notification Requirements | Yes. |
| §63.10(a), (b)(1), (c), (d)(1)-(2), (e), and (f) | Recordkeeping and Reporting Requirements | Yes, except for the requirements to submit written reports under §63.10(e)(3)(v). |
| §63.10(b)(2)(i) | Recordkeeping of occurrence and duration of startups and shutdowns | No. |
| §63.10(b)(2)(ii) | Recordkeeping of malfunctions | No. See §63.10001 for recordkeeping of (1) occurrence and duration and (2) actions taken during malfunction. |
| §63.10(b)(2)(iii) | Maintenance records | Yes. |
| §63.10(b)(2)(iv) | Actions taken to minimize emissions during SSM | No. |
| §63.10(b)(2)(v) | Actions taken to minimize emissions during SSM | No. |
| §63.10(b)(2)(vi) | Recordkeeping for CMS malfunctions | Yes. |
| §63.10(b)(2)(vii)-(ix) | Other CMS requirements | Yes. |
| §63.10(b)(3), and (d)(3)-(5) | | No. |
| §63.10(c)(7) | Additional recordkeeping requirements for CMS—identifying exceedances and excess emissions | Yes. |
| §63.10(c)(8) | Additional recordkeeping requirements for CMS—identifying exceedances and excess emissions | Yes. |
| §63.10(c)(10) | Recording nature and cause of malfunctions | No. See §63.10032(g) and (h) for malfunctions recordkeeping requirements. |
| §63.10(c)(11) | Recording corrective actions | No. See §63.10032(g) and (h) for malfunctions recordkeeping requirements. |

| Citation | Subject | Applies to subpart UUUUU |
|---|---|---|
| §63.10(c)(15) | Use of SSM Plan | No. |
| §63.10(d)(5) | SSM reports | No. See §63.10021(h) and (i) for malfunction reporting requirements. |
| §63.11 | Control Device Requirements | No. |
| §63.12 | State Authority and Delegation | Yes. |
| §§63.13-63.16 | Addresses, Incorporation by Reference, Availability of Information, Performance Track Provisions | Yes. |
| §§63.1(a)(5), (a)(7)-(9), (b)(2), (c)(3)-(4), (d), 63.6(b)(6), (c)(3), (c)(4), (d), (e)(2), (e)(3)(ii), (h)(3), (h)(5)(iv), 63.8(a)(3), 63.9(b)(3), (h)(4), 63.10(c)(2)-(4), (c)(9) | Reserved | No. |

[79 FR 68793, Nov. 19, 2014]

**Appendix A to Subpart UUUUU of Part 63—Hg Monitoring Provisions**

1. General Provisions

1.1 *Applicability.* These monitoring provisions apply to the measurement of total vapor phase mercury (Hg) in emissions from electric utility steam generating units, using either a mercury continuous emission monitoring system (Hg CEMS) or a sorbent trap monitoring system. The Hg CEMS or sorbent trap monitoring system must be capable of measuring the total vapor phase mercury in units of the applicable emissions standard (e.g., lb/TBtu or lb/GWh), regardless of speciation.

1.2 *Initial Certification and Recertification Procedures.* The owner or operator of an affected unit that uses a Hg CEMS or a sorbent trap monitoring system together with other necessary monitoring components to account for Hg emissions in units of the applicable emissions standard shall comply with the initial certification and recertification procedures in section 4 of this appendix.

1.3 *Quality Assurance and Quality Control Requirements.* The owner or operator of an affected unit that uses a Hg CEMS or a sorbent trap monitoring system together with other necessary monitoring components to account for Hg emissions in units of the applicable emissions standard shall meet the applicable quality assurance requirements in section 5 of this appendix.

1.4 *Missing Data Procedures.* The owner or operator of an affected unit is not required to substitute for missing data from Hg CEMS or sorbent trap monitoring systems. Any process operating hour for which quality-assured Hg concentration data are not obtained is counted as an hour of monitoring system downtime.

2. Monitoring of Hg Emissions

2.1 *Monitoring System Installation Requirements.* Flue gases from the affected units under this subpart vent to the atmosphere through a variety of exhaust configurations including single stacks, common stack configurations, and multiple stack configurations. For each of these configurations, §63.10010(a) specifies the appropriate location(s) at which to install continuous monitoring systems (CMS). These CMS installation provisions apply to the Hg CEMS, sorbent trap monitoring systems, and other continuous monitoring systems that provide data for the Hg emissions calculations in section 6.2 of this appendix.

2.2 *Primary and Backup Monitoring Systems.* In the electronic monitoring plan described in section 7.1.1.2.1 of this appendix, you must designate a primary Hg CEMS or sorbent trap monitoring system. The primary system must be used to report hourly Hg concentration values when the system is able to provide quality-assured data, *i.e.,* when the system is “in control”. However, to increase data availability in the event of a primary monitoring system outage, you may install, operate, maintain, and calibrate backup monitoring systems, as follows:

2.2.1 *Redundant Backup Systems.* A redundant backup monitoring system may be either a separate Hg CEMS with its own probe, sample interface, and analyzer, or a separate sorbent trap monitoring system. A redundant backup system is one that is permanently installed at the unit or stack location, and is kept on “hot standby” in case the primary monitoring system is unable to provide quality-assured data. A redundant backup system must be represented as a unique monitoring system in the electronic monitoring plan. Each redundant backup monitoring system must be certified according to the applicable provisions in section 4 of this appendix and must meet the applicable on-going QA requirements in section 5 of this appendix.

2.2.2 *Non-redundant Backup Monitoring Systems.* A non-redundant backup monitoring system is a separate Hg CEMS or sorbent trap system that has been certified at a particular unit or stack location, but is not permanently installed at that location. Rather, the system is kept on “cold standby” and may be reinstalled in the event of a primary monitoring system outage. A non-redundant backup monitoring system must be represented as a unique monitoring system in the electronic monitoring plan. Non-redundant backup Hg CEMS must complete the same certification tests as the primary monitoring system, with one exception. The 7-day calibration error test is not required for a non-redundant backup Hg CEMS. Except as otherwise provided in section 2.2.4.5 of this appendix, a non-redundant backup monitoring system may only be used for 720 hours per year at a particular unit or stack location.

2.2.3 *Temporary Like-kind Replacement Analyzers.* When a primary Hg analyzer needs repair or maintenance, you may temporarily install a like-kind replacement analyzer, to minimize data loss. Except as otherwise provided in section 2.2.4.5 of this appendix, a temporary like-kind replacement analyzer may only be used for 720 hours per year at a particular unit or stack location. The analyzer must be represented as a component of the primary Hg CEMS, and must be assigned a 3-character component ID number, beginning with the prefix “LK”.

2.2.4 *Quality Assurance Requirements for Non-redundant Backup Monitoring Systems and Temporary Like-kind Replacement Analyzers.* To quality-assure the data from non-redundant backup Hg monitoring systems and temporary like-kind replacement Hg analyzers, the following provisions apply:

2.2.4.1 When a certified non-redundant backup sorbent trap monitoring system is brought into service, you must follow the procedures for routine day-to-day operation of the system, in accordance with Performance Specification (PS) 12B in appendix B to part 60 of this chapter.

2.2.4.2 When a certified non-redundant backup Hg CEMS or a temporary like-kind replacement Hg analyzer is brought into service, a calibration error test and a linearity check must be performed and passed. A single point system integrity check is also required, unless a NIST-traceable source of oxidized Hg was used for the calibration error test.

2.2.4.3 Each non-redundant backup Hg CEMS or temporary like-kind replacement Hg analyzer shall comply with all required daily, weekly, and quarterly quality-assurance test requirements in section 5 of this appendix, for as long as the system or analyzer remains in service.

2.2.4.4 For the routine, on-going quality-assurance of a non-redundant backup Hg monitoring system, a relative accuracy test audit (RATA) must be performed and passed at least once every 8 calendar quarters at the unit or stack location(s) where the system will be used.

2.2.4.5 To use a non-redundant backup Hg monitoring system or a temporary like-kind replacement analyzer for more than 720 hours per year at a particular unit or stack location, a RATA must first be performed and passed at that location.

3. Mercury Emissions Measurement Methods

The following definitions, equipment specifications, procedures, and performance criteria are applicable to the measurement of vapor-phase Hg emissions from electric utility steam generating units, under relatively low-dust conditions (*i.e.*, sampling in the stack or duct after all pollution control devices). The analyte measured by these procedures and specifications is total vapor-phase Hg in the flue gas, which represents the sum of elemental Hg ($Hg^{0,}$ CAS Number 7439-97-6) and oxidized forms of Hg.

3.1 *Definitions.*

3.1.1 *Mercury Continuous Emission Monitoring System or Hg CEMS* means all of the equipment used to continuously determine the total vapor phase Hg concentration. The measurement system may include the following major subsystems: sample acquisition, $Hg^{+2}$ to $Hg^{0}$ converter, sample transport, sample conditioning, flow control/gas manifold, gas analyzer, and data acquisition and handling system (DAHS). Hg CEMS may be nominally real-time or time-integrated, batch sampling systems that sample the gas on an intermittent basis and concentrate on a collection medium before intermittent analysis and reporting.

3.1.2 *Sorbent Trap Monitoring System* means the equipment required to monitor Hg emissions continuously by using paired sorbent traps containing iodated charcoal (IC) or other suitable sorbent medium. The monitoring system consists of a probe, paired sorbent traps, an umbilical line, moisture removal components, an airtight sample pump, a gas flow meter, and an automated data acquisition and handling system. The system samples the stack gas at a constant proportional rate relative to the stack gas volumetric flow rate. The sampling is a batch process. The average Hg concentration in the stack gas for the sampling period is determined, in units of micrograms per dry standard cubic meter (µg/dscm), based on the sample volume measured by the gas flow meter and the mass of Hg collected in the sorbent traps.

3.1.3 *NIST* means the National Institute of Standards and Technology, located in Gaithersburg, Maryland.

3.1.4 *NIST-Traceable Elemental Hg Standards* means either: compressed gas cylinders having known concentrations of elemental Hg, which have been prepared according to the “EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards”; or calibration gases having known concentrations of elemental Hg, produced by a generator that meets the performance requirements of the “EPA Traceability Protocol for Qualification and Certification of Elemental Mercury Gas Generators” or an interim version of that protocol.

3.1.5 *NIST-Traceable Source of Oxidized Hg* means a generator that is capable of providing known concentrations of vapor phase mercuric chloride ($HgCl_2$), and that meets the performance requirements of the “EPA Traceability Protocol for Qualification and Certification of Mercuric Chloride Gas Generators” or an interim version of that protocol.

3.1.6 *Calibration Gas* means a NIST-traceable gas standard containing a known concentration of elemental or oxidized Hg that is produced and certified in accordance with an EPA traceability protocol.

3.1.7 *Span Value* means a conservatively high estimate of the Hg concentrations to be measured by a CEMS. The span value of a Hg CEMS should be set to approximately twice the concentration corresponding to the emission standard, rounded off as appropriate (see section 3.2.1.4.2 of this appendix).

3.1.8 *Zero-Level Gas* means calibration gas containing a Hg concentration that is below the level detectable by the Hg gas analyzer in use.

3.1.9 *Low-Level Gas* means calibration gas with a concentration that is 20 to 30 percent of the span value.

3.1.10 *Mid-Level Gas* means calibration gas with a concentration that is 50 to 60 percent of the span value.

3.1.11 *High-Level Gas* means calibration gas with a concentration that is 80 to 100 percent of the span value.

3.1.12 *Calibration Error Test* means a test designed to assess the ability of a Hg CEMS to measure the concentrations of calibration gases accurately. A zero-level gas and an upscale gas are required for this test. For the upscale gas, either a mid-level gas or a high-level gas may be used, and the gas may either be an elemental or oxidized Hg standard.

3.1.13 *Linearity Check* means a test designed to determine whether the response of a Hg analyzer is linear across its measurement range. Three elemental Hg calibration gas standards (*i.e.*, low, mid, and high-level gases) are required for this test.

3.1.14 *System Integrity Check* means a test designed to assess the transport and measurement of oxidized Hg by a Hg CEMS. Oxidized Hg standards are used for this test. For a three-level system integrity check, low, mid, and high-level calibration gases are required. For a single-level check, either a mid-level gas or a high-level gas may be used.

3.1.15 *Cycle Time Test* means a test designed to measure the amount of time it takes for a Hg CEMS, while operating normally, to respond to a known step change in gas concentration. For this test, a zero gas and a high-level gas are required. The high-level gas may be either an elemental or an oxidized Hg standard.

3.1.16 *Relative Accuracy Test Audit* or *RATA* means a series of nine or more test runs, directly comparing readings from a Hg CEMS or sorbent trap monitoring system to measurements made with a reference stack test method. The relative accuracy (RA) of the monitoring system is expressed as the absolute mean difference between the monitoring system and reference method measurements plus the absolute value of the 2.5 percent error confidence coefficient, divided by the mean value of the reference method measurements.

3.1.17 *Unit Operating Hour* means a clock hour in which a unit combusts any fuel, either for part of the hour or for the entire hour.

3.1.18 *Stack Operating Hour* means a clock hour in which gases flow through a particular monitored stack or duct (either for part of the hour or for the entire hour), while the associated unit(s) are combusting fuel.

3.1.19 *Operating Day* means a calendar day in which a source combusts any fuel.

3.1.20 *Quality Assurance (QA) Operating Quarter* means a calendar quarter in which there are at least 168 unit or stack operating hours (as defined in this section).

3.1.21 *Grace Period* means a specified number of unit or stack operating hours after the deadline for a required quality-assurance test of a continuous monitor has passed, in which the test may be performed and passed without loss of data.

3.2 *Continuous Monitoring Methods.*

3.2.1 *Hg CEMS.* A typical Hg CEMS is shown in Figure A-1. The CEMS in Figure A-1 is a dilution extractive system, which measures Hg concentration on a wet basis, and is the most commonly-used type of Hg CEMS. Other system designs may be used, provided that the CEMS meets the performance specifications in section 4.1.1 of this appendix.

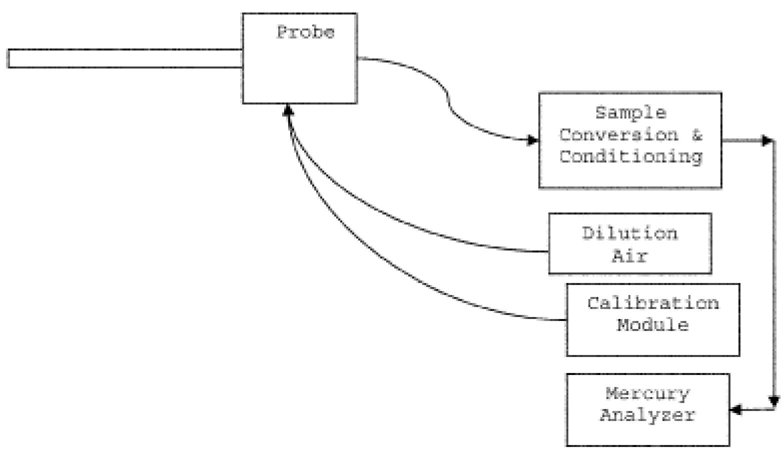


FIGURE A-1. TYPICAL MERCURY CEMS

3.2.1.1 *Equipment Specifications.*

3.2.1.1.1 *Materials of Construction.* All wetted sampling system components, including probe components prior to the point at which the calibration gas is introduced, must be chemically inert to all Hg species. Materials such as perfluoroalkoxy (PFA) Teflon™, quartz, and treated stainless steel (SS) are examples of such materials.

3.2.1.1.2 *Temperature Considerations.* All system components prior to the $Hg^{+2}$ to $Hg^0$ converter must be maintained at a sample temperature above the acid gas dew point.

3.2.1.1.3 *Measurement System Components.*

3.2.1.1.3.1 *Sample Probe.* The probe must be made of the appropriate materials as noted in paragraph 3.2.1.1.1 of this section, heated when necessary, as described in paragraph 3.2.1.1.3.4 of this section, and configured with ports for introduction of calibration gases.

3.2.1.1.3.2 *Filter or Other Particulate Removal Device.* The filter or other particulate removal device is part of the measurement system, must be made of appropriate materials, as noted in paragraph 3.2.1.1.1 of this section, and must be included in all system tests.

3.2.1.1.3.3 *Sample Line.* The sample line that connects the probe to the converter, conditioning system, and analyzer must be made of appropriate materials, as noted in paragraph 3.2.1.1.1 of this section.

3.2.1.1.3.4 *Conditioning Equipment.* For wet basis systems, such as the one shown in Figure A-1, the sample must be kept above its dew point either by: heating the sample line and all sample transport components up to the inlet of the analyzer (and, for hot-wet extractive systems, also heating the analyzer); or diluting the sample prior to analysis using a dilution probe system. The components required for these operations are considered to be conditioning equipment. For dry basis measurements, a condenser, dryer or other suitable device is required to remove moisture continuously from the sample gas, and any equipment needed to heat the probe or sample line to avoid condensation prior to the moisture removal component is also required.

3.2.1.1.3.5 *Sampling Pump.* A pump is needed to push or pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. If a mechanical sample pump is used and its surfaces are in contact with the sample gas prior to detection, the pump must be leak free and must be constructed of a material that is non-reactive to the gas being sampled (see paragraph 3.2.1.1.1 of this section). For dilution-type measurement systems, such as the system shown in Figure A-1, an ejector pump (eductor) may be used to create a sufficient vacuum that sample gas will be drawn through a critical orifice at a constant rate. The ejector pump must be constructed of any material that is non-reactive to the gas being sampled.

3.2.1.1.3.6 *Calibration Gas System(s).* Design and equip each Hg CEMS to permit the introduction of known concentrations of elemental Hg and $HgCl_2$ separately, at a point preceding the sample extraction filtration system, such that the entire measurement system can be checked. The calibration gas system(s) must be designed so that the flow rate exceeds the sampling system flow requirements and that the gas is delivered to the CEMS at atmospheric pressure.

3.2.1.1.3.7 *Sample Gas Delivery.* The sample line may feed directly to either a converter, a by-pass valve (for Hg speciating systems), or a sample manifold. All valve and/or manifold components must be made of material that is non-reactive to the gas sampled and the calibration gas, and must be configured to safely discharge any excess gas.

3.2.1.1.3.8 *Hg Analyzer.* An instrument is required that continuously measures the total vapor phase Hg concentration in the gas stream. The analyzer may also be capable of measuring elemental and oxidized Hg separately.

3.2.1.1.3.9 *Data Recorder.* A recorder, such as a computerized data acquisition and handling system (DAHS), digital recorder, or data logger, is required for recording measurement data.

3.2.1.2 *Reagents and Standards.*

3.2.1.2.1 *NIST Traceability.* Only NIST-certified or NIST-traceable calibration gas standards and reagents (as defined in paragraphs 3.1.4 and 3.1.5 of this section) shall be used for the tests and procedures required under this subpart. Calibration gases with known concentrations of $Hg^0$ and $HgCl_2$ are required. Special reagents and equipment may be needed to prepare the $Hg^0$ and $HgCl_2$ gas standards (e.g., NIST-traceable solutions of $HgCl_2$ and gas generators equipped with mass flow controllers).

3.2.1.2.2 *Required Calibration Gas Concentrations.*

3.2.1.2.2.1 *Zero-Level Gas.* A zero-level calibration gas with a Hg concentration below the level detectable by the Hg analyzer is required for calibration error tests and cycle time tests of the CEMS.

3.2.1.2.2.2 *Low-Level Gas.* A low-level calibration gas with a Hg concentration of 20 to 30 percent of the span value is required for linearity checks and 3-level system integrity checks of the CEMS. Elemental Hg standards are required for the linearity checks and oxidized Hg standards are required for the system integrity checks.

3.2.1.2.2.3 *Mid-Level Gas.* A mid-level calibration gas with a Hg concentration of 50 to 60 percent of the span value is required for linearity checks and for 3-level system integrity checks of the CEMS, and is optional for calibration error tests and single-level system integrity checks. Elemental Hg standards are required for the linearity checks, oxidized Hg standards are required for the system integrity checks, and either elemental or oxidized Hg standards may be used for the calibration error tests.

3.2.1.2.2.4 *High-Level Gas.* A high-level calibration gas with a Hg concentration of 80 to 100 percent of the span value is required for linearity checks, 3-level system integrity checks, and cycle time tests of the CEMS, and is optional for calibration error tests and single-level system integrity checks. Elemental Hg standards are required for the linearity checks, oxidized Hg standards are required for the system integrity checks, and either elemental or oxidized Hg standards may be used for the calibration error and cycle time tests.

3.2.1.3 *Installation and Measurement Location.* For the Hg CEMS and any additional monitoring system(s) needed to convert Hg concentrations to the desired units of measure (*i.e.*, a flow monitor, $CO_2$ or $O_2$ monitor, and/or moisture monitor, as applicable), install each monitoring system at a location: that is consistent with 63.10010(a); that represents the emissions exiting to the atmosphere; and where it is likely that the CEMS can pass the relative accuracy test.

3.2.1.4 *Monitor Span and Range Requirements.* Determine the appropriate span and range value(s) for the Hg CEMS as described in paragraphs 3.2.1.4.1 through 3.2.1.4.3 of this section.

3.2.1.4.1 *Maximum Potential Concentration.* There are three options for determining the maximum potential Hg concentration (MPC). Option 1 applies to coal combustion. You may use a default value of 10 µg/scm for all coal ranks (including coal refuse) except for lignite; for lignite, use 16 µg/scm. If different coals are blended as part of normal operation, use the highest MPC for any fuel in the blend. Option 2 is to base the MPC on the results of site-specific Hg emission testing. This option may be used only if the unit does not have add-on Hg emission controls or a flue gas desulfurization system, or if testing is performed upstream of all emission control devices. If Option 2 is selected, perform at least three test runs at the normal operating load, and the highest Hg concentration obtained in any of the tests shall be the MPC. Option 3 is to use fuel sampling and analysis to estimate the MPC. To make this estimate, use the average Hg content (*i.e.,* the weight percentage) from at least three representative fuel samples, together with other available information, including, but not limited to the maximum fuel feed rate, the heating value of the fuel, and an appropriate F-factor. Assume that all of the Hg in the fuel is emitted to the atmosphere as vapor-phase Hg.

3.2.1.4.2 *Span Value.* To determine the span value of the Hg CEMS, multiply the Hg concentration corresponding to the applicable emissions standard by two. If the result of this calculation is an exact multiple of 10 µg/scm, use the result as the span value. Otherwise, round off the result to either: the next highest integer; the next highest multiple of 5 µg/scm; or the next highest multiple of 10 µg/scm.

3.2.1.4.3 *Analyzer Range.* The Hg analyzer must be capable of reading Hg concentration as high as the MPC.

3.2.2 *Sorbent Trap Monitoring System.* A sorbent trap monitoring system (as defined in paragraph 3.1.2 of this section) may be used as an alternative to a Hg CEMS. If this option is selected, the monitoring system shall be installed, maintained, and operated in accordance with Performance Specification (PS) 12B in Appendix B to part 60 of this chapter. The system shall be certified in accordance with the provisions of section 4.1.2 of this appendix.

3.2.3 *Other Necessary Data Collection.* To convert measured hourly Hg concentrations to the units of the applicable emissions standard (*i.e.,* lb/TBtu or lb/GWh), additional data must be collected, as described in paragraphs 3.2.3.1 through 3.2.3.3 of this section. Any additional monitoring systems needed for this purpose must be certified, operated, maintained, and quality-assured according to the applicable provisions of part 75 of this chapter (see §§63.10010(b) through (d)). The calculation methods for the types of emission limits described in paragraphs 3.2.3.1 and 3.2.3.2 of this section are presented in section 6.2 of this appendix.

3.2.3.1 *Heat Input-Based Emission Limits.* For a heat input-based Hg emission limit (*i.e.,* in lb/TBtu), data from a certified $CO_2$ or $O_2$ monitor are needed, along with a fuel-specific F-factor and a conversion constant to convert measured Hg concentration values to the units of the standard. In some cases, the stack gas moisture content must also be considered in making these conversions.

3.2.3.2 *Electrical Output-Based Emission Rates.* If the applicable Hg limit is electrical output-based (*i.e.,* lb/GWh), hourly electrical load data and unit operating times are required in addition to hourly data from a certified stack gas flow rate monitor and (if applicable) moisture data.

3.2.3.3 *Sorbent Trap Monitoring System Operation.* Routine operation of a sorbent trap monitoring system requires the use of a certified stack gas flow rate monitor, to maintain an established ratio of stack gas flow rate to sample flow rate.

4. Certification and Recertification Requirements

4.1 *Certification Requirements.* All Hg CEMS and sorbent trap monitoring systems and the additional monitoring systems used to continuously measure Hg emissions in units of the applicable emissions standard in accordance with this appendix must be certified in a timely manner, such that the initial compliance demonstration is completed no later than the applicable date in §63.9984(f).

4.1.1 *Hg CEMS.* Table A-1, below, summarizes the certification test requirements and performance specifications for a Hg CEMS. The CEMS may not be used to report quality-assured data until these performance criteria are met. Paragraphs 4.1.1.1 through 4.1.1.5 of this section provide specific instructions for the required tests. All tests must be performed with the affected unit(s) operating (*i.e.,* combusting fuel). Except for the RATA, which must be performed at normal load, no particular load level is required for the certification tests.

4.1.1.1 *7-Day Calibration Error Test.* Perform the 7-day calibration error test on 7 consecutive source operating days, using a zero-level gas and either a high-level or a mid-level calibration gas standard (as defined in sections 3.1.8, 3.1.10, and 3.1.11 of this appendix). Either elemental or oxidized NIST-traceable Hg standards (as defined in sections 3.1.4 and 3.1.5 of this appendix) may be used for the test. If moisture and/or chlorine is added to the calibration gas, the dilution effect of the moisture and/or chlorine addition on the calibration gas concentration must be accounted for in an appropriate manner. Operate the Hg CEMS in its normal sampling mode during the test. The calibrations should be approximately 24 hours apart, unless the 7-day test is performed over nonconsecutive calendar days. On each day of the test, inject the zero-level and upscale gases in sequence and record the analyzer responses. Pass the calibration gas through all filters, scrubbers, conditioners, and other monitor components used during normal sampling, and through as much of the sampling probe as is practical. Do not make any manual adjustments to the monitor (*i.e.,* resetting the calibration) until after taking measurements at both the zero and upscale concentration levels. If automatic adjustments are made following both injections, conduct the calibration error test such that the magnitude of the adjustments can be determined, and use only the unadjusted analyzer responses in the calculations. Calculate the calibration error (CE) on each day of the test, as described in Table A-1. The CE on each day of the test must either meet the main performance specification or the alternative specification in Table A-1.

4.1.1.2 *Linearity Check.* Perform the linearity check using low, mid, and high-level concentrations of NIST-traceable elemental Hg standards. Three gas injections at each concentration level are required, with no two successive injections at the same concentration level. Introduce the calibration gas at the gas injection port, as specified in section 3.2.1.1.3.6 of this appendix. Operate the CEMS at its normal operating temperature and conditions. Pass the calibration gas through all filters, scrubbers, conditioners, and other components used during normal sampling, and through as much of the sampling probe as is practical. If moisture and/or chlorine is added to the calibration gas, the dilution effect of the moisture and/or chlorine addition on the calibration gas concentration must be accounted for in an appropriate manner. Record the monitor response from the data acquisition and handling system for each gas injection. At each concentration level, use the average analyzer response to calculate the linearity error (LE), as described in Table A-1. The LE must either meet the main performance specification or the alternative specification in Table A-1.

4.1.1.3 *Three-Level System Integrity Check.* Perform the 3-level system integrity check using low, mid, and high-level calibration gas concentrations generated by a NIST-traceable source of oxidized Hg. Follow the same basic procedure as for the linearity check. If moisture and/or chlorine is added to the calibration gas, the dilution effect of the moisture and/or chlorine addition on the calibration gas concentration must be accounted for in an appropriate manner. Calculate the system integrity error (SIE), as described in Table A-1. The SIE must either meet the main performance specification or the alternative specification in Table A-1. (Note: This test is not required if the CEMS does not have a converter).

Table A-1—Required Certification Tests and Performance Specifications for Hg CEMS

| For this required certification test . . . | The main performance specification[1] is . . . | The alternate performance specification[1] is . . . | And the conditions of the alternate specification are . . . |
|---|---|---|---|
| 7-day calibration error test[2] | $\|R - A\| \leq 5.0\%$ of span value, for both the zero and upscale gases, on each of the 7 days | $\|R - A\| \leq 1.0$ μg/scm | The alternate specification may be used on any day of the test. |
| Linearity check[3] | $\|R - A_{avg}\| \leq 10.0\%$ of the reference gas concentration at each calibration gas level (low, mid, or high) | $\|R - A_{avg}\| \leq 0.8$ μg/scm | The alternate specification may be used at any gas level. |
| 3-level system integrity check[4] | $\|R - A_{avg}\| \leq 10.0\%$ of the reference gas concentration at each calibration gas level | $\|R - A_{avg}\| \leq 0.8$ μg/scm | The alternate specification may be used at any gas level. |
| RATA | 20.0% RA | $\|RM_{avg} - C_{avg}\| \leq 1.0$ μg/scm** | $RM_{avg} < 5.0$ μg/scm. |
| Cycle time test[2] | 15 minutes.[5] | | |

[1]Note that $|R - A|$ is the absolute value of the difference between the reference gas value and the analyzer reading. $|R - A_{avg}, |$ is the absolute value of the difference between the reference gas concentration and the average of the analyzer responses, at a particular gas level.

[2]Use either elemental or oxidized Hg standards; a mid-level or high-level upscale gas may be used. This test is not required for Hg CEMS that use integrated batch sampling; however, those monitors must be capable of recording at least one Hg concentration reading every 15 minutes.

[3]Use elemental Hg standards.

[4]Use oxidized Hg standards. Not required if the CEMS does not have a converter.

[5]Stability criteria—Readings change by <2.0% of span *or* by ≤0.5 μg/scm, for 2 minutes.

**Note that $|RM_{avg} - C_{avg}|$ is the absolute difference between the mean reference method value and the mean CEMS value from the RATA. The arithmetic difference between $RM_{avg}$ and $C_{avg}$ can be either + or −.

4.1.1.4 *Cycle Time Test.* Perform the cycle time test, using a zero-level gas and a high-level calibration gas.

Either an elemental or oxidized NIST-traceable Hg standard may be used as the high-level gas. Perform the test in two stages—upscale and downscale. The slower of the upscale and downscale response times is the cycle time for the CEMS. Begin each stage of the test by injecting calibration gas after achieving a stable reading of the stack emissions. The cycle time is the amount of time it takes for the analyzer to register a reading that is 95 percent of the way between the stable stack emissions reading and the final, stable reading of the calibration gas concentration. Use the following criterion to determine when a stable reading of stack emissions or calibration gas has been attained—the reading is stable if it changes by no more than 2.0 percent of the span value or 0.5 µg/scm (whichever is less restrictive) for two minutes, or a reading with a change of less than 6.0 percent from the measured average concentration over 6 minutes. Integrated batch sampling type Hg CEMS are exempted from this test; however, these systems must be capable of delivering a measured Hg concentration reading at least once every 15 minutes. If necessary to increase measurement sensitivity of a batch sampling type Hg CEMS for a specific application, you may petition the Administrator for approval of a time longer than 15 minutes between readings.

4.1.1.5 *Relative Accuracy Test Audit (RATA).* Perform the RATA of the Hg CEMS at normal load. Acceptable Hg reference methods for the RATA include ASTM D6784-02 (Reapproved 2008), “Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method)” (incorporated by reference, see §63.14) and Methods 29, 30A, and 30B in appendix A-8 to part 60. When Method 29 or ASTM D6784-02 is used, paired sampling trains are required. To validate a Method 29 or ASTM D6784-02 test run, calculate the relative deviation (RD) using Equation A-1 of this section, and assess the results as follows to validate the run. The RD must not exceed 10 percent, when the average Hg concentration is greater than 1.0 µg/dscm. If the average concentration is ≤1.0 µg/dscm, the RD must not exceed 20 percent. The RD results are also acceptable if the absolute difference between the two Hg concentrations does not exceed 0.2 µg/dscm. If the RD specification is met, the results of the two samples shall be averaged arithmetically.

$$RD = \frac{|C_a - C_b|}{C_a + C_b} \, x\,100 \quad \text{(Eq. A-1)}$$

Where:

RD = Relative deviation between the Hg concentrations of samples “a” and “b” (percent)

$C_a$ = Hg concentration of Hg sample “a” (µg/dscm)

$C_b$ = Hg concentration of Hg sample “b” (µg/dscm)

4.1.1.5.1 *Special Considerations.* A minimum of nine valid test runs must be performed, directly comparing the CEMS measurements to the reference method. More than nine test runs may be performed. If this option is chosen, the results from a maximum of three test runs may be rejected so long as the total number of test results used to determine the relative accuracy is greater than or equal to nine; however, all data must be reported including the rejected data. The minimum time per run is 21 minutes if Method 30A is used. If Method 29, Method 30B, or ASTM D6784-02 (Reapproved 2008), “Standard Test Method for Elemental, Oxidized, Particle-Bound and Total Mercury in Flue Gas Generated from Coal-Fired Stationary Sources (Ontario Hydro Method)” (incorporated by reference, see §63.14) is used, the time per run must be long enough to collect a sufficient mass of Hg to analyze. Complete the RATA within 168 unit operating hours, except when Method 29 or ASTM D6784-02 is used, in which case up to 336 operating hours may be taken to finish the test.

4.1.1.5.2 *Calculation of RATA Results.* Calculate the relative accuracy (RA) of the monitoring system, on a µg/scm basis, as described in section 12 of Performance Specification (PS) 2 in Appendix B to part 60 of this chapter (see Equations 2-3 through 2-6 of PS2). For purposes of calculating the relative accuracy, ensure that the reference method and monitoring system data are on a consistent moisture basis, either wet or dry. The CEMS must either meet the main performance specification or the alternative specification in Table A-1.

4.1.1.5.3 *Bias Adjustment.* Measurement or adjustment of Hg CEMS data for bias is not required.

4.1.2 *Sorbent Trap Monitoring Systems.* For the initial certification of a sorbent trap monitoring system, only a RATA is required.

4.1.2.1 *Reference Methods.* The acceptable reference methods for the RATA of a sorbent trap monitoring system are the same as those listed in paragraph 4.1.1.5 of this section.

4.1.2.2 “The special considerations specified in paragraph 4.1.1.5.1 of this section apply to the RATA of a sorbent trap monitoring system. During the RATA, the monitoring system must be operated and quality-assured in accordance with Performance Specification (PS) 12B in Appendix B to part 60 of this chapter with the following exceptions for sorbent trap section 2 breakthrough:

4.1.2.2.1 For stack Hg concentrations >1 μg/dscm, ≤10% of section 1 Hg mass;

4.1.2.2.2 For stack Hg concentrations ≤1 μg/dscm and >0.5 μg/dscm, ≤20% of section 1 Hg mass;

4.1.2.2.3 For stack Hg concentrations ≤0.5 μg/dscm and >0.1 μg/dscm, ≤50% of section 1 Hg mass; and

4.1.2.2.4 For stack Hg concentrations ≤0.1μg/dscm, no breakthrough criterion assuming all other QA/QC specifications are met.

4.1.2.3 The type of sorbent material used by the traps during the RATA must be the same as for daily operation of the monitoring system; however, the size of the traps used for the RATA may be smaller than the traps used for daily operation of the system.

4.1.2.4 *Calculation of RATA Results.* Calculate the relative accuracy (RA) of the sorbent trap monitoring system, on a μg/scm basis, as described in section 12 of Performance Specification (PS) 2 in appendix B to part 60 of this chapter (see Equations 2-3 through 2-6 of PS2). For purposes of calculating the relative accuracy, ensure that the reference method and monitoring system data are on a consistent moisture basis, either wet or dry.The main and alternative RATA performance specifications in Table A-1 for Hg CEMS also apply to the sorbent trap monitoring system.

4.1.2.5 *Bias Adjustment.* Measurement or adjustment of sorbent trap monitoring system data for bias is not required.

4.1.3 *Diluent Gas, Flow Rate, and/or Moisture Monitoring Systems.* Monitoring systems that are used to measure stack gas volumetric flow rate, diluent gas concentration, or stack gas moisture content, either for routine operation of a sorbent trap monitoring system or to convert Hg concentration data to units of the applicable emission limit, must be certified in accordance with the applicable provisions of part 75 of this chapter.

4.2 *Recertification.* Whenever the owner or operator makes a replacement, modification, or change to a certified CEMS or sorbent trap monitoring system that may significantly affect the ability of the system to accurately measure or record pollutant or diluent gas concentrations, stack gas flow rates, or stack gas moisture content, the owner or operator shall recertify the monitoring system. Furthermore, whenever the owner or operator makes a replacement, modification, or change to the flue gas handling system or the unit operation that may significantly change the concentration or flow profile, the owner or operator shall recertify the monitoring system. The same tests performed for the initial certification of the monitoring system shall be repeated for recertification, unless otherwise specified by the Administrator. Examples of changes that require recertification include: replacement of a gas analyzer; complete monitoring system replacement, and changing the location or orientation of the sampling probe.

5. Ongoing Quality Assurance (QA) and Data Validation

5.1 *Hg CEMS.*

5.1.1 *Required QA Tests.* Periodic QA testing of each Hg CEMS is required following initial certification. The required QA tests, the test frequencies, and the performance specifications that must be met are summarized in Table A-2, below. All tests must be performed with the affected unit(s) operating (*i.e.,* combusting fuel). Except for the RATA, which must be performed at normal load, no particular load level is required for the tests. For each test, follow the same basic procedures in section 4.1.1 of this appendix that were used for initial certification.

5.1.2 *Test Frequency.* The frequency for the required QA tests of the Hg CEMS shall be as follows:

5.1.2.1 Calibration error tests of the Hg CEMS are required daily, except during unit outages. Use either NIST-traceable elemental Hg standards or NIST-traceable oxidized Hg standards for these calibrations. Both a zero-level gas and either a mid-level or high-level gas are required for these calibrations.

5.1.2.2 Perform a linearity check of the Hg CEMS in each QA operating quarter, using low-level, mid-level, and high-level NIST-traceable elemental Hg standards. For units that operate infrequently, limited exemptions from this test are allowed for “non-QA operating quarters”. A maximum of three consecutive exemptions for this reason are permitted, following the quarter of the last test. After the third consecutive exemption, a linearity check must be performed in the next calendar quarter or within a grace period of 168 unit or stack operating hours after the end of that quarter. The test frequency for 3-level system integrity checks (if performed in lieu of linearity checks) is the same as for the linearity checks. Use low-level, mid-level, and high-level NIST-traceable oxidized Hg standards for the system integrity checks.

5.1.2.3 If required, perform a single-level system integrity check weekly, *i.e.,* once every 7 operating days (see the third column in Table A-2).

5.1.2.4 The test frequency for the RATAs of the Hg CEMS shall be annual, *i.e.,* once every four QA operating quarters. For units that operate infrequently, extensions of RATA deadlines are allowed for non-QA operating quarters. Following a RATA, if there is a subsequent non-QA quarter, it extends the deadline for the next test by one calendar quarter. However, there is a limit to these extensions; the deadline may not be extended beyond the end of the eighth calendar quarter after the quarter of the last test. At that point, a RATA must either be performed within the eighth calendar quarter or in a 720 hour unit or stack operating hour grace period following that quarter. When a required annual RATA is done within a grace period, the deadline for the next RATA is three QA operating quarters after the quarter in which the grace period test is performed.

5.1.3 *Grace Periods.*

5.1.3.1 A 168 unit or stack operating hour grace period is available for quarterly linearity checks and 3-level system integrity checks of the Hg CEMS.

5.1.3.2 A 720 unit or stack operating hour grace period is available for RATAs of the Hg CEMS.

5.1.3.3 There is no grace period for weekly system integrity checks. The test must be completed once every 7 operating days.

5.1.4 *Data Validation.* The Hg CEMS is considered to be out-of-control, and data from the CEMS may not be reported as quality-assured, when any one of the acceptance criteria for the required QA tests in Table A-2 is not met. The CEMS is also considered to be out-of-control when a required QA test is not performed on schedule or within an allotted grace period. To end an out-of-control period, the QA test that was either failed or not done on time must be performed and passed. Out-of-control periods are counted as hours of monitoring system downtime.

5.1.5 *Conditional Data Validation.* For certification, recertification, and diagnostic testing of Hg monitoring systems, and for the required QA tests when non-redundant backup Hg monitoring systems or temporary like-kind Hg analyzers are brought into service, the conditional data validation provisions in §§75.20(b)(3)(ii) through (b)(3)(ix) of this chapter may be used to avoid or minimize data loss. The allotted window of time to complete 7-day calibration error tests, linearity checks, cycle time tests, and RATAs shall be as specified in §75.20(b)(3)(iv) of this chapter. Required system integrity checks must be completed within 168 unit or stack operating hours after the probationary calibration error test.

Table A-2—On-Going QA Test Requirements for Hg CEMS

| Perform this type of QA test . . . | At this frequency . . . | With these qualifications and exceptions . . . | Acceptance criteria . . . |
|---|---|---|---|
| Calibration error test | Daily | • Use either a mid- or high-level gas | $\lvert R-A \rvert \leq 5.0\%$ of span value.<br>*or*<br>$\lvert R-A \rvert \leq 1.0$ μg/scm. |
| | | • Use either elemental or oxidized Hg | |
| | | • Calibrations are not required when the unit is not in operation | |
| Single-level system integrity check | Weekly[1] | • Required only for systems with converters | $\lvert R-A_{avg} \rvert \leq 10.0\%$ of the reference gas value.<br>*or* |

| | | | |
|---|---|---|---|
| | | | $\lvert R-A_{avg}\rvert \leq 0.8$ µg/scm. |
| | | • Use oxidized Hg—either mid- or high-level | |
| | | • Not required if daily calibrations are done with a NIST-traceable source of oxidized Hg | |
| Linearity check<br>*or*<br>3-level system integrity check | Quarterly[3] | • Required in each “QA operating quarter”[2]—and no less than once every 4 calendar quarters | $\lvert R-A_{avg}\rvert \leq 10.0\%$ of the reference gas value, at each calibration gas level.<br>*or*<br>$\lvert R-A_{avg}\rvert \leq 0.8$ µg/scm. |
| | | • 168 operating hour grace period available | |
| | | • Use elemental Hg for linearity check | |
| | | • Use oxidized Hg for system integrity check | |
| | | • For system integrity check, CEMS must have a converter | |
| RATA | Annual[4] | • Test deadline may be extended for “non-QA operating quarters”, up to a maximum of 8 quarters from the quarter of the previous test | 20.0% RA.<br>*or*<br>$\lvert RM_{avg}-C_{avg}\rvert \leq 1.0$ µg/scm,<br>*if*<br>$RM_{avg} < 5.0$ µg/scm. |
| | | • 720 operating hour grace period available | |

[1]“Weekly” means once every 7 operating days.

[2]A “QA operating quarter” is a calendar quarter with at least 168 unit or stack operating hours.

[3]“Quarterly” means once every QA operating quarter.

[4]“Annual” means once every four QA operating quarters.

5.1.6 *Adjustment of Span.* If you discover that a span adjustment is needed (e.g., if the Hg concentration readings exceed the span value for a significant percentage of the unit operating hours in a calendar quarter), you must implement the span adjustment within 90 days after the end of the calendar quarter in which you identify the need for the adjustment. A diagnostic linearity check is required within 168 unit or stack operating hours after changing the span value.

5.2 *Sorbent Trap Monitoring Systems.*

5.2.1 Each sorbent trap monitoring system shall be continuously operated and maintained in accordance with Performance Specification (PS) 12B in appendix B to part 60 of this chapter. The QA/QC criteria for routine operation of the system are summarized in Table 12B-1 of PS 12B. Each pair of sorbent traps may be used to sample the stack gas for up to 14 operating days.

5.2.2 For ongoing QA, periodic RATAs of the system are required.

5.2.2.1 The RATA frequency shall be annual, *i.e.,* once every four QA operating quarters. The provisions in section 5.1.2.4 of this appendix pertaining to RATA deadline extensions also apply to sorbent trap monitoring systems.

5.2.2.2 The same RATA performance criteria specified in Table A-2 for Hg CEMS also apply to the annual RATAs of the sorbent trap monitoring system.

5.2.2.3 A 720 unit or stack operating hour grace period is available for RATAs of the monitoring system.

5.2.3 Data validation for sorbent trap monitoring systems shall be done in accordance with Table 12B-1 in Performance Specification (PS) 12B in appendix B to part 60 of this chapter. All periods of invalid data shall be counted as hours of monitoring system downtime.

5.3 *Flow Rate, Diluent Gas, and Moisture Monitoring Systems.* The on-going QA test requirements for these monitoring systems are specified in part 75 of this chapter (see §§63.10010(b) through (d)).

5.4 *QA/QC Program Requirements.* The owner or operator shall develop and implement a quality assurance/quality control (QA/QC) program for the Hg CEMS and/or sorbent trap monitoring systems that are used to provide data under this subpart. At a minimum, the program shall include a written plan that describes in detail (or that refers to separate documents containing) complete, step-by-step procedures and operations for the most important QA/QC activities. Electronic storage of the QA/QC plan is permissible, provided that the information can be made available in hard copy to auditors and inspectors. The QA/QC program requirements for the diluent gas, flow rate, and moisture monitoring systems described in section 3.2.1.3 of this appendix are specified in section 1 of appendix B to part 75 of this chapter.

5.4.1 *General Requirements.*

5.4.1.1 *Preventive Maintenance.* Keep a written record of procedures needed to maintain the Hg CEMS and/or sorbent trap monitoring system(s) in proper operating condition and a schedule for those procedures. Include, at a minimum, all procedures specified by the manufacturers of the equipment and, if applicable, additional or alternate procedures developed for the equipment.

5.4.1.2 *Recordkeeping and Reporting.* Keep a written record describing procedures that will be used to implement the recordkeeping and reporting requirements of this appendix.

5.4.1.3 *Maintenance Records.* Keep a record of all testing, maintenance, or repair activities performed on any Hg CEMS or sorbent trap monitoring system in a location and format suitable for inspection. A maintenance log may be used for this purpose. The following records should be maintained: date, time, and description of any testing, adjustment, repair, replacement, or preventive maintenance action performed on any monitoring system and records of any corrective actions associated with a monitor outage period. Additionally, any adjustment that may significantly affect a system's ability to accurately measure emissions data must be recorded (e.g., changing the dilution ratio of a CEMS), and a written explanation of the procedures used to make the adjustment(s) shall be kept.

5.4.2 *Specific Requirements for Hg CEMS.*

5.4.2.1 *Daily Calibrations, Linearity Checks and System Integrity Checks.* Keep a written record of the procedures used for daily calibrations of the Hg CEMS. If moisture and/or chlorine is added to the Hg calibration gas, document how the dilution effect of the moisture and/or chlorine addition on the calibration gas concentration is accounted for in an appropriate manner. Also keep records of the procedures used to perform linearity checks of the Hg CEMS and the procedures for system integrity checks of the Hg CEMS. Document how the test results are calculated and evaluated.

5.4.2.2 *Monitoring System Adjustments.* Document how each component of the Hg CEMS will be adjusted to provide correct responses to calibration gases after routine maintenance, repairs, or corrective actions.

5.4.2.3 *Relative Accuracy Test Audits.* Keep a written record of procedures used for RATAs of the Hg CEMS. Indicate the reference methods used and document how the test results are calculated and evaluated.

5.4.3 *Specific Requirements for Sorbent Trap Monitoring Systems.*

5.4.3.1 *Sorbent Trap Identification and Tracking.* Include procedures for inscribing or otherwise permanently marking a unique identification number on each sorbent trap, for chain of custody purposes. Keep records of the ID of the monitoring system in which each sorbent trap is used, and the dates and hours of each Hg collection period.

5.4.3.2 *Monitoring System Integrity and Data Quality.* Document the procedures used to perform the leak checks when a sorbent trap is placed in service and removed from service. Also Document the other QA procedures used to ensure system integrity and data quality, including, but not limited to, gas flow meter calibrations, verification of moisture removal, and ensuring air-tight pump operation. In addition, the QA plan must include the data acceptance and quality control criteria in Table 12B-1 in section 9.0 of Performance Specification (PS) 12B in Appendix B to part 60 of this chapter. All reference meters used to calibrate the gas flow meters (e.g., wet test meters) shall be periodically recalibrated. Annual, or more frequent, recalibration is recommended. If a NIST-traceable calibration device is used as a reference flow meter, the QA plan must include a protocol for ongoing maintenance and periodic recalibration to maintain the accuracy and NIST-traceability of the calibrator.

5.4.3.3 *Hg Analysis.* Explain the chain of custody employed in packing, transporting, and analyzing the sorbent traps. Keep records of all Hg analyses. The analyses shall be performed in accordance with the procedures described in section 11.0 of Performance Specification (PS) 12B in Appendix B to part 60 of this chapter.

5.4.3.4 *Data Collection Period.* State, and provide the rationale for, the minimum acceptable data collection period (e.g., one day, one week, etc.) for the size of sorbent trap selected for the monitoring. Address such factors as the Hg concentration in the stack gas, the capacity of the sorbent trap, and the minimum mass of Hg required for the analysis. Each pair of sorbent traps may be used to sample the stack gas for up to 14 operating days.

5.4.3.5 *Relative Accuracy Test Audit Procedures.* Keep records of the procedures and details peculiar to the sorbent trap monitoring systems that are to be followed for relative accuracy test audits, such as sampling and analysis methods.

6. Data Reduction and Calculations

6.1 Data Reduction.

6.1.1 Reduce the data from Hg CEMS to hourly averages, in accordance with §60.13(h)(2) of this chapter.

6.1.2 For sorbent trap monitoring systems, determine the Hg concentration for each data collection period and assign this concentration value to each operating hour in the data collection period.

6.1.3 For any operating hour in which valid data are not obtained, either for Hg concentration or for a parameter used in the emissions calculations (*i.e.,* flow rate, diluent gas concentration, or moisture, as applicable), do not calculate the Hg emission rate for that hour. For the purposes of this appendix, part 75 substitute data values are not considered to be valid data.

6.1.4 Operating hours in which valid data are not obtained for Hg concentration are considered to be hours of monitor downtime. The use of substitute data for Hg concentration is not required.

6.2 *Calculation of Hg Emission Rates.* Use the applicable calculation methods in paragraphs 6.2.1 and 6.2.2 of this section to convert Hg concentration values to the appropriate units of the emission standard.

6.2.1 *Heat Input-Based Hg Emission Rates.* Calculate hourly heat input-based Hg emission rates, in units of lb/TBtu, according to sections 6.2.1.1 through 6.2.1.4 of this appendix.

6.2.1.1 Select an appropriate emission rate equation from among Equations 19-1 through 19-9 in EPA Method 19 in appendix A-7 to part 60 of this chapter.

6.2.1.2 Calculate the Hg emission rate in lb/MMBtu, using the equation selected from Method 19. Multiply the Hg concentration value by $6.24 \times 10^{-11}$ to convert it from µg/scm to lb/scf. In cases where an appropriate F-factor is not listed in Table 19-2 of Method 19, you may use F-factors from Table 1 in section 3.3.5 of appendix F to part 75 of this chapter, or F-factors derived using the procedures in section 3.3.6 of appendix to part 75 of this chapter. Also, for startup and shutdown hours, you may calculate the Hg emission rate using the applicable diluent cap value specified in section 3.3.4.1 of appendix F to part 75 of this chapter, provided that the diluent gas monitor is not out-of-control and the hourly average $O_2$ concentration is above 14.0% $O_2$ (19.0% for an IGCC) or the hourly average $CO_2$ concentration is below 5.0% $CO_2$ (1.0% for an IGCC), as applicable.

6.2.1.3 Multiply the lb/MMBtu value obtained in section 6.2.1.2 of this appendix by $10^6$ to convert it to lb/TBtu.

6.2.1.4 The heat input-based Hg emission rate limit in Table 2 to this subpart must be met on a 30 boiler operating day rolling average basis, except as otherwise provided in §63.10009(a)(2). Use Equation 19-19 in EPA Method 19 to calculate the Hg emission rate for each averaging period. The term $E_{hj}$ in Equation 19-19 must be in the units of the applicable emission limit. Do not include non-operating hours with zero emissions in the average.

6.2.2 *Electrical Output-Based Hg Emission Rates.* Calculate electrical output-based Hg emission limits in units of lb/GWh, according to sections 6.2.2.1 through 6.2.2.3 of this appendix.

6.2.2.1 Calculate the Hg mass emissions for each operating hour in which valid data are obtained for all parameters, using Equation A-2 of this section (for wet-basis measurements of Hg concentration) or Equation A-3 of this section (for dry-basis measurements), as applicable:

$$M_h = K C_h Q_h \qquad \text{(Equation A-2)}$$

Where:

$M_h$ = Hg mass emission rate for the hour (lb/h)

K = Units conversion constant, $6.24 \times 10^{-11}$ lb-scm/µg-scf,

$C_h$ = Hourly average Hg concentration, wet basis (µg/scm)

$Q_h$ = Stack gas volumetric flow rate for the hour (scfh).

(Note: Use unadjusted flow rate values; bias adjustment is not required)

$$M_h = K C_h Q_h \left(1 - B_{ws}\right) \qquad \text{(Equation A-3)}$$

Where:

$M_h$ = Hg mass emission rate for the hour (lb/h)

K = Units conversion constant, $6.24 \times 10^{-11}$ lb-scm/µg-scf.

$C_h$ = Hourly average Hg concentration, dry basis (µg/dscm).

$Q_h$ = Stack gas volumetric flow rate for the hour (scfh)

(Note: Use unadjusted flow rate values; bias adjustment is not required).

$B_{ws}$ = Moisture fraction of the stack gas, expressed as a decimal (equal to % $H_2O$/100)

6.2.2.2 Use Equation A-4 of this section to calculate the emission rate for each unit or stack operating hour in which valid data are obtained for all parameters.

$$E_{ho} = \frac{M_h}{(MW)_h} x\, 10^3 \qquad \text{(Equation A-4)}$$

Where:

$E_{ho}$ = Electrical output-based Hg emission rate (lb/GWh).

$M_h$ = Hg mass emission rate for the hour, from Equation A-2 or A-3 of this section, as applicable (lb/h).

$(MW)_h$ = Gross electrical load for the hour, in megawatts (MW).

$10^3$ = Conversion factor from megawatts to gigawatts.

6.2.2.3 The applicable electrical output-based Hg emission rate limit in Table 1 or 2 to this subpart must be met on a 30-boiler operating day rolling average basis, except as otherwise provided in §63.10009(a)(2). Use Equation A-5 of this section to calculate the Hg emission rate for each averaging period.

$$\overline{E}_o = \frac{\sum_{h=1}^{n} E_{ho}}{n} \qquad \text{(Equation A-5)}$$

Where:

$\overline{E}_o$ = Hg emission rate for the averaging period (lb/GWh).

$E_{cho}$ = Electrical output-based hourly Hg emission rate for unit or stack operating hour "h" in the averaging period, from Equation A-4 of this section (lb/GWh).

n = Number of unit or stack operating hours in the averaging period in which valid data were obtained for all parameters.

(*Note:* Do *not* include non-operating hours with zero emission rates in the average).

7. Recordkeeping and Reporting

7.1 *Recordkeeping Provisions.* For the Hg CEMS and/or sorbent trap monitoring systems and any other necessary monitoring systems installed at each affected unit, the owner or operator must maintain a file of all measurements, data, reports, and other information required by this appendix in a form suitable for inspection, for 5 years from the date of each record, in accordance with §63.10033. The file shall contain the information in paragraphs 7.1.1 through 7.1.10 of this section.

7.1.1 *Monitoring Plan Records.* For each affected unit or group of units monitored at a common stack, the owner or operator shall prepare and maintain a monitoring plan for the Hg CEMS and/or sorbent trap monitoring system(s) and any other monitoring system(s) (*i.e.,* flow rate, diluent gas, or moisture systems) needed for routine operation of a sorbent trap monitoring system or to convert Hg concentrations to units of the applicable emission standard. The monitoring plan shall contain essential information on the continuous monitoring systems and shall Document how the data derived from these systems ensure that all Hg emissions from the unit or stack are monitored and reported.

7.1.1.1 *Updates.* Whenever the owner or operator makes a replacement, modification, or change in a certified continuous monitoring system that is used to provide data under this subpart (including a change in the automated data acquisition and handling system or the flue gas handling system) which affects information reported in the monitoring plan (e.g., a change to a serial number for a component of a monitoring system), the owner or operator shall update the monitoring plan.

7.1.1.2 *Contents of the Monitoring Plan.* For Hg CEMS and sorbent trap monitoring systems, the monitoring plan shall contain the information in sections 7.1.1.2.1 and 7.1.1.2.2 of this appendix, as applicable. For stack gas flow rate, diluent gas, and moisture monitoring systems, the monitoring plan shall include the information required for those systems under §75.53 (g) of this chapter.

7.1.1.2.1 *Electronic.* The electronic monitoring plan records must include the following: unit or stack ID number(s); monitoring location(s); the Hg monitoring methodologies used; Hg monitoring system information, including, but not limited to: Unique system and component ID numbers; the make, model, and serial number of the monitoring equipment; the sample acquisition method; formulas used to calculate Hg emissions; Hg monitor span and range information The electronic monitoring plan shall be evaluated and submitted using the Emissions Collection and Monitoring Plan System (ECMPS) Client Tool provided by the Clean Air Markets Division in the Office of Atmospheric Programs of the EPA.

7.1.1.2.2 *Hard Copy.* Keep records of the following: schematics and/or blueprints showing the location of the Hg monitoring system(s) and test ports; data flow diagrams; test protocols; monitor span and range calculations; miscellaneous technical justifications.

7.1.2 *Operating Parameter Records.* The owner or operator shall record the following information for each operating hour of each affected unit and also for each group of units utilizing a common stack, to the extent that these data are needed to convert Hg concentration data to the units of the emission standard. For non-operating hours, record only the items in paragraphs 7.1.2.1 and 7.1.2.2 of this section. If there is heat input to the unit(s), but no electrical load, record only the items in paragraphs 7.1.2.1, 7.1.2.2, and (if applicable) 7.1.2.4 of this section.

7.1.2.1 The date and hour;

7.1.2.2 The unit or stack operating time (rounded up to the nearest fraction of an hour (in equal increments that can range from one hundredth to one quarter of an hour, at the option of the owner or operator);

7.1.2.3 The hourly gross unit load (rounded to nearest MWe); and

7.1.2.4 If applicable, the F-factor used to calculate the heat input-based Hg emission rate.

7.1.2.5 If applicable, a flag to indicate that the hour is a startup or shutdown hour (as defined in §63.10042).

7.1.3 *Hg Emissions Records (Hg CEMS).* For each affected unit or common stack using a Hg CEMS, the owner or operator shall record the following information for each unit or stack operating hour:

7.1.3.1 The date and hour;

7.1.3.2 Monitoring system and component identification codes, as provided in the monitoring plan, if the CEMS provides a quality-assured value of Hg concentration for the hour;

7.1.3.3 The hourly Hg concentration, if a quality-assured value is obtained for the hour (µg/scm, rounded to three significant figures);

7.1.3.4 A special code, indicating whether or not a quality-assured Hg concentration is obtained for the hour. This code may be entered manually when a temporary like-kind replacement Hg analyzer is used for reporting; and

7.1.3.5 Monitor data availability, as a percentage of unit or stack operating hours, calculated according to §75.32 of this chapter.

7.1.4 *Hg Emissions Records (Sorbent Trap Monitoring Systems).* For each affected unit or common stack using a sorbent trap monitoring system, each owner or operator shall record the following information for the unit or stack operating hour in each data collection period:

7.1.4.1 The date and hour;

7.1.4.2 Monitoring system and component identification codes, as provided in the monitoring plan, if the sorbent trap system provides a quality-assured value of Hg concentration for the hour;

7.1.4.3 The hourly Hg concentration, if a quality-assured value is obtained for the hour (µg/scm, rounded to three significant figures). Note that when a quality-assured Hg concentration value is obtained for a particular data collection period, that single concentration value is applied to each operating hour of the data collection period.

7.1.4.4 A special code, indicating whether or not a quality-assured Hg concentration is obtained for the hour;

7.1.4.5 The average flow rate of stack gas through each sorbent trap (in appropriate units, e.g., liters/min, cc/min, dscm/min);

7.1.4.6 The gas flow meter reading (in dscm, rounded to the nearest hundredth), at the beginning and end of the collection period and at least once in each unit operating hour during the collection period;

7.1.4.7 The ratio of the stack gas flow rate to the sample flow rate, as described in section 12.2 of Performance Specification (PS) 12B in Appendix B to part 60 of this chapter; and

7.1.4.8 Monitor data availability, as a percentage of unit or stack operating hours, calculated according to §75.32 of this chapter.

7.1.5 *Stack Gas Volumetric Flow Rate Records.*

7.1.5.1 Hourly measurements of stack gas volumetric flow rate during unit operation are required for routine operation of sorbent trap monitoring systems, to maintain the required ratio of stack gas flow rate to sample flow rate (see section 8.2.2 of Performance Specification (PS) 12B in Appendix B to part 60 of this chapter). Hourly stack gas flow rate data are also needed in order to demonstrate compliance with electrical output-based Hg emissions limits, as provided in section 6.2.2 of this appendix.

7.1.5.2 For each affected unit or common stack, if hourly measurements of stack gas flow rate are needed for sorbent trap monitoring system operation or to convert Hg concentrations to the units of the emission standard, use a flow rate monitor that meets the requirements of part 75 of this chapter to record the required data. You must keep hourly flow rate records, as specified in §75.57(c)(2) of this chapter.

7.1.6 *Records of Stack Gas Moisture Content.*

7.1.6.1 Correction of hourly Hg concentration data for moisture is sometimes required when converting Hg concentrations to the units of the applicable Hg emissions limit. In particular, these corrections are required:

7.1.6.1.1 For sorbent trap monitoring systems;

7.1.6.1.2 For Hg CEMS that measure Hg concentration on a dry basis, when you must calculate electrical output-based Hg emission rates; and

7.1.6.1.3 When using certain equations from EPA Method 19 in appendix A-7 to part 60 of this chapter to calculate heat input-based Hg emission rates.

7.1.6.2 If hourly moisture corrections are required, either use a fuel-specific default moisture percentage from §75.11(b)(1) of this chapter or a certified moisture monitoring system that meets the requirements of part 75 of this chapter, to record the required data. If you use a moisture monitoring system, you must keep hourly records of the stack gas moisture content, as specified in §75.57(c)(3) of this chapter.

7.1.7 *Records of Diluent Gas ($CO_2$* or $O_2$) Concentration.

7.1.7.1 When a heat input-based Hg mass emissions limit must be met, in units of lb/TBtu, hourly measurements of $CO_2$ or $O_2$ concentration are required to convert Hg concentrations to units of the standard.

7.1.7.2 If hourly measurements of diluent gas concentration are needed, use a certified $CO_2$ or $O_2$ monitor that meets the requirements of part 75 of this chapter to record the required data. You must keep hourly $CO_2$ or $O_2$ concentration records, as specified in §75.57(g) of this chapter.

7.1.8 *Hg Emission Rate Records.* For applicable Hg emission limits in units of lb/TBtu or lb/GWh, record the following information for each affected unit or common stack:

7.1.8.1 The date and hour;

7.1.8.2 The hourly Hg emissions rate (lb/TBtu or lb/GWh, as applicable, calculated according to section 6.2.1 or 6.2.2 of this appendix, rounded to three significant figures), if valid values of Hg concentration and all other required parameters (stack gas volumetric flow rate, diluent gas concentration, electrical load, and moisture data, as applicable) are obtained for the hour;

7.1.8.3 An identification code for the formula (either the selected equation from Method 19 in section 6.2.1 of this appendix or Equation A-4 in section 6.2.2 of this appendix) used to derive the hourly Hg emission rate from Hg concentration, flow rate, electrical load, diluent gas concentration, and moisture data (as applicable); and

7.1.8.4 A code indicating that the Hg emission rate was not calculated for the hour, if valid data for Hg concentration and/or any of the other necessary parameters are not obtained for the hour. For the purposes of this appendix, the substitute data values required under part 75 of this chapter for diluent gas concentration, stack gas flow rate and moisture content are not considered to be valid data.

7.1.8.5 If applicable, a code to indicate that the default electrical load (as defined in §63.10042) was used to calculate the Hg emission rate.

7.1.8.6 If applicable, a code to indicate that the diluent cap (as defined in §63.10042) was used to calculate the Hg emission rate.

7.1.9 *Certification and Quality Assurance Test Records.* For any Hg CEMS and sorbent trap monitoring systems used to provide data under this subpart, record the following certification and quality-assurance information:

7.1.9.1 The reference values, monitor responses, and calculated calibration error (CE) values, and a flag to indicate whether the test was done using elemental or oxidized Hg, for all required 7-day calibration error tests and daily calibration error tests of the Hg CEMS;

7.1.9.2 The reference values, monitor responses, and calculated linearity error (LE) or system integrity error (SIE) values for all linearity checks of the Hg CEMS, and for all single-level and 3-level system integrity checks of the Hg CEMS;

7.1.9.3 The CEMS and reference method readings for each test run and the calculated relative accuracy results for all RATAs of the Hg CEMS and/or sorbent trap monitoring systems;

7.1.9.4 The stable stack gas and calibration gas readings and the calculated results for the upscale and downscale stages of all required cycle time tests of the Hg CEMS or, for a batch sampling Hg CEMS, the interval between measured Hg concentration readings;

7.1.9.5 Supporting information for all required RATAs of the Hg monitoring systems, including records of the test dates, the raw reference method and monitoring system data, the results of sample analyses to substantiate the reported test results, and records of sampling equipment calibrations;

7.1.9.6 For sorbent trap monitoring systems, also keep records of the results of all analyses of the sorbent traps used for routine daily operation of the system, and information documenting the results of all leak checks and the other applicable quality control procedures described in Table 12B-1 of Performance Specification (PS) 12B in appendix B to part 60 of this chapter.

7.1.9.7 For stack gas flow rate, diluent gas, and (if applicable) moisture monitoring systems, you must keep records of all certification, recertification, diagnostic, and on-going quality-assurance tests of these systems, as specified in §75.59 of this chapter.

7.2 *Reporting Requirements.*

7.2.1 *General Reporting Provisions.* The owner or operator shall comply with the following requirements for reporting Hg emissions from each affected unit (or group of units monitored at a common stack) under this subpart:

7.2.1.1 Notifications, in accordance with paragraph 7.2.2 of this section;

7.2.1.2 Monitoring plan reporting, in accordance with paragraph 7.2.3 of this section;

7.2.1.3 Certification, recertification, and QA test submittals, in accordance with paragraph 7.2.4 of this section; and

7.2.1.4 Electronic quarterly report submittals, in accordance with paragraph 7.2.5 of this section.

7.2.2 *Notifications.* The owner or operator shall provide notifications for each affected unit (or group of units monitored at a common stack) under this subpart in accordance with §63.10030.

7.2.3 *Monitoring Plan Reporting.* For each affected unit (or group of units monitored at a common stack) under this subpart using Hg CEMS or sorbent trap monitoring system to measure Hg emissions, the owner or operator shall make electronic and hard copy monitoring plan submittals as follows:

7.2.3.1 Submit the electronic and hard copy information in section 7.1.1.2 of this appendix pertaining to the Hg monitoring systems at least 21 days prior to the applicable date in §63.9984. Also submit the monitoring plan information in §75.53.(g) pertaining to the flow rate, diluent gas, and moisture monitoring systems within that same time frame, if the required records are not already in place.

7.2.3.2 Whenever an update of the monitoring plan is required, as provided in paragraph 7.1.1.1 of this section. An electronic monitoring plan information update must be submitted either prior to or concurrent with the quarterly report for the calendar quarter in which the update is required.

7.2.3.3 All electronic monitoring plan submittals and updates shall be made to the Administrator using the ECMPS Client Tool. Hard copy portions of the monitoring plan shall be kept on record according to section 7.1 of this appendix.

7.2.4 *Certification, Recertification, and Quality-Assurance Test Reporting.* Except for daily QA tests of the required monitoring systems (*i.e.*, calibration error tests and flow monitor interference checks), the results of all required certification, recertification, and quality-assurance tests described in paragraphs 7.1.9.1 through 7.1.9.7 of this section (except for test results previously submitted, e.g., under the ARP) shall be submitted electronically, using the ECMPS Client Tool, either prior to or concurrent with the relevant quarterly electronic emissions report.

7.2.5 *Quarterly Reports.*

7.2.5.1 Beginning with the report for the calendar quarter in which the initial compliance demonstration is completed or the calendar quarter containing the applicable date in §63.9984, the owner or operator of any affected unit shall use the ECMPS Client Tool to submit electronic quarterly reports to the Administrator, in an XML format specified by the Administrator, for each affected unit (or group of units monitored at a common stack) under this subpart.

7.2.5.2 The electronic reports must be submitted within 30 days following the end of each calendar quarter, except for units that have been placed in long-term cold storage.

7.2.5.3 Each electronic quarterly report shall include the following information:

7.2.5.3.1 The date of report generation;

7.2.5.3.2 Facility identification information;

7.2.5.3.3 The information in paragraphs 7.1.2 through 7.1.8 of this section, as applicable to the Hg emission measurement methodology (or methodologies) used and the units of the Hg emission standard(s); and

7.2.5.3.4 The results of all daily calibration error tests of the Hg CEMS, as described in paragraph 7.1.9.1 of this section and (if applicable) the results of all daily flow monitor interference checks.

7.2.5.4 *Compliance Certification.* Based on reasonable inquiry of those persons with primary responsibility for ensuring that all Hg emissions from the affected unit(s) under this subpart have been correctly and fully monitored, the owner or operator shall submit a compliance certification in support of each electronic quarterly emissions monitoring report. The compliance certification shall include a statement by a responsible official with that official's name, title, and signature, certifying that, to the best of his or her knowledge, the report is true, accurate, and complete.

[77 FR 9464, Feb. 16, 2012, as amended at 77 FR 23408, Apr. 19, 2012; 78 FR 24093, Apr. 24, 2013; 79 FR 68795, Nov. 19, 2014]

**Appendix B to Subpart UUUUU of Part 63—-HCl and HF Monitoring Provisions**

1. Applicability

These monitoring provisions apply to the measurement of HCl and/or HF emissions from electric utility steam generating units, using CEMS. The CEMS must be capable of measuring HCl and/or HF in the appropriate units of the applicable emissions standard (e.g., lb/MMBtu, lb/MWh, or lb/GWh).

2. Monitoring of HCl and/or HF Emissions

2.1 *Monitoring System Installation Requirements.* Install HCl and/or HF CEMS and any additional monitoring systems needed to convert pollutant concentrations to units of the applicable emissions limit in accordance with Performance Specification 15 for extractive Fourier Transform Infrared Spectroscopy (FTIR) continuous emissions monitoring systems in appendix B to part 60 of this chapter and §63.10010(a).

2.2 *Primary and Backup Monitoring Systems.* The provisions pertaining to primary and redundant backup monitoring systems in section 2.2 of appendix A to this subpart apply to HCl and HF CEMS and any additional monitoring systems needed to convert pollutant concentrations to units of the applicable emissions limit.

2.3 *FTIR Monitoring System Equipment, Supplies, Definitions, and General Operation.* The provisions of Performance Specification 15 Sections 2.0, 3.0, 4.0, 5.0, 6.0, and 10.0 apply.

3. Initial Certification Procedures

The initial certification procedures for the HCl or HF CEMS used to provide data under this subpart are as follows:

3.1 The HCl and/or HF CEMS must be certified according to Performance Specification 15 using the procedures for gas auditing and comparison to a reference method (RM) as specified in sections 3.1.1 and 3.1.2 below. (Please Note: EPA plans to publish a technology neutral performance specification and appropriate on-going quality-assurance requirements for HCl CEMS in the near future along with amendments to this appendix to accommodate their use.)

3.1.1 You must conduct a gas audit of the HCl and/or HF CEMS as described in section 9.1 of Performance Specification 15, with the exceptions listed in sections 3.1.2.1 and 3.1.2.2 below.

3.1.1.1 The audit sample gas does not have to be obtained from the Administrator; however, it must be (1) from a secondary source of certified gases (*i.e.*, independent of any calibration gas used for the daily calibration assessments) and (2) directly traceable to National Institute of Standards and Technology (NIST) or VSL Dutch Metrology Institute (VSL) reference materials through an unbroken chain of comparisons. If audit gas traceable to NIST or VSL reference materials is not available, you may use a gas with a concentration certified to a specified uncertainty by the gas manufacturer.

3.1.1.2 Analyze the results of the gas audit using the calculations in section 12.1 of Performance Specification 15. The calculated correction factor (CF) from Eq. 6 of Performance Specification 15 must be between 0.85 and 1.15. You do not have to test the bias for statistical significance.

3.1.2 You must perform a relative accuracy test audit or RATA according to section 11.1.1.4 of Performance Specification 15 and the requirements below. Perform the RATA of the HCl or HF CEMS at normal load. Acceptable HCl/HF reference methods (RM) are Methods 26 and 26A in appendix A-8 to part 60 of this chapter, Method 320 in

Appendix A to this part, or ASTM D6348-03 (Reapproved 2010) “Standard Test Method for Determination of Gaseous Compounds by Extractive Direct Interface Fourier Transform Infrared (FTIR) Spectroscopy” (incorporated by reference, see §63.14), each applied based on the criteria set forth in Table 5 of this subpart.

3.1.2.1 When ASTM D6348-03 is used as the RM, the following conditions must be met:

3.1.2.1.1 The test plan preparation and implementation in the Annexes to ASTM D6348-03, Sections A1 through A8 are mandatory;

3.1.2.1.2 In ASTM D6348-03 Annex A5 (Analyte Spiking Technique), the percent (%) R must be determined for each target analyte (see Equation A5.5);

3.1.2.1.3 For the ASTM D6348-03 test data to be acceptable for a target analyte, %R must be 70% ≤R ≤130%; and

3.1.2.1.4 The %R value for each compound must be reported in the test report and all field measurements corrected with the calculated %R value for that compound using the following equation:

$$\text{Reported Result} = \frac{(\text{Measured Concentration in Stack})}{\%R} x\,100 \qquad \text{(Eq. B-1)}$$

3.1.2.2 The relative accuracy (RA) of the HCl or HF CEMS must be no greater than 20 percent of the mean value of the RM test data in units of ppm on the same moisture basis. Alternatively, if the mean RM value is less than 1.0 ppm, the RA results are acceptable if the absolute value of the difference between the mean RM and CEMS values does not exceed 0.20 ppm.

3.2 Any additional stack gas flow rate, diluent gas, and moisture monitoring system(s) needed to express pollutant concentrations in units of the applicable emissions limit must be certified according to part 75 of this chapter.

4. Recertification Procedures

Whenever the owner or operator makes a replacement, modification, or change to a certified CEMS that may significantly affect the ability of the system to accurately measure or record pollutant or diluent gas concentrations, stack gas flow rates, or stack gas moisture content, the owner or operator shall recertify the monitoring system. Furthermore, whenever the owner or operator makes a replacement, modification, or change to the flue gas handling system or the unit operation that may significantly change the concentration or flow profile, the owner or operator shall recertify the monitoring system. The same tests performed for the initial certification of the monitoring system shall be repeated for recertification, unless otherwise specified by the Administrator. Examples of changes that require recertification include: Replacement of a gas analyzer; complete monitoring system replacement, and changing the location or orientation of the sampling probe.

5. On-Going Quality Assurance Requirements

5.1 For on-going QA test requirements for HCl and HF CEMS, implement the quality assurance/quality control procedures of Performance Specification 15 of appendix B to part 60 of this chapter as set forth in sections 5.1.1 through 5.1.3 and 5.3.2 of this appendix.

5.1.1 On a daily basis, you must assess the calibration error of the HCl or HF CEMS using either a calibration transfer standard as specified in Performance Specification 15 Section 10.1 which references Section 4.5 of the FTIR Protocol or a HCl and/or HF calibration gas at a concentration no greater than two times the level corresponding to the applicable emission limit. A calibration transfer standard is a substitute calibration compound chosen to ensure that the FTIR is performing well at the wavelength regions used for analysis of the target analytes. The measured concentration of the calibration transfer standard or HCl and/or HF calibration gas results must agree within ±5 percent of the reference gas value after correction for differences in pressure.

5.1.2 On a quarterly basis, you must conduct a gas audit of the HCl and/or HF CEMS as described in section 3.1.1 of this appendix. For the purposes of this appendix, “quarterly” means once every “QA operating quarter” (as defined in section 3.1.20 of appendix A to this subpart). You have the option to use HCl gas in lieu of HF gas for conducting this audit on an HF CEMS. To the extent practicable, perform consecutive quarterly gas audits at least 30 days apart. The initial quarterly audit is due in the first QA operating quarter following the calendar quarter in which certification testing of the CEMS is successfully completed. Up to three consecutive exemptions from the quarterly audit requirement are allowed for "non-QA operating quarters" (*i.e.,* calendar quarters in which there are less than 168 unit or stack operating hours). However, no more than four consecutive calendar quarters may elapse without performing a gas audit, except as otherwise provided in section 5.3.3.2.1 of this appendix.

5.1.3 You must perform an annual relative accuracy test audit or RATA of the HCl or HF CEMS as described in section 3.1.2 of this appendix. Perform the RATA at normal load. For the purposes of this appendix, "annual" means once every four "QA operating quarters" (as defined in section 3.1.20 of appendix A to this subpart). The first annual RATA is due within four QA operating quarters following the calendar quarter in which the initial certification testing of the HCl or HF CEMS is successfully completed. The provisions in section 5.1.2.4 of appendix A to this subpart pertaining to RATA deadline extensions also apply.

5.2 Stack gas flow rate, diluent gas, and moisture monitoring systems must meet the applicable on-going QA test requirements of part 75 of this chapter.

5.3 *Data Validation.*

5.3.1 *Out-of-Control Periods.* A HCl or HF CEMS that is used to provide data under this appendix is considered to be out-of-control, and data from the CEMS may not be reported as quality-assured, when any acceptance criteria for a required QA test is not met. The HCl or HF CEMS is also considered to be out-of-control when a required QA test is not performed on schedule or within an allotted grace period. To end an out-of-control period, the QA test that was either failed or not done on time must be performed and passed. Out-of-control periods are counted as hours of monitoring system downtime.

5.3.2 *Grace Periods.* For the purposes of this appendix, a "grace period" is defined as a specified number of unit or stack operating hours after the deadline for a required quality-assurance test of a continuous monitor has passed, in which the test may be performed and passed without loss of data.

5.3.2.1 For the flow rate, diluent gas, and moisture monitoring systems described in section 5.2 of this appendix, a 168 unit or stack operating hour grace period is available for quarterly linearity checks, and a 720 unit or stack operating hour grace period is available for RATAs, as provided, respectively, in sections 2.2.4 and 2.3.3 of appendix B to part 75 of this chapter.

5.3.2.2 For the purposes of this appendix, if the deadline for a required gas audit or RATA of a HCl or HF CEMS cannot be met due to circumstances beyond the control of the owner or operator:

5.3.2.2.1 A 168 unit or stack operating hour grace period is available in which to perform the gas audit; or

5.3.2.2.2 A 720 unit or stack operating hour grace period is available in which to perform the RATA.

5.3.2.3 If a required QA test is performed during a grace period, the deadline for the next test shall be determined as follows:

5.3.2.3.1 For a gas audit or RATA of the monitoring systems described in section 5.1 of this appendix, determine the deadline for the next gas audit or RATA (as applicable) in accordance with section 2.2.4(b) or 2.3.3(d) of appendix B to part 75 of this chapter; treat a gas audit in the same manner as a linearity check.

5.3.2.3.2 For the gas audit of a HCl or HF CEMS, the grace period test only satisfies the audit requirement for the calendar quarter in which the test was originally due. If the calendar quarter in which the grace period audit is performed is a QA operating quarter, an additional gas audit is required for that quarter.

5.3.2.3.3 For the RATA of a HCl or HF CEMS, the next RATA is due within three QA operating quarters after the calendar quarter in which the grace period test is performed.

5.3.3 *Conditional Data Validation* For recertification and diagnostic testing of the monitoring systems that are used to provide data under this appendix, and for the required QA tests when non-redundant backup monitoring systems or temporary like-kind replacement analyzers are brought into service, the conditional data validation provisions in §§75.20(b)(3)(ii) through (b)(3)(ix) of this chapter may be used to avoid or minimize data loss. The allotted window of time to complete calibration tests and RATAs shall be as specified in §75.20(b)(3)(iv) of this chapter; the allotted window of time to complete a gas audit shall be the same as for a linearity check (*i.e.,* 168 unit or stack operating hours).

6. Missing Data Requirements

For the purposes of this appendix, the owner or operator of an affected unit shall not substitute for missing data from HCl or HF CEMS. Any process operating hour for which quality-assured HCl or HF concentration data are not obtained is counted as an hour of monitoring system downtime.

7. Bias Adjustment

Bias adjustment of hourly emissions data from a HCl or HF CEMS is not required.

8. QA/QC Program Requirements

The owner or operator shall develop and implement a quality assurance/quality control (QA/QC) program for the HCl and/or HF CEMS that are used to provide data under this subpart. At a minimum, the program shall include a written plan that describes in detail (or that refers to separate documents containing) complete, step-by-step procedures and operations for the most important QA/QC activities. Electronic storage of the QA/QC plan is permissible, provided that the information can be made available in hard copy to auditors and inspectors. The QA/QC program requirements for the other monitoring systems described in section 5.2 of this appendix are specified in section 1 of appendix B to part 75 of this chapter.

8.1 *General Requirements for HCl and HF CEMS.*

8.1.1 *Preventive Maintenance.* Keep a written record of procedures needed to maintain the HCl and/or HF CEMS in proper operating condition and a schedule for those procedures. This shall, at a minimum, include procedures specified by the manufacturers of the equipment and, if applicable, additional or alternate procedures developed for the equipment.

8.1.2 *Recordkeeping and Reporting.* Keep a written record describing procedures that will be used to implement the recordkeeping and reporting requirements of this appendix.

8.1.3 *Maintenance Records.* Keep a record of all testing, maintenance, or repair activities performed on any HCl or HF CEMS in a location and format suitable for inspection. A maintenance log may be used for this purpose. The following records should be maintained: Date, time, and description of any testing, adjustment, repair, replacement, or preventive maintenance action performed on any monitoring system and records of any corrective actions associated with a monitor outage period. Additionally, any adjustment that may significantly affect a system's ability to accurately measure emissions data must be recorded and a written explanation of the procedures used to make the adjustment(s) shall be kept.

8.2 *Specific Requirements for HCl and HF CEMS.* The following requirements are specific to HCl and HF CEMS:

8.2.1 Keep a written record of the procedures used for each type of QA test required for each HCl and HF CEMS. Explain how the results of each type of QA test are calculated and evaluated.

8.2.2 Explain how each component of the HCl and/or HF CEMS will be adjusted to provide correct responses to calibration gases after routine maintenance, repairs, or corrective actions.

9. Data Reduction and Calculations

9.1 Design and operate the HCl and/or HF CEMS to complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.

9.2 Reduce the HCl and/or HF concentration data to hourly averages in accordance with §60.13(h)(2) of this chapter.

9.3 Convert each hourly average HCl or HF concentration to an HCl or HF emission rate expressed in units of the applicable emissions limit.

9.3.1 For heat input-based emission rates, select an appropriate emission rate equation from among Equations 19-1 through 19-9 in EPA Method 19 in Appendix A-7 to part 60 of this chapter, to calculate the HCl or HF emission rate in lb/MMBtu. Multiply the HCl concentration value (ppm) by $9.43 \times 10^{-8}$ to convert it to lb/scf, for use in the applicable Method 19 equation. For HF, the conversion constant from ppm to lb/scf is $5.18 \times 10^{-8}$. The appropriate diluent cap value from section 6.2.1.2 of Appendix A to this subpart may be used to calculate the HCl or HF emission rate (lb/MMBtu) during startup or shutdown hours.

9.3.2 For electrical output-based emission rates, first calculate the HCl or HF mass emission rate (lb/h), using an equation that has the general form of Equation A-2 or A-3 in appendix A to this subpart (as applicable), replacing the value of K with $9.43 \times 10^{-8}$ lb/scf-ppm (for HCl) or $5.18 \times 10^{-8}$ (for HF) and defining $C_h$ as the hourly average HCl or HF concentration in ppm. Then, use Equation A-4 in appendix A to this subpart to calculate the HCl or HF emission rate in lb/GWh. If the applicable HCl or HF limit is expressed in lb/MWh, divide the result from Equation A-4 by $10^3$.

9.4 Use Equation A-5 in appendix A of this subpart to calculate the required 30 operating day rolling average HCl or HF emission rates. Round off each 30 operating day average to two significant figures. The term $E_{ho}$ in Equation A-5 must be in the units of the applicable emissions limit.

10. Recordkeeping Requirements

10.1 For each HCl or HF CEMS installed at an affected source, and for any other monitoring system(s) needed to convert pollutant concentrations to units of the applicable emissions limit, the owner or operator must maintain a file of all measurements, data, reports, and other information required by this appendix in a form suitable for inspection, for 5 years from the date of each record, in accordance with §63.10033. The file shall contain the information in paragraphs 10.1.1 through 10.1.8 of this section.

10.1.1 *Monitoring Plan Records.* For each affected unit or group of units monitored at a common stack, the owner or operator shall prepare and maintain a monitoring plan for the HCl and/or HF CEMS and any other monitoring system(s) (*i.e,* flow rate, diluent gas, or moisture systems) needed to convert pollutant concentrations to units of the applicable emission standard. The monitoring plan shall contain essential information on the continuous monitoring systems and shall explain how the data derived from these systems ensure that all HCl or HF emissions from the unit or stack are monitored and reported.

10.1.1.1 *Updates.* Whenever the owner or operator makes a replacement, modification, or change in a certified continuous HCl or HF monitoring system that is used to provide data under this subpart (including a change in the automated data acquisition and handling system or the flue gas handling system) which affects information reported in the monitoring plan (e.g., a change to a serial number for a component of a monitoring system), the owner or operator shall update the monitoring plan.

10.1.1.2 *Contents of the Monitoring Plan.* For HCl and/or HF CEMS, the monitoring plan shall contain the applicable electronic and hard copy information in sections 10.1.1.2.1 and 10.1.1.2.2 of this appendix. For stack gas flow rate, diluent gas, and moisture monitoring systems, the monitoring plan shall include the electronic and hard copy information required for those systems under §75.53 (g) of this chapter. The electronic monitoring plan shall be evaluated using the ECMPS Client Tool.

10.1.1.2.1 *Electronic.* Record the unit or stack ID number(s); monitoring location(s); the HCl or HF monitoring methodology used (*i.e.,* CEMS); HCl or HF monitoring system information, including, but not limited to: unique system and component ID numbers; the make, model, and serial number of the monitoring equipment; the sample acquisition method; formulas used to calculate emissions; monitor span and range information (if applicable).

10.1.1.2.2 *Hard Copy.* Keep records of the following: schematics and/or blueprints showing the location of the monitoring system(s) and test ports; data flow diagrams; test protocols; monitor span and range calculations (if applicable); miscellaneous technical justifications.

10.1.2 *Operating Parameter Records.* For the purposes of this appendix, the owner or operator shall record the following information for each operating hour of each affected unit or group of units utilizing a common stack, to the extent that these data are needed to convert pollutant concentration data to the units of the emission standard. For non-operating hours, record only the items in paragraphs 10.1.2.1 and 10.1.2.2 of this section. If there is heat input to the unit(s), but no electrical load, record only the items in paragraphs 10.1.2.1, 10.1.2.2, and (if applicable) 10.1.2.4 of this section.

10.1.2.1 The date and hour;

10.1.2.2 The unit or stack operating time (rounded up to the nearest fraction of an hour (in equal increments that can range from one hundredth to one quarter of an hour, at the option of the owner or operator);

10.1.2.3 The hourly gross unit load (rounded to nearest MWge); and

10.1.2.4 If applicable, the F-factor used to calculate the heat input-based pollutant emission rate.

10.1.2.5 If applicable, a flag to indicate that the hour is a startup or shutdown hour (as defined in §63.10042).

10.1.3 *HCl and/or HF Emissions Records.* For HCl and/or HF CEMS, the owner or operator must record the following information for each unit or stack operating hour:

10.1.3.1 The date and hour;

10.1.3.2 Monitoring system and component identification codes, as provided in the electronic monitoring plan, for each hour in which the CEMS provides a quality-assured value of HCl or HF concentration (as applicable);

10.1.3.3 The pollutant concentration, for each hour in which a quality-assured value is obtained. For HCl and HF, record the data in parts per million (ppm), rounded to three significant figures.

10.1.3.4 A special code, indicating whether or not a quality-assured HCl or HF concentration value is obtained for the hour. This code may be entered manually when a temporary like-kind replacement HCl or HF analyzer is used for reporting; and

10.1.3.5 Monitor data availability, as a percentage of unit or stack operating hours, calculated according to §75.32 of this chapter.

10.1.4 *Stack Gas Volumetric Flow Rate Records.*

10.1.4.1 Hourly measurements of stack gas volumetric flow rate during unit operation are required to demonstrate compliance with electrical output-based HCl or HF emissions limits (*i.e.,* lb/MWh or lb/GWh).

10.1.4.2 Use a flow rate monitor that meets the requirements of part 75 of this chapter to record the required data. You must keep hourly flow rate records, as specified in §75.57(c)(2) of this chapter.

10.1.5 *Records of Stack Gas Moisture Content.*

10.1.5.1 Correction of hourly pollutant concentration data for moisture is sometimes required when converting concentrations to the units of the applicable Hg emissions limit. In particular, these corrections are required:

10.1.5.1.1 To calculate electrical output-based pollutant emission rates, when using a CEMS that measures pollutant concentrations on a dry basis; and

10.1.5.1.2 To calculate heat input-based pollutant emission rates, when using certain equations from EPA Method 19 in appendix A-7 to part 60 of this chapter.

10.1.5.2 If hourly moisture corrections are required, either use a fuel-specific default moisture percentage for coal-fired units from §75.11(b)(1) of this chapter, an Administrator approved default moisture value for non-coal-fired units (as per paragraph 63.10010(d) of this subpart), or a certified moisture monitoring system that meets the requirements of part 75 of this chapter, to record the required data. If you elect to use a moisture monitoring system, you must keep hourly records of the stack gas moisture content, as specified in §75.57(c)(3) of this chapter.

10.1.6 *Records of Diluent Gas ($CO_2$ or $O_2$) Concentration.*

10.1.6.1 To assess compliance with a heat input-based HCl or HF emission rate limit in units of lb/MMBtu, hourly measurements of $CO_2$ or $O_2$ concentration are required to convert pollutant concentrations to units of the standard.

10.1.6.2 If hourly measurements of diluent gas concentration are needed, you must use a certified $CO_2$ or $O_2$ monitor that meets the requirements of part 75 of this chapter to record the required data. For all diluent gas monitors, you must keep hourly $CO_2$ or $O_2$ concentration records, as specified in §75.57(g) of this chapter.

10.1.7 *HCl and HF Emission Rate Records.* For applicable HCl and HF emission limits in units of lb/MMBtu, lb/MWh, or lb/GWh, record the following information for each affected unit or common stack:

10.1.7.1 The date and hour;

10.1.7.2 The hourly HCl and/or HF emissions rate (lb/MMBtu, lb/MWh, or lb/GWh, as applicable, rounded to three significant figures), for each hour in which valid values of HCl or HF concentration and all other required parameters (stack gas volumetric flow rate, diluent gas concentration, electrical load, and moisture data, as applicable) are obtained for the hour;

10.1.7.3 An identification code for the formula used to derive the hourly HCl or HF emission rate from HCl or HF concentration, flow rate, electrical load, diluent gas concentration, and moisture data (as applicable); and

10.1.7.4 A code indicating that the HCl or HF emission rate was not calculated for the hour, if valid data for HCl or HF concentration and/or any of the other necessary parameters are not obtained for the hour. For the purposes of this appendix, the substitute data values required under part 75 of this chapter for diluent gas concentration, stack gas flow rate and moisture content are not considered to be valid data.

10.1.7.5 If applicable, a code to indicate that the default electrical load (as defined in §63.10042) was used to calculate the HCl or HF emission rate.

10.1.7.6 If applicable, a code to indicate that the diluent cap (as defined in §63.10042) was used to calculate the HCl or HF emission rate.

10.1.8 *Certification and Quality Assurance Test Records.* For the HCl and/or HF CEMS used to provide data under this subpart at each affected unit (or group of units monitored at a common stack), record the following information for all required certification, recertification, diagnostic, and quality-assurance tests:

10.1.8.1 *HCl and HF CEMS.*

10.1.8.1.1 For all required daily calibrations (including calibration transfer standard tests) of the HCl or HF CEMS, record the test dates and times, reference values, monitor responses, and calculated calibration error values;

10.1.8.1.2 For gas audits of HCl or HF CEMS, record the date and time of each spiked and unspiked sample, the audit gas reference values and uncertainties. Keep records of all calculations and data analyses required under sections 9.1 and 12.1 of Performance Specification 15, and the results of those calculations and analyses.

10.1.8.1.3 For each RATA of a HCl or HF CEMS, record the date and time of each test run, the reference method(s) used, and the reference method and HCl or HF CEMS values. Keep records of the data analyses and calculations used to determine the relative accuracy.

10.1.8.2 *Additional Monitoring Systems.* For the stack gas flow rate, diluent gas, and moisture monitoring systems described in section 3.2 of this appendix, you must keep records of all certification, recertification, diagnostic, and on-going quality-assurance tests of these systems, as specified in §75.59(a) of this chapter.

11. Reporting Requirements

11.1 *General Reporting Provisions.* The owner or operator shall comply with the following requirements for reporting HCl and/or HF emissions from each affected unit (or group of units monitored at a common stack):

11.1.1 Notifications, in accordance with paragraph 11.2 of this section;

11.1.2 Monitoring plan reporting, in accordance with paragraph 11.3 of this section;

11.1.3 Certification, recertification, and QA test submittals, in accordance with paragraph 11.4 of this section; and

11.1.4 Electronic quarterly report submittals, in accordance with paragraph 11.5 of this section.

11.2 *Notifications.* The owner or operator shall provide notifications for each affected unit (or group of units monitored at a common stack) in accordance with §63.10030.

11.3 *Monitoring Plan Reporting.* For each affected unit (or group of units monitored at a common stack) using HCl and/or HF CEMS, the owner or operator shall make electronic and hard copy monitoring plan submittals as follows:

11.3.1 Submit the electronic and hard copy information in section 10.1.1.2 of this appendix pertaining to the HCl and/or HF monitoring systems at least 21 days prior to the applicable date in §63.9984. Also, if applicable, submit monitoring plan information pertaining to any required flow rate, diluent gas, and/or moisture monitoring systems within that same time frame, if the required records are not already in place.

11.3.2 Update the monitoring plan when required, as provided in paragraph 10.1.1.1 of this appendix. An electronic monitoring plan information update must be submitted either prior to or concurrent with the quarterly report for the calendar quarter in which the update is required.

11.3.3 All electronic monitoring plan submittals and updates shall be made to the Administrator using the ECMPS Client Tool. Hard copy portions of the monitoring plan shall be kept on record according to section 10.1 of this appendix.

11.4 *Certification, Recertification, and Quality-Assurance Test Reporting Requirements.* Except for daily QA tests (*i.e.,* calibrations and flow monitor interference checks), which are included in each electronic quarterly emissions report, use the ECMPS Client Tool to submit the results of all required certification, recertification, quality-assurance, and diagnostic tests of the monitoring systems required under this appendix electronically, either prior to or concurrent with the relevant quarterly electronic emissions report.

11.4.1 For daily calibrations (including calibration transfer standard tests), report the information in §75.59(a)(1) of this chapter, excluding paragraphs (a)(1)(ix) through (a)(1)(xi).

11.4.2 For each quarterly gas audit of a HCl or HF CEMS, report:

11.4.2.1 Facility ID information;

11.4.2.2 Monitoring system ID number;

11.4.2.3 Type of test (e.g., quarterly gas audit);

11.4.2.4 Reason for test;

11.4.2.5 Certified audit (spike) gas concentration value (ppm);

11.4.2.6 Measured value of audit (spike) gas, including date and time of injection;

11.4.2.7 Calculated dilution ratio for audit (spike) gas;

11.4.2.8 Date and time of each spiked flue gas sample;

11.4.2.9 Date and time of each unspiked flue gas sample;

11.4.2.10 The measured values for each spiked gas and unspiked flue gas sample (ppm);

11.4.2.11 The mean values of the spiked and unspiked sample concentrations and the expected value of the spiked concentration as specified in section 12.1 of Performance Specification 15 (ppm);

11.4.2.12 Bias at the spike level as calculated using equation 3 in section 12.1 of Performance Specification 15; and

11.4.2.13 The correction factor (CF), calculated using equation 6 in section 12.1 of Performance Specification 15.

11.4.3 For each RATA of a HCl or HF CEMS, report:

11.4.3.1 Facility ID information;

11.4.3.2 Monitoring system ID number;

11.4.3.3 Type of test (*i.e.*, initial or annual RATA);

11.4.3.4 Reason for test;

11.4.3.5 The reference method used;

11.4.3.6 Starting and ending date and time for each test run;

11.4.3.7 Units of measure;

11.4.3.8 The measured reference method and CEMS values for each test run, on a consistent moisture basis, in appropriate units of measure;

11.4.3.9 Flags to indicate which test runs were used in the calculations;

11.4.3.10 Arithmetic mean of the CEMS values, of the reference method values, and of their differences;

11.4.3.11 Standard deviation, as specified in Equation 2-4 of Performance Specification 2 in appendix B to part 60 of this chapter;

11.4.3.12 Confidence coefficient, as specified in Equation 2-5 of Performance Specification 2 in appendix B to part 60 of this chapter; and

11.4.3.13 Relative accuracy calculated using Equation 2-6 of Performance Specification 2 in appendix B to part 60 of this chapter or, if applicable, according to the alternative procedure for low emitters described in section 3.1.2.2 of this appendix. If applicable use a flag to indicate that the alternative RA specification for low emitters has been applied.

11.4.4 *Reporting Requirements for Diluent Gas, Flow Rate, and Moisture Monitoring Systems.* For the certification, recertification, diagnostic, and QA tests of stack gas flow rate, moisture, and diluent gas monitoring systems that are certified and quality-assured according to part 75 of this chapter, report the information in section 10.1.9.3 of this appendix.

11.5 *Quarterly Reports.*

11.5.1 Beginning with the report for the calendar quarter in which the initial compliance demonstration is completed or the calendar quarter containing the applicable date in §63.10005(g), (h), or (j) (whichever is earlier), the owner or operator of any affected unit shall use the ECMPS Client Tool to submit electronic quarterly reports to the Administrator, in an XML format specified by the Administrator, for each affected unit (or group of units monitored at a common stack).

11.5.2 The electronic reports must be submitted within 30 days following the end of each calendar quarter, except for units that have been placed in long-term cold storage.

11.5.3 Each electronic quarterly report shall include the following information:

11.5.3.1 The date of report generation;

11.5.3.2 Facility identification information;

11.5.3.3 The information in sections 10.1.2 through 10.1.7 of this appendix, as applicable to the type(s) of monitoring system(s) used to measure the pollutant concentrations and other necessary parameters.

11.5.3.4 The results of all daily calibrations (including calibration transfer standard tests) of the HCl or HF monitor as described in section 10.1.8.1.1 of this appendix; and

11.5.3.5 If applicable, the results of all daily flow monitor interference checks, in accordance with section 10.1.8.2 of this appendix.

11.5.4 *Compliance Certification.* Based on reasonable inquiry of those persons with primary responsibility for ensuring that all HCl and/or HF emissions from the affected unit(s) have been correctly and fully monitored, the owner or operator shall submit a compliance certification in support of each electronic quarterly emissions monitoring report. The compliance certification shall include a statement by a responsible official with that official's name, title, and signature, certifying that, to the best of his or her knowledge, the report is true, accurate, and complete.

[77 FR 9464, Feb. 16, 2012, as amended at 78 FR 24094, Apr. 24, 2013; 79 FR 68795, Nov. 19, 2014]

**Attachment D**

**Part 70 Operating Permit No: 077-36338-00001**



**Electronic Code of Federal Regulations**

**Title 40: Protection of Environment**

## PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

## Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Source: 69 FR 33506, June 15, 2004, unless otherwise noted.

### What This Subpart Covers

### §63.6580 What is the purpose of subpart ZZZZ?

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

[73 FR 3603, Jan. 18, 2008]

### §63.6585 Am I subject to this subpart?

You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.

(a) A stationary RICE is any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

(b) A major source of HAP emissions is a plant site that emits or has the potential to emit any single HAP at a rate of 10 tons (9.07 megagrams) or more per year or any combination of HAP at a rate of 25 tons (22.68 megagrams) or more per year, except that for oil and gas production facilities, a major source of HAP emissions is determined for each surface site.

(c) An area source of HAP emissions is a source that is not a major source.

(d) If you are an owner or operator of an area source subject to this subpart, your status as an entity subject to a standard or other requirements under this subpart does not subject you to the obligation to obtain a permit under 40 CFR part 70 or 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart as applicable.

(e) If you are an owner or operator of a stationary RICE used for national security purposes, you may be eligible to request an exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C.

(f) The emergency stationary RICE listed in paragraphs (f)(1) through (3) of this section are not subject to this subpart. The stationary RICE must meet the definition of an emergency stationary RICE in §63.6675, which includes operating according to the provisions specified in §63.6640(f).

(1) Existing residential emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

(2) Existing commercial emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

(3) Existing institutional emergency stationary RICE located at an area source of HAP emissions that do not operate or are not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) and that do not operate for the purpose specified in §63.6640(f)(4)(ii).

[69 FR 33506, June 15, 2004, as amended at 73 FR 3603, Jan. 18, 2008; 78 FR 6700, Jan. 30, 2013]

**§63.6590 What parts of my plant does this subpart cover?**

This subpart applies to each affected source.

(a) *Affected source.* An affected source is any existing, new, or reconstructed stationary RICE located at a major or area source of HAP emissions, excluding stationary RICE being tested at a stationary RICE test cell/stand.

(1) *Existing stationary RICE.*

(i) For stationary RICE with a site rating of more than 500 brake horsepower (HP) located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before December 19, 2002.

(ii) For stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

(iii) For stationary RICE located at an area source of HAP emissions, a stationary RICE is existing if you commenced construction or reconstruction of the stationary RICE before June 12, 2006.

(iv) A change in ownership of an existing stationary RICE does not make that stationary RICE a new or reconstructed stationary RICE.

(2) *New stationary RICE.* (i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after December 19, 2002.

(ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

(iii) A stationary RICE located at an area source of HAP emissions is new if you commenced construction of the stationary RICE on or after June 12, 2006.

(3) *Reconstructed stationary RICE.* (i) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after December 19, 2002.

(ii) A stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.

(iii) A stationary RICE located at an area source of HAP emissions is reconstructed if you meet the definition of reconstruction in §63.2 and reconstruction is commenced on or after June 12, 2006.

(b) *Stationary RICE subject to limited requirements.* (1) An affected source which meets either of the criteria in paragraphs (b)(1)(i) through (ii) of this section does not have to meet the requirements of this subpart and of subpart A of this part except for the initial notification requirements of §63.6645(f).

(i) The stationary RICE is a new or reconstructed emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that does not operate or is not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii).

(ii) The stationary RICE is a new or reconstructed limited use stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.

(2) A new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis must meet the initial notification requirements of §63.6645(f) and the requirements of §§63.6625(c), 63.6650(g), and 63.6655(c). These stationary RICE do not have to meet the emission limitations and operating limitations of this subpart.

(3) The following stationary RICE do not have to meet the requirements of this subpart and of subpart A of this part, including initial notification requirements:

(i) Existing spark ignition 2 stroke lean burn (2SLB) stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions;

(ii) Existing spark ignition 4 stroke lean burn (4SLB) stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions;

(iii) Existing emergency stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that does not operate or is not contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii).

(iv) Existing limited use stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions;

(v) Existing stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis;

(c) *Stationary RICE subject to Regulations under 40 CFR Part 60.* An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

(1) A new or reconstructed stationary RICE located at an area source;

(2) A new or reconstructed 2SLB stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;

(3) A new or reconstructed 4SLB stationary RICE with a site rating of less than 250 brake HP located at a major source of HAP emissions;

(4) A new or reconstructed spark ignition 4 stroke rich burn (4SRB) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;

(5) A new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis;

(6) A new or reconstructed emergency or limited use stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions;

(7) A new or reconstructed compression ignition (CI) stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.

[69 FR 33506, June 15, 2004, as amended at 73 FR 3604, Jan. 18, 2008; 75 FR 9674, Mar. 3, 2010; 75 FR 37733, June 30, 2010; 75 FR 51588, Aug. 20, 2010; 78 FR 6700, Jan. 30, 2013]

**§63.6595 When do I have to comply with this subpart?**

(a) *Affected sources.* (1) If you have an existing stationary RICE, excluding existing non-emergency CI stationary RICE, with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the applicable emission limitations, operating limitations and other requirements no later than June 15, 2007. If you have an existing non-emergency CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, an existing stationary CI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary CI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations, operating limitations, and other requirements no later than May 3, 2013. If you have an existing stationary SI RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions, or an existing stationary SI RICE located at an area source of HAP emissions, you must comply with the applicable emission limitations, operating limitations, and other requirements no later than October 19, 2013.

(2) If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions before August 16, 2004, you must comply with the applicable emission limitations and operating limitations in this subpart no later than August 16, 2004.

(3) If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions after August 16, 2004, you must comply with the applicable emission limitations and operating limitations in this subpart upon startup of your affected source.

(4) If you start up your new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions before January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart no later than January 18, 2008.

(5) If you start up your new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions after January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart upon startup of your affected source.

(6) If you start up your new or reconstructed stationary RICE located at an area source of HAP emissions before January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart no later than January 18, 2008.

(7) If you start up your new or reconstructed stationary RICE located at an area source of HAP emissions after January 18, 2008, you must comply with the applicable emission limitations and operating limitations in this subpart upon startup of your affected source.

(b) *Area sources that become major sources.* If you have an area source that increases its emissions or its potential to emit such that it becomes a major source of HAP, the compliance dates in paragraphs (b)(1) and (2) of this section apply to you.

(1) Any stationary RICE for which construction or reconstruction is commenced after the date when your area source becomes a major source of HAP must be in compliance with this subpart upon startup of your affected source.

(2) Any stationary RICE for which construction or reconstruction is commenced before your area source becomes a major source of HAP must be in compliance with the provisions of this subpart that are applicable to RICE located at major sources within 3 years after your area source becomes a major source of HAP.

(c) If you own or operate an affected source, you must meet the applicable notification requirements in §63.6645 and in 40 CFR part 63, subpart A.

[69 FR 33506, June 15, 2004, as amended at 73 FR 3604, Jan. 18, 2008; 75 FR 9675, Mar. 3, 2010; 75 FR 51589, Aug. 20, 2010; 78 FR 6701, Jan. 30, 2013]

**Emission and Operating Limitations**

**§63.6600 What emission limitations and operating limitations must I meet if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?**

Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.

(a) If you own or operate an existing, new, or reconstructed spark ignition 4SRB stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the emission limitations in Table 1a to this subpart and the operating limitations in Table 1b to this subpart which apply to you.

(b) If you own or operate a new or reconstructed 2SLB stationary RICE with a site rating of more than 500 brake HP located at major source of HAP emissions, a new or reconstructed 4SLB stationary RICE with a site rating of more than 500 brake HP located at major source of HAP emissions, or a new or reconstructed CI stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the emission limitations in Table 2a to this subpart and the operating limitations in Table 2b to this subpart which apply to you.

(c) If you own or operate any of the following stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the emission limitations in Tables 1a, 2a, 2c, and 2d to this subpart or operating limitations in Tables 1b and 2b to this subpart: an existing 2SLB stationary RICE; an existing 4SLB stationary RICE; a stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis; an emergency stationary RICE; or a limited use stationary RICE.

(d) If you own or operate an existing non-emergency stationary CI RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must comply with the emission limitations in Table 2c to this subpart and the operating limitations in Table 2b to this subpart which apply to you.

[73 FR 3605, Jan. 18, 2008, as amended at 75 FR 9675, Mar. 3, 2010]

**§63.6601 What emission limitations must I meet if I own or operate a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP and less than or equal to 500 brake HP located at a major source of HAP emissions?**

Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart. If you own or operate a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at major source of HAP emissions manufactured on or after January 1, 2008, you must comply with the emission limitations in Table 2a to this subpart and the operating limitations in Table 2b to this subpart which apply to you.

[73 FR 3605, Jan. 18, 2008, as amended at 75 FR 9675, Mar. 3, 2010; 75 FR 51589, Aug. 20, 2010]

**§63.6602 What emission limitations and other requirements must I meet if I own or operate an existing stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions?**

If you own or operate an existing stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions, you must comply with the emission limitations and other requirements in Table 2c to this subpart which apply to you. Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.

[78 FR 6701, Jan. 30, 2013]

**§63.6603 What emission limitations, operating limitations, and other requirements must I meet if I own or operate an existing stationary RICE located at an area source of HAP emissions?**

Compliance with the numerical emission limitations established in this subpart is based on the results of testing the average of three 1-hour runs using the testing requirements and procedures in §63.6620 and Table 4 to this subpart.

(a) If you own or operate an existing stationary RICE located at an area source of HAP emissions, you must comply with the requirements in Table 2d to this subpart and the operating limitations in Table 2b to this subpart that apply to you.

(b) If you own or operate an existing stationary non-emergency CI RICE with a site rating of more than 300 HP located at an area source of HAP that meets either paragraph (b)(1) or (2) of this section, you do not have to meet the numerical CO emission limitations specified in Table 2d of this subpart. Existing stationary non-emergency CI RICE with a site rating of more than 300 HP located at an area source of HAP that meet either paragraph (b)(1) or (2) of this section must meet the management practices that are shown for stationary non-emergency CI RICE with a site rating of less than or equal to 300 HP in Table 2d of this subpart.

(1) The area source is located in an area of Alaska that is not accessible by the Federal Aid Highway System (FAHS).

(2) The stationary RICE is located at an area source that meets paragraphs (b)(2)(i), (ii), and (iii) of this section.

(i) The only connection to the FAHS is through the Alaska Marine Highway System (AMHS), or the stationary RICE operation is within an isolated grid in Alaska that is not connected to the statewide electrical grid referred to as the Alaska Railbelt Grid.

(ii) At least 10 percent of the power generated by the stationary RICE on an annual basis is used for residential purposes.

(iii) The generating capacity of the area source is less than 12 megawatts, or the stationary RICE is used exclusively for backup power for renewable energy.

(c) If you own or operate an existing stationary non-emergency CI RICE with a site rating of more than 300 HP located on an offshore vessel that is an area source of HAP and is a nonroad vehicle that is an Outer Continental Shelf (OCS) source as defined in 40 CFR 55.2, you do not have to meet the numerical CO emission limitations specified in Table 2d of this subpart. You must meet all of the following management practices:

(1) Change oil every 1,000 hours of operation or annually, whichever comes first. Sources have the option to utilize an oil analysis program as described in §63.6625(i) in order to extend the specified oil change requirement.

(2) Inspect and clean air filters every 750 hours of operation or annually, whichever comes first, and replace as necessary.

(3) Inspect fuel filters and belts, if installed, every 750 hours of operation or annually, whichever comes first, and replace as necessary.

(4) Inspect all flexible hoses every 1,000 hours of operation or annually, whichever comes first, and replace as necessary.

(d) If you own or operate an existing non-emergency CI RICE with a site rating of more than 300 HP located at an area source of HAP emissions that is certified to the Tier 1 or Tier 2 emission standards in Table 1 of 40 CFR 89.112 and that is subject to an enforceable state or local standard that requires the engine to be replaced no later than June 1, 2018, you may until January 1, 2015, or 12 years after the installation date of the engine (whichever is later), but not later than June 1, 2018, choose to comply with the management practices that are shown for stationary non-emergency CI RICE with a site rating of less than or equal to 300 HP in Table 2d of this subpart instead of the applicable emission limitations in Table 2d, operating limitations in Table 2b, and crankcase ventilation system requirements in §63.6625(g). You must comply with the emission limitations in Table 2d and operating limitations in Table 2b that apply for non-emergency CI RICE with a site rating of more than 300 HP located at an area source of HAP emissions by January 1, 2015, or 12 years after the installation date of the engine (whichever is later), but not later than June 1, 2018. You must also comply with the crankcase ventilation system requirements in §63.6625(g) by January 1, 2015, or 12 years after the installation date of the engine (whichever is later), but not later than June 1, 2018.

(e) If you own or operate an existing non-emergency CI RICE with a site rating of more than 300 HP located at an area source of HAP emissions that is certified to the Tier 3 (Tier 2 for engines above 560 kilowatt (kW)) emission standards in Table 1 of 40 CFR 89.112, you may comply with the requirements under this part by meeting the requirements for Tier 3 engines (Tier 2 for engines above 560 kW) in 40 CFR part 60 subpart IIII instead of the emission limitations and other requirements that would otherwise apply under this part for existing non-emergency CI RICE with a site rating of more than 300 HP located at an area source of HAP emissions.

(f) An existing non-emergency SI 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at area sources of HAP must meet the definition of remote stationary RICE in §63.6675 on the initial compliance date for the engine, October 19, 2013, in order to be considered a remote stationary RICE under this subpart. Owners and operators of existing non-emergency SI 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at area sources of HAP that meet the definition of remote stationary RICE in §63.6675 of this subpart as of October 19, 2013 must evaluate the status of their stationary RICE every 12 months. Owners and operators must keep records of the initial and annual evaluation of the status of the engine. If the evaluation indicates that the stationary RICE no longer meets the definition of remote stationary RICE in §63.6675 of this subpart, the owner or operator must comply with all of the requirements for existing non-emergency SI 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at area sources of HAP that are not remote stationary RICE within 1 year of the evaluation.

[75 FR 9675, Mar. 3, 2010, as amended at 75 FR 51589, Aug. 20, 2010; 76 FR 12866, Mar. 9, 2011; 78 FR 6701, Jan. 30, 2013]

**§63.6604 What fuel requirements must I meet if I own or operate a stationary CI RICE?**

(a) If you own or operate an existing non-emergency, non-black start CI stationary RICE with a site rating of more than 300 brake HP with a displacement of less than 30 liters per cylinder that uses diesel fuel, you must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel fuel.

(b) Beginning January 1, 2015, if you own or operate an existing emergency CI stationary RICE with a site rating of more than 100 brake HP and a displacement of less than 30 liters per cylinder that uses diesel fuel and operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) or that operates for the purpose specified in §63.6640(f)(4)(ii), you must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to January 1, 2015, may be used until depleted.

(c) Beginning January 1, 2015, if you own or operate a new emergency CI stationary RICE with a site rating of more than 500 brake HP and a displacement of less than 30 liters per cylinder located at a major source of HAP that uses diesel fuel and operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii), you must use diesel fuel that meets the requirements in 40 CFR 80.510(b) for nonroad diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to January 1, 2015, may be used until depleted.

(d) Existing CI stationary RICE located in Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, at area sources in areas of Alaska that meet either §63.6603(b)(1) or §63.6603(b)(2), or are on offshore vessels that meet §63.6603(c) are exempt from the requirements of this section.

[78 FR 6702, Jan. 30, 2013]

**General Compliance Requirements**

**§63.6605 What are my general requirements for complying with this subpart?**

(a) You must be in compliance with the emission limitations, operating limitations, and other requirements in this subpart that apply to you at all times.

(b) At all times you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

[75 FR 9675, Mar. 3, 2010, as amended at 78 FR 6702, Jan. 30, 2013]

**Testing and Initial Compliance Requirements**

**§63.6610 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions?**

If you own or operate a stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions you are subject to the requirements of this section.

(a) You must conduct the initial performance test or other initial compliance demonstrations in Table 4 to this subpart that apply to you within 180 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions in §63.7(a)(2).

(b) If you commenced construction or reconstruction between December 19, 2002 and June 15, 2004 and own or operate stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you must demonstrate initial compliance with either the proposed emission limitations or the promulgated emission limitations no later than February 10, 2005 or no later than 180 days after startup of the source, whichever is later, according to §63.7(a)(2)(ix).

(c) If you commenced construction or reconstruction between December 19, 2002 and June 15, 2004 and own or operate stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, and you chose to comply with the proposed emission limitations when demonstrating initial compliance, you must conduct a second performance test to demonstrate compliance with the promulgated emission limitations by December 13, 2007 or after startup of the source, whichever is later, according to §63.7(a)(2)(ix).

(d) An owner or operator is not required to conduct an initial performance test on units for which a performance test has been previously conducted, but the test must meet all of the conditions described in paragraphs (d)(1) through (5) of this section.

(1) The test must have been conducted using the same methods specified in this subpart, and these methods must have been followed correctly.

(2) The test must not be older than 2 years.

(3) The test must be reviewed and accepted by the Administrator.

(4) Either no process or equipment changes must have been made since the test was performed, or the owner or operator must be able to demonstrate that the results of the performance test, with or without adjustments, reliably demonstrate compliance despite process or equipment changes.

(5) The test must be conducted at any load condition within plus or minus 10 percent of 100 percent load.

[69 FR 33506, June 15, 2004, as amended at 73 FR 3605, Jan. 18, 2008]

**§63.6611 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate a new or reconstructed 4SLB SI stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions?**

If you own or operate a new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions, you must conduct an initial performance test within 240 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions specified in Table 4 to this subpart, as appropriate.

[73 FR 3605, Jan. 18, 2008, as amended at 75 FR 51589, Aug. 20, 2010]

**§63.6612 By what date must I conduct the initial performance tests or other initial compliance demonstrations if I own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions?**

If you own or operate an existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing stationary RICE located at an area source of HAP emissions you are subject to the requirements of this section.

(a) You must conduct any initial performance test or other initial compliance demonstration according to Tables 4 and 5 to this subpart that apply to you within 180 days after the compliance date that is specified for your stationary RICE in §63.6595 and according to the provisions in §63.7(a)(2).

(b) An owner or operator is not required to conduct an initial performance test on a unit for which a performance test has been previously conducted, but the test must meet all of the conditions described in paragraphs (b)(1) through (4) of this section.

(1) The test must have been conducted using the same methods specified in this subpart, and these methods must have been followed correctly.

(2) The test must not be older than 2 years.

(3) The test must be reviewed and accepted by the Administrator.

(4) Either no process or equipment changes must have been made since the test was performed, or the owner or operator must be able to demonstrate that the results of the performance test, with or without adjustments, reliably demonstrate compliance despite process or equipment changes.

[75 FR 9676, Mar. 3, 2010, as amended at 75 FR 51589, Aug. 20, 2010]

**§63.6615 When must I conduct subsequent performance tests?**

If you must comply with the emission limitations and operating limitations, you must conduct subsequent performance tests as specified in Table 3 of this subpart.

**§63.6620 What performance tests and other procedures must I use?**

(a) You must conduct each performance test in Tables 3 and 4 of this subpart that applies to you.

(b) Each performance test must be conducted according to the requirements that this subpart specifies in Table 4 to this subpart. If you own or operate a non-operational stationary RICE that is subject to performance testing, you do not need to start up the engine solely to conduct the performance test. Owners and operators of a non-operational engine can conduct the performance test when the engine is started up again. The test must be conducted at any load condition within plus or minus 10 percent of 100 percent load for the stationary RICE listed in paragraphs (b)(1) through (4) of this section.

(1) Non-emergency 4SRB stationary RICE with a site rating of greater than 500 brake HP located at a major source of HAP emissions.

(2) New non-emergency 4SLB stationary RICE with a site rating of greater than or equal to 250 brake HP located at a major source of HAP emissions.

(3) New non-emergency 2SLB stationary RICE with a site rating of greater than 500 brake HP located at a major source of HAP emissions.

(4) New non-emergency CI stationary RICE with a site rating of greater than 500 brake HP located at a major source of HAP emissions.

(c) [Reserved]

(d) You must conduct three separate test runs for each performance test required in this section, as specified in §63.7(e)(3). Each test run must last at least 1 hour, unless otherwise specified in this subpart.

(e)(1) You must use Equation 1 of this section to determine compliance with the percent reduction requirement:

$$\frac{C_i - C_o}{C_i} \times 100 = R \quad (Eq.\ 1)$$

Where:

$C_i$ = concentration of carbon monoxide (CO), total hydrocarbons (THC), or formaldehyde at the control device inlet,

$C_o$ = concentration of CO, THC, or formaldehyde at the control device outlet, and

R = percent reduction of CO, THC, or formaldehyde emissions.

(2) You must normalize the CO, THC, or formaldehyde concentrations at the inlet and outlet of the control device to a dry basis and to 15 percent oxygen, or an equivalent percent carbon dioxide ($CO_2$). If pollutant concentrations are to be corrected to 15 percent oxygen and $CO_2$ concentration is measured in lieu of oxygen concentration measurement, a $CO_2$ correction factor is needed. Calculate the $CO_2$ correction factor as described in paragraphs (e)(2)(i) through (iii) of this section.

(i) Calculate the fuel-specific $F_o$ value for the fuel burned during the test using values obtained from Method 19, Section 5.2, and the following equation:

$$F_o = \frac{0.209\ F_d}{F_c} \quad (Eq.\ 2)$$

Where:

$F_o$ = Fuel factor based on the ratio of oxygen volume to the ultimate $CO_2$ volume produced by the fuel at zero percent excess air.

0.209 = Fraction of air that is oxygen, percent/100.

$F_d$ = Ratio of the volume of dry effluent gas to the gross calorific value of the fuel from Method 19, dsm3/J (dscf/106 Btu).

$F_c$ = Ratio of the volume of $CO_2$ produced to the gross calorific value of the fuel from Method 19, dsm3/J (dscf/106 Btu)

(ii) Calculate the $CO_2$ correction factor for correcting measurement data to 15 percent $O_2$, as follows:

$$X_{CO2} = \frac{5.9}{F_O} \quad (Eq. 3)$$

Where:

$X_{CO2}$ = $CO_2$ correction factor, percent.

5.9 = 20.9 percent $O_2$—15 percent $O_2$, the defined $O_2$ correction value, percent.

(iii) Calculate the CO, THC, and formaldehyde gas concentrations adjusted to 15 percent $O_2$ using $CO_2$ as follows:

$$C_{adj} = C_d \frac{X_{CO2}}{\%CO_2} \quad (Eq. 4)$$

Where:

$C_{adj}$ = Calculated concentration of CO, THC, or formaldehyde adjusted to 15 percent $O_2$.

$C_d$ = Measured concentration of CO, THC, or formaldehyde, uncorrected.

$X_{CO2}$ = $CO_2$ correction factor, percent.

$\%CO_2$ = Measured $CO_2$ concentration measured, dry basis, percent.

(f) If you comply with the emission limitation to reduce CO and you are not using an oxidation catalyst, if you comply with the emission limitation to reduce formaldehyde and you are not using NSCR, or if you comply with the emission limitation to limit the concentration of formaldehyde in the stationary RICE exhaust and you are not using an oxidation catalyst or NSCR, you must petition the Administrator for operating limitations to be established during the initial performance test and continuously monitored thereafter; or for approval of no operating limitations. You must not conduct the initial performance test until after the petition has been approved by the Administrator.

(g) If you petition the Administrator for approval of operating limitations, your petition must include the information described in paragraphs (g)(1) through (5) of this section.

(1) Identification of the specific parameters you propose to use as operating limitations;

(2) A discussion of the relationship between these parameters and HAP emissions, identifying how HAP emissions change with changes in these parameters, and how limitations on these parameters will serve to limit HAP emissions;

(3) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

(4) A discussion identifying the methods you will use to measure and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

(5) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

(h) If you petition the Administrator for approval of no operating limitations, your petition must include the information described in paragraphs (h)(1) through (7) of this section.

(1) Identification of the parameters associated with operation of the stationary RICE and any emission control device which could change intentionally (*e.g.,* operator adjustment, automatic controller adjustment, etc.) or unintentionally (*e.g.,* wear and tear, error, etc.) on a routine basis or over time;

(2) A discussion of the relationship, if any, between changes in the parameters and changes in HAP emissions;

(3) For the parameters which could change in such a way as to increase HAP emissions, a discussion of whether establishing limitations on the parameters would serve to limit HAP emissions;

(4) For the parameters which could change in such a way as to increase HAP emissions, a discussion of how you could establish upper and/or lower values for the parameters which would establish limits on the parameters in operating limitations;

(5) For the parameters, a discussion identifying the methods you could use to measure them and the instruments you could use to monitor them, as well as the relative accuracy and precision of the methods and instruments;

(6) For the parameters, a discussion identifying the frequency and methods for recalibrating the instruments you could use to monitor them; and

(7) A discussion of why, from your point of view, it is infeasible or unreasonable to adopt the parameters as operating limitations.

(i) The engine percent load during a performance test must be determined by documenting the calculations, assumptions, and measurement devices used to measure or estimate the percent load in a specific application. A written report of the average percent load determination must be included in the notification of compliance status. The following information must be included in the written report: the engine model number, the engine manufacturer, the year of purchase, the manufacturer's site-rated brake horsepower, the ambient temperature, pressure, and humidity during the performance test, and all assumptions that were made to estimate or calculate percent load during the performance test must be clearly explained. If measurement devices such as flow meters, kilowatt meters, beta analyzers, stain gauges, etc. are used, the model number of the measurement device, and an estimate of its accurate in percentage of true value must be provided.

[69 FR 33506, June 15, 2004, as amended at 75 FR 9676, Mar. 3, 2010; 78 FR 6702, Jan. 30, 2013]

**§63.6625 What are my monitoring, installation, collection, operation, and maintenance requirements?**

(a) If you elect to install a CEMS as specified in Table 5 of this subpart, you must install, operate, and maintain a CEMS to monitor CO and either $O_2$ or $CO_2$ according to the requirements in paragraphs (a)(1) through (4) of this section. If you are meeting a requirement to reduce CO emissions, the CEMS must be installed at both the inlet and outlet of the control device. If you are meeting a requirement to limit the concentration of CO, the CEMS must be installed at the outlet of the control device.

(1) Each CEMS must be installed, operated, and maintained according to the applicable performance specifications of 40 CFR part 60, appendix B.

(2) You must conduct an initial performance evaluation and an annual relative accuracy test audit (RATA) of each CEMS according to the requirements in §63.8 and according to the applicable performance specifications of 40 CFR

part 60, appendix B as well as daily and periodic data quality checks in accordance with 40 CFR part 60, appendix F, procedure 1.

(3) As specified in §63.8(c)(4)(ii), each CEMS must complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period. You must have at least two data points, with each representing a different 15-minute period, to have a valid hour of data.

(4) The CEMS data must be reduced as specified in §63.8(g)(2) and recorded in parts per million or parts per billion (as appropriate for the applicable limitation) at 15 percent oxygen or the equivalent $CO_2$ concentration.

(b) If you are required to install a continuous parameter monitoring system (CPMS) as specified in Table 5 of this subpart, you must install, operate, and maintain each CPMS according to the requirements in paragraphs (b)(1) through (6) of this section. For an affected source that is complying with the emission limitations and operating limitations on March 9, 2011, the requirements in paragraph (b) of this section are applicable September 6, 2011.

(1) You must prepare a site-specific monitoring plan that addresses the monitoring system design, data collection, and the quality assurance and quality control elements outlined in paragraphs (b)(1)(i) through (v) of this section and in §63.8(d). As specified in §63.8(f)(4), you may request approval of monitoring system quality assurance and quality control procedures alternative to those specified in paragraphs (b)(1) through (5) of this section in your site-specific monitoring plan.

(i) The performance criteria and design specifications for the monitoring system equipment, including the sample interface, detector signal analyzer, and data acquisition and calculations;

(ii) Sampling interface (*e.g.,* thermocouple) location such that the monitoring system will provide representative measurements;

(iii) Equipment performance evaluations, system accuracy audits, or other audit procedures;

(iv) Ongoing operation and maintenance procedures in accordance with provisions in §63.8(c)(1)(ii) and (c)(3); and

(v) Ongoing reporting and recordkeeping procedures in accordance with provisions in §63.10(c), (e)(1), and (e)(2)(i).

(2) You must install, operate, and maintain each CPMS in continuous operation according to the procedures in your site-specific monitoring plan.

(3) The CPMS must collect data at least once every 15 minutes (see also §63.6635).

(4) For a CPMS for measuring temperature range, the temperature sensor must have a minimum tolerance of 2.8 degrees Celsius (5 degrees Fahrenheit) or 1 percent of the measurement range, whichever is larger.

(5) You must conduct the CPMS equipment performance evaluation, system accuracy audits, or other audit procedures specified in your site-specific monitoring plan at least annually.

(6) You must conduct a performance evaluation of each CPMS in accordance with your site-specific monitoring plan.

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must monitor and record your fuel usage daily with separate fuel meters to measure the volumetric flow rate of each fuel. In addition, you must operate your stationary RICE in a manner which reasonably minimizes HAP emissions.

(d) If you are operating a new or reconstructed emergency 4SLB stationary RICE with a site rating of greater than or equal to 250 and less than or equal to 500 brake HP located at a major source of HAP emissions, you must install a non-resettable hour meter prior to the startup of the engine.

(e) If you own or operate any of the following stationary RICE, you must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions:

(1) An existing stationary RICE with a site rating of less than 100 HP located at a major source of HAP emissions;

(2) An existing emergency or black start stationary RICE with a site rating of less than or equal to 500 HP located at a major source of HAP emissions;

(3) An existing emergency or black start stationary RICE located at an area source of HAP emissions;

(4) An existing non-emergency, non-black start stationary CI RICE with a site rating less than or equal to 300 HP located at an area source of HAP emissions;

(5) An existing non-emergency, non-black start 2SLB stationary RICE located at an area source of HAP emissions;

(6) An existing non-emergency, non-black start stationary RICE located at an area source of HAP emissions which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis.

(7) An existing non-emergency, non-black start 4SLB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(8) An existing non-emergency, non-black start 4SRB stationary RICE with a site rating less than or equal to 500 HP located at an area source of HAP emissions;

(9) An existing, non-emergency, non-black start 4SLB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year; and

(10) An existing, non-emergency, non-black start 4SRB stationary RICE with a site rating greater than 500 HP located at an area source of HAP emissions that is operated 24 hours or less per calendar year.

(f) If you own or operate an existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions or an existing emergency stationary RICE located at an area source of HAP emissions, you must install a non-resettable hour meter if one is not already installed.

(g) If you own or operate an existing non-emergency, non-black start CI engine greater than or equal to 300 HP that is not equipped with a closed crankcase ventilation system, you must comply with either paragraph (g)(1) or paragraph (2) of this section. Owners and operators must follow the manufacturer's specified maintenance requirements for operating and maintaining the open or closed crankcase ventilation systems and replacing the crankcase filters, or can request the Administrator to approve different maintenance requirements that are as protective as manufacturer requirements. Existing CI engines located at area sources in areas of Alaska that meet either §63.6603(b)(1) or §63.6603(b)(2) do not have to meet the requirements of this paragraph (g). Existing CI engines located on offshore vessels that meet §63.6603(c) do not have to meet the requirements of this paragraph (g).

(1) Install a closed crankcase ventilation system that prevents crankcase emissions from being emitted to the atmosphere, or

(2) Install an open crankcase filtration emission control system that reduces emissions from the crankcase by filtering the exhaust stream to remove oil mist, particulates and metals.

(h) If you operate a new, reconstructed, or existing stationary engine, you must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in Tables 1a, 2a, 2c, and 2d to this subpart apply.

(i) If you own or operate a stationary CI engine that is subject to the work, operation or management practices in items 1 or 2 of Table 2c to this subpart or in items 1 or 4 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 business days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 business days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

(j) If you own or operate a stationary SI engine that is subject to the work, operation or management practices in items 6, 7, or 8 of Table 2c to this subpart or in items 5, 6, 7, 9, or 11 of Table 2d to this subpart, you have the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Tables 2c and 2d to this subpart. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2c or 2d to this subpart. The analysis program must at a minimum analyze the following three parameters: Total Acid Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Acid Number increases by more than 3.0 milligrams of potassium hydroxide (KOH) per gram from Total Acid Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil. If any of the limits are exceeded, the engine owner or operator must change the oil within 2 business days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 business days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.

[69 FR 33506, June 15, 2004, as amended at 73 FR 3606, Jan. 18, 2008; 75 FR 9676, Mar. 3, 2010; 75 FR 51589, Aug. 20, 2010; 76 FR 12866, Mar. 9, 2011; 78 FR 6703, Jan. 30, 2013]

**§63.6630 How do I demonstrate initial compliance with the emission limitations, operating limitations, and other requirements?**

(a) You must demonstrate initial compliance with each emission limitation, operating limitation, and other requirement that applies to you according to Table 5 of this subpart.

(b) During the initial performance test, you must establish each operating limitation in Tables 1b and 2b of this subpart that applies to you.

(c) You must submit the Notification of Compliance Status containing the results of the initial compliance demonstration according to the requirements in §63.6645.

(d) Non-emergency 4SRB stationary RICE complying with the requirement to reduce formaldehyde emissions by 76 percent or more can demonstrate initial compliance with the formaldehyde emission limit by testing for THC instead of formaldehyde. The testing must be conducted according to the requirements in Table 4 of this subpart. The average reduction of emissions of THC determined from the performance test must be equal to or greater than 30 percent.

(e) The initial compliance demonstration required for existing non-emergency 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year must be conducted according to the following requirements:

(1) The compliance demonstration must consist of at least three test runs.

(2) Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

(3) If you are demonstrating compliance with the CO concentration or CO percent reduction requirement, you must measure CO emissions using one of the CO measurement methods specified in Table 4 of this subpart, or using appendix A to this subpart.

(4) If you are demonstrating compliance with the THC percent reduction requirement, you must measure THC emissions using Method 25A, reported as propane, of 40 CFR part 60, appendix A.

(5) You must measure $O_2$ using one of the $O_2$ measurement methods specified in Table 4 of this subpart. Measurements to determine $O_2$ concentration must be made at the same time as the measurements for CO or THC concentration.

(6) If you are demonstrating compliance with the CO or THC percent reduction requirement, you must measure CO or THC emissions and $O_2$ emissions simultaneously at the inlet and outlet of the control device.

[69 FR 33506, June 15, 2004, as amended at 78 FR 6704, Jan. 30, 2013]

**Continuous Compliance Requirements**

**§63.6635 How do I monitor and collect data to demonstrate continuous compliance?**

(a) If you must comply with emission and operating limitations, you must monitor and collect data according to this section.

(b) Except for monitor malfunctions, associated repairs, required performance evaluations, and required quality assurance or control activities, you must monitor continuously at all times that the stationary RICE is operating. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

(c) You may not use data recorded during monitoring malfunctions, associated repairs, and required quality assurance or control activities in data averages and calculations used to report emission or operating levels. You must, however, use all the valid data collected during all other periods.

[69 FR 33506, June 15, 2004, as amended at 76 FR 12867, Mar. 9, 2011]

**§63.6640 How do I demonstrate continuous compliance with the emission limitations, operating limitations, and other requirements?**

(a) You must demonstrate continuous compliance with each emission limitation, operating limitation, and other requirements in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you according to methods specified in Table 6 to this subpart.

(b) You must report each instance in which you did not meet each emission limitation or operating limitation in Tables 1a and 1b, Tables 2a and 2b, Table 2c, and Table 2d to this subpart that apply to you. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in §63.6650. If you change your catalyst, you must reestablish the values of the operating parameters measured during the initial performance test. When you reestablish the values of your operating parameters, you must also conduct a performance test to demonstrate that you are meeting the required emission limitation applicable to your stationary RICE.

(c) The annual compliance demonstration required for existing non-emergency 4SLB and 4SRB stationary RICE with a site rating of more than 500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year must be conducted according to the following requirements:

(1) The compliance demonstration must consist of at least one test run.

(2) Each test run must be of at least 15 minute duration, except that each test conducted using the method in appendix A to this subpart must consist of at least one measurement cycle and include at least 2 minutes of test data phase measurement.

(3) If you are demonstrating compliance with the CO concentration or CO percent reduction requirement, you must measure CO emissions using one of the CO measurement methods specified in Table 4 of this subpart, or using appendix A to this subpart.

(4) If you are demonstrating compliance with the THC percent reduction requirement, you must measure THC emissions using Method 25A, reported as propane, of 40 CFR part 60, appendix A.

(5) You must measure $O_2$ using one of the $O_2$ measurement methods specified in Table 4 of this subpart. Measurements to determine $O_2$ concentration must be made at the same time as the measurements for CO or THC concentration.

(6) If you are demonstrating compliance with the CO or THC percent reduction requirement, you must measure CO or THC emissions and $O_2$ emissions simultaneously at the inlet and outlet of the control device.

(7) If the results of the annual compliance demonstration show that the emissions exceed the levels specified in Table 6 of this subpart, the stationary RICE must be shut down as soon as safely possible, and appropriate corrective action must be taken (e.g., repairs, catalyst cleaning, catalyst replacement). The stationary RICE must be retested within 7 days of being restarted and the emissions must meet the levels specified in Table 6 of this subpart. If the retest shows that the emissions continue to exceed the specified levels, the stationary RICE must again be shut down as soon as safely possible, and the stationary RICE may not operate, except for purposes of startup and testing, until the owner/operator demonstrates through testing that the emissions do not exceed the levels specified in Table 6 of this subpart.

(d) For new, reconstructed, and rebuilt stationary RICE, deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a).

(e) You must also report each instance in which you did not meet the requirements in Table 8 to this subpart that apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE located at an area source of HAP emissions, or any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing emergency stationary RICE, an existing limited use stationary RICE, or an existing stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis. If you own or operate any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in Table 8 to this subpart, except for the initial notification requirements: a new or reconstructed stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new or reconstructed emergency stationary RICE, or a new or reconstructed limited use stationary RICE.

(f) If you own or operate an emergency stationary RICE, you must operate the emergency stationary RICE according to the requirements in paragraphs (f)(1) through (4) of this section. In order for the engine to be considered an emergency stationary RICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (4) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (4) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary RICE in emergency situations.

(2) You may operate your emergency stationary RICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraphs (f)(3) and (4) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary RICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency RICE beyond 100 hours per calendar year.

(ii) Emergency stationary RICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §63.14), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary RICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary RICE located at major sources of HAP may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. The 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(4) Emergency stationary RICE located at area sources of HAP may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. Except as provided in paragraphs (f)(4)(i) and (ii) of this section, the 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) Prior to May 3, 2014, the 50 hours per year for non-emergency situations can be used for peak shaving or non-emergency demand response to generate income for a facility, or to otherwise supply power as part of a financial arrangement with another entity if the engine is operated as part of a peak shaving (load management program) with the local distribution system operator and the power is provided only to the facility itself or to support the local distribution system.

(ii) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator.

(B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(D) The power is provided only to the facility itself or to support the local transmission and distribution system.

(E) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

[69 FR 33506, June 15, 2004, as amended at 71 FR 20467, Apr. 20, 2006; 73 FR 3606, Jan. 18, 2008; 75 FR 9676, Mar. 3, 2010; 75 FR 51591, Aug. 20, 2010; 78 FR 6704, Jan. 30, 2013]

**Notifications, Reports, and Records**

**§63.6645 What notifications must I submit and when?**

(a) You must submit all of the notifications in §§63.7(b) and (c), 63.8(e), (f)(4) and (f)(6), 63.9(b) through (e), and (g) and (h) that apply to you by the dates specified if you own or operate any of the following;

(1) An existing stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions.

(2) An existing stationary RICE located at an area source of HAP emissions.

(3) A stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions.

(4) A new or reconstructed 4SLB stationary RICE with a site rating of greater than or equal to 250 HP located at a major source of HAP emissions.

(5) This requirement does not apply if you own or operate an existing stationary RICE less than 100 HP, an existing stationary emergency RICE, or an existing stationary RICE that is not subject to any numerical emission standards.

(b) As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart, you must submit an Initial Notification not later than December 13, 2004.

(c) If you start up your new or reconstructed stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions on or after August 16, 2004, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.

(d) As specified in §63.9(b)(2), if you start up your stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions before the effective date of this subpart and you are required to submit an initial notification, you must submit an Initial Notification not later than July 16, 2008.

(e) If you start up your new or reconstructed stationary RICE with a site rating of equal to or less than 500 brake HP located at a major source of HAP emissions on or after March 18, 2008 and you are required to submit an initial notification, you must submit an Initial Notification not later than 120 days after you become subject to this subpart.

(f) If you are required to submit an Initial Notification but are otherwise not affected by the requirements of this subpart, in accordance with §63.6590(b), your notification should include the information in §63.9(b)(2)(i) through (v), and a statement that your stationary RICE has no additional requirements and explain the basis of the exclusion (for example, that it operates exclusively as an emergency stationary RICE if it has a site rating of more than 500 brake HP located at a major source of HAP emissions).

(g) If you are required to conduct a performance test, you must submit a Notification of Intent to conduct a performance test at least 60 days before the performance test is scheduled to begin as required in §63.7(b)(1).

(h) If you are required to conduct a performance test or other initial compliance demonstration as specified in Tables 4 and 5 to this subpart, you must submit a Notification of Compliance Status according to §63.9(h)(2)(ii).

(1) For each initial compliance demonstration required in Table 5 to this subpart that does not include a performance test, you must submit the Notification of Compliance Status before the close of business on the 30th day following the completion of the initial compliance demonstration.

(2) For each initial compliance demonstration required in Table 5 to this subpart that includes a performance test conducted according to the requirements in Table 3 to this subpart, you must submit the Notification of Compliance Status, including the performance test results, before the close of business on the 60th day following the completion of the performance test according to §63.10(d)(2).

(i) If you own or operate an existing non-emergency CI RICE with a site rating of more than 300 HP located at an area source of HAP emissions that is certified to the Tier 1 or Tier 2 emission standards in Table 1 of 40 CFR 89.112 and subject to an enforceable state or local standard requiring engine replacement and you intend to meet management practices rather than emission limits, as specified in §63.6603(d), you must submit a notification by March 3, 2013, stating that you intend to use the provision in §63.6603(d) and identifying the state or local regulation that the engine is subject to.

[73 FR 3606, Jan. 18, 2008, as amended at 75 FR 9677, Mar. 3, 2010; 75 FR 51591, Aug. 20, 2010; 78 FR 6705, Jan. 30, 2013]

**§63.6650 What reports must I submit and when?**

(a) You must submit each report in Table 7 of this subpart that applies to you.

(b) Unless the Administrator has approved a different schedule for submission of reports under §63.10(a), you must submit each report by the date in Table 7 of this subpart and according to the requirements in paragraphs (b)(1) through (b)(9) of this section.

(1) For semiannual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on June 30 or December 31, whichever date is the first date following the end of the first calendar half after the compliance date that is specified for your source in §63.6595.

(2) For semiannual Compliance reports, the first Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date follows the end of the first calendar half after the compliance date that is specified for your affected source in §63.6595.

(3) For semiannual Compliance reports, each subsequent Compliance report must cover the semiannual reporting period from January 1 through June 30 or the semiannual reporting period from July 1 through December 31.

(4) For semiannual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than July 31 or January 31, whichever date is the first date following the end of the semiannual reporting period.

(5) For each stationary RICE that is subject to permitting regulations pursuant to 40 CFR part 70 or 71, and if the permitting authority has established dates for submitting semiannual reports pursuant to 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6 (a)(3)(iii)(A), you may submit the first and subsequent Compliance reports according to the dates the permitting authority has established instead of according to the dates in paragraphs (b)(1) through (b)(4) of this section.

(6) For annual Compliance reports, the first Compliance report must cover the period beginning on the compliance date that is specified for your affected source in §63.6595 and ending on December 31.

(7) For annual Compliance reports, the first Compliance report must be postmarked or delivered no later than January 31 following the end of the first calendar year after the compliance date that is specified for your affected source in §63.6595.

(8) For annual Compliance reports, each subsequent Compliance report must cover the annual reporting period from January 1 through December 31.

(9) For annual Compliance reports, each subsequent Compliance report must be postmarked or delivered no later than January 31.

(c) The Compliance report must contain the information in paragraphs (c)(1) through (6) of this section.

(1) Company name and address.

(2) Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.

(3) Date of report and beginning and ending dates of the reporting period.

(4) If you had a malfunction during the reporting period, the compliance report must include the number, duration, and a brief description for each type of malfunction which occurred during the reporting period and which caused or may have caused any applicable emission limitation to be exceeded. The report must also include a description of actions taken by an owner or operator during a malfunction of an affected source to minimize emissions in accordance with §63.6605(b), including actions taken to correct a malfunction.

(5) If there are no deviations from any emission or operating limitations that apply to you, a statement that there were no deviations from the emission or operating limitations during the reporting period.

(6) If there were no periods during which the continuous monitoring system (CMS), including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were no periods during which the CMS was out-of-control during the reporting period.

(d) For each deviation from an emission or operating limitation that occurs for a stationary RICE where you are not using a CMS to comply with the emission or operating limitations in this subpart, the Compliance report must contain the information in paragraphs (c)(1) through (4) of this section and the information in paragraphs (d)(1) and (2) of this section.

(1) The total operating time of the stationary RICE at which the deviation occurred during the reporting period.

(2) Information on the number, duration, and cause of deviations (including unknown cause, if applicable), as applicable, and the corrective action taken.

(e) For each deviation from an emission or operating limitation occurring for a stationary RICE where you are using a CMS to comply with the emission and operating limitations in this subpart, you must include information in paragraphs (c)(1) through (4) and (e)(1) through (12) of this section.

(1) The date and time that each malfunction started and stopped.

(2) The date, time, and duration that each CMS was inoperative, except for zero (low-level) and high-level checks.

(3) The date, time, and duration that each CMS was out-of-control, including the information in §63.8(c)(8).

(4) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of malfunction or during another period.

(5) A summary of the total duration of the deviation during the reporting period, and the total duration as a percent of the total source operating time during that reporting period.

(6) A breakdown of the total duration of the deviations during the reporting period into those that are due to control equipment problems, process problems, other known causes, and other unknown causes.

(7) A summary of the total duration of CMS downtime during the reporting period, and the total duration of CMS downtime as a percent of the total operating time of the stationary RICE at which the CMS downtime occurred during that reporting period.

(8) An identification of each parameter and pollutant (CO or formaldehyde) that was monitored at the stationary RICE.

(9) A brief description of the stationary RICE.

(10) A brief description of the CMS.

(11) The date of the latest CMS certification or audit.

(12) A description of any changes in CMS, processes, or controls since the last reporting period.

(f) Each affected source that has obtained a title V operating permit pursuant to 40 CFR part 70 or 71 must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR 70.6 (a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A). If an affected source submits a Compliance report pursuant to Table 7 of this subpart along with, or as part of, the semiannual monitoring report required by 40 CFR 70.6(a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A), and the Compliance report includes all required information concerning deviations from any emission or operating limitation in this subpart, submission of the Compliance report shall be deemed to satisfy any obligation to report the same deviations in the semiannual monitoring report. However, submission of a Compliance report shall not otherwise affect any obligation the affected source may have to report deviations from permit requirements to the permit authority.

(g) If you are operating as a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must submit an annual report according to Table 7 of this subpart by the date specified unless the Administrator has approved a different schedule, according to the information described in paragraphs (b)(1) through (b)(5) of this section. You must report the data specified in (g)(1) through (g)(3) of this section.

(1) Fuel flow rate of each fuel and the heating values that were used in your calculations. You must also demonstrate that the percentage of heat input provided by landfill gas or digester gas is equivalent to 10 percent or more of the total fuel consumption on an annual basis.

(2) The operating limits provided in your federally enforceable permit, and any deviations from these limits.

(3) Any problems or errors suspected with the meters.

(h) If you own or operate an emergency stationary RICE with a site rating of more than 100 brake HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §63.6640(f)(2)(ii) and (iii) or that operates for the purpose specified in §63.6640(f)(4)(ii), you must submit an annual report according to the requirements in paragraphs (h)(1) through (3) of this section.

(1) The report must contain the following information:

(i) Company name and address where the engine is located.

(ii) Date of the report and beginning and ending dates of the reporting period.

(iii) Engine site rating and model year.

(iv) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.

(v) Hours operated for the purposes specified in §63.6640(f)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in §63.6640(f)(2)(ii) and (iii).

(vi) Number of hours the engine is contractually obligated to be available for the purposes specified in §63.6640(f)(2)(ii) and (iii).

(vii) Hours spent for operation for the purpose specified in §63.6640(f)(4)(ii), including the date, start time, and end time for engine operation for the purposes specified in §63.6640(f)(4)(ii). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

(viii) If there were no deviations from the fuel requirements in §63.6604 that apply to the engine (if any), a statement that there were no deviations from the fuel requirements during the reporting period.

(ix) If there were deviations from the fuel requirements in §63.6604 that apply to the engine (if any), information on the number, duration, and cause of deviations, and the corrective action taken.

(2) The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.

(3) The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (*www.epa.gov/cdx*). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in §63.13.

[69 FR 33506, June 15, 2004, as amended at 75 FR 9677, Mar. 3, 2010; 78 FR 6705, Jan. 30, 2013]

**§63.6655 What records must I keep?**

(a) If you must comply with the emission and operating limitations, you must keep the records described in paragraphs (a)(1) through (a)(5), (b)(1) through (b)(3) and (c) of this section.

(1) A copy of each notification and report that you submitted to comply with this subpart, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in §63.10(b)(2)(xiv).

(2) Records of the occurrence and duration of each malfunction of operation (*i.e.,* process equipment) or the air pollution control and monitoring equipment.

(3) Records of performance tests and performance evaluations as required in §63.10(b)(2)(viii).

(4) Records of all required maintenance performed on the air pollution control and monitoring equipment.

(5) Records of actions taken during periods of malfunction to minimize emissions in accordance with §63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.

(b) For each CEMS or CPMS, you must keep the records listed in paragraphs (b)(1) through (3) of this section.

(1) Records described in §63.10(b)(2)(vi) through (xi).

(2) Previous (*i.e.,* superseded) versions of the performance evaluation plan as required in §63.8(d)(3).

(3) Requests for alternatives to the relative accuracy test for CEMS or CPMS as required in §63.8(f)(6)(i), if applicable.

(c) If you are operating a new or reconstructed stationary RICE which fires landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, you must keep the records of your daily fuel usage monitors.

(d) You must keep the records required in Table 6 of this subpart to show continuous compliance with each emission or operating limitation that applies to you.

(e) You must keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan if you own or operate any of the following stationary RICE;

(1) An existing stationary RICE with a site rating of less than 100 brake HP located at a major source of HAP emissions.

(2) An existing stationary emergency RICE.

(3) An existing stationary RICE located at an area source of HAP emissions subject to management practices as shown in Table 2d to this subpart.

(f) If you own or operate any of the stationary RICE in paragraphs (f)(1) through (2) of this section, you must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engine is used for the purposes specified in §63.6640(f)(2)(ii) or (iii) or §63.6640(f)(4)(ii), the owner or operator must keep records of the notification of the emergency situation, and the date, start time, and end time of engine operation for these purposes.

(1) An existing emergency stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions that does not meet the standards applicable to non-emergency engines.

(2) An existing emergency stationary RICE located at an area source of HAP emissions that does not meet the standards applicable to non-emergency engines.

[69 FR 33506, June 15, 2004, as amended at 75 FR 9678, Mar. 3, 2010; 75 FR 51592, Aug. 20, 2010; 78 FR 6706, Jan. 30, 2013]

**§63.6660 In what form and how long must I keep my records?**

(a) Your records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).

(b) As specified in §63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

(c) You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).

[69 FR 33506, June 15, 2004, as amended at 75 FR 9678, Mar. 3, 2010]

**Other Requirements and Information**

**§63.6665 What parts of the General Provisions apply to me?**

Table 8 to this subpart shows which parts of the General Provisions in §§63.1 through 63.15 apply to you. If you own or operate a new or reconstructed stationary RICE with a site rating of less than or equal to 500 brake HP located at a major source of HAP emissions (except new or reconstructed 4SLB engines greater than or equal to 250 and less than or equal to 500 brake HP), a new or reconstructed stationary RICE located at an area source of HAP emissions, or any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with any of the requirements of the General Provisions specified in Table 8: An existing 2SLB stationary RICE, an existing 4SLB stationary RICE, an existing stationary RICE that combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, an existing emergency stationary RICE, or an existing limited use stationary RICE. If you own or operate any of the following RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, you do not need to comply with the requirements in the General Provisions specified in Table 8 except for the initial notification requirements: A new stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, a new emergency stationary RICE, or a new limited use stationary RICE.

[75 FR 9678, Mar. 3, 2010]

**§63.6670 Who implements and enforces this subpart?**

(a) This subpart is implemented and enforced by the U.S. EPA, or a delegated authority such as your State, local, or tribal agency. If the U.S. EPA Administrator has delegated authority to your State, local, or tribal agency, then that agency (as well as the U.S. EPA) has the authority to implement and enforce this subpart. You should contact your U.S. EPA Regional Office to find out whether this subpart is delegated to your State, local, or tribal agency.

(b) In delegating implementation and enforcement authority of this subpart to a State, local, or tribal agency under 40 CFR part 63, subpart E, the authorities contained in paragraph (c) of this section are retained by the Administrator of the U.S. EPA and are not transferred to the State, local, or tribal agency.

(c) The authorities that will not be delegated to State, local, or tribal agencies are:

(1) Approval of alternatives to the non-opacity emission limitations and operating limitations in §63.6600 under §63.6(g).

(2) Approval of major alternatives to test methods under §63.7(e)(2)(ii) and (f) and as defined in §63.90.

(3) Approval of major alternatives to monitoring under §63.8(f) and as defined in §63.90.

(4) Approval of major alternatives to recordkeeping and reporting under §63.10(f) and as defined in §63.90.

(5) Approval of a performance test which was conducted prior to the effective date of the rule, as specified in §63.6610(b).

**§63.6675 What definitions apply to this subpart?**

Terms used in this subpart are defined in the Clean Air Act (CAA); in 40 CFR 63.2, the General Provisions of this part; and in this section as follows:

*Alaska Railbelt Grid* means the service areas of the six regulated public utilities that extend from Fairbanks to Anchorage and the Kenai Peninsula. These utilities are Golden Valley Electric Association; Chugach Electric Association; Matanuska Electric Association; Homer Electric Association; Anchorage Municipal Light & Power; and the City of Seward Electric System.

*Area source* means any stationary source of HAP that is not a major source as defined in part 63.

*Associated equipment* as used in this subpart and as referred to in section 112(n)(4) of the CAA, means equipment associated with an oil or natural gas exploration or production well, and includes all equipment from the well bore to the point of custody transfer, except glycol dehydration units, storage vessels with potential for flash emissions, combustion turbines, and stationary RICE.

*Backup power for renewable energy* means an engine that provides backup power to a facility that generates electricity from renewable energy resources, as that term is defined in Alaska Statute 42.45.045(l)(5) (incorporated by reference, see §63.14).

*Black start engine* means an engine whose only purpose is to start up a combustion turbine.

*CAA* means the Clean Air Act (42 U.S.C. 7401 *et seq.,* as amended by Public Law 101-549, 104 Stat. 2399).

*Commercial emergency stationary RICE* means an emergency stationary RICE used in commercial establishments such as office buildings, hotels, stores, telecommunications facilities, restaurants, financial institutions such as banks, doctor's offices, and sports and performing arts facilities.

*Compression ignition* means relating to a type of stationary internal combustion engine that is not a spark ignition engine.

*Custody transfer* means the transfer of hydrocarbon liquids or natural gas: After processing and/or treatment in the producing operations, or from storage vessels or automatic transfer facilities or other such equipment, including product loading racks, to pipelines or any other forms of transportation. For the purposes of this subpart, the point at which such liquids or natural gas enters a natural gas processing plant is a point of custody transfer.

*Deviation* means any instance in which an affected source subject to this subpart, or an owner or operator of such a source:

(1) Fails to meet any requirement or obligation established by this subpart, including but not limited to any emission limitation or operating limitation;

(2) Fails to meet any term or condition that is adopted to implement an applicable requirement in this subpart and that is included in the operating permit for any affected source required to obtain such a permit; or

(3) Fails to meet any emission limitation or operating limitation in this subpart during malfunction, regardless or whether or not such failure is permitted by this subpart.

(4) Fails to satisfy the general duty to minimize emissions established by §63.6(e)(1)(i).

*Diesel engine* means any stationary RICE in which a high boiling point liquid fuel injected into the combustion chamber ignites when the air charge has been compressed to a temperature sufficiently high for auto-ignition. This process is also known as compression ignition.

*Diesel fuel* means any liquid obtained from the distillation of petroleum with a boiling point of approximately 150 to 360 degrees Celsius. One commonly used form is fuel oil number 2. Diesel fuel also includes any non-distillate fuel with comparable physical and chemical properties (*e.g.* biodiesel) that is suitable for use in compression ignition engines.

*Digester gas* means any gaseous by-product of wastewater treatment typically formed through the anaerobic decomposition of organic waste materials and composed principally of methane and $CO_2$.

*Dual-fuel engine* means any stationary RICE in which a liquid fuel (typically diesel fuel) is used for compression ignition and gaseous fuel (typically natural gas) is used as the primary fuel.

*Emergency stationary RICE* means any stationary reciprocating internal combustion engine that meets all of the criteria in paragraphs (1) through (3) of this definition. All emergency stationary RICE must comply with the requirements specified in §63.6640(f) in order to be considered emergency stationary RICE. If the engine does not comply with the requirements specified in §63.6640(f), then it is not considered to be an emergency stationary RICE under this subpart.

(1) The stationary RICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary RICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary RICE used to pump water in the case of fire or flood, etc.

(2) The stationary RICE is operated under limited circumstances for situations not included in paragraph (1) of this definition, as specified in §63.6640(f).

(3) The stationary RICE operates as part of a financial arrangement with another entity in situations not included in paragraph (1) of this definition only as allowed in §63.6640(f)(2)(ii) or (iii) and §63.6640(f)(4)(i) or (ii).

*Engine startup* means the time from initial start until applied load and engine and associated equipment reaches steady state or normal operation. For stationary engine with catalytic controls, engine startup means the time from initial start until applied load and engine and associated equipment, including the catalyst, reaches steady state or normal operation.

*Four-stroke engine* means any type of engine which completes the power cycle in two crankshaft revolutions, with intake and compression strokes in the first revolution and power and exhaust strokes in the second revolution.

*Gaseous fuel* means a material used for combustion which is in the gaseous state at standard atmospheric temperature and pressure conditions.

*Gasoline* means any fuel sold in any State for use in motor vehicles and motor vehicle engines, or nonroad or stationary engines, and commonly or commercially known or sold as gasoline.

*Glycol dehydration unit* means a device in which a liquid glycol (including, but not limited to, ethylene glycol, diethylene glycol, or triethylene glycol) absorbent directly contacts a natural gas stream and absorbs water in a contact tower or absorption column (absorber). The glycol contacts and absorbs water vapor and other gas stream constituents from the natural gas and becomes “rich” glycol. This glycol is then regenerated in the glycol dehydration unit reboiler. The “lean” glycol is then recycled.

*Hazardous air pollutants (HAP)* means any air pollutants listed in or pursuant to section 112(b) of the CAA.

*Institutional emergency stationary RICE* means an emergency stationary RICE used in institutional establishments such as medical centers, nursing homes, research centers, institutions of higher education, correctional facilities, elementary and secondary schools, libraries, religious establishments, police stations, and fire stations.

*ISO standard day conditions* means 288 degrees Kelvin (15 degrees Celsius), 60 percent relative humidity and 101.3 kilopascals pressure.

*Landfill gas* means a gaseous by-product of the land application of municipal refuse typically formed through the anaerobic decomposition of waste materials and composed principally of methane and $CO_2$.

*Lean burn engine* means any two-stroke or four-stroke spark ignited engine that does not meet the definition of a rich burn engine.

*Limited use stationary RICE* means any stationary RICE that operates less than 100 hours per year.

*Liquefied petroleum gas* means any liquefied hydrocarbon gas obtained as a by-product in petroleum refining of natural gas production.

*Liquid fuel* means any fuel in liquid form at standard temperature and pressure, including but not limited to diesel, residual/crude oil, kerosene/naphtha (jet fuel), and gasoline.

*Major Source,* as used in this subpart, shall have the same meaning as in §63.2, except that:

(1) Emissions from any oil or gas exploration or production well (with its associated equipment (as defined in this section)) and emissions from any pipeline compressor station or pump station shall not be aggregated with emissions from other similar units, to determine whether such emission points or stations are major sources, even when emission points are in a contiguous area or under common control;

(2) For oil and gas production facilities, emissions from processes, operations, or equipment that are not part of the same oil and gas production facility, as defined in §63.1271 of subpart HHH of this part, shall not be aggregated;

(3) For production field facilities, only HAP emissions from glycol dehydration units, storage vessel with the potential for flash emissions, combustion turbines and reciprocating internal combustion engines shall be aggregated for a major source determination; and

(4) Emissions from processes, operations, and equipment that are not part of the same natural gas transmission and storage facility, as defined in §63.1271 of subpart HHH of this part, shall not be aggregated.

*Malfunction* means any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

*Natural gas* means a naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in geologic formations beneath the Earth's surface, of which the principal constituent is methane. Natural gas may be field or pipeline quality.

*Non-selective catalytic reduction (NSCR)* means an add-on catalytic nitrogen oxides ($NO_X$) control device for rich burn engines that, in a two-step reaction, promotes the conversion of excess oxygen, $NO_X$, CO, and volatile organic compounds (VOC) into $CO_2$, nitrogen, and water.

*Oil and gas production facility* as used in this subpart means any grouping of equipment where hydrocarbon liquids are processed, upgraded (*i.e.,* remove impurities or other constituents to meet contract specifications), or stored prior to the point of custody transfer; or where natural gas is processed, upgraded, or stored prior to entering the natural gas transmission and storage source category. For purposes of a major source determination, facility (including a building, structure, or installation) means oil and natural gas production and processing equipment that is located within the boundaries of an individual surface site as defined in this section. Equipment that is part of a facility will typically be located within close proximity to other equipment located at the same facility. Pieces of production equipment or groupings of equipment located on different oil and gas leases, mineral fee tracts, lease tracts, subsurface or surface unit areas, surface fee tracts, surface lease tracts, or separate surface sites, whether or not connected by a road, waterway, power line or pipeline, shall not be considered part of the same facility. Examples of facilities in the oil and natural gas production source category include, but are not limited to, well sites, satellite tank batteries, central tank batteries, a compressor station that transports natural gas to a natural gas processing plant, and natural gas processing plants.

*Oxidation catalyst* means an add-on catalytic control device that controls CO and VOC by oxidation.

*Peaking unit or engine* means any standby engine intended for use during periods of high demand that are not emergencies.

*Percent load* means the fractional power of an engine compared to its maximum manufacturer's design capacity at engine site conditions. Percent load may range between 0 percent to above 100 percent.

*Potential to emit* means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the stationary source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable. For oil and natural gas production facilities subject to subpart HH of this part, the potential to emit provisions in §63.760(a) may be used. For natural gas transmission and storage facilities subject to subpart HHH of this part, the maximum annual facility gas throughput for storage facilities may be determined according to §63.1270(a)(1) and the maximum annual throughput for transmission facilities may be determined according to §63.1270(a)(2).

*Production field facility* means those oil and gas production facilities located prior to the point of custody transfer.

*Production well* means any hole drilled in the earth from which crude oil, condensate, or field natural gas is extracted.

*Propane* means a colorless gas derived from petroleum and natural gas, with the molecular structure $C_3H_8$.

*Remote stationary RICE* means stationary RICE meeting any of the following criteria:

(1) Stationary RICE located in an offshore area that is beyond the line of ordinary low water along that portion of the coast of the United States that is in direct contact with the open seas and beyond the line marking the seaward limit of inland waters.

(2) Stationary RICE located on a pipeline segment that meets both of the criteria in paragraphs (2)(i) and (ii) of this definition.

(i) A pipeline segment with 10 or fewer buildings intended for human occupancy and no buildings with four or more stories within 220 yards (200 meters) on either side of the centerline of any continuous 1-mile (1.6 kilometers) length of pipeline. Each separate dwelling unit in a multiple dwelling unit building is counted as a separate building intended for human occupancy.

(ii) The pipeline segment does not lie within 100 yards (91 meters) of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least 5 days a week for 10 weeks in any 12-month period. The days and weeks need not be consecutive. The building or area is considered occupied for a full day if it is occupied for any portion of the day.

(iii) For purposes of this paragraph (2), the term pipeline segment means all parts of those physical facilities through which gas moves in transportation, including but not limited to pipe, valves, and other appurtenance attached to pipe, compressor units, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies. Stationary RICE located within 50 yards (46 meters) of the pipeline segment providing power for equipment on a pipeline segment are part of the pipeline segment. Transportation of gas means the gathering, transmission, or distribution of gas by pipeline, or the storage of gas. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans.

(3) Stationary RICE that are not located on gas pipelines and that have 5 or fewer buildings intended for human occupancy and no buildings with four or more stories within a 0.25 mile radius around the engine. A building is intended for human occupancy if its primary use is for a purpose involving the presence of humans.

*Residential emergency stationary RICE* means an emergency stationary RICE used in residential establishments such as homes or apartment buildings.

*Responsible official* means responsible official as defined in 40 CFR 70.2.

*Rich burn engine* means any four-stroke spark ignited engine where the manufacturer's recommended operating air/fuel ratio divided by the stoichiometric air/fuel ratio at full load conditions is less than or equal to 1.1. Engines originally manufactured as rich burn engines, but modified prior to December 19, 2002 with passive emission control technology for $NO_X$ (such as pre-combustion chambers) will be considered lean burn engines. Also, existing engines where there are no manufacturer's recommendations regarding air/fuel ratio will be considered a rich burn engine if the excess oxygen content of the exhaust at full load conditions is less than or equal to 2 percent.

*Site-rated HP* means the maximum manufacturer's design capacity at engine site conditions.

*Spark ignition* means relating to either: A gasoline-fueled engine; or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark ignition engines usually use a throttle to regulate intake air flow to control power during normal operation. Dual-fuel engines in which a liquid fuel (typically diesel fuel) is used for CI and gaseous fuel (typically natural gas) is used as the primary fuel at an annual average ratio of less than 2 parts diesel fuel to 100 parts total fuel on an energy equivalent basis are spark ignition engines.

*Stationary reciprocating internal combustion engine (RICE)* means any reciprocating internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. Stationary RICE differ from mobile RICE in that a stationary RICE is not a non-road engine as defined at 40 CFR 1068.30, and is not used to propel a motor vehicle or a vehicle used solely for competition.

*Stationary RICE test cell/stand* means an engine test cell/stand, as defined in subpart PPPPP of this part, that tests stationary RICE.

*Stoichiometric* means the theoretical air-to-fuel ratio required for complete combustion.

*Storage vessel with the potential for flash emissions* means any storage vessel that contains a hydrocarbon liquid with a stock tank gas-to-oil ratio equal to or greater than 0.31 cubic meters per liter and an American Petroleum Institute gravity equal to or greater than 40 degrees and an actual annual average hydrocarbon liquid throughput equal to or greater than 79,500 liters per day. Flash emissions occur when dissolved hydrocarbons in the fluid evolve from solution when the fluid pressure is reduced.

*Subpart* means 40 CFR part 63, subpart ZZZZ.

*Surface site* means any combination of one or more graded pad sites, gravel pad sites, foundations, platforms, or the immediate physical location upon which equipment is physically affixed.

*Two-stroke engine* means a type of engine which completes the power cycle in single crankshaft revolution by combining the intake and compression operations into one stroke and the power and exhaust operations into a second stroke. This system requires auxiliary scavenging and inherently runs lean of stoichiometric.

[69 FR 33506, June 15, 2004, as amended at 71 FR 20467, Apr. 20, 2006; 73 FR 3607, Jan. 18, 2008; 75 FR 9679, Mar. 3, 2010; 75 FR 51592, Aug. 20, 2010; 76 FR 12867, Mar. 9, 2011; 78 FR 6706, Jan. 30, 2013]

**Table 1a to Subpart ZZZZ of Part 63—Emission Limitations for Existing, New, and Reconstructed Spark Ignition, 4SRB Stationary RICE >500 HP Located at a Major Source of HAP Emissions**

As stated in §§63.6600 and 63.6640, you must comply with the following emission limitations at 100 percent load plus or minus 10 percent for existing, new and reconstructed 4SRB stationary RICE >500 HP located at a major source of HAP emissions:

| For each . . . | You must meet the following emission limitation, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 1. 4SRB stationary RICE | a. Reduce formaldehyde emissions by 76 percent or more. If you commenced construction or reconstruction between December 19, 2002 and June 15, 2004, you may reduce formaldehyde emissions by 75 percent or more until June 15, 2007 or | Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.[1] |
| | b. Limit the concentration of formaldehyde in the stationary RICE exhaust to 350 ppbvd or less at 15 percent $O_2$ | |

[1] Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.6(g) for alternative work practices.

[75 FR 9679, Mar. 3, 2010, as amended at 75 FR 51592, Aug. 20, 2010]

**Table 1b to Subpart ZZZZ of Part 63—Operating Limitations for Existing, New, and Reconstructed SI 4SRB Stationary RICE >500 HP Located at a Major Source of HAP Emissions**

As stated in §§63.6600, 63.6603, 63.6630 and 63.6640, you must comply with the following operating limitations for existing, new and reconstructed 4SRB stationary RICE >500 HP located at a major source of HAP emissions:

| For each . . . | You must meet the following operating limitation, except during periods of startup . . . |
|---|---|
| 1. existing, new and reconstructed 4SRB stationary RICE >500 HP located at a major source of HAP emissions complying with the requirement to reduce formaldehyde emissions by 76 percent or more (or by 75 percent or more, if applicable) and using NSCR; or<br>existing, new and reconstructed 4SRB stationary RICE >500 HP located at a major source of HAP emissions complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust to 350 ppbvd or less at 15 percent $O_2$ and using NSCR; | a. maintain your catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst measured during the initial performance test; and<br>b. maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 750 °F and less than or equal to 1250 °F.[1] |
| 2. existing, new and reconstructed 4SRB stationary RICE >500 HP located at a major source of HAP emissions complying with the requirement to reduce formaldehyde emissions by 76 percent or more (or by 75 percent or more, if applicable) and not using NSCR; or | Comply with any operating limitations approved by the Administrator. |
| existing, new and reconstructed 4SRB stationary RICE >500 HP located at a major source of HAP emissions complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust to 350 ppbvd or less at 15 percent $O_2$ and not using NSCR. | |

[1]Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.8(f) for a different temperature range.

[78 FR 6706, Jan. 30, 2013]

**Table 2a to Subpart ZZZZ of Part 63—Emission Limitations for New and Reconstructed 2SLB and Compression Ignition Stationary RICE >500 HP and New and Reconstructed 4SLB Stationary RICE ≥250 HP Located at a Major Source of HAP Emissions**

As stated in §§63.6600 and 63.6640, you must comply with the following emission limitations for new and reconstructed lean burn and new and reconstructed compression ignition stationary RICE at 100 percent load plus or minus 10 percent:

| For each . . . | You must meet the following emission limitation, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 1. 2SLB stationary RICE | a. Reduce CO emissions by 58 percent or more; or<br>b. Limit concentration of formaldehyde in the stationary RICE exhaust to 12 ppmvd or less at 15 percent $O_2$. If you commenced construction or reconstruction between December 19, 2002 and June 15, 2004, you may limit concentration of formaldehyde to 17 ppmvd or less at 15 percent $O_2$ until June 15, 2007 | Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.[1] |
| 2. 4SLB stationary RICE | a. Reduce CO emissions by 93 percent or more; or | |
| | b. Limit concentration of formaldehyde in the stationary RICE exhaust to 14 ppmvd or less at 15 percent $O_2$ | |

| For each . . . | You must meet the following emission limitation, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 3. CI stationary RICE | a. Reduce CO emissions by 70 percent or more; or | |
| | b. Limit concentration of formaldehyde in the stationary RICE exhaust to 580 ppbvd or less at 15 percent $O_2$ | |

[1]Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.6(g) for alternative work practices.

[75 FR 9680, Mar. 3, 2010]

**Table 2b to Subpart ZZZZ of Part 63—Operating Limitations for New and Reconstructed 2SLB and CI Stationary RICE >500 HP Located at a Major Source of HAP Emissions, New and Reconstructed 4SLB Stationary RICE ≥250 HP Located at a Major Source of HAP Emissions, Existing CI Stationary RICE >500 HP**

As stated in §§63.6600, 63.6601, 63.6603, 63.6630, and 63.6640, you must comply with the following operating limitations for new and reconstructed 2SLB and CI stationary RICE >500 HP located at a major source of HAP emissions; new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions; and existing CI stationary RICE >500 HP:

| For each . . . | You must meet the following operating limitation, except during periods of startup . . . |
|---|---|
| 1. New and reconstructed 2SLB and CI stationary RICE >500 HP located at a major source of HAP emissions and new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions complying with the requirement to reduce CO emissions and using an oxidation catalyst; and New and reconstructed 2SLB and CI stationary RICE >500 HP located at a major source of HAP emissions and new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and using an oxidation catalyst. | a. maintain your catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test; and b. maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F.[1] |
| 2. Existing CI stationary RICE >500 HP complying with the requirement to limit or reduce the concentration of CO in the stationary RICE exhaust and using an oxidation catalyst | a. maintain your catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water from the pressure drop across the catalyst that was measured during the initial performance test; and |
| | b. maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F.[1] |
| 3. New and reconstructed 2SLB and CI stationary RICE >500 HP located at a major source of HAP emissions and new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions complying with the requirement to reduce CO emissions and not using an oxidation catalyst; and | Comply with any operating limitations approved by the Administrator. |
| New and reconstructed 2SLB and CI stationary RICE >500 HP located at a major source of HAP emissions and new and reconstructed 4SLB stationary RICE ≥250 HP located at a major source of HAP emissions complying with the requirement to limit the concentration of formaldehyde in the stationary RICE exhaust and not using an oxidation catalyst; and | |

| For each . . . | You must meet the following operating limitation, except during periods of startup . . . |
|---|---|
| existing CI stationary RICE >500 HP complying with the requirement to limit or reduce the concentration of CO in the stationary RICE exhaust and not using an oxidation catalyst. | |

[1]Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.8(f) for a different temperature range.

[78 FR 6707, Jan. 30, 2013]

**Table 2c to Subpart ZZZZ of Part 63—Requirements for Existing Compression Ignition Stationary RICE Located at a Major Source of HAP Emissions and Existing Spark Ignition Stationary RICE ≤500 HP Located at a Major Source of HAP Emissions**

As stated in §§63.6600, 63.6602, and 63.6640, you must comply with the following requirements for existing compression ignition stationary RICE located at a major source of HAP emissions and existing spark ignition stationary RICE ≤500 HP located at a major source of HAP emissions:

| For each . . . | You must meet the following requirement, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 1. Emergency stationary CI RICE and black start stationary CI RICE[1] | a. Change oil and filter every 500 hours of operation or annually, whichever comes first.[2]<br>b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary;<br>c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.[3] | Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.[3] |
| 2. Non-Emergency, non-black start stationary CI RICE <100 HP | a. Change oil and filter every 1,000 hours of operation or annually, whichever comes first.[2]<br>b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary;<br>c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.[3] | |
| 3. Non-Emergency, non-black start CI stationary RICE 100≤HP≤300 HP | Limit concentration of CO in the stationary RICE exhaust to 230 ppmvd or less at 15 percent $O_2$. | |

| For each . . . | You must meet the following requirement, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 4. Non-Emergency, non-black start CI stationary RICE 300<HP≤500 | a. Limit concentration of CO in the stationary RICE exhaust to 49 ppmvd or less at 15 percent $O_2$; or<br>b. Reduce CO emissions by 70 percent or more. | |
| 5. Non-Emergency, non-black start stationary CI RICE >500 HP | a. Limit concentration of CO in the stationary RICE exhaust to 23 ppmvd or less at 15 percent $O_2$; or<br>b. Reduce CO emissions by 70 percent or more. | |
| 6. Emergency stationary SI RICE and black start stationary SI RICE.[1] | a. Change oil and filter every 500 hours of operation or annually, whichever comes first;[2]<br>b. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary;<br>c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.[3] | |
| 7. Non-Emergency, non-black start stationary SI RICE <100 HP that are not 2SLB stationary RICE | a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;[2]<br>b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; | |
| | c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.[3] | |
| 8. Non-Emergency, non-black start 2SLB stationary SI RICE <100 HP | a. Change oil and filter every 4,320 hours of operation or annually, whichever comes first;[2]<br>b. Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first, and replace as necessary; | |
| | c. Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary.[3] | |

| For each . . . | You must meet the following requirement, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 9. Non-emergency, non-black start 2SLB stationary RICE 100≤HP≤500 | Limit concentration of CO in the stationary RICE exhaust to 225 ppmvd or less at 15 percent $O_2$. | |
| 10. Non-emergency, non-black start 4SLB stationary RICE 100≤HP≤500 | Limit concentration of CO in the stationary RICE exhaust to 47 ppmvd or less at 15 percent $O_2$. | |
| 11. Non-emergency, non-black start 4SRB stationary RICE 100≤HP≤500 | Limit concentration of formaldehyde in the stationary RICE exhaust to 10.3 ppmvd or less at 15 percent $O_2$. | |
| 12. Non-emergency, non-black start stationary RICE 100≤HP≤500 which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis | Limit concentration of CO in the stationary RICE exhaust to 177 ppmvd or less at 15 percent $O_2$. | |

[1]If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the work practice requirements on the schedule required in Table 2c of this subpart, or if performing the work practice on the required schedule would otherwise pose an unacceptable risk under federal, state, or local law, the work practice can be delayed until the emergency is over or the unacceptable risk under federal, state, or local law has abated. The work practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under federal, state, or local law has abated. Sources must report any failure to perform the work practice on the schedule required and the federal, state or local law under which the risk was deemed unacceptable.

[2]Sources have the option to utilize an oil analysis program as described in §63.6625(i) or (j) in order to extend the specified oil change requirement in Table 2c of this subpart.

[3]Sources can petition the Administrator pursuant to the requirements of 40 CFR 63.6(g) for alternative work practices.

[78 FR 6708, Jan. 30, 2013, as amended at 78 FR 14457, Mar. 6, 2013]

**Table 2d to Subpart ZZZZ of Part 63—Requirements for Existing Stationary RICE Located at Area Sources of HAP Emissions**

As stated in §§63.6603 and 63.6640, you must comply with the following requirements for existing stationary RICE located at area sources of HAP emissions:

| For each . . . | You must meet the following requirement, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 1. Non-Emergency, non-black start CI stationary RICE ≤300 HP | a. Change oil and filter every 1,000 hours of operation or annually, whichever comes first;[1]<br>b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary;<br>c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary. | Minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply. |
| 2. Non-Emergency, non-black start CI stationary RICE 300<HP≤500 | a. Limit concentration of CO in the stationary RICE exhaust to 49 ppmvd at 15 percent $O_2$; or | |
| | b. Reduce CO emissions by 70 percent or more. | |
| 3. Non-Emergency, non-black start CI stationary RICE >500 HP | a. Limit concentration of CO in the stationary RICE exhaust to 23 ppmvd at 15 percent $O_2$; or | |
| | b. Reduce CO emissions by 70 percent or more. | |
| 4. Emergency stationary CI RICE and black start stationary CI RICE.[2] | a. Change oil and filter every 500 hours of operation or annually, whichever comes first;[1] | |
| | b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and | |
| | c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary. | |

| For each . . . | You must meet the following requirement, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| 5. Emergency stationary SI RICE; black start stationary SI RICE; non-emergency, non-black start 4SLB stationary RICE >500 HP that operate 24 hours or less per calendar year; non-emergency, non-black start 4SRB stationary RICE >500 HP that operate 24 hours or less per calendar year.[2] | a. Change oil and filter every 500 hours of operation or annually, whichever comes first;[1]; b. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary. | |
| 6. Non-emergency, non-black start 2SLB stationary RICE | a. Change oil and filter every 4,320 hours of operation or annually, whichever comes first;[1] | |
| | b. Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first, and replace as necessary; and | |
| | c. Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary. | |
| 7. Non-emergency, non-black start 4SLB stationary RICE ≤500 HP | a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;[1] | |
| | b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and | |
| | c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary. | |
| 8. Non-emergency, non-black start 4SLB remote stationary RICE >500 HP | a. Change oil and filter every 2,160 hours of operation or annually, whichever comes first;[1] | |
| | b. Inspect spark plugs every 2,160 hours of operation or annually, whichever comes first, and replace as necessary; and | |

| For each . . . | You must meet the following requirement, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| | c. Inspect all hoses and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary. | |
| 9. Non-emergency, non-black start 4SLB stationary RICE >500 HP that are not remote stationary RICE and that operate more than 24 hours per calendar year | Install an oxidation catalyst to reduce HAP emissions from the stationary RICE. | |
| 10. Non-emergency, non-black start 4SRB stationary RICE ≤500 HP | a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;[1] | |
| | b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and | |
| | c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary. | |
| 11. Non-emergency, non-black start 4SRB remote stationary RICE >500 HP | a. Change oil and filter every 2,160 hours of operation or annually, whichever comes first;[1] | |
| | b. Inspect spark plugs every 2,160 hours of operation or annually, whichever comes first, and replace as necessary; and | |
| | c. Inspect all hoses and belts every 2,160 hours of operation or annually, whichever comes first, and replace as necessary. | |
| 12. Non-emergency, non-black start 4SRB stationary RICE >500 HP that are not remote stationary RICE and that operate more than 24 hours per calendar year | Install NSCR to reduce HAP emissions from the stationary RICE. | |
| 13. Non-emergency, non-black start stationary RICE which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis | a. Change oil and filter every 1,440 hours of operation or annually, whichever comes first;[1]<br>b. Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and | |

| For each . . . | You must meet the following requirement, except during periods of startup . . . | During periods of startup you must . . . |
|---|---|---|
| | c. Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary. | |

[1]Sources have the option to utilize an oil analysis program as described in §63.6625(i) or (j) in order to extend the specified oil change requirement in Table 2d of this subpart.

[2]If an emergency engine is operating during an emergency and it is not possible to shut down the engine in order to perform the management practice requirements on the schedule required in Table 2d of this subpart, or if performing the management practice on the required schedule would otherwise pose an unacceptable risk under federal, state, or local law, the management practice can be delayed until the emergency is over or the unacceptable risk under federal, state, or local law has abated. The management practice should be performed as soon as practicable after the emergency has ended or the unacceptable risk under federal, state, or local law has abated. Sources must report any failure to perform the management practice on the schedule required and the federal, state or local law under which the risk was deemed unacceptable.

[78 FR 6709, Jan. 30, 2013]

**Table 3 to Subpart ZZZZ of Part 63—Subsequent Performance Tests**

As stated in §§63.6615 and 63.6620, you must comply with the following subsequent performance test requirements:

| For each . . . | Complying with the requirement to . . . | You must . . . |
|---|---|---|
| 1. New or reconstructed 2SLB stationary RICE >500 HP located at major sources; new or reconstructed 4SLB stationary RICE ≥250 HP located at major sources; and new or reconstructed CI stationary RICE >500 HP located at major sources | Reduce CO emissions and not using a CEMS | Conduct subsequent performance tests semiannually.[1] |
| 2. 4SRB stationary RICE ≥5,000 HP located at major sources | Reduce formaldehyde emissions | Conduct subsequent performance tests semiannually.[1] |
| 3. Stationary RICE >500 HP located at major sources and new or reconstructed 4SLB stationary RICE 250≤HP≤500 located at major sources | Limit the concentration of formaldehyde in the stationary RICE exhaust | Conduct subsequent performance tests semiannually.[1] |
| 4. Existing non-emergency, non-black start CI stationary RICE >500 HP that are not limited use stationary RICE | Limit or reduce CO emissions and not using a CEMS | Conduct subsequent performance tests every 8,760 hours or 3 years, whichever comes first. |
| 5. Existing non-emergency, non-black start CI stationary RICE >500 HP that are limited use stationary RICE | Limit or reduce CO emissions and not using a CEMS | Conduct subsequent performance tests every 8,760 hours or 5 years, whichever comes first. |

[1]After you have demonstrated compliance for two consecutive tests, you may reduce the frequency of subsequent performance tests to annually. If the results of any subsequent annual performance test indicate the stationary RICE is not in compliance with the CO or formaldehyde emission limitation, or you deviate from any of your operating limitations, you must resume semiannual performance tests.

[78 FR 6711, Jan. 30, 2013]

**Table 4 to Subpart ZZZZ of Part 63—Requirements for Performance Tests**

As stated in §§63.6610, 63.6611, 63.6620, and 63.6640, you must comply with the following requirements for performance tests for stationary RICE:

Table 4 to Subpart ZZZZ of Part 63—Requirements for Performance Tests

| For each . . . | Complying with the requirement to . . . | You must . . . | Using . . . | According to the following requirements . . . |
|---|---|---|---|---|
| 1. 2SLB, 4SLB, and CI stationary RICE | a. reduce CO emissions | i. Select the sampling port location and the number/location of traverse points at the inlet and outlet of the control device; and | | (a) For CO and $O_2$ measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line (`3-point long line'). If the duct is >12 inches in diameter *and* the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, appendix A-1, the duct may be sampled at `3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, appendix A-4. |
| | | ii. Measure the $O_2$ at the inlet and outlet of the control device; and | (1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A-2, or ASTM Method D6522-00 (Reapproved 2005)[ac] (heated probe not necessary) | (b) Measurements to determine $O_2$ must be made at the same time as the measurements for CO concentration. |
| | | iii. Measure the CO at the inlet and the outlet of the control device | (1) ASTM D6522-00 (Reapproved 2005)[abc] (heated probe not necessary) or Method 10 of 40 CFR part 60, appendix A-4 | (c) The CO concentration must be at 15 percent $O_2$, dry basis. |

| For each . . . | Complying with the requirement to . . . | You must . . . | Using . . . | According to the following requirements . . . |
|---|---|---|---|---|
| 2. 4SRB stationary RICE | a. reduce formaldehyde emissions | i. Select the sampling port location and the number/location of traverse points at the inlet and outlet of the control device; and | | (a) For formaldehyde, $O_2$, and moisture measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line (`3-point long line'). If the duct is >12 inches in diameter *and* the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, appendix A, the duct may be sampled at `3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, appendix A. |
| | | ii. Measure $O_2$ at the inlet and outlet of the control device; and | (1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A-2, or ASTM Method D6522-00 (Reapproved 2005)[a] (heated probe not necessary) | (a) Measurements to determine $O_2$ concentration must be made at the same time as the measurements for formaldehyde or THC concentration. |
| | | iii. Measure moisture content at the inlet and outlet of the control device; and | (1) Method 4 of 40 CFR part 60, appendix A-3, or Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348-03[a] | (a) Measurements to determine moisture content must be made at the same time and location as the measurements for formaldehyde or THC concentration. |
| | | iv. If demonstrating compliance with the formaldehyde percent reduction requirement, measure formalde-hyde at the inlet and the outlet of the control device | (1) Method 320 or 323 of 40 CFR part 63, appendix A; or ASTM D6348-03[a], provided in ASTM D6348-03 Annex A5 (Analyte Spiking Technique), the percent R must be greater than or equal to 70 and less than or equal to 130 | (a) Formaldehyde concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |
| | | v. If demonstrating compliance with the THC percent reduction requirement, measure THC at the inlet and the outlet of the control device | (1) Method 25A, reported as propane, of 40 CFR part 60, appendix A-7 | (a) THC concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |

| For each . . . | Complying with the requirement to . . . | You must . . . | Using . . . | According to the following requirements . . . |
|---|---|---|---|---|
| 3. Stationary RICE | a. limit the concentra-tion of formalde-hyde or CO in the stationary RICE exhaust | i. Select the sampling port location and the number/location of traverse points at the exhaust of the stationary RICE; and | | (a) For formaldehyde, CO, $O_2$, and moisture measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line (`3-point long line'). If the duct is >12 inches in diameter *and* the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, appendix A, the duct may be sampled at `3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, appendix A. If using a control device, the sampling site must be located at the outlet of the control device. |
| | | ii. Determine the $O_2$ concentration of the stationary RICE exhaust at the sampling port location; and | (1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A-2, or ASTM Method D6522-00 (Reapproved 2005)[a] (heated probe not necessary) | (a) Measurements to determine $O_2$ concentration must be made at the same time and location as the measurements for formaldehyde or CO concentration. |
| | | iii. Measure moisture content of the station-ary RICE exhaust at the sampling port location; and | (1) Method 4 of 40 CFR part 60, appendix A-3, or Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348-03[a] | (a) Measurements to determine moisture content must be made at the same time and location as the measurements for formaldehyde or CO concentration. |
| | | iv. Measure formalde-hyde at the exhaust of the station-ary RICE; or | (1) Method 320 or 323 of 40 CFR part 63, appendix A; or ASTM D6348-03[a], provided in ASTM D6348-03 Annex A5 (Analyte Spiking Technique), the percent R must be greater than or equal to 70 and less than or equal to 130 | (a) Formaldehyde concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |
| | | v. measure CO at the exhaust of the station-ary RICE | (1) Method 10 of 40 CFR part 60, appendix A-4, ASTM Method D6522-00 (2005)[ac], Method 320 of 40 CFR part 63, appendix A, or ASTM D6348-03[a] | (a) CO concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |

[a]You may also use Methods 3A and 10 as options to ASTM-D6522-00 (2005). You may obtain a copy of ASTM-D6522-00 (2005) from at least one of the following addresses: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, or University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106.

[b]You may obtain a copy of ASTM-D6348-03 from at least one of the following addresses: American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, or University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106.

[79 FR 11290, Feb. 27, 2014]

**Table 5 to Subpart ZZZZ of Part 63—Initial Compliance With Emission Limitations, Operating Limitations, and Other Requirements**

As stated in §§63.6612, 63.6625 and 63.6630, you must initially comply with the emission and operating limitations as required by the following:

| For each . . . | Complying with the requirement to . . . | You have demonstrated initial compliance if . . . |
|---|---|---|
| 1. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP located at an area source of HAP | a. Reduce CO emissions and using oxidation catalyst, and using a CPMS | i. The average reduction of emissions of CO determined from the initial performance test achieves the required CO percent reduction; and<br>ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and<br>iii. You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test. |
| 2. Non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP located at an area source of HAP | a. Limit the concentration of CO, using oxidation catalyst, and using a CPMS | i. The average CO concentration determined from the initial performance test is less than or equal to the CO emission limitation; and |
| | | ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and |
| | | iii. You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test. |
| 3. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP located at an area source of HAP | a. Reduce CO emissions and not using oxidation catalyst | i. The average reduction of emissions of CO determined from the initial performance test achieves the required CO percent reduction; and<br>ii. You have installed a CPMS to continuously monitor operating parameters approved by the Administrator (if any) according to the requirements in §63.6625(b); and<br>iii. You have recorded the approved operating parameters (if any) during the initial performance test. |

| For each . . . | Complying with the requirement to . . . | You have demonstrated initial compliance if . . . |
|---|---|---|
| 4. Non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP located at an area source of HAP | a. Limit the concentration of CO, and not using oxidation catalyst | i. The average CO concentration determined from the initial performance test is less than or equal to the CO emission limitation; and<br>ii. You have installed a CPMS to continuously monitor operating parameters approved by the Administrator (if any) according to the requirements in §63.6625(b); and |
| | | iii. You have recorded the approved operating parameters (if any) during the initial performance test. |
| 5. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP located at an area source of HAP | a. Reduce CO emissions, and using a CEMS | i. You have installed a CEMS to continuously monitor CO and either $O_2$ or $CO_2$ at both the inlet and outlet of the oxidation catalyst according to the requirements in §63.6625(a); and<br>ii. You have conducted a performance evaluation of your CEMS using PS 3 and 4A of 40 CFR part 60, appendix B; and |
| | | iii. The average reduction of CO calculated using §63.6620 equals or exceeds the required percent reduction. The initial test comprises the first 4-hour period after successful validation of the CEMS. Compliance is based on the average percent reduction achieved during the 4-hour period. |
| 6. Non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP located at an area source of HAP | a. Limit the concentration of CO, and using a CEMS | i. You have installed a CEMS to continuously monitor CO and either $O_2$ or $CO_2$ at the outlet of the oxidation catalyst according to the requirements in §63.6625(a); and |
| | | ii. You have conducted a performance evaluation of your CEMS using PS 3 and 4A of 40 CFR part 60, appendix B; and |
| | | iii. The average concentration of CO calculated using §63.6620 is less than or equal to the CO emission limitation. The initial test comprises the first 4-hour period after successful validation of the CEMS. Compliance is based on the average concentration measured during the 4-hour period. |
| 7. Non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP | a. Reduce formaldehyde emissions and using NSCR | i. The average reduction of emissions of formaldehyde determined from the initial performance test is equal to or greater than the required formaldehyde percent reduction, or the average reduction of emissions of THC determined from the initial performance test is equal to or greater than 30 percent; and |

| For each . . . | Complying with the requirement to . . . | You have demonstrated initial compliance if . . . |
|---|---|---|
| | | ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and |
| | | iii. You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test. |
| 8. Non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP | a. Reduce formaldehyde emissions and not using NSCR | i. The average reduction of emissions of formaldehyde determined from the initial performance test is equal to or greater than the required formaldehyde percent reduction or the average reduction of emissions of THC determined from the initial performance test is equal to or greater than 30 percent; and |
| | | ii. You have installed a CPMS to continuously monitor operating parameters approved by the Administrator (if any) according to the requirements in §63.6625(b); and |
| | | iii. You have recorded the approved operating parameters (if any) during the initial performance test. |
| 9. New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP, and existing non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP | a. Limit the concentration of formaldehyde in the stationary RICE exhaust and using oxidation catalyst or NSCR | i. The average formaldehyde concentration, corrected to 15 percent $O_2$, dry basis, from the three test runs is less than or equal to the formaldehyde emission limitation; and<br>ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b); and |
| | | iii. You have recorded the catalyst pressure drop and catalyst inlet temperature during the initial performance test. |
| 10. New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP, and existing non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP | a. Limit the concentration of formaldehyde in the stationary RICE exhaust and not using oxidation catalyst or NSCR | i. The average formaldehyde concentration, corrected to 15 percent $O_2$, dry basis, from the three test runs is less than or equal to the formaldehyde emission limitation; and<br>ii. You have installed a CPMS to continuously monitor operating parameters approved by the Administrator (if any) according to the requirements in §63.6625(b); and |
| | | iii. You have recorded the approved operating parameters (if any) during the initial performance test. |
| 11. Existing non-emergency stationary RICE 100≤HP≤500 located at a major source of HAP, and existing non-emergency stationary CI RICE 300<HP≤500 located at an area source of HAP | a. Reduce CO emissions | i. The average reduction of emissions of CO or formaldehyde, as applicable determined from the initial performance test is equal to or greater than the required CO or formaldehyde, as applicable, percent reduction. |

| For each . . . | Complying with the requirement to . . . | You have demonstrated initial compliance if . . . |
|---|---|---|
| 12. Existing non-emergency stationary RICE 100≤HP≤500 located at a major source of HAP, and existing non-emergency stationary CI RICE 300<HP≤500 located at an area source of HAP | a. Limit the concentration of formaldehyde or CO in the stationary RICE exhaust | i. The average formaldehyde or CO concentration, as applicable, corrected to 15 percent $O_2$, dry basis, from the three test runs is less than or equal to the formaldehyde or CO emission limitation, as applicable. |
| 13. Existing non-emergency 4SLB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year | a. Install an oxidation catalyst | i. You have conducted an initial compliance demonstration as specified in §63.6630(e) to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent $O_2$; |
| | | ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b), or you have installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1350 °F. |
| 14. Existing non-emergency 4SRB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year | a. Install NSCR | i. You have conducted an initial compliance demonstration as specified in §63.6630(e) to show that the average reduction of emissions of CO is 75 percent or more, the average CO concentration is less than or equal to 270 ppmvd at 15 percent $O_2$, or the average reduction of emissions of THC is 30 percent or more; |
| | | ii. You have installed a CPMS to continuously monitor catalyst inlet temperature according to the requirements in §63.6625(b), or you have installed equipment to automatically shut down the engine if the catalyst inlet temperature exceeds 1250 °F. |

[78 FR 6712, Jan. 30, 2013]

**Table 6 to Subpart ZZZZ of Part 63—Continuous Compliance With Emission Limitations, and Other Requirements**

As stated in §63.6640, you must continuously comply with the emissions and operating limitations and work or management practices as required by the following:

| For each . . . | Complying with the requirement to . . . | You must demonstrate continuous compliance by . . . |
|---|---|---|
| 1. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, and new or reconstructed non-emergency CI stationary RICE >500 HP located at a major source of HAP | a. Reduce CO emissions and using an oxidation catalyst, and using a CPMS | i. Conducting semiannual performance tests for CO to demonstrate that the required CO percent reduction is achieved[a]; and<br>ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and<br>iii. Reducing these data to 4-hour rolling averages; and |

| For each . . . | Complying with the requirement to . . . | You must demonstrate continuous compliance by . . . |
|---|---|---|
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and |
| | | v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test. |
| 2. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, and new or reconstructed non-emergency CI stationary RICE >500 HP located at a major source of HAP | a. Reduce CO emissions and not using an oxidation catalyst, and using a CPMS | i. Conducting semiannual performance tests for CO to demonstrate that the required CO percent reduction is achieved[a]; and<br>ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and<br>iii. Reducing these data to 4-hour rolling averages; and |
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test. |
| 3. New or reconstructed non-emergency 2SLB stationary RICE >500 HP located at a major source of HAP, new or reconstructed non-emergency 4SLB stationary RICE ≥250 HP located at a major source of HAP, new or reconstructed non-emergency stationary CI RICE >500 HP located at a major source of HAP, and existing non-emergency stationary CI RICE >500 HP | a. Reduce CO emissions or limit the concentration of CO in the stationary RICE exhaust, and using a CEMS | i. Collecting the monitoring data according to §63.6625(a), reducing the measurements to 1-hour averages, calculating the percent reduction or concentration of CO emissions according to §63.6620; and<br>ii. Demonstrating that the catalyst achieves the required percent reduction of CO emissions over the 4-hour averaging period, or that the emission remain at or below the CO concentration limit; and |
| | | iii. Conducting an annual RATA of your CEMS using PS 3 and 4A of 40 CFR part 60, appendix B, as well as daily and periodic data quality checks in accordance with 40 CFR part 60, appendix F, procedure 1. |
| 4. Non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP | a. Reduce formaldehyde emissions and using NSCR | i. Collecting the catalyst inlet temperature data according to §63.6625(b); and |
| | | ii. Reducing these data to 4-hour rolling averages; and |
| | | iii. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and |
| | | iv. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test. |

| For each . . . | Complying with the requirement to . . . | You must demonstrate continuous compliance by . . . |
|---|---|---|
| 5. Non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP | a. Reduce formaldehyde emissions and not using NSCR | i. Collecting the approved operating parameter (if any) data according to §63.6625(b); and |
| | | ii. Reducing these data to 4-hour rolling averages; and |
| | | iii. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test. |
| 6. Non-emergency 4SRB stationary RICE with a brake HP ≥5,000 located at a major source of HAP | a. Reduce formaldehyde emissions | Conducting semiannual performance tests for formaldehyde to demonstrate that the required formaldehyde percent reduction is achieved, or to demonstrate that the average reduction of emissions of THC determined from the performance test is equal to or greater than 30 percent.[a] |
| 7. New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP | a. Limit the concentration of formaldehyde in the stationary RICE exhaust and using oxidation catalyst or NSCR | i. Conducting semiannual performance tests for formaldehyde to demonstrate that your emissions remain at or below the formaldehyde concentration limit[a]; and<br>ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and |
| | | iii. Reducing these data to 4-hour rolling averages; and |
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and |
| | | v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test. |
| 8. New or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP | a. Limit the concentration of formaldehyde in the stationary RICE exhaust and not using oxidation catalyst or NSCR | i. Conducting semiannual performance tests for formaldehyde to demonstrate that your emissions remain at or below the formaldehyde concentration limit[a]; and<br>ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and |
| | | iii. Reducing these data to 4-hour rolling averages; and |
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test. |

| For each . . . | Complying with the requirement to . . . | You must demonstrate continuous compliance by . . . |
|---|---|---|
| 9. Existing emergency and black start stationary RICE ≤500 HP located at a major source of HAP, existing non-emergency stationary RICE <100 HP located at a major source of HAP, existing emergency and black start stationary RICE located at an area source of HAP, existing non-emergency stationary CI RICE ≤300 HP located at an area source of HAP, existing non-emergency 2SLB stationary RICE located at an area source of HAP, existing non-emergency stationary SI RICE located at an area source of HAP which combusts landfill or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis, existing non-emergency 4SLB and 4SRB stationary RICE ≤500 HP located at an area source of HAP, existing non-emergency 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that operate 24 hours or less per calendar year, and existing non-emergency 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that are remote stationary RICE | a. Work or Management practices | i. Operating and maintaining the stationary RICE according to the manufacturer's emission-related operation and maintenance instructions; or<br>ii. Develop and follow your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. |
| 10. Existing stationary CI RICE >500 HP that are not limited use stationary RICE | a. Reduce CO emissions, or limit the concentration of CO in the stationary RICE exhaust, and using oxidation catalyst | i. Conducting performance tests every 8,760 hours or 3 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and |
| | | ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and |
| | | iii. Reducing these data to 4-hour rolling averages; and |
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and |
| | | v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test. |
| 11. Existing stationary CI RICE >500 HP that are not limited use stationary RICE | a. Reduce CO emissions, or limit the concentration of CO in the stationary RICE exhaust, and not using oxidation catalyst | i. Conducting performance tests every 8,760 hours or 3 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and |
| | | ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and |

| For each . . . | Complying with the requirement to . . . | You must demonstrate continuous compliance by . . . |
|---|---|---|
| | | iii. Reducing these data to 4-hour rolling averages; and |
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test. |
| 12. Existing limited use CI stationary RICE >500 HP | a. Reduce CO emissions or limit the concentration of CO in the stationary RICE exhaust, and using an oxidation catalyst | i. Conducting performance tests every 8,760 hours or 5 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and |
| | | ii. Collecting the catalyst inlet temperature data according to §63.6625(b); and |
| | | iii. Reducing these data to 4-hour rolling averages; and |
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the catalyst inlet temperature; and |
| | | v. Measuring the pressure drop across the catalyst once per month and demonstrating that the pressure drop across the catalyst is within the operating limitation established during the performance test. |
| 13. Existing limited use CI stationary RICE >500 HP | a. Reduce CO emissions or limit the concentration of CO in the stationary RICE exhaust, and not using an oxidation catalyst | i. Conducting performance tests every 8,760 hours or 5 years, whichever comes first, for CO or formaldehyde, as appropriate, to demonstrate that the required CO or formaldehyde, as appropriate, percent reduction is achieved or that your emissions remain at or below the CO or formaldehyde concentration limit; and |
| | | ii. Collecting the approved operating parameter (if any) data according to §63.6625(b); and |
| | | iii. Reducing these data to 4-hour rolling averages; and |
| | | iv. Maintaining the 4-hour rolling averages within the operating limitations for the operating parameters established during the performance test. |

| For each . . . | Complying with the requirement to . . . | You must demonstrate continuous compliance by . . . |
|---|---|---|
| 14. Existing non-emergency 4SLB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year | a. Install an oxidation catalyst | i. Conducting annual compliance demonstrations as specified in §63.6640(c) to show that the average reduction of emissions of CO is 93 percent or more, or the average CO concentration is less than or equal to 47 ppmvd at 15 percent $O_2$; and either<br>ii. Collecting the catalyst inlet temperature data according to §63.6625(b), reducing these data to 4-hour rolling averages; and maintaining the 4-hour rolling averages within the limitation of greater than 450 °F and less than or equal to 1350 °F for the catalyst inlet temperature; or<br>iii. Immediately shutting down the engine if the catalyst inlet temperature exceeds 1350 °F. |
| 15. Existing non-emergency 4SRB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that are operated more than 24 hours per calendar year | a. Install NSCR | i. Conducting annual compliance demonstrations as specified in §63.6640(c) to show that the average reduction of emissions of CO is 75 percent or more, the average CO concentration is less than or equal to 270 ppmvd at 15 percent $O_2$, or the average reduction of emissions of THC is 30 percent or more; and either<br>ii. Collecting the catalyst inlet temperature data according to §63.6625(b), reducing these data to 4-hour rolling averages; and maintaining the 4-hour rolling averages within the limitation of greater than or equal to 750 °F and less than or equal to 1250 °F for the catalyst inlet temperature; or<br>iii. Immediately shutting down the engine if the catalyst inlet temperature exceeds 1250 °F. |

[a] After you have demonstrated compliance for two consecutive tests, you may reduce the frequency of subsequent performance tests to annually. If the results of any subsequent annual performance test indicate the stationary RICE is not in compliance with the CO or formaldehyde emission limitation, or you deviate from any of your operating limitations, you must resume semiannual performance tests.

[78 FR 6715, Jan. 30, 2013]

**Table 7 to Subpart ZZZZ of Part 63—Requirements for Reports**

As stated in §63.6650, you must comply with the following requirements for reports:

| For each . . . | You must submit a . . . | The report must contain . . . | You must submit the report . . . |
|---|---|---|---|
| 1. Existing non-emergency, non-black start stationary RICE 100≤HP≤500 located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >500 HP located at a major source of HAP; existing non-emergency 4SRB stationary RICE >500 HP located at a major source of HAP; existing non-emergency, non-black start stationary CI RICE >300 HP located at an area source of HAP; new or reconstructed non-emergency stationary RICE >500 HP located at a major source of HAP; and new or reconstructed non-emergency 4SLB stationary RICE 250≤HP≤500 located at a major source of HAP | Compliance report | a. If there are no deviations from any emission limitations or operating limitations that apply to you, a statement that there were no deviations from the emission limitations or operating limitations during the reporting period. If there were no periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), a statement that there were not periods during which the CMS was out-of-control during the reporting period; or | i. Semiannually according to the requirements in §63.6650(b)(1)-(5) for engines that are not limited use stationary RICE subject to numerical emission limitations; and<br>ii. Annually according to the requirements in §63.6650(b)(6)-(9) for engines that are limited use stationary RICE subject to numerical emission limitations. |
| | | b. If you had a deviation from any emission limitation or operating limitation during the reporting period, the information in §63.6650(d). If there were periods during which the CMS, including CEMS and CPMS, was out-of-control, as specified in §63.8(c)(7), the information in §63.6650(e); or | i. Semiannually according to the requirements in §63.6650(b). |
| | | c. If you had a malfunction during the reporting period, the information in §63.6650(c)(4). | i. Semiannually according to the requirements in §63.6650(b). |
| 2. New or reconstructed non-emergency stationary RICE that combusts landfill gas or digester gas equivalent to 10 percent or more of the gross heat input on an annual basis | Report | a. The fuel flow rate of each fuel and the heating values that were used in your calculations, and you must demonstrate that the percentage of heat input provided by landfill gas or digester gas, is equivalent to 10 percent or more of the gross heat input on an annual basis; and | i. Annually, according to the requirements in §63.6650. |
| | | b. The operating limits provided in your federally enforceable permit, and any deviations from these limits; and | i. See item 2.a.i. |
| | | c. Any problems or errors suspected with the meters. | i. See item 2.a.i. |
| 3. Existing non-emergency, non-black start 4SLB and 4SRB stationary RICE >500 HP located at an area source of HAP that are not remote stationary RICE and that operate more than 24 hours per calendar year | Compliance report | a. The results of the annual compliance demonstration, if conducted during the reporting period. | i. Semiannually according to the requirements in §63.6650(b)(1)-(5). |

| For each . . . | You must submit a . . . | The report must contain . . . | You must submit the report . . . |
|---|---|---|---|
| 4. Emergency stationary RICE that operate or are contractually obligated to be available for more than 15 hours per year for the purposes specified in §63.6640(f)(2)(ii) and (iii) or that operate for the purposes specified in §63.6640(f)(4)( ii) | Report | a. The information in §63.6650(h)(1) | i. annually according to the requirements in §63.6650(h)(2)-(3). |

[78 FR 6719, Jan. 30, 2013]

**Table 8 to Subpart ZZZZ of Part 63—Applicability of General Provisions to Subpart ZZZZ.**

As stated in §63.6665, you must comply with the following applicable general provisions.

| General provisions citation | Subject of citation | Applies to subpart | Explanation |
|---|---|---|---|
| §63.1 | General applicability of the General Provisions | Yes. | |
| §63.2 | Definitions | Yes | Additional terms defined in §63.6675. |
| §63.3 | Units and abbreviations | Yes. | |
| §63.4 | Prohibited activities and circumvention | Yes. | |
| §63.5 | Construction and reconstruction | Yes. | |
| §63.6(a) | Applicability | Yes. | |
| §63.6(b)(1)-(4) | Compliance dates for new and reconstructed sources | Yes. | |
| §63.6(b)(5) | Notification | Yes. | |
| §63.6(b)(6) | [Reserved] | | |
| §63.6(b)(7) | Compliance dates for new and reconstructed area sources that become major sources | Yes. | |
| §63.6(c)(1)-(2) | Compliance dates for existing sources | Yes. | |
| §63.6(c)(3)-(4) | [Reserved] | | |
| §63.6(c)(5) | Compliance dates for existing area sources that become major sources | Yes. | |
| §63.6(d) | [Reserved] | | |
| §63.6(e) | Operation and maintenance | No. | |
| §63.6(f)(1) | Applicability of standards | No. | |
| §63.6(f)(2) | Methods for determining compliance | Yes. | |
| §63.6(f)(3) | Finding of compliance | Yes. | |
| §63.6(g)(1)-(3) | Use of alternate standard | Yes. | |
| §63.6(h) | Opacity and visible emission standards | No | Subpart ZZZZ does not contain opacity or visible emission standards. |
| §63.6(i) | Compliance extension procedures and criteria | Yes. | |

| General provisions citation | Subject of citation | Applies to subpart | Explanation |
|---|---|---|---|
| §63.6(j) | Presidential compliance exemption | Yes. | |
| §63.7(a)(1)-(2) | Performance test dates | Yes | Subpart ZZZZ contains performance test dates at §§63.6610, 63.6611, and 63.6612. |
| §63.7(a)(3) | CAA section 114 authority | Yes. | |
| §63.7(b)(1) | Notification of performance test | Yes | Except that §63.7(b)(1) only applies as specified in §63.6645. |
| §63.7(b)(2) | Notification of rescheduling | Yes | Except that §63.7(b)(2) only applies as specified in §63.6645. |
| §63.7(c) | Quality assurance/test plan | Yes | Except that §63.7(c) only applies as specified in §63.6645. |
| §63.7(d) | Testing facilities | Yes. | |
| §63.7(e)(1) | Conditions for conducting performance tests | No. | Subpart ZZZZ specifies conditions for conducting performance tests at §63.6620. |
| §63.7(e)(2) | Conduct of performance tests and reduction of data | Yes | Subpart ZZZZ specifies test methods at §63.6620. |
| §63.7(e)(3) | Test run duration | Yes. | |
| §63.7(e)(4) | Administrator may require other testing under section 114 of the CAA | Yes. | |
| §63.7(f) | Alternative test method provisions | Yes. | |
| §63.7(g) | Performance test data analysis, recordkeeping, and reporting | Yes. | |
| §63.7(h) | Waiver of tests | Yes. | |
| §63.8(a)(1) | Applicability of monitoring requirements | Yes | Subpart ZZZZ contains specific requirements for monitoring at §63.6625. |
| §63.8(a)(2) | Performance specifications | Yes. | |
| §63.8(a)(3) | [Reserved] | | |
| §63.8(a)(4) | Monitoring for control devices | No. | |
| §63.8(b)(1) | Monitoring | Yes. | |
| §63.8(b)(2)-(3) | Multiple effluents and multiple monitoring systems | Yes. | |
| §63.8(c)(1) | Monitoring system operation and maintenance | Yes. | |
| §63.8(c)(1)(i) | Routine and predictable SSM | No | |
| §63.8(c)(1)(ii) | SSM not in Startup Shutdown Malfunction Plan | Yes. | |
| §63.8(c)(1)(iii) | Compliance with operation and maintenance requirements | No | |
| §63.8(c)(2)-(3) | Monitoring system installation | Yes. | |
| §63.8(c)(4) | Continuous monitoring system (CMS) requirements | Yes | Except that subpart ZZZZ does not require Continuous Opacity Monitoring System (COMS). |
| §63.8(c)(5) | COMS minimum procedures | No | Subpart ZZZZ does not require COMS. |
| §63.8(c)(6)-(8) | CMS requirements | Yes | Except that subpart ZZZZ does not require COMS. |

| General provisions citation | Subject of citation | Applies to subpart | Explanation |
|---|---|---|---|
| §63.8(d) | CMS quality control | Yes. | |
| §63.8(e) | CMS performance evaluation | Yes | Except for §63.8(e)(5)(ii), which applies to COMS. |
| | | Except that §63.8(e) only applies as specified in §63.6645. | |
| §63.8(f)(1)-(5) | Alternative monitoring method | Yes | Except that §63.8(f)(4) only applies as specified in §63.6645. |
| §63.8(f)(6) | Alternative to relative accuracy test | Yes | Except that §63.8(f)(6) only applies as specified in §63.6645. |
| §63.8(g) | Data reduction | Yes | Except that provisions for COMS are not applicable. Averaging periods for demonstrating compliance are specified at §§63.6635 and 63.6640. |
| §63.9(a) | Applicability and State delegation of notification requirements | Yes. | |
| §63.9(b)(1)-(5) | Initial notifications | Yes | Except that §63.9(b)(3) is reserved. |
| | | Except that §63.9(b) only applies as specified in §63.6645. | |
| §63.9(c) | Request for compliance extension | Yes | Except that §63.9(c) only applies as specified in §63.6645. |
| §63.9(d) | Notification of special compliance requirements for new sources | Yes | Except that §63.9(d) only applies as specified in §63.6645. |
| §63.9(e) | Notification of performance test | Yes | Except that §63.9(e) only applies as specified in §63.6645. |
| §63.9(f) | Notification of visible emission (VE)/opacity test | No | Subpart ZZZZ does not contain opacity or VE standards. |
| §63.9(g)(1) | Notification of performance evaluation | Yes | Except that §63.9(g) only applies as specified in §63.6645. |
| §63.9(g)(2) | Notification of use of COMS data | No | Subpart ZZZZ does not contain opacity or VE standards. |
| §63.9(g)(3) | Notification that criterion for alternative to RATA is exceeded | Yes | If alternative is in use. |
| | | Except that §63.9(g) only applies as specified in §63.6645. | |
| §63.9(h)(1)-(6) | Notification of compliance status | Yes | Except that notifications for sources using a CEMS are due 30 days after completion of performance evaluations. §63.9(h)(4) is reserved. |
| | | | Except that §63.9(h) only applies as specified in §63.6645. |
| §63.9(i) | Adjustment of submittal deadlines | Yes. | |
| §63.9(j) | Change in previous information | Yes. | |
| §63.10(a) | Administrative provisions for recordkeeping/reporting | Yes. | |

| General provisions citation | Subject of citation | Applies to subpart | Explanation |
|---|---|---|---|
| §63.10(b)(1) | Record retention | Yes | Except that the most recent 2 years of data do not have to be retained on site. |
| §63.10(b)(2)(i)-(v) | Records related to SSM | No. | |
| §63.10(b)(2)(vi)-(xi) | Records | Yes. | |
| §63.10(b)(2)(xii) | Record when under waiver | Yes. | |
| §63.10(b)(2)(xiii) | Records when using alternative to RATA | Yes | For CO standard if using RATA alternative. |
| §63.10(b)(2)(xiv) | Records of supporting documentation | Yes. | |
| §63.10(b)(3) | Records of applicability determination | Yes. | |
| §63.10(c) | Additional records for sources using CEMS | Yes | Except that §63.10(c)(2)-(4) and (9) are reserved. |
| §63.10(d)(1) | General reporting requirements | Yes. | |
| §63.10(d)(2) | Report of performance test results | Yes. | |
| §63.10(d)(3) | Reporting opacity or VE observations | No | Subpart ZZZZ does not contain opacity or VE standards. |
| §63.10(d)(4) | Progress reports | Yes. | |
| §63.10(d)(5) | Startup, shutdown, and malfunction reports | No. | |
| §63.10(e)(1) and (2)(i) | Additional CMS Reports | Yes. | |
| §63.10(e)(2)(ii) | COMS-related report | No | Subpart ZZZZ does not require COMS. |
| §63.10(e)(3) | Excess emission and parameter exceedances reports | Yes. | Except that §63.10(e)(3)(i) (C) is reserved. |
| §63.10(e)(4) | Reporting COMS data | No | Subpart ZZZZ does not require COMS. |
| §63.10(f) | Waiver for recordkeeping/reporting | Yes. | |
| §63.11 | Flares | No. | |
| §63.12 | State authority and delegations | Yes. | |
| §63.13 | Addresses | Yes. | |
| §63.14 | Incorporation by reference | Yes. | |
| §63.15 | Availability of information | Yes. | |

[75 FR 9688, Mar. 3, 2010, as amended at 78 FR 6720, Jan. 30, 2013]

**Appendix A—Protocol for Using an Electrochemical Analyzer to Determine Oxygen and Carbon Monoxide Concentrations From Certain Engines**

**1.0 Scope and Application. What is this Protocol?**

This protocol is a procedure for using portable electrochemical (EC) cells for measuring carbon monoxide (CO) and oxygen ($O_2$) concentrations in controlled and uncontrolled emissions from existing stationary 4-stroke lean burn and 4-stroke rich burn reciprocating internal combustion engines as specified in the applicable rule.

**1.1 Analytes. What does this protocol determine?**

This protocol measures the engine exhaust gas concentrations of carbon monoxide (CO) and oxygen ($O_2$).

| Analyte | CAS No. | Sensitivity |
|---|---|---|
| Carbon monoxide (CO) | 630-08-0 | Minimum detectable limit should be 2 percent of the nominal range or 1 ppm, whichever is less restrictive. |
| Oxygen ($O_2$) | *7782-44-7* | |

**1.2 Applicability. When is this protocol acceptable?**

This protocol is applicable to 40 CFR part 63, subpart ZZZZ. Because of inherent cross sensitivities of EC cells, you must not apply this protocol to other emissions sources without specific instruction to that effect.

**1.3 Data Quality Objectives. How good must my collected data be?**

Refer to Section 13 to verify and document acceptable analyzer performance.

**1.4 Range. What is the targeted analytical range for this protocol?**

The measurement system and EC cell design(s) conforming to this protocol will determine the analytical range for each gas component. The nominal ranges are defined by choosing up-scale calibration gas concentrations near the maximum anticipated flue gas concentrations for CO and $O_2$, or no more than twice the permitted CO level.

**1.5 Sensitivity. What minimum detectable limit will this protocol yield for a particular gas component?**

The minimum detectable limit depends on the nominal range and resolution of the specific EC cell used, and the signal to noise ratio of the measurement system. The minimum detectable limit should be 2 percent of the nominal range or 1 ppm, whichever is less restrictive.

**2.0 Summary of Protocol**

In this protocol, a gas sample is extracted from an engine exhaust system and then conveyed to a portable EC analyzer for measurement of CO and $O_2$ gas concentrations. This method provides measurement system performance specifications and sampling protocols to ensure reliable data. You may use additions to, or modifications of vendor supplied measurement systems (e.g., heated or unheated sample lines, thermocouples, flow meters, selective gas scrubbers, etc.) to meet the design specifications of this protocol. Do not make changes to the measurement system from the as-verified configuration (Section 3.12).

**3.0 Definitions**

*3.1 Measurement System.* The total equipment required for the measurement of CO and $O_2$ concentrations. The measurement system consists of the following major subsystems:

*3.1.1 Data Recorder.* A strip chart recorder, computer or digital recorder for logging measurement data from the analyzer output. You may record measurement data from the digital data display manually or electronically.

*3.1.2 Electrochemical (EC) Cell.* A device, similar to a fuel cell, used to sense the presence of a specific analyte and generate an electrical current output proportional to the analyte concentration.

*3.1.3 Interference Gas Scrubber.* A device used to remove or neutralize chemical compounds that may interfere with the selective operation of an EC cell.

*3.1.4 Moisture Removal System.* Any device used to reduce the concentration of moisture in the sample stream so as to protect the EC cells from the damaging effects of condensation and to minimize errors in measurements caused by the scrubbing of soluble gases.

*3.1.5 Sample Interface.* The portion of the system used for one or more of the following: sample acquisition; sample transport; sample conditioning or protection of the EC cell from any degrading effects of the engine exhaust effluent; removal of particulate matter and condensed moisture.

*3.2 Nominal Range.* The range of analyte concentrations over which each EC cell is operated (normally 25 percent to 150 percent of up-scale calibration gas value). Several nominal ranges can be used for any given cell so long as the calibration and repeatability checks for that range remain within specifications.

*3.3 Calibration Gas.* A vendor certified concentration of a specific analyte in an appropriate balance gas.

*3.4 Zero Calibration Error.* The analyte concentration output exhibited by the EC cell in response to zero-level calibration gas.

*3.5 Up-Scale Calibration Error.* The mean of the difference between the analyte concentration exhibited by the EC cell and the certified concentration of the up-scale calibration gas.

*3.6 Interference Check.* A procedure for quantifying analytical interference from components in the engine exhaust gas other than the targeted analytes.

*3.7 Repeatability Check.* A protocol for demonstrating that an EC cell operated over a given nominal analyte concentration range provides a stable and consistent response and is not significantly affected by repeated exposure to that gas.

*3.8 Sample Flow Rate.* The flow rate of the gas sample as it passes through the EC cell. In some situations, EC cells can experience drift with changes in flow rate. The flow rate must be monitored and documented during all phases of a sampling run.

*3.9 Sampling Run.* A timed three-phase event whereby an EC cell's response rises and plateaus in a sample conditioning phase, remains relatively constant during a measurement data phase, then declines during a refresh phase. The sample conditioning phase exposes the EC cell to the gas sample for a length of time sufficient to reach a constant response. The measurement data phase is the time interval during which gas sample measurements can be made that meet the acceptance criteria of this protocol. The refresh phase then purges the EC cells with CO-free air. The refresh phase replenishes requisite $O_2$ and moisture in the electrolyte reserve and provides a mechanism to de-gas or desorb any interference gas scrubbers or filters so as to enable a stable CO EC cell response. There are four primary types of sampling runs: pre- sampling calibrations; stack gas sampling; post-sampling calibration checks; and measurement system repeatability checks. Stack gas sampling runs can be chained together for extended evaluations, providing all other procedural specifications are met.

*3.10 Sampling Day.* A time not to exceed twelve hours from the time of the pre-sampling calibration to the post-sampling calibration check. During this time, stack gas sampling runs can be repeated without repeated recalibrations, providing all other sampling specifications have been met.

*3.11 Pre-Sampling Calibration/Post-Sampling Calibration Check.* The protocols executed at the beginning and end of each sampling day to bracket measurement readings with controlled performance checks.

*3.12 Performance-Established Configuration.* The EC cell and sampling system configuration that existed at the time that it initially met the performance requirements of this protocol.

**4.0 Interferences.**

When present in sufficient concentrations, NO and $NO_2$ are two gas species that have been reported to interfere with CO concentration measurements. In the likelihood of this occurrence, it is the protocol user's responsibility to employ and properly maintain an appropriate CO EC cell filter or scrubber for removal of these gases, as described in Section 6.2.12.

**5.0 Safety. [Reserved]**

**6.0 Equipment and Supplies.**

**6.1 What equipment do I need for the measurement system?**

The system must maintain the gas sample at conditions that will prevent moisture condensation in the sample transport lines, both before and as the sample gas contacts the EC cells. The essential components of the measurement system are described below.

**6.2 Measurement System Components.**

*6.2.1 Sample Probe.* A single extraction-point probe constructed of glass, stainless steel or other non-reactive material, and of length sufficient to reach any designated sampling point. The sample probe must be designed to prevent plugging due to condensation or particulate matter.

*6.2.2 Sample Line.* Non-reactive tubing to transport the effluent from the sample probe to the EC cell.

*6.2.3 Calibration Assembly (optional).* A three-way valve assembly or equivalent to introduce calibration gases at ambient pressure at the exit end of the sample probe during calibration checks. The assembly must be designed such that only stack gas or calibration gas flows in the sample line and all gases flow through any gas path filters.

*6.2.4 Particulate Filter (optional).* Filters before the inlet of the EC cell to prevent accumulation of particulate material in the measurement system and extend the useful life of the components. All filters must be fabricated of materials that are non-reactive to the gas mixtures being sampled.

*6.2.5 Sample Pump.* A leak-free pump to provide undiluted sample gas to the system at a flow rate sufficient to minimize the response time of the measurement system. If located upstream of the EC cells, the pump must be constructed of a material that is non-reactive to the gas mixtures being sampled.

*6.2.8 Sample Flow Rate Monitoring.* An adjustable rotameter or equivalent device used to adjust and maintain the sample flow rate through the analyzer as prescribed.

*6.2.9 Sample Gas Manifold (optional).* A manifold to divert a portion of the sample gas stream to the analyzer and the remainder to a by-pass discharge vent. The sample gas manifold may also include provisions for introducing calibration gases directly to the analyzer. The manifold must be constructed of a material that is non-reactive to the gas mixtures being sampled.

*6.2.10 EC cell.* A device containing one or more EC cells to determine the CO and $O_2$ concentrations in the sample gas stream. The EC cell(s) must meet the applicable performance specifications of Section 13 of this protocol.

*6.2.11 Data Recorder.* A strip chart recorder, computer or digital recorder to make a record of analyzer output data. The data recorder resolution (i.e., readability) must be no greater than 1 ppm for CO; 0.1 percent for $O_2$; and one degree (either °C or °F) for temperature. Alternatively, you may use a digital or analog meter having the same resolution to observe and manually record the analyzer responses.

*6.2.12 Interference Gas Filter or Scrubber.* A device to remove interfering compounds upstream of the CO EC cell. Specific interference gas filters or scrubbers used in the performance-established configuration of the analyzer must continue to be used. Such a filter or scrubber must have a means to determine when the removal agent is exhausted. Periodically replace or replenish it in accordance with the manufacturer's recommendations.

**7.0 Reagents and Standards. What calibration gases are needed?**

*7.1 Calibration Gases.* CO calibration gases for the EC cell must be CO in nitrogen or CO in a mixture of nitrogen and $O_2$. Use CO calibration gases with labeled concentration values certified by the manufacturer to be within ±5 percent of the label value. Dry ambient air (20.9 percent $O_2$) is acceptable for calibration of the $O_2$ cell. If needed, any lower percentage $O_2$ calibration gas must be a mixture of $O_2$ in nitrogen.

*7.1.1 Up-Scale CO Calibration Gas Concentration.* Choose one or more up-scale gas concentrations such that the average of the stack gas measurements for each stack gas sampling run are between 25 and 150 percent of those concentrations. Alternatively, choose an up-scale gas that does not exceed twice the concentration of the applicable outlet standard. If a measured gas value exceeds 150 percent of the up-scale CO calibration gas value at any time during the stack gas sampling run, the run must be discarded and repeated.

*7.1.2 Up-Scale $O_2$ Calibration Gas Concentration.*

Select an $O_2$ gas concentration such that the difference between the gas concentration and the average stack gas measurement or reading for each sample run is less than 15 percent $O_2$. When the average exhaust gas $O_2$ readings are above 6 percent, you may use dry ambient air (20.9 percent $O_2$) for the up-scale $O_2$ calibration gas.

*7.1.3 Zero Gas.* Use an inert gas that contains less than 0.25 percent of the up-scale CO calibration gas concentration. You may use dry air that is free from ambient CO and other combustion gas products (e.g., $CO_2$).

**8.0 Sample Collection and Analysis**

8.1 Selection of Sampling Sites.

8.1.1 Control Device Inlet. Select a sampling site sufficiently downstream of the engine so that the combustion gases should be well mixed. Use a single sampling extraction point near the center of the duct (e.g., within the 10 percent centroidal area), unless instructed otherwise.

8.1.2 Exhaust Gas Outlet. Select a sampling site located at least two stack diameters downstream of any disturbance (e.g., turbocharger exhaust, crossover junction or recirculation take-off) and at least one-half stack diameter upstream of the gas discharge to the atmosphere. Use a single sampling extraction point near the center of the duct (e.g., within the 10 percent centroidal area), unless instructed otherwise.

8.2 Stack Gas Collection and Analysis. Prior to the first stack gas sampling run, conduct that the pre-sampling calibration in accordance with Section 10.1. Use Figure 1 to record all data. Zero the analyzer with zero gas. Confirm and record that the scrubber media color is correct and not exhausted. Then position the probe at the sampling point and begin the sampling run at the same flow rate used during the up-scale calibration. Record the start time. Record all EC cell output responses and the flow rate during the “sample conditioning phase” once per minute until constant readings are obtained. Then begin the “measurement data phase” and record readings every 15 seconds for at least two minutes (or eight readings), or as otherwise required to achieve two continuous minutes of data that meet the specification given in Section 13.1. Finally, perform the “refresh phase” by introducing dry air, free from CO and other combustion gases, until several minute-to-minute readings of consistent value have been obtained. For each run use the “measurement data phase” readings to calculate the average stack gas CO and $O_2$ concentrations.

8.3 EC Cell Rate. Maintain the EC cell sample flow rate so that it does not vary by more than ±10 percent throughout the pre-sampling calibration, stack gas sampling and post-sampling calibration check. Alternatively, the EC cell sample flow rate can be maintained within a tolerance range that does not affect the gas concentration readings by more than ±3 percent, as instructed by the EC cell manufacturer.

**9.0 Quality Control (Reserved)**

**10.0 Calibration and Standardization**

*10.1 Pre-Sampling Calibration.* Conduct the following protocol once for each nominal range to be used on each EC cell before performing a stack gas sampling run on each field sampling day. Repeat the calibration if you replace an EC cell before completing all of the sampling runs. There is no prescribed order for calibration of the EC cells; however, each cell must complete the measurement data phase during calibration. Assemble the measurement system by following the manufacturer's recommended protocols including for preparing and preconditioning the EC cell. Assure the measurement system has no leaks and verify the gas scrubbing agent is not depleted. Use Figure 1 to record all data.

*10.1.1 Zero Calibration.* For both the $O_2$ and CO cells, introduce zero gas to the measurement system (e.g., at the calibration assembly) and record the concentration reading every minute until readings are constant for at least two consecutive minutes. Include the time and sample flow rate. Repeat the steps in this section at least once to verify the zero calibration for each component gas.

*10.1.2 Zero Calibration Tolerance.* For each zero gas introduction, the zero level output must be less than or equal to ±3 percent of the up-scale gas value or ±1 ppm, whichever is less restrictive, for the CO channel and less than or equal to ±0.3 percent $O_2$ for the $O_2$ channel.

*10.1.3 Up-Scale Calibration.* Individually introduce each calibration gas to the measurement system (e.g., at the calibration assembly) and record the start time. Record all EC cell output responses and the flow rate during this “sample conditioning phase” once per minute until readings are constant for at least two minutes. Then begin the “measurement data phase” and record readings every 15 seconds for a total of two minutes, or as otherwise required. Finally, perform the “refresh phase” by introducing dry air, free from CO and other combustion gases, until readings are constant for at least two consecutive minutes. Then repeat the steps in this section at least once to verify the calibration for each component gas. Introduce all gases to flow through the entire sample handling system (i.e., at the exit end of the sampling probe or the calibration assembly).

*10.1.4 Up-Scale Calibration Error.* The mean of the difference of the “measurement data phase” readings from the reported standard gas value must be less than or equal to ±5 percent or ±1 ppm for CO or ±0.5 percent $O_2$, whichever is less restrictive, respectively. The maximum allowable deviation from the mean measured value of any single “measurement data phase” reading must be less than or equal to ±2 percent or ±1 ppm for CO or ±0.5 percent $O_2$, whichever is less restrictive, respectively.

*10.2 Post-Sampling Calibration Check.* Conduct a stack gas post-sampling calibration check after the stack gas sampling run or set of runs and within 12 hours of the initial calibration. Conduct up-scale and zero calibration checks using the protocol in Section 10.1. Make no changes to the sampling system or EC cell calibration until all post-sampling calibration checks have been recorded. If either the zero or up-scale calibration error exceeds the respective specification in Sections 10.1.2 and 10.1.4 then all measurement data collected since the previous successful calibrations are invalid and re-calibration and re-sampling are required. If the sampling system is disassembled or the EC cell calibration is adjusted, repeat the calibration check before conducting the next analyzer sampling run.

**11.0 Analytical Procedure**

The analytical procedure is fully discussed in Section 8.

**12.0 Calculations and Data Analysis**

Determine the CO and $O_2$ concentrations for each stack gas sampling run by calculating the mean gas concentrations of the data recorded during the “measurement data phase”.

**13.0 Protocol Performance**

Use the following protocols to verify consistent analyzer performance during each field sampling day.

*13.1 Measurement Data Phase Performance Check.* Calculate the mean of the readings from the “measurement data phase”. The maximum allowable deviation from the mean for each of the individual readings is ±2 percent, or ±1 ppm, whichever is less restrictive. Record the mean value and maximum deviation for each gas monitored. Data must conform to Section 10.1.4. The EC cell flow rate must conform to the specification in Section 8.3.

*Example:* A measurement data phase is invalid if the maximum deviation of any single reading comprising that mean is greater than ±2 percent *or* ±1 ppm (the default criteria). For example, if the mean = 30 ppm, single readings of below 29 ppm and above 31 ppm are disallowed).

*13.2 Interference Check.* Before the initial use of the EC cell and interference gas scrubber in the field, and semi-annually thereafter, challenge the interference gas scrubber with NO and $NO_2$ gas standards that are generally recognized as representative of diesel-fueled engine NO and $NO_2$ emission values. Record the responses displayed by the CO EC cell and other pertinent data on Figure 1 or a similar form.

*13.2.1 Interference Response.* The combined NO and $NO_2$ interference response should be less than or equal to ±5 percent of the up-scale CO calibration gas concentration.

*13.3 Repeatability Check.* Conduct the following check once for each nominal range that is to be used on the CO EC cell within 5 days prior to each field sampling program. If a field sampling program lasts longer than 5 days, repeat this check every 5 days. Immediately repeat the check if the EC cell is replaced or if the EC cell is exposed to gas concentrations greater than 150 percent of the highest up-scale gas concentration.

*13.3.1 Repeatability Check Procedure.* Perform a complete EC cell sampling run (all three phases) by introducing the CO calibration gas to the measurement system and record the response. Follow Section 10.1.3. Use Figure 1 to record all data. Repeat the run three times for a total of four complete runs. During the four repeatability check runs, do not adjust the system except where necessary to achieve the correct calibration gas flow rate at the analyzer.

*13.3.2 Repeatability Check Calculations.* Determine the highest and lowest average “measurement data phase” CO concentrations from the four repeatability check runs and record the results on Figure 1 or a similar form. The absolute value of the difference between the maximum and minimum average values recorded must not vary more than ±3 percent or ±1 ppm of the up-scale gas value, whichever is less restrictive.

**14.0 Pollution Prevention (Reserved)**

**15.0 Waste Management (Reserved)**

**16.0 Alternative Procedures (Reserved)**

**17.0 References**

(1) “Development of an Electrochemical Cell Emission Analyzer Test Protocol”, Topical Report, Phil Juneau, Emission Monitoring, Inc., July 1997.

(2) “Determination of Nitrogen Oxides, Carbon Monoxide, and Oxygen Emissions from Natural Gas-Fired Engines, Boilers, and Process Heaters Using Portable Analyzers”, EMC Conditional Test Protocol 30 (CTM-30), Gas Research Institute Protocol GRI-96/0008, Revision 7, October 13, 1997.

(3) “ICAC Test Protocol for Periodic Monitoring”, EMC Conditional Test Protocol 34 (CTM-034), The Institute of Clean Air Companies, September 8, 1999.

(4) “Code of Federal Regulations”, Protection of Environment, 40 CFR, Part 60, Appendix A, Methods 1-4; 10.

Table 1: Appendix A—Sampling Run Data.

| Facility__________ Engine I.D.__________ Date______ | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Run Type: | (_) | | | (_) | | | (_) | | | (_) | |
| (X) | Pre-Sample Calibration | | | Stack Gas Sample | | | Post-Sample Cal. Check | | | Repeatability Check | |
| Run # | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | Time | Scrub. OK | Flow- Rate |
| Gas | $O_2$ | CO | $O_2$ | CO | $O_2$ | CO | $O_2$ | CO | | | |
| Sample Cond. Phase | | | | | | | | | | | |
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| Measurement Data Phase | | | | | | | | | | | |
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[78 FR 6721, Jan. 30, 2013]

**Attachment E**

**Part 70 Operating Permit No: 077-36338-00001**

[Downloaded from the eCFR on September 30, 2014]

**Electronic Code of Federal Regulations**

**Title 40: Protection of Environment**

**PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES**

**Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines**

SOURCE: 71 FR 39172, July 11, 2006, unless otherwise noted.

**What This Subpart Covers**

**§60.4200 Am I subject to this subpart?**

(a) The provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in paragraphs (a)(1) through (4) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

(1) Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:

(i) 2007 or later, for engines that are not fire pump engines;

(ii) The model year listed in Table 3 to this subpart or later model year, for fire pump engines.

(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005, where the stationary CI ICE are:

(i) Manufactured after April 1, 2006, and are not fire pump engines, or

(ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.

(3) Owners and operators of any stationary CI ICE that are modified or reconstructed after July 11, 2005 and any person that modifies or reconstructs any stationary CI ICE after July 11, 2005.

(4) The provisions of §60.4208 of this subpart are applicable to all owners and operators of stationary CI ICE that commence construction after July 11, 2005.

(b) The provisions of this subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C (or the exemptions described in 40 CFR part 89, subpart J and 40 CFR part 94, subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

(e) Owners and operators of facilities with CI ICE that are acting as temporary replacement units and that are located at a stationary source for less than 1 year and that have been properly certified as meeting the standards that would be applicable to such engine under the appropriate nonroad engine provisions, are not required to meet any other provisions under this subpart with regard to such engines.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37967, June 28, 2011]

**Emission Standards for Manufacturers**

**§60.4201 What emission standards must I meet for non-emergency engines if I am a stationary CI internal combustion engine manufacturer?**

(a) Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later non-emergency stationary CI ICE with a maximum engine power less than or equal to 2,237 kilowatt (KW) (3,000 horsepower (HP)) and a displacement of less than 10 liters per cylinder to the certification emission standards for new nonroad CI engines in 40 CFR 89.112, 40 CFR 89.113, 40 CFR 1039.101, 40 CFR 1039.102, 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, and 40 CFR 1039.115, as applicable, for all pollutants, for the same model year and maximum engine power.

(b) Stationary CI internal combustion engine manufacturers must certify their 2007 through 2010 model year non-emergency stationary CI ICE with a maximum engine power greater than 2,237 KW (3,000 HP) and a displacement of less than 10 liters per cylinder to the emission standards in table 1 to this subpart, for all pollutants, for the same maximum engine power.

(c) Stationary CI internal combustion engine manufacturers must certify their 2011 model year and later non-emergency stationary CI ICE with a maximum engine power greater than 2,237 KW (3,000 HP) and a displacement of less than 10 liters per cylinder to the certification emission standards for new nonroad CI engines in 40 CFR 1039.101, 40 CFR 1039.102, 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, and 40 CFR 1039.115, as applicable, for all pollutants, for the same maximum engine power.

(d) Stationary CI internal combustion engine manufacturers must certify the following non-emergency stationary CI ICE to the certification emission standards for new marine CI engines in 40 CFR 94.8, as applicable, for all pollutants, for the same displacement and maximum engine power:

(1) Their 2007 model year through 2012 non-emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder;

(2) Their 2013 model year non-emergency stationary CI ICE with a maximum engine power greater than or equal to 3,700 KW (4,958 HP) and a displacement of greater than or equal to 10 liters per cylinder and less than 15 liters per cylinder; and

(3) Their 2013 model year non-emergency stationary CI ICE with a displacement of greater than or equal to 15 liters per cylinder and less than 30 liters per cylinder.

(e) Stationary CI internal combustion engine manufacturers must certify the following non-emergency stationary CI ICE to the certification emission standards and other requirements for new marine CI engines in 40 CFR 1042.101, 40 CFR 1042.107, 40 CFR 1042.110, 40 CFR 1042.115, 40 CFR 1042.120, and 40 CFR 1042.145, as applicable, for all pollutants, for the same displacement and maximum engine power:

(1) Their 2013 model year non-emergency stationary CI ICE with a maximum engine power less than 3,700 KW (4,958 HP) and a displacement of greater than or equal to 10 liters per cylinder and less than 15 liters per cylinder; and

(2) Their 2014 model year and later non-emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder.

(f) Notwithstanding the requirements in paragraphs (a) through (c) of this section, stationary non-emergency CI ICE identified in paragraphs (a) and (c) may be certified to the provisions of 40 CFR part 94 or, if Table 1 to 40 CFR 1042.1 identifies 40 CFR part 1042 as being applicable, 40 CFR part 1042, if the engines will be used solely in either or both of the following locations:

(1) Areas of Alaska not accessible by the Federal Aid Highway System (FAHS); and

(2) Marine offshore installations.

(g) Notwithstanding the requirements in paragraphs (a) through (f) of this section, stationary CI internal combustion engine manufacturers are not required to certify reconstructed engines; however manufacturers may elect to do so. The reconstructed engine must be certified to the emission standards specified in paragraphs (a) through (e) of this section that are applicable to the model year, maximum engine power, and displacement of the reconstructed stationary CI ICE.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37967, June 28, 2011]

**§60.4202 What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?**

(a) Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later emergency stationary CI ICE with a maximum engine power less than or equal to 2,237 KW (3,000 HP) and a displacement of less than 10 liters per cylinder that are not fire pump engines to the emission standards specified in paragraphs (a)(1) through (2) of this section.

(1) For engines with a maximum engine power less than 37 KW (50 HP):

(i) The certification emission standards for new nonroad CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants for model year 2007 engines, and

(ii) The certification emission standards for new nonroad CI engines in 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, 40 CFR 1039.115, and table 2 to this subpart, for 2008 model year and later engines.

(2) For engines with a maximum engine power greater than or equal to 37 KW (50 HP), the certification emission standards for new nonroad CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants beginning in model year 2007.

(b) Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later emergency stationary CI ICE with a maximum engine power greater than 2,237 KW (3,000 HP) and a displacement of less than 10 liters per cylinder that are not fire pump engines to the emission standards specified in paragraphs (b)(1) through (2) of this section.

(1) For 2007 through 2010 model years, the emission standards in table 1 to this subpart, for all pollutants, for the same maximum engine power.

(2) For 2011 model year and later, the certification emission standards for new nonroad CI engines for engines of the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants.

(c) [Reserved]

(d) Beginning with the model years in table 3 to this subpart, stationary CI internal combustion engine manufacturers must certify their fire pump stationary CI ICE to the emission standards in table 4 to this subpart, for all pollutants, for the same model year and NFPA nameplate power.

(e) Stationary CI internal combustion engine manufacturers must certify the following emergency stationary CI ICE that are not fire pump engines to the certification emission standards for new marine CI engines in 40 CFR 94.8, as applicable, for all pollutants, for the same displacement and maximum engine power:

(1) Their 2007 model year through 2012 emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder;

(2) Their 2013 model year and later emergency stationary CI ICE with a maximum engine power greater than or equal to 3,700 KW (4,958 HP) and a displacement of greater than or equal to 10 liters per cylinder and less than 15 liters per cylinder;

(3) Their 2013 model year emergency stationary CI ICE with a displacement of greater than or equal to 15 liters per cylinder and less than 30 liters per cylinder; and

(4) Their 2014 model year and later emergency stationary CI ICE with a maximum engine power greater than or equal to 2,000 KW (2,682 HP) and a displacement of greater than or equal to 15 liters per cylinder and less than 30 liters per cylinder.

(f) Stationary CI internal combustion engine manufacturers must certify the following emergency stationary CI ICE to the certification emission standards and other requirements applicable to Tier 3 new marine CI engines in 40 CFR 1042.101, 40 CFR 1042.107, 40 CFR 1042.115, 40 CFR 1042.120, and 40 CFR 1042.145, for all pollutants, for the same displacement and maximum engine power:

(1) Their 2013 model year and later emergency stationary CI ICE with a maximum engine power less than 3,700 KW (4,958 HP) and a displacement of greater than or equal to 10 liters per cylinder and less than 15 liters per cylinder; and

(2) Their 2014 model year and later emergency stationary CI ICE with a maximum engine power less than 2,000 KW (2,682 HP) and a displacement of greater than or equal to 15 liters per cylinder and less than 30 liters per cylinder.

(g) Notwithstanding the requirements in paragraphs (a) through (d) of this section, stationary emergency CI internal combustion engines identified in paragraphs (a) and (c) may be certified to the provisions of 40 CFR part 94 or, if Table 2 to 40 CFR 1042.101 identifies Tier 3 standards as being applicable, the requirements applicable to Tier 3 engines in 40 CFR part 1042, if the engines will be used solely in either or both of the following locations:

(1) Areas of Alaska not accessible by the FAHS; and

(2) Marine offshore installations.

(h) Notwithstanding the requirements in paragraphs (a) through (f) of this section, stationary CI internal combustion engine manufacturers are not required to certify reconstructed engines; however manufacturers may elect to do so. The reconstructed engine must be certified to the emission standards specified in paragraphs (a) through (f) of this section that are applicable to the model year, maximum engine power and displacement of the reconstructed emergency stationary CI ICE.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37968, June 28, 2011]

**§60.4203 How long must my engines meet the emission standards if I am a manufacturer of stationary CI internal combustion engines?**

Engines manufactured by stationary CI internal combustion engine manufacturers must meet the emission standards as required in §§60.4201 and 60.4202 during the certified emissions life of the engines.

[76 FR 37968, June 28, 2011]

**Emission Standards for Owners and Operators**

**§60.4204 What emission standards must I meet for non-emergency engines if I am an owner or operator of a stationary CI internal combustion engine?**

(a) Owners and operators of pre-2007 model year non-emergency stationary CI ICE with a displacement of less than 10 liters per cylinder must comply with the emission standards in table 1 to this subpart. Owners and operators of pre-2007 model year non-emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder must comply with the emission standards in 40 CFR 94.8(a)(1).

(b) Owners and operators of 2007 model year and later non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder must comply with the emission standards for new CI engines in §60.4201 for their 2007 model year and later stationary CI ICE, as applicable.

(c) Owners and operators of non-emergency stationary CI engines with a displacement of greater than or equal to 30 liters per cylinder must meet the following requirements:

(1) For engines installed prior to January 1, 2012, limit the emissions of $NO_X$ in the stationary CI internal combustion engine exhaust to the following:

(i) 17.0 grams per kilowatt-hour (g/KW-hr) (12.7 grams per horsepower-hr (g/HP-hr)) when maximum engine speed is less than 130 revolutions per minute (rpm);

(ii) $45 \cdot n^{-0.2}$ g/KW-hr ($34 \cdot n^{-0.2}$ g/HP-hr) when maximum engine speed is 130 or more but less than 2,000 rpm, where n is maximum engine speed; and

(iii) 9.8 g/KW-hr (7.3 g/HP-hr) when maximum engine speed is 2,000 rpm or more.

(2) For engines installed on or after January 1, 2012 and before January 1, 2016, limit the emissions of $NO_X$ in the stationary CI internal combustion engine exhaust to the following:

(i) 14.4 g/KW-hr (10.7 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $44 \cdot n^{-0.23}$ g/KW-hr ($33 \cdot n^{-0.23}$ g/HP-hr) when maximum engine speed is greater than or equal to 130 but less than 2,000 rpm and where n is maximum engine speed; and

(iii) 7.7 g/KW-hr (5.7 g/HP-hr) when maximum engine speed is greater than or equal to 2,000 rpm.

(3) For engines installed on or after January 1, 2016, limit the emissions of $NO_X$ in the stationary CI internal combustion engine exhaust to the following:

(i) 3.4 g/KW-hr (2.5 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $9.0 \cdot n^{-0.20}$ g/KW-hr ($6.7 \cdot n^{-0.20}$ g/HP-hr) where n (maximum engine speed) is 130 or more but less than 2,000 rpm; and

(iii) 2.0 g/KW-hr (1.5 g/HP-hr) where maximum engine speed is greater than or equal to 2,000 rpm.

(4) Reduce particulate matter (PM) emissions by 60 percent or more, or limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.15 g/KW-hr (0.11 g/HP-hr).

(d) Owners and operators of non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests in-use must meet the not-to-exceed (NTE) standards as indicated in §60.4212.

(e) Owners and operators of any modified or reconstructed non-emergency stationary CI ICE subject to this subpart must meet the emission standards applicable to the model year, maximum engine power, and displacement of the modified or reconstructed non-emergency stationary CI ICE that are specified in paragraphs (a) through (d) of this section.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37968, June 28, 2011]

**§60.4205 What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?**

(a) Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of less than 10 liters per cylinder that are not fire pump engines must comply with the emission standards in Table 1 to this subpart. Owners and operators of pre-2007 model year emergency stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards in 40 CFR 94.8(a)(1).

(b) Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.

(c) Owners and operators of fire pump engines with a displacement of less than 30 liters per cylinder must comply with the emission standards in table 4 to this subpart, for all pollutants.

(d) Owners and operators of emergency stationary CI engines with a displacement of greater than or equal to 30 liters per cylinder must meet the requirements in this section.

(1) For engines installed prior to January 1, 2012, limit the emissions of $NO_X$ in the stationary CI internal combustion engine exhaust to the following:

(i) 17.0 g/KW-hr (12.7 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $45 \cdot n^{-0.2}$ g/KW-hr ($34 \cdot n^{-0.2}$ g/HP-hr) when maximum engine speed is 130 or more but less than 2,000 rpm, where n is maximum engine speed; and

(iii) 9.8 g/kW-hr (7.3 g/HP-hr) when maximum engine speed is 2,000 rpm or more.

(2) For engines installed on or after January 1, 2012, limit the emissions of $NO_X$ in the stationary CI internal combustion engine exhaust to the following:

(i) 14.4 g/KW-hr (10.7 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $44 \cdot n^{-0.23}$ g/KW-hr ($33 \cdot n^{-0.23}$ g/HP-hr) when maximum engine speed is greater than or equal to 130 but less than 2,000 rpm and where n is maximum engine speed; and

(iii) 7.7 g/KW-hr (5.7 g/HP-hr) when maximum engine speed is greater than or equal to 2,000 rpm.

(3) Limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.40 g/KW-hr (0.30 g/HP-hr).

(e) Owners and operators of emergency stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests in-use must meet the NTE standards as indicated in §60.4212.

(f) Owners and operators of any modified or reconstructed emergency stationary CI ICE subject to this subpart must meet the emission standards applicable to the model year, maximum engine power, and displacement of the modified or reconstructed CI ICE that are specified in paragraphs (a) through (e) of this section.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

**§60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?**

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.

[76 FR 37969, June 28, 2011]

**Fuel Requirements for Owners and Operators**

**§60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?**

(a) Beginning October 1, 2007, owners and operators of stationary CI ICE subject to this subpart that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(a).

(b) Beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for nonroad diesel fuel, except that any existing diesel fuel purchased (or otherwise obtained) prior to October 1, 2010, may be used until depleted.

(c) [Reserved]

(d) Beginning June 1, 2012, owners and operators of stationary CI ICE subject to this subpart with a displacement of greater than or equal to 30 liters per cylinder are no longer subject to the requirements of paragraph (a) of this section, and must use fuel that meets a maximum per-gallon sulfur content of 1,000 parts per million (ppm).

(e) Stationary CI ICE that have a national security exemption under §60.4200(d) are also exempt from the fuel requirements in this section.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011; 78 FR 6695, Jan. 30, 2013]

**Other Requirements for Owners and Operators**

**§60.4208 What is the deadline for importing or installing stationary CI ICE produced in previous model years?**

(a) After December 31, 2008, owners and operators may not install stationary CI ICE (excluding fire pump engines) that do not meet the applicable requirements for 2007 model year engines.

(b) After December 31, 2009, owners and operators may not install stationary CI ICE with a maximum engine power of less than 19 KW (25 HP) (excluding fire pump engines) that do not meet the applicable requirements for 2008 model year engines.

(c) After December 31, 2014, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 19 KW (25 HP) and less than 56 KW (75 HP) that do not meet the applicable requirements for 2013 model year non-emergency engines.

(d) After December 31, 2013, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 56 KW (75 HP) and less than 130 KW (175 HP) that do not meet the applicable requirements for 2012 model year non-emergency engines.

(e) After December 31, 2012, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 130 KW (175 HP), including those above 560 KW (750 HP), that do not meet the applicable requirements for 2011 model year non-emergency engines.

(f) After December 31, 2016, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 560 KW (750 HP) that do not meet the applicable requirements for 2015 model year non-emergency engines.

(g) After December 31, 2018, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power greater than or equal to 600 KW (804 HP) and less than 2,000 KW (2,680 HP) and a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder that do not meet the applicable requirements for 2017 model year non-emergency engines.

(h) In addition to the requirements specified in §§60.4201, 60.4202, 60.4204, and 60.4205, it is prohibited to import stationary CI ICE with a displacement of less than 30 liters per cylinder that do not meet the applicable requirements specified in paragraphs (a) through (g) of this section after the dates specified in paragraphs (a) through (g) of this section.

(i) The requirements of this section do not apply to owners or operators of stationary CI ICE that have been modified, reconstructed, and do not apply to engines that were removed from one existing location and reinstalled at a new location.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

**§60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?**

If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.

(a) If you are an owner or operator of an emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, you must install a non-resettable hour meter prior to startup of the engine.

(b) If you are an owner or operator of a stationary CI internal combustion engine equipped with a diesel particulate filter to comply with the emission standards in §60.4204, the diesel particulate filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

**Compliance Requirements**

**§60.4210 What are my compliance requirements if I am a stationary CI internal combustion engine manufacturer?**

(a) Stationary CI internal combustion engine manufacturers must certify their stationary CI ICE with a displacement of less than 10 liters per cylinder to the emission standards specified in §60.4201(a) through (c) and §60.4202(a), (b) and (d) using the certification procedures required in 40 CFR part 89, subpart B, or 40 CFR part 1039, subpart C, as applicable, and must test their engines as specified in those parts. For the purposes of this subpart, engines certified to the standards in table 1 to this subpart shall be subject to the same requirements as engines certified to the standards in 40 CFR part 89. For the purposes of this subpart, engines certified to the standards in table 4 to this subpart shall be subject to the same requirements as engines certified to the standards in 40 CFR part 89, except that engines with NFPA nameplate power of less than 37 KW (50 HP) certified to model year 2011 or later standards shall be subject to the same requirements as engines certified to the standards in 40 CFR part 1039.

(b) Stationary CI internal combustion engine manufacturers must certify their stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder to the emission standards specified in §60.4201(d) and (e) and §60.4202(e) and (f) using the certification procedures required in 40 CFR part 94, subpart C, or 40 CFR part 1042, subpart C, as applicable, and must test their engines as specified in 40 CFR part 94 or 1042, as applicable.

(c) Stationary CI internal combustion engine manufacturers must meet the requirements of 40 CFR 1039.120, 1039.125, 1039.130, and 1039.135, and 40 CFR part 1068 for engines that are certified to the emission standards in 40 CFR part 1039. Stationary CI internal combustion engine manufacturers must meet the corresponding provisions of 40 CFR part 89, 40 CFR part 94 or 40 CFR part 1042 for engines that would be covered by that part if they were nonroad (including marine) engines. Labels on such engines must refer to stationary engines, rather than or in addition to nonroad or marine engines, as appropriate. Stationary CI internal combustion engine manufacturers must label their engines according to paragraphs (c)(1) through (3) of this section.

(1) Stationary CI internal combustion engines manufactured from January 1, 2006 to March 31, 2006 (January 1, 2006 to June 30, 2006 for fire pump engines), other than those that are part of certified engine families under the nonroad CI engine regulations, must be labeled according to 40 CFR 1039.20.

(2) Stationary CI internal combustion engines manufactured from April 1, 2006 to December 31, 2006 (or, for fire pump engines, July 1, 2006 to December 31 of the year preceding the year listed in table 3 to this subpart) must be labeled according to paragraphs (c)(2)(i) through (iii) of this section:

(i) Stationary CI internal combustion engines that are part of certified engine families under the nonroad regulations must meet the labeling requirements for nonroad CI engines, but do not have to meet the labeling requirements in 40 CFR 1039.20.

(ii) Stationary CI internal combustion engines that meet Tier 1 requirements (or requirements for fire pumps) under this subpart, but do not meet the requirements applicable to nonroad CI engines must be labeled according to 40 CFR 1039.20. The engine manufacturer may add language to the label clarifying that the engine meets Tier 1 requirements (or requirements for fire pumps) of this subpart.

(iii) Stationary CI internal combustion engines manufactured after April 1, 2006 that do not meet Tier 1 requirements of this subpart, or fire pumps engines manufactured after July 1, 2006 that do not meet the requirements for fire pumps under this subpart, may not be used in the U.S. If any such engines are manufactured in the U.S. after April 1, 2006 (July 1, 2006 for fire pump engines), they must be exported or must be brought into compliance with the appropriate standards prior to initial operation. The export provisions of 40 CFR 1068.230 would apply to engines for export and the manufacturers must label such engines according to 40 CFR 1068.230.

(3) Stationary CI internal combustion engines manufactured after January 1, 2007 (for fire pump engines, after January 1 of the year listed in table 3 to this subpart, as applicable) must be labeled according to paragraphs (c)(3)(i) through (iii) of this section.

(i) Stationary CI internal combustion engines that meet the requirements of this subpart and the corresponding requirements for nonroad (including marine) engines of the same model year and HP must be labeled according to the provisions in 40 CFR parts 89, 94, 1039 or 1042, as appropriate.

(ii) Stationary CI internal combustion engines that meet the requirements of this subpart, but are not certified to the standards applicable to nonroad (including marine) engines of the same model year and HP must be labeled according to the provisions in 40 CFR parts 89, 94, 1039 or 1042, as appropriate, but the words "stationary" must be included instead of "nonroad" or "marine" on the label. In addition, such engines must be labeled according to 40 CFR 1039.20.

(iii) Stationary CI internal combustion engines that do not meet the requirements of this subpart must be labeled according to 40 CFR 1068.230 and must be exported under the provisions of 40 CFR 1068.230.

(d) An engine manufacturer certifying an engine family or families to standards under this subpart that are identical to standards applicable under 40 CFR parts 89, 94, 1039 or 1042 for that model year may certify any such family that contains both nonroad (including marine) and stationary engines as a single engine family and/or may include any such family containing stationary engines in the averaging, banking and trading provisions applicable for such engines under those parts.

(e) Manufacturers of engine families discussed in paragraph (d) of this section may meet the labeling requirements referred to in paragraph (c) of this section for stationary CI ICE by either adding a separate label containing the information required in paragraph (c) of this section or by adding the words “and stationary” after the word “nonroad” or “marine,” as appropriate, to the label.

(f) Starting with the model years shown in table 5 to this subpart, stationary CI internal combustion engine manufacturers must add a permanent label stating that the engine is for stationary emergency use only to each new emergency stationary CI internal combustion engine greater than or equal to 19 KW (25 HP) that meets all the emission standards for emergency engines in §60.4202 but does not meet all the emission standards for non-emergency engines in §60.4201. The label must be added according to the labeling requirements specified in 40 CFR 1039.135(b). Engine manufacturers must specify in the owner's manual that operation of emergency engines is limited to emergency operations and required maintenance and testing.

(g) Manufacturers of fire pump engines may use the test cycle in table 6 to this subpart for testing fire pump engines and may test at the NFPA certified nameplate HP, provided that the engine is labeled as “Fire Pump Applications Only”.

(h) Engine manufacturers, including importers, may introduce into commerce uncertified engines or engines certified to earlier standards that were manufactured before the new or changed standards took effect until inventories are depleted, as long as such engines are part of normal inventory. For example, if the engine manufacturers' normal industry practice is to keep on hand a one-month supply of engines based on its projected sales, and a new tier of standards starts to apply for the 2009 model year, the engine manufacturer may manufacture engines based on the normal inventory requirements late in the 2008 model year, and sell those engines for installation. The engine manufacturer may not circumvent the provisions of §§60.4201 or 60.4202 by stockpiling engines that are built before new or changed standards take effect. Stockpiling of such engines beyond normal industry practice is a violation of this subpart.

(i) The replacement engine provisions of 40 CFR 89.1003(b)(7), 40 CFR 94.1103(b)(3), 40 CFR 94.1103(b)(4) and 40 CFR 1068.240 are applicable to stationary CI engines replacing existing equipment that is less than 15 years old.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37969, June 28, 2011]

**§60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?**

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must do all of the following, except as permitted under paragraph (g) of this section:

(1) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(2) Change only those emission-related settings that are permitted by the manufacturer; and

(3) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

(b) If you are an owner or operator of a pre-2007 model year stationary CI internal combustion engine and must comply with the emission standards specified in §§60.4204(a) or 60.4205(a), or if you are an owner or operator of a CI fire pump engine that is manufactured prior to the model years in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must demonstrate compliance according to one of the methods specified in paragraphs (b)(1) through (5) of this section.

(1) Purchasing an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

(2) Keeping records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in this subpart and these methods must have been followed correctly.

(3) Keeping records of engine manufacturer data indicating compliance with the standards.

(4) Keeping records of control device vendor data indicating compliance with the standards.

(5) Conducting an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

(c) If you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications, except as permitted in paragraph (g) of this section.

(d) If you are an owner or operator and must comply with the emission standards specified in §60.4204(c) or §60.4205(d), you must demonstrate compliance according to the requirements specified in paragraphs (d)(1) through (3) of this section.

(1) Conducting an initial performance test to demonstrate initial compliance with the emission standards as specified in §60.4213.

(2) Establishing operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.

(i) Identification of the specific parameters you propose to monitor continuously;

(ii) A discussion of the relationship between these parameters and $NO_X$ and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit $NO_X$ and PM emissions;

(iii) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

(iv) A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

(v) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

(3) For non-emergency engines with a displacement of greater than or equal to 30 liters per cylinder, conducting annual performance tests to demonstrate continuous compliance with the emission standards as specified in §60.4213.

(e) If you are an owner or operator of a modified or reconstructed stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(e) or §60.4205(f), you must demonstrate compliance according to one of the methods specified in paragraphs (e)(1) or (2) of this section.

(1) Purchasing, or otherwise owning or operating, an engine certified to the emission standards in §60.4204(e) or §60.4205(f), as applicable.

(2) Conducting a performance test to demonstrate initial compliance with the emission standards according to the requirements specified in §60.4212 or §60.4213, as appropriate. The test must be conducted within 60 days after the engine commences operation after the modification or reconstruction.

(f) If you own or operate an emergency stationary ICE, you must operate the emergency stationary ICE according to the requirements in paragraphs (f)(1) through (3) of this section. In order for the engine to be considered an emergency stationary ICE under this subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of this section, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (3) of this section, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) You may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of this section for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of this section counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(ii) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. Except as provided in paragraph (f)(3)(i) of this section, the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(A) The engine is dispatched by the local balancing authority or local transmission and distribution system operator;

(B) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(C) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(D) The power is provided only to the facility itself or to support the local transmission and distribution system.

(E) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

(ii) [Reserved]

(g) If you do not install, configure, operate, and maintain your engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, you must demonstrate compliance as follows:

(1) If you are an owner or operator of a stationary CI internal combustion engine with maximum engine power less than 100 HP, you must keep a maintenance plan and records of conducted maintenance to demonstrate compliance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, if you do not install and configure the engine and control device according to the manufacturer's emission-related written instructions, or you change the emission-related settings in a way that is not permitted by the manufacturer, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of such action.

(2) If you are an owner or operator of a stationary CI internal combustion engine greater than or equal to 100 HP and less than or equal to 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer.

(3) If you are an owner or operator of a stationary CI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer. You must conduct subsequent performance testing every 8,760 hours of engine operation or 3 years, whichever comes first, thereafter to demonstrate compliance with the applicable emission standards.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37970, June 28, 2011; 78 FR 6695, Jan. 30, 2013]

**Testing Requirements for Owners and Operators**

**§60.4212 What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of less than 30 liters per cylinder?**

Owners and operators of stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests pursuant to this subpart must do so according to paragraphs (a) through (e) of this section.

(a) The performance test must be conducted according to the in-use testing procedures in 40 CFR part 1039, subpart F, for stationary CI ICE with a displacement of less than 10 liters per cylinder, and according to 40 CFR part 1042, subpart F, for stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder.

(b) Exhaust emissions from stationary CI ICE that are complying with the emission standards for new CI engines in 40 CFR part 1039 must not exceed the not-to-exceed (NTE) standards for the same model year and maximum engine power as required in 40 CFR 1039.101(e) and 40 CFR 1039.102(g)(1), except as specified in 40 CFR 1039.104(d). This requirement starts when NTE requirements take effect for nonroad diesel engines under 40 CFR part 1039.

(c) Exhaust emissions from stationary CI ICE that are complying with the emission standards for new CI engines in 40 CFR 89.112 or 40 CFR 94.8, as applicable, must not exceed the NTE numerical requirements, rounded to the same number of decimal places as the applicable standard in 40 CFR 89.112 or 40 CFR 94.8, as applicable, determined from the following equation:

$$\text{NTE requirement for each pollutant} = (1.25) \times (\text{STD}) \qquad \text{(Eq. 1)}$$

Where:

STD = The standard specified for that pollutant in 40 CFR 89.112 or 40 CFR 94.8, as applicable.

Alternatively, stationary CI ICE that are complying with the emission standards for new CI engines in 40 CFR 89.112 or 40 CFR 94.8 may follow the testing procedures specified in §60.4213 of this subpart, as appropriate.

(d) Exhaust emissions from stationary CI ICE that are complying with the emission standards for pre-2007 model year engines in §60.4204(a), §60.4205(a), or §60.4205(c) must not exceed the NTE numerical requirements, rounded to the same number of decimal places as the applicable standard in §60.4204(a), §60.4205(a), or §60.4205(c), determined from the equation in paragraph (c) of this section.

Where:

STD = The standard specified for that pollutant in §60.4204(a), §60.4205(a), or §60.4205(c).

Alternatively, stationary CI ICE that are complying with the emission standards for pre-2007 model year engines in §60.4204(a), §60.4205(a), or §60.4205(c) may follow the testing procedures specified in §60.4213, as appropriate.

(e) Exhaust emissions from stationary CI ICE that are complying with the emission standards for new CI engines in 40 CFR part 1042 must not exceed the NTE standards for the same model year and maximum engine power as required in 40 CFR 1042.101(c).

[71 FR 39172, July 11, 2006, as amended at 76 FR 37971, June 28, 2011]

**§60.4213 What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of greater than or equal to 30 liters per cylinder?**

Owners and operators of stationary CI ICE with a displacement of greater than or equal to 30 liters per cylinder must conduct performance tests according to paragraphs (a) through (f) of this section.

(a) Each performance test must be conducted according to the requirements in §60.8 and under the specific conditions that this subpart specifies in table 7. The test must be conducted within 10 percent of 100 percent peak (or the highest achievable) load.

(b) You may not conduct performance tests during periods of startup, shutdown, or malfunction, as specified in §60.8(c).

(c) You must conduct three separate test runs for each performance test required in this section, as specified in §60.8(f). Each test run must last at least 1 hour.

(d) To determine compliance with the percent reduction requirement, you must follow the requirements as specified in paragraphs (d)(1) through (3) of this section.

(1) You must use Equation 2 of this section to determine compliance with the percent reduction requirement:

$$\frac{C_i - C_o}{C_i} \times 100 = R \qquad \text{(Eq. 2)}$$

Where:

$C_i$ = concentration of $NO_X$ or PM at the control device inlet,

$C_o$ = concentration of $NO_X$ or PM at the control device outlet, and

R = percent reduction of $NO_X$ or PM emissions.

(2) You must normalize the $NO_X$ or PM concentrations at the inlet and outlet of the control device to a dry basis and to 15 percent oxygen ($O_2$) using Equation 3 of this section, or an equivalent percent carbon dioxide ($CO_2$) using the procedures described in paragraph (d)(3) of this section.

$$C_{adj} = C_d \frac{5.9}{20.9 - \% O_2} \qquad \text{(Eq. 3)}$$

Where:

$C_{adj}$ = Calculated $NO_X$ or PM concentration adjusted to 15 percent $O_2$.

$C_d$ = Measured concentration of $NO_X$ or PM, uncorrected.

5.9 = 20.9 percent $O_2$−15 percent $O_2$, the defined $O_2$ correction value, percent.

$\%O_2$ = Measured $O_2$ concentration, dry basis, percent.

(3) If pollutant concentrations are to be corrected to 15 percent $O_2$ and $CO_2$ concentration is measured in lieu of $O_2$ concentration measurement, a $CO_2$ correction factor is needed. Calculate the $CO_2$ correction factor as described in paragraphs (d)(3)(i) through (iii) of this section.

(i) Calculate the fuel-specific $F_o$ value for the fuel burned during the test using values obtained from Method 19, Section 5.2, and the following equation:

$$F_o = \frac{0.209_{F_d}}{F_c} \qquad \text{(Eq. 4)}$$

Where:

$F_o$ = Fuel factor based on the ratio of $O_2$ volume to the ultimate $CO_2$ volume produced by the fuel at zero percent excess air.

0.209 = Fraction of air that is $O_2$, percent/100.

$F_d$ = Ratio of the volume of dry effluent gas to the gross calorific value of the fuel from Method 19, dsm3/J (dscf/106 Btu).

$F_c$ = Ratio of the volume of $CO_2$ produced to the gross calorific value of the fuel from Method 19, dsm3/J (dscf/106 Btu).

(ii) Calculate the $CO_2$ correction factor for correcting measurement data to 15 percent $O_2$, as follows:

$$X_{CO_2} = \frac{5.9}{F_o} \qquad \text{(Eq. 5)}$$

Where:

$X_{CO2}$ = $CO_2$ correction factor, percent.

5.9 = 20.9 percent $O_2$−15 percent $O_2$, the defined $O_2$ correction value, percent.

(iii) Calculate the $NO_X$ and PM gas concentrations adjusted to 15 percent $O_2$ using $CO_2$ as follows:

$$C_{adj} = C_d \frac{X_{CO_2}}{\%CO_2} \qquad \text{(Eq. 6)}$$

Where:

$C_{adj}$ = Calculated $NO_X$ or PM concentration adjusted to 15 percent $O_{2.}$

$C_d$ = Measured concentration of $NO_X$ or PM, uncorrected.

$\%CO_2$ = Measured $CO_2$ concentration, dry basis, percent.

(e) To determine compliance with the $NO_X$ mass per unit output emission limitation, convert the concentration of $NO_X$ in the engine exhaust using Equation 7 of this section:

$$ER = \frac{C_d \times 1.912 \times 10^{-3} \times Q \times T}{\text{KW-hour}} \qquad \text{(Eq. 7)}$$

Where:

ER = Emission rate in grams per KW-hour.

$C_d$ = Measured $NO_X$ concentration in ppm.

$1.912 \times 10^{-3}$ = Conversion constant for ppm $NO_X$ to grams per standard cubic meter at 25 degrees Celsius.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour.

T = Time of test run, in hours.

KW-hour = Brake work of the engine, in KW-hour.

(f) To determine compliance with the PM mass per unit output emission limitation, convert the concentration of PM in the engine exhaust using Equation 8 of this section:

$$ER = \frac{C_{adj} \times Q \times T}{\text{KW-hour}} \qquad \text{(Eq. 8)}$$

Where:

ER = Emission rate in grams per KW-hour.

$C_{adj}$ = Calculated PM concentration in grams per standard cubic meter.

Q = Stack gas volumetric flow rate, in standard cubic meter per hour.

T = Time of test run, in hours.

KW-hour = Energy output of the engine, in KW.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37971, June 28, 2011]

**Notification, Reports, and Records for Owners and Operators**

**§60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?**

(a) Owners and operators of non-emergency stationary CI ICE that are greater than 2,237 KW (3,000 HP), or have a displacement of greater than or equal to 10 liters per cylinder, or are pre-2007 model year engines that are greater than 130 KW (175 HP) and not certified, must meet the requirements of paragraphs (a)(1) and (2) of this section.

(1) Submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section.

(i) Name and address of the owner or operator;

(ii) The address of the affected source;

(iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

(iv) Emission control equipment; and

(v) Fuel used.

(2) Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.

(i) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(ii) Maintenance conducted on the engine.

(iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.

(iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

(b) If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.

(c) If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the owner or operator must keep records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached.

(d) If you own or operate an emergency stationary CI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §60.4211(f)(2)(ii) and (iii) or that operates for the purposes specified in §60.4211(f)(3)(i), you must submit an annual report according to the requirements in paragraphs (d)(1) through (3) of this section.

(1) The report must contain the following information:

(i) Company name and address where the engine is located.

(ii) Date of the report and beginning and ending dates of the reporting period.

(iii) Engine site rating and model year.

(iv) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.

(v) Hours operated for the purposes specified in §60.4211(f)(2)(ii) and (iii), including the date, start time, and end time for engine operation for the purposes specified in §60.4211(f)(2)(ii) and (iii).

(vi) Number of hours the engine is contractually obligated to be available for the purposes specified in §60.4211(f)(2)(ii) and (iii).

(vii) Hours spent for operation for the purposes specified in §60.4211(f)(3)(i), including the date, start time, and end time for engine operation for the purposes specified in §60.4211(f)(3)(i). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.

(2) The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.

(3) The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (*www.epa.gov/cdx*). However, if the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in §60.4.

[71 FR 39172, July 11, 2006, as amended at 78 FR 6696, Jan. 30, 2013]

**Special Requirements**

**§60.4215 What requirements must I meet for engines used in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands?**

(a) Stationary CI ICE with a displacement of less than 30 liters per cylinder that are used in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands are required to meet the applicable emission standards in §§60.4202 and 60.4205.

(b) Stationary CI ICE that are used in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands are not required to meet the fuel requirements in §60.4207.

(c) Stationary CI ICE with a displacement of greater than or equal to 30 liters per cylinder that are used in Guam, American Samoa, or the Commonwealth of the Northern Mariana Islands are required to meet the following emission standards:

(1) For engines installed prior to January 1, 2012, limit the emissions of $NO_X$ in the stationary CI internal combustion engine exhaust to the following:

(i) 17.0 g/KW-hr (12.7 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $45 \cdot n^{-0.2}$ g/KW-hr ($34 \cdot n^{-0.2}$ g/HP-hr) when maximum engine speed is 130 or more but less than 2,000 rpm, where n is maximum engine speed; and

(iii) 9.8 g/KW-hr (7.3 g/HP-hr) when maximum engine speed is 2,000 rpm or more.

(2) For engines installed on or after January 1, 2012, limit the emissions of $NO_X$ in the stationary CI internal combustion engine exhaust to the following:

(i) 14.4 g/KW-hr (10.7 g/HP-hr) when maximum engine speed is less than 130 rpm;

(ii) $44 \cdot n^{-0.23}$ g/KW-hr ($33 \cdot n^{-0.23}$ g/HP-hr) when maximum engine speed is greater than or equal to 130 but less than 2,000 rpm and where n is maximum engine speed; and

(iii) 7.7 g/KW-hr (5.7 g/HP-hr) when maximum engine speed is greater than or equal to 2,000 rpm.

(3) Limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.40 g/KW-hr (0.30 g/HP-hr).

[71 FR 39172, July 11, 2006, as amended at 76 FR 37971, June 28, 2011]

**§60.4216 What requirements must I meet for engines used in Alaska?**

(a) Prior to December 1, 2010, owners and operators of stationary CI ICE with a displacement of less than 30 liters per cylinder located in areas of Alaska not accessible by the FAHS should refer to 40 CFR part 69 to determine the diesel fuel requirements applicable to such engines.

(b) Except as indicated in paragraph (c) of this section, manufacturers, owners and operators of stationary CI ICE with a displacement of less than 10 liters per cylinder located in areas of Alaska not accessible by the FAHS may meet the requirements of this subpart by manufacturing and installing engines meeting the requirements of 40 CFR parts 94 or 1042, as appropriate, rather than the otherwise applicable requirements of 40 CFR parts 89 and 1039, as indicated in sections §§60.4201(f) and 60.4202(g) of this subpart.

(c) Manufacturers, owners and operators of stationary CI ICE that are located in areas of Alaska not accessible by the FAHS may choose to meet the applicable emission standards for emergency engines in §60.4202 and §60.4205, and not those for non-emergency engines in §60.4201 and §60.4204, except that for 2014 model year and later non-emergency CI ICE, the owner or operator of any such engine that was not certified as meeting Tier 4 PM standards, must meet the applicable requirements for PM in §60.4201 and §60.4204 or install a PM emission control device that achieves PM emission reductions of 85 percent, or 60 percent for engines with a displacement of greater than or equal to 30 liters per cylinder, compared to engine-out emissions.

(d) The provisions of §60.4207 do not apply to owners and operators of pre-2014 model year stationary CI ICE subject to this subpart that are located in areas of Alaska not accessible by the FAHS.

(e) The provisions of §60.4208(a) do not apply to owners and operators of stationary CI ICE subject to this subpart that are located in areas of Alaska not accessible by the FAHS until after December 31, 2009.

(f) The provisions of this section and §60.4207 do not prevent owners and operators of stationary CI ICE subject to this subpart that are located in areas of Alaska not accessible by the FAHS from using fuels mixed with used lubricating oil, in volumes of up to 1.75 percent of the total fuel. The sulfur content of the used lubricating oil must be less than 200 parts per million. The used lubricating oil must meet the on-specification levels and properties for used oil in 40 CFR 279.11.

[76 FR 37971, June 28, 2011]

**§60.4217 What emission standards must I meet if I am an owner or operator of a stationary internal combustion engine using special fuels?**

Owners and operators of stationary CI ICE that do not use diesel fuel may petition the Administrator for approval of alternative emission standards, if they can demonstrate that they use a fuel that is not the fuel on which the manufacturer of the engine certified the engine and that the engine cannot meet the applicable standards required in §60.4204 or §60.4205 using such fuels and that use of such fuel is appropriate and reasonably necessary, considering cost, energy, technical feasibility, human health and environmental, and other factors, for the operation of the engine.

[76 FR 37972, June 28, 2011]

**General Provisions**

**§60.4218 What parts of the General Provisions apply to me?**

Table 8 to this subpart shows which parts of the General Provisions in §§60.1 through 60.19 apply to you.

**Definitions**

**§60.4219 What definitions apply to this subpart?**

As used in this subpart, all terms not defined herein shall have the meaning given them in the CAA and in subpart A of this part.

*Certified emissions life* means the period during which the engine is designed to properly function in terms of reliability and fuel consumption, without being remanufactured, specified as a number of hours of operation or calendar years, whichever comes first. The values for certified emissions life for stationary CI ICE with a displacement of less than 10 liters per cylinder are given in 40 CFR 1039.101(g). The values for certified emissions life for stationary CI ICE with a displacement of greater than or equal to 10 liters per cylinder and less than 30 liters per cylinder are given in 40 CFR 94.9(a).

*Combustion turbine* means all equipment, including but not limited to the turbine, the fuel, air, lubrication and exhaust gas systems, control systems (except emissions control equipment), and any ancillary components and sub-components comprising any simple cycle combustion turbine, any regenerative/recuperative cycle combustion turbine, the combustion turbine portion of any cogeneration cycle combustion system, or the combustion turbine portion of any combined cycle steam/electric generating system.

*Compression ignition* means relating to a type of stationary internal combustion engine that is not a spark ignition engine.

*Date of manufacture* means one of the following things:

(1) For freshly manufactured engines and modified engines, date of manufacture means the date the engine is originally produced.

(2) For reconstructed engines, date of manufacture means the date the engine was originally produced, except as specified in paragraph (3) of this definition.

(3) Reconstructed engines are assigned a new date of manufacture if the fixed capital cost of the new and refurbished components exceeds 75 percent of the fixed capital cost of a comparable entirely new facility. An engine that is produced from a previously used engine block does not retain the date of manufacture of the engine in which the engine block was previously used if the engine is produced using all new components except for the engine block. In these cases, the date of manufacture is the date of reconstruction or the date the new engine is produced.

*Diesel fuel* means any liquid obtained from the distillation of petroleum with a boiling point of approximately 150 to 360 degrees Celsius. One commonly used form is number 2 distillate oil.

*Diesel particulate filter* means an emission control technology that reduces PM emissions by trapping the particles in a flow filter substrate and periodically removes the collected particles by either physical action or by oxidizing (burning off) the particles in a process called regeneration.

*Emergency stationary internal combustion engine* means any stationary reciprocating internal combustion engine that meets all of the criteria in paragraphs (1) through (3) of this definition. All emergency stationary ICE must comply with the requirements specified in §60.4211(f) in order to be considered emergency stationary ICE. If the engine does not comply with the requirements specified in §60.4211(f), then it is not considered to be an emergency stationary ICE under this subpart.

(1) The stationary ICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary ICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc.

(2) The stationary ICE is operated under limited circumstances for situations not included in paragraph (1) of this definition, as specified in §60.4211(f).

(3) The stationary ICE operates as part of a financial arrangement with another entity in situations not included in paragraph (1) of this definition only as allowed in §60.4211(f)(2)(ii) or (iii) and §60.4211(f)(3)(i).

*Engine manufacturer* means the manufacturer of the engine. See the definition of “manufacturer” in this section.

*Fire pump engine* means an emergency stationary internal combustion engine certified to NFPA requirements that is used to provide power to pump water for fire suppression or protection.

*Freshly manufactured engine* means an engine that has not been placed into service. An engine becomes freshly manufactured when it is originally produced.

*Installed* means the engine is placed and secured at the location where it is intended to be operated.

*Manufacturer* has the meaning given in section 216(1) of the Act. In general, this term includes any person who manufactures a stationary engine for sale in the United States or otherwise introduces a new stationary engine into commerce in the United States. This includes importers who import stationary engines for sale or resale.

*Maximum engine power* means maximum engine power as defined in 40 CFR 1039.801.

*Model year* means the calendar year in which an engine is manufactured (see “date of manufacture”), except as follows:

(1) Model year means the annual new model production period of the engine manufacturer in which an engine is manufactured (see “date of manufacture”), if the annual new model production period is different than the calendar year and includes January 1 of the calendar year for which the model year is named. It may not begin before January 2 of the previous calendar year and it must end by December 31 of the named calendar year.

(2) For an engine that is converted to a stationary engine after being placed into service as a nonroad or other non-stationary engine, model year means the calendar year or new model production period in which the engine was manufactured (see “date of manufacture”).

*Other internal combustion engine* means any internal combustion engine, except combustion turbines, which is not a reciprocating internal combustion engine or rotary internal combustion engine.

*Reciprocating internal combustion engine* means any internal combustion engine which uses reciprocating motion to convert heat energy into mechanical work.

*Rotary internal combustion engine* means any internal combustion engine which uses rotary motion to convert heat energy into mechanical work.

*Spark ignition* means relating to a gasoline, natural gas, or liquefied petroleum gas fueled engine or any other type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark ignition engines usually use a throttle to regulate intake air flow to control power during normal operation. Dual-fuel engines in which a liquid fuel (typically diesel fuel) is used for CI and gaseous fuel (typically natural gas) is used as the primary fuel at an annual average ratio of less than 2 parts diesel fuel to 100 parts total fuel on an energy equivalent basis are spark ignition engines.

*Stationary internal combustion engine* means any internal combustion engine, except combustion turbines, that converts heat energy into mechanical work and is not mobile. Stationary ICE differ from mobile ICE in that a stationary internal combustion engine is not a nonroad engine as defined at 40 CFR 1068.30 (excluding paragraph (2)(ii) of that definition), and is not used to propel a motor vehicle, aircraft, or a vehicle used solely for competition. Stationary ICE include reciprocating ICE, rotary ICE, and other ICE, except combustion turbines.

*Subpart* means 40 CFR part 60, subpart IIII.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37972, June 28, 2011; 78 FR 6696, Jan. 30, 2013]

**Table 1 to Subpart IIII of Part 60—Emission Standards for Stationary Pre-2007 Model Year Engines With a Displacement of <10 Liters per Cylinder and 2007-2010 Model Year Engines >2,237 KW (3,000 HP) and With a Displacement of <10 Liters per Cylinder**

[As stated in §§60.4201(b), 60.4202(b), 60.4204(a), and 60.4205(a), you must comply with the following emission standards]

| Maximum engine power | Emission standards for stationary pre-2007 model year engines with a displacement of <10 liters per cylinder and 2007-2010 model year engines >2,237 KW (3,000 HP) and with a displacement of <10 liters per cylinder in g/KW-hr (g/HP-hr) | | | | |
|---|---|---|---|---|---|
| | NMHC + $NO_X$ | HC | $NO_X$ | CO | PM |
| KW<8 (HP<11) | 10.5 (7.8) | | | 8.0 (6.0) | 1.0 (0.75) |
| 8≤KW<19 (11≤HP<25) | 9.5 (7.1) | | | 6.6 (4.9) | 0.80 (0.60) |
| 19≤KW<37 (25≤HP<50) | 9.5 (7.1) | | | 5.5 (4.1) | 0.80 (0.60) |
| 37≤KW<56 (50≤HP<75) | | | 9.2 (6.9) | | |
| 56≤KW<75 (75≤HP<100) | | | 9.2 (6.9) | | |
| 75≤KW<130 (100≤HP<175) | | | 9.2 (6.9) | | |
| 130≤KW<225 (175≤HP<300) | | 1.3 (1.0) | 9.2 (6.9) | 11.4 (8.5) | 0.54 (0.40) |
| 225≤KW<450 (300≤HP<600) | | 1.3 (1.0) | 9.2 (6.9) | 11.4 (8.5) | 0.54 (0.40) |
| 450≤KW≤560 (600≤HP≤750) | | 1.3 (1.0) | 9.2 (6.9) | 11.4 (8.5) | 0.54 (0.40) |
| KW>560 (HP>750) | | 1.3 (1.0) | 9.2 (6.9) | 11.4 (8.5) | 0.54 (0.40) |

**Table 2 to Subpart IIII of Part 60—Emission Standards for 2008 Model Year and Later Emergency Stationary CI ICE <37 KW (50 HP) With a Displacement of <10 Liters per Cylinder**

[As stated in §60.4202(a)(1), you must comply with the following emission standards]

| Engine power | Emission standards for 2008 model year and later emergency stationary CI ICE <37 KW (50 HP) with a displacement of <10 liters per cylinder in g/KW-hr (g/HP-hr) | | | |
|---|---|---|---|---|
| | Model year(s) | $NO_X$ + NMHC | CO | PM |
| KW<8 (HP<11) | 2008+ | 7.5 (5.6) | 8.0 (6.0) | 0.40 (0.30) |
| 8≤KW<19 (11≤HP<25) | 2008+ | 7.5 (5.6) | 6.6 (4.9) | 0.40 (0.30) |
| 19≤KW<37 (25≤HP<50) | 2008+ | 7.5 (5.6) | 5.5 (4.1) | 0.30 (0.22) |

**Table 3 to Subpart IIII of Part 60—Certification Requirements for Stationary Fire Pump Engines**

As stated in §60.4202(d), you must certify new stationary fire pump engines beginning with the following model years:

| Engine power | Starting model year engine manufacturers must certify new stationary fire pump engines according to §60.4202(d)[1] |
|---|---|
| KW<75 (HP<100) | 2011 |
| 75≤KW<130 (100≤HP<175) | 2010 |
| 130≤KW≤560 (175≤HP≤750) | 2009 |
| KW>560 (HP>750) | 2008 |

[1]Manufacturers of fire pump stationary CI ICE with a maximum engine power greater than or equal to 37 kW (50 HP) and less than 450 KW (600 HP) and a rated speed of greater than 2,650 revolutions per minute (rpm) are not required to certify such engines until three model years following the model year indicated in this Table 3 for engines in the applicable engine power category.

[71 FR 39172, July 11, 2006, as amended at 76 FR 37972, June 28, 2011]

**Table 4 to Subpart IIII of Part 60—Emission Standards for Stationary Fire Pump Engines**

[As stated in §§60.4202(d) and 60.4205(c), you must comply with the following emission standards for stationary fire pump engines]

| Maximum engine power | Model year(s) | NMHC + $NO_X$ | CO | PM |
|---|---|---|---|---|
| KW<8 (HP<11) | 2010 and earlier | 10.5 (7.8) | 8.0 (6.0) | 1.0 (0.75) |
| | 2011+ | 7.5 (5.6) | | 0.40 (0.30) |
| 8≤KW<19 (11≤HP<25) | 2010 and earlier | 9.5 (7.1) | 6.6 (4.9) | 0.80 (0.60) |
| | 2011+ | 7.5 (5.6) | | 0.40 (0.30) |
| 19≤KW<37 (25≤HP<50) | 2010 and earlier | 9.5 (7.1) | 5.5 (4.1) | 0.80 (0.60) |

| Maximum engine power | Model year(s) | NMHC + $NO_X$ | CO | PM |
|---|---|---|---|---|
| | 2011+ | 7.5 (5.6) | | 0.30 (0.22) |
| 37≤KW<56 (50≤HP<75) | 2010 and earlier | 10.5 (7.8) | 5.0 (3.7) | 0.80 (0.60) |
| | 2011+[1] | 4.7 (3.5) | | 0.40 (0.30) |
| 56≤KW<75 (75≤HP<100) | 2010 and earlier | 10.5 (7.8) | 5.0 (3.7) | 0.80 (0.60) |
| | 2011+[1] | 4.7 (3.5) | | 0.40 (0.30) |
| 75≤KW<130 (100≤HP<175) | 2009 and earlier | 10.5 (7.8) | 5.0 (3.7) | 0.80 (0.60) |
| | 2010+[2] | 4.0 (3.0) | | 0.30 (0.22) |
| 130≤KW<225 (175≤HP<300) | 2008 and earlier | 10.5 (7.8) | 3.5 (2.6) | 0.54 (0.40) |
| | 2009+[3] | 4.0 (3.0) | | 0.20 (0.15) |
| 225≤KW<450 (300≤HP<600) | 2008 and earlier | 10.5 (7.8) | 3.5 (2.6) | 0.54 (0.40) |
| | 2009+[3] | 4.0 (3.0) | | 0.20 (0.15) |
| 450≤KW≤560 (600≤HP≤750) | 2008 and earlier | 10.5 (7.8) | 3.5 (2.6) | 0.54 (0.40) |
| | 2009+ | 4.0 (3.0) | | 0.20 (0.15) |
| KW>560 (HP>750) | 2007 and earlier | 10.5 (7.8) | 3.5 (2.6) | 0.54 (0.40) |
| | 2008+ | 6.4 (4.8) | | 0.20 (0.15) |

[1]For model years 2011-2013, manufacturers, owners and operators of fire pump stationary CI ICE in this engine power category with a rated speed of greater than 2,650 revolutions per minute (rpm) may comply with the emission limitations for 2010 model year engines.

[2]For model years 2010-2012, manufacturers, owners and operators of fire pump stationary CI ICE in this engine power category with a rated speed of greater than 2,650 rpm may comply with the emission limitations for 2009 model year engines.

[3]In model years 2009-2011, manufacturers of fire pump stationary CI ICE in this engine power category with a rated speed of greater than 2,650 rpm may comply with the emission limitations for 2008 model year engines.

**Table 5 to Subpart IIII of Part 60—Labeling and Recordkeeping Requirements for New Stationary Emergency Engines**

[You must comply with the labeling requirements in §60.4210(f) and the recordkeeping requirements in §60.4214(b) for new emergency stationary CI ICE beginning in the following model years:]

| Engine power | Starting model year |
|---|---|
| 19≤KW<56 (25≤HP<75) | 2013 |
| 56≤KW<130 (75≤HP<175) | 2012 |
| KW≥130 (HP≥175) | 2011 |

**Table 6 to Subpart IIII of Part 60—Optional 3-Mode Test Cycle for Stationary Fire Pump Engines**

[As stated in §60.4210(g), manufacturers of fire pump engines may use the following test cycle for testing fire pump engines:]

| Mode No. | Engine speed[1] | Torque (percent)[2] | Weighting factors |
|---|---|---|---|
| 1 | Rated | 100 | 0.30 |
| 2 | Rated | 75 | 0.50 |
| 3 | Rated | 50 | 0.20 |

[1]Engine speed: ±2 percent of point.

[2]Torque: NFPA certified nameplate HP for 100 percent point. All points should be ±2 percent of engine percent load value.

**Table 7 to Subpart IIII of Part 60—Requirements for Performance Tests for Stationary CI ICE With a Displacement of ≥30 Liters per Cylinder**

As stated in §60.4213, you must comply with the following requirements for performance tests for stationary CI ICE with a displacement of ≥30 liters per cylinder:

| Each | Complying with the requirement to | You must | Using | According to the following requirements |
|---|---|---|---|---|
| 1. Stationary CI internal combustion engine with a displacement of ≥ 30 liters per cylinder | a. Reduce $NO_X$ emissions by 90 percent or more; | i. Select the sampling port location and number/location of traverse points at the inlet and outlet of the control device; | | (a) For $NO_X$, $O_2$, and moisture measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line ('3-point long line'). If the duct is >12 inches in diameter *and* the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, appendix A-1, the duct may be sampled at '3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, appendix A-4. |
| | | ii. Measure $O_2$ at the inlet and outlet of the control device; | (1) Method 3, 3A, or 3B of 40 CFR part 60, appendix A-2 | (b) Measurements to determine $O_2$ concentration must be made at the same time as the measurements for $NO_X$ concentration. |
| | | iii. If necessary, measure moisture content at the inlet and outlet of the control device; and | (2) Method 4 of 40 CFR part 60, appendix A-3, Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348-03 (incorporated by reference, see §60.17) | (c) Measurements to determine moisture content must be made at the same time as the measurements for $NO_X$ concentration. |

| Each | Complying with the requirement to | You must | Using | According to the following requirements |
|---|---|---|---|---|
| | | iv. Measure $NO_X$ at the inlet and outlet of the control device. | (3) Method 7E of 40 CFR part 60, appendix A-4, Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348-03 (incorporated by reference, see §60.17) | (d) $NO_X$ concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |
| | b. Limit the concentration of $NO_X$ in the stationary CI internal combustion engine exhaust. | i. Select the sampling port location and number/location of traverse points at the exhaust of the stationary internal combustion engine; | | (a) For $NO_X$, $O_2$, and moisture measurement, ducts ≤6 inches in diameter may be sampled at a single point located at the duct centroid and ducts >6 and ≤12 inches in diameter may be sampled at 3 traverse points located at 16.7, 50.0, and 83.3% of the measurement line ('3-point long line'). If the duct is >12 inches in diameter *and* the sampling port location meets the two and half-diameter criterion of Section 11.1.1 of Method 1 of 40 CFR part 60, appendix A-1, the duct may be sampled at '3-point long line'; otherwise, conduct the stratification testing and select sampling points according to Section 8.1.2 of Method 7E of 40 CFR part 60, appendix A-4. |
| | | ii. Determine the $O_2$ concentration of the stationary internal combustion engine exhaust at the sampling port location; | (1) Method 3, 3A, or 3B of 40 CFR part 60, appendix A-2 | (b) Measurements to determine $O_2$ concentration must be made at the same time as the measurement for $NO_X$ concentration. |
| | | iii. If necessary, measure moisture content of the stationary internal combustion engine exhaust at the sampling port location; and | (2) Method 4 of 40 CFR part 60, appendix A-3, Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348-03 (incorporated by reference, see §60.17) | (c) Measurements to determine moisture content must be made at the same time as the measurement for $NO_X$ concentration. |
| | | iv. Measure $NO_X$ at the exhaust of the stationary internal combustion engine; if using a control device, the sampling site must be located at the outlet of the control device. | (3) Method 7E of 40 CFR part 60, Appendix A-4, Method 320 of 40 CFR part 63, appendix A, or ASTM D 6348-03 (incorporated by reference, see §60.17) | (d) $NO_X$ concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |

| Each | Complying with the requirement to | You must | Using | According to the following requirements |
|---|---|---|---|---|
| | c. Reduce PM emissions by 60 percent or more | i. Select the sampling port location and the number of traverse points; | (1) Method 1 or 1A of 40 CFR part 60, appendix A-1 | (a) Sampling sites must be located at the inlet and outlet of the control device. |
| | | ii. Measure $O_2$ at the inlet and outlet of the control device; | (2) Method 3, 3A, or 3B of 40 CFR part 60, appendix A-2 | (b) Measurements to determine $O_2$ concentration must be made at the same time as the measurements for PM concentration. |
| | | iii. If necessary, measure moisture content at the inlet and outlet of the control device; and | (3) Method 4 of 40 CFR part 60, appendix A-3 | (c) Measurements to determine and moisture content must be made at the same time as the measurements for PM concentration. |
| | | iv. Measure PM at the inlet and outlet of the control device. | (4) Method 5 of 40 CFR part 60, appendix A-3 | (d) PM concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |
| | d. Limit the concentration of PM in the stationary CI internal combustion engine exhaust | i. Select the sampling port location and the number of traverse points; | (1) Method 1 or 1A of 40 CFR part 60, appendix A-1 | (a) If using a control device, the sampling site must be located at the outlet of the control device. |
| | | ii. Determine the $O_2$ concentration of the stationary internal combustion engine exhaust at the sampling port location; | (2) Method 3, 3A, or 3B of 40 CFR part 60, appendix A-2 | (b) Measurements to determine $O_2$ concentration must be made at the same time as the measurements for PM concentration. |
| | | iii. If necessary, measure moisture content of the stationary internal combustion engine exhaust at the sampling port location; and | (3) Method 4 of 40 CFR part 60, appendix A-3 | (c) Measurements to determine moisture content must be made at the same time as the measurements for PM concentration. |
| | | iv. Measure PM at the exhaust of the stationary internal combustion engine. | (4) Method 5 of 40 CFR part 60, appendix A-3. | (d) PM concentration must be at 15 percent $O_2$, dry basis. Results of this test consist of the average of the three 1-hour or longer runs. |

[79 FR 11251, Feb. 27, 2014]

**Table 8 to Subpart IIII of Part 60—Applicability of General Provisions to Subpart IIII**

[As stated in §60.4218, you must comply with the following applicable General Provisions:]

| General Provisions citation | Subject of citation | Applies to subpart | Explanation |
|---|---|---|---|
| §60.1 | General applicability of the General Provisions | Yes | |
| §60.2 | Definitions | Yes | Additional terms defined in §60.4219. |
| §60.3 | Units and abbreviations | Yes | |
| §60.4 | Address | Yes | |
| §60.5 | Determination of construction or modification | Yes | |
| §60.6 | Review of plans | Yes | |
| §60.7 | Notification and Recordkeeping | Yes | Except that §60.7 only applies as specified in §60.4214(a). |
| §60.8 | Performance tests | Yes | Except that §60.8 only applies to stationary CI ICE with a displacement of (≥30 liters per cylinder and engines that are not certified. |
| §60.9 | Availability of information | Yes | |
| §60.10 | State Authority | Yes | |
| §60.11 | Compliance with standards and maintenance requirements | No | Requirements are specified in subpart IIII. |
| §60.12 | Circumvention | Yes | |
| §60.13 | Monitoring requirements | Yes | Except that §60.13 only applies to stationary CI ICE with a displacement of (≥30 liters per cylinder. |
| §60.14 | Modification | Yes | |
| §60.15 | Reconstruction | Yes | |
| §60.16 | Priority list | Yes | |
| §60.17 | Incorporations by reference | Yes | |
| §60.18 | General control device requirements | No | |
| §60.19 | General notification and reporting requirements | Yes | |

# Indiana Department of Environmental Management
# Office of Air Quality

## Addendum to the Technical Support Document (ATSD) for a Part 70 Operating Permit Renewal

| Source Background and Description |
|---|

| | |
|---|---|
| **Source Name:** | **Indiana-Kentucky Electric Corporation Clifty Creek** |
| **Source Location:** | **1335 Clifty Hollow Road, Madison, IN 47250** |
| **County:** | **Jefferson (Madison Township)** |
| **SIC Code:** | **4911** |
| **Operation Permit No.:** | **T077-36338-00001** |
| **Permit Reviewer:** | **Deena Patton** |

On July 2, 2016, the Office of Air Quality (OAQ) had a notice published in the Madison Courier, Madison, Indiana, stating that Indiana-Kentucky Electric Corporation Clifty Creek Station had applied for a Part 70 Operating Permit Renewal to continue the operation of the stationary electric power generating facility. The notice also stated that the OAQ proposed to issue a Part 70 Operating Permit Renewal for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

| Comments and Responses |
|---|

On July 28, 2016, U.S. EPA submitted comments to IDEM, OAQ on the draft Part 70 Operating Permit Renewal.

The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes. IDEM, OAQ does not make any changes to the original TSD, but the Permit will have the updated changes. The comments and revised permit language are provided below with deleted language as ~~strikeouts~~ and new language **bolded**.

**Comment 1:**

> Condition D.2.3 states that, "in order to ensure compliance with Condition D.2.1, the baghouse for particulate control shall be in operation and control emissions from the associated coal processing points or drop conveyors at all times the associated coal processing points or drop point conveyors is in operation." However, the emission unit description box for Section D.2 does not identify the baghouse(s) and where they are installed. Condition D.2.3 and the emission calculations of the technical support document (TSD) Appendix A imply that at least some coal processing points or drop conveyors are equipped with a baghouse. We request that you include additional descriptive information in the permit to clarify the number and locations of the baghouse(s).

**Response to Comment 1:**

> IDEM agrees with the recommended changes, since the emission unit description needs to illustrate where the baghouses are located. The permit has been revised as follows:

(c) Coal handling facilities with a maximum design transfer rate of 2400 tons per hour, and coal storage systems, **utilizing baghouses as control,** including the following:

(1) facilities installed in the 1950's, including coal conveyors and transfer house facilities, coal unloading stations 1 and 4 using clamshell barge unloaders, coal pile unloading, and coal piles**, using baghouses at the following transfer points: Station 2 and 5, the Tripper Room Units 1 through 6, and Station 7**; and

(2) facilities installed in 1993 to allow increased use of subbituminous coal to reduce $SO_2$ emissions, including transfer stations B1, B2, B3 and B4, and conveyors 5B1, B12, B23, B34 E, and B34 W**, using baghouses at the following transfer points: B1, B2, B3, and B4.**

**Comment 2:**

Condition E.2.2 lists the applicable provisions of 40 CFR Part 60, Subpart OOO that apply to the Limestone Processing (LP) System. Condition E.2.2 appears to be missing several applicable provisions, as follows:

| Applicable Provisions | Description/Justification |
|---|---|
| 40 CFR 60.674(c), (d), and (e) | Describes visible emissions monitoring requirements and alternate monitoring options for affected facilities for which construction, modification, or reconstruction commenced on or after April 22, 2008, that use a baghouse to control emissions.<br><br>The permit record indicates the LP system was constructed on or after April 22, 2008, and that it is equipped with two storage silo bin vent filter dust collector to control emissions. |
| 40 CFR 60.676(b)(1) | Specifies that owners or operators of affected facilities (as defined in 60.670 and 60.671) for which construction, modification, or reconstruction commenced on or after April 22, 2008, must record each periodic inspection required under 60.674(b) or (c).<br><br>The permit record indicates the LP system was constructed on or after April 22, 2008, and it has applicable periodic inspection requirements in 60.674(b) or (c). |
| 40 CFR 60.676(k) | Specifies general information of where to submit notifications and reports required under the Subpart.<br><br>The permit indicates that the LP system is subject to reporting requirements (such as 40 CFR 60.676(g)) |
| 40 CFR Part 60, Subpart OOO Table 2 | Describes stack emission limits and compliance demonstration requirements for affected facilities with capture systems.<br><br>The permit cites 60.672(f) as an applicable requirement, which states that a baghouse that controls emissions from only an individual, |

| | |
|---|---|
| | enclosed storage bin must meet applicable stack opacity limits and compliance requirements in Table 2. The stack opacity limit appears to be applicable to the LP system's two storage silo bin vent filter dust collectors. |

We request that you review the applicability of the above provisions and update the permit, as appropriate.

**Response to Comment 2:**

IDEM agrees with the recommended changes. The permit has been revised as follows:

E.2.2 New Source Performance Standard for Nonmetallic Mineral Processing Plants NSPS [326 IAC 12] [40 CFR Part 60, Subpart OOO]

The Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart OOO (included as Attachment B to the operating permit), which are incorporated by reference as 326 IAC 12, for the emission unit(s) listed above:

(1) 40 CFR 60.670(a)(1) and (d)(1-3) through (f)
(2) 40 CFR 60.671
(3) 40 CFR 60.672(a), (b), and (d) through (f)
(4) 40 CFR 60.673(a) and (b)
(5) 40 CFR 60.674(b)(1)(i)**,** ~~and~~ (ii)**,** ~~and~~ (b)(2)**, (c), (d), and (e)**
(6) 40 CFR 60.676(a)(1)(i) and (ii), (a)(3)(i) and (ii), (a)(4)(i) and (ii), **(b)(1),** (f) through (h), (i)(1), ~~and~~ (j)**, and (k)**.
(7) 40 CFR 60, Subpart OOO, Table 1
**(8) 40 CFR 60, Subpart OOO, Table 2**
(~~8~~**9**) 40 CFR 60, Subpart OOO, Table 3

Upon review of the emission units involved with Condition E.2.2, IDEM had made the following changes throughout the permit for the Limestone Processing (LP) System to add clarity to the controls:

(f) One (1) Limestone Processing (LP) System, permitted in 2008, with a maximum transfer rate of 300 tons per hour, consisting of two (2) reclaim hoppers and feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) ball mill feeders, two (2) wet ball mills, and one (1) emergency reclaim hopper. Particulate emissions are controlled by partial to full enclosure and two (2) storage silo ~~bin vent filter dust collectors~~ **baghouses**.

[The Limestone Processing (LP) System is an affected source under the Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60, Subpart OOO).]

**Comment 3:**

Condition E.4.2 lists the applicable provisions of 40 CFR Part 63, Subpart ZZZZ that apply to the Clifty Quench Pump (CEQP-01). Condition E.4.2(3) cites 40 CFR 63.6590(a)(1)(ii) as an applicable requirement. However, it appears that the correct applicable requirement is 40 CFR 63.6590(a)(2)(ii), since CEQP-01 has a site rating of ≤ 500 brake horsepower, and commenced construction on or after June 12, 2006. We request you review the applicability of the above provisions, and update the permit, as appropriate.

**Response to Comment 3:**

IDEM agrees with the recommended changes. The permit has been revised as follows:

E.4.2 National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines [40 CFR Part 63, Subpart ZZZZ] [326 IAC 20-82]

The Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart ZZZZ (included as Attachment D to the operating permit), which are incorporated by reference as 326 IAC 20-82, for the emission unit(s) listed above:

The Clifty Quench Pump is subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(~~1~~**2**)(ii) and (c)(6)

***

**Comment 4:**

Condition E.4.2 lists the applicable provisions of 40 CFR Part 63, Subpart ZZZZ that apply to the two propane-fired emergency engines, identified as Clifty Emergency Microwave Generator (CEMG-01) and Clifty Emergency Substation Generator (CESG-1). Condition E.4.2(3) cites 40 CFR 63.6590(a)(1)(ii) as an applicable requirement for both engines, which classifies both engines as "existing stationary RICE".

However, it appears that the correct applicable requirement for CESG-1 is 40 CFR 63.6590(a)(2)(ii), since CESG-1 has a site rating of ≤ 500 brake horsepower, and it commenced construction on or after June 12, 2006 (CESG-01 was installed in 2008). As such, CESG-1 would be considered a "new stationary RICE". It follows that CESG-1 may be considered a new emergency stationary RICE subject to 40 CFR 63.6590(c)(6), as well as the applicable requirements (if any) of 40 CFR Part 60, Subpart JJJJ.

We request that you re-evaluate the applicability of the above provisions to CESG-1, and update the permit, as appropriate.

**Response to Comment 4:**

IDEM agrees with the recommended changes. The permit has been revised as follows:

E.4.2 National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines [40 CFR Part 63, Subpart ZZZZ] [326 IAC 20-82]

The Permittee shall comply with the following provisions of 40 CFR Part 63, Subpart ZZZZ (included as Attachment D to the operating permit), which are incorporated by reference as 326 IAC 20-82, for the emission unit(s) listed above:

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The ~~two~~ **one** (~~2~~**1**) propane fired engine~~s~~**, identified as CEMG-01,** ~~are~~ **is** subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(1)(ii)
(4) 40 CFR 63.6595(a)(1) and (c)
(5) 40 CFR 63.6602

(6) 40 CFR 63.6605
(7) 40 CFR 63.6625(e)(2) and (f)
(8) 40 CFR 63.6640(f)
(9) 40 CFR 63.6645(a)(5)
(10) 40 CFR 63.6655(e)(2) and (f)(1)
(11) 40 CFR 63.6660
(12) 40 CFR 63.6665
(13) 40 CFR 63.6670
(14) 40 CFR 63.6675
(15) Item 6 Table 2c to Subpart ZZZZ of Part 63
(16) Item 9 Table 6 to Subpart ZZZZ of Part 63
(17) Table 8 to Subpart ZZZZ of Part 63

**The one (1) propane fired engine, identified as CESG-1, is subject to the following portions of Subpart ZZZZ:**

**(1) 40 CFR 63.6580**
**(2) 40 CFR 63.6585(a) and (b)**
**(3) 40 CFR 63.6590(a)(2)(ii) and (c)(6)**
**(4) 40 CFR 63.6595(a)(1) and (c)**
**(5) 40 CFR 63.6602**
**(6) 40 CFR 63.6605**
**(7) 40 CFR 63.6625(e)(2) and (f)**
**(8) 40 CFR 63.6640(f)**
**(9) 40 CFR 63.6645(a)(5)**
**(10) 40 CFR 63.6655(e)(2) and (f)(1)**
**(11) 40 CFR 63.6660**
**(12) 40 CFR 63.6665**
**(13) 40 CFR 63.6670**
**(14) 40 CFR 63.6675**
**(15) Item 6 Table 2c to Subpart ZZZZ of Part 63**
**(16) Item 9 Table 6 to Subpart ZZZZ of Part 63**
**(17) Table 8 to Subpart ZZZZ of Part 63**

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Upon review of 40 CFR 60 Subpart JJJJ, it has been determined that CESG-1 is not subject to 40 CFR 60, Subpart JJJJ, pursuant to 40 CFR 60.4230(a)(4)(iv), CESG-1 is an emergency engine that was constructed prior to January 1, 2009. To clarify this IDEM OAQ has revised the emission unit description to illustrate that the five (5) stationary reciprocating internal combustion engines, identified as CEMG-01, CESG-1, CEQP-01, CEFP-01, and CEFP-02 emission units are emergency as shown below:

(c) Five (5) **emergency** stationary reciprocating internal combustion engines, consisting of the following:

(1) One (1) propane fired stationary RICE, identified as CEMG-01, installed in 1992, with a heat input capacity of 10.05 HP, using no controls, and exhausting outdoors.

(2) One (1) propane fired stationary RICE, identified as CESG-1, installed in 2008, with a heat input capacity of 107.24 HP, using no controls, and exhausting outdoors.

(3) One (1) diesel fired stationary RICE, identified as CEQP-01, installed in 2007,

with a heat input capacity of 207 HP, using no controls, and exhausting outdoors.

(4) Two (2) diesel fired stationary RICE fire pumps, identified as CEFP-01 and CEFP-02, each installed prior to 2006, each with a heat input capacity of 250 HP, each using no controls, and each exhausting outdoors.

**Comment 5:**

On page 14 of the TSD, the Indiana Department of Environmental Management has determined that the requirements of the Cross State Air Pollution Rule (CSAPR) apply to the six wet-bottom pulverized coal-fired boilers, identified as Units 1 through 6, but the requirements are not included in the permit. Both CSAPR and Federal Implementation Plan requirements are applicable requirements and, as such, must be included in the Part 70 Operating Permit. We request that you add the CSAPR applicable requirements to the permit.

**Response to Comment 5:**

Upon discussion with U.S.EPA, IDEM OAQ will not insert the CSAPR and Federal Implementation Plan into the pending renewal permit, CSAPR requirements will be included in the next significant permit modification. No changes were made as a result of this comment.

**Additional Comments and Responses**

On July 29, 2016, Indiana-Kentucky Electric Corporation (IKEC) Clifty Creek submitted comments to IDEM, OAQ on the draft Part 70 Operating Permit Renewal.

**Comment 1:**

IKEC would like to make changes to their Attachment A Federal Dust Control Plan, the changes include the following as shown in strikethrough and bold:

Table 1: Fugitive Dust Control Measures
Limestone Transfer - Conveying

| Emission Point ID | Transfer Description | Control Method |
|---|---|---|
| 22 (LH) | Clamshell Bucket ~~into~~ **from** Barge | None |
| 23 (LH) | Clamshell Bucket into Reclaim Hopper (RH1) | Fog Suppression |
| 23 (LH) | Reclaim Hopper (RH1) onto Vibrating Feeder | Partial Enclosure |
| 23 (LH) | Vibrating Feeder (VF1) onto LS Unloading Belt Conveyor (LU1) | Fog Suppression |
| 24 (LH) | LS Unloading Belt Conveyor (LU1) | 3/4 Conveyor Cover |
| 39a (LH) | Limestone Unloading Conveyor (LU1) to Limestone Transfer Conveyor (LU2) | Full Enclosure |
| 40a (LH) | Limestone Transfer Conveyor (LU2) | 3/4 Conveyor Cover |
| 39b (LH) | Limestone Transfer Conveyor (LU2) to Limestone Transfer Conveyor (LU3) | Full Enclosure |
| 40b (LH) | Limestone Transfer Conveyor (LU3) | 3/4 Conveyor Cover |
| 26 (LH) | Active Storage Pile into Reclaim Drawdown Hopper 1 or 2 | Full Enclosure |
| 26 (LP) | Vibratory Drawdown Hopper(DH-1 or DH-2) onto Vibratory Reclaim Feeder (VF-2 or VF-3) | Enclosed reclaim With Dust Suppression |

| Table 1: Fugitive Dust Control Measures<br>Limestone Transfer - Conveying | | |
|---|---|---|
| Emission Point ID | Transfer Description | Control Method |
| 26 (LP) | Vibratory Reclaim Feeder (VF-2 or VF-3) onto LS Reclaim Conveyor LR-1. | Full Enclosure |
| 28 (LP) | LS Reclaim Conveyor (LR-1) | 3/4 Conveyor Cover |
| 8 (LP) | LS Reclaim Conveyor (LR-1) into LS Storage Silo ~~A~~ **B** | Full Enclosure |
| 29 (LP) | LS Reclaim Conveyor (LR-1) onto Silo Transfer Conveyor (LR-3) | Full Enclosure |
| 29 (LP) | Silo Transfer Conveyor (LR-3) | Full Enclosure |
| 29 (LP) | Silo Transfer Conveyor (LR-3) into LS Storage Silo ~~B~~ **A** | Full Enclosure |
| 8 (LP) | LS Storage Silo A onto Feeder A | Full Enclosure |
| 8 (LP) | Feeder A into Wet Ball A | Full Enclosure |
| 8 (LP) | LS Storage Silo B onto Feeder B | Full Enclosure |
| 8 (LP) | Feeder B into Wet Ball B | Full Enclosure |
| 27 (LH) | Front End Loader into Emergency Reclaim Hopper | None |
| 27 (LP) | Emergency Reclaim Hopper onto Emergency Reclaim Vibrating Feeder | None |
| 27 (LP) | Emergency reclaim Vibrating Feeder onto Reclaim Conveyor | None |

***

| Table 4: Fugitive Dust Control Measures<br>Gypsum Pile Transfer | | |
|---|---|---|
| Emission Point ID | Transfer Description | Control Method |
| 34 (GH) | Gypsum Radial Stacker Conveyor onto Stockpile ~~in a three-sided storage building~~ | ~~3/4 Enclosure~~<br>**None** |
| 34 (GH) | Stockpile into Front-End loader | None |
| 34 (GH) | Front-End Loader onto Truck | None |
| 34 (GH) | Emergency Stock-out Conveyor onto Emergency Stock-out Pile | None |
| 34 (GH) | Stockpile into Front-End loader | None |
| 34 (GH) | Front-End Loader onto Truck<br>Water Cannon Dust Suppression System<br>Washing/flooding of Stack out Pad Area | ~~None~~<br>Material Wetting |

**Response to Comment 1:**

IDEM agrees with the recommended changes. The permit has been revised as requested above.

**Comment 2:**

IKEC would like to make the following changes to the permit, as shown in strikethrough and bold:

[Request 1]:

A.2 Emission Units and Pollution Control Equipment Summary
[326 IAC 2-7-4(c)(3)][326 IAC 2-7-5(14)]

This stationary source consists of the following emission units and pollution control devices:

(a) ***

(1) FGD System:
Units 1, 2, and 3 exhaust to Flue 13 of Stack 14. Units 4 and 5 exhaust to Flue 46 of Stack 14. Both Flue 13 and Flue 46 of Stack 14 have continuous emissions monitoring systems (CEMS) for particulate matter (PM). **They also have flow, sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance.** The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

(b) ***

(1) FGD System:
Units 6 exhausts to Flue 46 of Stack 14. Flue 46 of Stack 14 has continuous emissions monitoring systems (CEMS) for particulate matter (PM). **They also have flow, sulfur dioxide (SO2) and nitrogen oxide (NOx) monitors for 40 CFR Part 75 compliance.** The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

***

(f) One (1) Limestone Processing (LP) System, permitted in 2008, with a maximum transfer rate of 300 tons per hour, consisting of two (2) reclaim hoppers and feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) ball mill feeders, two (2) wet ball mills, and one (1) emergency reclaim hopper. Particulate emissions are controlled by **material wetting,** partial to full enclosure and two (2) storage silo bin vent filter dust collectors. The Limestone Processing (LP) System is an affected source under the Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60, Subpart OOO).

***

[Request 2]:

D.1.5 Flue Gas Desulfurization (FGD) System [326 IAC 2-7-6(1)][326 IAC 2-7-5(1)]

The Permittee shall comply with the following, except as otherwise provided by statute or rule or in this permit, ~~the JBR and~~ the flue gas desulfurization (FGD) system shall be operated at all times the boilers are in operation to maintain compliance with all applicable $SO_2$ and particulate emission limits.

***

[Request 3]:

D.1.10 PM Monitoring System Downtime [326 IAC 2-7-6] [326 IAC 2-7-5(3)]

Whenever the PM CEMS is malfunctioning or down for maintenance, repair or adjustments for 24 hours or more, the Permittee shall monitor particulate emissions in accordance with the following:

(1) The ability of the FGD system to control PM emissions shall be monitored once per day when in operation by measuring and recording the following:

(a) JBR reactor slurry level;

(2) Normal operation of the JBR reactor shall be deemed to be the following for purposes of Condition D.1.6(c):

(a) Slurry level at or between the range of 19.33 to 21.06 feet;~~ and~~

(3) As long as the JBR reactor slurry level indicates normal operation of the FGD system, no

further action is necessary. However, reasonable response steps shall be taken whenever the JBR reactor slurry level indicates abnormal operation of the FGD system.

***

[Request 4]:

D.3.2 Fugitive Particulate Matter Emission Limitations [326 IAC 6-5][40 CFR 64]

Pursuant to the Registration issued April 18, 1989, and 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissions from the fly ash handling shall comply with the fugitive dust control plan. This plan requires that:

***

(c) For transportation from silo area:

(1) To on-site disposal: Use of trucks which are covered while in motion and which go through a truck wash and hose down area as they exit the silo area. In-plant haul roads in silo area and to onsite disposal area are paved and are ~~periodically~~ swept/vacuumed **as needed**. Truck routes on the surface of the disposal area are treated as needed with a combination of water and/or dust-suppressant chemicals.

(2) For ash sold for use off site: The majority of fly ash hauled off-site is in closed, dry bulk container trucks. If conditioned fly ash is purchased for off site use, it is hauled in covered dump trucks which are washed prior to leaving site.

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[Request 5]:

D.4.1 PSD Minor Limits [326 IAC 2-2]

(a) Particulate emissions from the Limestone Handling (LH) System shall be controlled by partial to full enclosure and wet dust suppression as specified in the Fugitive Dust Control Plan in Attachment A.

(b) Particulate emissions from the Limestone Processing (LP) System shall be controlled by **material wetting,** partial to full enclosure and two (2) storage silo bin vent filter dust collectors as specified in the Fugitive Dust Control Plan in Attachment A.

***

***

[Request 6]:

SECTION E.5 NSPS

Emissions Unit Description:

~~(c) Five (5) stationary reciprocating internal combustion engines, consisting of the following:~~

***

~~(3)~~ One (1) diesel fired stationary RICE, identified as CEQP-01, installed in 2007, with a heat input capacity of 207 HP, using no controls, and exhausting outdoors.

(The information describing the process contained in this emissions unit description box is descriptive information and does not constitute enforceable conditions.)

**Response to Comment 2:**

IDEM agrees with all of the recommended changes, except Request 6. The permit has been revised as requested above for those changes designated as Request 1 through 5.

For Request 6, IDEM OAQ feels that deleting the above requested language would not add any clarification as to what emission unit the rule is applicable to, however, in deleting the language it could potentially confuse those who are reviewing Section A emission unit descriptions to those emission unit descriptions that are throughout the remainder of the permit. No changes were made as a result of this comment.

**Comment 3:**

IKEC has requested to make changes to the Technical Support Document (TSD) as shown below in bold and strikethrough.

[Request 1]:

(d) Dry fly ash handling and disposal facilities, using a baghouse as control, including the following:

(1) Dry fly ash handling system installed in 1990 and 1991, including pneumatic conveyance to two (2) main silos with a maximum design transfer rate of 40 tons per hour, rotary and dry unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area or for transportation offsite. **Particulate emissions are controlled on the plant paved and plant unpaved haul roads by wet material, watering, sweeping, and speed reduction.**

(2) Two (2) additional dry fly ash storage silos (a.k.a truck bins) installed in 1994 and 1995 for unmarketable fly ash, including pneumatic conveyance to silos with a maximum design transfer rate of 40 tons per hour, rotary unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area.

*****

(f) One (1) Limestone Processing (LP) System, permitted in 2008, with a maximum transfer rate of 300 tons per hour, consisting of two (2) reclaim hoppers and feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) ball mill feeders, two (2) wet ball mills, and one (1) emergency reclaim hopper. Particulate emissions are controlled by **material wetting,** partial to full enclosure and two (2) storage silo bin vent filter dust collectors. The Limestone Processing (LP) System is an affected source under the Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60, Subpart OOO).

(g) One (1) Gypsum Handling (GH) System, permitted in 2008, with a maximum capacity of 150 tons per hour, consisting of one (1) collecting conveyor, one (1) transfer conveyor, two (2) transfer stations, one (1) radial stackout conveyor, one (1) emergency collecting conveyor, one (1) emergency transfer station, one (1) emergency stackout, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area or for transportation offsite. Particulate emissions are controlled on the conveyors and transfer points by wet material and partial to full enclosure. Particulate emissions are controlled on the **plant** paved and **plant** unpaved haul roads by wet material, watering, sweeping, and speed reduction. **Particulate emissions from handling and placement of Gypsum in onsite disposal area or for transportation offsite are controlled by wet material, watering, compacting, covering, and other precautionary measures.**

(h) One (1) Chloride Purge Stream (CPS) Wastewater Treatment Plant (WWTP) Filter Cake Handling System, permitted in 2008, consisting of filter cake being loaded into trucks by a wheel loader, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area. Particulate emissions are controlled during loading of the filter cake into trucks by wet material and other precautionary measures. Particulate emissions are controlled on the paved and unpaved haul roads by wet material, watering, sweeping, and speed reduction.

Particulate emissions from handling and placement of CPS WWTP Filter Cake in onsite disposal area are controlled by wet material, watering, compacting, covering, and other precautionary measures~~. Particulate emissions from handling and placement of Gypsum in onsite disposal area or for transportation offsite are controlled by wet material, watering, compacting, covering, and other precautionary measures.~~

[Request 2]:

| Emission Unit/ID | Control | Operating Parameter | Monitoring Frequency | Range | Excursions and Exceedances | Rule Compliance |
|---|---|---|---|---|---|---|
| Coal Unloading Station | Baghouse | Visible Emission Inspections | Daily | Normal-Abnormal | Response Steps | D.2.3 |
| Dry ~~Ash~~ **Flyash** Handling System | Baghouse | Visible Emission Inspections | Daily | Normal-Abnormal | Response Steps | D.3.3 |
| Limestone Handling Operation | Wet Suppression | Visible Emission Inspections | Daily | Normal-Abnormal | Response Steps | D.4.4 |

| Emission Unit/ID | Control | Operating Parameter | Monitoring Frequency | Range | Excursions and Exceedances | Rule Compliance |
|---|---|---|---|---|---|---|
| Limestone Processing Operation | Bin Vent Filter | Visible Emission Inspections | Daily | Normal - Abnormal | Response Steps | D.4.4 |
| Gypsum Waste Handling Operation | Wet Suppression | Visible Emission Inspections | Daily | Normal - Abnormal | Response Steps | D.4.4 |
| Dry Sorbent Injection System | Bin Vent Filters | Visible Emission Inspections | Daily | Normal- Abnormal | Response Steps | D.5.2 |

These monitoring conditions are necessary because the ESP for the six (6) boilers must operate properly to ensure compliance with 326 IAC 6-3 (Process Operations).

These monitoring conditions are necessary because the bag filter systems, wet suppression, and bin vent filters for the coal handling, **dry** flyash operations, **dry fly**ash silo unloading station, limestone handling operations, limestone processing operations, and gypsum waste handling operation must operate properly to ensure compliance with 326 IAC 6-3 (Process Operations) and 326 IAC 6-3-2 (Particulate Matter Limitations).

**Response to Comment 3:**

The Technical Support Document (TSD) is used by IDEM, OAQ for historical purposes. IDEM, OAQ does not make any changes to the original TSD, but the Permit will have the updated changes.

**Additional Changes**

IDEM, OAQ has decided to make additional revisions to the permit as described below, with deleted language as ~~strikeouts~~ and new language **bolded**.

[Change 1]

Upon further review, IDEM has updated the control for the Dry Sorbent Injection System; the changes are as follows and are throughout the permit:

(i) One (1) Dry Sorbent Injection System, permitted in 2008, consisting of two (2) silos to store dry sorbent material, identified as East Trona Silo 13 and West Trona Silo 45. Each silo has a usable storage capacity of approximately 600 tons. The dry sorbent material is delivered to the plant by totally enclosed dry-cement type trucks on an as-needed basis. The dry sorbent material is pneumatically transferred from the trucks into the silos through a totally enclosed system. The unloading rate for each truck is approximately 26 tons per hour. Both silos are fitted with ~~bin vent filter systems~~ **baghouses** designed to remove the particulate in the exhaust air from the truck unloading process. A totally enclosed pneumatic system is also used to transfer the dry sorbent material from the silos for injection into the Units 1 through 5 flue gas ducts between the existing SCRs and ESPs.

## IDEM Contact

(a) Questions regarding this proposed Part 70 Operating Renewal can be directed to Deena Patton at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 234-5400 or toll free at 1-800-451-6027 extension 4-5400.

(b) A copy of the permit is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM Permit Guide on the Internet at: http://www.in.gov/idem/5881.htm; and the Citizens' Guide to IDEM on the Internet at: http://www.in.gov/idem/6900.htm.

**Indiana Department of Environmental Management**
Office of Air Quality

Technical Support Document (TSD) for a Part 70 Operating Permit Renewal

**Source Background and Description**

| | |
|---|---|
| **Source Name:** | **Indiana-Kentucky Electric Corporation Clifty Creek Station** |
| **Source Location:** | **1335 Clifty Hollow Road, Madison, IN 47250** |
| **County:** | **Jefferson (Madison Township)** |
| **SIC Code:** | **4911** |
| **Permit Renewal No.:** | **T077-36338-00001** |
| **Permit Reviewer:** | **Deena Patton** |

The Office of Air Quality (OAQ) has reviewed the operating permit renewal application from Indiana-Kentucky Electric Corporation Clifty Creek Station relating to the operation of an electric power generating facility. On September 30, 2015, Indiana-Kentucky Electric Corporation Clifty Creek Station submitted an application to the OAQ requesting to renew its operating permit. Indiana-Kentucky Electric Corporation Clifty Creek Station was issued its first Part 70 Operating Permit Renewal T077-29920-00001 on July 7, 2011.

**Permitted Emission Units and Pollution Control Equipment**

The source consists of the following permitted emission units:

(a) Five (5) wet-bottom pulverized coal-fired boilers identified as Units 1 through 5, with construction completed in 1955, each with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Units 1 through 5 have the following emission controls:

- over-fire air system ($NO_X$ control)
- selective catalytic reduction (SCR) system ($NO_X$ control)
- “cold-side” electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 1, 2, and 3 exhaust to Flue 13 of Stack 14. Units 4 and 5 exhaust to Flue 46 of Stack 14. Both Flue 13 and Flue 46 of Stack 14 have continuous emissions monitoring systems (CEMS) for particulate matter (PM). The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

(b) One (1) wet-bottom pulverized coal-fired boiler identified as Unit 6, with construction completed in 1956, with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

Unit 6 has the following emission controls:

- over-fire air system ($NO_X$ control)

- "hot-side" electrostatic precipitator (ESP) (particulate control)
- flue gas desulfurization (FGD) system ($SO_2$ and particulate control), permitted in 2008.

(1) FGD System:
Units 6 exhausts to Flue 46 of Stack 14. Flue 46 of Stack 14 has continuous emissions monitoring systems (CEMS) for particulate matter (PM). The flues are also equipped with sorbent trap monitoring systems for MATS Hg compliance per 40 CFR Part 63.

The Flue Gas Desulfurization (FGD) System for Units 1 through 6, permitted in 2008, consists of one (1) stack (Stack 14) with two flues (Flues 13 and 46), two (2) jet bubbling reactor (JBR) absorbers (JBRs 13 and 46), and associated limestone and gypsum material handling systems.

(c) Coal handling facilities with a maximum design transfer rate of 2400 tons per hour, and coal storage systems, including the following:

(1) facilities installed in the 1950's, including coal conveyors and transfer house facilities, coal unloading stations 1 and 4 using clamshell barge unloaders, coal pile unloading, and coal piles; and

(2) facilities installed in 1993 to allow increased use of subbituminous coal to reduce $SO_2$ emissions, including transfer stations B1, B2, B3 and B4, and conveyors 5B1, B12, B23, B34 E, and B34 W.

(d) Dry fly ash handling and disposal facilities, using a baghouse as control, including the following:

(1) Dry fly ash handling system installed in 1990 and 1991, including pneumatic conveyance to two (2) main silos with a maximum design transfer rate of 40 tons per hour, rotary and dry unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area or for transportation offsite.

(2) Two (2) additional dry fly ash storage silos (a.k.a truck bins) installed in 1994 and 1995 for unmarketable fly ash, including pneumatic conveyance to silos with a maximum design transfer rate of 40 tons per hour, rotary unloaders with a maximum design unloading rate of 250 tons per hour for each silo, and transportation by truck via in-plant paved and unpaved haul roads to onsite disposal area.

(e) One (1) Limestone Handling (LH) System, permitted in 2008, with a maximum capacity of 1,000 tons per hour, consisting of one (1) barge unloader, one (1) barge unloading hopper and feeder, three (3) conveyors, two (2) transfer stations, and one (1) stacking tube and storage pile. Particulate emissions are controlled by partial to full enclosure and wet dust suppression.

(f) One (1) Limestone Processing (LP) System, permitted in 2008, with a maximum transfer rate of 300 tons per hour, consisting of two (2) reclaim hoppers and feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) ball mill feeders, two (2) wet ball mills, and one (1) emergency reclaim hopper. Particulate emissions are controlled by partial to full enclosure and two (2) storage silo bin vent filter dust collectors. The Limestone Processing (LP) System is an affected source under the Standards of Performance for Nonmetallic Mineral Processing Plants (40 CFR Part 60, Subpart OOO).

(g) One (1) Gypsum Handling (GH) System, permitted in 2008, with a maximum capacity of 150 tons per hour, consisting of one (1) collecting conveyor, one (1) transfer conveyor, two (2) transfer stations, one (1) radial stackout conveyor, one (1) emergency collecting conveyor, one (1) emergency transfer station, one (1) emergency stackout, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area or for transportation offsite. Particulate emissions are controlled on the conveyors and transfer points by wet material and partial to full enclosure. Particulate emissions are controlled on the paved and unpaved haul roads by wet material, watering, sweeping, and speed reduction.

(h) One (1) Chloride Purge Stream (CPS) Wastewater Treatment Plant (WWTP) Filter Cake Handling System, permitted in 2008, consisting of filter cake being loaded into trucks by a wheel loader, and transportation by truck via in-plant paved and unpaved haul roads to and within the onsite disposal area. Particulate emissions are controlled during loading of the filter cake into trucks by wet material and other precautionary measures. Particulate emissions are controlled on the paved and unpaved haul roads by wet material, watering, sweeping, and speed reduction.

Particulate emissions from handling and placement of CPS WWTP Filter Cake in onsite disposal area are controlled by wet material, watering, compacting, covering, and other precautionary measures. Particulate emissions from handling and placement of Gypsum in onsite disposal area or for transportation offsite are controlled by wet material, watering, compacting, covering, and other precautionary measures.

(i) One (1) Dry Sorbent Injection System, permitted in 2008, consisting of two (2) silos to store dry sorbent material, identified as East Trona Silo 13 and West Trona Silo 45. Each silo has a usable storage capacity of approximately 600 tons. The dry sorbent material is delivered to the plant by totally enclosed dry-cement type trucks on an as-needed basis. The dry sorbent material is pneumatically transferred from the trucks into the silos through a totally enclosed system. The unloading rate for each truck is approximately 26 tons per hour. Both silos are fitted with bin vent filter systems designed to remove the particulate in the exhaust air from the truck unloading process. A totally enclosed pneumatic system is also used to transfer the dry sorbent material from the silos for injection into the Units 1 through 5 flue gas ducts between the existing SCRs and ESPs.

## Insignificant Activities

The source also consists of the following insignificant activities:

(a) Coal bunker and coal scale exhausts and associated dust collector vents. [326 IAC 6-3]

(b) Other activities or categories not previously identified with potential, uncontrolled emissions equal to or less than thresholds require listing only: Pb 0.6 ton per year or 3.29 pounds per day, $SO_2$ 5 pounds per hour or 25 pounds per day, $NO_X$ 5 pounds per hour or 25 pounds per day, CO 25 pounds per day, PM 5 pounds per hour or 25 pounds per day, VOC 3 pounds per hour or 15 pounds per day:

(1) Four (4) No. 2 fuel oil fired or distillate fuel fired coal transfer station heaters, installed in 1993 (that burn distillate fuel as defined under 40 CFR Part 60.41c):

(A) One (1) with 1.25 MMBtu/hr heat input capacity for Station 2;

(B) One (1) with 1.75 MMBtu/hr heat input capacity for Station 5; and

(C) Two (2) with 2.75 MMBtu/hr heat input capacity for Stations B3 and B4.

(2) Limestone/iron ore flux handling facility, including limestone storage area, dump hopper, conveyor, and enclosed surge bin, installed in 1994, with a maximum design throughput rate of 4566.2 lb/hr. [326 IAC 6-3][326 IAC 5].

(c) Five (5) stationary reciprocating internal combustion engines, consisting of the following:

(1) One (1) propane fired stationary RICE, identified as CEMG-01, installed in 1992, with a heat input capacity of 10.05 HP, using no controls, and exhausting outdoors.

(2) One (1) propane fired stationary RICE, identified as CESG-1, installed in 2008, with a heat input capacity of 107.24 HP, using no controls, and exhausting outdoors.

(3) One (1) diesel fired stationary RICE, identified as CEQP-01, installed in 2007, with a heat input capacity of 207 HP, using no controls, and exhausting outdoors.

(4) Two (2) diesel fired stationary RICE fire pumps, identified as CEFP-01 and CEFP-02, each installed prior to 2006, each with a heat input capacity of 250 HP, each using no controls, and each exhausting outdoors.

## Existing Approvals

Since the issuance of the Part 70 Operating Permit 077-29920-00001 on July 7, 2011, the source has constructed or has been operating under the following additional approvals:

(a) Significant Permit Modification No. 077-33569-00001 issued on November 19, 2013.

All terms and conditions of previous permits issued pursuant to permitting programs approved into the State Implementation Plan have been either incorporated as originally stated, revised, or deleted by this permit. All previous registrations and permits are superseded by this permit.

## Enforcement Issue

There are no enforcement actions pending.

## Emission Calculations

See Appendix A of this document for detailed emission calculations.

## County Attainment Status

The source is located in Jefferson County (Madison Township).

| Pollutant | Designation |
|---|---|
| $SO_2$ | Cannot be classified. |
| CO | Unclassifiable or attainment effective November 15, 1990. |
| $O_3$ | Unclassifiable or attainment effective July 20, 2012, for the 2008 8-hour ozone standard.[1] |
| $PM_{2.5}$ | Basic nonattainment designation effective federally April 5, 2005, for $PM_{2.5}$. for the Madison Township. Unclassifiable or attainment for all townships except Madison Township, effective April 5, 2005, for the annual $PM_{2.5}$ standard. |
| $PM_{2.5}$ | Unclassifiable or attainment effective December 13, 2009, for the 24-hour $PM_{2.5}$ standard. |
| $PM_{10}$ | Unclassifiable effective November 15, 1990. |
| $NO_2$ | Cannot be classified or better than national standards. |
| Pb | Unclassifiable or attainment effective December 31, 2011. |
| [1]Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005. | |

(a) Ozone Standards
Volatile organic compounds (VOC) and Nitrogen Oxides ($NO_x$) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and $NO_x$ emissions are considered when evaluating the rule applicability relating to ozone. Jefferson County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and $NO_x$ emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

(b) $PM_{2.5}$
U.S. EPA, in the Federal Register Notice 70 FR 943 dated January 5, 2005, has designated Jefferson County Madison Township as nonattainment for $PM_{2.5}$. On March 7, 2005, the Indiana Attorney General's Office, on behalf of IDEM, filed a lawsuit with the Court of Appeals for the District of Columbia Circuit challenging U.S. EPA's designation of nonattainment areas without sufficient data. However, in order to ensure that sources are not potentially liable for a violation of the Clean Air Act, the OAQ is following the U.S. EPA's New Source Review Rule for $PM_{2.5}$ promulgated on May 8, 2008. These rules became effective on July 15, 2008. Therefore, direct $PM_{2.5,}$ $SO_2$, and $NO_X$ emissions were reviewed pursuant to the requirements of Nonattainment New Source Review, 326 IAC 2-1.1-5.

(c) Other Criteria Pollutants
Jefferson County has been classified as attainment or unclassifiable in Indiana for $SO_2$, CO, $PM_{10}$, and Pb. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

## Fugitive Emissions

Since this source is classified as a fossil fuel fired steam electric plant of more than two hundred fifty million (250,000,000) British thermal units per hour heat input, it is considered one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7. Therefore, fugitive emissions are counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

## Unrestricted Potential Emissions

This table reflects the unrestricted potential emissions of the source.

| Unrestricted Potential Emissions | |
|---|---|
| Pollutant | Tons/year |
| PM | 12,839 |
| $PM_{10}$ | 9,614 |
| $PM_{2.5}$ | 5,146 |
| $SO_2$ | 406,319 |
| $NO_x$ | 81,050 |
| VOC | 168 |
| CO | 1,203 |
| Single HAP | >10 |
| Total HAP | >25 |

Appendix A of this TSD reflects the unrestricted potential emissions of the source.

On June 23, 2014, in the case of *Utility Air Regulatory Group v. EPA*, cause no. 12-1146, (available at http://www.supremecourt.gov/opinions/13pdf/12-1146_4g18.pdf ) the United States Supreme Court ruled that the U.S. EPA does not have the authority to treat greenhouse gases (GHGs) as an air pollutant for the purpose of determining operating permit applicability or PSD Major source status. On July 24, 2014, the U.S. EPA issued a memorandum to the Regional Administrators outlining next steps in permitting decisions in light of the Supreme Court's decision. U.S. EPA's guidance states that U.S. EPA will no longer require PSD or Title V permits for sources "previously classified as 'Major' based solely on greenhouse gas emissions."

The Indiana Environmental Rules Board adopted the GHG regulations required by U.S. EPA at 326 IAC 2-2-1(zz), pursuant to Ind. Code § 13-14-9-8(h) (Section 8 rulemaking). A rule, or part of a rule, adopted under Section 8 is automatically invalidated when the corresponding federal rule, or part of the rule, is invalidated. Due to the United States Supreme Court Ruling, IDEM, OAQ cannot consider GHGs emissions to determine operating permit applicability or PSD applicability to a source or modification.

(a) The potential to emit (as defined in 326 IAC 2-7-1(30)) of $PM_{10}$, $PM_{2.5}$, $SO_2$, VOC, CO, and NOx are equal to or greater than 100 tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-7 and will be issued a Part 70 Operating Permit Renewal.

(b) The potential to emit (as defined in 326 IAC 2-7-1(30)) of any single HAP is equal to or greater than ten (10) tons per year and/or the potential to emit (as defined in 326 IAC 2-7-1(30)) of a combination of HAPs is equal to or greater than twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-7.

## Part 70 Permit Conditions

This source is subject to the requirements of 326 IAC 2-7, because the source met the following:

(a) Emission limitations and standards, including those operational requirements and limitations that assure compliance with all applicable requirements at the time of issuance of Part 70 permits.

(b) Monitoring and related record keeping requirements which assume that all reasonable information is provided to evaluate continuous compliance with the applicable requirements.

**Potential to Emit After Issuance**

The table below summarizes the potential to emit, reflecting all limits, of the emission units. Any new control equipment is considered federally enforceable only after issuance of this Part 70 permit renewal, and only to the extent that the effect of the control equipment is made practically enforceable in the permit.

| Process/ Emission Unit | Potential To Emit of the Entire Source After Issuance of Renewal (tons/year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PM | $PM_{10}$* | $PM_{2.5}$** | $SO_2$ | $NO_x$ | VOC | CO | Total HAPs | Worst Single HAP |
| Boiler Unit 1 | 108.19 | 40.19 | 22.9 | 9,582.80 | 700.26 | 16.18 | 200.2 | > 25 | > 10 |
| Boiler Unit 2 | 106.71 | 39.64 | 22.6 | 9,906.33 | 723.90 | 15.96 | 199.63 | | |
| Boiler Unit 3 | 79.67 | 29.58 | 16.8 | 7,251.97 | 529.94 | 11.92 | 149.05 | | |
| Boiler Unit 4 | 365.03 | 135.58 | 77.2 | 9,426.02 | 712.61 | 14.89 | 186.26 | | |
| Boiler Unit 5 | 351.77 | 130.66 | 74.4 | 9,425.70 | 712.58 | 14.35 | 179.5 | | |
| Boiler Unit 6 | 338.05 | 125.56 | 71.5 | 8,883.08 | 4,639.5 | 13.79 | 172.5 | | |
| Coal Handling Facility | 1.26 | 0.60 | 0.09 | - | - | - | - | | |
| Dry Ash Handling Facility | 5.10 | 2.55 | 2.55 | - | - | - | - | | |
| Limestone Handling | 3.99 | 1.94 | 0.29 | - | - | - | - | | |
| Limestone Processing | 0.17 | 0.08 | 0.01 | - | - | - | - | | |
| Gypsum Handling | 1.83 | 0.89 | 0.01 | - | - | - | - | | |
| Landfill | 3.15 | 1.07 | 0.12 | - | - | - | - | | |
| Water Treatment Plant | 0.0032 | 0.0015 | 0.00023 | - | - | - | - | | |
| Dry Sorbent Injection System | 8.09 | 7.97 | 7.97 | - | - | - | - | | |
| Transfer Station Heaters | 0.53 | 0.61 | 0.41 | 18.88 | 6.38 | 0.05 | 1.33 | | |
| Limestone/iron Ore Flux Handling | 0.14 | 0.07 | 0.01 | - | - | - | - | | |
| Paved Road | 9.2 | 1.79 | 0.27 | - | - | - | - | | |
| Unpaved Road | 5.82 | 1.61 | 0.16 | - | - | - | - | | |

| Process/ Emission Unit | Potential To Emit of the Entire Source After Issuance of Renewal (tons/year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PM | $PM_{10}$* | $PM_{2.5}$** | $SO_2$ | $NO_x$ | VOC | CO | Total HAPs | Worst Single HAP |
| Fire Pumps | 0.39 | 0.39 | 0.39 | 0.36 | 5.48 | 0.44 | 1.18 | 4.79E-03 | 1.46E-03 |
| Emergency Generators | 2.51E-03 | 0.01 | 0.01 | 1.55E-04 | 0.58 | 0.01 | 0.98 | 0.01 | 2.05E-02 |
| **Total PTE of Entire Source** | **1389.07** | **520.78** | **297.81** | **54494.78** | **8025.17** | **87.14** | **1088.47** | **>25** | **>10** |
| Title V Major Source Thresholds | NA | 100 | 100 | 100 | 100 | 100 | 100 | 25 | 10 |
| PSD Major Source Thresholds | 100 | 100 | NA | 100 | 100 | 100 | 100 | NA | NA |
| Emission Offset/ Nonattainment NSR Major Source Thresholds | NA | NA | 100 | 100 | 100 | NA | NA | NA | NA |
| negl. = negligible<br>* Under the Part 70 Permit program (40 CFR 70), PM10 and PM2.5, not particulate matter (PM), are each considered as a "regulated air pollutant".<br>**$PM_{2.5}$ listed is direct $PM_{2.5}$. | | | | | | | | | |

On June 23, 2014, in the case of *Utility Air Regulatory Group v. EPA*, cause no. 12-1146, (available at http://www.supremecourt.gov/opinions/13pdf/12-1146_4g18.pdf ) the United States Supreme Court ruled that the U.S. EPA does not have the authority to treat greenhouse gases (GHGs) as an air pollutant for the purpose of determining operating permit applicability or PSD Major source status. On July 24, 2014, the U.S. EPA issued a memorandum to the Regional Administrators outlining next steps in permitting decisions in light of the Supreme Court's decision. U.S. EPA's guidance states that U.S. EPA will no longer require PSD or Title V permits for sources "previously classified as 'Major' based solely on greenhouse gas emissions."

The Indiana Environmental Rules Board adopted the GHG regulations required by U.S. EPA at 326 IAC 2-2-1(zz), pursuant to Ind. Code § 13-14-9-8(h) (Section 8 rulemaking). A rule, or part of a rule, adopted under Section 8 is automatically invalidated when the corresponding federal rule, or part of the rule, is invalidated. Due to the United States Supreme Court Ruling, IDEM, OAQ cannot consider GHGs emissions to determine operating permit applicability or PSD applicability to a source or modification.

(a) This existing source is a major stationary source, under PSD (326 IAC 2-2), because a PSD regulated pollutant is emitted at a rate of 100 tons per year or more, and it is one of the twenty-eight (28) listed source categories, as specified in 326 IAC 2-2-1(ff)(1).

(b) This existing source is a major stationary source, under Emission Offset (326 IAC 2-3), because $PM_{2.5}$, SO2, and NOx, nonattainment regulated pollutants, are emitted at a rate of 100 tons per year or more.

(c) These emissions are based upon TSD Appendix A.

(d) This existing source is a major source of HAPs, as defined in 40 CFR 63.2, because HAP emissions are greater than ten (10) tons per year for a single HAP and greater than twenty-five (25) tons per year for a combination of HAPs. Therefore, this source is a major source under Section 112 of the Clean Air Act (CAA).

## Federal Rule Applicability

**CAM**

(a) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is applicable to each existing pollutant-specific emission unit that meets the following criteria:

(1) has a potential to emit before controls equal to or greater than the major source threshold for the pollutant involved;

(2) is subject to an emission limitation or standard for that pollutant; and

(3) uses a control device, as defined in 40 CFR 64.1, to comply with that emission limitation or standard.

The following table is used to identify the applicability of each of the criteria, under 40 CFR 64.1, to each existing emission unit and specified pollutant subject to CAM:

| Emission Unit / Pollutant | Control Device Used | Emission Limitation (Y/N) | Uncontrolled PTE (tons/year) | Controlled PTE (tons/year) | Major Source Threshold (tons/year) | CAM Applicable (Y/N) | Large Unit (Y/N) |
|---|---|---|---|---|---|---|---|
| Six (6) Wet Pulverized Coal Fired Boiler Units 1 through 6 (PM) | ESP | Y | 2,125.10 | 42.50 | 100 | N* | N |
| Six (6) Wet Pulverized Coal Fired Boiler Units 1 through 6 (PM10) | ESP | N | 1,593.9 | 31.87 | 100 | N | N |
| Six (6) Wet Pulverized Coal Fired Boiler Units 1 through 6 (PM2.5) | ESP | N | 835.2 | 16.70 | 100 | N | N |
| Six (6) Wet Pulverized Coal Fired Boiler Units 1 through 6 (SO2) | FGD | Y | 67,716.4 | 3,385.82 | 100 | N* | Y |
| Six (6) Wet Pulverized Coal Fired Boiler Units 1 through 6 (NOx) | SCR | N | 13,507.3 | 675.36 | 100 | N | N |
| Dry Fly Ash Rotary and dry Unloaders (PM) | Baghouse | Y | 170 | 5.1 | 100 | Y | N |
| Dry Fly Ash Rotary and Dry Unloaders (PM10) | Baghouse | N | 85 | 2.55 | 100 | N | N |
| Dry Fly Ash Rotary and Dry Unloaders (PM2.5) | Baghouse | N | 85 | 2.55 | 100 | N | N |

*Pursuant to 40 CFR 64.2(b)(1)(vi), the requirements of 40 CFR Part 64 (CAM) shall not apply to emission limitations or standards for which a Part 70 permit specifies a continuous compliance determination method. The PM and SO2 emissions are measured by continuous emissions monitoring systems (CEMS), therefore, CAM is not applicable to Boilers #1 through #6 for SO2 and PM emissions.

Based on this evaluation, the requirements of 40 CFR 64, CAM is applicable to the Six (6) Wet Pulverized Coal Fired Boiler Units 1 through 6 for NOx and to the Dry Fly Ash Rotary and Dry Unloaders for PM upon issuance of the Title V Renewal. A CAM Plan will be incorporated into this Part 70 permit renewal.

All other emission units have uncontrolled emissions of criteria pollutants and HAPs less than the major source threshold.

**NSPS**

(a) The requirements of the New Source Performance Standard for Fossil-Fuel-Fired Steam Generators, 40 CFR 60.40, Subpart D, are still not included in the permit for the six (6) coal fired boilers. Construction of these units commenced prior to August 17, 1971.

(b) The requirements of the New Source Performance Standard for Electric Utility Generating Units, 40 CFR 60.40Da, Subpart Da, are not included in the permit for the six (6) coal fired boilers. Construction of these units commenced prior to September 18, 1978.

(c) The requirements of the New Source Performance Standard for Coal Preparation and Processing Plants, 40 CFR 60.250, Subpart Y, are still not included in the permit for the facility, since coal is not crushed, screened, or otherwise processed on site. Coal is only conveyed and stored.

(d) The Limestone Processing Operation is still subject to the New Source Performance Standard for Nonmetallic Mineral Processing Plants (40 CFR 60, Subpart OOO), which is incorporated by reference as 326 IAC 12. The two (2) reclaim feeders, one (1) reclaim silo supply conveyor, one (1) silo transfer conveyor, two (2) storage silos, two (2) storage silo bin vent filter dust collectors, two (2) ball mill feeders and two (2) wet ball mills are subject to Subpart OOO, because they are each directly connected or connected by conveyor to the remainder of the limestone processing system which contains the limestone ball mills.

The emission units are subject to the following portions of Subpart OOO.

(1) 40 CFR 60.670(a)(1) and (d)(1-3) through (f)
(2) 40 CFR 60.671
(3) 40 CFR 60.672(a), (b), and (d) through (f)
(4) 40 CFR 60.673(a) and (b)
(5) 40 CFR 60.674(b)(1)(i) and (ii) and (b)(2)
(6) 40 CFR 60.676(a)(1)(i) and (ii), (a)(3)(i) and (ii), (a)(4)(i) and (ii), (f) through (h), (i)(1), and (j).
(7) 40 CFR 60, Subpart OOO, Table 1
(8) 40 CFR 60, Subpart OOO, Table 3

(e) The one (1) diesel fired stationary RICE, identified as Clifty Quench Pump (CEQP-01), is subject to the New Source Performance Standard for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII), which is incorporated by reference as 326 IAC 12. The Clifty Quench Pump was installed after April 1, 2006 and is not a fire pump.

The emission unit is subject to the following portions of Subpart IIII:

(1) 40 CFR 60.4200(a)(2)(i)
(2) 40 CFR 60.4205(b)
(3) 40 CFR 60.4206
(4) 40 CFR 60.4207(a) and (b)
(5) 40 CFR 60.4208
(6) 40 CFR 60.4209
(7) 40 CFR 60.4211(f) and (g)
(8) 40 CFR 60.4214(b)
(9) 40 CFR 60.4218

(10) 40 CFR 60.4219
(11) Table 8 to Subpart IIII of Part 60

(f) The requirements of the New Source Performance Standard for Stationary Compression Ignition Internal Combustion Engines, 40 CFR 60, Subpart IIII, are not included in the permit for the two (2) Clifty Diesel Fire Pumps (CEFP-01 and CEFP-02), since these fire pumps were installed prior to July 1, 2006.

(g) The requirements of the New Source Performance Standard for Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60, Subpart JJJJ, are not included in the permit for the Clifty Microwave propane fired engine (CEMG-01), since it was manufactured prior to June 12, 2006.

(h) The requirements of the New Source Performance Standard for Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60, Subpart JJJJ, are not included in the permit for the Clifty Emergency Substation Generator (CESG-1), since it was manufactured prior to January 1, 2009.

(i) There are no other New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included in the permit for this source.

**NESHAP**

(a) The two (2) propane fired engines and the three (3) diesel fired engines are subject to the National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (40 CFR 63, Subpart ZZZZ), which is incorporated by reference as 326 IAC 20-82. The five (5) engines are located at a major source of HAPs and are not test cells/stands.

The Clifty Quench Pump is subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(1)(ii) and (c)(6)

The two (2) propane fired engines are subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(1)(ii)
(4) 40 CFR 63.6595(a)(1) and (c)
(5) 40 CFR 63.6602
(6) 40 CFR 63.6605
(7) 40 CFR 63.6625(e)(2) and (f)
(8) 40 CFR 63.6640(f)
(9) 40 CFR 63.6645(a)(5)
(10) 40 CFR 63.6655(e)(2) and (f)(1)
(11) 40 CFR 63.6660
(12) 40 CFR 63.6665
(13) 40 CFR 63.6670
(14) 40 CFR 63.6675
(15) Item 6 Table 2c to Subpart ZZZZ of Part 63
(16) Item 9 Table 6 to Subpart ZZZZ of Part 63
(17) Table 8 to Subpart ZZZZ of Part 63

The two (2) Clifty Diesel Fire Pumps are subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585(a) and (b)
(3) 40 CFR 63.6590(a)(1)(ii)
(4) 40 CFR 63.6595(a)(1) and (c)
(5) 40 CFR 63.6602
(6) 40 CFR 63.6604(b)
(7) 40 CFR 63.6605
(8) 40 CFR 63.6625(e)(2) and (f)
(9) 40 CFR 63.6640(f)
(10) 40 CFR 63.6645(a)(5)
(11) 40 CFR 63.6655(e)(2) and (f)(1)
(12) 40 CFR 63.6660
(13) 40 CFR 63.6665
(14) 40 CFR 63.6670
(15) 40 CFR 63.6675
(16) Item 1 Table 2c to Subpart ZZZZ of Part 63
(17) Item 9 Table 6 to Subpart ZZZZ of Part 63
(18) Table 8 to Subpart ZZZZ of Part 63

(b) The requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters, Subpart DDDDD (5D) are not included in the permit for the six (6) coal fired boilers. Pursuant to section 63.7491(a), the six (6) boilers are not subject to the provisions of Subpart DDDDD (5D), since they are subject to the provisions of Subpart UUUUU (5U).

(c) This source is subject to the National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units (40 CFR 63, Subpart UUUUU (5U)), which is incorporated by reference as 326 IAC 20-89. The compliance date for this source is April 16, 2015. This source is an coal fired electric utility steam generating unit as defined in section 40 CFR 63.10042 of this subpart. The units subject to this rule include the following:

Five (5) wet-bottom pulverized coal-fired boilers identified as Units 1 through 5, with construction completed in 1955, each with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

One (1) wet-bottom pulverized coal-fired boiler identified as Unit 6, with construction completed in 1956, with a rated capacity of 1,869 million Btu per hour (MMBtu/hr). Distillate fuel oil is combusted during startup and stabilization periods. Used oil generated at facilities within the OVEC-IKEC System may be combusted as supplemental fuel for energy recovery.

The emission units are subject to the following portions of Subpart UUUUU.

(1) 40 CFR 63.9980
(2) 40 CFR 63.9981
(3) 40 CFR 63.9982(a)(1) and (d)
(4) 40 CFR 63.9984(b), (c), and (f)
(5) 40 CFR 63.9990(a)(1)
(6) 40 CFR 63.9991(a) and (c)

(7) 40 CFR 63.10000(a), (b), (c), (d), and (e)
(8) 40 CFR 63.10001
(9) 40 CFR 63.10005(a), (b), (d), (e), (f), (j), and (k)
(10) 40 CFR 63.10006(c), (g), (i)(1), and (j)
(11) 40 CFR 63.10007(a), (b), (d), (e), (f), and (g)
(12) 40 CFR 63.10009(a) through (e), (h), (k), (m), and (n)
(13) 40 CFR 63.10010(a)(2), (f), (i), and (l)
(14) 40 CFR 63.10011(a), (c)(2), (e), (f), and (g)
(15) 40 CFR 63.10020(a), (b), (c), and (d)
(16) 40 CFR 63.10021(a), (b), (e), (f), (g), (h), and (i)
(17) 40 CFR 63.10030(a), (b), (d), and (e)
(18) 40 CFR 63.10031
(19) 40 CFR 63.10032(a), (b), (c), (d), (f), and (g)
(20) 40 CFR 63.10033
(21) 40 CFR 63.10040
(22) 40 CFR 63.10041(a) and (b)
(23) 40 CFR 63.10042
(24) Table 2 to Subpart UUUUU of Part 63
(25) Table 3 to Subpart UUUUU of Part 63
(26) Table 5 to Subpart UUUUU of Part 63
(27) Table 7 to Subpart UUUUU of Part 63
(28) Table 8 to Subpart UUUUU of Part 63
(29) Table 9 to Subpart UUUUU of Part 63
(30) Appendix A to Subpart UUUUU of Part 63

The provisions of 40 CFR 63 Subpart A – General Provisions, which are incorporated as 326 IAC 20-1-1, apply to the facility described in this section except when otherwise specified in 40 CFR 63 Subpart UUUUU.

(d) There are no other National Emission Standards for Hazardous Air Pollutants (NESHAP) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) included in this permit renewal.

**CAIR**

Pursuant to 326 IAC 24-1-1(a), 326 IAC 24-2-1(a), and 326 IAC 24-3-1(a), the source is subject to the provisions of CAIR. Section F of the permit contains the provisions the Permittee must follow.

**CSPAR**

(a) **Cross State Air Pollutant Rule (CSAPR)**
The preamble of the CSAPR regulations promulgated on August 8, 2011, states that the requirements established in the CSAPR trading program are applicable requirements that must be included in a source Title V permit pursuant to 40 CFR Part 70 and 71. The requirements of the Cross-State Air Pollution Rule (CSAPR) apply to the six (6) wet-bottom pulverized coal-fired boilers, identified as units 1 through 6 but are not included in this permit renewal. IDEM did not include the specific requirements in the permit because acceptable language for the inclusion of this rule had not been developed. IDEM is in the process of working with U.S. EPA Region 5 to develop appropriate language to be included in permits. Based on these discussions between representatives from IDEM and U.S. EPA Region 5, it has been determined that CSAPR will be incorporated into this source's operating permit at a later date through a Significant Permit Modification (SPM) after the approval of the CSAPR language by IDEM and U.S. EPA.

The EPA guidance for the inclusion of CSAPR into the Title V permits does not address the removal of the Clean Air Interstate Rule (CAIR) requirements from the Title V permits. The Indiana Department of Environmental Management (IDEM) adopted the CAIR rule as a State rule, under 326 IAC 24-3. The requirements of 326 IAC 24-3 will be in place until it is repealed by the Indiana Environmental Rules Board and the Indiana rule will stay in place until an alternative is developed and approved by the U.S. EPA.

IDEM is currently working to see if a demonstration can be made that would be approvable by the U.S. EPA. There is no estimated time for the repeal of 326 IAC 24-3.

The six (6) wet-bottom pulverized coal-fired boilers, identified as units 1 through 6 are subject to the Clean Air Interstate Rule (CAIR) Nitrogen Oxides Annual, Sulfur Dioxide, and Nitrogen Oxides Ozone Season Trading Programs - CAIR Permit for CAIR Units Under 326 IAC 24-1-1(a), 326 IAC 24-2-1(a), and 326 IAC 24-3-1(a).

## State Rule Applicability - Entire Source

**Commissioner's Order No 2016-02**

1. This Order approves the Petition submitted by the Petitioner according to the terms specified below. This Order imposes on the Petitioner the SO2 mass emission rate described below.

2. When any of Unit No. 1 through Unit No.6, or any combination thereof, is operating, the combined SO2 mass emisssion rate shall not exceed 2,624.5 lb/hour, as a 720 operating hour rolling average.

3. The Petitioner shall comply with the 720 operating hour rolling average SO2 mass emission rate beginning April 19, 2016.

4. As required by 326 IAC 2-7-2(d)(1) and 326 IAC 2-7-5, the Petitioner shall apply to incorporate these Order requirements, including reporting and recordkeeping requirements and methods to determine compliance, into its Part 70 Operating Permit within ninety (90) days of U.S. EPA's approval of the Commissioner's Order as part of the Indiana SIP.

5. From April 19, 2016 until IDEM issues a Permit incorporating these Order requirements, the Petitioner shall comply with the reporting and recordkeeping requirements and methods to determine compliance specified in this paragraph.

   a. Reporting: The Petitioner shall submit to IDEM, on a quarterly basis, a report of the facility-wide maximum 720 operating hour SO2 rolling average mass emission rate for each day that any of Unit No. 1 through Unit No. 6, or any combination thereof, operates, beginning the second quarter reporting period, which is July 2016.

   b. Recordkeeping: The Petitioner shall maintain records adequate to document compliance with the 720 operating hour rolling average SO2 mass emission rate.

   c. Method to determine compliance: Compliance shall be determined by a continuous emission monitoring system (CEMS) in accordance with 326 IAC 3-5; except that data substituted in accordance with 40 Code of Federal Regulations ("CFR") Part 75 will not be considered in this evaluation. The Petitioner may use the existing certified CEMS to meet this requirement.

6. This Order shally apply to and be binding upon the Petitioner, its successors and assigns. No change in ownership, corporate, or partnership status of the petitioner shall in any way alter its status or responsibilities under this Order.

7. The requirements of this Order supersede any less stringent requirements applicable to the Petitioner.

**326 IAC 1-6-3 (Preventive Maintenance Plan)**
The source is subject to 326 IAC 1-6-3.

**326 IAC 2-6 (Emission Reporting)**
This source is subject to 326 IAC 2-6 (Emission Reporting) because it is required to have an operating permit pursuant to 326 IAC 2-7 (Part 70). The potential to emit of PM10 is greater than 250 tons per year, and the potential to emit of NOx and SO2 is greater than 2,500 tons per year. Therefore, pursuant to 326 IAC 2-6-3(a)(1), annual reporting is required. An emission statement shall be submitted every year. The emission statement shall contain, at a minimum, the information specified in 326 IAC 2-6-4.

**326 IAC 2-7-6(5) (Annual Compliance Cerification)**
The U.S. EPA Federal Register 79 FR 54978 notice does not exempt the source from the requirements of 40 CFR 70.6(c)(5)(iv) or 326 IAC 2-7-6(5)(D), but the submittal of the Title V annual compliance certification to IDEM satisfies the requirement to submit the Title V annual compliance certifications to EPA. IDEM does not intend to revise any permits since the requirements of 40 CFR 70.6(c)(5)(iv) or 326 IAC 2-7-6(5)(D) still apply, but Permittees can note on their Title V annual compliance certification that submission to IDEM has satisfied reporting to EPA per Federal Register 79 FR 54978. This only applies to Title V Permittees and Title V compliance certifications.

**326 IAC 5-1 (Opacity Limitations)**
This source is subject to the opacity limitations specified in 326 IAC 5-1-2(1)

**326 IAC 5-1-3 (Temporary Alternative Opacity Limitations)**

(a) Pursuant to 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), when building a new fire in a boiler, opacity may exceed the applicable limit established in 326 IAC 5-1-2 for a period not to exceed thirty (30) minutes (five (5) six (6)-minute averaging periods) or until the flue gas temperature reaches two hundred fifty (250) degrees Fahrenheit at the inlet of the electrostatic precipitator, whichever occurs first. Operation of the electrostatic precipitator is not required during these times. [326 IAC 5-1-3(e)(2)]

(b) Pursuant to 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), when shutting down a boiler, opacity may exceed the applicable limit established in 326 IAC 5-1-2; however, opacity levels shall not exceed sixty percent (60%) for any six (6)-minute averaging period. Opacity in excess of the applicable limit established in 326 IAC 5-1-2 shall not continue for more than two (2) six (6)-minute averaging periods in any twenty-four (24) hour period. [326 IAC 5-1-3(a)]

(c) Pursuant to 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), when removing ashes from the fuel bed or furnace in a boiler or blowing tubes, opacity may exceed the applicable limit established in 326 IAC 5-1-2; however, opacity levels shall not exceed sixty percent (60%) for any six (6)-minute averaging period and opacity in excess of the applicable limit shall not continue for more than one (1) six (6)-minute averaging period in any sixty (60) minute period. The averaging periods shall not be permitted for more than three (3) six (6)-minute averaging periods in a twelve (12) hour period. [326 IAC 5-1-3(b)]

(d) The following operations are considered "startup conditions" pursuant to 326 IAC 1-2-76:

(1) Startup and firing of a boiler as part of a chemical cleaning operation; and

(2) Startup and firing of a boiler as part of a boiler floor refractory curing operation.

For each of these operations, opacity may exceed the applicable limit established in 326 IAC 5-1-3 for a period not to exceed thirty (30) minutes (five (5) six (6)-minute averaging periods).

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**326 IAC 6-4 (Fugitive Dust Emissions)**
The Permittee shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

**326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)**
Pursuant to CP 077-2716, issued March 16, 1993, and 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissiosn from the coal handling shall comply with the plan submitted December 7, 1992, as revised March 4, 2002.

**326 IAC 6.5 PM Limitations Except Lake County**
This source is not subject to 326 IAC 6.5 because it is not located in one of the following counties: Clark, Dearborn, Dubois, Howard, Marion, St. Joseph, Vanderburgh, Vigo or Wayne.

**326 IAC 6.8 PM Limitations for Lake County**
This source is not subject to 326 IAC 6.8 because it is not located in Lake County.

**326 IAC 21 Acid Rain Permit**
326 IAC 21 incorporates by reference the provisions of 40 CFR 72 through 40 CFR 78 for the purposes of implementing an acid rain program that meets the requirements of Title IV of the Clean Air Act and to incorporate monitoring, record keeping, and reporting requirements for nitrogen oxide and sulfur dioxide emissions to demonstrate compliance with nitrogen oxides and sulfur dioxide emission reduction requirements. This source is subject to the requirements of 326 IAC 21 which is issued as a separate Acid Rain Permit.

| **State Rule Applicability – Individual Facilities** |
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**<u>Boilers #1 through #6</u>**

**326 IAC 3-5 (Continuous Monitoring of Emissions)**

(a) Pursuant to 326 IAC 3-5 (Continuous Monitoring of Emissions), continuous emission monitoring systems for Boilers 1 through 6 shall be calibrated, maintained, and operated for measuring PM and SO2, which meet all applicable performance specifications of 326 IAC 3-5-2.

**326 IAC 6-2-3 (Particulate Emission Limitations for Sources of Indirect Heating)**
Pursuant to Amendment No. 2 to the Agreed Order entered October 26, 1973, Air Pollution Control Board vs. Indiana-Kentucky Electric Corporation (IKEC), and dated September 26, 1975, the particulate matter (PM) emissions from each boiler (Units 1 through 6) shall not exceed 0.236 pound per million Btu heat input (lb/MMBtu).

This limit is more stringent than the value that would be derived using the stack configuration information for the stacks in use on June 8, 1972 and the equation in 326 IAC 6-2-3(a); therefore, compliance with this limit is deemed compliance with 326 IAC 6-2.

**326 IAC 7-4-6 (Sulfur Dioxide)**

Pursuant to 326 IAC 7-4-6, $SO_2$ emissions from Boilers 1, 2, 3, 4, 5, and 6 shall not exceed 7.52 pounds per million Btu.

**Coal Handling**

**326 IAC 6-3 (Particulate Emission Limitations for Manufacturing Processes)**

(a) Pursuant to 326 IAC 6-3-1, the coal handling facilities are subject to the provisions of 326 IAC 6-3-2(e). Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the coal handling facilities shall not exceed 89.475 pounds per hour, each, when operating at a maximum process weight rate of 2400 tons per hour.

The pounds per hour limitation was calculated with the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 55.0\ P^{0.11} - 40$$

where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

(b) Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emissions may exceed the emission limits shown paragraph (a), provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

**326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)**

Pursuant to CP 077-2716, issued March 16, 1993, and 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissions from the coal handling shall comply with the fugitive dust plan.

**Dry fly ash handling and disposal facilities and Wet process boiler slag handling**

**326 IAC 6-3 (Particulate Emission Limitations for Manufacturing Processes)**

(a) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the fly ash pneumatic conveying system shall not exceed 42.52 pounds per hour when operating at a maximum process weight of 40 tons per hour.

The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 55.0\ P^{0.11} - 40$$

where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

(b) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the Rotary and Dry Unloaders shall not exceed 60.96 pounds per hour when operating at a maximum process weight of 250 tons per hour.

The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 55.0\ P^{0.11} - 40$$

where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

**326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)**
Pursuant to the Registration issued April 18, 1989, and 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissions from the fly ash handling shall comply with the fugitive dust plan.

**Limestone Handling System, Limestone Processing System, Gypsum Handling System, and Chloride Purge System Wastewater Treatment Plant Filter Cake Handling System**

**326 IAC 6-3 (Particulate Emission Limitations for Manufacturing Processes)**

(a) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the limestone handling operation shall not exceed 77.59 pounds per hour when operating at a maximum process weight of 1,000 tons per hour.

(b) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the limestone processing operation shall not exceed 63.00 pounds per hour when operating at a maximum process weight of 300 tons per hour.

(c) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), particulate emissions from the gypsum waste handling operations shall not exceed 55.44 pounds per hour when operating at a maximum process weight of 150 tons per hour.

(d) The pounds per hour limitations were calculated using the following equation:

Interpolation and extrapolation of the data for the process weight rate in excess of sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 55.0\ P^{0.11} - 40$$

where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

(e) Pursuant to 326 IAC 6-3-2(e)(3), when the process weight exceeds 200 tons per hour, the maximum allowable emissions may exceed the emission limits shown paragraph (a), provided the concentration of particulate matter in the gas discharged to the atmosphere is less than 0.10 pounds per 1,000 pounds of gases.

**326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)**
Pursuant to 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations), fugitive dust emissions from the limestone handling, limestone processing, and gypsum waste handling operations shall comply with the Fugitive Dust Control Plan in Attachment A.

**Dry Sorbent Injection System**

**326 IAC 6-3 (Particulate Emission Limitations for Manufacturing Processes)**
Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the Dry Sorbent Injection System shall not exceed 36.38 pounds per hour when operating at a process weight rate of 26 tons per hour.

The pounds per hour limitation was calculated with the following equation:

Interpolation of the data for the process weight rate up to 60,000 pounds per hour shall be accomplished by use of the equation:

$$E = 4.10\ P^{0.67}$$

Where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

**Limestone/iron ore flux handling facility**

**326 IAC 6-3 (Particulate Emission Limitations for Manufacturing Processes)**
Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the allowable particulate emission rate from the limestone and iron ore handing drop points shall not exceed 7.13 pounds per hour when operating at a process weight rate of 4566.2 pounds per hour.

The pounds per hour limitation was calculated with the following equation:

Interpolation of the data for the process weight rate up to 60,000 pounds per hour shall be accomplished by use of the equation:

$$E = 4.10\ P^{0.67}$$

Where E = rate of emission in pounds per hour; and
P = process weight rate in tons per hour

**Fuel Storage Tanks**

**326 IAC 8-4-3 (Petroleum Liquid Storage Facilities)**
(a) Pursuant to 326 IAC 8-4-3(a), this rule does not apply to the two (2) 60,000 gallon diesel fuel storage tanks, four (4) 5,000 gallon No. 2 fuel oil storage tanks and one (1) 20,000 gallon diesel fuel storage tank, though the tanks have capacities greater than thirty-nine thousand (39,000) gallons but the true vapor pressure of the volatile organic compounds stored in these tanks are less than 10.5 kPa.

(b) Pursuant to 326 IAC 8-4-3(a), this rule does not apply to the one (1) underground storage tank, the tank has a capacity less than thirty-nine thousand (39,000) gallons and the true vapor pressure of the volatile organic compounds stored in this tank is less than 10.5 kPa.

**Fire Pumps and Emergency Generators**

**326 IAC 6-2 (Particulate Emission Limitations for Source of Indirect Heating)**
Pursuant to 326 IAC 6-2-1, the two (2) emergency generators and the three (3) fire pumps are not subject to the requirements of 326 IAC 6-2-4, since they are not sources of indirect heating.

**326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)**

Pursuant to 326 IAC 6-3-1(b), the two (2) emergency generators and the three (3) fire pumps are not subject to the requirements of 326 IAC 6-3-2, since liquid and gaseous fuels and combustion air are not considered part of the process weight.

**326 IAC 8-1-6 (New Facilities; General Reduction Requirements)**
Pursuant to 326 IAC 8-1-6(1), the two (2) emergency generators and the three (3) fire pumps are not subject to the provisions of 326 IAC 8-1-6, since each have potential VOC emissions less than twenty-five (25) tons per year.

## Compliance Determination and Monitoring Requirements

Permits issued under 326 IAC 2-7 are required to ensure that sources can demonstrate compliance with all applicable state and federal rules on a continuous basis. All state and federal rules contain compliance provisions; however, these provisions do not always fulfill the requirement for a continuous demonstration. When this occurs, IDEM, OAQ, in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-7-5. As a result, Compliance Determination Requirements are included in the permit. The Compliance Determination Requirements in Section D of the permit are those conditions that are found directly within state and federal rules and the violation of which serves as grounds for enforcement action.

If the Compliance Determination Requirements are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also in Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

The compliance monitoring requirements applicable to this source are as follows:

| Emission Unit/ID | Control | Operating Parameter | Monitoring Frequency | Range | Excursions and Exceedances | Rule Compliance |
|---|---|---|---|---|---|---|
| Coal Unloading Station | Baghouse | Visible Emission Inspections | Daily | Normal-Abnormal | Response Steps | D.2.3 |
| Dry Ash Handling System | Baghouse | Visible Emission Inspections | Daily | Normal-Abnormal | Response Steps | D.3.3 |
| Limestone Handling Operation | Wet Suppression | Visible Emission Inspections | Daily | Normal-Abnormal | Response Steps | D.4.4 |
| Limestone Processing Operation | Bin Vent Filter | Visible Emission Inspections | Daily | Normal - Abnormal | Response Steps | D.4.4 |
| Gypsum Waste Handling Operation | Wet Suppression | Visible Emission Inspections | Daily | Normal - Abnormal | Response Steps | D.4.4 |
| Dry Sorbent Injection System | Bin Vent Filters | Visible Emission Inspections | Daily | Normal-Abnormal | Response Steps | D.5.2 |

These monitoring conditions are necessary because the ESP for the six (6) boilers must operate properly to ensure compliance with 326 IAC 6-3 (Process Operations).

These monitoring conditions are necessary because the bag filter systems, wet suppression, and bin vent filters for the coal handling, fly ash operations, ash silo unloading station, limestone handling operations, limestone processing operations, and gypsum waste handling operation must operate properly to ensure compliance with 326 IAC 6-3 (Process Operations) and 326 IAC 6-3-2 (Particulate Matter Limitations).

## Recommendation

The staff recommends to the Commissioner that the Part 70 Operating Permit Renewal be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on September 30, 2015.

## Conclusion

The operation of this stationary electric power generating facility shall be subject to the conditions of the attached Part 70 Operating Permit Renewal No. 077-36338-00001.

## IDEM Contact

(a) Questions regarding this proposed permit can be directed to Deena Patton at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 234-5400 or toll free at 1-800-451-6027 extension 4-5400.

(b) A copy of the findings is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/

(c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM Permit Guide on the Internet at: http://www.in.gov/idem/5881.htm; and the Citizens' Guide to IDEM on the Internet at: http://www.in.gov/idem/6900.htm.

**Appendix A: Emissions Calculations**
**Emission Summary**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Uncontrolled Potential to Emit**

| | PM (tons/yr) | $PM_{10}$ (tons/yr) | $PM_{2.5}$ (tons/yr) | $SO_2$ (tons/yr) | VOC (tons/yr) | CO (tons/yr) | NOx (tons/yr) | HAPs (tons/yr) |
|---|---|---|---|---|---|---|---|---|
| **Emission Unit** | | | | | | | | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 1 | 2125.14 | 1593.86 | 835.18 | 67,716.41 | 28.03 | 200.20 | 13,507.26 | Single HAP >10 Combined HAPs > 25 |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 2 | 2125.14 | 1593.86 | 835.18 | 67,716.41 | 28.03 | 200.20 | 13,507.26 | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 3 | 2125.14 | 1593.86 | 835.18 | 67,716.41 | 28.03 | 200.20 | 13,507.26 | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 4 | 2125.14 | 1593.86 | 835.18 | 67,716.41 | 28.03 | 200.20 | 13,507.26 | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 5 | 2125.14 | 1593.86 | 835.18 | 67,716.41 | 28.03 | 200.20 | 13,507.26 | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 6 | 2125.14 | 1593.86 | 835.18 | 67,716.41 | 28.03 | 200.20 | 13,507.26 | |
| Coal Handling Facilities | 25.30 | 11.96 | 1.81 | 0 | 0 | 0 | 0 | |
| Dry Fly ash handling and disposal facilities | 170 | 85 | 85 | 0 | 0 | 0 | 0 | |
| Limestone Handling and Limestone Processing | | | | | | | | |
| Limestone - Conveyor | 7.42 | 3.51 | 0.53 | 0 | 0 | 0 | 0 | |
| Limestone Pile Transfers | 1.11 | 0.52 | 0.08 | 0 | 0 | 0 | 0 | |
| LS Maintenance Unpaved Roads | 3.37 | 0.69 | 0.07 | 0 | 0 | 0 | 0 | |
| Limestone Active Pile WE | 0.77 | 0.39 | 0.06 | 0 | 0 | 0 | 0 | |
| Limestone Inactive Pile WE | 1.11 | 0.56 | 0.08 | 0 | 0 | 0 | 0 | |
| Gypsum Handling | | | | | | | | |
| Gypsum Transfers | 1.56 | 0.74 | 0.11 | 0 | 0 | 0 | 0 | |
| Gypsum Pile Transfers | 0.78 | 0.37 | 0.06 | 0 | 0 | 0 | 0 | |
| Gypsum - Wind Erosion | 0.63 | 0.32 | 0.05 | 0 | 0 | 0 | 0 | |
| Gypsum Emer Pile WE | 0.17 | 0.08 | 0.01 | 0 | 0 | 0 | 0 | |
| Gypsum Trucking 50 (Paved) | 83.34 | 16.25 | 2.43 | 0 | 0 | 0 | 0 | |
| Landfill Unpaved Roads | 9.46 | 2.63 | 0.26 | 0 | 0 | 0 | 0 | |
| LF Transfer to Working Face | 0.26 | 0.12 | 0.02 | 0 | 0 | 0 | 0 | |
| LF Wind Erosion | 1.40 | 0.70 | 0.10 | 0 | 0 | 0 | 0 | |
| Landfill Working on Face | 41.18 | 12.56 | 1.26 | 0 | 0 | 0 | 0 | |
| Bulk Chem (Paved) | 0.14 | 0.03 | 0.00 | 0 | 0 | 0 | 0 | |
| Transfers - Sludge (WWTP) | 0.0032 | 0.0015 | 0.0002 | 0 | 0 | 0 | 0 | |
| Sludge Trucking 50 (Paved) | 6.50 | 1.27 | 0.19 | 0 | 0 | 0 | 0 | |
| Sludge Trucking 50 Unpaved | 0.73 | 0.20 | 0.02 | 0 | 0 | 0 | 0 | |
| Transfer Station Heaters | 0.53 | 0.61 | 0.41 | 18.88 | 0.05 | 1.33 | 6.38 | |
| Limestone/iron ore flux handling | 0.16 | 0.08 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | |
| Pneumatic Delivery Truck Unload | 7.94 | 7.94 | 7.94 | 0 | 0 | 0 | 0 | |
| Dry Sorbent Injection | 8.09 | 7.97 | 7.94 | 0 | 0 | 0 | 0 | |
| Dry Sorbent Paved Road | 0.15 | 0.03 | 0.0042 | 0 | 0 | 0 | 0 | |
| Fire Pumps | 0.39 | 0.39 | 0.39 | 0.36 | 0.44 | 1.18 | 5.48 | 4.79E-03 |
| Emergency Generators | 2.51E-03 | 0.01 | 0.01 | 1.55E-04 | 0.01 | 0.98 | 0.58 | 0.01 |
| Total Emissions | 13123.35 | 9718.06 | 5119.94 | 406317.71 | 168.67 | 1204.67 | 81056.02 | Single HAP >10 Combined HAPs > 25 |

**Appendix A: Emissions Calculations**
**Emission Summary**
**Source Name:** Indiana-Kentucky Electric Corporation
**Source Location:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Permit Reviewer:** Deena Patton

**Limited Potential to Emit**

| | PM (tons/yr) | $PM_{10}$ (tons/yr) | $PM_{2.5}$ (tons/yr) | $SO_2$ (tons/yr) | VOC (tons/yr) | CO (tons/yr) | NOx (tons/yr) | HAPs (tons/yr) | Pb (tons/yr) | Hg (tons/yr) | $H_2SO_4$ (tons/yr) | HCl (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Emission Unit** | | | | | | | | | | | | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 1 | 108.19 | 40.19 | 22.9 | 9,582.80 | 16.18 | 200.2 | 700.26 | | | | | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 2 | 106.71 | 39.64 | 22.6 | 9,906.33 | 15.96 | 199.63 | 723.90 | | | | | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 3 | 79.64 | 29.58 | 16.8 | 7,251.97 | 11.92 | 149.05 | 529.94 | | | | | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 4 | 365.03 | 135.58 | 77.2 | 9,426.02 | 14.89 | 186.26 | 712.61 | | | | | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 5 | 351.77 | 130.66 | 74.4 | 9,425.70 | 14.35 | 179.5 | 712.58 | | | | | |
| One (1) Wet Pulverized Coal-Fired Boiler Unit 6 | 338.05 | 125.56 | 71.5 | 8,883.08 | 13.79 | 172.5 | 4,639.50 | | 0.17 | 0.03 | 0 | 480.47 |
| Coal Handling Facilities | 1.26 | 0.60 | 0.09 | 0 | 0 | 0 | 0 | Single HAP >10 Combined HAPs > 25 | 0 | 0 | 0 | 0 |
| Dry Fly ash handling and disposal facilities | 5.10 | 2.55 | 2.55 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Limestone Handling | 3.99 | 1.94 | 0.29 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Limestone Processing | 0.17 | 0.08 | 0.01 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Gysum Handling | 1.83 | 0.89 | 0.13 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Landfill | 3.15 | 1.07 | 0.12 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Water Treatment Plant | 0.0032 | 0.0015 | 0.00023 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Dry Sorbent Injection System | 8.09 | 7.97 | 7.97 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Transfer Station Heaters | 0.53 | 0.61 | 0.41 | 18.88 | 0.05 | 1.33 | 6.38 | | 0 | 0 | 0 | 0 |
| Limestone/iron ore flux handling | 0.14 | 0.07 | 0.01 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Paved Road | 9.2 | 1.79 | 0.27 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Unpaved Road | 5.82 | 1.61 | 0.16 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Fire Pumps | 0.39 | 0.39 | 0.39 | 0.36 | 0.44 | 1.18 | 5.48 | 4.79E-03 | 0 | 0 | 0 | 0 |
| Emergency Generators | 2.51E-03 | 0.01 | 0.01 | 1.55E-04 | 0.01 | 0.98 | 0.58 | 0.01 | 0 | 0 | 0 | 0 |
| Total Emissions | 1389.07 | 520.78 | 297.81 | 54495.14 | 87.60 | 1090.63 | 8031.23 | Single HAP >10 Combined HAPs > 25 | 0.17 | 0.03 | 0.00 | 480.47 |

**Notes:**

The potential PM and $PM_{10}$ emissions listed above are associated with the fugitive emissions generated form the Limestone Handling (LH), Limestone Processing (LP), the Gypsum Handling (GH), and the Chloride Purge Stream (CPS) Wastewater Treatment Plant (WWTP) Filter Cake Handling Systems for the Flue Gas Desulfurization (FGD) System. There will be a decrease in PM, $PM_{10}$, $PM_{2.5}$, and $SO_2$ emissions from existing Units 1 through 6 (wet-bottom pulverized coal-fired boilers) resulting from operation of the Flue Gas Desulfurization (FGD) System.
The SO2, NOx and CO emissons for the six boilers are from the CEMs data and the PM/PM10 emissions are from the stack tesing.

**Appendix A: Emissions Calculations**
**Potential to Emit - Boilers**
**Source Name:** Indiana-Kentucky Electric Corporation
**Source Location:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Permit Reviewer:** Deena Patton

| | | |
|---|---|---|
| Coal Btu/# value calculated from an SO3 spreadsheet using calculations for 70% eastern/30% PRB blend. | 11245 | Btu/# |
| #/mmBtu | 88.92841263 | #/mmBtu |
| Unit Heat Input Rate (Design) | 1869 | mmBtu/Hr |
| Heat Input Value used for PTE calculations (110% of design) | 2055.9 | mmBtu/Hr |
| Operating Hours/Year | 8760 | |
| Calculated Tons Coal/Year/Unit | 800,786.31 | |
| SO2 permit limit | 7.52 | #/mmBtu |
| PM permit limit | 0.236 | #/mmBtu |
| NOx assumed historical uncontrolled emission rate | 1.5 | #/mmBtu |
| PM10 factor (AP-42 Table 1.1-7 using controlled ratio of PM10 to PM: 0.042/0.056) | 0.75 | |
| PM2.5 factor (AP-42 Table 1.1-7 using controlled ratio of PM2.5 to PM: 0.022/0.056) | 0.393 | |
| VOC FIRE emission factor (SCC 10100101 & 10200210) | 0.07 | #/ton |
| CO AP-42/FIRE emission factor | 0.5 | #/ton |

| **Maximum Potential/Permitted Emissions Per Unit Per Year** | | |
|---|---|---|
| **SO2** | 67,716.4 | Tons |
| **NOx** | 13,507.3 | Tons |
| **PM** | 2,125.1 | Tons |
| **PM10** | 1,593.9 | Tons |
| **PM2.5** | 835.2 | Tons |
| **VOC** | 28.0 | Tons |
| **CO** | 200.2 | Tons |

| **Uncontrolled Potential to Emit (tons/year)** | | |
|---|---|---|
| HAPs | Emission Factor (lb/ton) | Uncontrolled Potential to Emit (ton/yr) |
| Antimony | 1.80E-05 | 7.21E-03 |
| Arsenic | 4.10E-04 | 1.64E-01 |
| Beryllium | 2.10E-05 | 8.41E-03 |
| Cadmium | 5.10E-05 | 2.04E-02 |
| Chromium | 2.60E-04 | 1.04E-01 |
| Chromium (VI) | 7.90E-05 | 3.16E-02 |
| Cobalt | 1.00E-04 | 4.00E-02 |
| Lead | 4.20E-04 | 1.68E-01 |
| Magnesium | 1.10E-02 | 4.40E+00 |
| Manganese | 4.90E-04 | 1.96E-01 |
| Mercury | 8.30E-05 | 3.32E-02 |
| Nickel | 2.80E-04 | 1.12E-01 |
| Selenium | 1.30E-03 | 5.21E-01 |
| HCl | 1.2 | 480.47 |

**Appendix A: Emissions Calculations**
**Potential to Emit - Boilers**
**Source Name:** Indiana-Kentucky Electric Corporation
**Source Location:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Permit Reviewer:** Deena Patton

| | | |
|---|---|---|
| Coal Btu/# value calculated from an SO3 spreadsheet using calculations for 70% eastern/30% PRB blend. | 11245 | Btu/# |
| #/mmBtu | 88.92841263 | #/mmBtu |
| Unit Heat Input Rate (Design) | 1869 | mmBtu/Hr |
| Heat Input Value used for PTE calculations (110% of design) | 2055.9 | mmBtu/Hr |
| Operating Hours/Year | 8760 | |
| Calculated Tons Coal/Year/Unit | 800,786.31 | |
| SO2 permit limit | 7.52 | #/mmBtu |
| PM permit limit | 0.236 | #/mmBtu |
| NOx assumed historical uncontrolled emission rate | 1.5 | #/mmBtu |
| PM10 factor (AP-42 Table 1.1-7 using controlled ratio of PM10 to PM: 0.042/0.056) | 0.75 | |
| PM2.5 factor (AP-42 Table 1.1-7 using controlled ratio of PM2.5 to PM: 0.022/0.056) | 0.393 | |
| VOC FIRE emission factor (SCC 10100101 & 10200210) | 0.07 | #/ton |
| CO AP-42/FIRE emission factor | 0.5 | #/ton |

| Particulate Control | Nox Control | SO2 Control |
|---|---|---|
| ESP Control Efficiency% | SCR Control Efficiency % | FGD Control Efficiency % |
| 98% | 95% | 95% |

| Maximum Potential/Permitted Emissions Per Unit Per Year | | | Controlled Potential to Emit (tons/year) | |
|---|---|---|---|---|
| **SO2** | 67,716.4 | Tons | SO2 | 3385.82059 |
| **NOx** | 13,507.3 | Tons | Nox | 675.36315 |
| **PM** | 2,125.1 | Tons | PM | 42.5028542 |
| **PM10** | 1,593.9 | Tons | PM10 | 31.8771407 |
| **PM2.5** | 835.2 | Tons | PM2.5 | 16.7036217 |
| **VOC** | 28.0 | Tons | VOC | 28.0 |
| **CO** | 200.2 | Tons | CO | 200.2 |

All values below come from the Title V Fee Emissions Report reflecting the 2014 emissions for Clifty Creek and were calculated by the IDEM online reporting tool Emission Inventory Tracking System (EMITS). Along with the data provided for each process (throughput, control efficiency & ash content), EMITS uses for coal the emission factors of 7 lbs/ton for PM, 1.48 lbs/ton for PM2.5, 0.0133 lbs/ton for Lead, and 0.5 lbs/ton for CO; and EMITS uses for oil the emission factors of 3.3 lbs/kgal for PM, 1.55 lbs/kgal for PM2.5, 0.0 lbs/kgal for Lead, and 5 lbs/kgal for CO.

| Process | CO | Nox | PM10 Filterable | PM2.5 Filterable | PM Condensible | SO2 | VOC |
|---|---|---|---|---|---|---|---|
| Clifty Creek Generating Station | 568.5056 | 9132.01 | 212.7493 | 114.1376 | 55.77723 | 3731.041 | 56.76393 |

## Clifty Creek Plant - FGD Emissions Summary

| | PM | PM-10 | PM-2.5 | | PM | PM-10 | PM-2.5 |
|---|---|---|---|---|---|---|---|
| | *ton/yr* | *ton/yr* | *ton/yr* | | *ton/yr* | *ton/yr* | *ton/yr* |
| ***Limestone Handling*** | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| Limestone - Conveying | 4.36 | 2.06 | 0.31 | | 1.37 | 0.65 | 0.10 |
| Limestone Pile Transfers | 1.11 | 0.52 | 0.08 | | 0.74 | 0.35 | 0.05 |
| Limestone Active Storage Pile | 0.77 | 0.39 | 0.06 | | 0.77 | 0.39 | 0.06 |
| Limestone Inactive Storage Pile | 1.11 | 0.56 | 0.08 | | 1.11 | 0.56 | 0.08 |
| ***Total*** | **7.35** | **3.53** | **0.53** | | **3.99** | **1.94** | **0.29** |
| | | | | | | | |
| | **PM** | **PM-10** | **PM-2.5** | | **PM** | **PM-10** | **PM-2.5** |
| ***Limestone Processing*** | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| Limestone Conveying and Crushing | 3.06 | 1.45 | 0.22 | | 0.17 | 0.08 | 0.01 |
| ***Total*** | **3.06** | **1.45** | **0.22** | | **0.17** | **0.08** | **0.01** |
| | | | | | | | |
| | **PM** | **PM-10** | **PM-2.5** | | **PM** | **PM-10** | **PM-2.5** |
| ***Gysum Handling*** | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| Gypsum Transfers | 1.56 | 0.74 | 0.11 | | 0.24 | 0.11 | 0.02 |
| Gypsum Pile Transfers | 0.78 | 0.37 | 0.06 | | 0.78 | 0.37 | 0.06 |
| Gypsum Storage Pile | 0.63 | 0.32 | 0.05 | | 0.63 | 0.32 | 0.05 |
| Gypsum Emergency Storage Pile | 0.17 | 0.08 | 0.01 | | 0.17 | 0.08 | 0.01 |
| ***Total*** | **3.15** | **1.51** | **0.23** | | **1.83** | **0.89** | **0.13** |
| | | | | | | | |
| | **PM** | **PM-10** | **PM-2.5** | | **PM** | **PM-10** | **PM-2.5** |
| ***Landfill*** | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| Gypsum Transfer to Working Face | 0.26 | 0.12 | 0.02 | | 0.26 | 0.12 | 0.02 |
| Gypsum Landfill Wind Erosion (Active Face Potential) | 1.27 | 0.63 | 0.09 | | 0.32 | 0.16 | 0.02 |
| Gypsum Landfill Wind Erosion (Open Cell Potential) | 0.13 | 0.06 | 0.01 | | 0.03 | 0.02 | 2.4E-03 |
| Gypsum Dozier Working on Face | 41.18 | 12.56 | 1.26 | | 2.54 | 0.78 | 0.08 |
| ***Total*** | **42.83** | **13.38** | **1.38** | | **3.15** | **1.07** | **0.12** |
| | | | | | | | |
| | **PM** | **PM-10** | **PM-2.5** | | **PM** | **PM-10** | **PM-2.5** |
| ***Water Treatment Plant*** | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| Sludge Transfer | 3.2E-03 | 1.5E-03 | 2.3E-04 | | 3.2E-03 | 1.5E-03 | 2.3E-04 |
| ***Total*** | **3.2E-03** | **1.5E-03** | **2.3E-04** | | **3.2E-03** | **1.5E-03** | **2.3E-04** |
| | | | | | | | |
| | **PM** | **PM-10** | **PM-2.5** | | **PM** | **PM-10** | **PM-2.5** |
| ***Paved Roads*** | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| Gypsum Trucking Paved Roads | 83.34 | 16.25 | 2.43 | | 8.52 | 1.66 | 0.25 |
| Sludge Trucking Paved | 6.50 | 1.27 | 0.19 | | 0.66 | 0.13 | 0.02 |
| Bulk Chemicals | 0.14 | 0.03 | 4.0E-03 | | 0.01 | 2.7E-03 | 4.0E-04 |
| ***Total*** | **89.98** | **17.54** | **2.62** | | **9.20** | **1.79** | **0.27** |
| | | | | | | | |
| | **PM** | **PM-10** | **PM-2.5** | | **PM** | **PM-10** | **PM-2.5** |
| ***Unpaved Roads*** | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| Gypsum Trucking Landfill Unpaved Roads | 17.27 | 4.79 | 0.48 | | 5.30 | 1.47 | 0.15 |
| Sludge Trucking Unpaved | 1.34 | 0.37 | 0.04 | | 0.41 | 0.11 | 0.01 |
| Limestone Unpaved Roads | 3.37 | 0.69 | 0.07 | | 0.12 | 0.02 | 2.4E-03 |
| ***Total*** | **21.98** | **5.85** | **0.59** | | **5.82** | **1.61** | **0.16** |
| | | | | | | | |
| | **PM** | **PM-10** | **PM-2.5** | | **PM** | **PM-10** | **PM-2.5** |
| | *Uncontrolled* | *Uncontrolled* | *Uncontrolled* | | *Controlled* | *Controlled* | *Controlled* |
| ***Project Total*** | **168.35** | **43.27** | **5.57** | | **24.16** | **7.38** | **0.99** |

Uncontrolled emissions and controlled emissions were calculated based on 8760 hours at 100% capacity of all six boilers burning a 5 lb/mmbtu sulfur coal.

**Appendix A: Emissions Calculations**
**Limestone Transfer Annual Emissions - Conveying Option**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = k * 0.0032 * ( (U / 5) ^ 1.3 / (M/2) ^ 1.4 )

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.74 | for PM |
| | | 0.35 | for PM-10 |
| | | 0.053 | for PM-2.5 |
| U = | mean wind speed, mph = | 8.3 | 2003 LCD For Louisville KY (SDF) Station No. 93821 |
| M = | material moisture content, % = | 5 | |

**Material Transfer Emission Factor =** **1.27E-03** **lb PM/ton Limestone**
**6.00E-04** **lb PM-10/ton Limestone**
**9.09E-05** **lb PM-2.5/ton Limestone**

1,476.00

**TSP/PM10/PM2.5 Emissions Calculation**

Annual emissions based on maximum transfer rates 1,880.00 tons/day 686,200 tons/yr

| Emission Point ID | Transfer Description | | Max Limestone Transferred | Potential Uncontrolled PM Emissions | Potential Uncontrolled PM-10 Emissions | Potential Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [2] | Potential Controlled PM Emission | Potential Controlled PM-10 Emission | Potential Controlled PM-2.5 Emission |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *ton/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| 22 (LH) | Clamshell Bucket into Barge | | 686,200 | 0.44 | 0.21 | 0.03 | None | 0% | 0.44 | 0.21 | 0.03 |
| 23 (LH) | Clamshell Bucket into Reclaim Hopper (RH1) | | 686,200 | 0.44 | 0.21 | 0.03 | Fog Suppression | 55% | 0.20 | 0.09 | 0.01 |
| 23 (LH) | Reclaim Hopper (RH1) ontoVibrating Feeder | | 686,200 | 0.44 | 0.21 | 0.03 | Partial Enlcosure | 50% | 0.22 | 0.10 | 0.02 |
| 23 (LH) | Vibrating Feeder (VF1) onto LS Unloading Belt Conveyor (LU1) | | 686,200 | 0.44 | 0.21 | 0.03 | Fog Suppression | 55% | 0.20 | 0.09 | 0.01 |
| 24 (LH) | LS Unloading Belt Conveyor (LU1) | | 686,200 | 0.44 | 0.21 | 0.03 | 3/4 Conveyor Cover | 50% | 0.22 | 0.10 | 0.02 |
| 39a (LH) | Limestone Unloading Conveyor (LU1) to Limestone Transfer Conveyor (LU2) | | 686,200 | 0.44 | 0.21 | 0.03 | Full Enclosure | 50% | 2.2E-01 | 1.0E-01 | 1.6E-02 |
| 40a (LH) | Limestone Transfer Conveyor (LU2) | | 686,200 | 0.44 | 0.21 | 0.03 | 3/4 Conveyor Cover | 50% | 0.22 | 0.10 | 0.02 |
| 39b (LH) | Limestone Transfer Conveyor (LU2) to Limestone Transfer Conveyor (LU3) | | 686,200 | 0.44 | 0.21 | 0.03 | Full Enclosure | 50% | 2.2E-01 | 1.0E-01 | 1.6E-02 |
| 40b (LH) | Limestone Transfer Conveyor (LU3) | | 686,200 | 0.44 | 0.21 | 0.03 | 3/4 Conveyor Cover | 50% | 0.22 | 0.10 | 0.02 |
| Landfill | Active Storage Pile into Reclaim Drawdown Hopper 1 or 2 | | 686,200 | 0.44 | 0.21 | 0.03 | Full Enclosure | 50% | 2.2E-01 | 1.0E-01 | 0.02 |
| 26 (LP) | Vibratory Drawndown Hopper(DH-1 or DH-2) onto Vibratory Reclaim Feeder (VF-2 or VF-3) | | 686,200 | 0.44 | 0.21 | 0.03 | Enclosed reclaim With Dust Suppression | 50% | 2.2E-01 | 1.0E-01 | 1.6E-02 |
| 26 (LP) | Vibratory Reclaim Feeder (VF-2 or VF-3) onto LS Reclaim Conveyor LR-1. | | 686,200 | 0.44 | 0.21 | 0.03 | Full Enclosure | 50% | 2.2E-01 | 1.0E-01 | 1.6E-02 |
| 28 (LP) | LS Reclaim Conveyor (LR-1) | | 686,200 | 0.44 | 0.21 | 0.03 | 3/4 Conveyor Cover | 50% | 0.22 | 0.10 | 0.02 |
| 8 (LP) | LS Reclaim Conveyor (LR-1) into LS Storage Silo A | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 29 (LP) | LS Reclaim Conveyor (LR-1) onto Silo Transfer Conveyor (LR-3) | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 29 (LP) | Silo Transfer Conveyor (LR-3) | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 29 (LP) | Silo Transfer Conveyor (LR-3) into LS Storage Silo B | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 8 (LP) | LS Storage Silo A onto Feeder A | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 8 (LP) | Feeder A into Wet Ball A | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 8 (LP) | LS Storage Silo B onto Feeder B | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 8 (LP) | Feeder B into Wet Ball B | | 343,100 | 0.22 | 0.10 | 0.02 | Full Enclosure | 50% | 1.1E-01 | 5.1E-02 | 7.8E-03 |
| 27 (LH) | Front End Loader into Emergency Reclaim Hopper | | 10,000 | 0.01 | 3.0E-03 | 4.5E-04 | None | 0% | 6.3E-03 | 3.0E-03 | 4.5E-04 |
| 27 (LP) | Emergency Reclaim Hopper onto Emergency Reclaim Vibrating Feeder | | 10,000 | 0.01 | 3.0E-03 | 4.5E-04 | None | 0% | 6.3E-03 | 3.0E-03 | 4.5E-04 |
| 27 (LP) | Emergency reclaim Vibrating Feeder onto Reclaim Conveyor | | 10,000 | 0.01 | 3.0E-03 | 4.5E-04 | None | 0% | 6.3E-03 | 3.0E-03 | 4.5E-04 |
| | **Conveying Option Transfers Limestone Handling** | **Uncontrolled Potential Emissions** | | **4.36** | **2.06** | **0.31** | **Controlled Potential Emissions** | | **2.36** | **1.11** | **0.17** |
| | **Conveying and Crushing Limestone Processing** | **Uncontrolled Potential Emissions** | | **3.06** | **1.45** | **0.22** | **Controlled Potential Emissions** | | **1.54** | **0.73** | **0.11** |
| Notes: | | | | 7.42 | 3.51 | 0.53 | | | 3.89 | 1.84 | 0.28 |

1. AP-42, Chapter 13.2.4, November 2006.
2. Control Efficiencies based on Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998
   Enclosures - Document states that partial to full enclosures can result in particulate emission reductions ranging from 70% to 99%, study conservatively assume 70% for partial enclosures and 99% for full enclosures.
   Fog Suppression - Document discussed the effect of increased moisture on particulate emissions - conservatively assume that fog suppression increases dust's moisture content by 50% and therefore would achieve a 55% control efficiency.

**Methodology:**

Potential Uncontrolled PM Emissions (ton/yr) = Material Transfer Emission Factor (lb PM/ ton Limestone) * Max Limestone Transferred (ton/yr) * 1 ton/2000 lbs
Potential Uncontrolled PM10 Emissions (ton/yr) = Material Transfer Emission Factor (lb PM10/ ton Limestone) * Max Limestone Transferred (ton/yr) * 1 ton/2000 lbs
Potential Uncontrolled PM12.5 Emissions (ton/yr) = Material Transfer Emission Factor (lb PM2.5/ ton Limestone) * Max Limestone Transferred (ton/yr) * 1 ton/2000 lbs
Potential Controlled PM Emissions (ton/yr) = Potential Uncontrolled PM Emissions (ton/y) * (1- Control Efficiency (%))
Potential Controlled PM10 Emissions (ton/yr) = Potential Uncontrolled PM10 Emissions (ton/y) * (1- Control Efficiency (%))
Potential Controlled PM2.5 Emissions (ton/yr) = Potential Uncontrolled PM2.5 Emissions (ton/y) * (1- Control Efficiency (%))

**Appendix A: Emissions Calculations**
**Limestone Pile Transfer**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = k * 0.0032 * ( (U / 5) ^ 1.3 / (M/2) ^ 1.4 )

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.74 | for PM |
| | | 0.35 | for PM-10 |
| | | 0.053 | for PM-2.5 |
| U = | mean wind speed, mph = | 8.3 | 2003 LCD For Louisville KY (SDF) Station No. 93821 |
| M = | material moisture content, % = | 5 | |

| | | |
|---|---|---|
| **Material Transfer Emission Factor =** | **1.27E-03** | **lb PM/ton Limestone** |
| | **6.00E-04** | **lb PM-10/ton Limestone** |
| | **9.09E-05** | **lb PM-2.5/ton Limestone** |

**TSP/PM10/PM2.5 Emissions Calculation**

Calculations for maximum limestone transfer based on operation
of the FGD's and all six units 8760 hours at 100% rated capacity using 5 lb/mmbtu sulfur coal*
Annual emissions based on maximum transfer rates* 1,880.00 tons/day 686,200 tons/yr For Active Pile
Annual emissions based on 80.4% of the pile being dead storage**
Annual emissions based on one months supply being transferred between piles***

| | Transfer Description | | Max Limestone Transferred | Potential Uncontrolled PM Emissions | Potential Uncontrolled PM-10 Emissions | Potential Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [2] | Potential Controlled PM Emission | Potential Controlled PM-10 Emission | Potential Controlled PM-2.5 Emission |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *ton/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| 25 (LH) | Limestone Transfer Conveyor (LU3) to Active Limestone Storage Pile (Counted in Total LS Pile Emissions)* | | 686,200 | 0.44 | 0.21 | 0.03 | Stacking Tube | 85% | 0.07 | 0.03 | 4.7E-03 |
| 25 (LH) | Active Storage Pile into Front End Loader (Pile Maintenance)** | | 433,147 | 0.27 | 0.13 | 0.02 | None | 0% | 0.27 | 0.13 | 0.02 |
| 25 (LH) | Front End Loader onto Active Storage Pile** | | 433,147 | 0.27 | 0.13 | 0.02 | None | 0% | 0.27 | 0.13 | 0.02 |
| 25 (LH) | Active Storage Pile into Front End Loader *** | | 44,895 | 0.03 | 0.01 | 0.00 | None | 0% | 0.03 | 0.01 | 2.0E-03 |
| 25 (LH) | Front End Loader onto Active Storage Pile*** | | 44,895 | 0.03 | 0.01 | 0.00 | None | 0% | 0.03 | 0.01 | 2.0E-03 |
| Landfill | Active Storage Pile into Front End Loader Emergency | | 10,000 | 0.01 | 0.00 | 0.00 | None | 0% | 0.01 | 3.0E-03 | 4.5E-04 |
| | | | | | | | | | | | |
| 30 (LH) | Front End Loader onto Long Term Storage Pile | | 44,895 | 0.03 | 0.01 | 0.00 | None | 0% | 0.03 | 0.01 | 2.0E-03 |
| 30 (LH) | Long Term Storage Pile into Front End Loader | | 44,895 | 0.03 | 0.01 | 0.00 | None | 0% | 0.03 | 0.01 | 2.0E-03 |
| | **Total** | **Uncontrolled Potential Emissions** | | **1.11** | **0.52** | **0.08** | **Controled Potential Emissions** | | **0.74** | **0.35** | **0.05** |

Notes:
1. AP-42, Chapter 13.2.4, November 2006.
2. Control Efficiencies based on Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998
Enclosures - Document states that partial to full enclosures can result in particulate emission reductions ranging from 70% to 99%, study conservatively assume 70% for partial enclosures and 99% for full enclosures. Here tube is more than a partial enclosure but not a full enclosure and assumed control to be in the middle.

Methodology:
Potential Uncontrolled PM Emissions (ton/yr) = Material Transfer Emission Factor (lb PM/ ton Limestone) * Max Limestone Transferred (ton/yr) * 1 ton/2000 lbs
Potential Uncontrolled PM10 Emissions (ton/yr) = Material Transfer Emission Factor (lb PM10/ ton Limestone) * Max Limestone Transferred (ton/yr) * 1 ton/2000 lbs
Potential Uncontrolled PM12.5 Emissions (ton/yr) = Material Transfer Emission Factor (lb PM2.5/ ton Limestone) * Max Limestone Transferred (ton/yr) * 1 ton/2000 lbs
Potential Controlled PM Emissions (ton/yr) = Potential Uncontrolled PM Emissions (ton/y) * (1- Control Efficiency (%))
Potential Controlled PM10 Emissions (ton/yr) = Potential Uncontrolled PM10 Emissions (ton/y) * (1- Control Efficiency (%))
Potential Controlled PM2.5 Emissions (ton/yr) = Potential Uncontrolled PM2.5 Emissions (ton/y) * (1- Control Efficiency (%))

**Appendix A: Emissions Calculations**
**Unpaved Road Emissions - Limestone Pile Maintenance and Pile Transfer Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation**

EF= k*(s/12)^a*(w/3)^b*((365-p)/365)
k= Particle Size Multiplier= 4.9 for PM
1.5 for PM-10
0.15 for PM-2.5
a= constant= 0.7 for PM
0.9 for PM-10/PM-2.5
s= surface material silt content, %= 1.6 Crushed Limestone (AP-42 Table 13.2.1-1
b= constant= 0.45 For PM/PM-10/PM-2.5
W= average vehicle weight, tons= see Table Below
p= number of days per year with at least .01in of precipitation 126 2004 LCD Louisville, KY (POR: 30 years)

**Control Efficiency (CE) Equation**[2]

CE = 100 - (0.8pdt)/i
p = Potential average hourly daytime evaporation rate (mm/hr) 0.0049*r 0.220500
r = reading from table 45
d = average hr daytime traffic rate (h-1) 1.12
t = time between applications (hr) 3
i = application intensity, (L/$m^2$) 0.1715

CE = 96.54%

| | | |
|---|---|---|
| LS transported between piles | 44895 | assumes one month of limestone transported between piles |
| FE Loader Capacity (tons) | 15.39 | based on 12 cu yd per bucket |
| FE Loader Round Trips per year | 2917 | |
| One Way Distance Pile to Pile (ft) | 200 | |
| One Way Distance Pile to Pile (mi) | 0.04 | |

| Emission Point ID | Maintenance or Transfer Activity | Average Vehicle Weight tons | PM Emission Factor lbs/VMT | PM-10 Emission Factor lbs/VMT | PM-2.5 Emission Factor lbs/VMT | Number of Trips Trips/yr | Total Trip Distance miles | Vehicle Mile Traveled mile/yr | Uncontrolled PM Emissions ton/yr | Uncontrolled PM-10 Emissions ton/yr | Uncontrolled PM-2.5 Emissions ton/yr | Control Method | Control Efficiency % | Controlled PM Emissions ton/yr | Controlled PM-10 Emissions ton/yr | Controlled PM-2.5 Emissions ton/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 (LH) | Active Pile Maintenance | 85.8 | 3.54 | 0.72 | 0.07 | | | 1460 | 2.58 | 0.53 | 0.05 | Watering | 96.54% | 0.09 | 0.02 | 1.8E-03 |
| UPR (LH) | Transport to long term storage pile from active storage pile | 85.8 | 3.54 | 0.72 | 0.07 | 2917 | 0.08 | 221 | 0.39 | 0.08 | 0.01 | Watering | 96.54% | 0.01 | 2.8E-03 | 2.8E-04 |
| UPR (LH) | Transport to active term storage pile from long storage pile | 85.8 | 3.54 | 0.72 | 0.07 | 2917 | 0.08 | 221 | 0.39 | 0.08 | 0.01 | Watering | 96.54% | 0.01 | 2.8E-03 | 2.8E-04 |
| **Landfill** | | | | **Totals** | | **Uncontrolled Potential Emissions** | | | **3.37** | **0.69** | **0.07** | **Controlled Potential Emissions** | | **0.12** | **0.02** | **0.002** |

Notes:
1. AP-42, Chapter 13.2.2, November 2006.
2. Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141, as referenced in Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
3. Control efficiency is conservatively calculated using 2600 operating hours per year.

**Appendix A: Emissions Calculations**
**Limestone Active Stockpile Wind Erosion Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile ($U^+$)[2] *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, (g/m²)* | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 1 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 6 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 7 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 8 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| January | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 10 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 12 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 14 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| January | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 20 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| Landfill | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 22 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 24 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| January | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 28 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 29 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 30 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| January | 31 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 3 | 41 | 0.86 | 0.39 | 2.59 | 1.16 | 3.88 | 1.73 | 0.00 | 0.99 | 37.28 |
| February | 4 | 37 | 0.78 | 0.35 | 2.34 | 1.04 | 3.50 | 1.57 | 0.00 | 0.00 | 22.64 |
| February | 5 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| February | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| February | 7 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 9 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 10 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| February | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 12 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| February | 13 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| February | 14 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 15 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| February | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 17 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 19 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 21 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | 40% of Pile<br>Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, ($g/m^2$)* | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| February | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 23 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| February | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 25 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| February | 26 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 27 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| February | 28 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| March | 1 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 2 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| March | 4 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 5 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 8 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| March | 9 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 13 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 15 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| March | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 17 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 20 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 21 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 22 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| March | 24 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 25 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 28 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 29 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| March | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 31 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 1 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| April | 2 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 3 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 4 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 5 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 6 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 7 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| April | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 9 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 10 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 11 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 12 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| April | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| April | 15 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| April | 16 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| April | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 18 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| April | 19 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| April | 20 | 67 | 1.41 | 0.63 | 4.23 | 1.89 | 6.34 | 2.83 | 0.00 | 53.62 | 213.41 |
| April | 21 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| April | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, ($g/m^2$) 40% of Pile | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| April | 23 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 25 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 26 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| April | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| April | 28 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| April | 29 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 1 | 46 | 0.97 | 0.43 | 2.90 | 1.30 | 4.35 | 1.95 | 0.00 | 6.26 | 60.25 |
| May | 2 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 3 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 5 | 44 | 0.93 | 0.41 | 2.78 | 1.24 | 4.17 | 1.86 | 0.00 | 3.88 | 50.44 |
| May | 6 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| May | 7 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| May | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| May | 9 | 43 | 0.90 | 0.40 | 2.71 | 1.21 | 4.07 | 1.82 | 0.00 | 2.82 | 45.85 |
| May | 10 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| May | 11 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| May | 12 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| May | 13 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 14 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 15 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| May | 19 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 20 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 22 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 25 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| May | 26 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| May | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 31 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| June | 1 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| June | 2 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 3 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 6 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 7 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 8 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| June | 9 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| June | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| June | 11 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| June | 12 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| June | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 14 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 19 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 20 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile $(U^{+})^{2}$ (mph) | Daily[3] $u^* = 0.02xU^{+}_{10}$ (mph) | Daily[3] $u^* = 0.02xU^{+}_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^{+}_{10}$ (mph) | Daily[3] $u^* = 0.06xU^{+}_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^{+}_{10}$ (mph) | Daily[3] $u^* = 0.09xU^{+}_{10}$ (m/s) | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, $(g/m^2)$ 40% of Pile | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| June | 22 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 23 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 24 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 26 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| June | 27 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 28 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 29 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| June | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 1 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| July | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| July | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 6 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| July | 7 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 9 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| July | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| July | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| July | 12 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 13 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 14 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 15 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| July | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 17 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| July | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| July | 21 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| July | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| July | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 24 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| July | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 27 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 28 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 29 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 30 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 31 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 1 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 2 | 45 | 0.95 | 0.42 | 2.84 | 1.27 | 4.26 | 1.90 | 0.00 | 5.02 | 55.24 |
| August | 3 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| August | 4 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| August | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 6 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 8 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| August | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| August | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 12 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| August | 13 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 14 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 15 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 17 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 18 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile<br>Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, ($g/m^2$) | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| August | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 22 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| August | 23 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 24 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| August | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 26 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 27 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 28 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 29 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| August | 30 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 31 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 1 | 40 | 0.84 | 0.38 | 2.52 | 1.13 | 3.79 | 1.69 | 0.00 | 0.21 | 33.31 |
| September | 2 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 3 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 4 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 5 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 9 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 10 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| September | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| September | 14 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| September | 15 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 16 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 17 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| September | 18 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 19 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 20 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 21 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 22 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 25 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 27 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| September | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| September | 29 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 3 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 4 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 6 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| October | 8 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 9 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, (g/m²)* 40% of Pile | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| October | 10 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 11 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 12 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 14 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| October | 15 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 16 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 17 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 19 | 8 | 0.17 | 0.08 | 0.50 | 0.23 | 0.76 | 0.34 | 0.00 | 0.00 | 0.00 |
| October | 20 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 21 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| October | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 23 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 24 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| October | 25 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| October | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 28 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 30 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| October | 31 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 1 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 4 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 6 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| November | 8 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 9 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 10 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 12 | 38 | 0.80 | 0.36 | 2.40 | 1.07 | 3.60 | 1.61 | 0.00 | 0.00 | 25.99 |
| November | 13 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| November | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 15 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 16 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| November | 17 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 18 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 20 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 23 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 24 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 26 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 28 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 29 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| December | 1 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 3 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| December | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| December | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, (g/m $^2$) | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| December | 9 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| December | 10 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 12 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| December | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 15 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 16 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 17 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| December | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| December | 21 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 23 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| December | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 25 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 26 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 27 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 28 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| December | 29 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 30 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| December | 31 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| Threshold wind speed ($u^*$)[5] | 1.12 | m/s | AP-42 Table 13.2.5-2 |
| Convert threshold to equiv fastest mile (mph) | 45.59 | mph | |
| Roughness length ($z_0$)[5] | 0.003 | m | AP-42 Table 13.2.5-2 |
| Measurement anemometer height ($z_a$) | 6.71 | m | 2004 LCD Louisville, KY |
| No. disturbances per day | 1 | | Estimate |
| Percent of area disturbed between events | 100 | % | Conservative |
| Control efficiency | 0 | % | None |

**Limestone Pile Potential TSP/PM10/PM2.5 Emissions (based on 8,760 hours per year)**

| | | |
|---|---|---|
| Height of Pile | 25.82 | m |
| Diameter of Pile | 61.54 | m |
| Surface area of pile [6] | 3,883 | $m^2$ |

| | 40% of Pile | 48% of Pile | 12% of Pile | Total | |
|---|---|---|---|---|---|
| **Uncontrolled TSP Emissions** | **0.00** | **0.19** | **0.58** | **0.77** | **(tons/year)** |
| **Uncontrolled PM-10 Emissions** | **0.00** | **0.09** | **0.29** | **0.39** | **(tons/year)** |
| **Uncontrolled PM-2.5 Emissions** | **0.00** | **0.01** | **0.04** | **0.06** | **(tons/year)** |
| **Controlled TSP Emissions** | **0.00** | **0.19** | **0.58** | **0.77** | **(tons/year)** |
| **Controlled PM-10 Emissions** | **0.00** | **0.09** | **0.29** | **0.39** | **(tons/year)** |
| **Controlled PM-2.5 Emissions** | **0.00** | **0.01** | **0.04** | **0.06** | **(tons/year)** |

1. AP-42, Chapter 13.2.5 Industrial Wind Erosion, November 2006.
2. Maximum daily 5-second wind speed. 2003 Local Climatological Data for Louisville, Kentucky (SDF) (Station No.: 93821).
3. us/ur = 0.2 for 40%, us/ur = 0.6 for 48%, and us/ur = 0.9 for 12% of elevated pile surface area from AP-42, Chp. 13.2.5
4. Equation from AP-42, Chp. 13.2.5 = P = 58 * (u*-u*t)^2 + 25 * (u* - u*t)
5. Assumed uncrusted coal pile similar to limestone pile.
6. Assume storage capacity of 38381 tons.

**Appendix A: Emissions Calculations**
**Limestone Inactive Stockpile Wind Erosion Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile $(U^+)^2$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, $(g/m^2)$ | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 1 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 6 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 7 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 8 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| January | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 10 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 12 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 14 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| January | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 20 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| Landfill | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 22 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 24 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| January | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 28 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 29 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 30 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| January | 31 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 3 | 41 | 0.86 | 0.39 | 2.59 | 1.16 | 3.88 | 1.73 | 0.00 | 0.99 | 37.28 |
| February | 4 | 37 | 0.78 | 0.35 | 2.34 | 1.04 | 3.50 | 1.57 | 0.00 | 0.00 | 22.64 |
| February | 5 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| February | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| February | 7 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 9 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 10 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| February | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 12 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| February | 13 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| February | 14 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 15 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| February | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 17 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 19 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile $(U^{+})^{2}$ *(mph)* | Daily[3] $u^{*} = 0.02xU^{+}_{10}$ *(mph)* | Daily[3] $u^{*} = 0.02xU^{+}_{10}$ *(m/s)* | Daily[3] $u^{*} = 0.06xU^{+}_{10}$ *(mph)* | Daily[3] $u^{*} = 0.06xU^{+}_{10}$ *(m/s)* | Daily[3] $u^{*} = 0.09xU^{+}_{10}$ *(mph)* | Daily[3] $u^{*} = 0.09xU^{+}_{10}$ *(m/s)* | Erosion Potential[4] $P = 58 * (u^{*}-u^{*}_{t})^{2} + 25 * (u^{*} - u^{*}_{t})$ *$Pi, (g/m^{2})$* — 40% of Pile | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| February | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 21 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| February | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 23 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| February | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 25 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| February | 26 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 27 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| February | 28 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| March | 1 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 2 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| March | 4 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 5 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 8 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| March | 9 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 13 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 15 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| March | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 17 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 20 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 21 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 22 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| March | 24 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 25 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 28 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 29 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| March | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 31 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 1 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| April | 2 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 3 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 4 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 5 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 6 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 7 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| April | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 9 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 10 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 11 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 12 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| April | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| April | 15 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| April | 16 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, (g/m²)* | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| April | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 18 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| April | 19 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| April | 20 | 67 | 1.41 | 0.63 | 4.23 | 1.89 | 6.34 | 2.83 | 0.00 | 53.62 | 213.41 |
| April | 21 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| April | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| April | 23 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 25 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 26 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| April | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| April | 28 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| April | 29 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 1 | 46 | 0.97 | 0.43 | 2.90 | 1.30 | 4.35 | 1.95 | 0.00 | 6.26 | 60.25 |
| May | 2 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 3 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 5 | 44 | 0.93 | 0.41 | 2.78 | 1.24 | 4.17 | 1.86 | 0.00 | 3.88 | 50.44 |
| May | 6 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| May | 7 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| May | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| May | 9 | 43 | 0.90 | 0.40 | 2.71 | 1.21 | 4.07 | 1.82 | 0.00 | 2.82 | 45.85 |
| May | 10 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| May | 11 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| May | 12 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| May | 13 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 14 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 15 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| May | 19 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 20 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 22 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 25 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| May | 26 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| May | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 31 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| June | 1 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| June | 2 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 3 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 6 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 7 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 8 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| June | 9 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| June | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| June | 11 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile $(U^+)^2$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, (g/m²)* | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| June | 12 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| June | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 14 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 19 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 20 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 22 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 23 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 24 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 26 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| June | 27 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 28 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 29 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| June | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 1 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| July | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| July | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 6 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| July | 7 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 9 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| July | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| July | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| July | 12 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 13 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 14 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 15 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| July | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 17 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| July | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| July | 21 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| July | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| July | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 24 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| July | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 27 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 28 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 29 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 30 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 31 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 1 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 2 | 45 | 0.95 | 0.42 | 2.84 | 1.27 | 4.26 | 1.90 | 0.00 | 5.02 | 55.24 |
| August | 3 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| August | 4 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| August | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 6 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, ($g/m^2$) | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| August | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 8 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| August | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| August | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 12 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| August | 13 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 14 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 15 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 17 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 18 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 22 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| August | 23 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 24 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| August | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 26 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 27 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 28 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 29 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| August | 30 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 31 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 1 | 40 | 0.84 | 0.38 | 2.52 | 1.13 | 3.79 | 1.69 | 0.00 | 0.21 | 33.31 |
| September | 2 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 3 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 4 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 5 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 9 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 10 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| September | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| September | 14 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| September | 15 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 16 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 17 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| September | 18 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 19 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 20 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 21 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 22 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 25 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 27 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| September | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| September | 29 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, (g/m²)* | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| October | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 3 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 4 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 6 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| October | 8 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 9 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 10 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 11 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 12 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 14 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| October | 15 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 16 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 17 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 19 | 8 | 0.17 | 0.08 | 0.50 | 0.23 | 0.76 | 0.34 | 0.00 | 0.00 | 0.00 |
| October | 20 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 21 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| October | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 23 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 24 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| October | 25 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| October | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 28 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 30 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| October | 31 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 1 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 4 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 6 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| November | 8 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 9 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 10 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 12 | 38 | 0.80 | 0.36 | 2.40 | 1.07 | 3.60 | 1.61 | 0.00 | 0.00 | 25.99 |
| November | 13 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| November | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 15 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 16 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| November | 17 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 18 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 20 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 23 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 24 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 26 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, (g/m²) | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| November | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 28 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 29 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| December | 1 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 3 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| December | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| December | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 9 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| December | 10 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 12 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| December | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 15 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 16 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 17 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| December | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| December | 21 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 23 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| December | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 25 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 26 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 27 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 28 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| December | 29 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 30 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| December | 31 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| | | | | | | | | | 40% of Pile | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | **Day** | **Fastest Mile ($U^+$)**[2] *(mph)* | **Daily**[3] **$u^* = 0.02xU^+_{10}$** *(mph)* | **Daily**[3] **$u^* = 0.02xU^+_{10}$** *(m/s)* | **Daily**[3] **$u^* = 0.06xU^+_{10}$** *(mph)* | **Daily**[3] **$u^* = 0.06xU^+_{10}$** *(m/s)* | **Daily**[3] **$u^* = 0.09xU^+_{10}$** *(mph)* | **Daily**[3] **$u^* = 0.09xU^+_{10}$** *(m/s)* | **Erosion Potential**[4] **$P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$** *Pi, ($g/m^2$)* | | |

| | | | |
|---|---|---|---|
| Threshold wind speed ($u^*$)[5] | 1.12 | m/s | AP-42 Table 13.2.5-2 |
| Convert threshold to equiv fastest mile (mph) | 45.59 | mph | |
| Roughness length ($z_0$)[5] | 0.003 | m | AP-42 Table 13.2.5-2 |
| Measurement anemometer height ($z_a$) | 6.71 | m | 2004 LCD Louisville, KY |
| No. disturbances per day | 1 | | Estimate |
| Percent of area disturbed between events | 100 | % | Conservative |
| Control efficiency | 0 | % | None |

**Limestone Pile Potential TSP/PM10/PM2.5 Emissions (based on 8,760 hours per year)**

Surface area of pile [6] 4,929 $m^2$

| | 36% of Pile | 50% of Pile | 14% of Pile | Total | |
|---|---|---|---|---|---|
| **Uncontrolled PM Emissions** | **0.00** | **0.25** | **0.87** | **1.11** | **(tons/year)** |
| **Uncontrolled PM-10 Emissions** | **0.00** | **0.12** | **0.43** | **0.56** | **(tons/year)** |
| **Uncontrolled PM-2.5 Emissions** | **0.00** | **0.02** | **0.06** | **0.08** | **(tons/year)** |
| | | | | | |
| **Controlled PM Emissions** | **0.00** | **0.25** | **0.87** | **1.11** | **(tons/year)** |
| **Controlled PM-10 Emissions** | **0.00** | **0.12** | **0.43** | **0.56** | **(tons/year)** |
| **Controlled PM-2.5 Emissions** | **0.00** | **0.02** | **0.06** | **0.08** | **(tons/year)** |

1. AP-42, Chapter 13.2.5 Industrial Wind Erosion, November 2006.
2. Maximum daily 5-second wind speed. 2003 Local Climatological Data for Louisville, Kentucky (SDF) (Station No.: 93821).
3. us/ur = 0.2 for 40%, us/ur = 0.6 for 48%, and us/ur = 0.9 for 12% of elevated pile surface area from AP-42, Chp. 13.2.5
4. Equation from AP-42, Chp. 13.2.5 = P = 58 * (u*-u*t)^2 + 25 * (u* - u*t)
5. Assumed uncrusted coal pile similar to limestone pile.
6. Assume storage capacity of 44280 tons.

**Appendix A: Emissions Calculations**
**Gypsum Transfer Annual Emissions - Trucking Option**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = k * 0.0032 * ( (U / 5) ^ 1.3 / (M/2) ^ 1.4 )

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.74 | for PM |
| | | 0.35 | for PM-10 |
| | | 0.053 | for PM-2.5 |
| U = | mean wind speed, mph = | 8.3 | 2004 LCD Louisville, KY (POR: 52 years) |
| M = | material moisture content, % = | 10 | |

**Material Transfer Emission Factor =** **4.81E-04** **lb PM/ton Gypsum**
**2.27E-04** **lb PM-10/ton Gypsum**
**3.44E-05** **lb PM-2.5/ton Gypsum**

**TSP/PM10/PM2.5 Emissions Calculation**

Annual emissions based on maximum transfer rates 123 tons/hr 1,077,480 tons/yr

| Emission Pt ID | Transfer Description | | Max Gypsum Transferred *ton/yr* | Potential Uncontrolled PM Emissions *ton/yr* | Potential Uncontrolled PM-10 Emissions *ton/yr* | Potential Uncontrolled PM-2.5 Emissions *ton/yr* | Control Method | Control Efficiency [2] *%* | Potential Controlled PM Emission *ton/yr* | Potential Controlled PM-10 Emission *ton/yr* | Potential Controlled PM-2.5 Emission *ton/yr* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 (GH) | Belt Filter A or B onto Gypsum Collecting Conveyor | | 1,077,480 | 0.26 | 0.12 | 0.02 | Full Enclosure | 50% | 1.3E-01 | 6.1E-02 | 9.3E-03 |
| 7 (GH) | Gypsum Collecting Conveyor | | 1,077,480 | 0.26 | 0.12 | 0.02 | 3/4 Conveyor Cover | 50% | 0.13 | 0.06 | 9.3E-03 |
| 7 (GH) | Gypsum Collecting Conveyor onto Gypsum Transfer Conveyor | | 1,077,480 | 0.26 | 0.12 | 0.02 | Full Enclosure | 50% | 1.3E-01 | 6.1E-02 | 9.3E-03 |
| 32 (GH) | Gypsum Transfer Conveyor | | 1,077,480 | 0.26 | 0.12 | 0.02 | 3/4 Conveyor Cover | 50% | 0.13 | 0.06 | 9.3E-03 |
| 32 (GH) | Gypsum Transfer Conveyor onto Gypsum Radial Stacker Conveyor | | 1,077,480 | 0.26 | 0.12 | 0.02 | Full Enclosure | 50% | 1.3E-01 | 6.1E-02 | 9.3E-03 |
| 33 (GH) | Gypsum Radial Stacker Conveyor | | 1,077,480 | 0.26 | 0.12 | 0.02 | 3/4 Conveyor Cover | 50% | 0.13 | 0.06 | 9.3E-03 |
| 7 (GH) | Belt Filter A or B onto Emergency Gypsum Collecting Conveyor | | 10,000 | 2.4E-03 | 1.1E-03 | 1.7E-04 | Full Enclosure | 50% | 1.2E-03 | 5.7E-04 | 8.6E-05 |
| 7 (GH) | Emergency Collecting Conveyor | | 10,000 | 2.4E-03 | 1.1E-03 | 1.7E-04 | 3/4 Conveyor Cover | 50% | 1.2E-03 | 5.7E-04 | 8.6E-05 |
| 31 (GH) | Emergency Collecting Conveyor onto Emergency Stock-out Conveyor | | 10,000 | 2.4E-03 | 1.1E-03 | 1.7E-04 | Full Enclosure | 50% | 1.2E-03 | 5.7E-04 | 8.6E-05 |
| Landfill | Emergency Stock-out Conveyor | | 10,000 | 2.4E-03 | 1.1E-03 | 1.7E-04 | 3/4 Conveyor Cover | 50% | 1.2E-03 | 5.7E-04 | 8.6E-05 |
| | **Total** | **Uncontrolled Potential Emissions** | | **1.56** | **0.74** | **0.11** | **Controlled Potential Emissions** | | **0.78** | **0.37** | **0.06** |

Notes:
1. AP-42, Chapter 13.2.4, November 2006.
2. Control Efficiencies based on Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998
Enclosures - Document states that partial to full enclosures can result in particulate emission reductions ranging from 70% to 99%, study conservatively assume 70% for partial enclosures and 99% for full enclosures.

**Appendix A: Emissions Calculations**
**Gypsum Pile Transfer Annual Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = k * 0.0032 * ( (U / 5) ^ 1.3 / (M/2) ^ 1.4 )

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.74 | for PM |
| | | 0.35 | for PM-10 |
| | | 0.053 | for PM-2.5 |
| U = | mean wind speed, mph = | 8.3 | 2004 LCD Louisville, KY (POR: 52 years) |
| M = | material moisture content, % = | 10 | |

**Material Transfer Emission Factor =** **4.81E-04** **lb PM/ton Gypsum**
**2.27E-04** **lb PM-10/ton Gypsum**
**3.44E-05** **lb PM-2.5/ton Gypsum**

**TSP/PM10/PM2.5 Emissions Calculation**

Annual emissions based on maximum transfer rates 123 tons/hr 1,077,480 tons/yr

| Emission Point ID | Transfer Description | | Max Gypsum Transferred | Potential Uncontrolled PM Emissions | Potential Uncontrolled PM-10 Emissions | Potential Uncontrolled PM-2.5 Emissions | Control Measures | Control Efficiency | Controlled Emissions PM | Controlled Emissions PM10 | Controlled Emissions PM2.5 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | *TPY* | *TPY* | *TPY* |
| 34 (GH) | Gypsum Radial Stacker Conveyor onto Stockpile | | 1,077,480 | 0.26 | 0.12 | 0.02 | None | 0% | 0.26 | 0.12 | 1.9E-02 |
| 34 (GH) | Stockpile into Front-End loader | | 1,077,480 | 0.26 | 0.12 | 0.02 | None | 0% | 0.26 | 0.12 | 1.9E-02 |
| 34 (GH) | Front-End Loader onto Truck | | 1,077,480 | 0.26 | 0.12 | 0.02 | None | 0% | 0.26 | 0.12 | 1.9E-02 |
| 34 (GH) | Emergency Stock-out Conveyor onto Emergency Stock-out Pile | | 10,000 | 2.4E-03 | 1.1E-03 | 1.7E-04 | None | 0% | 2.4E-03 | 1.1E-03 | 1.7E-04 |
| 34 (GH) | Stockpile into Front-End loader | | 10,000 | 2.4E-03 | 1.1E-03 | 1.7E-04 | None | 0% | 2.4E-03 | 1.1E-03 | 1.7E-04 |
| 34 (GH) | Front-End Loader onto Truck | | 10,000 | 2.4E-03 | 1.1E-03 | 1.7E-04 | None | 0% | 2.4E-03 | 1.1E-03 | 1.7E-04 |
| | **Total** | **Uncontrolled Potential Emissions** | | **0.78** | **0.37** | **0.06** | **Controlled Potential Emiss** | | **0.78** | **0.37** | **5.6E-02** |

1. AP-42, Chapter 13.2.4, November 2006.
Landfill

**Appendix A: Emissions Calculations**
**Gypsum Stockpile Wind Erosion Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile $(U^+)^2$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 36% of Pile | 50% of Pile | 14% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ $Pi, (g/m^2)$ | | |
| January | 1 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 6 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 7 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 8 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| January | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 10 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 12 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 14 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| January | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 20 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| Landfill | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 22 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 24 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| January | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 28 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 29 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 30 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| January | 31 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 3 | 41 | 0.86 | 0.39 | 2.59 | 1.16 | 3.88 | 1.73 | 0.00 | 0.99 | 37.28 |
| February | 4 | 37 | 0.78 | 0.35 | 2.34 | 1.04 | 3.50 | 1.57 | 0.00 | 0.00 | 22.64 |
| February | 5 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| February | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| February | 7 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 9 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 10 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| February | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 12 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| February | 13 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| February | 14 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 15 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| February | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 17 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 19 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 21 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| February | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 23 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| February | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 25 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile $(U^+)^2$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | 36% of Pile<br>Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, (g/m²)* | 50% of Pile | 14% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| February | 26 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 27 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| February | 28 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| March | 1 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 2 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| March | 4 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 5 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 8 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| March | 9 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 13 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 15 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| March | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 17 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 20 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 21 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 22 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| March | 24 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 25 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 28 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 29 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| March | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 31 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 1 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| April | 2 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 3 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 4 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 5 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 6 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 7 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| April | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 9 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 10 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 11 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 12 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| April | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| April | 15 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| April | 16 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| April | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 18 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| April | 19 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| April | 20 | 67 | 1.41 | 0.63 | 4.23 | 1.89 | 6.34 | 2.83 | 0.00 | 53.62 | 213.41 |
| April | 21 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| April | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| April | 23 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 25 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 26 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| April | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| April | 28 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| April | 29 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, $(g/m^2)$* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 36% of Pile | 50% of Pile | 14% of Pile |
| May | 1 | 46 | 0.97 | 0.43 | 2.90 | 1.30 | 4.35 | 1.95 | 0.00 | 6.26 | 60.25 |
| May | 2 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 3 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 5 | 44 | 0.93 | 0.41 | 2.78 | 1.24 | 4.17 | 1.86 | 0.00 | 3.88 | 50.44 |
| May | 6 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| May | 7 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| May | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| May | 9 | 43 | 0.90 | 0.40 | 2.71 | 1.21 | 4.07 | 1.82 | 0.00 | 2.82 | 45.85 |
| May | 10 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| May | 11 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| May | 12 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| May | 13 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 14 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 15 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| May | 19 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 20 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 22 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 25 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| May | 26 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| May | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 31 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| June | 1 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| June | 2 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 3 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 6 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 7 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 8 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| June | 9 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| June | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| June | 11 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| June | 12 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| June | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 14 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 19 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 20 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 22 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 23 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 24 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 26 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| June | 27 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 28 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 29 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| June | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 1 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile $(U^+)^2$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, (g/m²)* 36% of Pile | 50% of Pile | 14% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| July | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 6 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| July | 7 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 9 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| July | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| July | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| July | 12 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 13 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 14 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 15 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| July | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 17 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| July | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| July | 21 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| July | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| July | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 24 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| July | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 27 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 28 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 29 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 30 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 31 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 1 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 2 | 45 | 0.95 | 0.42 | 2.84 | 1.27 | 4.26 | 1.90 | 0.00 | 5.02 | 55.24 |
| August | 3 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| August | 4 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| August | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 6 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 8 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| August | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| August | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 12 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| August | 13 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 14 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 15 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 17 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 18 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 22 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| August | 23 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 24 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| August | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 26 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 27 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 28 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 29 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| August | 30 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 31 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 1 | 40 | 0.84 | 0.38 | 2.52 | 1.13 | 3.79 | 1.69 | 0.00 | 0.21 | 33.31 |
| September | 2 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 3 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 4 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 5 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile $(U^+)^2$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | 36% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, $(g/m^2)$* | 50% of Pile | 14% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| September | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 9 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 10 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| September | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| September | 14 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| September | 15 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 16 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 17 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| September | 18 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 19 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 20 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 21 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 22 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 25 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 27 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| September | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| September | 29 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 3 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 4 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 6 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| October | 8 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 9 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 10 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 11 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 12 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 14 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| October | 15 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 16 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 17 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 19 | 8 | 0.17 | 0.08 | 0.50 | 0.23 | 0.76 | 0.34 | 0.00 | 0.00 | 0.00 |
| October | 20 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 21 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| October | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 23 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 24 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| October | 25 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| October | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 28 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 30 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| October | 31 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 1 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 4 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 6 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| November | 8 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile $(U^+)^2$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 36% of Pile Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, $(g/m^2)$ | 50% of Pile | 14% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| November | 9 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 10 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 12 | 38 | 0.80 | 0.36 | 2.40 | 1.07 | 3.60 | 1.61 | 0.00 | 0.00 | 25.99 |
| November | 13 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| November | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 15 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 16 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| November | 17 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 18 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 20 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 23 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 24 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 26 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 28 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 29 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile $(U^+)^2$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 36% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, $(g/m^2)$ | 50% of Pile | 14% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| December | 1 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 3 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| December | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| December | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 9 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| December | 10 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 12 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| December | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 15 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 16 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 17 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| December | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| December | 21 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 23 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| December | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 25 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 26 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 27 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 28 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| December | 29 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 30 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| December | 31 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| Threshold wind speed $(u^*)^5$ | 1.12 | m/s | AP-42 Table 13.2.5-2 |
| Convert threshold to equiv fastest mile (mph) | 45.59 | mph | |
| Roughness length $(z_0)^5$ | 0.003 | m | AP-42 Table 13.2.5-2 |
| Measurement anemometer height $(z_a)$ | 6.71 | m | 2004 LCD Louisville, KY |
| No. disturbances per day | 1 | | Estimate |
| Percent of area disturbed between events | 100 | % | Conservative |
| Control efficiency | 0 | % | None |

**Gypsum Pile Potential TSP/PM10/PM2.5 Emissions (based on 8,760 hours per year)**

Surface area of 2,805 $m^2$

| | 36% of Pile | 50% of Pile | 14% of Pile | Total | |
|---|---|---|---|---|---|
| **Uncontrolled TSP Emissions** | **0.00** | **0.14** | **0.49** | **0.63** | **(tons/year)** |
| **Uncontrolled PM-10 Emissions** | **0.00** | **0.07** | **0.25** | **0.32** | **(tons/year)** |
| **Uncontrolled PM-2.5 Emissions** | **0.00** | **0.01** | **0.04** | **0.05** | **(tons/year)** |
| **Controlled TSP Emissions** | **0.00** | **0.14** | **0.49** | **0.63** | **(tons/year)** |
| **Controlled PM-10 Emissions** | **0.00** | **0.07** | **0.25** | **0.32** | **(tons/year)** |
| **Controlled PM-2.5 Emissions** | **0.00** | **0.01** | **0.04** | **0.05** | **(tons/year)** |

1. AP-42, Chapter 13.2.5 Industrial Wind Erosion, November 2006.
2. Maximum daily 5-second wind speed. 2003 Local Climatological Data for Louisville, Kentucky (SDF) (Station No.: 93821).
3. us/ur = 0.2 for 36%, us/ur = 0.6 for 50%, and us/ur = 0.9 for 14% of elevated pile surface area from AP-42, Chp. 13.2.5
4. Equation from AP-42, Chp. 13.2.5 = P = 58 * (u*-u*t)^2 + 25 * (u* - u*t)
5. Assumed uncrusted coal pile similar to limestone pile.

**Appendix A: Emissions Calculations**
**Gypsum Emergency Wind Erosion Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile $(U^{+})^{2}$ (mph) | Daily[3] $u^* = 0.02xU^{+}_{10}$ (mph) | Daily[3] $u^* = 0.02xU^{+}_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^{+}_{10}$ (mph) | Daily[3] $u^* = 0.06xU^{+}_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^{+}_{10}$ (mph) | Daily[3] $u^* = 0.09xU^{+}_{10}$ (m/s) | 40% of Pile: Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ $Pi, (g/m^2)$ | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 1 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 6 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 7 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 8 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| January | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 10 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| January | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| January | 12 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 14 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| January | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| January | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| January | 20 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| Landfill | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 22 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| January | 24 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| January | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| January | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| January | 28 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| January | 29 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| January | 30 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| January | 31 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 3 | 41 | 0.86 | 0.39 | 2.59 | 1.16 | 3.88 | 1.73 | 0.00 | 0.99 | 37.28 |
| February | 4 | 37 | 0.78 | 0.35 | 2.34 | 1.04 | 3.50 | 1.57 | 0.00 | 0.00 | 22.64 |
| February | 5 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| February | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| February | 7 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 9 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 10 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| February | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 12 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| February | 13 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| February | 14 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 15 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| February | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| February | 17 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| February | 19 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| February | 21 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| February | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| February | 23 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| February | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| February | 25 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| February | 26 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| February | 27 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| February | 28 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| March | 1 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 2 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| March | 4 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, ($g/m^2$) 40% of Pile | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| March | 5 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 8 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| March | 9 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| March | 13 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 15 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| March | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 17 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| March | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| March | 19 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 20 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 21 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| March | 22 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| March | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| March | 24 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 25 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| March | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| March | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| March | 28 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| March | 29 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| March | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| March | 31 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 1 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| April | 2 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 3 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 4 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 5 | 48 | 1.01 | 0.45 | 3.03 | 1.35 | 4.54 | 2.03 | 0.00 | 9.02 | 70.89 |
| April | 6 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 7 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| April | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 9 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 10 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| April | 11 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 12 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| April | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| April | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| April | 15 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| April | 16 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| April | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 18 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| April | 19 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| April | 20 | 67 | 1.41 | 0.63 | 4.23 | 1.89 | 6.34 | 2.83 | 0.00 | 53.62 | 213.41 |
| April | 21 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| April | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| April | 23 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| April | 25 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| April | 26 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| April | 27 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| April | 28 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| April | 29 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| April | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 1 | 46 | 0.97 | 0.43 | 2.90 | 1.30 | 4.35 | 1.95 | 0.00 | 6.26 | 60.25 |
| May | 2 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 3 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 5 | 44 | 0.93 | 0.41 | 2.78 | 1.24 | 4.17 | 1.86 | 0.00 | 3.88 | 50.44 |
| May | 6 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| May | 7 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| May | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| May | 9 | 43 | 0.90 | 0.40 | 2.71 | 1.21 | 4.07 | 1.82 | 0.00 | 2.82 | 45.85 |
| May | 10 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| May | 11 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| May | 12 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| May | 13 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile $(U^+)^2$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile: Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, $(g/m^2)$ | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| May | 14 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 15 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 16 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 17 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| May | 19 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 20 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 22 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| May | 23 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| May | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 25 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| May | 26 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| May | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| May | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| May | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| May | 30 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| May | 31 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| June | 1 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| June | 2 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 3 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 6 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 7 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 8 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| June | 9 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| June | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| June | 11 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| June | 12 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| June | 13 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 14 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 15 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 16 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| June | 17 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 18 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 19 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| June | 20 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| June | 21 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| June | 22 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 23 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 24 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| June | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 26 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| June | 27 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| June | 28 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| June | 29 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| June | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 1 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 2 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 3 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| July | 4 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| July | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 6 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| July | 7 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 8 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 9 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| July | 10 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| July | 11 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| July | 12 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| July | 13 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 14 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 15 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| July | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 17 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| July | 18 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| July | 21 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| July | 22 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile $(U^+)^2$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.02xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.06xU^+_{10}$ *(m/s)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(mph)* | Daily[3] $u^* = 0.09xU^+_{10}$ *(m/s)* | Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ *Pi, $(g/m^2)$* — 40% of Pile | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| July | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| July | 24 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| July | 25 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| July | 26 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| July | 27 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 28 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| July | 29 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| July | 30 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| July | 31 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 1 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| August | 2 | 45 | 0.95 | 0.42 | 2.84 | 1.27 | 4.26 | 1.90 | 0.00 | 5.02 | 55.24 |
| August | 3 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| August | 4 | 28 | 0.59 | 0.26 | 1.77 | 0.79 | 2.65 | 1.18 | 0.00 | 0.00 | 1.86 |
| August | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 6 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 8 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 9 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| August | 10 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| August | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 12 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| August | 13 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 14 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| August | 15 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 16 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 17 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 18 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| August | 19 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 20 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 22 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| August | 23 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 24 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| August | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 26 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| August | 27 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| August | 28 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| August | 29 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| August | 30 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| August | 31 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 1 | 40 | 0.84 | 0.38 | 2.52 | 1.13 | 3.79 | 1.69 | 0.00 | 0.21 | 33.31 |
| September | 2 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 3 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 4 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 5 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 6 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 7 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 8 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 9 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 10 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| September | 11 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| September | 12 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| September | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| September | 14 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| September | 15 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 16 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 17 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| September | 18 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 19 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 20 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| September | 21 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| September | 22 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| September | 23 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| September | 24 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 25 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| September | 27 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| September | 28 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| September | 29 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| September | 30 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation**[1]

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile — Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, ($g/m^2$) | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| October | 1 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 3 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 4 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 5 | 21 | 0.44 | 0.20 | 1.33 | 0.59 | 1.99 | 0.89 | 0.00 | 0.00 | 0.00 |
| October | 6 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| October | 8 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 9 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 10 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 11 | 10 | 0.21 | 0.09 | 0.63 | 0.28 | 0.95 | 0.42 | 0.00 | 0.00 | 0.00 |
| October | 12 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 14 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| October | 15 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| October | 16 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 17 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 18 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 19 | 8 | 0.17 | 0.08 | 0.50 | 0.23 | 0.76 | 0.34 | 0.00 | 0.00 | 0.00 |
| October | 20 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 21 | 26 | 0.55 | 0.24 | 1.64 | 0.73 | 2.46 | 1.10 | 0.00 | 0.00 | 0.00 |
| October | 22 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| October | 23 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| October | 24 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| October | 25 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| October | 26 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 27 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| October | 28 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| October | 29 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| October | 30 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| October | 31 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 1 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 2 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 3 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 4 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 5 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 6 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| November | 7 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| November | 8 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 9 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 10 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| November | 12 | 38 | 0.80 | 0.36 | 2.40 | 1.07 | 3.60 | 1.61 | 0.00 | 0.00 | 25.99 |
| November | 13 | 36 | 0.76 | 0.34 | 2.27 | 1.02 | 3.41 | 1.52 | 0.00 | 0.00 | 19.50 |
| November | 14 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| November | 15 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 16 | 14 | 0.29 | 0.13 | 0.88 | 0.39 | 1.33 | 0.59 | 0.00 | 0.00 | 0.00 |
| November | 17 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 18 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 20 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| November | 21 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| November | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 23 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 24 | 30 | 0.63 | 0.28 | 1.89 | 0.85 | 2.84 | 1.27 | 0.00 | 0.00 | 5.02 |
| November | 25 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |

**Emission Factor Calculation[1]**

| Month | Day | Fastest Mile ($U^+$)[2] (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (mph) | Daily[3] $u^* = 0.02xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.06xU^+_{10}$ (mph) | Daily[3] $u^* = 0.06xU^+_{10}$ (m/s) | Daily[3] $u^* = 0.09xU^+_{10}$ (mph) | Daily[3] $u^* = 0.09xU^+_{10}$ (m/s) | 40% of Pile Erosion Potential[4] $P = 58 * (u^*-u^*_t)^2 + 25 * (u^* - u^*_t)$ Pi, ($g/m^2$) | 48% of Pile | 12% of Pile |
|---|---|---|---|---|---|---|---|---|---|---|---|
| November | 26 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| November | 27 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| November | 28 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| November | 29 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| November | 30 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| December | 1 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 2 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 3 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 4 | 15 | 0.32 | 0.14 | 0.95 | 0.42 | 1.42 | 0.63 | 0.00 | 0.00 | 0.00 |
| December | 5 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 6 | 23 | 0.48 | 0.22 | 1.45 | 0.65 | 2.18 | 0.97 | 0.00 | 0.00 | 0.00 |
| December | 7 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 8 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 9 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |
| December | 10 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 11 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 12 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 13 | 16 | 0.34 | 0.15 | 1.01 | 0.45 | 1.51 | 0.68 | 0.00 | 0.00 | 0.00 |
| December | 14 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 15 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 16 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 17 | 25 | 0.53 | 0.24 | 1.58 | 0.71 | 2.37 | 1.06 | 0.00 | 0.00 | 0.00 |
| December | 18 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 19 | 29 | 0.61 | 0.27 | 1.83 | 0.82 | 2.75 | 1.23 | 0.00 | 0.00 | 3.34 |
| December | 20 | 13 | 0.27 | 0.12 | 0.82 | 0.37 | 1.23 | 0.55 | 0.00 | 0.00 | 0.00 |
| December | 21 | 24 | 0.50 | 0.23 | 1.51 | 0.68 | 2.27 | 1.02 | 0.00 | 0.00 | 0.00 |
| December | 22 | 22 | 0.46 | 0.21 | 1.39 | 0.62 | 2.08 | 0.93 | 0.00 | 0.00 | 0.00 |
| December | 23 | 32 | 0.67 | 0.30 | 2.02 | 0.90 | 3.03 | 1.35 | 0.00 | 0.00 | 9.02 |
| December | 24 | 18 | 0.38 | 0.17 | 1.14 | 0.51 | 1.70 | 0.76 | 0.00 | 0.00 | 0.00 |
| December | 25 | 17 | 0.36 | 0.16 | 1.07 | 0.48 | 1.61 | 0.72 | 0.00 | 0.00 | 0.00 |
| December | 26 | 9 | 0.19 | 0.08 | 0.57 | 0.25 | 0.85 | 0.38 | 0.00 | 0.00 | 0.00 |
| December | 27 | 12 | 0.25 | 0.11 | 0.76 | 0.34 | 1.14 | 0.51 | 0.00 | 0.00 | 0.00 |
| December | 28 | 31 | 0.65 | 0.29 | 1.96 | 0.87 | 2.93 | 1.31 | 0.00 | 0.00 | 6.92 |
| December | 29 | 33 | 0.69 | 0.31 | 2.08 | 0.93 | 3.12 | 1.40 | 0.00 | 0.00 | 11.33 |
| December | 30 | 35 | 0.74 | 0.33 | 2.21 | 0.99 | 3.31 | 1.48 | 0.00 | 0.00 | 16.57 |
| December | 31 | 20 | 0.42 | 0.19 | 1.26 | 0.56 | 1.89 | 0.85 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| Threshold wind speed ($u^*$)[5] | 1.12 | m/s | AP-42 Table 13.2.5-2 |
| Convert threshold to equiv fastest mile (mph) | 45.59 | mph | |
| Roughness length ($z_0$)[5] | 0.003 | m | AP-42 Table 13.2.5-2 |
| Measurement anemometer height ($z_a$) | 6.71 | m | 2004 LCD Louisville, KY |
| No. disturbances per day | 1 | | Estimate |
| Percent of area disturbed between events | 100 | % | Conservative |
| Control efficiency | 0 | % | None |

**Limestone Pile Potential TSP/PM10/PM2.5 Emissions (based on 8,760 hours per year)**

| | | |
|---|---|---|
| Height of Pile | 22.06 | m |
| Diameter of Pile | 21.77 | m |
| Surface area of pile [6] | 841 | $m^2$ |

| | 40% of Pile | 48% of Pile | 12% of Pile | Total | |
|---|---|---|---|---|---|
| **Uncontrolled PM Emissions** | **0.00** | **0.04** | **0.13** | **0.17** | **(tons/year)** |
| **Uncontrolled PM-10 Emissions** | **0.00** | **0.02** | **0.06** | **0.08** | **(tons/year)** |
| **Uncontrolled PM-2.5 Emissions** | **0.00** | **3.0E-03** | **0.01** | **0.01** | **(tons/year)** |
| | | | | | |
| **Controlled PM Emissions** | **0.00** | **0.04** | **0.13** | **0.17** | **(tons/year)** |
| **Controlled PM-10 Emissions** | **0.00** | **0.02** | **0.06** | **0.08** | **(tons/year)** |
| **Controlled PM-2.5 Emissions** | **0.00** | **3.0E-03** | **0.01** | **0.01** | **(tons/year)** |

1. AP-42, Chapter 13.2.5 Industrial Wind Erosion, November 2006.
2. Maximum daily 5-second wind speed. 2003 Local Climatological Data for Louisville, Kentucky (SDF) (Station No.: 93821).
3. us/ur = 0.2 for 40%, us/ur = 0.6 for 48%, and us/ur = 0.9 for 12% of elevated pile surface area from AP-42, Chp. 13.2.5
4. Equation from AP-42, Chp. 13.2.5 = P = 58 * (u*-u*t)^2 + 25 * (u* - u*t)
5. Assumed uncrusted coal pile similar to limestone pile.
6. Assume storage capacity of 2900 tons.

**Appendix A: Emissions Calculations**
**Paved Roads Emissions - Trucking Option**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = [k * (sL / 2) ^ 0.65 * (W / 3) ^ 1.5 - C] * (1-P/4N)

k = Particle size multiplier = 0.082 for PM
0.016 for PM-10
0.0024 for PM-2.5

sL = Silt loading ($g/m^2$) = 0.282 Field Sampling 9/28/2007

W = Vehicle weight (tons) = see Table below

P = number of days during the averaging period with at least 0.01 in of precipitation = 126 2004 LCD Louisville, KY (POR: 30 years)

N = number of days in the averaging period = 365

C = factor for exhaust, brake wear, and tire wear = 0.00047 for PM/PM-10 (lb/VMT)
0.00036 for PM-2.5 (lb/VMT)

**Control Efficiency (CE) Equation[2]**

**Watering Roadway**

CE = 100 - (0.8pdt)/i

p = Potential average hourly daytime evaporation rate (mm/hr) 0.0049*r 0.220500

r = reading from table 45

d = average hr daytime traffic rate (h-1) 9.94

t = time between applications (hr) 1

i = application intensity, ($L/m^2$) 0.1715

CE = 89.78%

| | |
|---|---|
| Gypsum Transported (tons) | 1,077,480 |
| Truck Capacity (tons) | 45.4 |
| Empty Truck Weight (tons) | 43.32 |
| Average Vehicle Weight | 66.02 |
| Round Trips Per Year | 23,733 |
| Round Trip Distance | 3.25 |

**TSP/PM10/PM2.5 Emissions Calculation**

| Vehicle Traffic | Average Vehicle Weight | PM Emission Factor | PM-10 Emission Factor | PM-2.5 Emission Factor | Number of Trips | Total Trip Distance | Vehicle Mile Traveled | Uncontrolled TSP Emissions | Uncontrolled PM-10 Emissions | Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [(2)] | Controlled PM Emissions | Controlled PM-10 Emissions | Controlled PM-2.5 Emissions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *tons* | *lbs/VMT* | *lbs/VMT* | *lbs/VMT* | *trips/yr* | *miles* | *mile/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| Round Trip from Gypsum Pile to Entrance of Landfill | 66.0 | 2.16 | 0.42 | 0.06 | 23,733 | 3.25 | 77,020 | 83.34 | 16.25 | 2.43 | Watering | 89.78% | 8.52 | 1.66 | 0.25 |
| **Landfill** | | | | | **Uncontrolled Emissions (tons/yr)** | | | 83.34 | 16.25 | 2.43 | **Controlled Emissions (tons/yr)** | | 8.52 | 1.66 | 0.25 |

Notes:
1. AP-42, Chapter 13.2.1 Paved Roads, November 2006.
2. Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141, as referenced in Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
3. Control efficiency is conservatively calculated using 2600 operating hours per year and maximum truck runs of 25840 for gypsum hauling.

**Appendix A: Emissions Calculations**
**Landfill Unpaved Road Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation**[1]

| | | | |
|---|---|---|---|
| EF = | k * (s/12)^a * (W/3)^b * ((365-p)/365) | | |
| k = | Particle size multiplier = | 4.9 | for PM |
| | | 1.5 | for PM10 |
| | | 0.15 | for PM-2.5 |
| a = | constant = | 0.7 | for PM |
| | | 0.9 | for PM-10/PM-2.5 |
| s = | surface material silt content, % = | 7.4 | Field Sampling 9/29/2007 |
| b = | constant = | 0.45 | for PM/PM-10/PM-2.5 |
| W = | average vehicle weight, tons = | see Table below | |
| p = | number of days per year with at least 0.01 in of precipitation | 126 | 2004 LCD Louisville, KY (POR: 30 years) |

**Control Efficiency (CE) Equation**[2]

| | | | |
|---|---|---|---|
| CE = | 100 - (0.8pdt)/i | | |
| p = | Potential average hourly daytime evaporation rate (mm/hr) | 0.0049*r | 0.220500 |
| r = | reading from table | 45 | |
| d = | average hr daytime traffic rate (h-1) | 9.94 | |
| t = | time between applications (hr) | 3 | |
| i = | application intensity, (L/m$^2$) | 0.1715 | |
| CE = | 69.33% | | |

| | | |
|---|---|---|
| Gypsum Disposal per Year (tons) | 1,077,480 | tpy gypsum and tpy purge stream solid disposal |
| Truck Load (tons) | 45.4 | |
| Trips per year | 23,733 | |
| Round Trip Distance (ft) | 840 | |
| Round Trip Distance (miles) | 0.16 | |

**TSP/PM10/PM2.5 Emissions Calculation**

| Vehicle Traffic | Average Vehicle Weight | PM Emission Factor | PM-10 Emission Factor | PM-2.5 Emission Factor | Number of Trips | Total Trip Distance | Vehicle Mile Traveled | Uncontrolled PM Emissions | Uncontrolled PM-10 Emissions | Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [2] | Controlled PM Emissions | Controlled PM-10 Emissions | Controlled PM-2.5 Emissions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *tons* | *lbs/VMT* | *lbs/VMT* | *lbs/VMT* | *trips/yr* | *miles* | *mile/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| RT on Unpaved Roads | 66.0 | 9.15 | 2.54 | 0.25 | 23,733 | 0.16 | 3,776 | 17.27 | 4.79 | 0.48 | Watering | 69.33% | 5.30 | 1.47 | 0.15 |
| | | | | | **Uncontrolled Emissions (tons/yr)** | | | 17.27 | 4.79 | 0.48 | **Controlled Emissions (tons/yr)** | | 5.30 | 1.47 | 0.15 |
| | | | | | **Max. Hourly Emission Rate (lb/hr)** [3] | | | 9.5 | 2.6 | 0.3 | **Max. Hourly ER (lb/hr)** [3] | | 2.9 | 0.8 | 0.1 |

Notes:
Landfill
2. Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141, as referenced in Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
3. Assumed operating hours per year 3650
4. Control efficiency is conservatively calculated using 2600 operating hours per year and maximum truck runs of 25840 for gypsum hauling.

**Appendix A: Emissions Calculations**
**Landfill Transfer to Working Face**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation**[1]

EF (lb/ton) = k * 0.0032 * ( (U / 5) ^ 1.3 / (M/2) ^ 1.4 )

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.74 | for PM |
| | | 0.35 | for PM-10 |
| | | 0.053 | for PM-2.5 |
| U = | mean wind speed, mph = | 8.3 | 2003 Louisville, Ky NCDC 2003 |
| M = | material moisture content, % = | 10 | |

| | | |
|---|---|---|
| **Material Transfer Emission Factor =** | **4.81E-04** | **lb PM/ton Gypsum** |
| | **2.27E-04** | **lb PM-10/ton Gypsum** |
| | **3.44E-05** | **lb PM-2.5/ton Gypsum** |

**TSP/PM10/PM2.5 Emissions Calculation**

Annual emissions based on maximum transfer rates 1,077,480 tpy gypsum and tpy purge stream solid disposal

| Transfer Description | Max Gypsum Transferred | Potential Uncontrolled PM Emissions | Potential Uncontrolled PM-10 Emissions | Potential Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency | Controlled PM Emission | Controlled PM-10 Emission | Controlled PM-2.5 Emission |
|---|---|---|---|---|---|---|---|---|---|
| | *ton/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| Transfer to Working Face | 1,077,480 | 0.26 | 0.12 | 0.02 | None | 0 | 0.26 | 0.12 | 0.02 |
| **Uncontrolled Emissions (tons/yr)** | | 0.26 | 0.12 | 0.02 | **Controlled Emissions (tons/yr)** | | 0.26 | 0.12 | 0.02 |
| **Max. Hourly Emission Rate (lb/hr)** [(2)] | | 0.8 | 0.4 | 0.1 | **Max. Hourly ER (lb/hr)** [(3)] | | 0.8 | 0.4 | 0.1 |

Notes:
1. AP-42, Chapter 13.2.4, November 2006.
2. 18400 trips per year, 2 min. per unload 613 operating hrs
Landfill

**Appendix A: Emissions Calculations**
**Landfill Wind Erosion**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Wind Erosion** **From AP-42 S**

Emission Factor Calculation1

| Month (yr) | Fastest Mile2 (mph) | Monthly3 u* (mph) | Monthly4 u* (m/s) | Erosion Potential5 Pi, (g/m2) | |
|---|---|---|---|---|---|
| Jan | 38 | 2.12 | 0.95 | -2.59 | |
| Feb | 44 | 2.45 | 1.10 | -0.56 | |
| Mar | 43 | 2.40 | 1.07 | -1.07 | |
| Apr | 56 | 3.12 | 1.40 | 11.29 | |
| May | 40 | 2.23 | 1.00 | 0.00 | less than friction velocity |
| Jun | 54 | 3.01 | 1.35 | 0.00 | less than friction velocity |
| Jul | 46 | 2.56 | 1.15 | 0.70 | |
| Aug | 47 | 2.62 | 1.17 | 1.43 | |
| Sep | 39 | 2.17 | 0.97 | 0.00 | less than friction velocity |
| Oct | 40 | 2.23 | 1.00 | 0.00 | less than friction velocity |
| Nov | 44 | 2.45 | 1.10 | -0.56 | |
| Dec | 40 | 2.23 | 1.00 | -2.20 | |

| | | | |
|---|---|---|---|
| Threshold friction velocity (ut)6 | 1.12 | m/s | AP-42 Table 13.2.5-2 |
| Convert threshold to equivalent fastest mile (mph) | 44.94 | mph | |
| Roughness height (zo)6 | 0.003 | m | AP-42 Table 13.2.5-2 |
| Measurement anemometer height (za)2 | 6.71 | m | LCD 2004 Louisville KY |

**Active Face Potential Emissions:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Surface Area of Pile | 8094 | m^2 | 2 | acres | 4046.86 | m^2 per acre | |
| Landfill No. disturbances per month | 22 | | Estimate | working days per month | | | |
| Percentage of area disturbed between events | 100 | % | Estimate | | | | |

| | Potential Emissions | | Controlled Emissions | | Control Efficiency | |
|---|---|---|---|---|---|---|
| | *g/yr* | *tpy* | *tpy* | *lb/hr* | *%* | *method* |
| **PM** | 574,697.45 | 0.63 | 0.16 | 0.036126 | 75% | Watering |
| **PM10** | 1,149,394.90 | 1.27 | 0.32 | 0.0722519 | 75% | Watering |
| **PM2.5** | 86,204.62 | 0.09 | 0.02 | 0.0054189 | 75% | Watering |

**Open Cell Potential Emissions:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Surface Area of Pile | 72843 | m^2 | 18 | acres | 4046.86 | m^2 per acre |
| No. disturbances per month | 0.25 | | Estimate | | | |
| Percentage of area disturbed between events | 100 | % | Estimate | | | |

| | Potential Emissions | | Controlled Emissions | | Control Efficiency | |
|---|---|---|---|---|---|---|
| | *g/yr* | *tpy* | *tpy* | *lb/hr* | *%* | *method* |
| **PM** | 58,775.88 | 0.06 | 0.02 | 0.0036947 | 75% | Watering |
| **PM10** | 117,551.75 | 0.13 | 0.03 | 0.0073894 | 75% | Watering |
| **PM2.5** | 8,816.38 | 0.01 | 0.0024 | 0.0005542 | 75% | Watering |

**Total Wind Erosion Emissions:**

| | | | | | |
|---|---|---|---|---|---|
| Uncontrolled PM Emissions | 1.40 | tons/year | Controlled PM Emissions | 0.35 | tons/year |
| Uncontrolled PM10 Emissions | 0.70 | tons/year | Controlled PM10 Emissions | 0.17 | tons/year |
| Uncontrolled PM2.5 Emissions | 0.10 | tons/year | Controlled PM2.5 Emissions | 0.03 | tons/year |
| Uncontrolled PM Emissions | 0.32 | lb/hr | Controlled PM Emissions | 0.08 | lb/hr |
| Uncontrolled PM10 Emissions | 0.16 | lb/hr | Controlled PM10 Emissions | 0.04 | lb/hr |
| Uncontrolled PM2.5 Emissions | 0.02 | lb/hr | Controlled PM2.5 Emissions | 0.01 | lb/hr |

Notes:
1. AP-42, Chapter 13.2.5 Industrial Wind Erosion, November 2006
2. Data from Pittsburgh 1990 LCD, anemometer height
3. Equation from AP-42, Chapter 13.2.5 - u10+ = u(za)*((ln(10/zo))/ln(za/zo)) eq. 5 correct fastest mile to height of 10m
4. Equation from AP-42, Chapter 13.2.5 - u* = 0.053*u10+ eq. 4 friction velocity
5. Equation from AP-42, Chapter 13.2.5 - P = 58*(u*-ut*)^2 + 25*(u*-ut*)
6. Assumed uncrusted coal pile similar to gypsum and wastewater piles.

Working area - Material is moist and watering as necessary, precautionary measures, 75% from Title V application
Open area - Material is compacted and flat, precautionary measures, 75% from Title V Application
Assume operating hours for wind erosion are 8760

**Appendix A: Emissions Calculations**
**Landfill Working on Face**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation**[1]

| | | | | |
|---|---|---|---|---|
| EF = | k * (s/12)^a * (W/3)^b * ((365-p)/365) | | | |
| k = | Particle size multiplier = | 4.9 | for PM | |
| | | 1.5 | for PM10 | |
| | | 0.15 | for PM-2.5 | |
| a = | constant = | 0.7 | for PM | |
| | | 0.9 | for PM-10/PM-2.5 | |
| s = | surface material silt content, % = | 11.8 | Field Sampling 9/29/2007 | |
| b = | constant = | 0.45 | for PM/PM-10/PM-2.5 | |
| W = | average vehicle weight, tons = | see Table below | | |
| p = | number of days per year with at least 0.01 in of precipitation | | | 126 |

**Control Efficiency (CE) Equation**[2]

| | | | |
|---|---|---|---|
| CE = | 100 - (0.8pdt)/i | | |
| p = | Potential average hourly daytime evaporation rate (mm/hr) | 0.0049*r | 0.220500 |
| r = | reading from table | 45 | |
| d = | average hr daytime traffic rate (h-1) | 2.00 | |
| t = | time between applications (hr) | 3 | |
| i = | application intensity, (L/m$^2$) | 0.1715 | |
| CE = | 93.83% | | |

2004 LCD Louisville, KY (POR: 30 years)

| | | |
|---|---|---|
| Bulldozer daily use (hrs) | 10 | |
| Days per year | 260 | 5 days per week, 52 weeks per year |
| Ave speed (mph) | 2 | |
| Annual VMT | 5,200 | |

**TSP/PM10/PM2.5 Emissions Calculation**

| Vehicle Traffic | Average Vehicle Weight | PM Emission Factor | PM-10 Emission Factor | PM-2.5 Emission Factor | Vehicle Mile Traveled | Uncontrolled PM Emissions | Uncontrolled PM-10 Emissions | Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [2] | Controlled PM Emissions | Controlled PM-10 Emissions | Controlled PM-2.5 Emissions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *tons* | *lbs/VMT* | *lbs/VMT* | *lbs/VMT* | *mile/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| Bulldozer on Working Face | 107.0 | 15.84 | 4.83 | 0.48 | 5,200 | 41.18 | 12.56 | 1.26 | Watering | 93.83% | 2.54 | 0.78 | 0.08 |
| | | | **Uncontrolled Emissions (tons/yr)** | | | 41.18 | 12.56 | 1.26 | **Controlled Emissions (tons/yr)** | | 2.54 | 0.78 | 0.08 |
| **Landfill** | | | **Max. Hourly Emission Rate (lb/hr)** [(3)] | | | 31.7 | 9.7 | 1.0 | **Max. Hourly ER (lb/hr)** [(3)] | | 2.0 | 0.6 | 0.1 |

Notes:
1. AP-42, Chapter 13.2.2 Unpaved Roads, November 2006.
2. Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141, as referenced in Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
3. Assumed operating hours per year 2600
Ave. vehicle wt from MT "tractor" weight

**Appendix A: Emissions Calculations**
**Paved Road Emissions - Trucking Chemicals On-Site**

| | |
|---|---|
| **Company Name:** | Indiana-Kentucky Electric Corporation |
| **Source Address:** | 1335 Clifty Hollow Road, Madison, IN 47250 |
| **Permit Number:** | T077-36338-00001 |
| **Reviewer:** | Deena Patton |

**Emission Factor (EF) Equation[1]**

| | | | | |
|---|---|---|---|---|
| EF (lb/ton) = | [k * (sL / 2) ^ 0.65 * (W / 3) ^ 1.5 - C] * (1-P/4N) | | | |
| k = | Particle size multiplier = | 0.082 | for PM | |
| | | 0.016 | for PM10 | |
| | | 0.0024 | for PM-2.5 | |
| sL = | Silt loading ($g/m^2$) = | 0.282 | Field Sampling 9/29/2007 | |
| W = | Vehicle weight (tons) = | see Table below | | |
| P = | number of days during the averaging period with at least 0.01 in of precipitation = | 126 | | 2004 LCD Louisville, KY (POR: 30 years) |
| N = | number of days in the averaging period = | 365 | | |
| C = | factor for exhaust, brake wear, and tire wear = | 0.00047 | for PM/PM-10 (lb/VMT) | |
| | | 0.00036 | for PM-2.5 (lb/VMT) | |

**Control Efficiency (CE) Equation[2]**

| | | | |
|---|---|---|---|
| CE = | 100 - (0.8pdt)/i | | |
| p = | Potential average hourly daytime evaporation rate (mm/hr) | 0.0049*r | 0.220500 |
| r = | reading from table | 45 | |
| d = | average hr daytime traffic rate (h-1) | 9.94 | |
| t = | time between applications (hr) | 1 | |
| i = | application intensity, ($L/m^2$) | 0.1715 | |
| CE = | 89.78% | | |

**Chemicals Delivery**

| | |
|---|---|
| Transported (tons) | 6,800 |
| Truck Capacity (tons) | 25 |
| Round Trips Per Year | 272 |
| Empty Vehicle Weight (tons) | 15 |
| Full Vehicle Weight (tons) | 40 |
| One-way Distance (mi) | 0.87 |

**TSP/PM10/PM2.5 Emissions Calculation [2]**

| Figure 6-3 ID | Vehicle Traffic | Average Vehicle Weight | PM Emission Factor | PM-10 Emission Factor | PM-2.5 Emission Factor | Number of Trips[2] | Total Trip Distance | Vehicle Mile Traveled | Uncontrolled PM Emissions | Uncontrolled PM-10 Emissions | Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [(3)] | Controlled PM Emissions | Controlled PM-10 Emissions | Controlled PM-2.5 Emissions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *tons* | *lbs/VMT* | *lbs/VMT* | *lbs/VMT* | *trips/yr* | *miles* | *mile/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| | Chemicals | 27.5 | 0.58 | 0.11 | 0.02 | 272 | 1.74 | 474 | 0.14 | 0.03 | 4.0E-03 | Watering | 89.78% | 0.01 | 2.7E-03 | 4.0E-04 |
| | | | | | **Total** | **Uncontrolled Emissions (tons/yr)** | | | 0.14 | 0.03 | 4.0E-03 | **Controlled Emissions (tons/yr)** | | 0.01 | 2.7E-03 | 4.0E-04 |

1. AP-42, Chapter 13.2.1 Paved Roads, November 2006.
2. Based on 100% capacity factor and maximum hourly reagent injection rate.
3. Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141, as referenced in Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
4. Control efficiency is conservatively calculated using 2600 operating hours per year and maximum truck runs of 25840 for gypsum hauling.

**Appendix A: Emissions Calculations**
**WWTP Sludge Transfer Annual Emissions - Trucking Option**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = k * 0.0032 * ( (U / 5) ^ 1.3 / (M/2) ^ 1.4 )

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.74 | for PM |
| | | 0.35 | for PM-10 |
| | | 0.053 | for PM-2.5 |
| U = | mean wind speed, mph = | 8.3 | 2004 LCD Louisville, KY (POR: 52 years) |
| M = | material moisture content, % = | 60 | |

| | | |
|---|---|---|
| **Material Transfer Emission Factor =** | **3.91E-05** | **lb PM/ton Sludge** |
| | **1.85E-05** | **lb PM-10/ton Sludge** |
| | **2.80E-06** | **lb PM-2.5/ton Sludge** |

**TSP/PM10/PM2.5 Emissions Calculation**

Annual emissions based on maximum transfer rates 227 tons/day 83,000 tons/yr

| Fig 4-3 ID | Transfer Description | | Max Sludge Transferred | Potential Uncontrolled PM Emissions | Potential Uncontrolled PM-10 Emissions | Potential Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency | Potential Controlled PM Emission | Potential Controlled PM-10 Emission | Potential Controlled PM-2.5 Emission |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *ton/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| 1 | Stockpile to Front-End Loaders | | 83,000 | 0.0016 | 0.0008 | 0.0001 | None | 0% | 0.0016 | 0.0008 | 0.0001 |
| 2 | Load-In to Dump Truck at Facility | | 83,000 | 0.0016 | 0.0008 | 0.0001 | None | 0% | 0.0016 | 0.0008 | 0.0001 |
| | **Trucking Option Transfers** | **Uncontrolled Potential Emissions** | | **0.0032** | **0.0015** | **0.0002** | **Controlled Potential Emissions** | | **0.0032** | **0.0015** | **0.0002** |

Notes:
1. AP-42, Chapter 13.2.4, November 2006.
Landfill

**Appendix A: Emissions Calculations**
**Paved Road Emissions - Sludge**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = [k * (sL / 2) ^ 0.65 * (W / 3) ^ 1.5 - C] * (1-P/4N)

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.082 | for PM |
| | | 0.016 | for PM-10 |
| | | 0.0024 | for PM-2.5 |
| sL = | Silt loading (g/m$^2$) = | 0.282 | Field Sampling 9/29/2007 |
| W = | Vehicle weight (tons) = | see Table below | |
| P = | number of days during the averaging period with at least 0.01 in of precipitation = | 126 | 2004 LCD Louisville, KY (POR: 30 years) |
| N = | number of days in the averaging period = | 365 | |
| C = | factor for exhaust, brake wear, and tire wear = | 0.00047 | for PM/PM-10 (lb/VMT) |
| | | 0.00036 | for PM-2.5 (lb/VMT) |

**Control Efficiency (CE) Equation[2]**

CE = 100 - (0.8pdt)/i

| | | | |
|---|---|---|---|
| p = | Potential average hourly daytime evaporation rate (mm/hr) | 0.0049*r | 0.220500 |
| r = | reading from table | 45 | |
| d = | average hr daytime traffic rate (h-1) | 9.94 | |
| t = | time between applications (hr) | 1 | |
| i = | application intensity, (L/m$^2$) | 0.1715 | |
| CE = | 89.78% | | |

| | |
|---|---|
| Sludge Transported (tons) | 83,000 |
| Truck Capacity (tons) | 45.40 |
| Empty Truck Weight (tons) | 43.32 |
| Average Vehicle Weight | 66.02 |
| Round Trips Per Year | 1,828 |
| Round Trip Distance | 3.28 |

**TSP/PM10/PM2.5 Emissions Calculation**

| Vehicle Traffic | Average Vehicle Weight | PM Emission Factor | PM-10 Emission Factor | PM-2.5 Emission Factor | Number of Trips | Total Trip Distance | Vehicle Mile Traveled | Uncontrolled PM Emissions | Uncontrolled PM-10 Emissions | Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [(2)] | Controlled PM Emissions | Controlled PM-10 Emissions | Controlled PM-2.5 Emissions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *tons* | *lbs/VMT* | *lbs/VMT* | *lbs/VMT* | *trips/yr* | *miles* | *mile/yr* | *ton/yr* | *ton/yr* | *ton/yr* | | *%* | *ton/yr* | *ton/yr* | *ton/yr* |
| Round Trip from WWTP Sludge Pile to Entrance of Landfill | 66.0 | 2.16 | 0.42 | 0.06 | 1,828 | 3.28 | 6,002 | 6.50 | 1.27 | 0.19 | Watering | 89.78% | 0.66 | 0.13 | 0.02 |
| **Landfill** | | | | **Total** | **Uncontrolled Emissions (tons/yr)** | | | 6.50 | 1.27 | 0.19 | **Controlled Emissions (tons/yr)** | | 0.66 | 0.13 | 0.02 |

Notes:
1. AP-42, Chapter 13.2.1 Paved Roads, November 2006.
2. Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141, as referenced in Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
3. Control efficiency is conservatively calculated using 2600 operating hours per year and maximum truck runs of 25840 for gypsum hauling.

**Appendix A: Emissions Calculations**
**Sludge Trucking Unpaved Roads to Landfill**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF = k * (s/12)^a * (W/3)^b * ((365-p)/365)

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 4.9 | for PM |
| | | 1.5 | for PM10 |
| | | 0.15 | for PM-2.5 |
| a = | constant = | 0.7 | for PM |
| | | 0.9 | for PM-10/PM-2.5 |
| s = | surface material silt content, % = | 7.4 | Field Sampling 9/29/2007 |
| b = | constant = | 0.45 | for PM/PM-10/PM-2.5 |
| W = | average vehicle weight, tons = | see Table below | |
| p = | #days/yr w/at least 0.01 in of precipitation | 126 | 2004 LCD Louisville, KY (POR: 30 years) |

**Control Efficiency (CE) Equation[2]**

CE = 100 - (0.8pdt)/i

| | | | |
|---|---|---|---|
| p = | Potential average hourly daytime evaporation rate (mm/hr) | 0.0049*r | 0.220500 |
| r = | reading from table | 45 | |
| d = | average hr daytime traffic rate (h-1) | 9.94 | |
| t = | time between applications (hr) | 3 | |
| i = | application intensity, (L/m$^2$) | 0.1715 | |

CE = 69.33%

| | | |
|---|---|---|
| Gypsum Disposal/Yr (tons | 83,300 | tpy gypsum and tpy purge stream solid disposal |
| Truck Load (tons) | 45.4 | |
| Trips per year | 1,835 | |
| Round Trip Distance (ft) | 840 | |
| Round Trip Distance (mi) | 0.16 | |

**TSP/PM10/PM2.5 Emissions Calculation**

| Vehicle Traffic | Average Vehicle Weight | PM Emission Factor | PM-10 Emission Factor | PM-2.5 Emission Factor | Number of Trips | Total Trip Distance | Vehicle Mile Traveled | Uncontrolled PM Emissions | Uncontrolled PM-10 Emissions | Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [2] | Controlled PM Emissions | Controlled PM-10 Emissions | Controlled PM-2.5 Emissions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | tons | lbs/VMT | lbs/VMT | lbs/VMT | trips/yr | miles | mile/yr | ton/yr | ton/yr | ton/yr | | % | ton/yr | ton/yr | ton/yr |
| RT on Unpaved | 66.0 | 9.15 | 2.54 | 0.25 | 1,835 | 0.16 | 292 | 1.34 | 0.37 | 0.04 | Watering | 69.33% | 0.41 | 0.11 | 0.01 |
| | | | | | **Uncontrolled Emissions (tons/yr)** | | | 1.34 | 0.37 | 0.04 | **Controlled Emissions (tons/yr)** | | 0.41 | 0.11 | 0.01 |
| | | | | | **Max. Hourly Emission Rate (lb/hr) [(3)]** | | | 0.7 | 0.2 | 2.0E-02 | **Max. Hourly ER (lb/hr) [(3)]** | | 0.2 | 0.1 | 6.2E-03 |

Notes:
Landfill
2. Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141, as referenced in Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
3. Assumed operating hours per year 3650
4. Control efficiency is conservatively calculated using 2600 operating hours per year and maximum truck runs of 25840 for gypsum hauling.

**Appendix A: Emissions Calculations**
**Four (4) No. 2 fuel oil coal transfer station heaters**
**#1 and #2 Fuel Oil**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

| Emisison Units | MMBtu/hr |
|---|---|
| Station 2 | 1.25 |
| Station 5 | 1.75 |
| Station B3 | 2.75 |
| Station B4 | 2.75 |
| Total | 8.5 |

| Heat Input Capacity MMBtu/hr | Potential Throughput kgals/year | S = Weight % Sulfur |
|---|---|---|
| 8.5 | 531.86 | 0.5 |

| | Pollutant | | | | | | |
|---|---|---|---|---|---|---|---|
| | PM* | PM10 | direct PM2.5 | SO2 | NOx | VOC | CO |
| Emission Factor in lb/kgal | 2.0 | 2.3 | 1.6 | 71 *(142S)* | 24.0 | 0.20 | 5.0 |
| Potential Emission in tons/yr | 0.5 | 0.6 | 0.4 | 18.9 | 6.4 | 0.1 | 1.3 |

**Methodology**
1 gallon of No. 2 Fuel Oil has a heating value of 140,000 Btu
Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MMBtu
Emission Factors are from AP 42, Tables 1.3-1, 1.3-2, 1.3-3, and 1.3-6 (SCC 1-02-005-01/02/03) Supplement E 9/98
*PM emission factor is filterable PM only. Condensable PM emission factor is 1.3 lb/kgal.
Note to Reviewer: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).
Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton

**Hazardous Air Pollutants (HAPs)**

| | HAPs - Metals | | | | |
|---|---|---|---|---|---|
| | Arsenic | Beryllium | Cadmium | Chromium | Lead |
| Emission Factor in lb/mmBtu | 4.0E-06 | 3.0E-06 | 3.0E-06 | 3.0E-06 | 9.0E-06 |
| Potential Emission in tons/yr | 1.5E-04 | 1.1E-04 | 1.1E-04 | 1.1E-04 | 3.4E-04 |

| | HAPs - Metals (continued) | | | |
|---|---|---|---|---|
| | Mercury | Manganese | Nickel | Selenium |
| Emission Factor in lb/mmBtu | 3.0E-06 | 6.0E-06 | 3.0E-06 | 1.5E-05 |
| Potential Emission in tons/yr | 1.1E-04 | 2.2E-04 | 1.1E-04 | 5.6E-04 |

| | | |
|---|---|---|
| **Combined HAPs:** | **1.82E-03** | |
| **Worst Single HAP:** | **5.6E-04** | **Selenium** |

**Methodology**
No data was available in AP-42 for organic HAPs.
Potential Emissions (tons/year) = Potential Throughput (MMBtu/hr)*Emission Factor (lb/MMBtu)*8,760 hrs/yr / 2,000 lb/ton

**Appendix A: Emissions Calculations**
**Pneumatic Delivery Truck Unloading Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Pneumatic Delivery Truck Unloading Emissions**

| Description (Units of Measure) | Trona Data |
|---|---|
| Storage Silo Bin Vent Filter (Baghouse) Emission Factor (gr/dscf) | 0.01 |
| Storage Silo Bin Vent Rate (cfm) | 1950 |
| Truck Unloading Time (hr) | 1 |
| No. Truck Unloads (1/yr) | 950 |

**Controlled Emissions (tpy) =** (0.01 gr/dscf) * (lb/7000gr) * (tons/2000lb) * (1950 cf/min) * (60min/hr) * (hr/TU) * (950TU/yr) = 0.0794 tpy
**Uncontrolled Emissions (tpy) =** Controlled Emissions / 0.01 = 7.94 tpy

Notes:
TU = Number of Truck Unloads
Based on 99.9% baghouse efficiency

**Appendix A: Emissions Calculations**
**Dry Sorbent Injection System**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Dry Sorbent Injection System (TR)**

| Emission Unit | PM (tons/yr) | PM10 (tons/yr) | PM2.5 (tons/yr) | $SO_2$ (tons/yr) | VOC (tons/yr) | CO (tons/yr) | NOx (tons/yr) |
|---|---|---|---|---|---|---|---|
| East Trona Storage Silo 13 [1] | 4.76 | 4.76 | 4.76 | 0.00 | 0.00 | 0.00 | 0.00 |
| West Trona Storage Silo 45 [2] | 3.18 | 3.18 | 3.18 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fugitive [3] | 0.15 | 0.03 | 0.0042 | 0.00 | 0.00 | 0.00 | 0.00 |
| **TOTAL** | **8.09** | **7.97** | **7.94** | **0.00** | **0.00** | **0.00** | **0.00** |

Notes:
1. East Dry Sorbent Storage Silo 13 has PTE 60% (dry sorbent injected into 3/5 ducts)
2. West Dry Sorbent Storage Silo 45 has PTE 40% (dry sorbent injected into 2/5 ducts)
3. Fugitive emissions from 950 truck loads per year

**Appendix A: Emissions Calculations**
**Trona Paved Road Emissions**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Paved Road Emissions - Trona**

| | |
|---|---|
| Trona Transported (tons) | 24,700 |
| Truck Capacity (tons) | 26 |
| Empty Truck Wt (tons) | 14 |
| Avg Vehicle Wt | 27 |
| Round Trips / Yr | 950 |
| Round Trip Distance | 0.55 |

Emission Factor (EF) Equation [1]

EF (lb/ton) = [ k * (sL/2) ^ 0.65 * (W/3) ^ 1.5 - C] * (1-P/4N)

| | | |
|---|---|---|
| k = | 0.082 | particle size multiplier for TSP |
| | 0.016 | particle size multiplier for $PM_{10}$ |
| | 0.0024 | particle size multiplier for $PM_{2.5}$ |
| sL = | 0.282 [4] | silt loading ($g/m^2$) |
| W = | 27 | vehicle weight (tons) |
| P = | 126 | # days during averaging period with at least 0.01 in of precipitation (2004 LCD Louisville, KY (POR: 30 yrs)) |
| N = | 365 | # days in averaging period |
| C = | 0.00047 | factor for exhaust, brake wear, and tire wear for TSP/$PM_{10}$ (lb/VMT) |
| | 0.00036 | factor for exhaust, brake wear, and tire wear for $PM_{2.5}$ (lb/VMT) [3] |

Control Efficiency Equation [2]

| | | |
|---|---|---|
| CE = | 100-(0.8*p*d*t/i) | 89.78% |
| p = | 0.0049*r = 0.2205 | potential avg hourly daytime evaporation rate (mm/hr) |
| r = | 45 | reading from table |
| d = | 9.94 | avg hr daytime traffic rate (h-1) |
| t = | 1 | time between applications (hr) |
| i = | 0.1715 | application intensity ($L/m^2$) |

**Uncontrolled Emissions Calculations**

| TSP EF (lbs/VMT) | $PM_{10}$ EF | $PM_{2.5}$ EF | Vehicle | **TSP (tons/yr)** | **$PM_{10}$ (tons/yr)** | **$PM_{2.5}$ (tons/yr)** |
|---|---|---|---|---|---|---|
| 0.57 | 0.11 | 0.02 | 522 | **0.15** | **0.03** | **0.0042** |

**Controlled Emissions Calculations**

| Control Method | Control Eff [2] | **TSP (tons/yr)** | **$PM_{10}$ (tons/yr)** | **$PM_{2.5}$ (tons/yr)** |
|---|---|---|---|---|
| watering / flushing | 89.78% | **0.0151** | **0.0029** | **0.0004** |

Notes:
1. AP-42, Chapter 13.2.1 Paved Roads, November 2006
2. Water Flushing based on Air Pollution Control Manual, 1992, Air & Waste Management Assoc. p. 141,
   as referenced in Technical Background Documenton Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998.
3. Revised $PM_{2.5}$ EF per AP-42, Chapter 13.2.1, November 2006
4. Field sampling at plant site performed on 09/29/2007 by OCS Environmental

**Appendix A: Emissions Calculations**
**Dry Fly Ash Particulate Potential to Emit**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

* Calculations submitted by IKEC and approved by IDEM.

| | | | |
|---|---|---|---|
| Between 2008 and 2015 the single highest annual coal consumption was 2008 at | 4393213 | tons | based on the Production Reports |
| To be conservative the annual coal consumption will be | 5000000 | tons | for the calculations |
| From the annual emissions reports 2015 had the highest ash content at | 8.34 | % | |
| To be conservative the ash content of the coal will be set at | 10 | % | for the calculations |
| The tons per year (Cell U2) * the ash content (Cell U4) produces a value of XXX tons ash per year | 500000 | tons | total ash |
| Based on operational data the flyash/boiler slag split is 85/15. I.E. for each ton of ash 85% will be flyash | | | |
| Using this 85/15 split the flyash generated will be Cell U6 * 0.85 | 425000 | tons | Flyash |
| Dividing by 8760 operating hours per year (24/7/365) gives a value of | 48.51598174 | tons/hour | Flyash production |

All of the flyash produced will pass through the flyash handling system.
The value in Cell U10 will be used in fugitive dust calculations

| Emission Process | Tons Flyash per Year | Uncontrolled PM Emission Factor (lb/ton) | Uncontrolled PM10 Emission Factor (lb/ton) | Uncontrolled PM2.5 Emission Factor (lb/ton) | Control Efficiency (%) | Uncontrolled Potential to Emit PM (lb/year) | Uncontrolled Potential to Emit PM10 (lb/year) | Uncontrolled Potential to Emit PM2.5 (lb/year) |
|---|---|---|---|---|---|---|---|---|
| Pneumatic Conveyance to Main Silos | 425000 | 0.2 | 0.1 | 0.1 | 99% | 85000.00 | 42500.00 | 42500.00 |
| Rotary and Dry Unloaders | 425000 | | | | 95% | 85000.00 | 42500.00 | 42500.00 |
| Truck Bins pneumatic conveyance to silos | 425000 | | | | 99% | 85000.00 | 42500.00 | 42500.00 |
| Truck Bins rotary unloaders | 425000 | | | | 95% | 85000.00 | 42500.00 | 42500.00 |

Emission Factors from SCC 3-05-006-07 AP 42 Emission factor for cement raw material unloading
Pneumatic Conveyance control efficiency equals 99%
The rotary unloaders operate within an enclosed area with spray curtains keeping the fly ash wet.

| Emission Process | Uncontrolled Potential to Emit PM (tons/yr) | Uncontrolled Potential to Emit PM10 (tons/yr) | Uncontrolled Potential to Emit PM2.5 (tons/year) | Controlled Potential to Emit PM (tons/year) | Controlled Potential to Emit PM10 (tons/year) | Controlled Potential to Emit PM2.5 (tons/year) |
|---|---|---|---|---|---|---|
| Pneumatic Conveyance to Main Silos | 42.5 | 21.25 | 21.25 | 0.425 | 0.2125 | 0.2125 |
| Rotary and Dry Unloaders | 42.5 | 21.25 | 21.25 | 2.125 | 1.0625 | 1.0625 |
| Truck Bins pneumatic conveyance to silos | 42.5 | 21.25 | 21.25 | 0.425 | 0.2125 | 0.2125 |
| Truck Bins rotary unloaders | 42.5 | 21.25 | 21.25 | 2.125 | 1.0625 | 1.0625 |
| **Total** | **170** | **85** | **85** | **5.1** | **2.55** | **2.55** |

Methodlogy:
Uncontrolled Potential to Emit PM (lb/year) = Tons Fly ash per year * Uncontrolled PM Emission Factor (lb/ton)
Uncontrolled Potential to Emit PM10 (lb/year) = Tons Fly ash per year * Uncontrolled PM10 Emission Factor (lb/ton)
Uncontrolled Potential to Emit PM2.5 (lb/year) = Tons Fly ash per year * Uncontrolled PM2.5 Emission Factor (lb/ton)

Uncontrolled Potential to Emit PM (tons/year) = Uncontrolled Potential to Emit PM (lb/year) * 1ton/2000lbs
Uncontrolled Potential to Emit PM10 (tons/year) = Uncontrolled Potential to Emit PM10 (lb/year) * 1ton/2000lbs
Uncontrolled Potential to Emit PM2.5 (tons/year) = Uncontrolled Potential to Emit PM2.5 (lb/year) * 1ton/2000lbs

Controlled Potential to Emit PM (tons/year) = Uncontrolled Potential to Emit PM (tons/year) * (1- Control Efficiency %)
Controlled Potential to Emit PM10 (tons/year) = Uncontrolled Potential to Emit PM10 (tons/year) * (1- Control Efficiency %)
Controlled Potential to Emit PM2.5 (tons/year) = Uncontrolled Potential to Emit PM2.5 (tons/year) * (1- Control Efficiency %)

**Appendix A: Emission Calculations**
**Fugitive Dust from Coal Storage & Handling**

**Company Name:** Indiana-Kentucky Electric Corporation
**Address City IN Zip:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

Emission factor = (k)(0.0032)[(U/5)^1.3/(M/2)^1.4]
AP 42 Chapter 13.2.4, 11/06

| | | Coal Unloading |
|---|---|---|
| | Throughput (tons/hour) | 2400 |
| k | PM | 0.74 |
| | PM10 | 0.35 |
| | PM2.5 | 0.053 |
| U | Conveyor Speed (MPH) | 8 |
| M | Moisture % | 11 |
| | PM Emission Factor (lb/ton) | 0.00040 |
| | PM10 Emission Factor (lb/ton) | 0.00019 |
| | PM2.5 Emission Factor (lb/ton) | 0.00003 |
| | Transfer Points | 6 |
| | Control Efficiency (%) | 95% |

| Uncontrolled Potential to Emit (tons/year) | | | Controlled Potential to Emit (tons/year) | | |
|---|---|---|---|---|---|
| **PM** | **PM10** | **PM2.5** | **PM** | **PM10** | **PM2.5** |
| 25.30 | 11.96 | 1.81 | 1.26 | 0.60 | 0.09 |

Methodolgy:
Uncontrolled Potential to Emit (tons/year) = Emission Factor (lb/ton) * Throughput (tons/hour) * 8760 hours * 1ton/2000lbs * Transfer points

**Appendix A: Emission Calculations**
**Reciprocating Internal Combustion Engines - Diesel Fuel**
**Output Rating (<=600 HP)**
**Maximum Input Rate (<=4.2 MMBtu/hr)**

**Company Name:** Indiana-Kentucky Electric Corporation
**Address City IN Zip:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

| Emission Units | HP |
|---|---|
| Clifty Quench Pump | 207 |
| Clifty Diesel Fire Pump | 250 |
| Clifty Diesel Fire Pump | 250 |
| **Total** | **707** |

| | |
|---|---|
| Output Horsepower Rating (hp) | 707.0 |
| Maximum Hours Operated per Year | 500 |
| Potential Throughput (hp-hr/yr) | 353,500 |

| | Pollutant | | | | | | |
|---|---|---|---|---|---|---|---|
| | PM* | PM10* | direct PM2.5* | SO2 | NOx | VOC | CO |
| Emission Factor in lb/hp-hr | 0.0022 | 0.0022 | 0.0022 | 0.0021 | 0.0310 | 0.0025 | 0.0067 |
| Potential Emission in tons/yr | 0.39 | 0.39 | 0.39 | 0.36 | 5.48 | 0.44 | 1.18 |

*PM and PM2.5 emission factors are assumed to be equivalent to PM10 emission factors. No information was given regarding which method was used to determine the factor or the fraction of PM10 which is condensable.

**Hazardous Air Pollutants (HAPs)**

| | Pollutant | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Benzene | Toluene | Xylene | 1,3-Butadiene | Formaldehyde | Acetaldehyde | Acrolein | Total PAH HAPs*** |
| Emission Factor in lb/hp-hr**** | 6.53E-06 | 2.86E-06 | 2.00E-06 | 2.74E-07 | 8.26E-06 | 5.37E-06 | 6.48E-07 | 1.18E-06 |
| Potential Emission in tons/yr | 1.15E-03 | 5.06E-04 | 3.53E-04 | 4.84E-05 | 1.46E-03 | 9.49E-04 | 1.14E-04 | 2.08E-04 |

***PAH = Polyaromatic Hydrocarbon (PAHs are considered HAPs, since they are considered Polycyclic Organic Matter)
****Emission factors in lb/hp-hr were calculated using emission factors in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.3-1).

| | |
|---|---|
| **Potential Emission of Total HAPs (tons/yr)** | **4.79E-03** |

**Methodology**
Emission Factors are from AP 42 (Supplement B 10/96) Tables 3.4-1 , 3.4-2, 3.4-3, and 3.4-4.

Potential Throughput (hp-hr/yr) = [Output Horsepower Rating (hp)] * [Maximum Hours Operated per Year]
Potential Emission (tons/yr) = [Potential Throughput (hp-hr/yr)] * [Emission Factor (lb/hp-hr)] / [2,000 lb/ton]

**Green House Gas Emissions (GHG)**

| | Pollutant | | |
|---|---|---|---|
| | CO2 | CH4 | N2O |
| Emission Factor in lb/hp-hr | 1.15E+00 | 4.63E-05 | 9.26E-06 |
| Potential Emission in tons/yr | 2.03E+02 | 8.18E-03 | 1.64E-03 |

| | |
|---|---|
| **Summed Potential Emissions in tons/yr** | **2.03E+02** |
| **CO2e Total in tons/yr** | **2.04E+02** |

**Methodology**
Emission Factors are from AP42 (Supplement B 10/96), Tables 3.3-1 and 3.3-2
CH4 and N2O Emission Factor from 40 CFR 98 Subpart C Table C-2.
Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
Potential Throughput (hp-hr/yr) = [Output Horsepower Rating (hp)] * [Maximum Hours Operated per Year]
Potential Emission (tons/yr) = [Potential Throughput (hp-hr/yr)] * [Emission Factor (lb/hp-hr)] / [2,000 lb/ton]
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).

**Appendix A: Emission Calculations**
**Reciprocating Internal Combustion Engines - Natural Gas**
**4-Stroke Rich-Burn (4SRB) Engines**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

Clifty Emergency Microwave Generator 10.05HP
Clifty Emergency Substation Generator 107.24 HP

| | |
|---|---|
| Maximum Output Horsepower Rating (hp) | 117 |
| Brake Specific Fuel Consumption (BSFC) (Btu/hp-hr) | 9000 |
| Maximum Hours Operated per Year (hr/yr) | 500 |
| Potential Fuel Usage (MMBtu/yr) | 528 |
| High Heat Value (MMBtu/MMscf) | 1020 |
| Potential Fuel Usage (MMcf/yr) | 0.52 |

| | Pollutant | | | | | | |
|---|---|---|---|---|---|---|---|
| **Criteria Pollutants** | PM* | PM10* | PM2.5* | SO2 | NOx | VOC | CO |
| Emission Factor (lb/MMBtu) | 9.50E-03 | 1.94E-02 | 1.94E-02 | 5.88E-04 | 2.21E+00 | 2.96E-02 | 3.72E+00 |
| Potential Emissions (tons/yr) | 0.0025 | 0.01 | 0.01 | 0.000 | 0.58 | 0.01 | 0.98 |

*PM emission factor is for filterable PM-10. PM10 emission factor is filterable PM10 + condensable PM.
PM2.5 emission factor is filterable PM2.5 + condensable PM.

**Hazardous Air Pollutants (HAPs)**

| Pollutant | Emission Factor (lb/MMBtu) | Potential Emissions (tons/yr) |
|---|---|---|
| Acetaldehyde | 2.79E-03 | 0.001 |
| Acrolein | 2.63E-03 | 0.001 |
| Benzene | 1.58E-03 | 0.000 |
| 1,3-Butadiene | 6.63E-04 | 0.000 |
| Formaldehyde | 2.05E-02 | 0.005 |
| Methanol | 3.06E-03 | 0.001 |
| Total PAH** | 1.41E-04 | 0.000 |
| Toluene | 5.58E-04 | 0.000 |
| Xylene | 1.95E-04 | 0.000 |
| | **Total** | **0.01** |

HAP pollutants consist of the nine highest HAPs included in AP-42 Table 3.2-3.
**PAH = Polyaromatic Hydrocarbon (PAHs are considered HAPs, since they are considered Polycyclic Organic Matter)

**Methodology**
Emission Factors are from AP-42 (Supplement F, July 2000), Table 3.2-3
Potential Fuel Usage (MMBtu/yr) = [Maximum Output Horsepower Rating (hp)] * [Brake Specific Fuel Consumption (Btu/hp-hr)] * [Maximum Hours Operated per Year (hr/yr)] / [1000000 Btu/MMBtu]
Potential Emissions (tons/yr) = [Potential Fuel Usage (MMBtu/yr)] * [Emission Factor (lb/MMBtu)] / [2000 lb/ton]

| | Greenhouse Gas (GHG) | | |
|---|---|---|---|
| **Greenhouse Gases (GHGs)** | CO2 | CH4 | N2O |
| Emission Factor in lb/MMBtu* | 110 | 1.25 | |
| Emission Factor in lb/MMcf** | | | 2.2 |
| Potential Emission in tons/yr | 29.03 | 0.33 | 0.00 |
| Summed Potential Emissions in tons/yr | 29.36 | | |
| CO2e Total in tons/yr | 37.45 | | |

**Methodology**
*The CO2 and CH4 emission factors are from Emission Factors are from AP-42 (Supplement F, July 2000), Table 3.2-2
**The N2O emission factor is from AP 42, Table 1.4-2. The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low Nox burner is 0.64.
Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
For CO2 and CH4: Emission (tons/yr) = [Potential Fuel Usage (MMBtu/yr)] * [Emission Factor (lb/MMBtu)] / [2,000 lb/ton]
For N2O: Emission (tons/yr) = [Potential Fuel Usage (MMCF/yr)] * [Emission Factor (lb/MMCF)] / [2,000 lb/ton]
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).

**Abbreviations**

PM = Particulate Matter
PM10 = Particulate Matter (<10 um)
SO2 = Sulfur Dioxide
NOx = Nitrous Oxides
VOC - Volatile Organic Compounds
CO = Carbon Monoxide
CO2 = Cabon Dioxide
CH4 = Methane
N2O = Nitrous Oxide
CO2e = CO2 equivalent emissions

**Appendix A: Emissions Calculations**
**Limestone Transfer Annual Emissions - Conveying Option**

**Company Name:** Indiana-Kentucky Electric Corporation
**Source Address:** 1335 Clifty Hollow Road, Madison, IN 47250
**Permit Number:** T077-36338-00001
**Reviewer:** Deena Patton

**Emission Factor (EF) Equation[1]**

EF (lb/ton) = k * 0.0032 * ( (U / 5) ^ 1.3 / (M/2) ^ 1.4 )

| | | | |
|---|---|---|---|
| k = | Particle size multiplier = | 0.74 | for PM |
| | | 0.35 | for PM-10 |
| | | 0.053 | for PM-2.5 |
| U = | mean wind speed, mph = | 8.3 | 2003 LCD For Louisville KY (SDF) Station No. 93821 |
| M = | material moisture content, % = | 2.2 | |

| | | |
|---|---|---|
| **Material Transfer Emission Factor =** | **4.00E-03** | **lb PM/ton Limestone** |
| | **1.89E-03** | **lb PM-10/ton Limestone** |
| | **2.87E-04** | **lb PM-2.5/ton Limestone** |

**TSP/PM10/PM2.5 Emissions Calculation**

| | | | | |
|---|---|---|---|---|
| Maximum rate, pounds per hour, per permit. | 4,566.2 | lbs/hour | | |
| Annual emissions based on maximum transfer rates | 54.79 | tons/day | 19,998 | tons/yr |

| Emission Point ID | Transfer Description | | Max Limestone Transferred | Potential Uncontrolled PM Emissions | Potential Uncontrolled PM-10 Emissions | Potential Uncontrolled PM-2.5 Emissions | Control Method | Control Efficiency [2] | Potential Controlled PM Emission | Potential Controlled PM-10 Emission | Potential Controlled PM-2.5 Emission |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ton/yr | ton/yr | ton/yr | ton/yr | | % | ton/yr | ton/yr | ton/yr |
| | Front End Loader into hopper | | 19,998 | 0.04 | 0.02 | 0.00 | None | 0% | 0.04 | 0.02 | 0.00 |
| | Hopper to conveyor | | 19,998 | 0.04 | 0.02 | 0.00 | None | 0% | 0.04 | 0.02 | 0.00 |
| | Conveyor | | 19,998 | 0.04 | 0.02 | 0.00 | Partial Enlcosure | 50% | 0.02 | 0.01 | 0.00 |
| | Conveyor to coal belt | | 19,998 | 0.04 | 0.02 | 0.00 | None | 0% | 0.04 | 0.02 | 0.00 |
| | | | | 0.16 | 0.08 | 0.01 | | | 0.14 | 0.07 | 0.01 |

Notes:
1. AP-42, Chapter 13.2.4, November 2006.
2. Control Efficiencies based on Technical Background Document on Control of Fugitive Dust at Cement Manufacturing Facilities, March 1998
Enclosures - Document states that partial to full enclosures can result in particulate emission reductions ranging from 70% to 99%, study conservatively assume 70% for partial enclosures and 99% for full enclosures.

**Methodology:**
Potential Uncontrolled PM Emissions (ton/yr) = Material Transfer Emission Factor (lb PM/ ton Pellet Ore) * Max Pellet Ore Transferred (ton/yr) * 1 ton/2000 lbs
Potential Uncontrolled PM10 Emissions (ton/yr) = Material Transfer Emission Factor (lb PM10/ ton Pellet Ore) * Max Pellet Ore Transferred (ton/yr) * 1 ton/2000 lbs
Potential Uncontrolled PM12.5 Emissions (ton/yr) = Material Transfer Emission Factor (lb PM2.5/ ton Pellet Ore) * Max Pellet Ore Transferred (ton/yr) * 1 ton/2000 lbs
Potential Controlled PM Emissions (ton/yr) = Potential Uncontrolled PM Emissions (ton/y) * (1- Control Efficiency (%))
Potential Controlled PM10 Emissions (ton/yr) = Potential Uncontrolled PM10 Emissions (ton/y) * (1- Control Efficiency (%))
Potential Controlled PM2.5 Emissions (ton/yr) = Potential Uncontrolled PM2.5 Emissions (ton/y) * (1- Control Efficiency (%))

This system can transfer either limestone or pellet iron ore. Pellet iron ore was selected for the calculations due to the lower moisture content and consequent increase emissions.

Indiana Department of Environmental Management
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**Michael R. Pence**
*Governor*

**Carol S. Comer**
*Commissioner*

**SENT VIA U.S. MAIL: CONFIRMED DELIVERY AND SIGNATURE REQUESTED**

TO: John Markley
Indiana-Kentucky Electric Corporation - Clifty Cre
PO Box 468
Piketon, OH 45661

DATE: September 27, 2016

FROM: Matt Stuckey, Branch Chief
Permits Branch
Office of Air Quality

SUBJECT: Final Decision
Title V
077-36338-00001

Enclosed is the final decision and supporting materials for the air permit application referenced above. Please note that this packet contains the original, signed, permit documents.

The final decision is being sent to you because our records indicate that you are the contact person for this application. However, if you are not the appropriate person within your company to receive this document, please forward it to the correct person.

A copy of the final decision and supporting materials has also been sent via standard mail to:
OAQ Permits Branch Interested Parties List

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178, or toll-free at 1-800-451-6027 (ext. 3-0178), and ask to speak to the permit reviewer who prepared the permit. If you think you have received this document in error, please contact Joanne Smiddie-Brush of my staff at 1-800-451-6027 (ext 3-0185), or via e-mail at jbrush@idem.IN.gov.

Final Applicant Cover letter.dot 2/17/2016

Indiana Department of Environmental Management
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**Michael R. Pence**
*Governor*

**Carol S. Comer**
*Commissioner*

September 27, 2016

TO: Madison Jefferson County Public Library

From: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

Subject: **Important Information for Display Regarding a Final Determination**

**Applicant Name: Indiana Kentucky Electric Corporation Clifty Creek**
**Permit Number: 077-36338-00001**

You previously received information to make available to the public during the public comment period of a draft permit. Enclosed is a copy of the final decision and supporting materials for the same project. Please place the enclosed information along with the information you previously received. To ensure that your patrons have ample opportunity to review the enclosed permit, **we ask that you retain this document for at least 60 days.**

The applicant is responsible for placing a copy of the application in your library. If the permit application is not on file, or if you have any questions concerning this public review process, please contact Joanne Smiddie-Brush, OAQ Permits Administration Section at 1-800-451-6027, extension 3-0185.

Enclosures
Final Library.dot 2/17/2016

# Mail Code 61-53

| IDEM Staff | CDENNY 9/27/2016<br>Indiana-Kentucky Electric Corporation - Clifty Creek Station 077-36338-00001 (final) | | | AFFIX STAMP<br>HERE IF<br>USED AS<br>CERTIFICATE<br>OF MAILING |
|---|---|---|---|---|
| Name and address of Sender | ▶ | Indiana Department of Environmental Management<br>Office of Air Quality – Permits Branch<br>100 N. Senate<br>Indianapolis, IN 46204 | Type of Mail:<br>**CERTIFICATE OF MAILING ONLY** | |

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| 2 | | J Michael Brown ESH Director Indiana-Kentucky Electric Corporation - Clifty Cre PO Box 468 Piketon OH 45661 *(RO CAATS)* | | | | | | | | | |
| 3 | | Jefferson County Health Department 715 Green Rd Madison IN 47250-2143 *(Health Department)* | | | | | | | | | |
| 4 | | Madison Jefferson Co Public Library 420 W Main St Madison IN 47250-3796 *(Library)* | | | | | | | | | |
| 5 | | Madison City Council and Mayors Office 101 W. Main St. Madison IN 47250 *(Local Official)* | | | | | | | | | |
| 6 | | Meredith Gregg 512 E Main Stt, Apt. 4 Madison IN 47250 *(Affected Party)* | | | | | | | | | |
| 7 | | Resident 241 Holcroft Road Madison IN 47250 *(Affected Party)* | | | | | | | | | |
| 8 | | Mr. David C. Bender McGillivray Westerberg & Bender LLC 211 S Patterson St., #320 Madison WI 53703 *(Affected Party)* | | | | | | | | | |
| 9 | | Mr. Richard Hill SAVE THE VALLEY INC 3800 W H&H RUSTIC LANE PO BOX 813 MADISON IN 47250 *(Affected Party)* | | | | | | | | | |
| 10 | | Jefferson County Commissioners & Planning Board 300 E Main Street Madison IN 47250 *(Local Official)* | | | | | | | | | |
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