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

Thomas W. Easterly
Commissioner

TO: Interested Parties / Applicant

DATE: September 11, 2013

RE: Enbridge Energy – Hartsdale/Griffith Terminal / 089-33314-00497

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

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 enclosed matter. Pursuant to IC 13-17-3-4 and 326 IAC 2, this permit modification is effective immediately, unless a petition for stay of effectiveness is filed and granted, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3-7 and IC 13-15-7-3 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 Environmental Adjudication, 100 North Senate Avenue, Government Center North, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) days of the mailing of this notice**. 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 a Title V operating permit 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

IDEM

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Rhonda O'Leary
Enbridge Energy - Hartsdale/Griffith Terminal
1320 Grand Avenue
Superior, WI, 54880

September 11, 2013

Re: 089-33314-00497
Significant Permit Modification to
Part 70 Renewal No.: T089-31293-00497

Dear Ms O'Leary:

Enbridge Energy - Hartsdale/Griffith Terminal was issued a Part 70 Operating Permit Renewal No. T089-31293-00497 on August 29, 2012 for a stationary bulk petroleum storage company located at 1500 W. Main Street, Griffith, IN 46319, and Central Avenue and Division Street, Schererville, IN 46375. An application requesting changes to this permit was received on June 11, 2013. Pursuant to the provisions of 326 IAC 2-7-12, a significant permit modification to this permit is hereby approved as described in the attached Technical Support Document.

For your convenience, the entire Part 70 Operating Permit Renewal as modified is attached.

A copy of the permit is available on the Internet at: http://www.in.gov/ai/appfiles/idem-caats/. For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: www.idem.in.gov

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter, please contact Kristen Willoughby, of my staff, at 317-233-3031 or 1-800-451-6027, and ask for extension 3-3031.

Sincerely,

Jenny Acker, Section Chief
Permits Branch
Office of Air Quality

Attachments: Updated Permit and Technical Support Document
JA/kw

cc: File - Lake County
Lake County Health Department
U.S. EPA, Region V
Compliance and Enforcement Branch
Billing, Licensing and Training Section
IDEM Northwest Regional Office

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Commissioner

Part 70 Operating Permit Renewal

OFFICE OF AIR QUALITY

Enbridge Energy - Hartsdale/Griffith Terminal
1500 W. Main Street, Griffith, Indiana 46319 and
Central Avenue and Division Street, Schererville, Indiana, 46375

(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.: T089-31293-00497	
Issued by: Original Signed Tripurari P. Sinha, Ph.D., Section Chief Permits Branch, Office of Air Quality	Issuance Date: August 29, 2012 Expiration Date: August 29, 2017

Significant Permit Modification No.: 089-33314-00497	
Issued by: Jenny Acker, Section Chief Permits Branch Office of Air Quality	Issuance Date: September 11, 2013 Expiration Date: August 29, 2017

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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 bulk petroleum storage company.

Source Address:	1500 W. Main Street, Griffith, IN 46319, and Central Avenue and Division Street, Schererville, IN 46375
General Source Phone Number:	(713) 821-2110
SIC Code:	4612
County Location:	Lake
Source Location Status:	Nonattainment for 8-hour ozone standard Attainment for all other criteria pollutants
Source Status:	Part 70 Operating Permit Program Minor Source, under PSD Major Source, under Emission Offset Rules Minor Source, Section 112 of the Clean Air Act 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:

Hartsdale Terminal:

(a) Nine (9) crude oil storage tanks, all constructed in 1958, modification permitted in 2012, identified as EU1601 through EU1609, each with an external floating roof, each with a maximum storage capacity of 4,200,000 gallons (100,000 barrels) of crude oil.

(b) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels. [40 CFR 60, Subpart Kb]

(c) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels. [40 CFR 60, Subpart Kb]

(d) Piping component fugitive emission sources in VOC service.

Griffith Terminal:

(a) One (1) crude oil storage tank, constructed in 1969, identified as EU70, with an external floating roof, with a maximum capacity of 120,000 barrels.

(b) One (1) crude oil storage tank, constructed in 1970, identified as EU71, with an external floating roof, with a maximum capacity of 217,000 barrels.

(c) One (1) crude oil storage tank, constructed in 1971, identified as EU72, with an external floating roof, with a maximum capacity of 217,000 barrels.

(d) One (1) crude oil storage tank, constructed in 1971, identified as EU73, with an external floating roof, with a maximum capacity of 217,000 barrels.

(e) One (1) crude oil storage tank, constructed in 1972, identified as EU74, with an external floating roof, with a maximum capacity of 217,000 barrels.

(f) One (1) crude oil storage tank, constructed in 1972, identified as EU75, with an external floating roof, with guide-pole controls (guide-pole sleeve and guide-pole wiper), permitted in 2008, with a maximum capacity of 217,000 barrels.

(g) One (1) crude oil storage tank, constructed in 1973, identified as EU76, with an external floating roof, with a maximum capacity of 395,000 barrels.

(h) One (1) crude oil storage tank, constructed in 1973, identified as EU77, with an external floating roof, with a maximum capacity of 395,000 barrels.

(i) One (1) crude oil storage tank, constructed in 1979, identified as EU78, with an external floating roof, with a maximum capacity of 217,000 barrels. [40 CFR 60, Subpart Ka]

(j) One (1) crude oil storage tank, constructed in 2007, identified as EU79, with an external floating roof, with a maximum capacity of 392,169 barrels (16,471,098 gallons). [40 CFR 60, Subpart Kb]

(k) One (1) crude oil storage tank, constructed in 2007, identified as EU80, with an external floating roof, with a maximum capacity of 240,000 barrels (10,080,000 gallons). [40 CFR 60, Subpart Kb]

(l) Piping component fugitive emission sources in VOC service.

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) Paved and unpaved roads and parking lots with public access. [326 IAC 6-4]

(b) The following equipment related to manufacturing activities not resulting in the emission of HAPs; brazing equipment, cutting torches, soldering equipment, welding equipment [326 IAC 6-3-2].

(c) Two (2) emergency diesel generators: [40 CFR 63, Subpart ZZZZ]
(1) Griffith emergency generator constructed in 1993 rated at 207 horsepower.
(2) Hartsdale emergency generator constructed in 1998 rated at 207 horsepower.

(d) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp. [40 CFR 60, Subpart IIII] [40 CFR 63, Subpart ZZZZ]

(e) Two (2) stationary diesel fire pumps: [40 CFR 63, Subpart ZZZZ]
(1) Griffith fire pump constructed in 1971 rated at 175 horsepower.
(2) Hartsdale fire pump constructed in 2002 rated at 300 horsepower.

(f) Portable blast-cleaning equipment with enclosures [326 IAC 6-3-2]

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).

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, T089-31293-00497, 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.

(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 April 15 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 Northwest 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
Northwest Regional Office phone: (219) 464-0233; fax: (219) 464-0553.

(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 T089-31293-00497 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.

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(40). 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]

(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) 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).

(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.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(36)) 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.

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 twenty percent (20%) 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 Emissions [326 IAC 6.8-10-3]

Pursuant to 326 IAC 6.8-10-3 (formerly 326 IAC 6-1-11.1) (Lake County Fugitive Particulate Matter Control Requirements), the particulate matter emissions from source wide activities shall meet the following requirements:

(a) The average instantaneous opacity of fugitive particulate emissions from a paved road shall not exceed ten percent (10%).

(b) The average instantaneous opacity of fugitive particulate emissions from an unpaved road shall not exceed ten percent (10%).

(c) The opacity of fugitive particulate emissions from exposed areas shall not exceed ten percent (10%) on a six (6) minute average.

(d) The opacity of fugitive particulate emissions from continuous transfer of material onto and out of storage piles shall not exceed ten percent (10%) on a three (3) minute average.

(e) The opacity of fugitive particulate emissions from storage piles shall not exceed ten percent (10%) on a six (6) minute average.

(f) There shall be a zero (0) percent frequency of visible emission observations of a material during the inplant transportation of material by truck or rail at any time.

(g) The opacity of fugitive particulate emissions from the inplant transportation of material by front end loaders and skip hoists shall not exceed ten percent (10%).

(h) Material processing facilities shall include the following:

(1) There shall be a zero (0) percent frequency of visible emission observations from a building enclosing all or part of the material processing equipment, except from a vent in the building.

(2) The PM_{10} emissions from building vents shall not exceed twenty-two thousandths (0.022) grains per dry standard cubic foot and ten percent (10%) opacity.

(3) The PM_{10} stack emissions from a material processing facility shall not exceed twenty-two thousandths (0.022) grains per dry standard cubic foot and ten percent (10%) opacity.

(4) The opacity of fugitive particulate emissions from the material processing facilities, except a crusher at which a capture system is not used, shall not exceed ten percent (10%) opacity.

(5) The opacity of fugitive particulate emissions from a crusher at which a capture system is not used shall not exceed fifteen percent (15%).

(i) The opacity of particulate emissions from dust handling equipment shall not exceed ten percent (10%).

(j) Material transfer limits shall be as follows:

(1) The average instantaneous opacity of fugitive particulate emissions from batch transfer shall not exceed ten percent (10%).

(2) Where adequate wetting of the material for fugitive particulate emissions control is prohibitive to further processing or reuse of the material, the opacity shall not exceed ten percent (10%), three (3) minute average.

(3) Slag and kish handling activities at integrated iron and steel plants shall comply with the following particulate emissions limits:

(A) The opacity of fugitive particulate emissions from transfer from pots and trucks into pits shall not exceed twenty percent (20%) on a six (6) minute average.

(B) The opacity of fugitive particulate emissions from transfer from pits into front end loaders and from transfer from front end loaders into trucks shall comply with the fugitive particulate emission limits in 326 IAC 6.8-10-3(9).

(k) Any facility or operation not specified in 326 IAC 6.8-10-3 shall meet a twenty percent (20%), three (3) minute average opacity standard.

The Permittee shall achieve these limits by controlling fugitive particulate matter emissions according to the attached Fugitive Dust Control Plan.

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

(a) Notification requirements apply to each owner or operator. If the combined amount of regulated asbestos containing material (RACM) to be stripped, removed or disturbed is at least 260 linear feet on pipes or 160 square feet on other facility components, or at least thirty-five (35) cubic feet on all facility components, then the notification requirements of 326 IAC 14-10-3 are mandatory. All demolition projects require notification whether or not asbestos is present.

(b) The Permittee shall ensure that a written notification is sent on a form provided by the Commissioner at least ten (10) working days before asbestos stripping or removal work or before demolition begins, per 326 IAC 14-10-3, and shall update such notice as necessary, including, but not limited to the following:

(1) When the amount of affected asbestos containing material increases or decreases by at least twenty percent (20%); or

(2) If there is a change in the following:

(A) Asbestos removal or demolition start date;

(B) Removal or demolition contractor; or

(C) Waste disposal site.

(c) The Permittee shall ensure that the notice is postmarked or delivered according to the guidelines set forth in 326 IAC 14-10-3(2).

(d) The notice to be submitted shall include the information enumerated in 326 IAC 14-10-3(3).

All required notifications 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

The notice shall include a signed certification from the owner or operator that the information provided in this notification is correct and that only Indiana licensed workers and project supervisors will be used to implement the asbestos removal project. The notifications 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).

(e) Procedures for Asbestos Emission Control
The Permittee shall comply with the applicable emission control procedures in 326 IAC 14-10-4 and 40 CFR 61.145(c). Per 326 IAC 14-10-1, emission control requirements are applicable for any removal or disturbance of RACM greater than three (3) linear feet on pipes or three (3) square feet on any other facility components or a total of at least 0.75 cubic feet on all facility components.

(f) Demolition and Renovation
The Permittee shall thoroughly inspect the affected facility or part of the facility where the demolition or renovation will occur for the presence of asbestos pursuant to 40 CFR 61.145(a).

(g) Indiana Licensed Asbestos Inspector
The Permittee shall comply with 326 IAC 14-10-1(a) that requires the owner or operator, prior to a renovation/demolition, to use an Indiana Licensed Asbestos Inspector to thoroughly inspect the affected portion of the facility for the presence of asbestos. The requirement to use an Indiana Licensed Asbestos inspector is not federally enforceable.

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)]

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 or of initial start-up, whichever is later, 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 or the date of initial startup, whichever is later, 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).

Unless otherwise specified in the approval for the new emission unit(s), compliance monitoring for new emission units or emission units added through a source modification shall be implemented when operation begins.

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(12)] [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 [326 IAC 2-7-5] [326 IAC 2-7-6]

Upon detecting an excursion where a response step is required by the D Section or an exceedance of a limitation 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.

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]

(a) In accordance with the compliance schedule specified in 326 IAC 2-6-3(b)(1), the Permittee shall submit by July 1 an emission statement covering the previous calendar year as follows:

(1) starting in 2004 and every three (3) years thereafter, and

(2) any year not already required under (1) if the source emits volatile organic compounds or oxides of nitrogen into the ambient air at levels equal to or greater than twenty-five (25) tons during the previous calendar year.

(b) 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(32) ("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 2-3]

(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(~~34~~**35**). A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit.

(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:

Hartsdale Terminal:

(a) Nine (9) crude oil storage tanks, all constructed in 1958, modification permitted in 2012, identified as EU1601 through EU1609, each with an external floating roof, each with a maximum storage capacity of 4,200,000 gallons (100,000 barrels) of crude oil.

(b) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels. [40 CFR 60, Subpart Kb]

(c) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels. [40 CFR 60, Subpart Kb]

(d) Piping component fugitive emission sources in VOC service.

Griffith Terminal:

(a) One (1) crude oil storage tank, constructed in 1969, identified as EU70, with an external floating roof, with a maximum capacity of 120,000 barrels.

(b) One (1) crude oil storage tank, constructed in 1970, identified as EU71, with an external floating roof, with a maximum capacity of 217,000 barrels.

(c) One (1) crude oil storage tank, constructed in 1971, identified as EU72, with an external floating roof, with a maximum capacity of 217,000 barrels.

(d) One (1) crude oil storage tank, constructed in 1971, identified as EU73, with an external floating roof, with a maximum capacity of 217,000 barrels.

(e) One (1) crude oil storage tank, constructed in 1972, identified as EU74, with an external floating roof, with a maximum capacity of 217,000 barrels.

(f) One (1) crude oil storage tank, constructed in 1972, identified as EU75, with an external floating roof, with guide-pole controls (guide-pole sleeve and guide-pole wiper), permitted in 2008, with a maximum capacity of 217,000 barrels.

(g) One (1) crude oil storage tank, constructed in 1973, identified as EU76, with an external floating roof, with a maximum capacity of 395,000 barrels.

(h) One (1) crude oil storage tank, constructed in 1973, identified as EU77, with an external floating roof, with a maximum capacity of 395,000 barrels.

(i) One (1) crude oil storage tank, constructed in 1979, identified as EU78, with an external floating roof, with a maximum capacity of 217,000 barrels. [40 CFR 60, Subpart Ka]

(j) One (1) crude oil storage tank, constructed in 2007, identified as EU79, with an external floating roof, with a maximum capacity of 392,169 barrels (16,471,098 gallons). [40 CFR 60, Subpart Kb]

(k) One (1) crude oil storage tank, constructed in 2007, identified as EU80, with an external floating roof, with a maximum capacity of 240,000 barrels (10,080,000 gallons). [40 CFR 60, Subpart Kb]

(l) Piping component fugitive emission sources in VOC service.

(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 Volatile Organic Compounds (VOC) [326 IAC 8-4-3]

Pursuant to 326 IAC 8-4-3(c)(2), the Permittee shall not store petroleum liquid in the storage tanks EU70 through EU80, and EU1601 through EU1611, unless:

(a) The storage tanks have been fitted with:

(1) A continuous secondary seal extending from the floating roof to the tank wall (rim-mounted secondary seal); or

(2) A closure or other device approved by the commissioner which is equally effective.

(b) All seal closure devices meet the following requirements:

(1) There are no visible holes, tears, or other openings in the seal(s) or seal fabric;

(2) The seal(s) are intact and uniformly in place around the circumference of the floating roof between the floating roof and the tank wall.

(3) For vapor mounted primary seals, the accumulated gap area around the circumference of the secondary seal where a gap exceeding one-eighth (1/8) inch exists between the secondary seal and the tank wall shall not exceed one (1.0) square inch per foot of tank diameter. There shall be no gaps exceeding one-half (½) inch between the secondary seal and the tank wall of welded tanks and no gaps exceeding one (1) inch between the secondary seal and the tank wall of riveted tanks.

(c) All openings in the external floating roof, except for automatic bleeder vents, rim space vents, and leg sleeves, are:

(1) Equipped with covers, seals, or lids in the closed position except when the openings are in actual use; and

(2) Equipped with projections into the tank which remain below the liquid surface at all times.

(d) Automatic bleeder vents are closed at all times except when the roof is floated off or landed on the roof leg supports;

(e) Rim vents are set to open when the roof is being floated off the leg supports or at the manufacturer's recommended setting; and

(f) Emergency roof drains are provided with slotted membrane fabric covers or equivalent covers which cover at least ninety percent (90%) of the area of the opening.

D.1.2 Volatile Organic Compounds (VOC) [326 IAC 8-9-4]

Pursuant to 326 IAC 8-9-4(e) (Volatile Organic Liquid Storage Vessels), the Permittee shall comply with the following standards for the external floating roofs on storage tanks EU70 through EU78 and EU1601 through 1609:

(a) Each external floating roof shall be equipped with a closure device between the wall of the vessel and the roof edge. The closure device shall consist of two (2) seals, one (1) above the other. The lower seal shall be referred to as the primary seal; the upper seal shall be referred to as the secondary seal.

(b) Except as provided in 326 IAC 8-9-5(c)(4), the primary seal shall completely cover the annular space between the edge of the floating roof and vessel wall and shall be either a liquid-mounted seal or a shoe seal.

(c) The secondary seal shall completely cover the annular space between the external floating roof and the wall of the vessel in a continuous fashion except as allowed in 326 IAC 8-9-5(c)(4).

(d) Except for automatic bleeder vents and rim space vents, each opening in a noncontact external floating roof shall provide a projection below the liquid surface.

(e) Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof shall be equipped with a gasketed cover, seal, or lid that shall be maintained in a closed position at all times, without visible gap, except when the device is in actual use.

(f) Automatic bleeder vents shall be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports.

(g) Rim vents shall be set to open when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting. Automatic bleeder vents and rim space vents shall be gasketed.

(h) Each emergency roof drain shall be provided with a slotted membrane fabric cover that covers at least ninety percent (90%) of the area of the opening.

(i) The roof shall be floating on the liquid at all times, for example, off the roof leg supports, except when the vessel is completely emptied and subsequently refilled. The process of filling, emptying, or refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible.

D.1.3 Preventive Maintenance Plan [326 IAC 2-7-5(12)]

A Preventive Maintenance Plan, is required for these facilities and their control devices. Section B - Preventive Maintenance Plan contains the Permittee's obligation with regard to the preventive maintenance plan required by this condition.

Compliance Determination Requirements

D.1.4 Compliance Determination [326 IAC 8-9-5]

Pursuant to 326 IAC 8-9-5(a), for storage tanks EU70 through EU78 and EU1601 through 1609, the Permittee shall comply with the following requirements:

(a) Determine the gap areas and maximum gap widths between the primary seal and the wall of the vessel and between the secondary seal and the wall of the vessel according to the following frequency:

(1) Measurements of gaps between the vessel wall and the primary seal (seal gaps) shall be performed during the hydrostatic testing of the vessel or within sixty (60) days of the initial fill with VOL and at least once every five (5) years thereafter.

(2) Measurements of gaps between the vessel wall and the secondary seal shall be performed within sixty (60) days of the initial fill with VOL and at least once per year thereafter.

(3) If any source ceases to store VOL for a period of one (1) year or more, subsequent introduction of VOL into the vessel shall be considered an initial fill for purposes of this subdivision.

(b) Determine gap widths and areas in the primary and secondary seals individually by the following procedures:

(1) Measure seal gaps, if any, at one (1) or more floating roof levels when the roof is floating off the roof leg supports.

(2) Measure seal gaps around the entire circumference of the vessel in each place where a one-eighth (⅛) inch diameter uniform probe passes freely (without forcing or binding against seal) between the seal and the wall of the vessel and measure the circumferential distance of each such location.

(3) The total surface area of each gap described in 326 IAC 8-9-5(c)(2)(B) shall be determined by using probes of various widths to measure accurately the actual distance from the vessel wall to the seal and multiplying each such width by its respective circumferential distance.

(c) Add the gap surface area of each gap location for the primary seal and the secondary seal individually and divide the sum for each by the nominal diameter of the vessel and compare each ratio to the respective standards in 326 IAC 8-9-5(c)(4).

(d) Make necessary repairs or empty the vessel within forty-five (45) days of identification of seals not meeting the requirements listed in 326 IAC 8-9-5(c)(4)(A) and 326 IAC 8-9-5(c)(4)(B) as follows:

(1) The accumulated area of gaps between the vessel wall and the mechanical shoe or liquid-mounted primary seal shall not exceed ten (10) square inches per foot of vessel diameter, and the width of any portion of any gap shall not exceed one and five-tenths (1.5) inches. There shall be no holes, tears, or other openings in the shoe, seal fabric, or seal envelope.

(2) The secondary seal shall meet the following requirements:

(A) The secondary seal shall be installed above the primary seal so that it completely covers the space between the roof edge and the vessel wall except as provided in 326 IAC 8-9-5(c)(2)(C).

(B) The accumulated area of gaps between the vessel wall and the secondary seal used in combination with a metallic shoe or liquid-mounted primary seal shall not exceed one (1) square inch per foot of vessel diameter, and the width of any portion of any gap shall not exceed five-tenths (0.5) inch. There shall be no gaps between the vessel wall and the secondary seal when used in combination with a vapor-mounted primary seal.

(C) There shall be no holes, tears, or other openings in the seal or seal fabric.

(3) If a failure that is detected during inspections required in subdivision (1) cannot be repaired within forty-five (45) days and if the vessel cannot be emptied within forty-five (45) days, a thirty (30) day extension may be requested from IDEM, OAQ in the inspection report required in 326 IAC 8-9-6(d)(3). Such extension request must include a demonstration of unavailability of alternate storage capacity and a specification of a schedule that will assure that the control equipment will be repaired or the vessel will be emptied as soon as possible.

(e) Notify the department thirty days in advance of any gap measurements required to afford the department the opportunity to have an observer present.

(f) Visually inspect the external floating roof, the primary seal, secondary seal, and fittings each time the vessel is emptied and degassed. For all visual inspections, the following requirements apply:

(1) If the external floating roof has defects, the primary seal has holes, tears, or other openings in the seal or the seal fabric, or the secondary seal has holes, tears, or other openings in the seal fabric, the Permittee shall repair the items as necessary so that none of the conditions specified in this clause exist before filling or refilling the vessel with VOL.

(2) The owner or operator shall notify the department in writing at least thirty days prior to the filling or refilling of each vessel to afford the department the opportunity to inspect the vessel prior to the filling. If the inspection is not planned and the owner or operator could not have known about the inspection thirty days in advance of refilling the vessel, the owner or operator shall notify the department at least seven days prior to the refilling of the vessel. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification including the written documentation may be made in writing and sent by express mail so that it is received by the department at least 7 days prior to the refilling.

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

D.1.5 Record Keeping Requirements [326 IAC 8-4] [326 IAC 8-9]

(a) Pursuant to 326 IAC 8-4-3(d), the Permittee shall maintain the following records for storage tanks EU70 through EU80 and EU1601 through EU1611:

(1) The types of volatile petroleum liquid stored,

(2) The maximum true vapor pressure of the liquid as stored, and

(3) The results of the inspections performed on the storage vessels.

Records shall be maintained for a period of two (2) years and shall be made available to the commissioner upon written request.

(b) Pursuant to 326 IAC 8-9-6(b), the Permittee shall maintain a record of the following for storage tanks EU70 through EU78 and EU1601 through EU1609:

(1) The vessel identification number.

(2) The vessel dimensions.

(3) The vessel capacity.

(4) A description of the emission control equipment for each storage vessel with a certification that the emission control equipment meets the applicable standards.

These records shall be maintained for the life of the vessel.

(c) Pursuant to 326 IAC 8-9-6(d), the Permittee shall keep a record for storage tanks EU70 through EU78 and EU1601 through EU1609 of each gap measurement performed as required by 326 IAC 8-9-5(c). Each record shall identify the vessel in which the measurement was made and shall contain the following:

(1) The date of measurement.

(2) The raw data obtained in the measurement.

(3) The calculations described in 326 IAC 8-9-5(c)(2) and 326 IAC 8-9-5(c)(3).

These records shall be maintained for a period of three (3) years.

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

D.1.6 Reporting and Notification Requirements [326 IAC 8-4] [326 IAC 8-9]

(a) Pursuant to 326 IAC 8-9-5(c)(5), the Permittee shall notify IDEM, OAQ thirty (30) days in advance of any gap measurements required by Condition D.1.4 to afford IDEM, OAQ the opportunity to have an observer present.

(b) Pursuant to 326 IAC 8-9-5(c)(6)(B), the Permittee shall notify IDEM, OAQ in writing at least thirty (30) days prior to the filling or refilling of each vessel to afford IDEM, OAQ the opportunity to inspect the vessel prior to the filling. If the inspection required by 326 IAC 8-9-5(c)(6) is not planned and the Permittee could not have known about the inspection thirty (30) days in advance of refilling the vessel, the Permittee shall notify IDEM, OAQ at least seven (7) days prior to the refilling of the vessel. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification including the written documentation may be made in writing and sent by express mail so that it is received by IDEM, OAQ at least seven (7) days prior to the refilling.

(c) Pursuant to 326 IAC 8-9-6:

(1) A seal gap report must be submitted for initial seal gap measurement. For subsequent seal gap measurements, a seal gap report must be submitted only when the measured gaps exceed the limitations specified in 326 IAC 8-9-5(c). Within sixty (60) days of exceeding the limitations, the Permitttee shall furnish IDEM, OAQ with a report that contains the following:

(A) The date of measurement.

(B) The raw data obtained in the measurement.

(C) The calculations described in 326 IAC 8-9-5(c)(2) and 326 IAC 8-9-5(c)(3).

(2) After each seal gap measurement that detects gaps exceeding the limitations specified in 326 IAC 8-9-5(c), the Permittee shall submit a report to IDEM, OAQ within thirty (30) days of the inspection. The report shall identify the vessel and contain the date of measurement, the raw data obtained in the measurement, the calculations described in 326 IAC 8-9-5(c)(2) and 326 IAC 8-9-5(c)(3), and the date the vessel was emptied or the repairs made and date of repair.

(d) Pursuant to 326 IAC 8-9-6, the Permittee of storage vessels EU70 through EU78 and EU1601 through EU1609, shall submit to IDEM, OAQ a report containing the following information for each vessel:

(1) The vessel identification number.

(2) The vessel dimensions.

(3) The vessel capacity.

(4) A description of the emission control equipment for each storage vessel with a certification that the emission control equipment meets the applicable standards.

(e) The reports and notifications required by this Condition shall be submitted to the address listed in Section C - General Reporting Requirements, of this permit. Section C - General Reporting contains the Permittee’s obligation with regard to the reporting required by this condition. The report 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).

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(14)]

(b) The following equipment related to manufacturing activities not resulting in the emission of HAPs; brazing equipment, cutting torches, soldering equipment, welding equipment [326 IAC 6-3-2].

(f) Portable blast-cleaning equipment with enclosures [326 IAC 6-3-2]

(The information describing the process in this facility description is descriptive information and does not constitute enforceable condition.)

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

D.2.1 Particulate Emission Limitations for Processes with Process Weight Rates Less Than One Hundred (100) Pounds per Hour [326 IAC 6-3-2(e)]

Pursuant to 326 IAC 6-3-2(e), the allowable particulate emissions rate for any process which has a maximum process weight rate less than 100 pounds per hour shall not exceed 0.551 pounds per hour. These include the brazing equipment, cutting torches, soldering equipment, welding equipment, walk behind grinder, belt grinders, plasma torch cutters, shears, and portable blast-cleaning equipment.

SECTION E.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

Griffith Terminal:

(i) One (1) crude oil storage tank, constructed in 1979, identified as EU78, with an external floating roof, with a maximum capacity of 217,000 barrels. [40 CFR 60, Subpart Ka]

(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.1.1 General Provisions Relating to New Source Performance Standards [40 CFR Part 60] [326 IAC 12-1]

The provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 12-1-1, apply to tank EU78 except when otherwise specified in 40 CFR Part 60, Subpart Ka.

E.1.2 Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984 NSPS Requirements [40 CFR Part 60, Subpart Ka] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Ka, the Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart Ka (included as Attachment C), which are incorporated by reference as 326 IAC 12, for tank EU78:

(1) 40 CFR 60.110a(a) & (b)
(2) 40 CFR 60.111a
(3) 40 CFR 60.112a(a)
(4) 40 CFR 60.113a
(5) 40 CFR 60.115a(a), (b), (c)

SECTION E.2 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

Hartsdale Terminal:

(a) Nine (9) crude oil storage tanks, all constructed in 1958, modification permitted in 2012, identified as EU1601 through EU1609, each with an external floating roof, each with a maximum storage capacity of 4,200,000 gallons (100,000 barrels) of crude oil. [40 CFR 60, Subpart Kb]

(b) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels. [40 CFR 60, Subpart Kb]

(c) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels. [40 CFR 60, Subpart Kb]

Griffith Terminal:

(j) One (1) crude oil storage tank, constructed in 2007, identified as EU79, with an external floating roof, with a maximum capacity of 392,169 barrels (16,471,098 gallons). [40 CFR 60, Subpart Kb]

(k) One (1) crude oil storage tank, constructed in 2007, identified as EU80, with an external floating roof, with a maximum capacity of 240,000 barrels (10,080,000 gallons). [40 CFR 60, Subpart Kb]

(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 [40 CFR Part 60] [326 IAC 12-1]

The provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 12-1-1, apply to tanks EU79, EU80, and EU1601 through EU1611 except when otherwise specified in 40 CFR Part 60, Subpart Kb.

Note: Tanks 1601 – 1609 will become subject to 40 CFR Part 60, Subpart A upon modification.

E.2.2 Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 NSPS Requirements [40 CFR Part 60, Subpart Kb] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Kb, the Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart Kb (included as Attachment D), which are incorporated by reference as 326 IAC 12, for tanks EU79, EU80, and EU1601 through EU1611:

(1) 40 CFR 60.110b(a), (b)
(2) 40 CFR 60.111b
(3) 40 CFR 60.112b(a)(2)
(4) 40 CFR 60.113b(b)
(5) 40 CFR 60.115b(b)

(6) 40 CFR 60.116b(a), (b), (c), (d), (e)
(7) 40 CFR 60.117b

Note: Tanks 1601 – 1609 will become subject to 40 CFR Part 60, Subpart Kb upon modification.

SECTION E.3 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description: Insignificant Activities

(c) Two (2) emergency diesel generators: [40 CFR 63, Subpart ZZZZ]
 (1) Griffith emergency generator constructed in 1993 rated at 207 horsepower.
 (2) Hartsdale emergency generator constructed in 1998 rated at 207 horsepower.

(d) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp. [40 CFR 60, Subpart IIII] [40 CFR 63, Subpart ZZZZ]

(e) Two (2) stationary diesel fire pumps: [40 CFR 63, Subpart ZZZZ]
 (1) Griffith fire pump constructed in 1971 rated at 175 horsepower.
 (2) Hartsdale fire pump constructed in 2002 rated at 300 horsepower.

(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)]

E.3.1 General Provisions Relating to National Emission Standards for Hazardous Air Pollutants (NESHAP) [326 IAC 20-82] [40 CFR 63, Subpart A]

The provisions of 40 CFR 63, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 20-82, apply to the three (3) emergency generators and two (2) stationary fire pumps, except when otherwise specified in 40 CFR 63, Subpart ZZZZ.

E.3.2 Stationary Reciprocating Internal Combustion Engines (RICE) NESHAP [326 IAC 20-82] [40 CFR 63, Subpart ZZZZ]

Pursuant to 40 CFR 63 Subpart ZZZZ, the Permittee shall comply with the provisions of 40 CFR 63 Subpart ZZZZ (included as Attachment E), which are incorporated as 326 IAC 20-82 for the three (3) emergency generators and two (2) stationary fire pumps, as specified as follows:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585
(3) 40 CFR 63.6590
(4) 40 CFR 63.6595
(5) 40 CFR 63.6603
(6) 40 CFR 63.6604
(7) 40 CFR 63.6605
(8) 40 CFR 63.6612
(9) 40 CFR 63.6625(e)
(10) 40 CFR 63.6630
(11) 40 CFR 63.6640
(12) 40 CFR 63.6645
(13) 40 CFR 63.6650
(14) 40 CFR 63.6655
(15) 40 CFR 63.6660
(16) 40 CFR 63.6665
(17) 40 CFR 63.6670
(18) 40 CFR 63.6675
(19) Table 8

SECTION E.4 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description: Insignificant Activities

(d) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp. [40 CFR 60, Subpart IIII] [40 CFR 63, Subpart ZZZZ]

(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.4.1 General Provisions Relating to New Source Performance Standards [40 CFR Part 60] [326 IAC 12-1]

The provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 12-1-1, apply to the emergency diesel generator except when otherwise specified in 40 CFR Part 60, Subpart IIII.

E.4.2 New Source Performance Standards for Stationary Compression Ignition Internal Combustion Engines [40 CFR Part 60, Subpart IIII] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart IIII, the Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart IIII (included as Attachment F), which are incorporated by reference as 326 IAC 12, for the emergency diesel generator:

(1) 40 CFR 60.4200(a)
(2) 40 CFR 60.4205 (b), (e)
(3) 40 CFR 60.4206
(4) 40 CFR 60.4207 (b)
(5) 40 CFR 60.4209
(6) 40 CFR 60.4211 (a), (c), (f), (g)
(7) 40 CFR 60.4212
(8) 40 CFR 60.4214 (b), (c), (d)
(9) 40 CFR 60.4218
(10) 40 CFR 60.4219
(11) Table 5
(12) Table 8

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

Source Name:	Enbridge Energy - Hartsdale/Griffith Terminal
Source Address:	1500 W. Main Street, Griffith, IN 46319, and Central Avenue and Division Street, Hartsdale, IN 46375
Part 70 Permit No.:	T089-31293-00497

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: Enbridge Energy - Hartsdale/Griffith Terminal
Source Address: 1500 W. Main Street, Griffith, IN 46319, and Central Avenue and Division Street, Hartsdale, IN 46375
Part 70 Permit No.: T089-31293-00497

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**) 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:	Enbridge Energy - Hartsdale/Griffith Terminal
Source Address:	1500 W. Main Street, Griffith, IN 46319, and Central Avenue and Division Street, Hartsdale, IN 46375
Part 70 Permit No.:	T089-31293-00497

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:	

Page 2 of 2

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 - Fugitive Particulate Matter Emission Control Plan

Source Description and Location

Source Name:	Enbridge Energy – Griffith Terminal
Source Location:	1500 West Main Street, Griffith, Indiana 46319
County:	Lake
SIC Code:	4612
Part 70 Operation Permit No.:	T089-31293-00497

Fugitive Particulate Matter Emission Control Plan

This plan addresses the fugitive particulate matter (dust) generated by the operation of the Enbridge Energy – Griffith Terminal located in Griffith, Indiana.

The Chicago Region main office resides inside the facility. Various operations and technical staff are also assigned to the facility. The facility receives deliveries of fuel, bulk chemicals, equipment and miscellaneous maintenance products by truck for use on operational projects. Operational projects may include use of several contractor vehicles and heavy equipment on the facility.

1) Company Address:

Enbridge Energy – Griffith Terminal
1500 West Main Street
Griffith, Indiana 46319

2) Person Responsible for Plan Implementation:

Terminal Supervisor
1500 West Main Street
Griffith, Indiana 46319

3) Processes, Operations, and Areas which have the Potential to Emit Fugitive Dust:

a. Vehicle Travel on Paved Roads
b. Vehicle Travel on Unpaved Roads

4) Measures to be Implemented to Control Fugitive Dust

For the purposes of this fugitive dust control plan, abnormal fugitive dust emissions are defined as fugitive dust emissions heavier than normal or fugitive dust emissions reaching the facility's property boundary.

a. Paved Roads and Parking Areas

i) Description: The roads on the facility that are traveled by tanker trucks, fork trucks, employee vehicles, and contractor vehicles are paved. Parking areas are also paved. Trucks in the delivery process do not travel at sufficient speed to normally generate fugitive dust.

Contractor personnel adhere to local dust suppressant directives during operational and engineering projects.

ii) Fugitive Dust Control Measures: Specific fugitive dust control measures that will be implemented include:

- Maintaining a speed limit of 20 miles per hour on all paved facility roads.
- Performing wet sweeping annually upon entry into vernal months as deemed necessary by the terminal supervisor based on actual conditions.

If abnormal fugitive dust emissions are observed, additional corrective actions will be taken by facility personnel. As deemed necessary by the terminal supervisor, corrective measures may include sweeping the roads using a wet sweeper.

Operational and Engineering project leads will be required to maintain acceptable road conditions and apply fugitive dust control measures for the extent of their projects within the facility. Measures may include sweeping the roads using a wet sweeper.

Facility maintenance staff will perform regular roadway inspections and report the results to the terminal supervisor to determine necessary actions.

b. Unpaved Roads

i) Description: Daily operations will require occasional travel on unpaved surfaces.

ii) Fugitive Dust Control Measures: Specific fugitive dust control measures that will be implemented include:

- Maintaining a speed limit of 10 miles per hour on all unpaved facility roads.
- Performing annual application of dust suppressant upon entry into vernal months as deemed necessary by the terminal supervisor based on actual conditions.

If abnormal fugitive dust emissions are observed, additional corrective actions will be taken by facility personnel. As deemed necessary by the terminal supervisor, corrective measures may include application of water or application of an acceptable dust suppressant in addition to the annual dust suppressant application.

Operational and Engineering project leads will be required to maintain acceptable road conditions and apply fugitive dust control measures for the duration of their projects within the facility. Measures may include application of water or application of an acceptable dust suppressant at regular intervals.

Facility maintenance staff will perform regular roadway inspections and report the results to the terminal supervisor to determine necessary actions.

5) Plan implementation:

This plan will be implemented beginning August 2012.

The terminal supervisor and the Enbridge Environment department will perform an annual review of this plan to evaluate its effectiveness.

Attachment B - Fugitive Particulate Matter Emission Control Plan

Source Description and Location

Source Name:	Enbridge Energy – Hartsdale Terminal
Source Location:	131 West Division Street, Schererville, Indiana 46375
County:	Lake
SIC Code:	4612
Part 70 Operation Permit No.:	T089-31293-00497

Fugitive Particulate Matter Emission Control Plan

This plan addresses the fugitive particulate matter (dust) generated by the operation of the Enbridge Energy – Hartsdale Terminal located in Schererville, Indiana.

The facility is accessed several times per day by operations and technical staff for routine maintenance.

1) Company Address:

Enbridge Energy – Hartsdale Terminal
131 West Division Street
Schererville, Indiana 46375

2) Person Responsible for Plan Implementation:

Terminal Supervisor
1500 West Main Street
Griffith, Indiana 46319

3) Processes, Operations, and Areas which have the Potential to Emit Fugitive Dust:

a. Vehicle Travel on Unpaved Roads

4) Measures to be Implemented to Control Fugitive Dust

For the purposes of this fugitive dust control plan, abnormal fugitive dust emissions are defined as fugitive dust emissions heavier than normal or fugitive dust emissions reaching the facility's property boundary.

a. Unpaved Roads

i) Description: Daily operations will require occasional travel on unpaved surfaces. Operations and Engineering projects may require regular travel on unpaved surfaces.

ii) Fugitive Dust Control Measures: Specific fugitive dust control measures that will be implemented include:

- Maintaining a speed limit of 10 miles per hour on all unpaved facility roads.
- Performing annual application of dust suppressant upon entry into vernal months as deemed necessary by the terminal supervisor based on actual conditions.

If abnormal fugitive dust emissions are observed, additional corrective actions will be taken by facility personnel. As deemed necessary by the terminal supervisor, corrective measures may include application of water or application of an acceptable dust suppressant in addition to the annual dust suppressant application.

Operational and Engineering project leads will be required to maintain acceptable road conditions and apply fugitive dust control measures for the duration of their projects within the facility. Measures may include application of water or application of an acceptable dust suppressant at regular intervals.

Facility maintenance staff will perform regular roadway inspections and report the results to the terminal supervisor to determine necessary actions.

The terminal supervisor and the Enbridge Environment department will perform an annual review of this plan to evaluate its effectiveness.

5) Plan implementation:

This plan will be implemented beginning August 2012.

The terminal supervisor and the Enbridge Environment department will perform an annual review of this plan to evaluate its effectiveness.

Attachment C
To Part 70 Operating Permit Renewal No.: T089-31293-00497

Electronic Code of Federal Regulations

Title 40: Protection of Environment

Part 60, Subpart Ka—Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984

§ 60.110a Applicability and designation of affected facility.

(a) *Affected facility.* Except as provided in paragraph (b) of this section, the affected facility to which this subpart applies is each storage vessel with a storage capacity greater than 151,416 liters (40,000 gallons) that is used to store petroleum liquids for which construction is commenced after May 18, 1978.

(b) Each petroleum liquid storage vessel with a capacity of less than 1,589,873 liters (420,000 gallons) used for petroleum or condensate stored, processed, or treated prior to custody transfer is not an affected facility and, therefore, is exempt from the requirements of this subpart.

(c) *Alternative means of compliance* —(1) *Option to comply with part 65.* Owners or operators may choose to comply with 40 CFR part 65, subpart C, to satisfy the requirements of §§ 60.112a through 60.114a for storage vessels that are subject to this subpart that store petroleum liquids that, as stored, have a maximum true vapor pressure equal to or greater than 10.3 kPa (1.5 psia). Other provisions applying to owners or operators who choose to comply with 40 CFR part 65 are provided in 40 CFR 65.1.

(2) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 65, subpart C, must also comply with §§ 60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for those storage vessels. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (c)(2) do not apply to owners or operators of storage vessels complying with 40 CFR part 65, subpart C, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart C, must comply with 40 CFR part 65, subpart A.

[45 FR 23379, Apr. 4, 1980, as amended at 65 FR 78275, Dec. 14, 2000]

§ 60.111a Definitions.

In addition to the terms and their definitions listed in the Act and subpart A of this part the following definitions apply in this subpart:

(a) *Storage vessel* means each tank, reservoir, or container used for the storage of petroleum liquids, but does not include:

(1) Pressure vessels which are designed to operate in excess of 204.9 kPa (15 psig) without emissions to the atmosphere except under emergency conditions.

(2) Subsurface caverns or porous rock reservoirs, or

(3) Underground tanks if the total volume of petroleum liquids added to and taken from a tank annually does not exceed twice the volume of the tank.

(b) *Petroleum liquids* means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery but does not mean Nos. 2 through 6 fuel oils as specified in ASTM D396-78, 89, 90, 92, 96, or 98, gas turbine fuel oils Nos. 2-GT through 4-GT as specified in ASTM D2880-78 or 96, gas turbine fuel oils Nos. 2-GT through 4-GT as specified in ASTM D2880-78 or 96, or diesel fuel oils Nos. 2-D and 4-D as specified in ASTM D975-78, 96, or 98a. (These three methods are incorporated by reference—see § 60.17.)

(c) *Petroleum refinery* means each facility engaged in producing gasoline, kerosene, distillate fuel oils, residual fuel oils, lubricants, or other products through distillation of petroleum or through redistillation, cracking, extracting, or reforming of unfinished petroleum derivatives.

(d) *Petroleum* means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

(e) *Condensate* means hydrocarbon liquid separated from natural gas which condenses due to changes in the temperature or pressure, or both, and remains liquid at standard conditions.

(f) *True vapor pressure* means the equilibrium partial pressure exerted by a petroleum liquid such as determined in accordance with methods described in American Petroleum Institute Bulletin 2517, Evaporation Loss from External Floating-Roof Tanks, Second Edition, February 1980 (incorporated by reference—see § 60.17).

(g) *Reid vapor pressure* is the absolute vapor pressure of volatile crude oil and nonviscous petroleum liquids, except liquified petroleum gases, as determined by ASTM D323-82 or 94 (incorporated by reference—see § 60.17).

(h) *Liquid-mounted seal* means a foam or liquid-filled primary seal mounted in contact with the liquid between the tank wall and the floating roof continuously around the circumference of the tank.

(i) *Metallic shoe seal* includes but is not limited to a metal sheet held vertically against the tank wall by springs or weighted levers and is connected by braces to the floating roof. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

(j) *Vapor-mounted seal* means a foam-filled primary seal mounted continuously around the circumference of the tank so there is an annular vapor space underneath the seal. The annular vapor space is bounded by the bottom of the primary seal, the tank wall, the liquid surface, and the floating roof.

(k) *Custody transfer* means the transfer of produced petroleum and/or condensate, after processing and/or treating in the producing operations, from storage tanks or automatic transfer facilities to pipelines or any other forms of transportation.

[45 FR 23379, Apr. 4, 1980, as amended at 48 FR 3737, Jan. 27, 1983; 52 FR 11429, Apr. 8, 1987; 65 FR 61756, Oct. 17, 2000]

§ 60.112a Standard for volatile organic compounds (VOC).

(a) The owner or operator of each storage vessel to which this subpart applies which contains a petroleum liquid which, as stored, has a true vapor pressure equal to or greater than 10.3 kPa (1.5 psia) but not greater than 76.6 kPa (11.1 psia) shall equip the storage vessel with one of the following:

(1) An external floating roof, consisting of a pontoon-type or double-deck-type cover that rests on the surface of the liquid contents and is equipped with a closure device between the tank wall and the roof edge. Except as provided in paragraph (a)(1)(ii)(D) of this section, the closure device is to consist of two seals, one above the other. The lower seal is referred to as the primary seal and the upper seal is referred to as the secondary seal. The roof is to be floating on the liquid at all times (i.e., off the roof leg supports) except during initial fill and when the tank is completely emptied and subsequently refilled. The process of emptying and refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible.

(i) The primary seal is to be either a metallic shoe seal, a liquid-mounted seal, or a vapor-mounted seal. Each seal is to meet the following requirements:

(A) The accumulated area of gaps between the tank wall and the metallic shoe seal or the liquid-mounted seal shall not exceed 212 cm^2 per meter of tank diameter (10.0 in^2 per ft of tank diameter) and the width of any portion of any gap shall not exceed 3.81 cm ($1\frac{1}{2}$ in).

(B) The accumulated area of gaps between the tank wall and the vapor-mounted seal shall not exceed 21.2 cm^2 per meter of tank diameter (1.0 in^2 per ft of tank diameter) and the width of any portion of any gap shall not exceed 1.27 cm (½ in).

(C) One end of the metallic shoe is to extend into the stored liquid and the other end is to extend a minimum vertical distance of 61 cm (24 in) above the stored liquid surface.

(D) There are to be no holes, tears, or other openings in the shoe, seal fabric, or seal envelope.

(ii) The secondary seal is to meet the following requirements:

(A) The secondary seal is to be installed above the primary seal so that it completely covers the space between the roof edge and the tank wall except as provided in paragraph (a)(1)(ii)(B) of this section.

(B) The accumulated area of gaps between the tank wall and the secondary seal used in combination with a metallic shoe or liquid-mounted primary seal shall not exceed 21.2 cm^2 per meter of tank diameter (1.0 in^2 per ft. of tank diameter) and the width of any portion of any gap shall not exceed 1.27 cm (½ in.). There shall be no gaps between the tank wall and the secondary seal used in combination with a vapor-mounted primary seal.

(C) There are to be no holes, tears or other openings in the seal or seal fabric.

(D) The owner or operator is exempted from the requirements for secondary seals and the secondary seal gap criteria when performing gap measurements or inspections of the primary seal.

(iii) Each opening in the roof except for automatic bleeder vents and rim space vents is to provide a projection below the liquid surface. Each opening in the roof except for automatic bleeder vents, rim space vents and leg sleeves is to be equipped with a cover, seal or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use or as described in pargraph (a)(1)(iv) of this section. Automatic bleeder vents are to be closed at all times when the roof is floating, except when the roof is being floated off or is being landed on the roof leg supports. Rim vents are to be set to open when the roof is being floated off the roof legs supports or at the manufacturer's recommended setting.

(iv) Each emergency roof drain is to be provided with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening.

(2) A fixed roof with an internal floating type cover equipped with a continuous closure device between the tank wall and the cover edge. The cover is to be floating at all times, (i.e., off the leg supports) except during initial fill and when the tank is completely emptied and subsequently refilled. The process of emptying and refilling when the cover is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible. Each opening in the cover except for automatic bleeder vents and the rim space vents is to provide a projection below the liquid surface. Each opening in the cover except for automatic bleeder vents, rim space vents, stub drains and leg sleeves is to be equipped with a cover, seal, or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. Automatic bleeder vents are to be closed at all times when the cover is floating except when the cover is being floated off or is being landed on the leg supports. Rim vents are to be set to open only when the cover is being floated off the leg supports or at the manufacturer's recommended setting.

(3) A vapor recovery system which collects all VOC vapors and gases discharged from the storage vessel, and a vapor return or disposal system which is designed to process such VOC vapors and gases so as to reduce their emission to the atmosphere by at least 95 percent by weight.

(4) A system equivalent to those described in paragraphs (a)(1), (a)(2), or (a)(3) of this section as provided in § 60.114a.

(b) The owner or operator of each storage vessel to which this subpart applies which contains a petroleum liquid which, as stored, has a true vapor pressure greater than 76.6 kPa (11.1 psia), shall equip the storage vessel with a vapor recovery system which collects all VOC vapors and gases discharged from the storage vessel, and a vapor return or disposal system which is designed to process such VOC vapors and gases so as to reduce their emission to the atmosphere by at least 95 percent by weight.

[45 FR 23379, Apr. 4, 1980, as amended at 45 FR 83229, Dec. 18, 1980]

§ 60.113a Testing and procedures.

(a) Except as provided in § 60.8(b) compliance with the standard prescribed in § 60.112a shall be determined as follows or in accordance with an equivalent procedure as provided in § 60.114a.

(1) The owner or operator of each storage vessel to which this subpart applies which has an external floating roof shall meet the following requirements:

(i) Determine the gap areas and maximum gap widths between the primary seal and the tank wall and between the secondary seal and the tank wall according to the following frequency:

(A) For primary seals, gap measurements shall be performed within 60 days of the initial fill with petroleum liquid and at least once every five years thereafter. All primary seal inspections or gap measurements which require the removal or dislodging of the secondary seal shall be accomplished as rapidly as possible and the secondary seal shall be replaced as soon as possible.

(B) For secondary seals, gap measurements shall be performed within 60 days of the initial fill with petroleum liquid and at least once every year thereafter.

(C) If any storage vessel is out of service for a period of one year or more, subsequent refilling with petroleum liquid shall be considered initial fill for the purposes of paragraphs (a)(1)(i)(A) and (a)(1)(i)(B) of this section.

(D) Keep records of each gap measurement at the plant for a period of at least 2 years following the date of measurement. Each record shall identify the vessel on which the measurement was performed and shall contain the date of the seal gap measurement, the raw data obtained in the measurement process required by paragraph (a)(1)(ii) of this section and the calculation required by paragraph (a)(1)(iii) of this section.

(E) If either the seal gap calculated in accord with paragraph (a)(1)(iii) of this section or the measured maximum seal gap exceeds the limitations specified by § 60.112a of this subpart, a report shall be furnished to the Administrator within 60 days of the date of measurements. The report shall identify the vessel and list each reason why the vessel did not meet the specifications of § 60.112a. The report shall also describe the actions necessary to bring the storage vessel into compliance with the specifications of § 60.112a.

(ii) Determine gap widths in the primary and secondary seals individually by the following procedures:

(A) Measure seal gaps, if any, at one or more floating roof levels when the roof is floating off the roof leg supports.

(B) Measure seal gaps around the entire circumference of the tank in each place where a $\frac{1}{8}''$ diameter uniform probe passes freely (without forcing or binding against seal) between the seal and the tank wall and measure the circumferential distance of each such location.

(C) The total surface area of each gap described in paragraph (a)(1)(ii)(B) of this section shall be determined by using probes of various widths to accurately measure the actual distance from the tank wall to the seal and multiplying each such width by its respective circumferential distance.

(iii) Add the gap surface area of each gap location for the primary seal and the secondary seal individually. Divide the sum for each seal by the nominal diameter of the tank and compare each ratio to the appropriate ratio in the standard in § 60.112a(a)(1)(i) and § 60.112a(a)(1)(ii).

(iv) Provide the Administrator 30 days prior notice of the gap measurement to afford the Administrator the opportunity to have an observer present.

(2) The owner or operator of each storage vessel to which this subpart applies which has a vapor recovery and return or disposal system shall provide the following information to the Administrator on or before the date on which construction of the storage vessel commences:

(i) Emission data, if available, for a similar vapor recovery and return or disposal system used on the same type of storage vessel, which can be used to determine the efficiency of the system. A complete description of the emission measurement method used must be included.

(ii) The manufacturer's design specifications and estimated emission reduction capability of the system.

(iii) The operation and maintenance plan for the system.

(iv) Any other information which will be useful to the Administrator in evaluating the effectiveness of the system in reducing VOC emissions.

[45 FR 23379, Apr. 4, 1980, as amended at 52 FR 11429, Apr. 8, 1987]

§ 60.114a Alternative means of emission limitation.

(a) If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in emissions at least equivalent to the reduction in emissions achieved by any requirement in § 60.112a, the Administrator will publish in the FEDERAL REGISTER a notice permitting the use of the alternative means for purposes of compliance with that requirement.

(b) Any notice under paragraph (a) of this section will be published only after notice and an opportunity for a hearing.

(c) Any person seeking permission under this section shall submit to the Administrator a written application including:

(1) An actual emissions test that uses a full-sized or scale-model storage vessel that accurately collects and measures all VOC emissions from a given control device and that accurately simulates wind and accounts for other emission variables such as temperature and barometric pressure.

(2) An engineering evaluation that the Administrator determines is an accurate method of determining equivalence.

(d) The Administrator may condition the permission on requirements that may be necessary to ensure operation and maintenance to achieve the same emissions reduction as specified in § 60.112a.

(e) The primary vapor-mounted seal in the “Volume-Maximizing Seal” manufactured by R.F.I. Services Corporation is approved as equivalent to the vapor-mounted seal required by § 60.112a(a)(1)(i) and must meet the gap criteria specified in § 60.112a(a)(1)(i)(B). There shall be no gaps between the tank wall and any secondary seal used in conjunction with the primary seal in the “Volume-Maximizing Seal”.

[52 FR 11429, Apr. 8, 1987]

§ 60.115a Monitoring of operations.

(a) Except as provided in paragraph (d) of this section, the owner or operator subject to this subpart shall maintain a record of the petroleum liquid stored, the period of storage, and the maximum true vapor pressure of that liquid during the respective storage period.

(b) Available data on the typical Reid vapor pressure and the maximum expected storage temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API Bulletin 2517, unless the Administrator specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from the sample(s).

(c) The true vapor pressure of each type of crude oil with a Reid vapor pressure less than 13.8 kPa (2.0 psia) or whose physical properties preclude determination by the recommended method is to be determined from available data and recorded if the estimated true vapor pressure is greater than 6.9 kPa (1.0 psia).

(d) The following are exempt from the requirements of this section:

(1) Each owner or operator of each storage vessel storing a petroleum liquid with a Reid vapor pressure of less than 6.9 kPa (1.0 psia) provided the maximum true vapor pressure does not exceed 6.9 kPa (1.0 psia).

(2) The owner or operator of each storage vessel equipped with a vapor recovery and return or disposal system in accordance with the requirements of § 60.112a(a)(3) and (b), or a closed vent system and control device meeting the specifications of 40 CFR 65.42(b)(4), (b)(5), or (c).

[45 FR 23379, Apr. 4, 1980, as amended at 65 FR 78275, Dec. 14, 2000]

Attachment D
To Part 70 Operating Permit Renewal No.: T089-31293-00497

[Downloaded from the eCFR on May 13. 2013]

Electronic Code of Federal Regulations

Title 40: Protection of Environment

Part 60, Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

SOURCE: 52 FR 11429, Apr. 8, 1987, unless otherwise noted.

§ 60.110b Applicability and designation of affected facility.

(a) Except as provided in paragraph (b) of this section, the affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after July 23, 1984.

(b) This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa.

(c) [Reserved]

(d) This subpart does not apply to the following:

(1) Vessels at coke oven by-product plants.

(2) Pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere.

(3) Vessels permanently attached to mobile vehicles such as trucks, railcars, barges, or ships.

(4) Vessels with a design capacity less than or equal to 1,589.874 m^3 used for petroleum or condensate stored, processed, or treated prior to custody transfer.

(5) Vessels located at bulk gasoline plants.

(6) Storage vessels located at gasoline service stations.

(7) Vessels used to store beverage alcohol.

(8) Vessels subject to subpart GGGG of 40 CFR part 63.

(e) *Alternative means of compliance* —(1) *Option to comply with part 65.* Owners or operators may choose to comply with 40 CFR part 65, subpart C, to satisfy the requirements of §§ 60.112b through 60.117b for storage vessels that are subject to this subpart that meet the specifications in paragraphs (e)(1)(i) and (ii) of this section. When choosing to comply with 40 CFR part 65, subpart C, the monitoring requirements of § 60.116b(c), (e), (f)(1), and (g) still apply. Other provisions applying to owners or operators who choose to comply with 40 CFR part 65 are provided in 40 CFR 65.1.

(i) A storage vessel with a design capacity greater than or equal to 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa; or

(ii) A storage vessel with a design capacity greater than 75 m^3 but less than 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 27.6 kPa.

(2) *Part 60, subpart A.* Owners or operators who choose to comply with 40 CFR part 65, subpart C, must also comply with §§ 60.1, 60.2, 60.5, 60.6, 60.7(a)(1) and (4), 60.14, 60.15, and 60.16 for those storage vessels. All sections and paragraphs of subpart A of this part that are not mentioned in this paragraph (e)(2) do not apply to owners or operators of storage vessels complying with 40 CFR part 65, subpart C, except that provisions required to be met prior to implementing 40 CFR part 65 still apply. Owners and operators who choose to comply with 40 CFR part 65, subpart C, must comply with 40 CFR part 65, subpart A.

(3) *Internal floating roof report.* If an owner or operator installs an internal floating roof and, at initial startup, chooses to comply with 40 CFR part 65, subpart C, a report shall be furnished to the Administrator stating that the control equipment meets the specifications of 40 CFR 65.43. This report shall be an attachment to the notification required by 40 CFR 65.5(b).

(4) *External floating roof report.* If an owner or operator installs an external floating roof and, at initial startup, chooses to comply with 40 CFR part 65, subpart C, a report shall be furnished to the Administrator stating that the control equipment meets the specifications of 40 CFR 65.44. This report shall be an attachment to the notification required by 40 CFR 65.5(b).

[52 FR 11429, Apr. 8, 1987, as amended at 54 FR 32973, Aug. 11, 1989; 65 FR 78275, Dec. 14, 2000; 68 FR 59332, Oct. 15, 2003]

§ 60.111b Definitions.

Terms used in this subpart are defined in the Act, in subpart A of this part, or in this subpart as follows:

Bulk gasoline plant means any gasoline distribution facility that has a gasoline throughput less than or equal to 75,700 liters per day. Gasoline throughput shall be the maximum calculated design throughput as may be limited by compliance with an enforceable condition under Federal requirement or Federal, State or local law, and discoverable by the Administrator and any other person.

Condensate means hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature or pressure, or both, and remains liquid at standard conditions.

Custody transfer means the transfer of produced petroleum and/or condensate, after processing and/or treatment in the producing operations, from storage vessels or automatic transfer facilities to pipelines or any other forms of transportation.

Fill means the introduction of VOL into a storage vessel but not necessarily to complete capacity.

Gasoline service station means any site where gasoline is dispensed to motor vehicle fuel tanks from stationary storage tanks.

Maximum true vapor pressure means the equilibrium partial pressure exerted by the volatile organic compounds (as defined in 40 CFR 51.100) in the stored VOL at the temperature equal to the highest calendar-month average of the VOL storage temperature for VOL's stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for VOL's stored at the ambient temperature, as determined:

(1) In accordance with methods described in American Petroleum institute Bulletin 2517, Evaporation Loss From External Floating Roof Tanks, (incorporated by reference—see § 60.17); or

(2) As obtained from standard reference texts; or

(3) As determined by ASTM D2879-83, 96, or 97 (incorporated by reference—see § 60.17);

(4) Any other method approved by the Administrator.

Petroleum means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

Petroleum liquids means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery.

Process tank means a tank that is used within a process (including a solvent or raw material recovery process) to collect material discharged from a feedstock storage vessel or equipment within the process before the material is transferred to other equipment within the process, to a product or by-product storage vessel, or to a vessel used to store recovered solvent or raw material. In many process tanks, unit operations such as reactions and blending are conducted. Other process tanks, such as surge control vessels and bottoms receivers, however, may not involve unit operations.

Reid vapor pressure means the absolute vapor pressure of volatile crude oil and volatile nonviscous petroleum liquids except liquified petroleum gases, as determined by ASTM D323-82 or 94 (incorporated by reference—see § 60.17).

Storage vessel means each tank, reservoir, or container used for the storage of volatile organic liquids but does not include:

(1) Frames, housing, auxiliary supports, or other components that are not directly involved in the containment of liquids or vapors;

(2) Subsurface caverns or porous rock reservoirs; or

(3) Process tanks.

Volatile organic liquid (VOL) means any organic liquid which can emit volatile organic compounds (as defined in 40 CFR 51.100) into the atmosphere.

Waste means any liquid resulting from industrial, commercial, mining or agricultural operations, or from community activities that is discarded or is being accumulated, stored, or physically, chemically, or biologically treated prior to being discarded or recycled.

[52 FR 11429, Apr. 8, 1987, as amended at 54 FR 32973, Aug. 11, 1989; 65 FR 61756, Oct. 17, 2000; 68 FR 59333, Oct. 15, 2003]

§ 60.112b Standard for volatile organic compounds (VOC).

(a) The owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 5.2 kPa but less than 76.6 kPa or with a design capacity greater than or equal to 75 m^3 but less than 151 m^3 containing a VOL that, as stored, has a maximum true vapor pressure equal to or greater than 27.6 kPa but less than 76.6 kPa, shall equip each storage vessel with one of the following:

(1) A fixed roof in combination with an internal floating roof meeting the following specifications:

(i) The internal floating roof shall rest or float on the liquid surface (but not necessarily in complete contact with it) inside a storage vessel that has a fixed roof. The internal floating roof shall be floating on the liquid surface at all times, except during initial fill and during those intervals when the storage vessel is completely emptied or subsequently emptied and refilled. When the roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be accomplished as rapidly as possible.

(ii) Each internal floating roof shall be equipped with one of the following closure devices between the wall of the storage vessel and the edge of the internal floating roof:

(A) A foam- or liquid-filled seal mounted in contact with the liquid (liquid-mounted seal). A liquid-mounted seal means a foam- or liquid-filled seal mounted in contact with the liquid between the wall of the storage vessel and the floating roof continuously around the circumference of the tank.

(B) Two seals mounted one above the other so that each forms a continuous closure that completely covers the space between the wall of the storage vessel and the edge of the internal floating roof. The lower seal may be vapor-mounted, but both must be continuous.

(C) A mechanical shoe seal. A mechanical shoe seal is a metal sheet held vertically against the wall of the storage vessel by springs or weighted levers and is connected by braces to the floating roof. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

(iii) Each opening in a noncontact internal floating roof except for automatic bleeder vents (vacuum breaker vents) and the rim space vents is to provide a projection below the liquid surface.

(iv) Each opening in the internal floating roof except for leg sleeves, automatic bleeder vents, rim space vents, column wells, ladder wells, sample wells, and stub drains is to be equipped with a cover or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. The cover or lid shall be equipped with a gasket. Covers on each access hatch and automatic gauge float well shall be bolted except when they are in use.

(v) Automatic bleeder vents shall be equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports.

(vi) Rim space vents shall be equipped with a gasket and are to be set to open only when the internal floating roof is not floating or at the manufacturer's recommended setting.

(vii) Each penetration of the internal floating roof for the purpose of sampling shall be a sample well. The sample well shall have a slit fabric cover that covers at least 90 percent of the opening.

(viii) Each penetration of the internal floating roof that allows for passage of a column supporting the fixed roof shall have a flexible fabric sleeve seal or a gasketed sliding cover.

(ix) Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

(2) An external floating roof. An external floating roof means a pontoon-type or double-deck type cover that rests on the liquid surface in a vessel with no fixed roof. Each external floating roof must meet the following specifications:

(i) Each external floating roof shall be equipped with a closure device between the wall of the storage vessel and the roof edge. The closure device is to consist of two seals, one above the other. The lower seal is referred to as the primary seal, and the upper seal is referred to as the secondary seal.

(A) The primary seal shall be either a mechanical shoe seal or a liquid-mounted seal. Except as provided in § 60.113b(b)(4), the seal shall completely cover the annular space between the edge of the floating roof and tank wall.

(B) The secondary seal shall completely cover the annular space between the external floating roof and the wall of the storage vessel in a continuous fashion except as allowed in § 60.113b(b)(4).

(ii) Except for automatic bleeder vents and rim space vents, each opening in a noncontact external floating roof shall provide a projection below the liquid surface. Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof is to be equipped with a gasketed cover, seal, or lid that is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. Automatic bleeder vents are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports. Rim vents are to be set to open when the roof is being floated off the roof legs supports or at the manufacturer's recommended setting. Automatic bleeder vents and rim space vents are to be gasketed. Each emergency roof drain is to be provided with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening.

(iii) The roof shall be floating on the liquid at all times (i.e., off the roof leg supports) except during initial fill until the roof is lifted off leg supports and when the tank is completely emptied and subsequently refilled. The process of filling, emptying, or refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible.

(3) A closed vent system and control device meeting the following specifications:

(i) The closed vent system shall be designed to collect all VOC vapors and gases discharged from the storage vessel and operated with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background and visual inspections, as determined in part 60, subpart VV, § 60.485(b).

(ii) The control device shall be designed and operated to reduce inlet VOC emissions by 95 percent or greater. If a flare is used as the control device, it shall meet the specifications described in the general control device requirements (§ 60.18) of the General Provisions.

(4) A system equivalent to those described in paragraphs (a)(1), (a)(2), or (a)(3) of this section as provided in § 60.114b of this subpart.

(b) The owner or operator of each storage vessel with a design capacity greater than or equal to 75 m^3 which contains a VOL that, as stored, has a maximum true vapor pressure greater than or equal to 76.6 kPa shall equip each storage vessel with one of the following:

(1) A closed vent system and control device as specified in § 60.112b(a)(3).

(2) A system equivalent to that described in paragraph (b)(1) as provided in § 60.114b of this subpart.

(c) *Site-specific standard for Merck & Co., Inc.'s Stonewall Plant in Elkton, Virginia.* This paragraph applies only to the pharmaceutical manufacturing facility, commonly referred to as the Stonewall Plant, located at Route 340 South, in Elkton, Virginia (“site”).

(1) For any storage vessel that otherwise would be subject to the control technology requirements of paragraphs (a) or (b) of this section, the site shall have the option of either complying directly with the requirements of this subpart, or reducing the site-wide total criteria pollutant emissions cap (total emissions cap) in accordance with the procedures set forth in a permit issued pursuant to 40 CFR 52.2454. If the site chooses the option of reducing the total emissions cap in accordance with the procedures set forth in such permit, the requirements of such permit shall apply in lieu of the otherwise applicable requirements of this subpart for such storage vessel.

(2) For any storage vessel at the site not subject to the requirements of 40 CFR 60.112b (a) or (b), the requirements of 40 CFR 60.116b (b) and (c) and the General Provisions (subpart A of this part) shall not apply.

[52 FR 11429, Apr. 8, 1987, as amended at 62 FR 52641, Oct. 8, 1997]

§ 60.113b Testing and procedures.

The owner or operator of each storage vessel as specified in § 60.112b(a) shall meet the requirements of paragraph (a), (b), or (c) of this section. The applicable paragraph for a particular storage vessel depends on the control equipment installed to meet the requirements of § 60.112b.

(a) After installing the control equipment required to meet § 60.112b(a)(1) (permanently affixed roof and internal floating roof), each owner or operator shall:

(1) Visually inspect the internal floating roof, the primary seal, and the secondary seal (if one is in service), prior to filling the storage vessel with VOL. If there are holes, tears, or other openings in the primary seal, the secondary seal,

or the seal fabric or defects in the internal floating roof, or both, the owner or operator shall repair the items before filling the storage vessel.

(2) For Vessels equipped with a liquid-mounted or mechanical shoe primary seal, visually inspect the internal floating roof and the primary seal or the secondary seal (if one is in service) through manholes and roof hatches on the fixed roof at least once every 12 months after initial fill. If the internal floating roof is not resting on the surface of the VOL inside the storage vessel, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric, the owner or operator shall repair the items or empty and remove the storage vessel from service within 45 days. If a failure that is detected during inspections required in this paragraph cannot be repaired within 45 days and if the vessel cannot be emptied within 45 days, a 30-day extension may be requested from the Administrator in the inspection report required in § 60.115b(a)(3). Such a request for an extension must document that alternate storage capacity is unavailable and specify a schedule of actions the company will take that will assure that the control equipment will be repaired or the vessel will be emptied as soon as possible.

(3) For vessels equipped with a double-seal system as specified in § 60.112b(a)(1)(ii)(B):

(i) Visually inspect the vessel as specified in paragraph (a)(4) of this section at least every 5 years; or

(ii) Visually inspect the vessel as specified in paragraph (a)(2) of this section.

(4) Visually inspect the internal floating roof, the primary seal, the secondary seal (if one is in service), gaskets, slotted membranes and sleeve seals (if any) each time the storage vessel is emptied and degassed. If the internal floating roof has defects, the primary seal has holes, tears, or other openings in the seal or the seal fabric, or the secondary seal has holes, tears, or other openings in the seal or the seal fabric, or the gaskets no longer close off the liquid surfaces from the atmosphere, or the slotted membrane has more than 10 percent open area, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before refilling the storage vessel with VOL. In no event shall inspections conducted in accordance with this provision occur at intervals greater than 10 years in the case of vessels conducting the annual visual inspection as specified in paragraphs (a)(2) and (a)(3)(ii) of this section and at intervals no greater than 5 years in the case of vessels specified in paragraph (a)(3)(i) of this section.

(5) Notify the Administrator in writing at least 30 days prior to the filling or refilling of each storage vessel for which an inspection is required by paragraphs (a)(1) and (a)(4) of this section to afford the Administrator the opportunity to have an observer present. If the inspection required by paragraph (a)(4) of this section is not planned and the owner or operator could not have known about the inspection 30 days in advance or refilling the tank, the owner or operator shall notify the Administrator at least 7 days prior to the refilling of the storage vessel. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification including the written documentation may be made in writing and sent by express mail so that it is received by the Administrator at least 7 days prior to the refilling.

(b) After installing the control equipment required to meet § 60.112b(a)(2) (external floating roof), the owner or operator shall:

(1) Determine the gap areas and maximum gap widths, between the primary seal and the wall of the storage vessel and between the secondary seal and the wall of the storage vessel according to the following frequency.

(i) Measurements of gaps between the tank wall and the primary seal (seal gaps) shall be performed during the hydrostatic testing of the vessel or within 60 days of the initial fill with VOL and at least once every 5 years thereafter.

(ii) Measurements of gaps between the tank wall and the secondary seal shall be performed within 60 days of the initial fill with VOL and at least once per year thereafter.

(iii) If any source ceases to store VOL for a period of 1 year or more, subsequent introduction of VOL into the vessel shall be considered an initial fill for the purposes of paragraphs (b)(1)(i) and (b)(1)(ii) of this section.

(2) Determine gap widths and areas in the primary and secondary seals individually by the following procedures:

(i) Measure seal gaps, if any, at one or more floating roof levels when the roof is floating off the roof leg supports.

(ii) Measure seal gaps around the entire circumference of the tank in each place where a 0.32-cm diameter uniform probe passes freely (without forcing or binding against seal) between the seal and the wall of the storage vessel and measure the circumferential distance of each such location.

(iii) The total surface area of each gap described in paragraph (b)(2)(ii) of this section shall be determined by using probes of various widths to measure accurately the actual distance from the tank wall to the seal and multiplying each such width by its respective circumferential distance.

(3) Add the gap surface area of each gap location for the primary seal and the secondary seal individually and divide the sum for each seal by the nominal diameter of the tank and compare each ratio to the respective standards in paragraph (b)(4) of this section.

(4) Make necessary repairs or empty the storage vessel within 45 days of identification in any inspection for seals not meeting the requirements listed in (b)(4) (i) and (ii) of this section:

(i) The accumulated area of gaps between the tank wall and the mechanical shoe or liquid-mounted primary seal shall not exceed 212 Cm^2 per meter of tank diameter, and the width of any portion of any gap shall not exceed 3.81 cm.

(A) One end of the mechanical shoe is to extend into the stored liquid, and the other end is to extend a minimum vertical distance of 61 cm above the stored liquid surface.

(B) There are to be no holes, tears, or other openings in the shoe, seal fabric, or seal envelope.

(ii) The secondary seal is to meet the following requirements:

(A) The secondary seal is to be installed above the primary seal so that it completely covers the space between the roof edge and the tank wall except as provided in paragraph (b)(2)(iii) of this section.

(B) The accumulated area of gaps between the tank wall and the secondary seal shall not exceed 21.2 cm^2 per meter of tank diameter, and the width of any portion of any gap shall not exceed 1.27 cm.

(C) There are to be no holes, tears, or other openings in the seal or seal fabric.

(iii) If a failure that is detected during inspections required in paragraph (b)(1) of § 60.113b(b) cannot be repaired within 45 days and if the vessel cannot be emptied within 45 days, a 30-day extension may be requested from the Administrator in the inspection report required in § 60.115b(b)(4). Such extension request must include a demonstration of unavailability of alternate storage capacity and a specification of a schedule that will assure that the control equipment will be repaired or the vessel will be emptied as soon as possible.

(5) Notify the Administrator 30 days in advance of any gap measurements required by paragraph (b)(1) of this section to afford the Administrator the opportunity to have an observer present.

(6) Visually inspect the external floating roof, the primary seal, secondary seal, and fittings each time the vessel is emptied and degassed.

(i) If the external floating roof has defects, the primary seal has holes, tears, or other openings in the seal or the seal fabric, or the secondary seal has holes, tears, or other openings in the seal or the seal fabric, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before filling or refilling the storage vessel with VOL.

(ii) For all the inspections required by paragraph (b)(6) of this section, the owner or operator shall notify the Administrator in writing at least 30 days prior to the filling or refilling of each storage vessel to afford the Administrator the opportunity to inspect the storage vessel prior to refilling. If the inspection required by paragraph (b)(6) of this section is not planned and the owner or operator could not have known about the inspection 30 days in advance of refilling the tank, the owner or operator shall notify the Administrator at least 7 days prior to the refilling of the storage vessel. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification including the written documentation may be made in writing and sent by express mail so that it is received by the Administrator at least 7 days prior to the refilling.

(c) The owner or operator of each source that is equipped with a closed vent system and control device as required in § 60.112b (a)(3) or (b)(2) (other than a flare) is exempt from § 60.8 of the General Provisions and shall meet the following requirements.

(1) Submit for approval by the Administrator as an attachment to the notification required by § 60.7(a)(1) or, if the facility is exempt from § 60.7(a)(1), as an attachment to the notification required by § 60.7(a)(2), an operating plan containing the information listed below.

(i) Documentation demonstrating that the control device will achieve the required control efficiency during maximum loading conditions. This documentation is to include a description of the gas stream which enters the control device, including flow and VOC content under varying liquid level conditions (dynamic and static) and manufacturer's design specifications for the control device. If the control device or the closed vent capture system receives vapors, gases, or liquids other than fuels from sources that are not designated sources under this subpart, the efficiency demonstration is to include consideration of all vapors, gases, and liquids received by the closed vent capture system and control device. If an enclosed combustion device with a minimum residence time of 0.75 seconds and a minimum temperature of 816 °C is used to meet the 95 percent requirement, documentation that those conditions will exist is sufficient to meet the requirements of this paragraph.

(ii) A description of the parameter or parameters to be monitored to ensure that the control device will be operated in conformance with its design and an explanation of the criteria used for selection of that parameter (or parameters).

(2) Operate the closed vent system and control device and monitor the parameters of the closed vent system and control device in accordance with the operating plan submitted to the Administrator in accordance with paragraph (c)(1) of this section, unless the plan was modified by the Administrator during the review process. In this case, the modified plan applies.

(d) The owner or operator of each source that is equipped with a closed vent system and a flare to meet the requirements in § 60.112b (a)(3) or (b)(2) shall meet the requirements as specified in the general control device requirements, § 60.18 (e) and (f).

[52 FR 11429, Apr. 8, 1987, as amended at 54 FR 32973, Aug. 11, 1989]

§ 60.114b Alternative means of emission limitation.

(a) If, in the Administrator's judgment, an alternative means of emission limitation will achieve a reduction in emissions at least equivalent to the reduction in emissions achieved by any requirement in § 60.112b, the Administrator will publish in the FEDERAL REGISTER a notice permitting the use of the alternative means for purposes of compliance with that requirement.

(b) Any notice under paragraph (a) of this section will be published only after notice and an opportunity for a hearing.

(c) Any person seeking permission under this section shall submit to the Administrator a written application including:

(1) An actual emissions test that uses a full-sized or scale-model storage vessel that accurately collects and measures all VOC emissions from a given control device and that accurately simulates wind and accounts for other emission variables such as temperature and barometric pressure.

(2) An engineering evaluation that the Administrator determines is an accurate method of determining equivalence.

(d) The Administrator may condition the permission on requirements that may be necessary to ensure operation and maintenance to achieve the same emissions reduction as specified in § 60.112b.

§ 60.115b Reporting and recordkeeping requirements.

The owner or operator of each storage vessel as specified in § 60.112b(a) shall keep records and furnish reports as required by paragraphs (a), (b), or (c) of this section depending upon the control equipment installed to meet the requirements of § 60.112b. The owner or operator shall keep copies of all reports and records required by this section, except for the record required by (c)(1), for at least 2 years. The record required by (c)(1) will be kept for the life of the control equipment.

(a) After installing control equipment in accordance with § 60.112b(a)(1) (fixed roof and internal floating roof), the owner or operator shall meet the following requirements.

(1) Furnish the Administrator with a report that describes the control equipment and certifies that the control equipment meets the specifications of § 60.112b(a)(1) and § 60.113b(a)(1). This report shall be an attachment to the notification required by § 60.7(a)(3).

(2) Keep a record of each inspection performed as required by § 60.113b (a)(1), (a)(2), (a)(3), and (a)(4). Each record shall identify the storage vessel on which the inspection was performed and shall contain the date the vessel was inspected and the observed condition of each component of the control equipment (seals, internal floating roof, and fittings).

(3) If any of the conditions described in § 60.113b(a)(2) are detected during the annual visual inspection required by § 60.113b(a)(2), a report shall be furnished to the Administrator within 30 days of the inspection. Each report shall identify the storage vessel, the nature of the defects, and the date the storage vessel was emptied or the nature of and date the repair was made.

(4) After each inspection required by § 60.113b(a)(3) that finds holes or tears in the seal or seal fabric, or defects in the internal floating roof, or other control equipment defects listed in § 60.113b(a)(3)(ii), a report shall be furnished to the Administrator within 30 days of the inspection. The report shall identify the storage vessel and the reason it did not meet the specifications of § 61.112b(a)(1) or § 60.113b(a)(3) and list each repair made.

(b) After installing control equipment in accordance with § 61.112b(a)(2) (external floating roof), the owner or operator shall meet the following requirements.

(1) Furnish the Administrator with a report that describes the control equipment and certifies that the control equipment meets the specifications of § 60.112b(a)(2) and § 60.113b(b)(2), (b)(3), and (b)(4). This report shall be an attachment to the notification required by § 60.7(a)(3).

(2) Within 60 days of performing the seal gap measurements required by § 60.113b(b)(1), furnish the Administrator with a report that contains:

(i) The date of measurement.

(ii) The raw data obtained in the measurement.

(iii) The calculations described in § 60.113b (b)(2) and (b)(3).

(3) Keep a record of each gap measurement performed as required by § 60.113b(b). Each record shall identify the storage vessel in which the measurement was performed and shall contain:

(i) The date of measurement.

(ii) The raw data obtained in the measurement.

(iii) The calculations described in § 60.113b (b)(2) and (b)(3).

(4) After each seal gap measurement that detects gaps exceeding the limitations specified by § 60.113b(b)(4), submit a report to the Administrator within 30 days of the inspection. The report will identify the vessel and contain the information specified in paragraph (b)(2) of this section and the date the vessel was emptied or the repairs made and date of repair.

(c) After installing control equipment in accordance with § 60.112b (a)(3) or (b)(1) (closed vent system and control device other than a flare), the owner or operator shall keep the following records.

(1) A copy of the operating plan.

(2) A record of the measured values of the parameters monitored in accordance with § 60.113b(c)(2).

(d) After installing a closed vent system and flare to comply with § 60.112b, the owner or operator shall meet the following requirements.

(1) A report containing the measurements required by § 60.18(f) (1), (2), (3), (4), (5), and (6) shall be furnished to the Administrator as required by § 60.8 of the General Provisions. This report shall be submitted within 6 months of the initial start-up date.

(2) Records shall be kept of all periods of operation during which the flare pilot flame is absent.

(3) Semiannual reports of all periods recorded under § 60.115b(d)(2) in which the pilot flame was absent shall be furnished to the Administrator.

§ 60.116b Monitoring of operations.

(a) The owner or operator shall keep copies of all records required by this section, except for the record required by paragraph (b) of this section, for at least 2 years. The record required by paragraph (b) of this section will be kept for the life of the source.

(b) The owner or operator of each storage vessel as specified in § 60.110b(a) shall keep readily accessible records showing the dimension of the storage vessel and an analysis showing the capacity of the storage vessel.

(c) Except as provided in paragraphs (f) and (g) of this section, the owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure greater than or equal to 3.5 kPa or with a design capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure greater than or equal to 15.0 kPa shall maintain a record of the VOL stored, the period of storage, and the maximum true vapor pressure of that VOL during the respective storage period.

(d) Except as provided in paragraph (g) of this section, the owner or operator of each storage vessel either with a design capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure that is normally less than 5.2 kPa or with a design capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure that is normally less than 27.6 kPa shall notify the Administrator within 30 days when the maximum true vapor pressure of the liquid exceeds the respective maximum true vapor vapor pressure values for each volume range.

(e) Available data on the storage temperature may be used to determine the maximum true vapor pressure as determined below.

(1) For vessels operated above or below ambient temperatures, the maximum true vapor pressure is calculated based upon the highest expected calendar-month average of the storage temperature. For vessels operated at ambient temperatures, the maximum true vapor pressure is calculated based upon the maximum local monthly average ambient temperature as reported by the National Weather Service.

(2) For crude oil or refined petroleum products the vapor pressure may be obtained by the following:

(i) Available data on the Reid vapor pressure and the maximum expected storage temperature based on the highest expected calendar-month average temperature of the stored product may be used to determine the maximum true vapor pressure from nomographs contained in API Bulletin 2517 (incorporated by reference—see § 60.17), unless the Administrator specifically requests that the liquid be sampled, the actual storage temperature determined, and the Reid vapor pressure determined from the sample(s).

(ii) The true vapor pressure of each type of crude oil with a Reid vapor pressure less than 13.8 kPa or with physical properties that preclude determination by the recommended method is to be determined from available data and recorded if the estimated maximum true vapor pressure is greater than 3.5 kPa.

(3) For other liquids, the vapor pressure:

(i) May be obtained from standard reference texts, or

(ii) Determined by ASTM D2879-83, 96, or 97 (incorporated by reference—see § 60.17); or

(iii) Measured by an appropriate method approved by the Administrator; or

(iv) Calculated by an appropriate method approved by the Administrator.

(f) The owner or operator of each vessel storing a waste mixture of indeterminate or variable composition shall be subject to the following requirements.

(1) Prior to the initial filling of the vessel, the highest maximum true vapor pressure for the range of anticipated liquid compositions to be stored will be determined using the methods described in paragraph (e) of this section.

(2) For vessels in which the vapor pressure of the anticipated liquid composition is above the cutoff for monitoring but below the cutoff for controls as defined in § 60.112b(a), an initial physical test of the vapor pressure is required; and a physical test at least once every 6 months thereafter is required as determined by the following methods:

(i) ASTM D2879-83, 96, or 97 (incorporated by reference—see § 60.17); or

(ii) ASTM D323-82 or 94 (incorporated by reference—see § 60.17); or

(iii) As measured by an appropriate method as approved by the Administrator.

(g) The owner or operator of each vessel equipped with a closed vent system and control device meeting the specification of § 60.112b or with emissions reductions equipment as specified in 40 CFR 65.42(b)(4), (b)(5), (b)(6), or (c) is exempt from the requirements of paragraphs (c) and (d) of this section.

[52 FR 11429, Apr. 8, 1987, as amended at 65 FR 61756, Oct. 17, 2000; 65 FR 78276, Dec. 14, 2000; 68 FR 59333, Oct. 15, 2003]

§ 60.117b Delegation of authority.

(a) In delegating implementation and enforcement authority to a State under section 111(c) of the Act, the authorities contained in paragraph (b) of this section shall be retained by the Administrator and not transferred to a State.

(b) Authorities which will not be delegated to States: §§ 60.111b(f)(4), 60.114b, 60.116b(e)(3)(iii), 60.116b(e)(3)(iv), and 60.116b(f)(2)(iii).

[52 FR 11429, Apr. 8, 1987, as amended at 52 FR 22780, June 16, 1987]

Attachment E
To Part 70 Operating Permit Renewal No.: T089-31293-00497

Electronic Code of Federal Regulations

Title 40: Protection of Environment

Part 63, 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, dsm^3 /J ($dscf/10^6$ Btu).

F_c = Ratio of the volume of CO_2 produced to the gross calorific value of the fuel from Method 19, dsm^3 /J ($dscf/10^6$ 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 1 a 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 1 b 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 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 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 2 a 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 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 2 b 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 2 c 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] b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; 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] b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; 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 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 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] b. Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; 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] 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] 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 2 d 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] b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; 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] 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, 63.6612, 63.6620, and 63.6640, you must comply with the following requirements for performance tests for stationary RICE:

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. Measure the O_2at the inlet and outlet of the control device; and	(1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A, or ASTM Method D6522-00 (Reapproved 2005).[a c]	(a) Measurements to determine O_2must be made at the same time as the measurements for CO concentration.
		ii. Measure the CO at the inlet and the outlet of the control device	(1) ASTM D6522-00 (Reapproved 2005) [a b c]or Method 10 of 40 CFR part 60, appendix A	(a) The CO concentration must be at 15 percent O_2, dry basis.
2. 4SRB stationary RICE	a. reduce formaldehyde emissions	i. Select the sampling port location and the number of traverse points; and	(1) Method 1 or 1A of 40 CFR part 60, appendix A § 63.7(d)(1)(i)	(a) sampling sites must be located at the inlet and outlet of the control device.
		ii. Measure O_2at the inlet and outlet of the control device; and	(1) Method 3 or 3A or 3B of 40 CFR part 60, appendix A, or ASTM Method D6522-00 (Reapproved 2005).[a]	(a) measurements to determine O_2concentration 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, or Test 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 formaldehyde 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	(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.
3. Stationary RICE	a. limit the concentration of formaldehyde or CO in the stationary RICE exhaust	i. Select the sampling port location and the number of traverse points; and	(1) Method 1 or 1A of 40 CFR part 60, appendix A § 63.7(d)(1)(i)	(a) if using a control device, the sampling site must be located at the outlet of the control device.

For each . . .	Complying with the requirement to . . .	You must . . .	Using . . .	According to the following requirements . . .
		ii. Determine the O_2concentration 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, or ASTM Method D6522-00 (Reapproved 2005).[a]	(a) measurements to determine O_2concentration must be made at the same time and location as the measurements for formaldehyde or CO concentration.
		iii. Measure moisture content of the stationary RICE exhaust at the sampling port location; and	(1) Method 4 of 40 CFR part 60, appendix A, or Test 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 formaldehyde at the exhaust of the stationary 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 stationary RICE.	(1) Method 10 of 40 CFR part 60, appendix A, ASTM Method D6522-00 (2005),[a] [c]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] Incorporated by reference, see 40 CFR 63.14. You may also obtain copies from University Microfilms International, 300 North Zeeb Road, Ann Arbor, MI 48106.

[b] You may also use Method 320 of 40 CFR part 63, appendix A, or ASTM D6348-03.

[c] ASTM-D6522-00 (2005) may be used to test both CI and SI stationary RICE.

[78 FR 6711, Jan. 30, 2013]

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 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.
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 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.
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 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.

For each . . .	Complying with the requirement to . . .	You have demonstrated initial compliance if . . .
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_2or CO_2at both the inlet and 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 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_2or CO_2at 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
		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

For each . . .	Complying with the requirement to . . .	You have demonstrated initial compliance if . . .
		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 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 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.
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;

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), 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 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.

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .
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 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.
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 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.
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.

For each . . .	Complying with the requirement to . . .	You must demonstrate continuous compliance by . . .
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 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 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 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 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 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 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 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 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.

<table>
<tr><td></td><td colspan="3"></td><td colspan="3"></td><td colspan="3"></td><td colspan="2"></td></tr>
<tr><td colspan="12">Facility___________ Engine I.D.___________ Date______</td></tr>
<tr><td>Run Type:</td><td colspan="3">(_)</td><td colspan="3">(_)</td><td colspan="3">(_)</td><td colspan="2">(_)</td></tr>
<tr><td>(X)</td><td colspan="3">Pre-Sample Calibration</td><td colspan="3">Stack Gas Sample</td><td colspan="3">Post-Sample Cal. Check</td><td colspan="2">Repeatability Check</td></tr>
<tr><td>Run #</td><td>1</td><td>1</td><td>2</td><td>2</td><td>3</td><td>3</td><td>4</td><td>4</td><td>Time</td><td>Scrub. OK</td><td>Flow- Rate</td></tr>
</table>

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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"											
Mean											
Refresh Phase											
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"											

[78 FR 6721, Jan. 30, 2013]

Attachment F
To Part 70 Operating Permit Renewal No.: T089-31293-00497

[Downloaded from the eCFR on May 13. 2013]

Electronic Code of Federal Regulations

Title 40: Protection of Environment

Part 60, 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 NOX 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 · n−0.2 g/KW-hr (34 · 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 NOX 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 · n−0.23 g/KW-hr (33 · 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 NOX 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 · n−0.20 g/KW-hr (6.7 · 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 NOX 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 · n−0.2 g/KW-hr (34 · 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 NOX 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 · n−0.23 g/KW-hr (33 · 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 NOX 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 NOX 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:

Ci = concentration of NOX or PM at the control device inlet,

Co = concentration of NOX or PM at the control device outlet, and

R = percent reduction of NOX or PM emissions.

(2) You must normalize the NOX or PM concentrations at the inlet and outlet of the control device to a dry basis and to 15 percent oxygen (O2) using Equation 3 of this section, or an equivalent percent carbon dioxide (CO2) 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:

Cadj = Calculated NOX or PM concentration adjusted to 15 percent O2 .

Cd = Measured concentration of NOX or PM, uncorrected.

5.9 = 20.9 percent O2 −15 percent O2 , the defined O2 correction value, percent.

%O2 = Measured O2 concentration, dry basis, percent.

(3) If pollutant concentrations are to be corrected to 15 percent O2 and CO2 concentration is measured in lieu of O2 concentration measurement, a CO2 correction factor is needed. Calculate the CO2 correction factor as described in paragraphs (d)(3)(i) through (iii) of this section.

(i) Calculate the fuel-specific Fo 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:

Fo = Fuel factor based on the ratio of O2 volume to the ultimate CO2 volume produced by the fuel at zero percent excess air.

0.209 = Fraction of air that is O2 , percent/100.

Fd = Ratio of the volume of dry effluent gas to the gross calorific value of the fuel from Method 19, dsm3 /J (dscf/106 Btu).

Fc = Ratio of the volume of CO2 produced to the gross calorific value of the fuel from Method 19, dsm3 /J (dscf/106 Btu).

(ii) Calculate the CO2 correction factor for correcting measurement data to 15 percent O2 , as follows:

$$X_{CO_2} = \frac{5.9}{F_o} \qquad \text{(Eq. 5)}$$

Where:

XCO2 = CO2 correction factor, percent.

5.9 = 20.9 percent O2 −15 percent O2 , the defined O2 correction value, percent.

(iii) Calculate the NOX and PM gas concentrations adjusted to 15 percent O2 using CO2 as follows:

$$C_{adj} = C_d \frac{X_{CO_2}}{\%CO_2} \qquad \text{(Eq. 6)}$$

Where:

Cadj = Calculated NOX or PM concentration adjusted to 15 percent O2 .

Cd = Measured concentration of NOX or PM, uncorrected.

%CO2 = Measured CO2 concentration, dry basis, percent.

(e) To determine compliance with the NOX mass per unit output emission limitation, convert the concentration of NOX 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.

Cd = Measured NOX concentration in ppm.

1.912x10−3 = Conversion constant for ppm NOX 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.

Cadj = 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 NOX 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 · n−0.2 g/KW-hr (34 · 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 NOX 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 · n−0.23 g/KW-hr (33 · 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)

Maximum engine power	Model year(s)	$NMHC + NO_X$	CO	PM
19≤KW<37 (25≤HP<50)	2010 and earlier	9.5 (7.1)	5.5 (4.1)	0.80 (0.60)
	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:]

For 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 the number of traverse points;	(1) Method 1 or 1A of 40 CFR part 60, appendix A	(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	(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,	(3) Method 4 of 40 CFR part 60, appendix A, 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.
		iv. Measure NO_X at the inlet and outlet of the control device	(4) Method 7E of 40 CFR part 60, appendix A, 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.

For each	Complying with the requirement to	You must	Using	According to the following requirements
	b. Limit the concentration of NO_X 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	(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; and,	(2) Method 3, 3A, or 3B of 40 CFR part 60, appendix A	(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,	(3) Method 4 of 40 CFR part 60, appendix A, 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	(4) Method 7E of 40 CFR part 60, appendix A, 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.
	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	(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	(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	(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	(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	(a) If using a control device, the sampling site must be located at the outlet of the control device.

For each	Complying with the requirement to	You must	Using	According to the following requirements
		ii. Determine the O_2concentration of the stationary internal combustion engine exhaust at the sampling port location; and	(2) Method 3, 3A, or 3B of 40 CFR part 60, appendix A	(b) Measurements to determine O_2concentration 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	(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	(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.

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	

General Provisions citation	Subject of citation	Applies to subpart	Explanation
§ 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

Technical Support Document (TSD) for a Part 70 Minor Source and Significant Permit Modification

Source Description and Location

Source Name:	Enbridge Energy - Hartsdale / Griffith Terminal
Source Location:	1500 W. Main St., Griffith, IN 46319 & Central Ave. and Division St., Schererville, IN 46375
County:	Lake
SIC Code:	4612
Operation Permit No.:	T 089-31293-00497
Operation Permit Issuance Date:	August 29, 2012
Minor Source Modification No.:	089-33306-00497
Significant Permit Modification No.:	089-33314-00497
Permit Reviewer:	Kristen Willoughby

Source Definition

This bulk petroleum storage company consists of two (2) plants:

(a) Hartsdale Terminal with Plant ID 089-00081 is located at Central Avenue and Division Street, Schererville, Indiana 46375; and

(b) Griffith Terminal with Plant ID 089-00059 is located at 1500 West Main Street and Lakehead Road, Griffith, Indiana 46319.

IDEM, OAQ has determined that these two (2) terminals are considered one plant and therefore, the two (2) Part 70 permits are combined into one permit. Therefore, the term “source” in the Part 70 documents refers to both the Hartsdale Terminal and the Griffith Terminal as one source.

Existing Approvals

The source was issued Part 70 Operating Permit Renewal No. 089-31293-00497 on August 29, 2012.

County Attainment Status

The source is located in Lake County.

Pollutant	Designation
SO_2	Better than national standards.
CO	Attainment effective February 18, 2000, for the part of the city of East Chicago bounded by Columbus Drive on the north; the Indiana Harbor Canal on the west; 148th Street, if extended, on the south; and Euclid Avenue on the east. Unclassifiable or attainment effective November 15, 1990, for the remainder of East Chicago and Lake County.
O_3	On June 11, 2012, the U.S. EPA designated Lake County nonattainment, for the 8-hour ozone standard.
PM_{10}	Attainment effective March 11, 2003, for the cities of East Chicago, Hammond, Whiting, and Gary. Unclassifiable effective November 15, 1990, for the remainder of Lake County.
NO_2	Cannot be classified or better than national standards.
Pb	Not designated.
[1]The U. S. EPA has acknowledged in both the proposed and final rulemaking for this redesignation that the anti-backsliding provisions for the 1-hour ozone standard no longer apply as a result of the redesignation under the 8-hour ozone standard. Therefore, permits in Lake County are no longer subject to review pursuant to Emission Offset, 326 IAC 2-3. Unclassifiable or attainment effective February 6, 2012, for PM2.5.	

(a) Ozone Standards
U.S. EPA, in the Federal Register Notice 77 FR 112 dated June 11, 2012, has designated Lake County as nonattainment for ozone. On August 1, 2012 the air pollution control board issued an emergency rule adopting the U.S. EPA's designation. This rule became effective, August 9, 2012. IDEM, does not agree with U.S. EPA's designation of nonattainment. IDEM filed a suit against US EPA in the US Court of Appeals for the DC Circuit on July 19, 2012. 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 designation. 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. Therefore, VOC and NO_x emissions were evaluated pursuant to the requirements of Emission Offset, 326 IAC 2-3. See the State Rule Applicability – Entire Source section.

(b) $PM_{2.5}$
Lake County has been classified as attainment for $PM_{2.5}$. On May 8, 2008 U.S. EPA promulgated the requirements for Prevention of Significant Deterioration (PSD) for $PM_{2.5}$ emissions. These rules became effective on July 15, 2008. On May 4, 2011 the air pollution control board issued an emergency rule establishing the direct $PM_{2.5}$ significant level at ten (10) tons per year. This rule became effective, June 28, 2011. Therefore, direct $PM_{2.5}$, SO_2, and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2. See the State Rule Applicability – Entire Source section.

(c) Other Criteria Pollutants
Lake County has been classified as attainment or unclassifiable in Indiana for all other criteria pollutants. 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 petroleum storage and transfer units with a total storage capacity exceeding three hundred thousand (300,000) barrels, 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.

Source Status

The table below summarizes the potential to emit of the entire source, prior to the proposed modification, after consideration of all enforceable limits established in the effective permits:

Pollutant	**Emissions** (ton/yr)
PM	<100
PM_{10}	<100
$PM_{2.5}$	<100
SO_2	<100
VOC	>100
CO	<100
NO_X	<100
GHGs as CO_2e	<100,000
Single HAP	<10
Total HAPs	<25

(a) This existing source is not a major stationary source, under PSD (326 IAC 2-2), because no regulated pollutant, excluding GHGs, is emitted at a rate of one hundred (100) tons per year or more, emissions of GHGs are less than one hundred thousand (100,000) tons of CO_2 equivalent emissions (CO_2e) per year, 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 VOC a precursor for ozone, a nonattainment regulated pollutant, is emitted at a rate of 100 tons per year or more.

(c) These emissions are based upon Part 70 Operating Permit Renewal No. T089-32193-00497.

This existing source is not a major source of HAPs, as defined in 40 CFR 63.2, because HAPs emissions are less than ten (10) tons per year for any single HAP and less than twenty-five (25) tons per year of a combination of HAPs. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA).

Description of Proposed Modification

The Office of Air Quality (OAQ) has reviewed a modification application submitted by Enbridge Energy - Hartsdale/Griffith Terminal on June 11, 2013, relating to the following:

(a) The following new units:

(1) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels.

(2) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels.

(3) Piping component fugitive emission sources in VOC service.

(4) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp.

(b) Storage tank 1606 is being removed.

(c) The following changes to the inbound and outbound pipelines, resulting increase in a throughput capacity from 950,000 bbl/day to 1,388,000 bbl/day:

(1) A new connection to incoming pipeline Line 78, with a maximum throughput of 570,000 barrels per day.

(2) A new connection to outbound pipeline Buckeye Terminal Takeoff, with a maximum throughput of 368,000 barrels per day.

(3) Increase throughput capacity of outbound pipeline Line 6B from 500,000 barrels per day to 570,000 barrels per day.

Enforcement Issues

There are no pending enforcement actions.

Emission Calculations

See Appendix A, B, and C of this Technical Support Document for detailed emission calculations.

Permit Level Determination – Part 70

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source or emission unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, IDEM, or the appropriate local air pollution control agency."

The following table is used to determine the appropriate permit level under 326 IAC 2-7-10.5. This table reflects the PTE before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Increase in PTE Before Controls of the New Units	
Pollutant	**Potential To Emit** (ton/yr)
PM	0.01
PM_{10}	0.01
$PM_{2.5}$	0.01
SO_2	0.02
VOC	15.96
CO	0.29
NO_X	0.54
Single HAPs	0.03
Total HAPs	0.89

PTE Change of the Modified Process (Increased Throughput at Existing Tanks)			
Pollutant	**PTE Before Modification** (ton/yr)	**PTE After Modification** (ton/yr)	**Increase from Modification** (ton/yr)
PM	-	-	-
PM_{10}	-	-	-
$PM_{2.5}$	-	-	-
SO_2	-	-	-
VOC	121.39	125.99	4.60
CO	-	-	-
NO_X	-	-	-
HAPs	5.91	6.58	0.67

Total PTE Increase due to the Modification			
Pollutant	**PTE New Emission Units** (ton/yr)	**Net Increase to PTE of Modified Emission Units** (ton/yr)	**Total PTE for New and Modified Units** (ton/yr)
PM	0.01	-	0.01
PM_{10}	0.01	-	0.01
$PM_{2.5}$	0.01	-	0.01
SO_2	0.02	-	0.02
VOC	15.96	4.60	20.56
CO	0.29	-	0.29
NO_X	0.54	-	0.54
HAPs	0.89	0.67	1.56

Appendix A of this TSD reflects the unrestricted potential emissions of the modification.

This source modification is subject to 326 IAC 2-7-10.5(e), modifications that would have a potential to emit less than twenty-five (25) tons per year and equal to or greater than five (5) tons per year of VOC. Additionally, the modification will be incorporated into the Part 70 Operating Permit through a significant permit modification issued pursuant to 326 IAC 2-7-12(d), because the modification does involve a significant change to monitoring, record keeping and reporting.

Permit Level Determination – PSD or Emission Offset

The table below summarizes the potential to emit, reflecting all limits, of the emission units. Any control equipment is considered federally enforceable only after issuance of this Part 70 source and permit modification, and only to the extent that the effect of the control equipment is made practically enforceable in the permit.

	Potential to Emit (ton/yr)							
Process / Emission Unit	**PM**	**PM_{10}**	**$PM_{2.5}$***	**SO_2**	**VOC**	**CO**	**NO_X**	**GHGs**
EU1610	-	-	-	-	8.72	-	-	136.79
EU1611	-	-	-	-	6.87	-	-	93.14
Emergency Diesel Generator	0.01	0.01	0.01	0.02	0.05	0.29	0.54	70.57
Piping Components	-	-	-	-	0.32	-	-	-
Total for Modification	0.01	0.01	0.01	0.02	15.96	0.29	0.54	300.50

	Potential to Emit (ton/yr)							
Process / Emission Unit	**PM**	**PM_{10}**	**$PM_{2.5}$***	**SO_2**	**VOC**	**CO**	**NO_X**	**GHGs**
ATPA for Affected Units								
Baseline Actual Emissions	-	-	-	-	16.34	-	-	-
Projected Actual Emissions	-	-	-	-	36.59	-	-	-
Total ATPA Emissions	-	-	-	-	20.24	-	-	-
Emissions Increase Due to Project (Hybrid Test)	0.01	0.01	0.01	0.02	36.20	0.29	0.54	300.50
Could Have Accommodated (Excluded Demand Growth Emissions)	-	-	-	-	3.94	-	-	-
Total ATPA Emissions with Could Have Accommodated	0.01	0.01	0.01	0.02	32.26	0.29	0.54	300.50
PSD Major Source Thresholds	100	100	100	100	NA	100	100	100,000 CO_2e
Significant Level	NA	NA	NA	NA	40	NA	40	NA

*$PM_{2.5}$ listed is direct $PM_{2.5}$.

This modification to an existing minor stationary source is not major because the emissions increase is less than the PSD major source thresholds. Therefore, pursuant to 326 IAC 2-2, the PSD requirements do not apply.

This modification to an existing major stationary source is not major because the emissions increase is less than the Emission Offset significant levels. Therefore, pursuant to 326 IAC 2-3, the Emission Offset requirements do not apply.

Project Aggregation

Two applications were reviewed to determine if they should be considered one project under PSD.

The first application was submitted on June 15, 2012 and involved increasing the outbound pipeline capacity bottleneck from 800,000 barrels per day to 950,000 barrels per day for Line 6B and BP Pipeline. The modification also included construction of additional piping components and pumps, replacement of existing pump station sand pipeline operations support equipment, piping and manifold changes, and the addition of adding two additional nozzles to each storage tank EU1601 - 1609.

The second application was received on June 11, 2013 and concerned an increase to the terminal capacity throughput (involving Line 78, the Buckeye Terminal Takeoff, and Line 6B) and construct two (2) external floating roof tanks, piping components, and an emergency diesel generator.

New Source Review Circumvention (3M Project Aggregation) memo of John Rasnic, OAQPS, March 16, 1992.

Rasnic raises 5 issues.

1. Filing more than one minor source or minor modification application associated with emission increases at a single plant within a short period of time may constitute strong evidence of an intent to circumvent the requirements of preconstruction review.

   Response:

   (a) Enbridge submitted a permit application for Project One on June 15, 2012 which encompassed expansion work that was approved by Enbridge's Board of Directors and for which final design information was complete at that time. It is not Enbridge's policy to apply for permits for future work that has not received Board approval and for which a defined scope of work has not been established. With respect to the former, the Board approves and disapproves many different changes within its US fleet of facilities, so completing a permit application prior to this approval will later lead to retractions of certain applications and result in corresponding permit processing inefficiency. Regarding the latter, an undefined scope of work could cause inaccurate estimates of permitted emission rates and an incomplete permit application package, again resulting in re-work and substantial permit processing inefficiency.

(b) Enbridge submitted a permit application for Project Two on June 10, 2013, or nearly a year after the application for Project One. Corresponding Board approvals and defined scopes of work for the physical modifications associated with Project Two were completed several months after the permit application was submitted for Project One.

(c) It is inconceivable to have considered the future modifications with Project Two as part of the Project One permit action, since the changes in Project Two were neither defined nor approved until months after the permit application for Project One. Conversely, it is unrealistic for Enbridge to have simply waited an entire year for submitting a permit application for Project One in order to determine whether shifting market forces and product demand, engineering design efforts, and future Board approvals would change in the future without responding to existing business case and Board approvals.

2. If a project would not be funded or if it would not be economically viable if operated on an extended basis (at least a year) without the other projects, this should be considered evidence of circumvention.

Response:

(a) The authorization for expenditure (AFE) for Project One included the changes described in the Project One permit application as well as an authorized expenditure to construct an additional storage tank at the Hartsdale Griffith terminal. However, because design information was not available at the time for this tank, Enbridge could not have requested permission to construct the storage tank as part of Project One without compromising the permitting and project schedule for the changes associated with Project One. Upon completion of engineering design information for this tank (identified as EU1610), it was included as part of Project Two's permit action.

(b) Inclusion of this tank in Project One's permit action would not have otherwise changed the PSD applicability determination for Project One, as described further below in this correspondence.

(c) All other portions of Project Two were authorized under separate AFEs.

3. If reported production levels are necessary to meet projected production demands but are higher than permitted levels, this is additional evidence of circumvention.

Response:

(a) Enbridge's leadership attempts to project market demand associated with its assets but cannot predict the long-term increase in oil production and demand due to the extreme volatility of important external factors associated with crude oil transportation in the United States. In order to respond to customer demands, Enbridge frequently will work to optimize its existing infrastructure rather than to construct new pipelines. Often, this results in incremental pipeline throughput increases to existing pipelines in its pipeline system. These throughput increases are generally accompanied by physical changes necessary to achieve the increased rate such as upgrading pump stations. Changes at the Hartsdale/Griffith Terminal required to accommodate the increase to 500,000 bpd include demolition of the existing Line 6B pump station, construction of a new pump station, installation of new pumps, and installation of a new substation.

(b) Enbridge's Board of Directors authorized the expansion of Line 6B to 500,000 barrels per day (bpd) and this expansion was permitted as part of Project One.

(c) Several months later, Enbridge was faced with additional customer demands for transporting crude oil in Line 6B. As part of a separate review and approval process, Enbridge's Board of Directors authorized an additional increase in the capacity of Line 6B up to 570,000 bpd to meet the increased customer demand. Enbridge applied for authorization to complete separate and independent physical changes associated with this new, additional throughput increase as part of Project Two. To accommodate the increase to 570,000 bpd, Enbridge will be required to install additional booster pumps, a new 42" header line, and a new pump unit at the Hartsdale/Griffith Terminal.

4. Statements of representatives of the source about the source's plans for operation can be evidence to show intent to circumvent preconstruction review requirements.

Response:

(a) The company announced publicly its efforts to expand capacity on Line 6B to 500,000 bpd on May 16, 2012 to meet demand from refineries seeking to secure access to ample crude oil supplies from western Canada and the Bakken region in North Dakota. [*Enbridge press release can be found at the following URL: http://www.enbridgepartners.com/Media-Center/News/2012/1696863/*]

(b) A second press release on December 6, 2012 announced a further upsizing of Line 6B to 570,000 bpd from the previously announced 500,000 bpd. [*Enbridge press release can be found at the following URL: http://www.enbridgepartners.com/Media-Center/News/2012/1765244/*]. The second increase was required as part of a large series of projects encompassed under the business objective of Light Oil Market Access Program, which would accommodate substantial additional deliveries of light oil from the U.S. north central formations and western Canada. This additional demand could not have been contemplated or otherwise projected at the time of Project One.

5. It is reasonable to expect that company management would coordinate the planning and coordination of projects considering their intrinsic relationship with each other and their impact on the economic viability of the plant.

Response:
Each project was planned and approved as a standalone project. The financial justification for the capital approval for each project was based on changing market demand and was not dependant on any other past, present, or future project.

Federal Rule Applicability Determination

The following federal rules are applicable to the source due to this modification:

NSPS:

(a) The two (2) new storage tanks, EU1610 and EU1611, are subject to the New Source Performance Standards for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 (40 CFR 60, Subpart Kb), which is incorporated by reference as 326 IAC 12. The units subject to this rule include the following:

(1) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels.

(2) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels.

Nonapplicable portions of the NSPS will not be included in the permit. This source is subject to the following portions of Subpart Kb.

(1) 40 CFR 60.110b (a), (b)
(2) 40 CFR 60.111b
(3) 40 CFR 60.112b (a)(2)
(4) 40 CFR 60.113b (b)
(5) 40 CFR 60.115b (b)
(6) 40 CFR 60.116b (a), (b), (c), (d), (e)
(7) 40 CFR 60.117b

(b) The requirements of New Source Performance Standard for Bulk Gasoline Terminals (40 CFR 60, Subpart XX, 326 IAC 12) are not included in this permit because this source is not a bulk gasoline terminal and does not have loading racks which deliver liquid product into gasoline tank trucks.

(c) The new emergency diesel generator is subject to the New Source Performance Standards for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII), which is incorporated by reference as 326 IAC 12. The units subject to this rule include the following:

(1) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp.

Nonapplicable portions of the NSPS will not be included in the permit. This source is subject to the following portions of Subpart IIII.

(1) 40 CFR 60.4200(a)
(2) 40 CFR 60.4205 (b), (e)
(3) 40 CFR 60.4206
(4) 40 CFR 60.4207 (b)
(5) 40 CFR 60.4209
(6) 40 CFR 60.4211 (a), (c), (f), (g)
(7) 40 CFR 60.4212
(8) 40 CFR 60.4214 (b), (c), (d)
(9) 40 CFR 60.4218
(10) 40 CFR 60.4219
(11) Table 5
(12) Table 8

(d) The new emergency diesel generator is not subject to the requirements of the New Source Performance Standard for Stationary Spark Ignition Internal Combustion Engines, 40 CFR 60, Subpart JJJJ, because it is not a spark ignition internal combustion engine.

NESHAP:

(e) The requirements of the National Emission Standards for Hazardous Air Pollutants for Gasoline Distribution Facilities (Bulk Gasoline Terminals and Pipeline Breakout Stations (40 CFR 63, Subpart R, 326 IAC 14) are not included in this permit because this source is not a major source of HAPs, as defined in 40 CFR 63.2.

(f) The requirements of the National Emission Standards for Hazardous Air Pollutants for Organic Liquids Distribution (Non-Gasoline) (40 CFR 63, Subpart EEEE) are not included in this permit because this source is not a major source of HAPs, as defined in 40 CFR 63.2.

(g) The new emergency generator is 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 unit subject to this rule include the following:

(1) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp.

Nonapplicable portions of the NESHAP will not be included in the permit. The emission unit) is subject to the following portions of Subpart ZZZZ:

(1) 40 CFR 63.6580
(2) 40 CFR 63.6585 (a), (c)
(3) 40 CFR 63.6590 (a)(2)(iii), (c)(1)
(4) 40 CFR 63.6665
(5) 40 CFR 63.6670
(6) 40 CFR 63.6675
(7) Table 8

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 ZZZZ.

(h) The requirements of the National Emission Standards for Hazardous Air Pollutants for Source Categorty: Gasoline Distribution Bulk Terminals, Bulk Plants, and Pipeline Facilities (40 CFR 63, Subpart BBBBBB) are not included in this permit because this source stores and distrubutes crude oil not gasoline as defined in 40 CFR 63.11100.

CAM:

(i) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is applicable to new or modified emission units that involve a pollutant-specific emission unit and meet the following criteria:

(1) has a potential to emit before controls equal to or greater than the Part 70 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.

Based on this evaluation, the requirements of 40 CFR Part 64, CAM are not applicable to any of the new units as part of this modification.

State Rule Applicability Determination

The following state rules are applicable to the source due to the modification:

326 IAC 2-2 and 2-3 (PSD and Emission Offset)
PSD and Emission Offset applicability is discussed under the Permit Level Determination – PSD and Emission Offset section.

326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAP))
The operation of this facility will emit less than ten (10) tons per year for a single HAP and less than twenty-five (25) tons per year for a combination of HAPs. Therefore, 326 IAC 2-4.1 does not apply.

326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating)
The new emergency generator is not subject to the requirements of 326 IAC 6-2 because it is not a source of indirect heating.

326 IAC 6-3 (Particulate Emission Limitations for Manufacturing Processes)
The new emergency generator is not subject to the requirements of 326 IAC 6-3 because it is not a munfacturing process as defined in 326 IAC 6-3-1.5.

326 IAC 7-1.1 Sulfur Dioxide Emission Limitations
The new emergency generator is not subject to 326 IAC 326 IAC 7-1.1 because its SO_2 PTE is less than 25 tons/year and 10 pounds/hour.

326 IAC 8-1-6 (New facilities; general reduction requirements)
The new storage tanks at this source are subject to the requirements of 326 IAC 8-4-3. Therefore, the requirements of 326 IAC 8-1-6 do not apply to these facilities.

326 IAC 8-4-3 (Petroleum Liquid Storage Facilities)
The source is located in Lake County. The new storage tanks (EU1610 and EU1611) contain a petroleum liquid, have a maximum storage capacity greater than one hundred fifty thousand (150,000) liters (thirty-nine thousand (39,000) gallons) and contain a volatile organic compound (crude oil) with a true vapor pressure greater than 10.5 kPa (1.5 psia). The petroleum storage tanks at this source are equipped with external floating roofs. Therefore, the storage tanks comply with the requirements of 326 IAC 8-4-3(c) & (d).

326 IAC 8-4-4 (Bulk Gasoline Terminals)
The source is located in Lake County, and does not load gasoline into any transport. Therefore, pursuant to 326 IAC 8-4-1, the source is not subject to the requirements of 326 IAC 8-4-4.

326 IAC 8-4-5 (Bulk Gasoline Plants)
The source is located in Lake County, and does not accept gasoline from transports. Therefore, pursuant to 326 IAC 8-4-1, the source is not subject to the requirements of 326 IAC 8-4-5.

326 IAC 8-4-6 (Gasoline Dispensing Facilities)
The source is located in Lake County, and does not dispense gasoline into motor vehicles or portable containers from a storage tank. Therefore, pursuant to 326 IAC 8-4-1, the source is not subject to the requirements of 326 IAC 8-4-6.

326 IAC 8-4-7 (Gasoline Transports)
The source is located in Lake County does not transfer gasoline between transports and storage tanks. Therefore, pursuant to 326 IAC 8-4-1, the source is not subject to the requirements of 326 IAC 8-4-7.

326 IAC 8-4-9 (Leaks from Transports and Vapor Collection Systems; Records)
The source is located in Lake County, and is not subject to the requirements of 326 IAC 8-4-4, 326 IAC 8-4-5, 326 IAC 8-4-6, or 326 IAC 8-4-7. Therefore, pursuant to 326 IAC 8-4-9(a), the source is not subject to the requirements of 326 IAC 8-4-9.

326 IAC 8-6 (Organic Solvent Emission Limitations)
This source is located in Lake County and was an existing source as of January 1, 1980. The potential to emit of VOC of this source is greater than 100 tons per year. However, this souce is subject to another Article 8 rule (326 IAC 8-4). Therefore, the requirements of 326 IAC 8-6 (Organic Solvent Emission Limitations) do not apply.

326 IAC 8-7 (Specific VOC Reduction Requirements for Lake, Porter, Clark and Floyd Counties)
This source is located in Lake County, and has the potential to emit volatile organic compounds at levels equal to or greater than twenty-five (25) tons per year. However, the new petroleum storage tanks are subject to 326 IAC 8-4. Therefore, pursuant to 326 IAC 8-7-2(a)(3)(C), the new storage tanks are exempted from the requirements of 326 IAC 8-7-2.

326 IAC 8-9 (Volatile Organic Liquid Storage Vessels)
The new petroleum storage tanks identified as EU1610 and EU1611 are subject to the requirements of 40 CFR 60, Subpart Kb. Therefore, pursuant to 326 IAC 8-9-2(8), the requirements of 326 IAC 8-9 do not apply to EU1610 and EU1611.

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.

New compliance determination and monitoring requirements applicable per 40 CFR Part 60, Subpart IIII are added to Section E.4 of the permit as shown in the Proposed Changes section below. Changes to the compliance determination and monitoring requirements are detailed in the Proposed Changes section of this document.

Proposed Changes

The changes listed below have been made to Part 70 Operating Permit No. T089-32193-00497. These changes may include Title I changes (ex changes that add or modify synthetic minor emission limits). Deleted language appears as ~~strikethroughs~~ and new language appears in **bold**:

Summary of Model Updates Throughout the Permit

(a) On October 27, 2010, the Indiana Air Pollution Control Board issued revisions to 326 IAC 2. These revisions resulted in changes to the rule citations listed in the permit. These changes are not changes to the underlining provisions. The change is only to cite of these rules in Section A - Emission Units and Pollution Control Equipment Summary and the Facility Descriptions.

(b) On November 3, 2011, the Indiana Air Pollution Control Board issued a revision to 326 IAC 2. The revision resulted in a change to the rule cite of the "responsible official" definition. The rule citation has been changed throughout the permit as follows:

326 IAC 2-7-1~~(34)~~**(35)**

(c) The Northwest Regional Office has changed locations. The Region Office address and telephone numbers have been updated.

(d) IDEM has clarified Section C - Instrument Specifications to indicate that the analog instrument must be capable of measuring the parameters outside the normal range.

(e) IDEM has added "where applicable" to the lists in Section C - General Record Keeping Requirements to more closely match the underlining rule.

Updates Specific to This Permit

(a) Section A - General Information has been updated to reflect the change in Lake County's attainment status. This change in status also makes the source a Major Source under Emission Offset Rules instead of PSD. Condition C - General Record Keeping Requirements and Section C - General Reporting Requirements have been modified to reflect the sources emission offset major status.

(b) Section A - Emission units and Pollution Control Equipment Summary, Section A - Specifically Regulated Insignificant Activities, and the Facility Description Boxes have been updated to reflect the new emission units.

(c) Sections D.1 and E.2 have been updated to reflect the new storage tanks.

(d) Emission unit lettering in the Facility Description Boxes has been updated to match Section A - Emission units and Pollution Control Equipment Summary and Section A - Specifically Regulated Insignificant Activities.

(e) Section E.3 has been updated to reflect the new emergency diesel generator.

(f) Section E.4 has been added to include the applicability of 40 CFR 60, Subpart IIII.

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 bulk petroleum storage company.

Source Address:	1500 W. Main Street, Griffith, IN 46319, and Central Avenue and Division Street, Schererville, IN 46375
General Source Phone Number:	(713) 821-2110
SIC Code:	4612
County Location:	Lake
Source Location Status:	**Nonattainment for 8-hour ozone standard** Attainment for all **other** criteria pollutants
Source Status:	Part 70 Operating Permit Program **Minor Source, under PSD** Major Source, under ~~PSD~~ **Emission Offset Rules** Minor Source, Section 112 of the Clean Air Act 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(~~15~~**14**)]

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

Hartsdale Terminal:

(a) Nine (9) crude oil storage tanks, all constructed in 1958, modification permitted in 2012, identified as EU1601 through EU1609, each with an external floating roof, each with a maximum storage capacity of 4,200,000 gallons (100,000 barrels) of crude oil.

(b) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels. [40 CFR 60, Subpart Kb]

(c) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels. [40 CFR 60, Subpart Kb]

(~~b~~**d**) Piping component fugitive emission sources in VOC service.

***

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) Paved and unpaved roads and parking lots with public access. [326 IAC 6-4]

(b) The following equipment related to manufacturing activities not resulting in the emission of HAPs; brazing equipment, cutting torches, soldering equipment, welding equipment [326 IAC 6-3-2].

(c) Two (2) emergency diesel generators: [40 CFR 63, Subpart ZZZZ]
(1) Griffith emergency generator constructed in 1993 rated at 207 horsepower.
(2) Hartsdale emergency generator constructed in 1998 rated at 207 horsepower.

(d) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp. [40 CFR 60, Subpart IIII] [40 CFR 63, Subpart ZZZZ]

(~~d~~**e**) Two (2) stationary diesel fire pumps: [40 CFR 63, Subpart ZZZZ]
(1) Griffith fire pump constructed in 1971 rated at 175 horsepower.
(2) Hartsdale fire pump constructed in 2002 rated at 300 horsepower.

(~~e~~**f**) Portable blast-cleaning equipment with enclosures [326 IAC 6-3-2]

***

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

***

(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:

***

(4) For each emergency lasting one (1) hour or more, the Permittee notified IDEM, OAQ, or Northwest 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
Northwest Regional Office phone: (219) ~~757-0265~~ **464-0233**; fax: (219) ~~757-0267~~ **464-0553.**

***

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.

***

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 2-3]**

(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(~~34~~**35**). A deviation is an exceedance of a permit limitation or a failure to comply with a requirement of the permit.

(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.

***

SECTION D.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description: Hartsdale Terminal: (a) Nine (9) crude oil storage tanks, all constructed in 1958, modification permitted in 2012, identified as EU1601 through EU1609, each with an external floating roof, each with a maximum storage capacity of 4,200,000 gallons (100,000 barrels) of crude oil. **(b) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels. [40 CFR 60, Subpart Kb]** **(c) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels. [40 CFR 60, Subpart Kb]** (~~b~~**d**) Piping component fugitive emission sources in VOC service. ***

D.1.1 Volatile Organic Compounds (VOC) [326 IAC 8-4-3]

Pursuant to 326 IAC 8-4-3(c)(2), the Permittee shall not store petroleum liquid in the storage tanks EU70 through EU80, and EU1601 through ~~EU1609~~**EU1611**, unless:

***

D.1.5 Record Keeping Requirements [326 IAC 8-4] [326 IAC 8-9]

(a) Pursuant to 326 IAC 8-4-3(d), the Permittee shall maintain the following records for storage tanks EU70 through EU80 and EU1601 through ~~1609~~**EU1611**:

***

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(~~15~~**14**)] (b) The following equipment related to manufacturing activities not resulting in the emission of HAPs; brazing equipment, cutting torches, soldering equipment, welding equipment [326 IAC 6-3-2]. (~~e~~**f**) Portable blast-cleaning equipment with enclosures [326 IAC 6-3-2] (The information describing the process in this facility description is descriptive information and does not constitute enforceable condition.)

***

SECTION E.1 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

Griffith Terminal:

(~~a~~**i**) One (1) crude oil storage tank, constructed in 1979, identified as EU78, with an external floating roof, with a maximum capacity of 217,000 barrels. **[40 CFR 60, Subpart Ka]**

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

***

E.1.2 Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984 NSPS Requirements [40 CFR Part 60, Subpart Ka] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Ka, the Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart Ka **(included as Attachment C)**, which are incorporated by reference as 326 IAC 12, for tank EU78:

***

SECTION E.2 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description:

Hartsdale Terminal:

(a) Nine (9) crude oil storage tanks, all constructed in 1958, modification permitted in 2012, identified as EU1601 through EU1609, each with an external floating roof, each with a maximum storage capacity of 4,200,000 gallons (100,000 barrels) of crude oil. **[40 CFR 60, Subpart Kb]**

(b) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1610, with an external floating roof, with a maximum storage capacity of 530,000 barrels. [40 CFR 60, Subpart Kb]

(c) One (1) crude oil storage tank, approved in 2013 for construction, identified as EU1611, with an external floating roof, with a maximum storage capacity of 360,000 barrels. [40 CFR 60, Subpart Kb]

Griffith Terminal:

(~~a~~**j**) One (1) crude oil storage tank, constructed in 2007, identified as EU79, with an external floating roof, with a maximum capacity of 392,169 barrels (16,471,098 gallons). **[40 CFR 60, Subpart Kb]**

(~~b~~**k**) One (1) crude oil storage tank, constructed in 2007, identified as EU80, with an external floating roof, with a maximum capacity of 240,000 barrels (10,080,000 gallons). **[40 CFR 60, Subpart Kb]**

(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 [40 CFR Part 60] [326 IAC 12-1]

The provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 12-1-1, apply to tanks EU79**,** ~~and~~ EU80**, and EU1601 through EU1611** except when otherwise specified in 40 CFR Part 60, Subpart Kb.

Note: Tanks 1601 – 1609 will become subject to 40 CFR Part 60, Subpart A upon modification.

E.2.2 Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 NSPS Requirements [40 CFR Part 60, Subpart Kb] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart Kb, the Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart Kb **(included as Attachment D)**, which are incorporated by reference as 326 IAC 12, for tanks EU79**,** ~~and~~ EU80**, and EU1601 through EU1611**:

(1) 40 CFR 60.110b(a), (b)
(2) 40 CFR 60.111b
(3) 40 CFR 60.112b(a)(2)
(4) 40 CFR 60.113b(b)
(5) 40 CFR 60.115b(b)
(6) 40 CFR 60.116b(a), (b), (c), (d), (e)
(7) 40 CFR 60.117b

Note: Tanks 1601 - 1609 will become subject to 40 CFR Part 60, Subpart Kb upon modification.

***

SECTION E.3 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description: Insignificant Activities

(c) Two (2) emergency diesel generators: [40 CFR 63, Subpart ZZZZ]
  (1) Griffith emergency generator constructed in 1993 rated at 207 horsepower.
  (2) Hartsdale emergency generator constructed in 1998 rated at 207 horsepower.

(d) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp. [40 CFR 60, Subpart IIII] [40 CFR 63, Subpart ZZZZ]

(~~d~~**e**) Two (2) stationary diesel fire pumps: [40 CFR 63, Subpart ZZZZ]
  (1) Griffith fire pump constructed in 1971 rated at 175 horsepower.
  (2) Hartsdale fire pump constructed in 2002 rated at 300 horsepower.

(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)]

E.3.1 General Provisions Relating to National Emission Standards for Hazardous Air Pollutants (NESHAP) [326 IAC 20-82] [40 CFR 63, Subpart A]

The provisions of 40 CFR 63, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 20-82, apply to the ~~two (2)~~ **three (3)** emergency generators and two (2) stationary fire pumps, except when otherwise specified in 40 CFR 63, Subpart ZZZZ**.**

E.3.2 Stationary Reciprocating Internal Combustion Engines (RICE) NESHAP [326 IAC 20-82] [40 CFR 63, Subpart ZZZZ]

Pursuant to 40 CFR 63 Subpart ZZZZ, the Permittee shall comply with the provisions of 40 CFR 63 Subpart ZZZZ **(included as Attachment E)**, which are incorporated as 326 IAC 20-82 for the ~~two (2)~~ **three (3)** emergency generators and two (2) stationary fire pumps, as specified as follows:

(8) 40 CFR 63.6580
(9) 40 CFR 63.6585
(10) 40 CFR 63.6590
(11) 40 CFR 63.6595
(12) 40 CFR 63.6603
(13) 40 CFR 63.6604
(14) 40 CFR 63.6605
(15) 40 CFR 63.6612
(16) 40 CFR 63.6625(e)
(17) 40 CFR 63.6630
(18) 40 CFR 63.6640
(19) 40 CFR 63.6645
(20) 40 CFR 63.6650
(21) 40 CFR 63.6655
(22) 40 CFR 63.6660
(23) 40 CFR 63.6665
(24) 40 CFR 63.6670
(25) 40 CFR 63.6675
(19) Table 8

***

SECTION E.4 EMISSIONS UNIT OPERATION CONDITIONS

Emissions Unit Description: Insignificant Activities
(d) One (1) emergency diesel generator, approved in 2013 for construction, with a maximum capacity of 266 hp. [40 CFR 60, Subpart IIII] [40 CFR 63, Subpart ZZZZ]
(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.4.1 General Provisions Relating to New Source Performance Standards [40 CFR Part 60] [326 IAC 12-1]

The provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 12-1-1, apply to the emergency diesel generator except when otherwise specified in 40 CFR Part 60, Subpart IIII.

E.4.2 New Source Performance Standards for Stationary Compression Ignition Internal Combustion Engines [40 CFR Part 60, Subpart IIII] [326 IAC 12]

Pursuant to 40 CFR Part 60, Subpart IIII, the Permittee shall comply with the following provisions of 40 CFR Part 60, Subpart IIII (included as Attachment F), which are incorporated by reference as 326 IAC 12, for the emergency diesel generator:

(1) 40 CFR 60.4200(a)
(2) 40 CFR 60.4205 (b), (e)
(3) 40 CFR 60.4206
(4) 40 CFR 60.4207 (b)
(5) 40 CFR 60.4209

(6) 40 CFR 60.4211 (a), (c), (f), (g)
(7) 40 CFR 60.4212
(8) 40 CFR 60.4214 (b), (c), (d)
(9) 40 CFR 60.4218
(10) 40 CFR 60.4219
(11) Table 5
(12) Table 8

Conclusion and Recommendation

The construction of this proposed modification shall be subject to the conditions of the attached proposed Part 70 Minor Source Modification No. 089-33306-00497 and Significant Permit Modification No. 089-33314-00497. The staff recommend to the Commissioner that this Part 70 Minor Source and Significant Permit Modification be approved.

IDEM Contact

(a) Questions regarding this proposed permit can be directed to Kristen Willoughby 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) 233-3031 or toll free at 1-800-451-6027 extension 3-3031.

(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's Guide for Citizen Participation and Permit Guide on the Internet at: www.idem.in.gov

Appendix A: Emission Calculations
Project Summary

Source Name: Enbridge Energy-Hartsdale/Griffith Terminal
Source Location: Griffith, IN and Schererville, IN
Minor Source Modification No.: 089-33306-00497
Significant Permit Modification No.: 089-33314-00497
Permit Reviewer: Kristen Willoughby

Change in Potential to Emit of the Modified Units

Process / Emission Unit	PM (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	SO2 (ton/yr)	NOx (ton/yr)	VOC (ton/yr)	CO (ton/yr)	CO_2e (ton/yr)	n-Hexane (ton/yr)	HAPs (ton/yr)
Existing Tanks (before increased throughput)	-	-	-	-	-	121.39	-	675.93	3.74	5.91
Existing Tanks (after increased throughput)	-	-	-	-	-	125.99	-	942.82	3.75	6.58
Total Emission Increase	-	-	-	-	-	4.60	-	266.89	0.01	0.67

Potential to Emit of the New Units

Process / Emission Unit	PM (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	SO2 (ton/yr)	NOx (ton/yr)	VOC (ton/yr)	CO (ton/yr)	CO_2e (ton/yr)	n-Hexane (ton/yr)	HAPs (ton/yr)
Tanks GT-1610 & GT-1611	-	-	-	-	-	15.59	-	229.93	0.45	0.88
Piping Component Fugitives for New Tanks	-	-	-	-	-	0.32	-	-	0.01	0.01
New Emergency Generator	0.01	0.01	0.01	0.02	0.54	0.05	0.29	70.57	-	2.83E-03
Total	0.01	0.01	0.01	0.02	0.54	15.96	0.29	300.50	0.46	0.89

Potential to Emit of the Modification

Process / Emission Unit	PM (ton/yr)	PM_{10} (ton/yr)	$PM_{2.5}$ (ton/yr)	SO2 (ton/yr)	NOx (ton/yr)	VOC (ton/yr)	CO (ton/yr)	CO_2e (ton/yr)	n-Hexane (ton/yr)	HAPs (ton/yr)
Existing Tanks (increase in emission)	-	-	-	-	-	4.60	-	266.89	0.01	0.67
New Units	0.01	0.01	0.01	0.02	0.54	15.96	0.29	300.50	0.46	0.89
Total for the Modification	0.01	0.01	0.01	0.02	0.54	20.56	0.29	567.39	0.46	1.56

Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Table 2-1: Facility-Wide Emissions Summary

	Emissions[1] (ton/yr)													
Emission Unit ID	**VOC**	**Total HAPs**	**Highest Single HAP[2]**	**PM**	**PM10**	**PM2.5**	**Pb**	**SO_2**	**NOx**	**CO**	**CO_2**	**CH_4**	**N_2O**	**CO_2e[3]**
GT-70	6.13	0.31	0.18	-	-	-	-	-	-	-	-	1.48	-	31.05
GT-71	8.05	0.41	0.24	-	-	-	-	-	-	-	-	2.67	-	56.14
GT-72	8.81	0.44	0.27	-	-	-	-	-	-	-	-	2.67	-	56.14
GT-73	8.04	0.41	0.24	-	-	-	-	-	-	-	-	2.67	-	56.14
GT-74	7.43	0.39	0.22	-	-	-	-	-	-	-	-	2.67	-	56.14
GT-75	7.43	0.39	0.22	-	-	-	-	-	-	-	-	2.67	-	56.14
GT-76	10.74	0.57	0.32	-	-	-	-	-	-	-	-	4.87	-	102.19
GT-77	10.74	0.57	0.32	-	-	-	-	-	-	-	-	4.87	-	102.19
GT-78	7.44	0.39	0.22	-	-	-	-	-	-	-	-	2.67	-	56.14
GT-79	7.28	0.41	0.21	-	-	-	-	-	-	-	-	4.83	-	101.46
GT-80	5.41	0.31	0.15	-	-	-	-	-	-	-	-	2.96	-	62.09
GT-1601	4.79	0.25	0.14	-	-	-	-	-	-	-	-	1.23	-	25.87
GT-1602	4.79	0.25	0.14	-	-	-	-	-	-	-		1.23	-	25.87
GT-1603	4.97	0.25	0.15	-	-	-	-	-	-	-	-	1.23	-	25.87
GT-1604	4.79	0.25	0.14	-	-	-	-	-	-	-	-	1.23	-	25.87
GT-1605	4.79	0.25	0.14	-	-	-	-	-	-	-	-	1.23	-	25.87
GT-1606	DEMOLISHED													
GT-1607	4.79	0.25	0.14	-	-	-	-	-	-	-	-	1.23	-	25.87
GT-1608	4.79	0.25	0.14	-	-	-	-	-	-	-	-	1.23	-	25.87
GT-1609	4.79	0.25	0.14	-	-	-	-	-	-	-	-	1.23	-	25.87
GT-1610	8.72	0.49	0.25	-	-	-	-	-	-	-	-	6.51	-	136.79
GT-1611	6.87	0.39	0.20	-	-	-	-	-	-	-	-	4.44	-	93.14
New Emergency Generator[5]	0.05	0.00	0.00	0.01	0.01	0.01	-	0.02	0.54	0.29	70.57	0.00	0.00	70.81
Griffith Emergency Generator[5]	0.13	0.00	-	0.11	0.11	0.11	-	0.11	1.60	0.35	58.30	0.00	0.00	58.50
Griffith Fire Pump[5]	0.11	0.00	-	0.10	0.10	0.10	-	0.09	1.36	0.29	49.28	0.00	0.00	49.45
Hartsdale Emergency Generator[5]	0.13	0.00	-	0.11	0.11	0.11	-	0.11	1.60	0.35	58.30	0.00	0.00	58.50
Hartsdale Fire Pump[5]	0.20	0.00	-	0.18	0.18	0.18	-	0.17	2.58	0.56	94.11	0.00	0.00	94.43
Piping Component Fugitive[6]	1.61	0.07	0.05	-	-	-	-	-	-	-	-	-	-	-
Unpaved Roads Fugitive	-	-	-	14.88	4.02	0.40	-	-	-	-	-	-	-	-
Paved Roads Fugitive	-	-	-	9.73	1.95	0.48	-	-	-	-	-	-	-	-
Total Facility	143.81	7.54	4.26	25.12	6.48	1.39	-	0.50	7.68	1.83	330.56	55.86	0.00	1,504.43

Notes:
1. Storage tank emissions were calculated using TANKS 4.09d, and RVP 8 crude oil. See Tables 2-2 through 2-5 for additional detail.
2. See Table 2-7 for VOC HAP calculations and Tables 2-9 to 2-12 for diesel combustion source HAP calculations. The highest emitted (facility-wide) HAP is hexane.
3. See Table 2-8 for GHG emissions from storage vessels and Tables 2-9 to 2-13 for GHG emissions from diesel combustion sources.
4. See Table 2-5 for information regarding roof landing losses.
5. See Tables 2-9 to 2-13 for diesel generator emissions.
6. See Table 2-6 for piping component fugitive emissions.
Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Table 2-2: Storage Tank VOC PTE Emissions Summary

Tank Emission Unit ID	Enbridge Tank Number	Tank Volume (bbl)	Annual Tank Throughput[1] (bbl/yr)	Annual Number of Tank Turnovers	Tank Standing Loss[2] (tpy)	Tank Withdrawal Loss[2] (tpy)	Tank Roof Landing Loss[3] (tpy)	Total Loss (tpy)
Griffith Tanks								
GT-70	GT-70	120,000	13,411,888	111.77	1.86	2.01	2.26	6.13
GT-71	GT-71	217,000	24,253,165	111.77	1.89	2.71	3.46	8.05
GT-72	GT-72	217,000	24,253,165	111.77	2.65	2.71	3.46	8.81
GT-73	GT-73	217,000	24,253,165	111.77	1.88	2.71	3.46	8.04
GT-74	GT-74	217,000	24,253,165	111.77	1.27	2.71	3.46	7.43
GT-75	GT-75	217,000	24,253,165	111.77	1.27	2.71	3.46	7.43
GT-76	GT-76	395,000	44,147,466	111.77	2.15	4.22	4.36	10.74
GT-77	GT-77	395,000	44,147,466	111.77	2.15	4.22	4.36	10.74
GT-78	GT-78	217,000	24,253,165	111.77	1.28	2.71	3.46	7.44
GT-79	GT-79	392,169	43,831,057	111.77	1.72	3.93	1.64	7.28
GT-80	GT-80	240,000	26,823,777	111.77	1.36	2.99	1.06	5.41
Hartsdale Tanks[4]								
GT-1601	GT-1601	100,000	11,176,574	111.77	0.85	1.68	2.26	4.79
GT-1602	GT-1602	100,000	11,176,574	111.77	0.85	1.68	2.26	4.79
GT-1603	GT-1603	100,000	11,176,574	111.77	1.04	1.68	2.26	4.97
GT-1604	GT-1604	100,000	11,176,574	111.77	0.85	1.68	2.26	4.79
GT-1605	GT-1605	100,000	11,176,574	111.77	0.85	1.68	2.26	4.79
GT-1606	GT-1606				DEMOLISHED			
GT-1607	GT-1607	100,000	11,176,574	111.77	0.86	1.68	2.26	4.79
GT-1608	GT-1608	100,000	11,176,574	111.77	0.85	1.68	2.26	4.79
GT-1609	GT-1609	100,000	11,176,574	111.77	0.85	1.68	2.26	4.79
New Storage Tanks								
GT-1610	GT-1610	528,705	59,091,104	111.77	1.95	4.40	2.38	8.72
GT-1611	GT-1611	360,000	40,235,665	111.77	1.62	3.62	1.62	6.87
		3,644,169	506,620,000	bbl/yr	30.06	55.04	56.48	141.58
			1,388,000	bpd				

Notes:
1. Tank throughput is based on the proposed terminal throughput limit of 506,620,000 bbls/year (1,388,000 bbl/day) equally distributed to the individual tanks based on tank capacity.
2. Calculated using TANKS 4.0.9d and crude oil with an of RVP 8.0. See TANKS emissions summary report in Attachment C.
3. See Table 2-5 Tank Roof Landing Emission Calculations
4. Emissions shown for the Hartsdale Tanks represents the PTE after modification under permit number 089-32030-00497.
Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Enbridge Energy, Limited Partnership - Flanagan Terminal
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Table 2-3: Terminal Pipeline Throughput Capacity Summary

		Maximum Pipeline Design Capacity (bbl/day)			
Pipeline Number	**Pipeline Direction**	**Current**	**Proposed Increase**	**Proposed After Project**	**Notes**
Line 6A	Inbound	634,080	-	634,080	
Line 64	Inbound	211,360	-	211,360	
Line 62	Inbound	235,000	-	235,000	
Line 78	Inbound	-	570,000	570,000	Proposed new pipeline
	Total inbound capacity	**1,080,440**	**570,000**	**1,650,440**	
Line 6B	Outbound	500,000	70,000	570,000	Proposed increase
Refinery Takeoff	Outbound	450,000	-	450,000	
Buckeye Terminal Takeoff	Outbound	-	-	368,000	Proposed new pipeline
	Total outbound capacity[1]	**950,000**		**1,388,000**	

Notes:

1. Potential throughput for the terminals is limited by outbound pipeline capacity which is less than the outbound pipeline capacity.

Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Table 2-4: PTE Throughput Summary[1]

2013 Permit Application Basis

Total Maximum Throughput (bbl/day):	1,388,000
Maximum Pipeline Throughput (bbl/year):	506,620,000
Crude Oil RVP:	8.0

Tank Number	Product	RVP (psia)	Tank Diameter (ft)	Tank Volume (bbl)	Tank Volume (gal)	Fraction of Total Terminal Tankage Volume	PTE Throughput (bbl/yr)	PTE Throughput (gal/yr)	Potential Annual Tank Turnovers
GT-70	Crude Oil	8.0	134	120,000	5,040,000	3%	13,411,888	563,299,311	111.77
GT-71	Crude Oil	8.0	180	217,000	9,114,000	5%	24,253,165	1,018,632,920	111.77
GT-72	Crude Oil	8.0	180	217,000	9,114,000	5%	24,253,165	1,018,632,920	111.77
GT-73	Crude Oil	8.0	180	217,000	9,114,000	5%	24,253,165	1,018,632,920	111.77
GT-74	Crude Oil	8.0	180	217,000	9,114,000	5%	24,253,165	1,018,632,920	111.77
GT-75	Crude Oil	8.0	180	217,000	9,114,000	5%	24,253,165	1,018,632,920	111.77
GT-76	Crude Oil	8.0	210	395,000	16,590,000	9%	44,147,466	1,854,193,565	111.77
GT-77	Crude Oil	8.0	210	395,000	16,590,000	9%	44,147,466	1,854,193,565	111.77
GT-78	Crude Oil	8.0	180	217,000	9,114,000	5%	24,253,165	1,018,632,920	111.77
GT-79	Crude Oil	8.0	224	392,169	16,471,098	9%	43,831,057	1,840,904,395	111.77
GT-80	Crude Oil	8.0	180	240,000	10,080,000	5%	26,823,777	1,126,598,622	111.77
GT-1601	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1602	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1603	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1604	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1605	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1606	DEMOLISHED								
GT-1607	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1608	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1609	Crude Oil	8.0	134	100,000	4,200,000	2%	11,176,574	469,416,092	111.77
GT-1610	Crude Oil	8.0	270	528,705	22,205,610	12%	59,091,104	2,481,826,351	111.77
GT-1611	Crude Oil	8.0	223	360,000	15,120,000	8%	40,235,665	1,689,897,932	111.77
					190,380,708	100%	506,620,000	21,278,040,000	

Notes:

1. Throughput is based on a volume weighted average of the annual limiting throughput flowing through all tanks based on their physical storage capacity.

Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Table 2-5: Floating Roof Landing Emissions [1]

TANK INFORMATION:											
	Tank Number	**GT-70**	**GT-71**	**GT-72**	**GT-73**	**GT-74**	**GT-75**	**GT-76**	**GT-77**	**GT-78**	**GT-79**
	Tank Color	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good
	Tank Type	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	Drain Dry
	Month	July	July	July	July	July	July	July	July	July	July
n_d	Total Number of Days on Roof Legs without Refilling	5	5	5	5	5	5	5	5	5	5
D	Tank Diameter, ft	134	180	180	180	180	180	210	210	180	224
H_d	Height of the deck above the tank bottom, ft	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20
H_{Le}	Height of the liquid above the tank bottom, ft	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
H_{VO}	Height of the vapor space, ft	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95
STORED PRODUCT INFORMATION:											
	Product Name:	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude
RVP	Reid Vapor Pressure of Product, psia	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	50	50	50	50
W_l	Liquid Density, lb/gal	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
A	Vapor Pressure Coefficient, dimensionless	10.809	10.809	10.809	10.809	10.809	10.809	10.809	10.809	10.809	10.809
B	Vapor Pressure Coefficient, dimensionless	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4
P_{VA}	Vapor Pressure at Daily Ave. Surface Temp, psia	6.869	6.869	6.869	6.869	6.869	6.869	6.869	6.869	6.869	6.869
REFILLED PRODUCT INFORMATION:											
	Product Name:	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude
RVP	Reid Vapor Pressure of Product, psia	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	50	50	50	50
W_l	Liquid Density, lb/gal	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
A	Vapor Pressure Coefficient, dimensionless	10.809	10.809	10.809	10.809	10.809	10.809	10.809	10.809	10.809	10.809
B	Vapor Pressure Coefficient, dimensionless	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4
$P_{VA\ refill}$	Vapor Pressure at Daily Ave. Surface Temp, psia	5.486	5.486	5.486	5.486	5.486	5.486	5.486	5.486	5.486	5.486
T_{refill}	Temperature of the Liquid Refilling, degrees F,	60	60	60	60	60	60	60	60	60	60
T_{refill}	Temperature of the Liquid Refilling, degrees R	520	520	520	520	520	520	520	520	520	520
METEOROLOGICAL INFORMATION:											
	Month	July	July	July	July	July	July	July	July	July	July
Delta Tv	Daily Vapor Temperature Range, degrees R	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4	24.4
T_{AA}	Daily Average Ambient Temperature, degrees R	532.82	532.82	532.82	532.82	532.82	532.82	532.82	532.82	532.82	532.82
T_{AX}	Daily Maximum Average Ambient Temp, degrees F	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7	83.7
T_{AN}	Daily Minimum Average Ambient Temp, degrees F	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6
Delta T_A	Daily Ambient Temperature Range, degrees R	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1
Pa	Atmospheric Pressure, psia	14.38	14.38	14.38	14.38	14.38	14.38	14.38	14.38	14.38	14.38
I	Daily Total Solar Insulation Factor, BTU/ft ^{2}*d	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5
alpha	Tank Paint Solar Absorptance, dimensionless	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17

STANDING LOSS CALCULATION:											
L_{SL}	Standing Idle Losses per day, lb/day	614	825	825	825	825	825	963	963	825	1763
K_E	Vapor space expansion factor, dimensionless	0.232	0.232	0.232	0.232	0.232	0.232	0.232	0.232	0.232	0.232
P_{VA}	True Vapor Pressure of the stock liquid, psia	6.869	6.869	6.869	6.869	6.869	6.869	6.869	6.869	6.869	6.869
Vv	Vapor Space Volume, ft^3	55,705	100,515	100,515	100,515	100,515	100,515	136,812	136,812	100,515	155,662
R	Ideal Gas Constant, psia*ft^3/lbmole*R	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
T_S	Average Monthly Stock Temperature, degrees R	532.82	532.82	532.82	532.82	532.82	532.82	532.82	532.82	532.82	532.82
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	50	50	50	50
Ks	Vented vapor saturation factor, dimensionless	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.15
H_{VO}	Height of Vapor Space under Floating Roof, ft	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95
P*	Vapor pressure function	0.16088	0.16088	0.16088	0.16088	0.16088	0.16088	0.16088	0.16088	0.16088	0.16088
$L_{SL\ max}$	Limit on standing losses, lb/event	940,221	1,696,545	1,696,545	1,696,545	1,696,545	1,696,545	2,309,186	2,309,186	1,696,545	5,610
REFILLING LOSS CALCULATION:											
L_{FL}	Filling Losses per episode, lb	1,444	2,790	2,790	2,790	2,790	2,790	3,902	3,902	2,790	1,512
$P_{VA\ refill}$	True Vapor Pressure Liquid Refilling, psia	5.486	5.486	5.486	5.486	5.486	5.486	5.486	5.486	5.486	5.486
Vv	Vapor Space Volume, ft^3	55,705	100,515	100,515	100,515	100,515	100,515	136,812	136,812	100,515	204,922
H_{VO}	Height of Vapor Space under Floating Roof, ft	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	5.20
D	Tank Diameter, ft	134	180	180	180	180	180	210	210	180	224
R	Ideal Gas Constant, psia*ft^3/lbmole*R	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
T_{refill}	Temperature of the Liquid Refilling, degrees R	520	520	520	520	520	520	520	520	520	520
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	50	50	50	50
S	Refilling Saturation Factor, dimensionless	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.15
K_E	Vapor space expansion factor, dimensionless	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179	0.179
Ks	Vented vapor saturation factor, dimensionless	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.15
C_{sf}	Filling saturation correction factor	0.878	0.940	0.940	0.940	0.940	0.940	0.966	0.966	0.940	0.724
$L_{s\ wind}$	Standing loss associated with wind, calculated for C_{sf}	456.38	613.04	613.04	613.04	613.04	613.04	715.22	715.22	613.04	762.90
P*	Vapor pressure function	0.11950	0.11950	0.11950	0.11950	0.11950	0.11950	0.11950	0.11950	0.11950	0.11950
Ls	Standing loss calculated for C_{sf}, lb/day	228.17	411.71	411.71	411.71	411.71	411.71	560.38	560.38	411.71	270.51
L_F	Filling loss calculated for C_{sf}, lb	1,644.04	2,966.53	2,966.53	2,966.53	2,966.53	2,966.53	4,037.78	4,037.78	2,966.53	1,511.98

Summary of Tank Landing Losses:											
	Tank Number	GT-70	GT-71	GT-72	GT-73	GT-74	GT-75	GT-76	GT-77	GT-78	GT-79
	Tank Type	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	EFRT	Drain Dry
	Stored Product	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude
	Refill Product	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude	Crude
	Month of Landing	July	July	July	July	July	July	July	July	July	July
L_{SL}	Cumulative Standing Idle Losses per episode, lb	3,072	4,127	4,127	4,127	4,127	4,127	4,814	4,814	4,127	1,763
L_{FL}	Filling Losses per episode, lb	1,444	2,790	2,790	2,790	2,790	2,790	3,902	3,902	2,790	1,512
L_{TL}	Total Landing Loss per episode, lb	4,516	6,916	6,916	6,916	6,916	6,916	8,716	8,716	6,916	3,275

Total Landing Losses (lb/yr)	4,516	6,916	6,916	6,916	6,916	6,916	8,716	8,716	6,916	3,275
Total Landing Losses (ton/yr)	2.26	3.46	3.46	3.46	3.46	3.46	4.36	4.36	3.46	1.64

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Table 2-5: Floating Roof Landing Emissions (1)

TANK INFORMATION:								
	Tank Number	**GT-80**	**GT-1601**	**GT-1602**	**GT-1603**	**GT-1604**	**GT-1605**	**GT-1606**
	Tank Color	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good	DEMOLISHED
	Tank Type	Drain Dry	EFRT	EFRT	EFRT	EFRT	EFRT	
	Month	July	July	July	July	July	July	
n_d	Total Number of Days on Roof Legs without Refilling	5	5	5	5	5	5	
D	Tank Diameter, ft	180	134	134	134	134	134	
H_d	Height of the deck above the tank bottom, ft	5.20	5.20	5.20	5.20	5.20	5.20	
H_{Le}	Height of the liquid above the tank bottom, ft	1.25	1.25	1.25	1.25	1.25	1.25	
H_{VO}	Height of the vapor space, ft	3.95	3.95	3.95	3.95	3.95	3.95	
STORED PRODUCT INFORMATION:								
	Product Name:	Crude	Crude	Crude	Crude	Crude	Crude	DEMOLISHED
RVP	Reid Vapor Pressure of Product, psia	8.0	8.0	8.0	8.0	8.0	8.0	
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	
W_l	Liquid Density, lb/gal	7.1	7.1	7.1	7.1	7.1	7.1	
A	Vapor Pressure Coefficient, dimensionless	10.809	10.809	10.809	10.809	10.809	10.809	
B	Vapor Pressure Coefficient, dimensionless	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	
P_{VA}	Vapor Pressure at Daily Ave. Surface Temp, psia	6.869	6.869	6.869	6.869	6.869	6.869	
REFILLED PRODUCT INFORMATION:								
	Product Name:	Crude	Crude	Crude	Crude	Crude	Crude	DEMOLISHED
RVP	Reid Vapor Pressure of Product, psia	8.0	8.0	8.0	8.0	8.0	8.0	
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	
W_l	Liquid Density, lb/gal	7.1	7.1	7.1	7.1	7.1	7.1	
A	Vapor Pressure Coefficient, dimensionless	10.809	10.809	10.809	10.809	10.809	10.809	
B	Vapor Pressure Coefficient, dimensionless	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4	
$P_{VA\ refill}$	Vapor Pressure at Daily Ave. Surface Temp, psia	5.486	5.486	5.486	5.486	5.486	5.486	
T_{refill}	Temperature of the Liquid Refilling, degrees F,	60	60	60	60	60	60	
T_{refill}	Temperature of the Liquid Refilling, degrees R	520	520	520	520	520	520	
METEOROLOGICAL INFORMATION:								
	Month	July	July	July	July	July	July	DEMOLISHED
Delta Tv	Daily Vapor Temperature Range, degrees R	24.4	24.4	24.4	24.4	24.4	24.4	
T_{AA}	Daily Average Ambient Temperature, degrees R	532.82	532.82	532.82	532.82	532.82	532.82	
T_{AX}	Daily Maximum Average Ambient Temp, degrees F	83.7	83.7	83.7	83.7	83.7	83.7	
T_{AN}	Daily Minimum Average Ambient Temp, degrees F	62.6	62.6	62.6	62.6	62.6	62.6	
Delta T_A	Daily Ambient Temperature Range, degrees R	21.1	21.1	21.1	21.1	21.1	21.1	
Pa	Atmospheric Pressure, psia	14.38	14.38	14.38	14.38	14.38	14.38	
I	Daily Total Solar Insulation Factor, BTU/ft ^{2}*d	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5	
alpha	Tank Paint Solar Absorptance, dimensionless	0.17	0.17	0.17	0.17	0.17	0.17	

STANDING LOSS CALCULATION:

L_{SL}	Standing Idle Losses per day, lb/day	1138	614	614	614	614	614	DEMOLISHED
K_E	Vapor space expansion factor, dimensionless	0.232	0.232	0.232	0.232	0.232	0.232	
P_{VA}	True Vapor Pressure of the stock liquid, psia	6.869	6.869	6.869	6.869	6.869	6.869	
Vv	Vapor Space Volume, ft^3	100,515	55,705	55,705	55,705	55,705	55,705	
R	Ideal Gas Constant, psia*ft^3/lbmole*R	10.731	10.731	10.731	10.731	10.731	10.731	
T_S	Average Monthly Stock Temperature, degrees R	532.82	532.82	532.82	532.82	532.82	532.82	
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	
Ks	Vented vapor saturation factor, dimensionless	0.15	0.41	0.41	0.41	0.41	0.41	
H_{VO}	Height of Vapor Space under Floating Roof, ft	3.95	3.95	3.95	3.95	3.95	3.95	
P*	Vapor pressure function	0.16088	0.16088	0.16088	0.16088	0.16088	0.16088	
$L_{SL\ max}$	Limit on standing losses, lb/event	3,622	940,221	940,221	940,221	940,221	940,221	

REFILLING LOSS CALCULATION:

L_{FL}	Filling Losses per episode, lb	976	1,444	1,444	1,444	1,444	1,444	DEMOLISHED
$P_{VA\ refill}$	True Vapor Pressure Liquid Refilling, psia	5.486	5.486	5.486	5.486	5.486	5.486	
Vv	Vapor Space Volume, ft^3	132,324	55,705	55,705	55,705	55,705	55,705	
H_{VO}	Height of Vapor Space under Floating Roof, ft	5.20	3.95	3.95	3.95	3.95	3.95	
D	Tank Diameter, ft	180	134	134	134	134	134	
R	Ideal Gas Constant, psia*ft^3/lbmole*R	10.731	10.731	10.731	10.731	10.731	10.731	
T_{refill}	Temperature of the Liquid Refilling, degrees R	520	520	520	520	520	520	
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50	50	
S	Refilling Saturation Factor, dimensionless	0.15	0.60	0.60	0.60	0.60	0.60	
K_E	Vapor space expansion factor, dimensionless	0.179	0.179	0.179	0.179	0.179	0.179	
Ks	Vented vapor saturation factor, dimensionless	0.15	0.47	0.47	0.47	0.47	0.47	
C_{sf}	Filling saturation correction factor	0.619	0.878	0.878	0.878	0.878	0.878	
$L_{s\ wind}$	Standing loss associated with wind, calculated for C_{sf}	613.04	456.38	456.38	456.38	456.38	456.38	
P*	Vapor pressure function	0.11950	0.11950	0.11950	0.11950	0.11950	0.11950	
Ls	Standing loss calculated for C_{sf}, lb/day	174.67	228.17	228.17	228.17	228.17	228.17	
L_F	Filling loss calculated for C_{sf}, lb	976.33	1,644.04	1,644.04	1,644.04	1,644.04	1,644.04	

Summary of Tank Landing Losses:

	Tank Number	GT-80	GT-1601	GT-1602	GT-1603	GT-1604	GT-1605	DEMOLISHED
	Tank Type	Drain Dry	EFRT	EFRT	EFRT	EFRT	EFRT	
	Stored Product	Crude	Crude	Crude	Crude	Crude	Crude	
	Refill Product	Crude	Crude	Crude	Crude	Crude	Crude	
	Month of Landing	July	July	July	July	July	July	
L_{SL}	Cumulative Standing Idle Losses per episode, lb	1,138	3,072	3,072	3,072	3,072	3,072	
L_{FL}	Filling Losses per episode, lb	976	1,444	1,444	1,444	1,444	1,444	
L_{TL}	Total Landing Loss per episode, lb	2,115	4,516	4,516	4,516	4,516	4,516	

2,115	4,516	4,516	4,516	4,516	4,516	-
1.06	2.26	2.26	2.26	2.26	2.26	-

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Table 2-5: Floating Roof Landing Emissions [1]

TANK INFORMATION:						
	Tank Number	**GT-1607**	**GT-1608**	**GT-1609**	**GT-1610**	**GT-1611**
	Tank Color	White/White, Good	White/White, Good	White/White, Good	White/White, Good	White/White, Good
	Tank Type	EFRT	EFRT	EFRT	Drain Dry	Drain Dry
	Month	July	July	July	July	July
n_d	Total Number of Days on Roof Legs without Refilling	5	5	5	5	5
D	Tank Diameter, ft	134	134	134	270	223
H_d	Height of the deck above the tank bottom, ft	5.20	5.20	5.20	5.20	5.20
H_{Le}	Height of the liquid above the tank bottom, ft	1.25	1.25	1.25	1.25	1.25
H_{VO}	Height of the vapor space, ft	3.95	3.95	3.95	3.95	3.95
STORED PRODUCT INFORMATION:						
	Product Name:	Crude	Crude	Crude	Crude	Crude
RVP	Reid Vapor Pressure of Product, psia	8.0	8.0	8.0	8.0	8.0
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50
W_l	Liquid Density, lb/gal	7.1	7.1	7.1	7.1	7.1
A	Vapor Pressure Coefficient, dimensionless	10.809	10.809	10.809	10.809	10.809
B	Vapor Pressure Coefficient, dimensionless	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4
P_{VA}	Vapor Pressure at Daily Ave. Surface Temp, psia	6.869	6.869	6.869	6.869	6.869
REFILLED PRODUCT INFORMATION:						
	Product Name:	Crude	Crude	Crude	Crude	Crude
RVP	Reid Vapor Pressure of Product, psia	8.0	8.0	8.0	8.0	8.0
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50
W_l	Liquid Density, lb/gal	7.1	7.1	7.1	7.1	7.1
A	Vapor Pressure Coefficient, dimensionless	10.809	10.809	10.809	10.809	10.809
B	Vapor Pressure Coefficient, dimensionless	4,732.4	4,732.4	4,732.4	4,732.4	4,732.4
$P_{VA\ refill}$	Vapor Pressure at Daily Ave. Surface Temp, psia	5.486	5.486	5.486	5.486	5.486
T_{refill}	Temperature of the Liquid Refilling, degrees F,	60	60	60	60	60
T_{refill}	Temperature of the Liquid Refilling, degrees R	520	520	520	520	520
METEOROLOGICAL INFORMATION:						
	Month	July	July	July	July	July
Delta Tv	Daily Vapor Temperature Range, degrees R	24.4	24.4	24.4	24.4	24.4
T_{AA}	Daily Average Ambient Temperature, degrees R	532.82	532.82	532.82	532.82	532.82
T_{AX}	Daily Maximum Average Ambient Temp, degrees F	83.7	83.7	83.7	83.7	83.7
T_{AN}	Daily Minimum Average Ambient Temp, degrees F	62.6	62.6	62.6	62.6	62.6
Delta T_A	Daily Ambient Temperature Range, degrees R	21.1	21.1	21.1	21.1	21.1
Pa	Atmospheric Pressure, psia	14.38	14.38	14.38	14.38	14.38
I	Daily Total Solar Insulation Factor, BTU/ft ^{2}*d	1,938.5	1,938.5	1,938.5	1,938.5	1,938.5
alpha	Tank Paint Solar Absorptance, dimensionless	0.17	0.17	0.17	0.17	0.17

STANDING LOSS CALCULATION:						
L_{SL}	Standing Idle Losses per day, lb/day	614	614	614	2561	1747
K_E	Vapor space expansion factor, dimensionless	0.232	0.232	0.232	0.232	0.232
P_{VA}	True Vapor Pressure of the stock liquid, psia	6.869	6.869	6.869	6.869	6.869
Vv	Vapor Space Volume, ft^3	55,705	55,705	55,705	226,159	154,275
R	Ideal Gas Constant, psia*ft^3/lbmole*R	10.731	10.731	10.731	10.731	10.731
T_S	Average Monthly Stock Temperature, degrees R	532.82	532.82	532.82	532.82	532.82
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50
Ks	Vented vapor saturation factor, dimensionless	0.41	0.41	0.41	0.15	0.15
H_{VO}	Height of Vapor Space under Floating Roof, ft	3.95	3.95	3.95	3.95	3.95
P*	Vapor pressure function	0.16088	0.16088	0.16088	0.16088	0.16088
$L_{SL\ max}$	Limit on standing losses, lb/event	940,221	940,221	940,221	8,151	5,560
REFILLING LOSS CALCULATION:						
L_{FL}	Filling Losses per episode, lb	1,444	1,444	1,444	2,197	1,499
$P_{VA\ refill}$	True Vapor Pressure Liquid Refilling, psia	5.486	5.486	5.486	5.486	5.486
Vv	Vapor Space Volume, ft^3	55,705	55,705	55,705	297,729	203,097
H_{VO}	Height of Vapor Space under Floating Roof, ft	3.95	3.95	3.95	5.20	5.20
D	Tank Diameter, ft	134	134	134	270	223
R	Ideal Gas Constant, psia*ft^3/lbmole*R	10.731	10.731	10.731	10.731	10.731
T_{refill}	Temperature of the Liquid Refilling, degrees R	520	520	520	520	520
Mv	Vapor Molecular Weight, lb/lbmole	50	50	50	50	50
S	Refilling Saturation Factor, dimensionless	0.60	0.60	0.60	0.15	0.15
K_E	Vapor space expansion factor, dimensionless	0.179	0.179	0.179	0.179	0.179
Ks	Vented vapor saturation factor, dimensionless	0.47	0.47	0.47	0.15	0.15
C_{sf}	Filling saturation correction factor	0.878	0.878	0.878	0.797	0.722
$L_{s\ wind}$	Standing loss associated with wind, calculated for C_{sf}	456.38	456.38	456.38	919.56	759.49
P*	Vapor pressure function	0.11950	0.11950	0.11950	0.11950	0.11950
Ls	Standing loss calculated for C_{sf}, lb/day	228.17	228.17	228.17	393.02	268.10
L_F	Filling loss calculated for C_{sf}, lb	1,644.04	1,644.04	1,644.04	2,196.74	1,498.51
Summary of Tank Landing Losses:						
	Tank Number	GT-1607	GT-1608	GT-1609	GT-1610	GT-1611
	Tank Type	EFRT	EFRT	EFRT	Drain Dry	Drain Dry
	Stored Product	Crude	Crude	Crude	Crude	Crude
	Refill Product	Crude	Crude	Crude	Crude	Crude
	Month of Landing	July	July	July	July	July
L_{SL}	Cumulative Standing Idle Losses per episode, lb	3,072	3,072	3,072	2,561	1,747
L_{FL}	Filling Losses per episode, lb	1,444	1,444	1,444	2,197	1,499
L_{TL}	Total Landing Loss per episode, lb	4,516	4,516	4,516	4,758	3,246
		4,516	4,516	4,516	4,758	3,246
		2.26	2.26	2.26	2.38	1.62

Total Roof Landing Emissions per episode (lb VOC/yr)	104,961
Total Roof Landing Emissions per episode (ton VOC/yr)	56.48

Notes:

1. Tank landing emissions calculated using US Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, AP-42, Chapter 7.1 Liquid Storage Tanks, November 2006.

Base equations for roof landing loss calculations:

External Floating Roof Tank

EFRT Standing Loss $L_{SL} = 0.57\ n_d\ D\ P^*\ Mv$ (Maximum standing loss can not exceed LS max = $5.9\ D^2\ h_{le}\ W_l$)

EFRT Filling Loss $L_{FL} = (P_{VA\ refill}\ V_V / R\ T_{refill})\ Mv\ (C_{sf}\ S)$

Drain-Dry Tanks (Tank with a bottom that slopes to a sump where there is no liquid heel)

Drain-Dry Standing Loss $L_{SL} = 42\ C_S\ W_l\ (\pi\ D^2 / 4)$ (Maximum standing loss can not exceed LS max = $0.60\ (P_{VA}\ V_V / R\ T)\ Mv$)

Drain-Dry Filling Loss $L_{FL} = (P_{VA\ refill}\ V_V / R\ T_{refill})\ Mv\ S$

Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

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Table 2-5: Floating Roof Landing Emissions [1]

TANK INFORMATION:		
	Tank Number	**Notes**
	Tank Color	
	Tank Type	Enter tank type
	Month	Enter the month the tank landed
n_d	Total Number of Days on Roof Legs without Refilling	Enter the number of days roof was on Legs
D	Tank Diameter, ft	Enter tank diameter
H_d	Height of the deck above the tank bottom, ft	Enter the height of tank legs
H_{Le}	Height of the liquid above the tank bottom, ft	Enter the height of liquid remaining in the tank, based on low level alarm setting
H_{VO}	Height of the vapor space, ft	AP-42, Chapter 7.1, Formula 1-15
STORED PRODUCT INFORMATION:		
	Product Name:	Enter stored product name
RVP	Reid Vapor Pressure of Product, psia	Enter crude oil RVP
Mv	Vapor Molecular Weight, lb/lbmole	Enter vapor molecular weight of product stored
W_l	Liquid Density, lb/gal	Enter density of product stored.
A	Vapor Pressure Coefficient, dimensionless	AP-42, Chapter 7.1, Figures 7.1-15, 7.1-16 and Table 7.1-5
B	Vapor Pressure Coefficient, dimensionless	AP-42, Chapter 7.1, Figures 7.1-15, 7.1-16 and Table 7.1-5
P_{VA}	Vapor Pressure at Daily Ave. Surface Temp, psia	AP-42 Chapter 7.1, Figure 7.1-13b, where T = temperature of stock liquid
REFILLED PRODUCT INFORMATION:		
	Product Name:	Enter refilled product name
RVP	Reid Vapor Pressure of Product, psia	Enter crude oil RVP
Mv	Vapor Molecular Weight, lb/lbmole	Enter vapor molecular weight of product stored
W_l	Liquid Density, lb/gal	Enter density of product stored.
A	Vapor Pressure Coefficient, dimensionless	AP-42, Chapter 7.1, Figures 7.1-15, 7.1-16 and Table 7.1-5
B	Vapor Pressure Coefficient, dimensionless	AP-42, Chapter 7.1, Figures 7.1-15, 7.1-16 and Table 7.1-5
$P_{VA\ refill}$	Vapor Pressure at Daily Ave. Surface Temp, psia	AP-42 Chapter 7.1, Figure 7.1-13b, where T = temperature of refill liquid
T_{refill}	Temperature of the Liquid Refilling, degrees F,	Assume refilled proudct is at 60 ^oF
T_{refill}	Temperature of the Liquid Refilling, degrees R	Trefill +459.67
METEOROLOGICAL INFORMATION:		
	Month	Enter month tank landed
Delta Tv	Daily Vapor Temperature Range, degrees R	AP-42, Chapter 7.1, Formula 1-8
T_{AA}	Daily Average Ambient Temperature, degrees R	AP-42, Chapter 7.1, Formula 1-27
T_{AX}	Daily Maximum Average Ambient Temp, degrees F	Tanks 4.09d Meteorological Data
T_{AN}	Daily Minimum Average Ambient Temp, degrees F	Tanks 4.09d Meteorological Data
Delta T_A	Daily Ambient Temperature Range, degrees R	AP-42, Chapter 7.1, Formula 1-12
Pa	Atmospheric Pressure, psia	Tanks 4.09d Meteorological Data
I	Daily Total Solar Insulation Factor, BTU/ft ^{2}*d	Tanks 4.09d Meteorological Data
alpha	Tank Paint Solar Absorptance, dimensionless	AP-42, Chapter 7.1, Table 7.1-6

STANDING LOSS CALCULATION:		
L_{SL}	Standing Idle Losses per day, lb/day	AP-42, Chapter 7.1, IFRT Formula 2-16, EFRT Formula 2-19, Drain Dry Formula 2-22.
K_E	Vapor space expansion factor, dimensionless	AP-42, Chapter 7.1, Formula 2-31
P_{VA}	True Vapor Pressure of the stock liquid, psia	AP-42 Chapter 7.1, Figure 7.1-13b, where T = temperature of stock liquid
Vv	Vapor Space Volume, ft^3	AP-42, Chapter 7.1, Formula 2-32
R	Ideal Gas Constant, psia*ft^3/lbmole*R	
T_S	Average Monthly Stock Temperature, degrees R	AP-42, Formula 2-3, Note 3
Mv	Vapor Molecular Weight, lb/lbmole	
Ks	Vented vapor saturation factor, dimensionless	AP-42, Chapter 7.1, Formula 1-20, For IFRT must be < Saturation factor, S
H_{VO}	Height of Vapor Space under Floating Roof, ft	AP-42, Chapter 7.1, Formula 1-15
P*	Vapor pressure function	AP-42, Chapter 7.1, Formula 2-18
$L_{SL\ max}$	Limit on standing losses, lb/event	AP-42, Chapter 7.1, IFRT and EFRT Formula 2-13, Drain Dry Formula 2-23
REFILLING LOSS CALCULATION:		
L_{FL}	Filling Losses per episode, lb	AP-42, Chapter 7.1, IFRT Formula 2-26, EFRT Formula 2-27, Drain Dry Formula 2-26; where nd = 1
$P_{VA\ refill}$	True Vapor Pressure Liquid Refilling, psia	AP-42 Chapter 7.1, Figure 7.1-13b,, with T = Temperate of refill liquid
Vv	Vapor Space Volume, ft^3	AP-42, Chapter 7.1, Formula 2-32
H_{VO}	Height of Vapor Space under Floating Roof, ft	For flat bottom drain dry, Hvo = hd; for liquid heel, Hvo = hd-hl
D	Tank Diameter, ft	
R	Ideal Gas Constant, psia*ft^3/lbmole*R	
T_{refill}	Temperature of the Liquid Refilling, degrees R	
Mv	Vapor Molecular Weight, lb/lbmole	
S	Refilling Saturation Factor, dimensionless	Defaults: IFRT = 0.60, EFRT = 0.60, Drain Dry = 0.15
K_E	Vapor space expansion factor, dimensionless	AP-42, Chapter 7.1, Formula 2-31
Ks	Vented vapor saturation factor, dimensionless	AP-42, Chapter 7.1, Formula 1-20, For IFRT must be < Saturation factor, S
C_{sf}	Filling saturation correction factor	AP-42, Chapter 7.1, Formula 2-29, where nd = 1
$L_{s\ wind}$	Standing loss associated with wind, calculated for C_{sf}	AP-42, Chapter 7.1, Formula 2-19
P*	Vapor pressure function	AP-42, Chapter 7.1, Formula 2-18
Ls	Standing loss calculated for C_{sf}, lb/day	AP-42, Chapter 7.1, Formula 2-16
L_F	Filling loss calculated for C_{sf}, lb	AP-42, Chapter 7.1, Formula 2-26

Summary of Tank Landing Losses:	
	Tank Number
	Tank Type
	Stored Product
	Refill Product
	Month of Landing
L_{SL}	Cumulative Standing Idle Losses per episode, lb
L_{FL}	Filling Losses per episode, lb
L_{TL}	Total Landing Loss per episode, lb

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Table 2-6: Piping Component Fugitive Volatile Organic Compound Emission Calculations

Project Piping Component Potential to Emit

Piping Component Type	Component Count(1)	Service	Emission Factor(2) (kg/hr/source)	Emission Factor (lb/hr/source)	Emissions(3) (lb/yr)	Emissions (tpy)
Valves	250	Crude/ Light Liquid	4.30E-05	9.47E-05	207	0.10
Flanges	750	Crude/ Light Liquid	8.00E-06	1.76E-05	116	0.06
Orifices	-	Crude/ Light Liquid	1.30E-04	2.86E-04	-	-
Sample Points(4)	-	Crude/ Light Liquid	1.30E-04	2.86E-04	-	-
Pump Seals	30	Crude/ Light Liquid	5.40E-04	1.19E-03	313	0.16
	1,030			Total	636	**0.32**

Existing Hartsdale/Griffith Terminal Piping Component Potential to Emit

Piping Component Type	Component Count	Service	Emission Factor(2) (kg/hr/source)	Emission Factor (lb/hr/source)	Emissions(3) (lb/yr)	Emissions (tpy)
Valves	1,381	Crude/ Light Liquid	4.30E-05	9.47E-05	1,146	0.573
Flanges	4,642	Crude/ Light Liquid	8.00E-06	1.76E-05	717	0.358
Orifices	10	Crude/ Light Liquid	1.30E-04	2.86E-04	25	0.013
Sample Points(4)	27	Crude/ Light Liquid	1.30E-04	2.86E-04	68	0.034
Pump Seals	61	Crude/ Light Liquid	5.40E-04	1.19E-03	636	0.318
	6,121			Total	2,591	**1.30**

Proposed Total Hartsdale/Griffith Terminal Piping Component Potential to Emit

Piping Component Type	Component Count	Service	Emission Factor(2) (kg/hr/source)	Emission Factor (lb/hr/source)	Emissions(3) (lb/yr)	Emissions (tpy)
Valves	1,631	Crude/ Light Liquid	4.30E-05	9.47E-05	1,353	0.677
Flanges	5,392	Crude/ Light Liquid	8.00E-06	1.76E-05	832	0.416
Orifices	10	Crude/ Light Liquid	1.30E-04	2.86E-04	25	0.013
Sample Points(4)	27	Crude/ Light Liquid	1.30E-04	2.86E-04	68	0.034
Pump Seals	91	Crude/ Light Liquid	5.40E-04	1.19E-03	948	0.474
	7,151			Total	3,227	**1.61**

Notes:
1. Estimated number of project piping components that may be constructed at the terminal for the terminal enhancement project.
2. Table 2-3 Light liquid emission factors, Marketing Terminal Average Emission Factors from Protocol for Equipment Leak Emission Estimates, USEPA Office of Air Quality Planning and Standards, November 1995 (EPA-453/R-95-017).
3. Assumes 8760 hour of operation per year.
4. Sample points uses the "Other" equipment type to determine the emission factor.
Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Enbridge Energy, Limited Partnership - Flanagan Terminal
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Table 2-7: VOC Hazardous Air Pollutant Emission Summary[(1)]

					HAP Emissions[(1,2)] (lb/yr)												
					1,2,4-Trimethylbenzene	Benzene	Cumene/Isopropyl benzene	Cyclohexane	Ethylbenzene	n-Hexane	Toluene	Xylenes	Isooctane/2,2,4-Trimethylpentane	Biphenyl	Naphthalene	Phenol	TOTAL HAP
				Crude Oil - Vapor Weight Fraction [(3)]	4.15E-05	4.82E-03	3.03E-05	5.87E-03	2.80E-04	3.29E-02	2.20E-03	8.25E-04	4.06E-04	7.75E-08	3.21E-06	4.91E-06	
				Crude Oil - Liquid Weight Fraction [(4)]	3.30E-03	6.00E-03	1.00E-03	7.00E-03	4.00E-03	2.46E-02	1.00E-02	1.42E-02	1.00E-03	6.00E-04	2.19E-03	3.23E-03	
Tank ID	Total Standing Loss (lb VOC/yr)	Total Withdrawal Loss (lb VOC/yr)	Total Landing Loss (lb VOC/yr)	Total Loss (lb VOC/yr)	HAP	HAP	HAP	No	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP	HAP
GT-70	3,716	4,021	4,516	12,253	13.61	63.79	4.27	76.43	18.39	370.00	58.33	63.89	7.36	2.41	8.83	13.03	623.90
GT-71	3,775	5,413	6,916	16,104	18.31	83.99	5.74	100.60	24.64	485.24	77.66	85.68	9.75	3.25	11.89	17.54	823.68
GT-72	5,293	5,413	6,916	17,622.51	18.37	91.31	5.78	109.51	25.07	535.22	81.01	86.94	10.37	3.25	11.89	17.54	886.74
GT-73	3,756	5,413	6,916	16,085	18.30	83.90	5.74	100.49	24.64	484.60	77.62	85.67	9.74	3.25	11.89	17.54	822.88
GT-74	2,531	5,413	6,916	14,860	18.25	78.00	5.70	93.30	24.30	444.27	74.92	84.66	9.24	3.25	11.88	17.53	772.01
GT-75	2,531	5,413	6,916	14,860	18.25	78.00	5.70	93.30	24.30	444.27	74.92	84.66	9.24	3.25	11.88	17.53	772.01
GT-76	4,310	8,445	8,716	21,471	28.41	113.44	8.84	135.52	37.43	636.77	113.13	130.67	13.73	5.07	18.54	27.34	1,133.36
GT-77	4,310	8,445	8,716	21,471	28.41	113.44	8.84	135.52	37.43	636.77	113.13	130.67	13.73	5.07	18.54	27.34	1,133.36
GT-78	2,558	5,413	6,916	14,887	18.25	78.13	5.70	93.46	24.30	445.17	74.98	84.68	9.26	3.25	11.88	17.53	773.14
GT-79	3,431	7,861	3,275	14,566	26.22	79.48	8.06	94.36	33.32	414.33	93.37	117.15	10.58	4.72	17.24	25.42	829.89
GT-80	2,716	5,986	2,115	10,817	19.96	59.19	6.13	70.24	25.30	306.44	70.50	88.99	7.95	3.59	13.13	19.36	620.53
GT-1601	1,710	3,351	4,516	9,576	11.32	50.10	3.54	59.97	15.15	287.44	47.21	52.72	5.88	2.01	7.36	10.85	493.56
GT-1602	1,710	3,351	4,516	9,576	11.32	50.10	3.54	59.97	15.15	287.44	47.21	52.72	5.88	2.01	7.36	10.85	493.56
GT-1603	2,081	3,351	4,516	9,947	11.33	51.89	3.55	62.15	15.25	299.66	48.03	53.02	6.03	2.01	7.36	10.85	508.98
GT-1604	1,710	3,351	4,516	9,576	11.32	50.10	3.54	59.97	15.15	287.44	47.21	52.72	5.88	2.01	7.36	10.85	493.56
GT-1605	1,710	3,351	4,516	9,576	11.32	50.10	3.54	59.97	15.15	287.44	47.21	52.72	5.88	2.01	7.36	10.85	493.56
GT-1606	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GT-1607	1,715	3,351	4,516	9,582	11.32	50.13	3.54	60.00	15.15	287.63	47.22	52.72	5.88	2.01	7.36	10.85	493.80
GT-1608	1,710	3,351	4,516	9,576	11.32	50.10	3.54	59.97	15.15	287.44	47.21	52.72	5.88	2.01	7.36	10.85	493.56
GT-1609	1,710	3,351	4,516	9,576	11.32	50.10	3.54	59.97	15.15	287.44	47.21	52.72	5.88	2.01	7.36	10.85	493.56
GT-1610	3,896	8,792	4,758	17,446	29.37	94.45	9.05	112.30	37.59	501.39	106.97	131.98	12.30	5.28	19.28	28.44	976.11
GT-1611	3,241	7,248	3,246	13,735	24.19	74.74	7.44	88.79	30.81	392.04	86.76	108.28	9.88	4.35	15.89	23.44	777.83
Piping Component Fugitive New Piping[(5)]				636	0.03	3.06	0.02	3.73	0.18	20.93	1.40	0.52	0.26	0.00	0.00	0.00	26.40
Piping Component Fugitive Total[(5)]				3,227	0.13	15.55	0.10	18.93	0.90	106.21	7.10	2.66	1.31	0.00	0.01	0.02	133.99
Totals (lb)	60,115	110,079	112,964	286,386	370.57	1510.02	115.42	1804.72	489.68	8514.65	1488.91	1708.61	181.60	66.06	241.64	356.42	**15,069.98**
Totals (ton)	30.06	55.04	56.48	143.19	0.19	0.76	0.06	0.90	0.24	4.26	0.74	0.85	0.09	0.03	0.12	0.18	**7.53**

Notes:
1. Calculated per US Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, AP-42, Chapter 7.1 Liquid Storage Tanks, September 1997, Hazardous Air Pollutant Speciation Methodology, Section 7.1.4.
2. See tables below for the crude oil speciation vapor weight fraction calculations using the TANKS and EPCRA Section 313 Industry Guidance.
3. Standing and landing loss HAP emissions are calculated using vapor weight fraction.
4. Withdrawal loss HAP emissions are calculated using liquid weight fraction.
5. Piping component fugitive HAP emissions are calculated using vapor weight fraction.
Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Facility-wide HAP Emissions Summary

	Lb/yr	Ton/yr	
Total HAPS	**15,043.58**	**7.52**	**Less than major source thresholds**
Individual HAP with the Highest Emissions: n-Hexane	**8,515**	**4.26**	**Less than major source thresholds**

HAP Speciation Vapor Weight Fraction Calculations

Crude Oil

Data Source:
TANKS 4.09b

	Z_{Li}	M_i		x_i	P	P_i	y_i	M_V	Z_{Vi}
Chemical Component	**Liquid Weight Percent**	**Mole Weight**	**Moles**	**Liquid Mole Fraction**	**True Vapor Pressure**	**Partial Pressure**	**Vapor Mole Fraction**	**Vapor Mole Weight**	**Vapor Weight Fraction**
1,2,4-Trimethylbenzene	0.3300%	120.19	0.0000	0.0057	0.01423	0.0001	0.0000		4.15E-05
Benzene	0.6000%	78.11	0.0001	0.0159	0.90933	0.0145	0.0031		4.82E-03
Cyclohexane	0.7000%	84.16	0.0001	0.0172	0.94880	0.0163	0.0035		5.87E-03
Ethylbenzene	0.4000%	106.17	0.0000	0.0078	0.07925	0.0006	0.0001		2.80E-04
n-Hexane	0.4000%	86.17	0.0000	0.0096	1.51322	0.0145	0.0031		5.35E-03
Isooctane/2,2,4-Trimethylpentane	0.1000%	114.23	0.0000	0.0018	0.45930	0.0008	0.0002		4.06E-04
Cumene/Isopropyl benzene	0.1000%	120.20	0.0000	0.0017	0.03429	0.0001	0.0000		3.03E-05
Toluene	1.0000%	92.13	0.0001	0.0225	0.24926	0.0056	0.0012		2.20E-03
Xylenes	1.4000%	106.17	0.0001	0.0273	0.06579	0.0018	0.0004		8.14E-04
Crude Oil - Unspeciated		207.00			4.69			50.00	
Totals	0.05		0.001	0.1095		0.0543	0.01	50.00	0.02

Data Source:
EPCRA Section 313
Industry Guide
Petroleum Terminal
and Bulk Storage
Facilities Table 3-4

Chemical Component	**Liquid Weight Percent**	**Mole Weight**	**Moles** (on a 1 lb basis)	**Liquid Mole Fraction**	**True Vapor Pressure**	**Partial Pressure**	**Vapor Mole Fraction**	**Vapor Mole Weight**	**Vapor Weight Fraction**
Benzene	0.4460%	78.11	0.0001	0.0118	0.90933	0.0107	0.0023		0.0036
Biphenyl	0.0600%	154.21	0.0000	0.0008	0.00015	0.0000	0.0000		0.0000
Cyclohexane	0.7000%	84.16	0.0001	0.0172	0.94880	0.0163	0.0035		0.0059
Ethylbenzene	0.3460%	106.17	0.0000	0.0067	0.07925	0.0005	0.0001		0.0002
n-Hexane	2.4630%	86.17	0.0003	0.0592	1.51322	0.0895	0.0191		0.0329
Naphthalene	0.2190%	128.20	0.0000	0.0035	0.00166	0.0000	0.0000		0.0000
Phenol	0.3230%	94.11	0.0000	0.0071	0.00172	0.0000	0.0000		0.0000
Toluene	0.8780%	92.13	0.0001	0.0197	0.24926	0.0049	0.0010		0.0019
1,2,4-Trimethylbenzene	0.3260%	120.19	0.0000	0.0056	0.01423	0.0001	0.0000		0.0000
Xylenes	1.4200%	106.17	0.0001	0.0277	0.06579	0.0018	0.0004		0.0008
Crude Oil - Unspeciated		207.00			4.69			50.00	
Totals	0.07		0.0008	0.16		0.12	0.03		0.05

Liquid Surface Temperature for TVP Calculation

$T = T_{LA}$	Daily Liquid Surface Temperature, °R =	510.33	Annual average calculated from all monthly daily average liquid surface temperatures calculated for each of the tanks.
	Daily Liquid Surface Temperature, °F =	50.73	
	Daily Liquid Surface Temperature, °C =	10.64	

Chemical	Antoine's coefficients[1]			True Vapor Pressure at Daily Average Liquid Surface Temperature (psia)	Molecular Weight	CAS #	Notes
	A	B	C				
1,2,4-Trimethylbenzene	7.04383	1573.267	208.56	0.0142	120.19	95636	
Benzene	6.905	1211.033	220.79	0.9093	78.11	71432	
Cumene/Isopropyl benzene	6.93666	1460.793	207.78	0.0343	120.20	98828	
Cyclohexane	6.841	1201.530	222.65	0.9488	84.16	110827	
Ethyl alcohol	8.321	1718.210	237.52	0.4828	46.07	64175	
Ethylbenzene	6.975	1424.255	213.21	0.0793	106.17	100414	
Naphthalene	7.3729	1968.360	222.61	0.0017	128.20	91203	
n-Hexane	6.876	1171.170	224.41	1.5132	86.17	110543	
Toluene	6.954	1344.800	219.48	0.2493	92.13	108883	
Xylenes	7.009	1462.266	215.11	0.0658	106.17	1330207	Equal to m-Xylene
Biphenyl	7.2454	1998.72	202.74	0.0001	154.211	92524	
Phenol	7.1345	1516.07	174.57	0.0017	94.1128	108952	
Isooctane/2,2,4-Trimethylpentane	6.8118	1257.840	220.74	0.4593	114.23	540841	
Crude Oil - Unspeciated				4.6876	207		AP-42 Table 7.1-2 and Figure 7.1-16

Notes:
1) Source of data: Yaws and Yang (Yaws, C. L. and Yang, H. C., "To estimate vapor pressure easily" *Hydrocarbon Processing* , October, 1989, page 65.)

	Description, Units of Measure	Formula/ Constant Value	Equation Number[1]
Z_{Li}	Liquid weight fraction of component, lb/lb	Input Value	
M_i	Molecular weight of component, lb/lb-mole	Input Value	
	Moles	Moles = $Z_{li\ Normalized}/ M_i$	
x_i	Liquid mole fraction of component, lb-mole/lb-mole	x_i = $Moles_i$/ Summation Moles	10
P	True vapor pressure of pure component at daily average	Input Value	
P_i	Partial pressure of component, psia	$P_i = P * x_i$	11
P_{VA}	temperature, psia	P_{VA} = Summation P_i	12
y_i	Vapor mole fraction of component, lb-mole/lb-mole	$y_i = P_i/ P_{VA}$	13
M_V	Vapor molecular weight, lb/lb-mole	M_V = Summation ($M_i * y_i$)	9
Z_i	Vapor weight fraction of component, lb/lb	$Z_i = y_i * M_i/ M_V$	14
L_i	Annual Emission Rate of component, lb/yr	$L_i = Z_i * L_T$	15

Notes:
1). Calculated per API Manual of Petroleum Measurement Standards Chapter 19.4 - Recommended Practice for Speciation of Evaporative Losses, Second Edition, September 2005.

Enbridge Energy, Limited Partnership - Flanagan Terminal
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Table 2-8: Storage Tank GHG Emissions

Tank Number	Product	PTE Throughput (bbl/yr)	PTE Throughput (MMbbl/yr)	CH_4 Emissions[1] (metric tons)	CH_4 Emissions (tons)	CO_2e[2] (ton)
GT-70	Crude Oil	13,411,888.35	13.41	1.34	1.48	31.05
GT-71	Crude Oil	24,253,164.77	24.25	2.43	2.67	56.14
GT-72	Crude Oil	24,253,164.77	24.25	2.43	2.67	56.14
GT-73	Crude Oil	24,253,164.77	24.25	2.43	2.67	56.14
GT-74	Crude Oil	24,253,164.77	24.25	2.43	2.67	56.14
GT-75	Crude Oil	24,253,164.77	24.25	2.43	2.67	56.14
GT-76	Crude Oil	44,147,465.82	44.15	4.41	4.87	102.19
GT-77	Crude Oil	44,147,465.82	44.15	4.41	4.87	102.19
GT-78	Crude Oil	24,253,164.77	24.25	2.43	2.67	56.14
GT-79	Crude Oil	43,831,057.02	43.83	4.38	4.83	101.46
GT-80	Crude Oil	26,823,776.70	26.82	2.68	2.96	62.09
GT-1601	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1602	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1603	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1604	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1605	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1606	DEMOLISHED					
GT-1607	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1608	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1609	Crude Oil	11,176,573.63	11.18	1.12	1.23	25.87
GT-1610	Crude Oil	59,091,103.59	59.09	5.91	6.51	136.79
GT-1611	Crude Oil	40,235,665.05	40.24	4.02	4.44	93.14
				Total GHG Emissions:	**55.85**	**1,172.75**

Notes:
1. Methane emission calculation and emission factor obtained from 40 CFR 98 Subpart Y, equation Y-22 for crude oil storage tanks.
2. Global Warming Potential (CO_2e) factor obtained from 40 CFR 98 Subpart A Table A-1.
Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Enbridge Energy, Limited Partnership - Flanagan Termina
2013 Enhancement Project
Table 2-9: New Diesel Engine Emissions

Engine horsepower[1]:	266
Fuel consumption[1], gal/hr	12.8
Fuel consumption, lb/hr	90.88
Diesel fuel heat content[2], Btu/lb:	19,300
Density[3], lb/gal:	7.10
Fuel Consumption Rate, mmBtu/hr	1.75
Hours of operation[8]:	500

Pollutant Category	Pollutant	Emission Factor (grams/hP-hour)[4]	Emission Factor (lb/mmBtu)[5]	Emission Factor (lb/hr)	Emissions (ton/year)[6]
Criteria Pollutants	NOx	3.69	4.41	2.16	0.5410
	SO_2	0.17	0.29	0.10	0.0249
	CO	2.00	0.95	1.17	0.2932
	VOC	0.35	0.35	0.21	0.0513
	PM	0.07	0.31	0.04	0.0103
	PM10	0.07	0.31	0.04	0.0103
	PM2.5	0.07	0.31	0.04	0.0103
	PM Condensible	0.07	0.31	0.04	0.0103
	CO_2	--	160.93	282.27	70.5672
	CH_4	--	0.0066	0.0116	0.0029
	N_2O	--	0.00132	0.00232	0.0006
	Total CO_2e	--	--	--	70.5706
HAPS	Benzene	--	9.33E-04	1.64E-03	0.000409
	Toluene	--	4.09E-04	7.17E-04	0.000179
	Xylenes	--	2.85E-04	5.00E-04	0.000125
	Propylene	--	2.58E-03	4.53E-03	0.001131
	1,3 Butadiene	--	3.91E-05	6.86E-05	0.000017
	Formaldehyde	--	1.18E-03	2.07E-03	0.000517
	Acetaldehyde	--	7.67E-04	1.35E-03	0.000336
	Acrolein	--	9.25E-05	1.62E-04	0.000041
	Naphthalene	--	8.48E-05	1.49E-04	0.000037
	Acenapthylene	--	5.06E-06	8.88E-06	0.000002
	Acenapthene	--	1.42E-06	2.49E-06	0.000001
	Fluorene	--	2.92E-05	5.12E-05	0.000013
	Phenanthrene	--	2.94E-05	5.16E-05	0.000013
	Anthracene	--	1.87E-06	3.28E-06	0.000001
	Fluoranthene	--	7.61E-06	1.33E-05	0.000003
	Pyrene	--	4.78E-06	8.38E-06	0.000002
	Benzo(a)anthracene	--	1.68E-06	2.95E-06	0.000001
	Chrysene	--	3.53E-07	6.19E-07	0.000000
	Benzo(b)fluoranthene	--	9.91E-08	1.74E-07	0.000000
	Benzo(k)fluoranthene	--	1.55E-07	2.72E-07	0.000000
	Benzo(a)pyrene	--	1.88E-07	3.30E-07	0.000000
	Inden(1,2,3-cd)pyrene	--	3.75E-07	6.58E-07	0.000000
	Dibenz(a,h)anthracene	--	5.83E-07	1.02E-06	0.000000
	Benzo(g,h,l)perylene	--	4.89E-07	8.58E-07	0.000000
	Total HAPS	--	--	--	0.002830

Notes:
(1) Information from Exhaust Emissions Data Sheet, Cummins Model QSB7-G5 NR3, 60 Hz.
(2) HHV of fuel and lb/mmBtu emission factors from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3.

(3) Density of fuel is from AP -42 Table 7.1-2. Properties Of Selected Petroleum Liquids.

(4) Gram/hP-hour emission factors obtained from Exhaust Emission Data Sheet for engine model QSB7-G3 NR3. VOC emission factor is based on emission factor for "total unburned hydrocarbons". PM10, PM2.5, and condensable PM is assumed to be equal to total PM.
(5) Emission factors for GHGs are from The Climate Registry General Reporting Protocol Version 1.1 (2008), Tables 12.1 & 12.9. Emission factors for HAPS from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3 Table 3.3-2
(6) $CO_2e = CO_2 + 21 \times CH_4 + 310 \times N_2O$

Enbridge Energy, Limited Partnership - Flanagan Terminal
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Table 2-10: Existing Griffith Emergency Generator

			Engine horsepower[1]:	207
			Hours of operation:	500
Pollutant Category	**Pollutant**	**Emission Factor (lb/mmBtu)[2,3]**	**Emission Factor (lb/hp-hr)[2]**	**Emissions (ton/year)[4]**
Criteria Pollutants	NOx	--	0.03100	1.6043
	SO_2	--	0.00205	0.1061
	CO	--	0.00668	0.3457
	VOC	--	0.00247	0.1278
	PM	--	0.00220	0.1139
	PM10	--	0.00220	0.1139
	PM2.5	--	0.00220	0.1139
	PM Condensible	--	0.00220	0.1139
	CO_2	160.93	1.126510	58.2969
	CH_4	0.0066	0.000046	0.0024
	N_2O	0.00132	0.000009	0.0005
	Total CO_2e	--	--	58.2998
HAPS	Benzene	9.33E-04	6.53E-06	0.000338
	Toluene	4.09E-04	2.86E-06	0.000148
	Xylenes	2.85E-04	2.00E-06	0.000103
	Propylene	2.58E-03	1.81E-05	0.000935
	1,3 Butadiene	3.91E-05	2.74E-07	0.000014
	Formaldehyde	1.18E-03	8.26E-06	0.000427
	Acetaldehyde	7.67E-04	5.37E-06	0.000278
	Acrolein	9.25E-05	6.48E-07	0.000034
	Naphthalene	8.48E-05	5.94E-07	0.000031
	Acenapthylene	5.06E-06	3.54E-08	0.000002
	Acenapthene	1.42E-06	9.94E-09	0.000001
	Fluorene	2.92E-05	2.04E-07	0.000011
	Phenanthrene	2.94E-05	2.06E-07	0.000011
	Anthracene	1.87E-06	1.31E-08	0.000001
	Fluoranthene	7.61E-06	5.33E-08	0.000003
	Pyrene	4.78E-06	3.35E-08	0.000002
	Benzo(a)anthracene	1.68E-06	1.18E-08	0.000001
	Chrysene	3.53E-07	2.47E-09	0.000000
	Benzo(b)fluoranthene	9.91E-08	6.94E-10	0.000000
	Benzo(k)fluoranthene	1.55E-07	1.09E-09	0.000000
	Benzo(a)pyrene	1.88E-07	1.32E-09	0.000000
	Inden(1,2,3-cd)pyrene	3.75E-07	2.63E-09	0.000000
	Dibenz(a,h)anthracene	5.83E-07	4.08E-09	0.000000
	Benzo(g,h,l)perylene	4.89E-07	3.42E-09	0.000000
	Total HAPS	--	--	0.002338

Notes:
(1) Information from engine nameplate.
(2) Emission factors and conversion factor from lb/mmbtu to lb/hp-hr (7000 btu/hp-hr) from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3, Table 3.3-1.
(3) Emission factors for GHGs are from The Climate Registry General Reporting Protocol Version 1.1 (2008), Tables 12.1 & 12.9.
Emission factors for HAPS from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3 Table 3.3-2.
(4) $CO_2e = CO_2 + 21 \times CH_4 + 310 \times N_2O$

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Table 2-11: Existing Griffith Fire Pump

			Engine horsepower[1]:	175
			Hours of operation:	500
Pollutant Category	**Pollutant**	**Emission Factor (lb/mmBtu)[2,3]**	**Emission Factor (lb/hp-hr)[2]**	**Emissions (ton/year)[4]**
Criteria Pollutants	NOx		0.031000	1.3563
	SO_2		0.002050	0.0897
	CO		0.006680	0.2923
	VOC		0.002470	0.1081
	PM		0.002200	0.0963
	PM10		0.002200	0.0963
	PM2.5		0.002200	0.0963
	PM Condensible		0.002200	0.0963
	CO_2	160.93	1.126510	49.2848
	CH_4	0.0066	0.000046	0.0020
	N_2O	0.00132	0.000009	0.0004
	Total CO_2e	--	--	49.2872
HAPS	Benzene	9.33E-04	6.53E-06	0.000286
	Toluene	4.09E-04	2.86E-06	0.000125
	Xylenes	2.85E-04	2.00E-06	0.000087
	Propylene	2.58E-03	1.81E-05	0.000790
	1,3 Butadiene	3.91E-05	2.74E-07	0.000012
	Formaldehyde	1.18E-03	8.26E-06	0.000361
	Acetaldehyde	7.67E-04	5.37E-06	0.000235
	Acrolein	9.25E-05	6.48E-07	0.000028
	Naphthalene	8.48E-05	5.94E-07	0.000026
	Acenapthylene	5.06E-06	3.54E-08	0.000002
	Acenapthene	1.42E-06	9.94E-09	0.000000
	Fluorene	2.92E-05	2.04E-07	0.000009
	Phenanthrene	2.94E-05	2.06E-07	0.000009
	Anthracene	1.87E-06	1.31E-08	0.000001
	Fluoranthene	7.61E-06	5.33E-08	0.000002
	Pyrene	4.78E-06	3.35E-08	0.000001
	Benzo(a)anthracene	1.68E-06	1.18E-08	0.000001
	Chrysene	3.53E-07	2.47E-09	0.000000
	Benzo(b)fluoranthene	9.91E-08	6.94E-10	0.000000
	Benzo(k)fluoranthene	1.55E-07	1.09E-09	0.000000
	Benzo(a)pyrene	1.88E-07	1.32E-09	0.000000
	Inden(1,2,3-cd)pyrene	3.75E-07	2.63E-09	0.000000
	Dibenz(a,h)anthracene	5.83E-07	4.08E-09	0.000000
	Benzo(g,h,l)perylene	4.89E-07	3.42E-09	0.000000
	Total HAPS	--	--	0.001976

Notes:
(1) Information from Enbrigde US RICE inventory.
(2) Emission factors and conversion factor from lb/mmbtu to lb/hp-hr (7000 btu/hp-hr) from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3, Table 3.3-1.
(3) Emission factors for GHGs are from The Climate Registry General Reporting Protocol Version 1.1 (2008), Tables 12.1 & 12.9.
Emission factors for HAPS from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3 Table 3.3-2.
(4) $CO_2e = CO_2 + 21 \times CH_4 + 310 \times N_2O$

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Table 2-12: Existing Hartsdale Emergency Generator

Pollutant Category	Pollutant	Emission Factor (lb/mmBtu)(2,3)	Emission Factor (lb/hp-hr)(2)	Emissions (ton/year)(4)
		Engine horsepower(1):		207
		Hours of operation:		500
Criteria Pollutants	NOx	--	0.031000	1.6043
	SO_2	--	0.002050	0.1061
	CO	--	0.006680	0.3457
	VOC	--	0.002470	0.1278
	PM	--	0.002200	0.1139
	PM10	--	0.002200	0.1139
	PM2.5	--	0.002200	0.1139
	PM Condensible	--	0.002200	0.1139
	CO_2	160.93	1.126510	58.2969
	CH_4	0.0066	0.000046	0.0024
	N_2O	0.00132	0.000009	0.0005
	Total CO_2e	--	--	58.2998
HAPS	Benzene	9.33E-04	6.53E-06	0.000338
	Toluene	4.09E-04	2.86E-06	0.000148
	Xylenes	2.85E-04	2.00E-06	0.000103
	Propylene	2.58E-03	1.81E-05	0.000935
	1,3 Butadiene	3.91E-05	2.74E-07	0.000014
	Formaldehyde	1.18E-03	8.26E-06	0.000427
	Acetaldehyde	7.67E-04	5.37E-06	0.000278
	Acrolein	9.25E-05	6.48E-07	0.000034
	Naphthalene	8.48E-05	5.94E-07	0.000031
	Acenapthylene	5.06E-06	3.54E-08	0.000002
	Acenapthene	1.42E-06	9.94E-09	0.000001
	Fluorene	2.92E-05	2.04E-07	0.000011
	Phenanthrene	2.94E-05	2.06E-07	0.000011
	Anthracene	1.87E-06	1.31E-08	0.000001
	Fluoranthene	7.61E-06	5.33E-08	0.000003
	Pyrene	4.78E-06	3.35E-08	0.000002
	Benzo(a)anthracene	1.68E-06	1.18E-08	0.000001
	Chrysene	3.53E-07	2.47E-09	0.000000
	Benzo(b)fluoranthene	9.91E-08	6.94E-10	0.000000
	Benzo(k)fluoranthene	1.55E-07	1.09E-09	0.000000
	Benzo(a)pyrene	1.88E-07	1.32E-09	0.000000
	Inden(1,2,3-cd)pyrene	3.75E-07	2.63E-09	0.000000
	Dibenz(a,h)anthracene	5.83E-07	4.08E-09	0.000000
	Benzo(g,h,l)perylene	4.89E-07	3.42E-09	0.000000
	Total HAPS	--	--	0.002338

Notes:
(1) Information from engine nameplate.
(2) Emission factors and conversion factor from lb/mmbtu to lb/hp-hr (7000 btu/hp-hr) from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3, Table 3.3-1.
(3) Emission factors for GHGs are from The Climate Registry General Reporting Protocol Version 1.1 (2008), Tables 12.1 & 12.9.
Emission factors for HAPS from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3 Table 3.3-2.
(4) $CO_2e = CO_2 + 21 \times CH_4 + 310 \times N_2O$

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Table 2-13: Existing Hartsdale Fire Pump

Engine horsepower(1):	300
Fuel consumption(1), gal/hr	17.1
Fuel consumption, lb/hr	121.2
Diesel fuel heat content(2), Btu/lb:	19,300
Density(3), lb/gal:	7.10
Fuel Consumption Rate, mmBtu/hr	2.34
Hours of operation:	500

Pollutant Category	Pollutant	Emission Factor (lb/mmBtu)(2,4)	Emission Factor (lb/hr)	Emissions (ton/year)(5)
Criteria Pollutants	NOx	4.41	10.32	2.5789
	SO_2	0.29	0.68	0.1696
	CO	0.95	2.22	0.5556
	VOC	0.35	0.82	0.2047
	PM	0.31	0.73	0.1813
	PM10	0.31	0.73	0.1813
	PM2.5	0.31	0.73	0.1813
	PM Condensible	0.31	0.73	0.1813
	CO_2	160.93	376.44	94.1103
	CH_4	0.0066	0.0154	0.0039
	N_2O	0.00132	0.00309	0.0008
	Total CO_2e	--	--	94.1149
HAPS	Benzene	9.33E-04	2.18E-03	0.000546
	Toluene	4.09E-04	9.57E-04	0.000239
	Xylenes	2.85E-04	6.67E-04	0.000167
	Propylene	2.58E-03	6.04E-03	0.001509
	1,3 Butadiene	3.91E-05	9.15E-05	0.000023
	Formaldehyde	1.18E-03	2.76E-03	0.000690
	Acetaldehyde	7.67E-04	1.79E-03	0.000449
	Acrolein	9.25E-05	2.16E-04	0.000054
	Naphthalene	8.48E-05	1.98E-04	0.000050
	Acenapthylene	5.06E-06	1.18E-05	0.000003
	Acenapthene	1.42E-06	3.32E-06	0.000001
	Fluorene	2.92E-05	6.83E-05	0.000017
	Phenanthrene	2.94E-05	6.88E-05	0.000017
	Anthracene	1.87E-06	4.37E-06	0.000001
	Fluoranthene	7.61E-06	1.78E-05	0.000004
	Pyrene	4.78E-06	1.12E-05	0.000003
	Benzo(a)anthracene	1.68E-06	3.93E-06	0.000001
	Chrysene	3.53E-07	8.26E-07	0.000000
	Benzo(b)fluoranthene	9.91E-08	2.32E-07	0.000000
	Benzo(k)fluoranthene	1.55E-07	3.63E-07	0.000000
	Benzo(a)pyrene	1.88E-07	4.40E-07	0.000000
	Inden(1,2,3-cd)pyrene	3.75E-07	8.77E-07	0.000000
	Dibenz(a,h)anthracene	5.83E-07	1.36E-06	0.000000
	Benzo(g,h,l)perylene	4.89E-07	1.14E-06	0.000000
	Total HAPS	--	--	0.003774

Notes:
(1) Information from Engine Specification Data sheet for John Deere model 6081HF001, 50 Hz
(2) HHV of fuel and lb/mmbtu emission factors from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3.
(3) Density of fuel is from AP -42 Table 7.1-2. Properties Of Selected Petroleum Liquids
(4) Emission factors for GHGs are from The Climate Registry General Reporting Protocol Version 1.1 (2008), Tables 12.1 & 12.9.
Emission factors for HAPS from AP-42 fifth edition Chapter 3: Stationary Internal Combustion Sources Section 3.3 Table 3.3-2.
(5) $CO_2e = CO_2 + 21 \times CH_4 + 310 \times N_2O$

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Unpaved Road Emissions

1. Emission Factors: AP-42

According to AP-42, Chapter 13.2.2 - Unpaved Roads (11/06), the PM/PM10 emission factors for unpaved roads can be estimated from the following equation:

$$E = k \times (s/12)^a \times (w/3)^b \times ((365 - p)/365)$$

where:

E = emission factor (lb/vehicle mile traveled)
s = surface material silt content (%) = 6.4 % (AP-42, Table 13.2.2-1)
w = mean vehicle weight (tons) = 4.9 tons
k = empirical constant = 4.9 for PM and 1.5 for PM10 and 0.15 for PM2.5
a = empirical constant = 0.7 for PM and 0.9 for PM10 and 0.9 for PM2.5
b = empirical constant = 0.45 for PM and PM10 and PM2.5
p = number of days per year with 0.01 inches precipitation 120

PM Emission Factor = **2.64** lbs/mile
PM10 Emission Factor = **0.71** lbs/mile
PM2.5 Emission Factor= **0.07** lbs/mile

Length of Unpaved Roads in One Direction[2] = **0.5** miles

2. Potential to Emit (PTE) of PM/PM10 Before Control from Unpaved Roads:

Vehicle Type	Trucks per day[1]	Average Vehicle Weight[3]	Total Trip Number[1]	Traffic Component	Vehicle Mile Traveled (VMT)	PTE of PM	PTE of PM10	PTE of PM2.5	Contribution to Mean Vehicle Weight
		(tons)	(trips/yr)	(%)	(miles/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons)
Private vehicle	30	4	10,950	97.1%	10,950	14.44	3.90	0.39	3.88
Roll-Off Container	ee column	16	33	0.3%	33	0.04	0.01	0.00	0.05
Quad Dump Truck	ee column	36.5	100	0.9%	100	0.13	0.04	0.00	0.32
Lead Dump Truck	ee column	36.5	20	0.2%	20	0.03	0.01	0.00	0.06
Front End Loader	ee column	36.5	8	0.1%	8	0.01	0.00	0.00	0.03
Transfer Trailer	see column	36.5	167	1.5%	167	0.22	0.06	0.01	0.54
Total	**30**		**11,278**	**100%**	**11,278**	**14.9**	**4.0**	**0.40**	**4.89**

<= mean vehicle weight (tons)

Methodology

Average Vehicle Weight (ton) = (Weight of Unloaded Vehicles + Weight of Loaded Vehicles) / 2
Total Trip Number (trips/yr) = Trucks per day x 365 (days/yr)
VMT(miles/yr) = Length of Unpaved Roads in One Direction (miles) x 2 x Total Trip Numbers (trips/yr)
PTE (tons/yr) = VMT (miles/yr) x Emission Factors (lbs/mile) x 1 tons/ 2000 lbs

Notes:

(1) Number of vehicles per day/year per Marc Curry, Terminal Supervisor on June 28, 2012.
(2) Conservative assumption of round-trip distance on unpaved roads.
(3) Conservative assumption of vehicle weights. For private vehicles, assumes typical weight of a heavy duty truck plus 25% to account for hauled equipment, material, etc.

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Paved Road Emissions

1. Emission Factors: AP-42

AP-42, Chapter 13.2.1 - Paved Roads (1/11), the PM/PM10 emission factors for paved roads can be estimated from the following equation:

$$E = (k \times (sL)^{0.91} \times (w)^{1.02}) \times (1 - p/(4 \times 365))$$

where:

E = emission factor (lb/vehicle mile traveled)
sL = road surface silt loading (g/m^2) = 7.4 (g/m^2)
w = mean vehicle weight (tons) = 3.4 tons
k = empirical constant = 0.011 for PM; 0.0022 for PM10; 0.00054 for PM2.5
p = number of days per year with 0.01 inches precipitation 120

PM Emission Factor = **0.22** lbs/mile
PM10 Emission Factor = **0.04** lbs/mile
PM2.5 Emission Factor= **0.01** lbs/mile

Length of Unpaved Roads in One Direction (2) = **0.6** miles

2. Potential to Emit (PTE) of PM/PM10 Before Control from Paved Roads:

Vehicle Type	Trucks per day(1)	Average Vehicle Weight(3)	Total Trip Number(1)	Traffic Component	Vehicle Mile Traveled (VMT)	PTE of PM	PTE of PM10	PTE of PM2.5	Contribution to Mean Vehicle Weight
		(tons)	(trips/yr)	(%)	(miles/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons)
Private vehicle	200	3.2	73,000	99.2%	87,600	9.66	1.93	0.474	3.17
Roll-Off Container	see column E	16	67	0.1%	80	0.01	0.00	0.000	0.01
Quad Dump Truck	see column E	36.5	100	0.1%	120	0.01	0.00	0.001	0.05
Lead Dump Truck	see column E	36.5	20	0.0%	24	0.00	0.00	0.000	0.01
Front End Loader	see column E	36.5	17	0.0%	20	0.00	0.00	0.000	0.01
Garbage Truck	see column E	36.5	50	0.1%	60	0.01	0.00	0.000	0.02
Transfer Trailer	see column E	36.5	333	0.5%	400	0.04	0.01	0.002	0.17
Total	**200**		**73587**	**100%**	**88304**	**9.7**	**1.9**	**0.5**	**3.45** <= mean vehicle weight (tons)

Methodology

Average Vehicle Weight (ton) = (Weight of Unloaded Vehicles + Weight of Loaded Vehicles) / 2
Total Trip Number (trips/yr) = Trucks per day x 365 (days/yr)
VMT(miles/yr) = Length of Paved Roads in One Direction (miles) x 2 x Total Trip Numbers (trips/yr)
PTE of PM/PM10 (tons/yr) = VMT (miles/yr) x Emission Factors (lbs/mile) x 1 tons/ 2000 lbs

Notes:

(1) Number of vehicles per day/year per Marc Curry, Terminal Supervisor on June 28, 2012.
(2) Approximate distance from West Main Street to Terminal Operations building.
(3) Conservative assumption of vehicle weights. For private vehicles, assumes typical weight of a heavy duty truck.

a. Roll Off Containers: 100, 1/3 unpaved
b. Quad Dump Trucks: 100 paved, 100 unpaved
c. Lead Dump Trucks: 20 paved, 200 un
d. Front End Loaders: 25, 1/3 un
e. Garbage Trucks: 50
f. Tractor Truck and Trailer: 500, 1/3 unpaved

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Storage Tank Properties

This Table is an Output Data Table used by the Source to calcualte tank emissions. They have submitted TANKS 4.09 data to confirm the results of this input.

	1	2	3	4	5	6	7	8	9	10
NSPS	**Tank Number**	**Tank Type**	**Tank Type**	**Working Volume (bbl)**	**Tank Diameter (ft)**	**Working Volume (gal)**	**Shell Color/Shade**	**Shell Condition**	**Internal Shell Condition**	**Shell Color/Shade + Internal Shell Condition Lookup**
Grandfathered	GT-70	External Floating Roof Tank	EFRT	120,000	134	5,040,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-71	External Floating Roof Tank	EFRT	217,000	180	9,114,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-72	External Floating Roof Tank	EFRT	217,000	180	9,114,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-73	External Floating Roof Tank	EFRT	217,000	180	9,114,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-74	External Floating Roof Tank	EFRT	217,000	180	9,114,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-75	External Floating Roof Tank	EFRT	217,000	180	9,114,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-76	External Floating Roof Tank	EFRT	395,000	210	16,590,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-77	External Floating Roof Tank	EFRT	395,000	210	16,590,000	White/White	Light Rust	Good	White/White, Good
Ka	GT-78	External Floating Roof Tank	EFRT	217,000	180	9,114,000	White/White	Light Rust	Good	White/White, Good
Kb	GT-79	External Floating Roof Tank	EFRT	392,169	224	16,471,098	White/White	Light Rust	Good	White/White, Good
Kb	GT-80	External Floating Roof Tank	EFRT	240,000	180	10,080,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1601	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1602	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1603	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1604	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1605	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1606	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1607	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1608	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Grandfathered	GT-1609	External Floating Roof Tank	EFRT	100,000	134	4,200,000	White/White	Light Rust	Good	White/White, Good
Kb	GT-1610	External Floating Roof Tank	EFRT	528,705	270	22,205,610	White/White	Light Rust	Good	White/White, Good
Kb	GT-1611	External Floating Roof Tank	EFRT	360,000	223	15,120,000	White/White	Light Rust	Good	White/White, Good

11 Roof Color	12 Roof Condition	13 Roof Type	14 Tank Construction	15 Primary Rim Seal	16 Secondary Rim Seal	17 Rim Seal Lookup	18 Deck Construction	19 Deck Construction	20 Deak Seam Construction	21 Deck Seam Construction Lookup	22 Roof Fitting Category
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Double Deck	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail
		Pontoon	Welded	Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	Welded				Detail

23	F_F 2-6 24	25	26	27	28	29	30	31	32	33	34
Self Supporting Roof	**Total Deck Fitting Loss Factor (lb-mole/yr)**			**Tank Height/Length (ft)**	**Maximum Liquid Height (ft)**	**Cone or Dome Roof [Cone/Dome]**	**Is Temperature Controlled and Recorded? (Chilled,Heated,Ambient)**	**If Chilled or Heated, Average Liquid Surface Temperature (R)**	**Breather Vent Pressure Setting (psi) (default 0.03)**	**Breather Vent Vacuum Setting (psi) (default - 0.03)**	**Number of fixed roof support columns (Calculate using Formula 2-4 Note 2 if not known)**
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No	-	-	-				Ambient				
No							Ambient				
No							Ambient				

35	36	37	38
Effective column diameter (ft) (Note: Assumes default 1.0, see Formula 2-4 Note 3)	**Tank Roof Height (ft)**	**Tank Cone Roof Slope (ft/ft) (default 0.0625)**	nk Floor Configurat
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Drain Dry
			Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Non Drain Dry
			Drain Dry
			Drain Dry

Deck Fitting Loss Factor (lb-mole/yr)	K_{Fa}
Deck Fitting Loss Factor (lb-mole/yr)	K_{Fb}
Deck Fitting Loss Factor	**m**

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project

These Tables are Output Data Tables used by the Source to calcualte tank emissions. They have submitted TANKS 4.09 data to

Tank Types

Horizontal Fixed Roof Tank	HFRT
Vertical Fixed Roof Tank	VFRT
Internal Floating Roof Tank	IFRT
External Floating Roof Tank	EFRT
Domed External Floating Roof Tank	DEFRT

Table 7.1-6 Paint Solar Absorptance for Fixed Roof Tanks

Paint Color	Paint Shade	Paint Condition	VLOOKUP Parameter	Paint Factors (alpha)	Average Annual Stock Storage Temperature Factor	From AP-42, Formula 2-3, Note 3
Aluminum	Specular	Good	Aluminum/Specular, Good	0.39	2.5	
Aluminum	Diffuse	Good	Aluminum/Diffuse, Good	0.60	2.5	
Gray	Light	Good	Gray/Light, Good	0.54	3.5	
Gray	Medium	Good	Gray/Medium, Good	0.68	3.5	
Red	Primer	Good	Red/Primer, Good	0.89	5.0	Assumed Black
White	White	Good	White/White, Good	0.17	-	
Aluminum	Specular	Poor	Aluminum/Specular, Poor	0.49	2.5	
Aluminum	Diffuse	Poor	Aluminum/Diffuse, Poor	0.68	2.5	
Gray	Light	Poor	Gray/Light, Poor	0.63	3.5	
Gray	Medium	Poor	Gray/Medium, Poor	0.74	3.5	
Red	Primer	Poor	Red/Primer, Poor	0.91	5.0	Assumed Black
White	White	Poor	White/White, Poor	0.34	-	

Data Source: AP-42, Table 7.1-6, September 1997

Table 7.1-8 Rim-Seal Loss Factors for Floating Roof Tanks

Primary Seal	Secondary Seal	VLOOKUP Parameter	K_{RA} (lb-mole/ft-yr)	K_{RB} (lb-mole/(mph)^n-ft-yr)	n (dimensionless)
Welded Tanks					
Mechanical Shoe	None	Welded, Mechanical Shoe, None	5.8	0.3	2.1
Mechanical Shoe	Shoe-mounted	Welded, Mechanical Shoe, Shoe-mounted	1.6	0.3	1.6
Liquid-mounted	None	Welded, Liquid-mounted, None	1.6	0.3	1.5
Mechanical Shoe	Rim-mounted	Welded, Mechanical Shoe, Rim-mounted	0.6	0.4	1.0
Liquid-mounted	Weather Shield	Welded, Liquid-mounted, Weather Shield	0.7	0.3	1.2
Liquid-mounted	Rim-mounted	Welded, Liquid-mounted, Rim-mounted	0.3	0.6	0.3
Vapor-mounted	None	Welded, Vapor-mounted, None	6.7	0.2	3.0
Vapor-mounted	Weather Shield	Welded, Vapor-mounted, Weather Shield	3.3	0.1	3.0
Vapor-mounted	Rim-mounted	Welded, Vapor-mounted, Rim-mounted	2.2	0.003	4.3
Riveted Tanks					
Mechanical Shoe	None	Riveted, Mechanical Shoe, None	10.8	0.4	2
Mechanical Shoe	Shoe-mounted	Riveted, Mechanical Shoe, Shoe-mounted	9.2	0.2	1.9
Mechanical Shoe	Rim-mounted	Riveted, Mechanical Shoe, Rim-mounted	1.1	0.3	1.5

Data Source: From TANKS, also AP-42, Table 7.1-8 Rim-Seal Loss Factors for Floating Roof Tanks, September 1997

Table 7.1-10 Average Clingage Factors

Product Stored, Shell Condition	Clingage Factor
Gasoline, Light Rust	0.0015
Single-Component Stocks, Light Rust	0.0015
Crude, Light Rust	0.0060
Gasoline, Dense Rust	0.0075
Single-Component Stocks, Dense Rust	0.0075
Crude, Dense Rust	0.030
Gasoline, Gunite Lining	0.15
Single-Component Stocks, Gunite Lining	0.15
Crude, Gunite Lining	0.60

Data Source: AP-42, Table 7.1-10, Average Clingage Factors, September 1997

Table 7.1-11, IFR Tank Typical Support Column Numbers

Tank Diameter Range D, (ft)	Lookup Value	Typical Number of Columns, N_C
0 < D <= 85	0	1
85 < D <= 100	85.01	6
100 < D <= 120	100.01	7
120 < D <= 135	120.01	8
135 < D <= 150	135.01	9
150 < D <= 170	150.01	16
170 < D <= 190	170.01	19
190 < D <= 220	190.01	22
220 < D <= 235	220.01	31
235 < D <= 270	235.01	37
270 < D <= 275	270.01	43
275 < D <= 290	275.01	49
290 < D <= 330	290.01	61
330 < D <= 360	330.01	71
360 < D <= 400	360.01	81

Data from AP-42, Table 7.1-11 Typical Number of Columns as a Function of Tank Diameter for IFRs with Columnsupported Roofs, September 1997

Table 7.1-16, Deck Seal Length Factors for IFRs

NAME	SD
Sheet, 5 Ft Wide	0.2
Sheet, 6 Ft Wide	0.17
Sheet, 7 Ft Wide	0.14
Panel, 5 x 7.5 Ft	0.33
Panel, 5 x 12 Ft	0.28

Data from AP-42, Table 7.1-16 Deck Seal Length Factors for IFRs, September 1997

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
Met data from US EPA TANKS 4.09d for Chicago, IL

These Tables are Output Data Tables used by the Source to calcualte tank emissions. They have submitted TANKS 4.09 data to confirm the results of this input.

		Monthly Average												
Property	**Symbol**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Annual**
Daily Maximum Ambient Temperature (F)	TAX	29	33.5	45.8	58.6	70.1	79.6	83.7	81.8	74.8	63.3	48.4	34	58.55
Daily Minimum Ambient Temperature (F)	TAN	12.9	17.2	28.5	38.6	47.7	57.5	62.6	61.6	53.9	42.2	31.6	19.1	39.45
Daily Total Solar Insolation Factor (Btu/ft2-day)	I	574.89	826.49	1102.83	1456.27	1803.36	1988.33	1938.52	1698.98	1331.90	948.64	575.53	461.31	1225.59
Average Wind Speed (mph)		11.7	11.5	11.9	12	10.5	9.3	8.4	8.2	8.9	10.1	11.2	11	10.39
Number of Days per Month (Days)		31	28	31	30	31	30	31	31	30	31	30	31	365
	Count	1	2	3	4	5	6	7	8	9	10	11	12	13
Daily Ambient Temperature Range (R)	DeltaTA	16.1	16.3	17.3	20	22.4	22.1	21.1	20.2	20.9	21.1	16.8	14.9	19.10
Daily Average Ambient Temperature (F)	TAA	20.95	25.35	37.15	48.6	58.9	68.55	73.15	71.7	64.35	52.75	40	26.55	49.00
Stock temperature at tank color, °F [3]														
White/White	T_S	20.95	25.35	37.15	48.60	58.90	68.55	73.15	71.70	64.35	52.75	40.00	26.55	
Aluminum/Specular	T_S	23.45	27.85	39.65	51.10	61.40	71.05	75.65	74.20	66.85	55.25	42.50	29.05	
Grey	T_S	24.45	28.85	40.65	52.10	62.40	72.05	76.65	75.20	67.85	56.25	43.50	30.05	
Red/Primer	T_S	25.15	29.55	41.35	52.80	63.10	72.75	77.35	75.90	68.55	56.95	44.20	30.75	
Black	T_S	25.95	30.35	42.15	53.60	63.90	73.55	78.15	76.70	69.35	57.75	45.00	31.55	

Table 16 - Average Annual Stock Storage Temperature, T_S, as a Function of Paint Color[1]

Tank Color	**Average Annual Stock**	
White/White	$T_a + 0$	0
Aluminum/Specul	$T_a + 2.5$	2.5
Grey	$T_a + 3.5$	3.5
Red/Primer	$T_a + 4.2$	4.2
Black	$T_a + 5.0$	5.0

Notes

1. From API Manual of Petroleum Measurement Standards Chapter 19, Section 2, Evaporative Loss from Floating-roof Tanks, second edition, September 2003, Table 16.

Facility Location

Chicago, Illinois

Annual Average Data for Chicago, Illinois	
Atmospheric Pressure (psia)	14.384
Daily Average Ambient Temperature (F)	49.00

Enbridge Energy, Limited Partnership - Flanagan Terminal
2013 Enhancement Project
TANKS Output

These Tables are Output Data Tables used by the Source to calcualte tank emissions. They have submitted TANKS 4.09 data to confirm the results of this input.

		S_LOSS	W_LOSS	RIM_LOSS	WD_LOSS	DECKF_LOSS	DECKS_LOSS	**Standing Loss[(1)] (lb VOC/yr)**	**Withdrawal Loss[(1)] (lb VOC/yr)**	**Total Emissions**	**Tanks Throughput (gal)**
GT-70	GT-70	-	-	1,238.37	4,020.74	2,477.83	-	3,716.21	4,020.74	7,736.95	563,299,311
GT-71	GT-71	-	-	1,663.49	5,412.74	2,111.47	-	3,774.96	5,412.74	9,187.70	1,018,632,920
GT-72	GT-72	-	-	1,663.49	5,412.74	3,629.92	-	5,293.41	5,412.74	10,706.15	1,018,632,920
GT-73	GT-73	-	-	1,663.49	5,412.74	2,092.19	-	3,755.67	5,412.74	9,168.41	1,018,632,920
GT-74	GT-74	-	-	1,663.49	5,412.74	867.04	-	2,530.53	5,412.74	7,943.27	1,018,632,920
GT-75	GT-75	-	-	1,663.49	5,412.74	867.04	-	2,530.53	5,412.74	7,943.27	1,018,632,920
GT-76	GT-76	-	-	1,940.73	8,445.16	2,368.93	-	4,309.66	8,445.16	12,754.82	1,854,193,564
GT-77	GT-77	-	-	1,940.73	8,445.16	2,368.93	-	4,309.66	8,445.16	12,754.82	1,854,193,564
GT-78	GT-78	-	-	1,663.49	5,412.74	894.33	-	2,557.82	5,412.74	7,970.56	1,018,632,920
GT-79	GT-79	-	-	2,070.12	7,860.59	1,360.83	-	3,430.94	7,860.59	11,291.53	1,840,904,394
GT-80	GT-80	-	-	1,663.49	5,986.44	1,052.10	-	2,715.58	5,986.44	8,702.03	1,126,598,622
GT-1601	GT-1601	-	-	1,238.37	3,350.62	471.20	-	1,709.57	3,350.62	5,060.19	469,416,092
GT-1602	GT-1602	-	-	1,238.37	3,350.62	471.20	-	1,709.57	3,350.62	5,060.19	469,416,092
GT-1603	GT-1603	-	-	1,238.37	3,350.62	842.42	-	2,080.80	3,350.62	5,431.42	469,416,092
GT-1604	GT-1604	-	-	1,238.37	3,350.62	471.20	-	1,709.57	3,350.62	5,060.19	469,416,092
GT-1605	GT-1605	-	-	1,238.37	3,350.62	471.20	-	1,709.57	3,350.62	5,060.19	469,416,092
GT-1606	GT-1606					DEMOLISHED					
GT-1607	GT-1607	-	-	1,238.37	3,350.62	476.83	-	1,715.20	3,350.62	5,065.82	469,416,092
GT-1608	GT-1608	-	-	1,238.37	3,350.62	471.20	-	1,709.57	3,350.62	5,060.19	469,416,092
GT-1609	GT-1609	-	-	1,238.37	3,350.62	471.20	-	1,709.57	3,350.62	5,060.19	469,416,092
GT-1610	GT-1610	-	-	2,495.23	8,791.84	1,400.70	-	3,895.93	8,791.84	12,687.77	2,481,826,350
GT-1611	GT-1611	-	-	2,060.87	7,248.16	1,180.12	-	3,241.00	7,248.16	10,489.15	1,689,897,931

PASTE BELOW

ID	MIX ID	PRIMARY	NAME	CAS	MONTH	TANK_TYPE	USER ID	CITY	STATE	COMPANY	DESC	MET CTYS	AMB_T
112	1	TRUE	Crude oil (RVP 8)		March	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
112	1	TRUE	Crude oil (RVP 8)		April	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
112	1	TRUE	Crude oil (RVP 8)		July	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15
112	1	TRUE	Crude oil (RVP 8)		August	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
112	1	TRUE	Crude oil (RVP 8)		January	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
112	1	TRUE	Crude oil (RVP 8)		February	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
112	1	TRUE	Crude oil (RVP 8)		May	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
112	1	TRUE	Crude oil (RVP 8)		June	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
112	1	TRUE	Crude oil (RVP 8)		September	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
112	1	TRUE	Crude oil (RVP 8)		October	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
112	1	TRUE	Crude oil (RVP 8)		November	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
112	1	TRUE	Crude oil (RVP 8)		December	External Floatin	GT-1601	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
113	1	TRUE	Crude oil (RVP 8)		January	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
113	1	TRUE	Crude oil (RVP 8)		February	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
113	1	TRUE	Crude oil (RVP 8)		May	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
113	1	TRUE	Crude oil (RVP 8)		June	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
113	1	TRUE	Crude oil (RVP 8)		September	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
113	1	TRUE	Crude oil (RVP 8)		October	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
113	1	TRUE	Crude oil (RVP 8)		March	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
113	1	TRUE	Crude oil (RVP 8)		April	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
113	1	TRUE	Crude oil (RVP 8)		July	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15
113	1	TRUE	Crude oil (RVP 8)		August	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
113	1	TRUE	Crude oil (RVP 8)		November	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
113	1	TRUE	Crude oil (RVP 8)		December	External Floatin	GT-1602	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
114	1	TRUE	Crude oil (RVP 8)		January	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
114	1	TRUE	Crude oil (RVP 8)		February	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
114	1	TRUE	Crude oil (RVP 8)		March	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
114	1	TRUE	Crude oil (RVP 8)		April	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
114	1	TRUE	Crude oil (RVP 8)		July	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15
114	1	TRUE	Crude oil (RVP 8)		August	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
114	1	TRUE	Crude oil (RVP 8)		November	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
114	1	TRUE	Crude oil (RVP 8)		December	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
114	1	TRUE	Crude oil (RVP 8)		May	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
114	1	TRUE	Crude oil (RVP 8)		June	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
114	1	TRUE	Crude oil (RVP 8)		September	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
114	1	TRUE	Crude oil (RVP 8)		October	External Floatin	GT-1603	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
115	1	TRUE	Crude oil (RVP 8)		March	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
115	1	TRUE	Crude oil (RVP 8)		April	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
115	1	TRUE	Crude oil (RVP 8)		January	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
115	1	TRUE	Crude oil (RVP 8)		February	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
115	1	TRUE	Crude oil (RVP 8)		May	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
115	1	TRUE	Crude oil (RVP 8)		June	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
115	1	TRUE	Crude oil (RVP 8)		September	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
115	1	TRUE	Crude oil (RVP 8)		October	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
115	1	TRUE	Crude oil (RVP 8)		July	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15
115	1	TRUE	Crude oil (RVP 8)		August	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
115	1	TRUE	Crude oil (RVP 8)		November	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
115	1	TRUE	Crude oil (RVP 8)		December	External Floatin	GT-1604	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
116	1	TRUE	Crude oil (RVP 8)		January	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
116	1	TRUE	Crude oil (RVP 8)		February	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
116	1	TRUE	Crude oil (RVP 8)		May	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
116	1	TRUE	Crude oil (RVP 8)		June	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
116	1	TRUE	Crude oil (RVP 8)		September	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
116	1	TRUE	Crude oil (RVP 8)		October	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
116	1	TRUE	Crude oil (RVP 8)		March	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
116	1	TRUE	Crude oil (RVP 8)		April	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
116	1	TRUE	Crude oil (RVP 8)		July	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15

116	1	TRUE	Crude oil (RVP 8)	August	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
116	1	TRUE	Crude oil (RVP 8)	November	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
116	1	TRUE	Crude oil (RVP 8)	December	External Floatin	GT-1605	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
117	1	TRUE	Crude oil (RVP 8)	March	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
117	1	TRUE	Crude oil (RVP 8)	April	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
117	1	TRUE	Crude oil (RVP 8)	July	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15
117	1	TRUE	Crude oil (RVP 8)	August	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
117	1	TRUE	Crude oil (RVP 8)	November	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
117	1	TRUE	Crude oil (RVP 8)	December	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
117	1	TRUE	Crude oil (RVP 8)	January	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
117	1	TRUE	Crude oil (RVP 8)	February	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
117	1	TRUE	Crude oil (RVP 8)	May	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
117	1	TRUE	Crude oil (RVP 8)	June	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
117	1	TRUE	Crude oil (RVP 8)	September	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
117	1	TRUE	Crude oil (RVP 8)	October	External Floatin	GT-1607	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
118	1	TRUE	Crude oil (RVP 8)	January	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
118	1	TRUE	Crude oil (RVP 8)	February	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
118	1	TRUE	Crude oil (RVP 8)	May	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
118	1	TRUE	Crude oil (RVP 8)	June	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
118	1	TRUE	Crude oil (RVP 8)	September	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
118	1	TRUE	Crude oil (RVP 8)	October	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
118	1	TRUE	Crude oil (RVP 8)	March	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
118	1	TRUE	Crude oil (RVP 8)	April	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
118	1	TRUE	Crude oil (RVP 8)	July	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15
118	1	TRUE	Crude oil (RVP 8)	August	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
118	1	TRUE	Crude oil (RVP 8)	November	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
118	1	TRUE	Crude oil (RVP 8)	December	External Floatin	GT-1608	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
119	1	TRUE	Crude oil (RVP 8)	January	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	20.95
119	1	TRUE	Crude oil (RVP 8)	February	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	25.35
119	1	TRUE	Crude oil (RVP 8)	May	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	58.9
119	1	TRUE	Crude oil (RVP 8)	June	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	68.55
119	1	TRUE	Crude oil (RVP 8)	March	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	37.15
119	1	TRUE	Crude oil (RVP 8)	April	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	48.6
119	1	TRUE	Crude oil (RVP 8)	July	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	73.15
119	1	TRUE	Crude oil (RVP 8)	August	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	71.7
119	1	TRUE	Crude oil (RVP 8)	November	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	40
119	1	TRUE	Crude oil (RVP 8)	December	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	26.55
119	1	TRUE	Crude oil (RVP 8)	September	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	64.35
119	1	TRUE	Crude oil (RVP 8)	October	External Floatin	GT-1609	Hartsdale	Indiana	Enbridge	Hartsdale T	Chicago, Ill	52.75
120	1	TRUE	Crude oil (RVP 8)	March	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	37.15
120	1	TRUE	Crude oil (RVP 8)	April	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	48.6
120	1	TRUE	Crude oil (RVP 8)	July	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	73.15
120	1	TRUE	Crude oil (RVP 8)	August	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	71.7
120	1	TRUE	Crude oil (RVP 8)	January	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	20.95
120	1	TRUE	Crude oil (RVP 8)	February	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	25.35
120	1	TRUE	Crude oil (RVP 8)	May	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	58.9
120	1	TRUE	Crude oil (RVP 8)	June	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	68.55
120	1	TRUE	Crude oil (RVP 8)	September	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	64.35
120	1	TRUE	Crude oil (RVP 8)	October	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	52.75
120	1	TRUE	Crude oil (RVP 8)	November	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	40
120	1	TRUE	Crude oil (RVP 8)	December	External Floatin	GT-1610	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	26.55
121	1	TRUE	Crude oil (RVP 8)	January	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	20.95
121	1	TRUE	Crude oil (RVP 8)	February	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	25.35
121	1	TRUE	Crude oil (RVP 8)	May	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	58.9
121	1	TRUE	Crude oil (RVP 8)	June	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	68.55
121	1	TRUE	Crude oil (RVP 8)	September	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	64.35
121	1	TRUE	Crude oil (RVP 8)	October	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	52.75
121	1	TRUE	Crude oil (RVP 8)	March	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	37.15
121	1	TRUE	Crude oil (RVP 8)	April	External Floatin	GT-1611	Hartsdale	Indiana	Enbridge	New Tank	Chicago, Ill	48.6

121	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-1611	Hartsdale	Indiana	Enbridge	New Tank Chicago, Ill	73.15
121	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-1611	Hartsdale	Indiana	Enbridge	New Tank Chicago, Ill	71.7
121	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-1611	Hartsdale	Indiana	Enbridge	New Tank Chicago, Ill	40
121	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-1611	Hartsdale	Indiana	Enbridge	New Tank Chicago, Ill	26.55
122	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
122	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
122	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
122	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
122	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
122	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
122	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
122	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
122	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
122	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
122	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
122	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-70	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
123	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
123	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
123	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
123	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
123	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
123	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
123	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
123	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
123	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
123	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
123	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
123	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-71	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
124	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
124	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
124	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
124	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
124	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
124	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
124	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
124	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
124	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
124	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
124	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
124	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-72	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
125	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	37.15
125	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	48.6
125	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	73.15
125	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	71.7
125	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	40
125	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	26.55
125	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	20.95
125	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	25.35
125	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	58.9
125	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	68.55
125	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	64.35
125	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-73	Griffith	Indiana	Hartsdale	Griffith Tan Chicago, Ill	52.75
126	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
126	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
126	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
126	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
126	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
126	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
126	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15

126	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
126	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
126	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
126	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
126	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-74	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
128	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
128	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
128	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
128	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
128	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
128	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
128	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
128	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
128	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
128	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
128	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
128	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-75	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
129	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
129	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
129	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
129	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
129	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
129	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
129	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
129	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
129	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
129	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
129	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
129	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-76	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
130	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
130	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
130	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
130	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
130	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
130	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
130	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
130	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
130	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
130	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
130	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
130	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-77	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
131	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
131	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
131	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
131	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
131	1	TRUE	Crude oil (RVP 8)	July	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
131	1	TRUE	Crude oil (RVP 8)	August	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
131	1	TRUE	Crude oil (RVP 8)	November	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
131	1	TRUE	Crude oil (RVP 8)	December	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
131	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
131	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
131	1	TRUE	Crude oil (RVP 8)	September	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
131	1	TRUE	Crude oil (RVP 8)	October	External Floatin GT-78	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
132	1	TRUE	Crude oil (RVP 8)	March	External Floatin GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
132	1	TRUE	Crude oil (RVP 8)	April	External Floatin GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
132	1	TRUE	Crude oil (RVP 8)	January	External Floatin GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
132	1	TRUE	Crude oil (RVP 8)	February	External Floatin GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
132	1	TRUE	Crude oil (RVP 8)	May	External Floatin GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
132	1	TRUE	Crude oil (RVP 8)	June	External Floatin GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55

132	1	TRUE	Crude oil (RVP 8)	September	External Floatin	GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
132	1	TRUE	Crude oil (RVP 8)	October	External Floatin	GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
132	1	TRUE	Crude oil (RVP 8)	July	External Floatin	GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
132	1	TRUE	Crude oil (RVP 8)	August	External Floatin	GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
132	1	TRUE	Crude oil (RVP 8)	November	External Floatin	GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
132	1	TRUE	Crude oil (RVP 8)	December	External Floatin	GT-79	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55
133	1	TRUE	Crude oil (RVP 8)	January	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	20.95
133	1	TRUE	Crude oil (RVP 8)	February	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	25.35
133	1	TRUE	Crude oil (RVP 8)	May	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	58.9
133	1	TRUE	Crude oil (RVP 8)	June	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	68.55
133	1	TRUE	Crude oil (RVP 8)	September	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	64.35
133	1	TRUE	Crude oil (RVP 8)	October	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	52.75
133	1	TRUE	Crude oil (RVP 8)	March	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	37.15
133	1	TRUE	Crude oil (RVP 8)	April	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	48.6
133	1	TRUE	Crude oil (RVP 8)	July	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	73.15
133	1	TRUE	Crude oil (RVP 8)	August	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	71.7
133	1	TRUE	Crude oil (RVP 8)	November	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	40
133	1	TRUE	Crude oil (RVP 8)	December	External Floatin	GT-80	Griffith	Indiana	Enbridge	Griffith Tan Chicago, Ill	26.55

Spreadsheet Throughput (gal)	Difference (gal)	TANKS Turnovers	Spreadsheet Turnovers	Difference
563,299,311	(0.01)	111.77	111.77	0.00
1,018,632,920	(0.03)	111.77	111.77	0.00
1,018,632,920	(0.03)	111.77	111.77	0.00
1,018,632,920	(0.03)	111.77	111.77	0.00
1,018,632,920	(0.03)	111.77	111.77	0.00
1,018,632,920	(0.03)	111.77	111.77	0.00
1,854,193,565	(1.01)	111.77	111.77	0.00
1,854,193,565	(1.01)	111.77	111.77	0.00
1,018,632,920	(0.03)	111.77	111.77	0.00
1,840,904,395	(1.04)	111.77	111.77	0.00
1,126,598,622	(0.02)	111.77	111.77	0.00
469,416,092	(0.03)	111.77	111.77	0.00
469,416,092	(0.03)	111.77	111.77	0.00
469,416,092	(0.03)	111.77	111.77	0.00
469,416,092	(0.03)	111.77	111.77	0.00
469,416,092	(0.03)	111.77	111.77	0.00
DEMOLISHED				
469,416,092	(0.03)	111.77	111.77	0.00
469,416,092	(0.03)	111.77	111.77	0.00
469,416,092	(0.03)	111.77	111.77	0.00
2,481,826,351	(0.83)	111.77	111.77	0.00
1,689,897,932	(1.11)	111.77	111.77	0.00

T_MIN	T_MAX	INSOL	P_A	S_LOSS	W_LOSS	RIM_LOSS	WD_LOSS	DECKF_L(	DECKS_L(	MOLES	L_WT_FR/	V_WT_FR/	L_MO_FR/	V_MO_FR/	MOLWT
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	39.10805	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	44.50528	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	42.7763	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	41.14005	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	32.38925	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	33.53856	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	44.19937	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	44.23922	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	40.23992	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	39.28975	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	37.49466	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	32.278	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	32.38925	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	33.53856	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	44.19937	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	44.23922	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	40.23992	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	39.28975	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	39.10805	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	44.50528	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	42.7763	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	41.14005	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	37.49466	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	32.278	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	58.8609	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	60.82358	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	71.21479	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	81.12359	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	74.60776	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	71.53695	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	67.78128	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	58.22308	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	79.27319	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	78.15355	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	70.69649	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	70.1295	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	39.10805	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	44.50528	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	32.38925	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	33.53856	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	44.19937	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	44.23922	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	40.23992	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	39.28975	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	42.7763	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	41.14005	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	37.49466	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	32.278	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	32.38925	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	33.53856	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	44.19937	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	44.23922	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	40.23992	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	39.28975	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	39.10805	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	44.50528	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	42.7763	0	0	0	0	0	0	207

61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	41.14005	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	37.49466	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	32.278	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	39.5518	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	45.00872	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	43.31986	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	41.66634	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	37.92953	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	32.65475	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	32.75906	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	33.9239	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	44.72357	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	44.78479	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	40.74279	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	39.76177	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	32.38925	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	33.53856	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	44.19937	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	44.23922	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	40.23992	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	39.28975	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	39.10805	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	44.50528	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	42.7763	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	41.14005	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	37.49466	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	32.278	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	279.2183	32.38925	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	279.2183	33.53856	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	279.2183	44.19937	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	279.2183	44.23922	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	279.2183	39.10805	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	279.2183	44.50528	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	279.2183	42.7763	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	279.2183	41.14005	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	279.2183	37.49466	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	279.2183	32.278	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	279.2183	40.23992	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	279.2183	39.28975	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	208.1029	732.6531	113.4771	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	236.7786	732.6531	128.961	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	223.8733	732.6531	131.1245	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	214.6965	732.6531	126.5625	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	172.4012	732.6531	94.24241	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	178.551	732.6531	97.86125	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	235.0706	732.6531	130.8762	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	233.7834	732.6531	133.5223	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	211.8616	732.6531	122.2757	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	208.6621	732.6531	117.0602	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	199.6216	732.6531	109.8754	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	171.8263	732.6531	94.86452	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	142.3906	604.0131	80.42273	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	147.4699	604.0131	83.3732	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	194.1509	604.0131	110.5372	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	193.0878	604.0131	111.4921	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	174.982	604.0131	101.6867	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	172.3394	604.0131	98.50528	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	171.8776	604.0131	96.99416	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	195.5616	604.0131	110.3174	0	0	0	0	0	0	207

62.6	83.7	1938.5197	14.384	0	0	184.9028	604.0131	108.4716	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	177.3234	604.0131	104.4706	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	164.8727	604.0131	93.37242	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	141.9158	604.0131	80.47756	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	85.56208	335.062	175.6337	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	88.61419	335.062	181.217	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	103.2807	335.062	212.7993	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	117.5123	335.062	242.5739	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	111.1075	335.062	214.2212	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	106.5531	335.062	204.679	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	99.07148	335.062	201.459	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	85.27676	335.062	172.7522	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	116.6647	335.062	234.0996	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	116.0259	335.062	227.5395	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	105.1461	335.062	204.6417	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	103.5582	335.062	206.2182	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	138.7353	451.0617	181.6964	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	157.8524	451.0617	207.1422	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	114.9341	451.0617	149.929	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	119.034	451.0617	154.6593	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	156.7138	451.0617	199.5467	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	155.8556	451.0617	193.6332	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	141.2411	451.0617	174.0417	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	139.1081	451.0617	175.6878	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	149.2489	451.0617	182.0423	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	143.131	451.0617	173.8749	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	133.0811	451.0617	171.8738	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	114.5509	451.0617	147.3469	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	114.9341	451.0617	261.6871	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	119.034	451.0617	269.4386	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	156.7138	451.0617	344.0879	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	155.8556	451.0617	329.0103	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	141.2411	451.0617	294.0627	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	139.1081	451.0617	301.5611	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	138.7353	451.0617	317.7111	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	157.8524	451.0617	362.5275	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	149.2489	451.0617	305.2419	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	143.131	451.0617	290.5985	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	133.0811	451.0617	298.5569	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	114.5509	451.0617	255.4357	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	138.7353	451.0617	180.1111	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	157.8524	451.0617	205.34	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	149.2489	451.0617	180.2787	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	143.131	451.0617	172.1797	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	133.0811	451.0617	170.3441	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	114.5509	451.0617	146.0279	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	114.9341	451.0617	148.6135	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	119.034	451.0617	153.2947	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	156.7138	451.0617	197.7341	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	155.8556	451.0617	191.8093	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	141.2411	451.0617	172.3819	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	139.1081	451.0617	174.0727	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	114.9341	451.0617	58.23638	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	119.034	451.0617	60.49224	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	156.7138	451.0617	81.01852	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	155.8556	451.0617	82.76501	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	141.2411	451.0617	75.81663	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	139.1081	451.0617	72.50184	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	138.7353	451.0617	70.0989	0	0	0	0	0	0	207

38.6	58.6	1456.2693	14.384	0	0	157.8524	451.0617	79.65032	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	149.2489	451.0617	81.32479	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	143.131	451.0617	78.50069	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	133.0811	451.0617	67.95049	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	114.5509	451.0617	58.68479	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	114.9341	451.0617	58.23638	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	119.034	451.0617	60.49224	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	156.7138	451.0617	81.01852	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	155.8556	451.0617	82.76501	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	138.7353	451.0617	70.0989	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	157.8524	451.0617	79.65032	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	149.2489	451.0617	81.32479	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	143.131	451.0617	78.50069	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	133.0811	451.0617	67.95049	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	114.5509	451.0617	58.68479	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	141.2411	451.0617	75.81663	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	139.1081	451.0617	72.50184	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	161.8578	703.7632	201.1353	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	184.1611	703.7632	229.1424	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	174.1237	703.7632	208.1832	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	166.9862	703.7632	199.3353	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	134.0898	703.7632	166.2075	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	138.873	703.7632	171.7047	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	182.8327	703.7632	223.3308	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	181.8316	703.7632	219.2026	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	164.7812	703.7632	197.8775	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	162.2928	703.7632	197.3319	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	155.2613	703.7632	191.2547	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	133.6427	703.7632	164.2223	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	134.0898	703.7632	166.2075	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	138.873	703.7632	171.7047	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	182.8327	703.7632	223.3308	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	181.8316	703.7632	219.2026	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	164.7812	703.7632	197.8775	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	162.2928	703.7632	197.3319	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	161.8578	703.7632	201.1353	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	184.1611	703.7632	229.1424	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	174.1237	703.7632	208.1832	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	166.9862	703.7632	199.3353	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	155.2613	703.7632	191.2547	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	133.6427	703.7632	164.2223	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	114.9341	451.0617	60.0338	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	119.034	451.0617	62.3647	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	138.7353	451.0617	72.25616	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	157.8524	451.0617	82.09794	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	149.2489	451.0617	83.95141	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	143.131	451.0617	81.04245	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	133.0811	451.0617	70.06293	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	114.5509	451.0617	60.51441	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	156.7138	451.0617	83.56242	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	155.8556	451.0617	85.407	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	141.2411	451.0617	78.24965	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	139.1081	451.0617	74.79109	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	172.6483	655.0493	113.7519	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	196.4385	655.0493	129.5027	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	143.0291	655.0493	94.13242	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	148.1312	655.0493	97.39173	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	195.0216	655.0493	127.7892	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	193.9537	655.0493	127.1723	0	0	0	0	0	0	207

53.9	74.8	1331.89946	14.384	0	0	175.7667	655.0493	115.4414	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	173.1123	655.0493	113.384	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	185.7319	655.0493	122.3982	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	178.1186	655.0493	117.5911	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	165.612	655.0493	108.7412	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	142.5522	655.0493	93.5308	0	0	0	0	0	0	207
12.9	29	574.89324	14.384	0	0	114.9341	498.8701	72.19196	0	0	0	0	0	0	207
17.2	33.5	826.48835	14.384	0	0	119.034	498.8701	74.77283	0	0	0	0	0	0	207
47.7	70.1	1803.36268	14.384	0	0	156.7138	498.8701	98.66685	0	0	0	0	0	0	207
57.5	79.6	1988.33109	14.384	0	0	155.8556	498.8701	98.90734	0	0	0	0	0	0	207
53.9	74.8	1331.89946	14.384	0	0	141.2411	498.8701	90.01227	0	0	0	0	0	0	207
42.2	63.3	948.6373	14.384	0	0	139.1081	498.8701	87.75183	0	0	0	0	0	0	207
28.5	45.8	1102.83052	14.384	0	0	138.7353	498.8701	87.14498	0	0	0	0	0	0	207
38.6	58.6	1456.2693	14.384	0	0	157.8524	498.8701	99.15896	0	0	0	0	0	0	207
62.6	83.7	1938.5197	14.384	0	0	149.2489	498.8701	95.7481	0	0	0	0	0	0	207
61.6	81.8	1698.98085	14.384	0	0	143.131	498.8701	92.10987	0	0	0	0	0	0	207
31.6	48.4	575.52778	14.384	0	0	133.0811	498.8701	83.62494	0	0	0	0	0	0	207
19.1	34	461.31058	14.384	0	0	114.5509	498.8701	72.00858	0	0	0	0	0	0	207

VP_MOLW	L_DENS	ALPHA	ALPHA_2	ALS_TEMP	MLS_TEMP	XLS_TEMP	BULK_T	A_VP	M_VP	X_VP	DIAMETER	EFF_DIAM	HEIGHT_S	HEIGHT_R	HEIGHT_L	HEIGHT_A	VOLUME	Q_NET
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008

50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	4200000	39118008
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	270	0	0	0	0	0	22205610	2.07E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	223	0	0	0	0	0	15120000	1.41E+08

50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	223	0	0	0	0	0	15120000	1.41E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	134	0	0	0	0	0	5040000	46941609
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	180	0	0	0	0	0	9114000	84886077

50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	210	0	0	0	0	0	16590000	1.55E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	180	0	0	0	0	0	9114000	84886077
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	224	0	0	0	0	0	16471098	1.53E+08

50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	224	0	0	0	0	0	16471098	1.53E+08
50	7.1	0.17	0	497.1113	493.5292	500.6934	508.69	3.629032	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	499.3852	495.4677	503.3027	508.69	3.7898	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	515.4591	509.2811	521.6371	508.69	5.092783	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	519.9535	513.6094	526.2976	508.69	5.51341	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	517.2239	511.877	522.5709	508.69	5.254846	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	511.6052	506.6783	516.5321	508.69	4.752472	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	504.9483	500.5219	509.3747	508.69	4.206864	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	510.461	505.128	515.7939	508.69	4.654944	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	521.9106	515.8058	528.0155	508.69	5.70483	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	520.9509	515.2931	526.6087	508.69	5.610327	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	505.4941	501.7853	509.203	508.69	4.249653	0	0	180	0	0	0	0	0	10080000	93883218
50	7.1	0.17	0	499.4227	496.1918	502.6537	508.69	3.792502	0	0	180	0	0	0	0	0	10080000	93883218

TURNOVE	SHL COLS	SHL_CONI	PT_COND	RF_COLSI	RF_COND	RF_TYPE	VP_RANGI	T_RANGE	VT_RANGI	RF_OUT	VS_OUT	VS_VOL	V_DENS	BV_RANGI	K_E	K_S	K_N	K_P
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good				0	0	0	0	0	0	0	0	0	0	0	0

111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0

111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0

111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0

111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0
111.7657	White/Whit	Light Rust	Good	0	0	0	0	0	0	0	0	0	0	0	0

M_KR	M_P	M_KC	M_C	VENT_P	VENT_V	C_SLOPE	D_RADIUS	NC	FC	M_FF	SD	KD	N_FACT	TANK_COI	RIM_PRIM	RIM_SEC	M_KRA	M_KRB
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	271.9672	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	274.048	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	204.296	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	200.7406	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	267.8295	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	263.7238	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	243.6816	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	220.7198	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	213.3349	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	235.8943	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	257.6257	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	253.6009	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	267.8295	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	263.7238	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	243.6816	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	220.7198	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	213.3349	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	235.8943	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	271.9672	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	274.048	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	204.296	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	200.7406	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	257.6257	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	253.6009	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	486.7257	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	478.274	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	495.2455	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	499.5308	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	356.3203	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	349.0607	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	465.7251	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	457.4454	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	437.0519	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	389.9263	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	374.8027	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	421.055	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	271.9672	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	274.048	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	267.8295	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	263.7238	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	243.6816	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	220.7198	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	213.3349	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	235.8943	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	204.296	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	200.7406	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	257.6257	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	253.6009	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	267.8295	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	263.7238	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	243.6816	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	220.7198	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	213.3349	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	235.8943	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	271.9672	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	274.048	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	204.296	0	0	1	Welded	Mechanica	Rim-mount	0.6	0.4

3.88	0.122965	0.4	0.006	0	0	0	0	8	0	200.7406	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	257.6257	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	253.6009	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	275.0532	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	277.148	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	206.892	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	203.3086	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	260.6137	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	256.5609	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	270.8875	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	266.7538	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	246.5716	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	223.4418	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	216.0009	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	238.7283	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	267.8295	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	263.7238	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	243.6816	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	220.7198	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	213.3349	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	235.8943	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	271.9672	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	274.048	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	204.296	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	200.7406	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	257.6257	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	253.6009	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	267.8295	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	263.7238	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	243.6816	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	220.7198	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	271.9672	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	274.048	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	204.296	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	200.7406	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	257.6257	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	253.6009	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	213.3349	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	235.8943	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	37	0	789.1483	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	37	0	794.0971	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	37	0	626.2393	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	37	0	617.5547	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	37	0	779.2984	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	37	0	769.5124	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	37	0	721.5516	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	37	0	666.174	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	37	0	648.2538	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	37	0	702.8256	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	37	0	754.9538	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	37	0	745.3289	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	31	0	665.0223	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	31	0	655.5885	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	31	0	609.4177	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	31	0	556.2599	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	31	0	539.0997	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	31	0	591.4223	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	31	0	674.5218	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	31	0	679.2961	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4

3.96	0.12563	0.4	0.006	0	0	0	0	31	0	518.0513	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	31	0	509.7584	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	31	0	641.5618	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	31	0	632.2938	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	8	0	1452.33	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	8	0	1424.964	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	8	0	1479.86	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	8	0	1493.686	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	8	0	1023.102	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	8	0	998.7198	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	8	0	1384.225	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	8	0	1357.275	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	8	0	1290.646	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	8	0	1135.248	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	8	0	1084.923	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	8	0	1238.127	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	19	0	1263.562	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	19	0	1275.51	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	19	0	1239.775	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	19	0	1216.133	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	19	0	1100.148	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	19	0	966.0811	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	19	0	922.695	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	19	0	1054.823	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	19	0	869.4188	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	19	0	848.4133	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	19	0	1180.945	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	19	0	1157.671	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	19	0	2163.912	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	19	0	2118.677	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	19	0	1897.038	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	19	0	1641.509	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	19	0	1558.995	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	19	0	1810.563	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	19	0	2209.443	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	19	0	2232.318	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	19	0	1457.81	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	19	0	1417.96	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	19	0	2051.384	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	19	0	2006.9	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	19	0	1252.538	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	19	0	1264.412	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	19	0	860.996	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	19	0	840.1417	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	19	0	1170.434	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	19	0	1147.308	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	19	0	1228.897	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	19	0	1205.402	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	19	0	1090.155	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	19	0	956.9813	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	19	0	913.8953	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	19	0	1045.126	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	19	0	481.5615	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	19	0	475.6686	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	19	0	446.6743	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	19	0	412.9339	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	19	0	401.9475	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	19	0	435.2985	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	19	0	487.4854	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4

5.4	0.09744	0.4	0.006	0	0	0	0	19	0	490.4589	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	19	0	388.4003	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	19	0	383.0398	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	19	0	466.8877	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	19	0	461.073	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	19	0	481.5615	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	19	0	475.6686	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	19	0	446.6743	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	19	0	412.9339	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	19	0	487.4854	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	19	0	490.4589	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	19	0	388.4003	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	19	0	383.0398	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	19	0	466.8877	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	19	0	461.073	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	19	0	401.9475	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	19	0	435.2985	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	22	0	1398.745	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	22	0	1410.979	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	22	0	994.2651	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	22	0	972.646	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	22	0	1374.384	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	22	0	1350.166	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	22	0	1231.275	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	22	0	1093.653	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	22	0	1049.062	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	22	0	1184.774	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	22	0	1314.111	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	22	0	1290.257	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	22	0	1374.384	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	22	0	1350.166	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	22	0	1231.275	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	22	0	1093.653	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	22	0	1049.062	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	22	0	1184.774	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	22	0	1398.745	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	22	0	1410.979	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	22	0	994.2651	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	22	0	972.646	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	22	0	1314.111	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	22	0	1290.257	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	19	0	496.4245	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	19	0	490.3923	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	19	0	502.4875	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	19	0	505.5305	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	19	0	400.9448	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	19	0	395.4422	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	19	0	481.4023	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	19	0	475.4479	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	19	0	460.6994	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	19	0	426.1154	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	19	0	414.8463	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	19	0	449.0431	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	31	0	791.0594	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	31	0	797.4328	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	31	0	778.3889	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	31	0	765.8204	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	31	0	704.5318	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	31	0	634.4924	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4

4.16	0.113174	0.4	0.006	0	0	0	0	31	0	612.0213	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	31	0	680.7537	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	31	0	584.5635	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	31	0	573.7795	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	31	0	747.1606	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	31	0	734.8501	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.28	0.072559	0.4	0.006	0	0	0	0	19	0	596.9613	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.2	0.076304	0.4	0.006	0	0	0	0	19	0	587.9612	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.8	0.108829	0.4	0.006	0	0	0	0	19	0	543.9736	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.32	0.120259	0.4	0.006	0	0	0	0	19	0	493.4718	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.16	0.113174	0.4	0.006	0	0	0	0	19	0	477.2067	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
4.64	0.099934	0.4	0.006	0	0	0	0	19	0	526.8589	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.36	0.086278	0.4	0.006	0	0	0	0	19	0	606.0281	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.4	0.09744	0.4	0.006	0	0	0	0	19	0	610.5863	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.96	0.12563	0.4	0.006	0	0	0	0	19	0	457.2848	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
3.88	0.122965	0.4	0.006	0	0	0	0	19	0	449.4451	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5.08	0.087324	0.4	0.006	0	0	0	0	19	0	574.5868	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4
5	0.076367	0.4	0.006	0	0	0	0	19	0	565.7549	0	0	1	Welded	Mechanica Rim-mount	0.6	0.4

FITTING	M_V	DECK_TYI	DECK_CO	DECK_SE	DECK_SE	COL_NO	COL_DIAM	SELF_SUF	UNDER	HEATED
Detail	11.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	12			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.4			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.7			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	9.3			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.1			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.7			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	9.3			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.1			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	12			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.4			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.7			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	12			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.4			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	9.3			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.1			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	12			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.7			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	9.3			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.1			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.4			0	0	8	0	FALSE	FALSE	FALSE
Detail	8.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.2			0	0	8	0	FALSE	FALSE	FALSE
Detail	11			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.7			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.5			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.5			0	0	8	0	FALSE	FALSE	FALSE
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Detail	8.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	10.1			0	0	8	0	FALSE	FALSE	FALSE
Detail	11.9			0	0	8	0	FALSE	FALSE	FALSE
Detail	12			0	0	8	0	FALSE	FALSE	FALSE
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Detail	11	0	0	19	0	FALSE	FALSE	FALSE
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Detail	11.7	0	0	22	0	FALSE	FALSE	FALSE
Detail	11.5	0	0	22	0	FALSE	FALSE	FALSE
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Detail	10.1	0	0	19	0	FALSE	FALSE	FALSE
Detail	11.9	0	0	31	0	FALSE	FALSE	FALSE
Detail	12	0	0	31	0	FALSE	FALSE	FALSE
Detail	11.7	0	0	31	0	FALSE	FALSE	FALSE
Detail	11.5	0	0	31	0	FALSE	FALSE	FALSE
Detail	10.5	0	0	31	0	FALSE	FALSE	FALSE
Detail	9.3	0	0	31	0	FALSE	FALSE	FALSE

Detail	8.9	0	0	31	0	FALSE	FALSE	FALSE
Detail	10.1	0	0	31	0	FALSE	FALSE	FALSE
Detail	8.4	0	0	31	0	FALSE	FALSE	FALSE
Detail	8.2	0	0	31	0	FALSE	FALSE	FALSE
Detail	11.2	0	0	31	0	FALSE	FALSE	FALSE
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Detail	11.7	0	0	19	0	FALSE	FALSE	FALSE
Detail	11.5	0	0	19	0	FALSE	FALSE	FALSE
Detail	10.5	0	0	19	0	FALSE	FALSE	FALSE
Detail	9.3	0	0	19	0	FALSE	FALSE	FALSE
Detail	8.9	0	0	19	0	FALSE	FALSE	FALSE
Detail	10.1	0	0	19	0	FALSE	FALSE	FALSE
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Detail	8.4	0	0	19	0	FALSE	FALSE	FALSE
Detail	8.2	0	0	19	0	FALSE	FALSE	FALSE
Detail	11.2	0	0	19	0	FALSE	FALSE	FALSE
Detail	11	0	0	19	0	FALSE	FALSE	FALSE

Appendix B: Emission Calculations
Project Summary

Source Name: Enbridge Energy-Hartsdale/Griffith Terminal
Source Location: Griffith, IN and Schererville, IN
Minor Source Modification No.: 089-33306-00497
Significant Permit Modification No.: 089-33314-00497
Permit Reviewer: Kristen Willoughby

Table 3-1
Prevention of Significant Deterioration (PSD) Applicability Volatile Organic Compound Emission Calculation Summary

Emission Unit Description	Baseline Actual Emissions(5) (tpy)	Projected Actual Emissions(1),(2) (tpy)	Emissions Increase Due to the Project (tpy)	Capable of Being Accommodated Emissions(3) (tpy)	Excluded Demand Growth Emissions(4) (tpy)	Emission Increase Due to the Project with Excluded Demand Growth(6) (tpy)	Notes
New tank GT-1610	-	8.72	8.72	-	-	8.72	Includes standing, withdrawal and floating roof landing losses
New tank GT-1611	-	6.87	6.87	-	-	6.87	Includes standing, withdrawal and floating roof landing losses
Existing tank withdrawal loss emissions	16.34	36.59	20.24	20.28	3.94	16.31	Increase in withdrawal loss emissions for the existing tanks due to the throughput capacity increase of the terminal.
Emergency Diesel generator	-	0.05	0.05	-	-	0.05	Emissions from new generator constructed as part of the project.
Piping components	-	0.32	0.32	-	-	0.32	Emissions from new pumps and piping components (valves, flanges, etc.) constructed for the project.

PSD Project Emission Increases(7) (ton VOC/year)	**36.20**	**PSD Project Emission Increases(7) (ton VOC/year)**	**32.26**
PSD Emission Threshold (ton VOC/year)	**40**	**PSD Emission Threshold (ton VOC/year)**	**40**
Is total project emissions increase greater than the PSD Threshold?	**No**	**Is total project emissions increase greater than the PSD Threshold?**	**No**

Notes:

1. Potential to emit for the proposed new storage tanks, piping components, and diesel generator that will be constructed as part of the proposed Project. Refer to Table 2-2 for the tank emission calculations, Table 2-6 for the piping component emission calculations, and table 2-9 for the emergency generator calculations.
2. Projected actual emissions calculated per 326 IAC 2-2-1(pp). Terminal throughput is limited by outbound pipeline capacity. The projected actual emissions are estimated using the projected actual throughput of the three outbound pipelines. Projected actual throughput is assumed to be equal to the physical capacities of Line 6B and the refinery take-off. Projected actual throughput for the Buckeye take-off pipeline is assumed to be 60,000 bbl/day, which is the estimated maximum actual delivery volume per day. Refer to the projected actual withdrawal loss emission in Table 3-2.

3. Tank withdrawal loss emissions that the terminal was capable of accommodating is calculated based on the maximum monthly terminal throughput for the years 2011 through 2012 which was 14,523,912 bbl in May 2012. Annualized throughput (maximum monthly throughput x 12 months) is equal to 477,498 barrels per day. Refer to Table 3-3.
4. Excluded product demand growth emissions are calculated as the difference between the capable of accommodating emissions minus the baseline emissions. Calculated per the 326 IAC 2-2-1(pp)(2)(A)(iii).

5. Baseline actual emissions for the 24-month period 2011 and 2012. Refer to Table 3-4.
6. The proposed project includes existing and new emission units, the proposed project emission increase is calculated per the requirements specified in 326 IAC 2-2-2(d)(5). Project emissions increase is calculated as the sum of the difference between the projected actual and the baseline actual emissions for existing emission units and the difference between the potential-to-emit emissions and the baseline actual emissions for new emission units.

7. Project emission increase conservatively includes additional withdrawal losses resulting from increased throughput due to debottlenecking of the terminal's outbound pipeline capacity and additional piping components to connect the project to exiting storage tanks and manifolds and the proposed new storage tanks.

Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Table 3-2
Enbridge Energy, Limited Partnership - Hartsdale/Griffith Terminal
2013 Enhancement Project
Projected Actual Withdrawal Loss Calculations[1]

Projected Actual Throughput[1] (bbl/day)	**1,080,000**
Projected Actual Throughput[2] (bbl/yr)	**394,200,000**

Storage Tank Number	Tank Type	Storage Tank Working Volume (bbl)	Percent of Total Terminal Working Volume	Q Tank Throughput[3] (bbl/yr)	D Tank Diameter (ft)	N_C Number of fixed roof support columns	F_C Effective column diameter	C_S Shell Clingage factor (bbl/1000 ft^2)	W_L Average organic liquid density (lb/gal)	0.943 Constant (1000 ft^3 gal/bbl^2)	L_{WD} Potential Withdrawal Losses[4] (lb VOC/yr)	Potential Withdrawal Losses (ton VOC/yr)
GT-70	EFRT	120,000	2.65%	10,435,763	134	-	-	0.006	7.1	0.943	3,129	1.56
GT-71	EFRT	217,000	4.79%	18,871,339	180	-	-	0.006	7.1	0.943	4,212	2.11
GT-72	EFRT	217,000	4.79%	18,871,339	180	-	-	0.006	7.1	0.943	4,212	2.11
GT-73	EFRT	217,000	4.79%	18,871,339	180	-	-	0.006	7.1	0.943	4,212	2.11
GT-74	EFRT	217,000	4.79%	18,871,339	180	-	-	0.006	7.1	0.943	4,212	2.11
GT-75	EFRT	217,000	4.79%	18,871,339	180	-	-	0.006	7.1	0.943	4,212	2.11
GT-76	EFRT	395,000	8.71%	34,351,054	210	-	-	0.006	7.1	0.943	6,571	3.29
GT-77	EFRT	395,000	8.71%	34,351,054	210	-	-	0.006	7.1	0.943	6,571	3.29
GT-78	EFRT	217,000	4.79%	18,871,339	180	-	-	0.006	7.1	0.943	4,212	2.11
GT-79	EFRT	392,169	8.65%	34,104,857	224	-	-	0.006	7.1	0.943	6,116	3.06
GT-80	EFRT	240,000	5.29%	20,871,527	180	-	-	0.006	7.1	0.943	4,658	2.33
GT-1601	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1602	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1603	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1604	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1605	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1606	EFRT	To be demolished.										
GT-1607	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1608	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1609	EFRT	100,000	2.21%	8,696,469	134	-	-	0.006	7.1	0.943	2,607	1.30
GT-1610	EFRT	528,705	11.66%	45,978,669	270	-	-	0.006	7.1	0.943	6,841	3.42
GT-1611	EFRT	360,000	7.94%	31,307,290	223	-	-	0.006	7.1	0.943	5,640	2.82
	Totals[5]	4,532,874	1	394,200,000								42.83

Notes:

1. Terminal throughput is limited by outbound pipeline capacity. The projected actual emissions are estimated using the projected actual throughput of the three outbound pipelines. Projected actual throughput is assumed to be equal to the physical capacities of Line 6B and the refinery take-off. Projected actual throughput for the Buckeye take-off pipeline is assumed to be 60,000 bbl/day, which is the estimated actual maximum delivery volume per day. Refer to the projected actual withdrawal loss emission in Table 3-2. Refer to Table 2-4 for a summary of the permitted maximum terminal throughput capacity.
2. Calculated based on operation of 365 days per year.

3. Individual storage tank throughput is calculated using a tank volume flow weighted throughput allocation. This calculation method results in the same number of turnovers for all tanks. The individual tank throughput is calculated by multiplying the potential facility-wide throughput by the storage tank capacity and dividing by the combined terminal tank capacity.

4. Withdrawal loss formula from US Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, AP-42, Chapter 7.1 Liquid Storage Tanks, November 2006, Formula 2-4.

$$L_{WD} = \frac{(0.943)\,Q C_S W_L}{D}\left[1 + \frac{N_C F_C}{D}\right]$$

5. The potential withdrawal loss for existing tanks is equal to the total withdrawal loss shown minus the withdrawal loss emissions of proposed tanks GT-1610 and GT-1611 (42.83 tpy - 2.82 tpy - 3.42 tpy = 36.59 tpy).

Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

Table 3-3
Enbridge Energy, Limited Partnership - Hartsdale/Griffith Terminal
2013 Enhancement Project
Capable of Being Accommodated Withdrawal Loss Calculations(1)

Maximum Monthly Throughput(2) (bbl/month)	**14,523,912**
Annualized Maximum Monthly Throughput(3) (bbl/yr)	**174,286,949**
Capable of Being Accommodated Throughput (3) (bbl/day)	**477,498**

						2-4 Note 2	2-4 Note 3	Table 7.1-10	Table 7.1-2		2-4	
				Q	D	N_C	F_C	C_S	W_L	0.943	L_{WD}	
Storage Tank Number	**Tank Type**	**Storage Tank Working Volume (bbl)**	**Percent of Total Terminal Working Volume**	**Tank Throughput(4) (bbl/yr)**	**Tank Diameter (ft)**	**Number of fixed roof support columns**	**Effective column diameter**	**Shell Clingage factor (bbl/1000 ft^2)**	**Average organic liquid density (lb/gal)**	**Constant (1000 ft^3 gal/bbl^2)**	**Potential Withdrawal Losses(5) (lb VOC/yr)**	**Potential Withdrawal Losses (ton VOC/yr)**
GT-70	EFRT	120,000	3.20%	5,585,868	134	-	-	0.006	7.1	0.943	1,675	0.84
GT-71	EFRT	217,000	5.80%	10,101,111	180	-	-	0.006	7.1	0.943	2,254	1.13
GT-72	EFRT	217,000	5.80%	10,101,111	180	-	-	0.006	7.1	0.943	2,254	1.13
GT-73	EFRT	217,000	5.80%	10,101,111	180	-	-	0.006	7.1	0.943	2,254	1.13
GT-74	EFRT	217,000	5.80%	10,101,111	180	-	-	0.006	7.1	0.943	2,254	1.13
GT-75	EFRT	217,000	5.80%	10,101,111	180	-	-	0.006	7.1	0.943	2,254	1.13
GT-76	EFRT	395,000	10.55%	18,386,816	210	-	-	0.006	7.1	0.943	3,517	1.76
GT-77	EFRT	395,000	10.55%	18,386,816	210	-	-	0.006	7.1	0.943	3,517	1.76
GT-78	EFRT	217,000	5.80%	10,101,111	180	-	-	0.006	7.1	0.943	2,254	1.13
GT-79	EFRT	392,169	10.47%	18,255,036	224	-	-	0.006	7.1	0.943	3,274	1.64
GT-80	EFRT	240,000	6.41%	11,171,736	180	-	-	0.006	7.1	0.943	2,493	1.25
GT-1601	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1602	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1603	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1604	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1605	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1606	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1607	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1608	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
GT-1609	EFRT	100,000	2.67%	4,654,890	134	-	-	0.006	7.1	0.943	1,395	0.70
	Total	3,744,169	100.00%	174,286,949								20.28

Notes:

1. Represents the level of throughput and associated withdrawal loss emissions that the terminal has demonstrated that it is capable of accommodating during the consecutive 24-month period used to establish the baseline emissions and that are also unrelated to the project.
2. Tank withdrawal loss emissions the terminal was capable of accommodating are calculated based on the maximum monthly terminal throughput of 14,523,912 bbl in May 2012 which was part of the 24-month period used to establish the baseline actual emissions and that are unrelated to the project.
3. Annualized accommodated throughput (maximum monthly throughput x 12 months) is equal to 174,286,949 bbl/year or 477,498 bbl/day

4. Individual storage tank throughput is calculated using a tank volume flow weighted throughput allocation, this calculation method results in the same number of turnovers for all tanks. The individual tank throughput is calculated by multiplying the potential facility-wide throughput by the storage tank capacity and dividing by the combined terminal tank capacity.
5. Withdrawal loss formula from US Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, Volume 1, 5th edition, AP-42, Chapter 7.1 Liquid Storage Tanks, November 2006, Formula 2-4.

Note: The Source uses "GT" as an internal identifier. This correlates to "EU" in the permit.

$$L_{WD} = \frac{(0.943)\,Q C_S W_L}{D}\left[1 + \frac{N_C F_C}{D}\right]$$

Table 3-4
Enbridge Energy, Limited Partnership - Hartsdale/Griffith Terminal
2013 Enhancement Project
Baseline Actual Throughput and Volatile Organic Compound Emission Summary[1]

Annual Emission Inventory Reporting Year	Total Facility Storage Tank Throughput (bbl/yr)	Total Facility Storage Tank Throughput (bbl/day)	Facility-wide Withdrawal Loss Emissions (tpy)	Piping Component Emissions (tpy)	Notes
2012	147,168,291	403,201	16.58	0.65	
2011	142,533,834	390,504	16.11	0.65	
2010	121,106,112	331,798	13.75	0.65	

Notes:
1. Actual storage tank throughput and emissions from annual emission inventory reporting.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-1601
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1601 Griffith Hartsdale Terminal PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Double Deck
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	2
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1601 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1601 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	32.3893	33.5386	39.1080	44.5053	44.1994	44.2392	42.7763	41.1401	40.2399	39.2898	37.4947	32.2780
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	267.8295	263.7238	271.9672	274.0480	243.6816	220.7198	204.2960	200.7406	213.3349	235.8943	257.6257	253.6009
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	397.1697	401.3711	421.6071	441.2359	440.0824	439.4834	433.1021	426.9115	424.6044	422.0663	415.7845	396.7731

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.1695
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	79.3595
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3	0.47	0.02	0.97	3.5906
Roof Drain (3-in. Diameter)/90% Closed	2	1.80	0.14	1.10	11.9405
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33	0.82	0.53	0.14	99.1563
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1601 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	471.20	0.00	5,060.19

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-1602
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1602 Griffith Hartsdale Terminal PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Double Deck
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	2
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1602 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1602 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	32.3893	33.5386	39.1080	44.5053	44.1994	44.2392	42.7763	41.1401	40.2399	39.2898	37.4947	32.2780
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	267.8295	263.7238	271.9672	274.0480	243.6816	220.7198	204.2960	200.7406	213.3349	235.8943	257.6257	253.6009
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	397.1697	401.3711	421.6071	441.2359	440.0824	439.4834	433.1021	426.9115	424.6044	422.0663	415.7845	396.7731

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.1695
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	79.3595
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3	0.47	0.02	0.97	3.5906
Roof Drain (3-in. Diameter)/90% Closed	2	1.80	0.14	1.10	11.9405
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33	0.82	0.53	0.14	99.1563
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1602 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	471.20	0.00	5,060.19

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-1603
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1603 Griffith Hartsdale Terminal PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Pontoon
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	24
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	25

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1603 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1603 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	58.8609	60.8236	71.2148	81.1236	79.2732	78.1535	74.6078	71.5370	70.6965	70.1295	67.7813	58.2231
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	486.7257	478.2740	495.2455	499.5308	437.0519	389.9263	356.3203	349.0607	374.8027	421.0550	465.7251	457.4454
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	423.6413	428.6561	453.7138	477.8543	475.1562	473.3977	464.9336	457.3084	455.0610	452.9061	446.0711	422.7182

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	6.3390
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2	8.30	4.40	1.60	439.2138
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	24	2.00	0.37	0.91	199.9476
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	25	0.82	0.53	0.14	75.1184

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1603 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	842.42	0.00	5,431.42

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-1604
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1604 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	2
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1604 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1604 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	86.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	32.3893	33.5386	39.1080	44.5053	44.1994	44.2392	42.7763	41.1401	40.2399	39.2898	37.4947	32.2780
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	267.8295	263.7238	271.9672	274.0480	243.6816	220.7198	204.2960	200.7406	213.3349	235.8943	257.6257	253.6009
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	397.1697	401.3711	421.6071	441.2359	440.0824	439.4834	433.1021	426.9115	424.6044	422.0663	415.7845	396.7731

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.1695
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	79.3595
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3	0.47	0.02	0.97	3.5906
Roof Drain (3-in. Diameter)/90% Closed	2	1.80	0.14	1.10	11.9405
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33	0.82	0.53	0.14	99.1563
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1604 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	471.20	0.00	5,060.19

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-1605
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1605 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	2
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1605 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1605 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	32.3893	33.5386	39.1080	44.5053	44.1994	44.2392	42.7763	41.1401	40.2399	39.2898	37.4947	32.2780
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	267.8295	263.7238	271.9672	274.0480	243.6816	220.7198	204.2960	200.7406	213.3349	235.8943	257.6257	253.6009
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	397.1697	401.3711	421.6071	441.2359	440.0824	439.4834	433.1021	426.9115	424.6044	422.0663	415.7845	396.7731

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	Roof Fitting Loss Factors KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.1695
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	79.3595
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3	0.47	0.02	0.97	3.5906
Roof Drain (3-in. Diameter)/90% Closed	2	1.80	0.14	1.10	11.9405
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33	0.82	0.53	0.14	99.1563
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1605 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	471.20	0.00	5,060.19

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-1607
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1607 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	2
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1607 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1607 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	32.7591	33.9239	39.5518	45.0087	44.7236	44.7848	43.3199	41.6663	40.7428	39.7618	37.9295	32.6547
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	270.8875	266.7538	275.0532	277.1480	246.5716	223.4418	206.8920	203.3086	216.0009	238.7283	260.6137	256.5609
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	397.5395	401.7564	422.0508	441.7394	440.6066	440.0290	433.6457	427.4378	425.1073	422.5383	416.2193	397.1498

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.1695
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	79.3595
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3	0.47	0.02	0.97	3.5906
Roof Drain (3-in. Diameter)/90% Closed	2	1.80	0.14	1.10	11.9405
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33	0.82	0.53	0.14	99.1563
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	2	0.71	0.10	1.00	5.6331

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1607 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	476.83	0.00	5,065.82

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-1608
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1608 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	2
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1608 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1608 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900	39,118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	32.3893	33.5386	39.1080	44.5053	44.1994	44.2392	42.7763	41.1401	40.2399	39.2898	37.4947	32.2780
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	267.8295	263.7238	271.9672	274.0480	243.6816	220.7198	204.2960	200.7406	213.3349	235.8943	257.6257	253.6009
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	397.1697	401.3711	421.6071	441.2359	440.0824	439.4834	433.1021	426.9115	424.6044	422.0663	415.7845	396.7731

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.1695
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	79.3595
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3	0.47	0.02	0.97	3.5906
Roof Drain (3-in. Diameter)/90% Closed	2	1.80	0.14	1.10	11.9405
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33	0.82	0.53	0.14	99.1563
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1608 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	471.20	0.00	5,060.19

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-1609
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Hartsdale Tank 1609 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	134.00
Volume (gallons):	4,200,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	2
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1609 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1609 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183	279.2183
Net Throughput (gal/mo.):	39,118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.690039,	118,007.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	32.3893	33.5386	39.1080	44.5053	44.1994	44.2392	42.7763	41.1401	40.2399	39.2898	37.4947	32.2780
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	267.8295	263.7238	271.9672	274.0480	243.6816	220.7198	204.2960	200.7406	213.3349	235.8943	257.6257	253.6009
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	397.1697	401.3711	421.6071	441.2359	440.0824	439.4834	433.1021	426.9115	424.6044	422.0663	415.7845	396.7731

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.1695
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	79.3595
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	3	0.47	0.02	0.97	3.5906
Roof Drain (3-in. Diameter)/90% Closed	2	1.80	0.14	1.10	11.9405
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	33	0.82	0.53	0.14	99.1563
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1609 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	3,350.62	471.20	0.00	5,060.19

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-1610
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	New Tank 1610 Griffith Hartsdale PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	270.00
Volume (gallons):	22,205,610.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Pontoon
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	6
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	9
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	50
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	124
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1610 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1610 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	172.4012	178.5510	208.1029	236.7786	235.0706	233.7834	223.8733	214.6965	211.8616	208.6621	199.6216	171.8263
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	732.6531	732.6531	732.6531	732.6531	732.6531	732.6531	732.6531	732.6531	732.6531	732.6531	732.6531	732.6531
Net Throughput (gal/mo.):	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000	206,818,862.5000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000	270.0000
Roof Fitting Losses (lb):	94.2424	97.8612	113.4771	128.9610	130.8762	133.5223	131.1245	126.5625	122.2757	117.0602	109.8754	94.8645
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	779.2984	769.5124	789.1483	794.0971	721.5516	666.1740	626.2393	617.5547	648.2538	702.8256	754.9538	745.3289
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	999.2967	1,009.0653	1,054.2331	1,098.3927	1,098.6000	1,099.9588	1,087.6508	1,073.9121	1,066.7904	1,058.3754	1,042.1501	999.3439

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	6	1.60	0.00	0.00	19.0169
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	81.9460
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	9	0.47	0.02	0.97	10.7717
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	50	2.00	0.37	0.91	416.5575
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	124	0.82	0.53	0.14	372.5873
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2	8.30	4.40	1.60	439.2138

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1610 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	2,495.23	8,791.84	1,400.70	0.00	12,687.77

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-1611
City:	Hartsdale
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	New Tank 1611 Griffith Hartsdale PTE Calcs 2013

Tank Dimensions

Diameter (ft):	223.00
Volume (gallons):	15,120,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Automatic Gauge Float Well/Bolted Cover, Gasketed	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	40
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	71
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-1611 - External Floating Roof Tank
Hartsdale, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-1611 - External Floating Roof Tank
Hartsdale, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	142.3906	147.4699	171.8776	195.5616	194.1509	193.0878	184.9028	177.3234	174.9820	172.3394	164.8727	141.9158
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	604.0131	604.0131	604.0131	604.0131	604.0131	604.0131	604.0131	604.0131	604.0131	604.0131	604.0131	604.0131
Net Throughput (gal/mo.):	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000	140,824,827.6000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000	223.0000
Roof Fitting Losses (lb):	80.4227	83.3732	96.9942	110.3174	110.5372	111.4921	108.4716	104.4706	101.6867	98.5063	93.3724	80.4776
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	665.0223	655.5885	674.5218	679.2961	609.4177	556.2599	518.0513	509.7584	539.0997	591.4223	641.5618	632.2938
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	826.8265	834.8562	872.8849	909.8921	908.7012	908.5930	897.3875	885.8071	880.6818	874.8578	862.2582	826.4065

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	12.6779
Automatic Gauge Float Well/Bolted Cover, Gasketed	1	2.80	0.00	0.00	5.5466
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4	6.20	1.20	0.94	109.2613
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	40	2.00	0.37	0.91	333.2460
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	71	0.82	0.53	0.14	213.3363
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2	8.30	4.40	1.60	439.2138

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-1611 - External Floating Roof Tank
Hartsdale, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	2,060.87	7,248.16	1,180.12	0.00	10,489.15

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-70
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 70 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	134.00
Volume (gallons):	5,040,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	2
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	24
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	36
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

GT-70 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-70 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	85.5621	88.6142	103.2807	117.5123	116.6647	116.0259	111.1075	106.5531	105.1461	103.5582	99.0715	85.2768
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	335.0620	335.0620	335.0620	335.0620	335.0620	335.0620	335.0620	335.0620	335.0620	335.0620	335.0620	335.0620
Net Throughput (gal/mo.):	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300	46,941,609.2300
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000	134.0000
Roof Fitting Losses (lb):	175.6337	181.2170	212.7993	242.5739	234.0996	227.5395	214.2212	204.6790	204.6417	206.2182	201.4590	172.7522
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	1,452.3301	1,424.9639	1,479.8600	1,493.6857	1,290.6465	1,135.2477	1,023.1023	998.7198	1,084.9233	1,238.1272	1,384.2248	1,357.2749
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	596.2578	604.8932	651.1420	695.1482	685.8263	678.6274	660.3907	646.2940	644.8499	644.8385	635.5925	593.0910

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	6.3390
Access Hatch (24-in. Diam.)/Unbolted Cover, Gasketed	2	31.00	5.20	1.30	387.9810
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1	41.00	48.00	1.40	1,572.7031
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4	6.20	1.20	0.94	109.2613
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	24	2.00	0.37	0.91	199.9476
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	36	0.82	0.53	0.14	108.1705
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1	0.68	1.80	1.00	26.7286

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-70 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,238.37	4,020.74	2,477.83	0.00	7,736.95

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-71
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 71 Griffith Hartsdale PTE Calcs 2013

Tank Dimensions

Diameter (ft):	180.00
Volume (gallons):	9,114,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	**Quantity**
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	32
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	45

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-71 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-71 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	114.9341	119.0340	138.7353	157.8524	156.7138	155.8556	149.2489	143.1310	141.2411	139.1081	133.0811	114.5509
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617
Net Throughput (gal/mo.):	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Roof Fitting Losses (lb):	149.9290	154.6593	181.6964	207.1422	199.5467	193.6332	182.0423	173.8749	174.0417	175.6878	171.8738	147.3469
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	1,239.7751	1,216.1329	1,263.5622	1,275.5096	1,100.1483	966.0811	869.4188	848.4133	922.6950	1,054.8231	1,180.9446	1,157.6712
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	715.9248	724.7550	771.4933	816.0563	807.3222	800.5505	782.3529	768.0677	766.3445	765.8575	756.0166	712.9595

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	3	1.60	0.00	0.00	9.5084
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1	41.00	48.00	1.40	1,572.7031
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	2	6.20	1.20	0.94	54.6307
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	32	2.00	0.37	0.91	266.5968
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	45	0.82	0.53	0.14	135.2131

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-71 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,663.49	5,412.74	2,111.47	0.00	9,187.70

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-72
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 72 Griffith Hartsdale PTE Calcs 2013

Tank Dimensions

Diameter (ft):	180.00
Volume (gallons):	9,114,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	5
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	2
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	18
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	50
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-72 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-72 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	114.9341	119.0340	138.7353	157.8524	156.7138	155.8556	149.2489	143.1310	141.2411	139.1081	133.0811	114.5509
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617
Net Throughput (gal/mo.):	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Roof Fitting Losses (lb):	261.6871	269.4386	317.7111	362.5275	344.0879	329.0103	305.2419	290.5985	294.0627	301.5611	298.5569	255.4357
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	2,163.9121	2,118.6767	2,209.4430	2,232.3182	1,897.0380	1,641.5090	1,457.8097	1,417.9597	1,558.9951	1,810.5626	2,051.3838	2,006.9000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	827.6829	839.5343	907.5081	971.4416	951.8634	935.9276	905.5525	884.7913	886.3655	891.7309	882.6997	821.0483

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	5	1.60	0.00	0.00	15.8474
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	2	41.00	48.00	1.40	3,145.4062
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	136.5767
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	18	2.00	0.37	0.91	149.9607
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	50	0.82	0.53	0.14	150.2368
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1	0.68	1.80	1.00	26.7286

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-72 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,663.49	5,412.74	3,629.92	0.00	10,706.15

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-73
City:	Griffith
State:	Indiana
Company:	Hartsdale
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 73 Griffith Hartsdale Terminal PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	180.00
Volume (gallons):	9,114,000.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Pontoon
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	5
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	18
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	50

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-73 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-73 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	114.9341	119.0340	138.7353	157.8524	156.7138	155.8556	149.2489	143.1310	141.2411	139.1081	133.0811	114.5509
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617
Net Throughput (gal/mo.):	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Roof Fitting Losses (lb):	148.6135	153.2947	180.1111	205.3400	197.7341	191.8093	180.2787	172.1797	172.3819	174.0727	170.3441	146.0279
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	1,228.8973	1,205.4019	1,252.5379	1,264.4122	1,090.1548	956.9813	860.9960	840.1417	913.8953	1,045.1265	1,170.4342	1,147.3081
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	714.6093	723.3904	769.9081	814.2541	805.5096	798.7266	780.5893	766.3725	764.6847	764.2425	754.4869	711.6405

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	5	1.60	0.00	0.00	15.8474
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1	41.00	48.00	1.40	1,572.7031
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	136.5767
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	18	2.00	0.37	0.91	149.9607
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	50	0.82	0.53	0.14	150.2368

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-73 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,663.49	5,412.74	2,092.19	0.00	9,168.41

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-74
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 74 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	180.00
Volume (gallons):	9,114,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	**Quantity**
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	28
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	55
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

GT-74 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-74 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	114.9341	119.0340	138.7353	157.8524	156.7138	155.8556	149.2489	143.1310	141.2411	139.1081	133.0811	114.5509
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617
Net Throughput (gal/mo.):	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Roof Fitting Losses (lb):	58.2364	60.4922	70.0989	79.6503	81.0185	82.7650	81.3248	78.5007	75.8166	72.5018	67.9505	58.6848
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	481.5615	475.6686	487.4854	490.4589	446.6743	412.9339	388.4003	383.0398	401.9475	435.2985	466.8877	461.0730
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	624.2322	630.5879	659.8959	688.5644	688.7940	689.6823	681.6354	672.6934	668.1194	662.6716	652.0933	624.2974

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	12.6779
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	136.5767
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	28	2.00	0.37	0.91	233.2722
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	55	0.82	0.53	0.14	165.2605
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1	0.68	1.80	1.00	26.7286

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-74 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,663.49	5,412.74	867.04	0.00	7,943.27

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-75
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 75 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	180.00
Volume (gallons):	9,114,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	28
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	55
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

GT-75 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-75 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	114.9341	119.0340	138.7353	157.8524	156.7138	155.8556	149.2489	143.1310	141.2411	139.1081	133.0811	114.5509
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617
Net Throughput (gal/mo.):	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Roof Fitting Losses (lb):	58.2364	60.4922	70.0989	79.6503	81.0185	82.7650	81.3248	78.5007	75.8166	72.5018	67.9505	58.6848
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	481.5615	475.6686	487.4854	490.4589	446.6743	412.9339	388.4003	383.0398	401.9475	435.2985	466.8877	461.0730
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	624.2322	630.5879	659.8959	688.5644	688.7940	689.6823	681.6354	672.6934	668.1194	662.6716	652.0933	624.2974

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	12.6779
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	5	6.20	1.20	0.94	136.5767
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	28	2.00	0.37	0.91	233.2722
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	55	0.82	0.53	0.14	165.2605
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1	0.68	1.80	1.00	26.7286

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-75 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,663.49	5,412.74	867.04	0.00	7,943.27

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-76
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 76 Griffith Hartsdale Terminal PTE Calcs 2013

Tank Dimensions

Diameter (ft):	210.00
Volume (gallons):	16,590,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	**Quantity**
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	13
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	105
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

GT-76 - External Floating Roof Tank
Griffith, Indiana

		Daily Liquid Surf. Temperature (deg F)			Liquid Bulk Temp	Vapor Pressure (psia)			Vapor Mol.	Liquid Mass	Vapor Mass	Mol.	Basis for Vapor Pressure
Mixture/Component	Month	Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Weight.	Fract.	Fract.	Weight	Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-76 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	134.0898	138.8730	161.8578	184.1611	182.8327	181.8316	174.1237	166.9862	164.7812	162.2928	155.2613	133.6427
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632
Net Throughput (gal/mo.):	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000
Roof Fitting Losses (lb):	166.2075	171.7047	201.1353	229.1424	223.3308	219.2026	208.1832	199.3353	197.8775	197.3319	191.2547	164.2223
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	1,374.3839	1,350.1659	1,398.7451	1,410.9790	1,231.2754	1,093.6528	994.2651	972.6460	1,049.0622	1,184.7740	1,314.1107	1,290.2571
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	1,004.0605	1,014.3409	1,066.7562	1,117.0667	1,109.9267	1,104.7973	1,086.0700	1,070.0847	1,066.4219	1,063.3878	1,050.2791	1,001.6281

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	Roof Fitting Loss Factors KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	12.6779
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1	41.00	48.00	1.40	1,572.7031
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	13	0.47	0.02	0.97	15.5591
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4	6.20	1.20	0.94	109.2613
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30	2.00	0.37	0.91	249.9345
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	105	0.82	0.53	0.14	315.4973
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1	0.68	1.80	1.00	26.7286

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-76 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,940.73	8,445.16	2,368.93	0.00	12,754.82

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-77
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 77 Griffith Hartsdale Terminal PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	210.00
Volume (gallons):	16,590,000.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Pontoon
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	13
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	105
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

GT-77 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-77 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	134.0898	138.8730	161.8578	184.1611	182.8327	181.8316	174.1237	166.9862	164.7812	162.2928	155.2613	133.6427
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632	703.7632
Net Throughput (gal/mo.):	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000	154,516,130.3000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000	210.0000
Roof Fitting Losses (lb):	166.2075	171.7047	201.1353	229.1424	223.3308	219.2026	208.1832	199.3353	197.8775	197.3319	191.2547	164.2223
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	1,374.3839	1,350.1659	1,398.7451	1,410.9790	1,231.2754	1,093.6528	994.2651	972.6460	1,049.0622	1,184.7740	1,314.1107	1,290.2571
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	1,004.0605	1,014.3409	1,066.7562	1,117.0667	1,109.9267	1,104.7973	1,086.0700	1,070.0847	1,066.4219	1,063.3878	1,050.2791	1,001.6281

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	12.6779
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Wiper	1	41.00	48.00	1.40	1,572.7031
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	13	0.47	0.02	0.97	15.5591
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	4	6.20	1.20	0.94	109.2613
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	30	2.00	0.37	0.91	249.9345
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	105	0.82	0.53	0.14	315.4973
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1	0.68	1.80	1.00	26.7286

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-77 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,940.73	8,445.16	2,368.93	0.00	12,754.82

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-78
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 78 Griffith Hartsdale Terminal PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	180.00
Volume (gallons):	9,114,000.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Pontoon
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	28
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	55
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d

Emissions Report - Detail Format
Liquid Contents of Storage Tank

GT-78 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-78 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	114.9341	119.0340	138.7353	157.8524	156.7138	155.8556	149.2489	143.1310	141.2411	139.1081	133.0811	114.5509
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617	451.0617
Net Throughput (gal/mo.):	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900	84,886,076.6900
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Roof Fitting Losses (lb):	60.0338	62.3647	72.2562	82.0979	83.5624	85.4070	83.9514	81.0424	78.2496	74.7911	70.0629	60.5144
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	496.4245	490.3923	502.4875	505.5305	460.6994	426.1154	400.9448	395.4422	414.8463	449.0431	481.4023	475.4479
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	626.0296	632.4604	662.0531	691.0120	691.3379	692.3243	684.2620	675.2352	670.5524	664.9609	654.2057	626.1270

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	4	1.60	0.00	0.00	12.6779
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	1	8.30	4.40	1.60	219.6069
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	5	0.47	0.02	0.97	5.9843
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	6	6.20	1.20	0.94	163.8920
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	28	2.00	0.37	0.91	233.2722
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	55	0.82	0.53	0.14	165.2605
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Ungask.	1	0.68	1.80	1.00	26.7286

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-78 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,663.49	5,412.74	894.33	0.00	7,970.56

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	GT-79
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 79 Griffith Hartsdale Terminals PTE Calcs 2013
Tank Dimensions	
Diameter (ft):	224.00
Volume (gallons):	16,471,098.00
Turnovers:	111.77
Paint Characteristics	
Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Characteristics	
Type:	Pontoon
Fitting Category	Detail
Tank Construction and Rim-Seal System	
Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	3
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	9
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	40
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	88

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-79 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-79 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	143.0291	148.1312	172.6483	196.4385	195.0216	193.9537	185.7319	178.1186	175.7667	173.1123	165.6120	142.5522
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	655.0493	655.0493	655.0493	655.0493	655.0493	655.0493	655.0493	655.0493	655.0493	655.0493	655.0493	655.0493
Net Throughput (gal/mo.):	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000	153,408,699.5000
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000	224.0000
Roof Fitting Losses (lb):	94.1324	97.3917	113.7519	129.5027	127.7892	127.1723	122.3962	117.5911	115.4414	113.3840	108.7412	93.5308
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	778.3889	765.8204	791.0594	797.4328	704.5318	634.4924	584.5635	573.7795	612.0213	680.7537	747.1606	734.8501
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	892.2108	900.5722	941.4495	980.9905	977.8600	976.1753	963.1794	950.7590	946.2574	941.5456	929.4025	891.1323

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	6.3390
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	3	8.30	4.40	1.60	658.8206
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	9	0.47	0.02	0.97	10.7717
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	81.9460
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	40	2.00	0.37	0.91	333.2460
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	88	0.82	0.53	0.14	264.4168

TANKS 4.0.9d

Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-79 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	2,070.12	7,860.59	1,360.83	0.00	11,291.53

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	GT-80
City:	Griffith
State:	Indiana
Company:	Enbridge
Type of Tank:	External Floating Roof Tank
Description:	Griffith Tank 80 Griffith Hartsdale Terminal PTE Calc 2013

Tank Dimensions

Diameter (ft):	180.00
Volume (gallons):	10,080,000.00
Turnovers:	111.77

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	9
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3
Roof Drain (3-in. Diameter)/90% Closed	1
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	32
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	60

Meterological Data used in Emissions Calculations: Chicago, Illinois (Avg Atmospheric Pressure = 14.38 psia)

TANKS 4.0.9d
Emissions Report - Detail Format

Liquid Contents of Storage Tank

GT-80 - External Floating Roof Tank
Griffith, Indiana

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Crude oil (RVP 8)	Jan	37.44	33.86	41.02	49.02	3.6290	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Feb	39.72	35.80	43.63	49.02	3.7898	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Mar	45.28	40.85	49.70	49.02	4.2069	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Apr	50.79	45.46	56.12	49.02	4.6549	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	May	55.79	49.61	61.97	49.02	5.0928	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jun	60.28	53.94	66.63	49.02	5.5134	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Jul	62.24	56.14	68.35	49.02	5.7048	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Aug	61.28	55.62	66.94	49.02	5.6103	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Sep	57.55	52.21	62.90	49.02	5.2548	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Oct	51.94	47.01	56.86	49.02	4.7525	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Nov	45.82	42.12	49.53	49.02	4.2497	N/A	N/A	50.0000			207.00	Option 4: RVP=8
Crude oil (RVP 8)	Dec	39.75	36.52	42.98	49.02	3.7925	N/A	N/A	50.0000			207.00	Option 4: RVP=8

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

GT-80 - External Floating Roof Tank
Griffith, Indiana

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	114.9341	119.0340	138.7353	157.8524	156.7138	155.8556	149.2489	143.1310	141.2411	139.1081	133.0811	114.5509
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.6290	3.7898	4.2069	4.6549	5.0928	5.5134	5.7048	5.6103	5.2548	4.7525	4.2497	3.7925
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Withdrawal Losses (lb):	498.8701	498.8701	498.8701	498.8701	498.8701	498.8701	498.8701	498.8701	498.8701	498.8701	498.8701	498.8701
Net Throughput (gal/mo.):	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600	93,883,218.4600
Shell Clingage Factor (bbl/1000 sqft):	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060	0.0060
Average Organic Liquid Density (lb/gal):	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000	7.1000
Tank Diameter (ft):	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000	180.0000
Roof Fitting Losses (lb):	72.1920	74.7728	87.1450	99.1590	98.6668	98.9073	95.7481	92.1099	90.0123	87.7518	83.6249	72.0086
Value of Vapor Pressure Function:	0.0726	0.0763	0.0863	0.0974	0.1088	0.1203	0.1256	0.1230	0.1132	0.0999	0.0873	0.0764
Vapor Molecular Weight (lb/lb-mole):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Product Factor:	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	596.9613	587.9612	606.0281	610.5863	543.9736	493.4718	457.2848	449.4451	477.2067	526.8589	574.5868	565.7549
Average Wind Speed (mph):	11.7000	11.5000	11.9000	12.0000	10.5000	9.3000	8.4000	8.2000	8.9000	10.1000	11.2000	11.0000
Total Losses (lb):	685.9962	692.6769	724.7503	755.8814	754.2507	753.6331	743.8671	734.1110	730.1234	725.7300	715.5761	685.4295

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	2	1.60	0.00	0.00	6.3390
Unslotted Guide-Pole Well/Gasketed sliding Cover, w. Wiper	1	14.00	3.70	0.78	61.5588
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve,Wiper	2	8.30	4.40	1.60	439.2138
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	9	0.47	0.02	0.97	10.7717
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	3	6.20	1.20	0.94	81.9460
Roof Drain (3-in. Diameter)/90% Closed	1	1.80	0.14	1.10	5.9703
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Ungasketed	32	2.00	0.37	0.91	266.5968
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Ungasketed	60	0.82	0.53	0.14	180.2842

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

GT-80 - External Floating Roof Tank
Griffith, Indiana

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Crude oil (RVP 8)	1,663.49	5,986.44	1,052.10	0.00	8,702.03

TANKS 4.0.9d
Emissions Report - Detail Format
Total Emissions Summaries - All Tanks in Report

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

Tank Identification				Losses (lbs)
GT-1601	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,060.19
GT-1602	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,060.19
GT-1603	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,431.42
GT-1604	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,060.19
GT-1605	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,060.19
GT-1607	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,065.82
GT-1608	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,060.19
GT-1609	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	5,060.19
GT-1610	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	12,687.77
GT-1611	Enbridge	External Floating Roof Tank	Hartsdale, Indiana	10,489.15
GT-70	Enbridge	External Floating Roof Tank	Griffith, Indiana	7,736.95
GT-71	Enbridge	External Floating Roof Tank	Griffith, Indiana	9,187.70
GT-72	Enbridge	External Floating Roof Tank	Griffith, Indiana	10,706.15
GT-73	Hartsdale	External Floating Roof Tank	Griffith, Indiana	9,168.41
GT-74	Enbridge	External Floating Roof Tank	Griffith, Indiana	7,943.27
GT-75	Enbridge	External Floating Roof Tank	Griffith, Indiana	7,943.27
GT-76	Enbridge	External Floating Roof Tank	Griffith, Indiana	12,754.82
GT-77	Enbridge	External Floating Roof Tank	Griffith, Indiana	12,754.82

GT-78	Enbridge	External Floating Roof Tank	Griffith, Indiana	7,970.56
GT-79	Enbridge	External Floating Roof Tank	Griffith, Indiana	11,291.53
GT-80	Enbridge	External Floating Roof Tank	Griffith, Indiana	8,702.03
Total Emissions for all Tanks:				170,194.82

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

Thomas W. Easterly
Commissioner

SENT VIA U.S. MAIL: CONFIRMED DELIVERY AND SIGNATURE REQUESTED

TO: Rhonda O'Leary
Enbridge Energy – Hartsdale/Griffith Terminal
1320 Grand Avenue
Superior, WI 54880

DATE: September 11, 2013

FROM: Matt Stuckey, Branch Chief
Permits Branch
Office of Air Quality

SUBJECT: Final Decision
Significant Permit Modification to a Part 70 Operating Permit
089-33314-00497

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:
John Gauderman, GM – Chicago Region
Lillian Woolley, Barr Engineering Company
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 6/13/2013

September 11, 2013

TO: Lake 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: Enbridge Energy – Hartsdale/Griffith Terminal
Permit Number: 089-33314-00497

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 6/13/2013

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100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Michael R. Pence
Governor

Thomas W. Easterly
Commissioner

TO: Interested Parties / Applicant

DATE: September 11, 2013

RE: Enbridge Energy – Hartsdale/Griffith Terminal / 089-33314-00497

FROM: Matthew Stuckey, Branch Chief
Permits Branch
Office of Air Quality

In order to conserve paper and reduce postage costs, IDEM's Office of Air Quality is now sending many permit decisions on CDs in Adobe PDF format. The enclosed CD contains information regarding the company named above.

This permit is also available on the IDEM website at:
http://www.in.gov/ai/appfiles/idem-caats/

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

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

Please Note: *If you feel you have received this information in error, or would like to be removed from the Air Permits mailing list, please contact Patricia Pear with the Air Permits Administration Section at 1-800-451-6027, ext. 3-6875 or via e-mail at PPEAR@IDEM.IN.GOV.*

Enclosures
CD Memo.dot 6/13/2013

Mail Code 61-53

IDEM Staff	VHAUN 9/11/2013 Enbridge Energy-Hartsdale/Griffith Terminal 089-33314-00497 FINAL			AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING
Name and address of Sender	▶	Indiana Department of Environmental Management Office of Air Quality – Permits Branch 100 N. Senate Indianapolis, IN 46204	Type of Mail: **CERTIFICATE OF MAILING ONLY**	

Line	Article Number	Name, Address, Street and Post Office Address	Postage	Handing Charges	Act. Value (If Registered)	Insured Value	Due Send if COD	R.R. Fee	S.D. Fee	S.H. Fee	Rest. Del. Fee Remarks
1		Rhonda OLeary Enbridge Energy-Hartsdale/Griffith Terminal 1320 Grand Ave Superior WI 54880 (Source CAATS) Confirmed Delivery									
2		John Gauderman GM - Chicago Region Enbridge Energy-Hartsdale/Griffith Terminal 1500 W Main St Griffith IN 46319-0630 *(RO CAATS)*									
3		East Chicago City Council 4525 Indianapolis Blvd East Chicago IN 46312 *(Local Official)*									
4		Gary - Hobart Water Corp 650 Madison St, P.O. Box M486 Gary IN 46401-0486 *(Affected Party)*									
5		Lake County Health Department-Gary 1145 W. 5th Ave Gary IN 46402-1795 *(Health Department)*									
6		WJOB / WZVN Radio 6405 Olcott Ave Hammond IN 46320 *(Affected Party)*									
7		Schererville Town Council and Town Manager 10 E Joliet Street Schererville IN 46375 *(Local Official)*									
8		Shawn Sobocinski 3229 E. Atlanta Court Portage IN 46368 *(Affected Party)*									
9		Mark Coleman 107 Diana Road Portage IN 46368 *(Affected Party)*									
10		Mr. Chris Hernandez Pipefitters Association, Local Union 597 8762 Louisiana St., Suite G Merrillville IN 46410 *(Affected Party)*									
11		Craig Hogarth 7901 West Morris Street Indianapolis IN 46231 *(Affected Party)*									
12		Lake County Commissioners 2293 N. Main St, Building A 3rd Floor Crown Point IN 46307 *(Local Official)*									
13		Griffith Town Council 111 N Broad Street Griffith IN 46319 (Local Official)									
14		Calumet Township Trustee 35 E. 5th Ave Gary IN 46402 *(Affected Party)*									
15		ST. John Township Trustee 1515 Lincoln HWY Schererville IN 46375 *(Affected Party)*									

Total number of pieces Listed by Sender	Total number of Pieces Received at Post Office	Postmaster, Per (Name of Receiving employee)	The full declaration of value is required on all domestic and international registered mail. The maximum indemnity payable for the reconstruction of nonnegotiable documents under Express Mail document reconstructing insurance is $50,000 per piece subject to a limit of $50, 000 per occurrence. The maximum indemnity payable on Express mil merchandise insurance is $500. The maximum indemnity payable is $25,000 for registered mail, sent with optional postal insurance. See ***Domestic Mail Manual*** **R900, S913**, and **S921** for limitations of coverage on inured and COD mail. See ***International Mail Manual*** for limitations o coverage on international mail. Special handling charges apply only to Standard Mail (A) and Standard Mail (B) parcels.
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Mail Code 61-53

IDEM Staff	VHAUN 9/11/2013 Enbridge Energy-Hartsdale/Griffith Terminal 089-33314-00497 FINAL			AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING
Name and address of Sender	▶	Indiana Department of Environmental Management Office of Air Quality – Permits Branch 100 N. Senate Indianapolis, IN 46204	Type of Mail: **CERTIFICATE OF MAILING ONLY**	

Line	Article Number	Name, Address, Street and Post Office Address	Postage	Handing Charges	Act. Value (If Registered)	Insured Value	Due Send if COD	R.R. Fee	S.D. Fee	S.H. Fee	Rest. Del. Fee Remarks
1		Lake County Public Library-Griffith Branch 940 North Broad Street Griffith IN 46319 (Library)									
2		Anthony Copeland 2006 E. 140th Street East Chicago IN 46312 *(Affected Party)*									
3		Barbara G. Perez 506 Lilac Street East Chicago IN 46312 *(Affected Party)*									
4		Mr. Robert Garcia 3733 Parrish Avenue East Chicago IN 46312 *(Affected Party)*									
5		Ms. Karen Kroczek 8212 Madison Ave Munster IN 46321-1627 *(Affected Party)*									
6		Joseph Hero 11723 S Oakridge Drive St. John IN 46373 *(Affected Party)*									
7		Gary City Council 401 Broadway # 209 Gary IN 46402 *(Local Official)*									
8		Mr. Larry Davis 268 South, 600 West Hebron IN 46341 *(Affected Party)*									
9		Ryan Dave 939 Cornwallis Munster IN 46321 *(Affected Party)*									
10		Matt Mikus 409 Yellowstone Rd - Apt 1 Valparaiso IN 46385 *(Affected Party)*									
11		Ms. Lillian Woolley Barr Engineering Company 3005 Boardwalk St, Ste 100 Ann Arbor MI 48108 *(Consultant)*									
12											
13											
14											
15											

Total number of pieces Listed by Sender	Total number of Pieces Received at Post Office	Postmaster, Per (Name of Receiving employee)	The full declaration of value is required on all domestic and international registered mail. The maximum indemnity payable for the reconstruction of nonnegotiable documents under Express Mail document reconstructing insurance is $50,000 per piece subject to a limit of $50, 000 per occurrence. The maximum indemnity payable on Express mil merchandise insurance is $500. The maximum indemnity payable is $25,000 for registered mail, sent with optional postal insurance. See ***Domestic Mail Manual* R900, S913**, and **S921** for limitations of coverage on inured and COD mail. See ***International Mail Manual*** for limitations o coverage on international mail. Special handling charges apply only to Standard Mail (A) and Standard Mail (B) parcels.
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