

**CONSTRUCTION PERMIT
OFFICE OF AIR MANAGEMENT**

**Indiana Veterans' Home
3851 N. River Road
West Lafayette, Indiana 47906**

is hereby authorized to construct

one (1) natural gas and number 2 fuel oil-fired boiler, designated as boiler #3, with a maximum heat input capacity of 20.2 million British thermal units per hour, with emissions uncontrolled.

This permit is issued to the above mentioned company (herein known as the Permittee) under the provisions of 326 IAC 2-1 and 40 CFR 52.780, with conditions listed on the attached pages.

Construction Permit No.: CP-157-10005-00009	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Management	Issuance Date:

Construction Conditions

General Construction Conditions

1. That the data and information supplied with the application shall be considered part of this permit. Prior to any proposed change in construction which may affect allowable emissions, the change must be approved by the Office of Air Management (OAM).
2. That this permit to construct does not relieve the Permittee of the responsibility to comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder, as well as other applicable local, state, and federal requirements.

Effective Date of the Permit

3. That pursuant to IC 13-15-5-3, this permit becomes effective upon its issuance.
4. That pursuant to 326 IAC 2-1-9(b)(Revocation of Permits), the Commissioner may revoke this permit if construction is not commenced within eighteen (18) months after receipt of this approval or if construction is suspended for a continuous period of one (1) year or more.
5. That notwithstanding Construction Condition No. 6, all requirements and conditions of this construction permit shall remain in effect unless modified in a manner consistent with procedures established for modifications of construction permits pursuant to 326 IAC 2 (Permit Review Rules).

First Time Operation Permit

6. That this document shall also become a first-time operation permit pursuant to 326 IAC 2-1-4 (Operating Permits) when, prior to start of operation, the following requirements are met:
 - (a) The attached affidavit of construction shall be submitted to the Office of Air Management (OAM), Permit Administration & Development Section, verifying that the facilities were constructed as proposed in the application. The facilities covered in the Construction Permit may begin operating on the date the Affidavit of Construction is postmarked or hand delivered to IDEM.
 - (b) If construction is completed in phases; i.e., the entire construction is not done continuously, a separate affidavit must be submitted for each phase of construction. Any permit conditions associated with operation start up dates such as stack testing for New Source Performance Standards (NSPS) shall be applicable to each individual phase.
 - (c) Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.
 - (d) The operation permit will be subject to annual operating permit fees pursuant to 326 IAC 2-7-19 (Fees).

- (e) Pursuant to 326 IAC 2-7-4, the Permittee shall apply for a Title V operating permit within twelve (12) months after the source becomes subject to Title V. This 12-month period starts at the postmarked submission date of the Affidavit of Construction. If the construction is completed in phases, the 12-month period starts at the postmarked submission date of the Affidavit of Construction that triggers the Title V applicability. The operation permit issued shall contain as a minimum the conditions in the Operation Conditions section of this permit.

NSPS Reporting Requirement

- 7. That pursuant to the New Source Performance Standards (NSPS), Part 60.40c, Subpart Dc, the source owner/operator is hereby advised of the requirement to report the following at the appropriate times:
 - (a) Commencement of construction date (no later than 30 days after such date);
 - (b) Anticipated start-up date (not more than 60 days or less than 30 days prior to such date);
 - (c) Actual start-up date (within 15 days after such date); and
 - (d) Date of performance testing (at least 30 days prior to such date), when required by a condition elsewhere in this permit.

Reports are to be sent to:

Indiana Department of Environmental Management
Compliance Data Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, IN 46206-6015

The application and enforcement of these standards have been delegated to the IDEM-OAM. The requirements of 40 CFR Part 60 are also federally enforceable.

- 8. That when the facility is constructed and placed into operation the following operation conditions shall be met:

Operation Conditions

General Operation Conditions

- 1. That the data and information supplied in the application shall be considered part of this permit. Prior to any change in the operation which may result in an increase in allowable emissions exceeding those specified in 326 IAC 2-1-1 (Construction and Operating Permit Requirements), the change must be approved by the Office of Air Management (OAM).
- 2. That the Permittee shall comply with the provisions of the Indiana Environmental Management Law (IC 13-11 through 13-20; 13-22 through 13-25; and 13-30), the Air Pollution Control Law (IC 13-17) and the rules promulgated thereunder.

Preventive Maintenance Plan

3. That pursuant to 326 IAC 1-6-3 (Preventive Maintenance Plans), the Permittee shall prepare and maintain a preventive maintenance plan, including the following information:

- (a) Identification of the individual(s) responsible for inspecting, maintaining, and repairing emission control devices.
- (b) A description of the items or conditions that will be inspected and the inspection schedule for said items or conditions.
- (c) Identification of the replacement parts which will be maintained in inventory for quick replacement.

The preventive maintenance plan shall be submitted to IDEM, OAM upon request and shall be subject to review and approval.

Transfer of Permit

4. That pursuant to 326 IAC 2-1-6 (Transfer of Permits):

- (a) In the event that ownership of this hospital is changed, the Permittee shall notify OAM, Permit Branch, within thirty (30) days of the change. Notification shall include the date or proposed date of said change.
- (b) The written notification shall be sufficient to transfer the permit from the current owner to the new owner.
- (c) The OAM shall reserve the right to issue a new permit.

Permit Revocation

5. That pursuant to 326 IAC 2-1-9(a)(Revocation of Permits), this permit to construct and operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this permit.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this permit.
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this permit shall not require revocation of this permit.
- (d) Noncompliance with orders issued pursuant to 326 IAC 1-5 (Episode Alert Levels) to reduce emissions during an air pollution episode.
- (e) For any cause which establishes in the judgment of IDEM, the fact that continuance of this permit is not consistent with purposes of 326 IAC 2-1 (Permit Review Rules).

Availability of Permit

6. That pursuant to 326 IAC 2-1-3(l), the Permittee shall maintain the applicable permit on the premises of this source and shall make this permit available for inspection by the IDEM, or other public official having jurisdiction.

Performance Testing

7. That pursuant to 326 IAC 2-1-3 (Construction and Operating Permit Requirements) compliance stack tests shall be performed for opacity from the boiler #3 when combusting #2 fuel oil, within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up. These tests shall be performed according to 326 IAC 3-6 (Source Sampling Procedures) using the methods specified in the rule or as approved by the Commissioner.
- (a) A test protocol shall be submitted to the OAM, Compliance Data Section, 35 days in advance of the test.
 - (b) The Compliance Data Section shall be notified of the actual test date at least two (2) weeks prior to the date.
 - (c) All test reports must be received by the Compliance Data Section within 45 days of completion of the testing.
 - (d) Whenever the results of the stack test performed exceed the level specified in any condition of this permit, the Permittee shall take appropriate corrective actions. The Permittee shall submit a description of these corrective actions to IDEM, OAM, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize emissions from the affected facility while the corrective actions are being implemented. IDEM, OAM shall notify the Permittee within thirty (30) days, if the corrective actions taken are deficient. The Permittee shall submit a description of additional corrective actions taken to IDEM, OAM within thirty (30) days of receipt of the notice of deficiency. IDEM, OAM reserves the right to use enforcement activities to resolve noncompliant stack tests.
 - (e) Whenever the results of the stack test performed exceed the level specified in this permit, a second test to demonstrate compliance shall be performed within 120 days. Failure of the second test to demonstrate compliance may be grounds for immediate revocation of this permit to operate the affected facility.

Annual Emission Reporting

8. That pursuant to 326 IAC 2-6 (Emission Reporting), the Permittee must annually submit an emission statement for the source. This statement must be received by July 1 of each year and must comply with the minimum requirements specified in 326 IAC 2-6-4. The annual statement must be submitted to:

Indiana Department of Environmental Management
Technical Support and Modeling Section, Office of Air Management
100 North Senate Avenue, P. O. Box 6015
Indianapolis, Indiana 46206-6015

The annual emission statement covers the twelve (12) consecutive month time period starting January 1 and ending December 31.

Opacity Limitations

9. That pursuant to 326 IAC 5-1-2 (Visible Emission Limitations) except as provided in 326 IAC 5-1-3 (Temporary Exemptions) and by the New Source Performance Standard, 326 IAC 12, (40 CFR Part 60.40c, Subpart Dc), the visible emissions shall meet the following:

- (a) visible emissions shall not exceed an average of 40% opacity in 24 consecutive readings.
- (b) visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

Particulate Matter Limitation

10. That pursuant to 326 IAC 6-2-4, the particulate matter (PM) emissions from the 20.2 million Btu per hour boiler #3 shall be limited to 0.39 pounds/MMBTU heat input. This limitation is based on the following equation:

$$Pt = \frac{1.09}{Q^{0.26}}$$

where Pt = Pounds of particulate matter emitted per million Btu heat input (lb/MMBtu).

Q = Total source maximum operating capacity rating in million Btu per hour of heat input. The maximum operating capacity rating is defined as the maximum capacity at which the facility is operated or the nameplate capacity, whichever is specified in the facility's operation permit application, except when some lower capacity is contained in the facility's operation permit; in which case, the capacity specified in the operation permit shall be used.

Visible Emission Notations

11. When combusting fuel oil, daily visible emission notations of the boiler #3 stack exhaust shall be performed during normal daylight operations when exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.

- (a) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, 80% of the time, the process is in operation, not counting start up or shut down time.
- (b) In the case of batch or discontinuous operation, readings shall be taken during that part of the operation specified in the facility's specific condition prescribing visible emissions.
- (c) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal and abnormal visible emissions for that specific process.
- (d) The Preventive Maintenance Plan for this facility shall contain troubleshooting contingency and corrective actions for when an abnormal emission is observed.

Sulfur Dioxide Emission Limitations

12. That pursuant to 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations) and 40 CFR Part 60.40c, Subpart Dc, sulfur dioxide (SO₂) emissions from the 20.2 million Btu per hour boiler #3 shall be limited to 0.5 pound per million BTU heat input.

Sulfur Dioxide Record Keeping and Reporting Requirements

13. That pursuant to 326 IAC 7-2-1 (Sulfur Dioxide Compliance Reporting) and 40 CFR Part 60.40c, Subpart Dc, a quarterly report shall be submitted including the average sulfur content, heat content, the sulfur dioxide emission rate in pounds per million Btu, and the #2 fuel oil consumptions. Fuel sampling and analysis data shall be collected pursuant to the procedures specified in 326 IAC 3-7-4 for oil combustion.

Fuel Oil Analysis

14. That oil samples shall be collected from the fuel tank immediately after the tank is filled and before any oil is combusted.
- (a) The Permittee shall analyze the oil sample to determine the sulfur content of the oil in accordance with 326 IAC 3-7-4.
- (b) If a partially empty tank is refilled, a new sample and analysis is required upon filling. Vendor analysis of each delivered load is acceptable, in lieu of the above, if accompanied by a certification.

Open Burning

15. That 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.

Emergency Reduction Plans

16. Pursuant to 326 IAC 1-5-2 (Emergency Reduction Plans; Submission):
- (a) The Permittee shall prepare written emergency reduction plans (ERPs) consistent with safe operating procedures.
- (b) These ERPs shall be submitted for approval to:
- Indiana Department of Environmental Management
Compliance Branch, Office of Air Management
100 North Senate Avenue, P.O. Box 6015
Indianapolis, Indiana 46206-6015
- within 180 calendar days from the date on which this boiler #3 commences operation.
- (c) If the ERP is disapproved by IDEM, OAM, the Permittee shall have an additional thirty (30) days to resolve the differences and submit an approvable ERP.
- (d) These ERPs shall state those actions that will be taken, when each episode level is declared, to reduce or eliminate emissions of the appropriate air pollutants.

- (e) Said ERPs shall also identify the sources of air pollutants, the approximate amount of reduction of the pollutants, and a brief description of the manner in which the reduction will be achieved.

- (f) Upon direct notification by IDEM, OAM, 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 level. [326 IAC 1-5-3]

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR MANAGEMENT
COMPLIANCE DATA SECTION**

Quarterly Report

Source Name: Indiana Veterans' Home
Source Address: 3851 N. River Road, West Lafayette, Indiana 47906
Mailing Address: 3851 N. River Road, West Lafayette, Indiana 47906
Permit No.: CP-157-10005-00009
Facility: boiler #3
Parameter: Sulfur content and heat content of fuel oil used, amount of fuel oil used, and SO₂ emissions
Limits: SO₂ emissions of 0.5 lb/MMBTU of heat input when combusting #2 fuel oil

Month: _____ Year: _____

Month	Sulfur Content (%)	Heat Content	Fuel usage (gal/month)	SO ₂ Emissions (lb/MMBTU)

9 No deviation occurred in this month.
9 Deviation/s occurred in this month.
Deviation has been reported on: _____

Submitted by: _____

Title/Position: _____

Signature: _____

Date: _____

Phone: _____

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR MANAGEMENT
COMPLIANCE DATA SECTION**

NATURAL GAS FIRED BOILER CERTIFICATION

Source Name: Indiana Veterans' Home
Source Address: 3851 N. River Road, West Lafayette, Indiana 47906
Mailing Address: 3851 N. River Road, West Lafayette, Indiana 47906
Permit No.: CP-157-10005-00009

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

Report period

Beginning: _____

Ending: _____

Boiler Affected

Alternate Fuel

Days burning alternate fuel

From

To

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:

Date:

Indiana Department of Environmental Management Office of Air Management

Technical Support Document (TSD) for New Construction and Operation

Source Background and Description

Source Name: Indiana Veterans' Home
 Source Location: 3851 N. River Road, West Lafayette, Indiana 47906
 County: Tippecanoe
 Construction Permit No.: CP-157-10005-00009
 SIC Code: 8060
 Permit Reviewer: Nisha Sizemore

The Office of Air Management (OAM) has reviewed an application from Indiana Veterans' Home relating to the construction and operation of boilers, consisting of the following equipment:

- (a) one (1) natural gas and number 2 fuel oil-fired boiler, designated as boiler #3, with a maximum heat input capacity of 20.2 million British thermal units per hour, with emissions uncontrolled.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
4	boiler #3	10	--	--	--

Recommendation

The staff recommends to the Commissioner that the construction and operation be approved. This recommendation is based on the following facts and conditions:

Information, unless otherwise stated, used in this review was derived from the application and additional information submitted by the applicant.

A complete application for the purposes of this review was received on August 3, 1998.

Emissions Calculations

See Appendix A (Emissions Calculation Spreadsheets) for detailed calculations (4 pages).

Total Potential and Allowable Emissions

Indiana Permit Allowable Emissions Definition (after compliance with applicable rules, based on 8,760 hours of operation per year at rated capacity):

Pollutant	Allowable Emissions (tons/year)	Potential Emissions (tons/year)
Particulate Matter (PM)	89.5	1.27
Particulate Matter (PM10)	89.5	1.27
Sulfur Dioxide (SO ₂)	44.2	45.2
Volatile Organic Compounds (VOC)	0.13	0.13
Carbon Monoxide (CO)	3.18	3.18
Nitrogen Oxides (NO _x)	12.7	12.7
Single Hazardous Air Pollutant (HAP)	0.00	0.00
Combination of HAPs	0.00	0.00

- (a) Allowable PM emissions are determined from the applicability of rule 326 IAC 6-2. Allowable SO₂ emissions are determined from the applicability of rule 326 IAC 7-1. See attached spreadsheets for detailed calculations.
- (b) The potential PM emissions before control are less than the allowable PM emissions, therefore, the potential PM emissions before control are used for the permitting determination.
- (c) The allowable SO₂ emissions based on the rules cited are less than the potential SO₂ emissions, therefore, the allowable emissions are used for the permitting determination.
- (d) Allowable emissions (as defined in the Indiana Rule) of SO₂ are greater than 25 tons per year. Therefore, pursuant to 326 IAC 2-1, Sections 1 and 3, a construction permit is required.

County Attainment Status

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO_x) are precursors for the formation of ozone. Therefore, VOC and NO_x emissions are considered when evaluating the rule applicability relating to the ozone standards. Tippecanoe County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO_x emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Tippecanoe County has been classified as attainment or unclassifiable for all criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

Source Status

Existing Source PSD, Part 70 or FESOP Definition (emissions after controls, based on 8,760 hours of operation per year at rated capacity and/ or as otherwise limited):

Pollutant	Emissions (ton/yr)
PM	11.0
PM10	11.0
SO ₂	75.5
VOC	4.24
CO	18.4
NO _x	27.0

- (a) This existing source is **not** a major stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or more, and it is not in one of the 28 listed source categories.
- (b) These emissions were based on calculations as shown in Appendix A of this document.

Proposed Modification

PTE from the proposed modification (based on 8,760 hours of operation per year at rated capacity including enforceable emission control and production limit, where applicable):

Pollutant	PM (ton/yr)	PM10 (ton/yr)	SO ₂ (ton/yr)	VOC (ton/yr)	CO (ton/yr)	NO _x (ton/yr)
Proposed Modification	1.27	1.27	44.2	0.2	3.18	12.7
PSD or Offset Threshold Level	250	250	250	250	250	250

This modification to an existing minor stationary source is not major because the emission increase is less than the PSD significant levels. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This existing source, including the emissions from this permit CP-157-10005-00009, is now subject to the Part 70 Permit requirements because the potential to emit (PTE) of SO₂ emissions is greater than 100 tons per year.

This status is based on all the air approvals issued to the source.

Federal Rule Applicability

- (a) This boiler #3 is subject to the New Source Performance Standard, 326 IAC 12, (40 CFR Part 60.40c, Subpart Dc) because it will be constructed after June 9, 1989 and has a heat input capacity greater than 10 million Btu per hour but equal to or less than 100 million Btu per hour.

Pursuant to this rule, the following conditions shall apply:

- (1) The opacity from the boiler #3 shall not exceed twenty percent (20%).
 - (2) Within 180 days after the issuance of this permit, opacity testing shall be conducted for boiler #3.
 - (3) The SO₂ emissions from the boiler #3 shall not exceed 0.5 pound per million Btu of heat input.
 - (4) Records shall be kept of the amounts of each fuel combusted during each day.
- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Part 63, applicable to this source.

State Rule Applicability

326 IAC 2-6 (Emission Reporting)

This facility is subject to 326 IAC 2-6 (Emission Reporting), because the source emits more than 100 tons per year of VOC. Pursuant to this rule, the owner/operator of this facility must annually submit an emission statement of the facility. The annual statement must be received by July 1 of each year and must contain the minimum requirements as specified in 326 IAC 2-6-4.

326 IAC 5-1-2 (Visible Emission Limitations)

Pursuant to this rule, except as provided in 326 IAC 5-1-3 (Temporary Exemptions) and by the New Source Performance Standard, 326 IAC 12, (40 CFR Part 60.40c, Subpart Dc), the visible emissions shall meet the following:

- (a) visible emissions shall not exceed an average of 40% opacity in 24 consecutive readings.
- (b) visible emissions shall not exceed 60% opacity for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period.

326 IAC 6-2 (Particulate Emissions Limitations for Sources of Indirect Heating)

The 20.2 million Btu per hour natural gas fired boiler #3 is subject 326 IAC 6-2 (Particulate Emissions Limitations for Sources of Indirect Heating). Pursuant to 326 IAC 6-2-4, the particulate matter (PM) emissions shall be limited to 0.39 pound per million BTU heat input.

Based on calculations shown in Appendix A of this document, the controlled potential emissions are less than the allowable emissions, therefore, boiler #3 complies with the rule.

326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations)

The boiler #3 is subject to this rule because the boiler has the potential to emit greater than 25 tons per year or 10 pounds per hour of SO₂. When combusting #2 fuel oil, the SO₂ emissions from boiler #3 shall not exceed 0.5 pound per million Btu of heat input. In order to comply with this limit, the sulfur content of the fuel oil shall not exceed 0.5 weight percent.

326 IAC 7-2-1 (Sulfur Dioxide Compliance Reporting)

Pursuant to this rule, a quarterly report shall be submitted including the average sulfur content, heat content, the sulfur dioxide emission rate in pounds per million Btu, and the #2 fuel oil consumptions. Fuel sampling and analysis data shall be collected pursuant to the procedures specified in 326 IAC 3-7-4 for oil combustion.

Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 187 hazardous air pollutants set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Construction Permit Application Form Y.

- (a) None of these listed air toxics will be emitted from this proposed construction.
- (b) See attached spreadsheets for detailed air toxic calculations.

Conclusion

The construction of this boiler #3 will be subject to the conditions of the attached proposed Construction Permit No. CP-157-10005-00009.

Boiler #1

**Appendix A: Emissions Calculations
Industrial Boilers
#1 and #2 Fuel Oil**

Company Name: Indiana Veterans' Home
Address, City IN Zip: 3851 N. River Road, W. Lafayette, IN 47906
CP: 157-10005-00009
Reviewer: Nisha Sizemore

Heat Input Capacity
MMBtu/hr

Potential Throughput
kgals/year

S = Weight % Sulfur
0.5

20.2

1273.03597

Emission Factor in lb/kgal	Pollutant				
	PM	SO2	NOx	VOC	CO
	2.0	71 (142.0S)	20.0	0.20	5.0
Potential Emission in tons/yr	1.273	45.193	12.730	0.127	3.183

Methodology

1 gallon of No. 2 Fuel Oil has a heating value of 139,000 Btu

Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MM Btu

Emission Factors are from AP 42, Tables 1.3-2 and 1.3-4 (SCC 1-02-005-01/02/03)

Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton

Boiler #2

**Appendix A: Emissions Calculations
Industrial Boilers
#1 and #2 Fuel Oil**

Company Name: Indiana Veterans' Home
Address, City IN Zip: 3851 N. River Road, W. Lafayette, IN 47906
CP: 157-10005-00009
Reviewer: Nisha Sizemore

Heat Input Capacity Potential Throughput S = Weight % Sulfur
MMBtu/hr kgals/year

 762.561151

Emission Factor in lb/kgal	Pollutant				
	PM	SO2	NOx	VOC	CO
	2.0	71 (142.0S)	20.0	0.20	5.0
Potential Emission in tons/yr	0.763	27.071	7.626	0.076	1.906

Methodology

1 gallon of No. 2 Fuel Oil has a heating value of 139,000 Btu

Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MM Btu

Emission Factors are from AP 42, Tables 1.3-2 and 1.3-4 (SCC 1-02-005-01/02/03)

Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton

Boiler #3**Appendix A: Emissions Calculations
Industrial Boilers
#1 and #2 Fuel Oil**

Company Name: Indiana Veterans' Home
Address, City IN Zip: 3851 N. River Road, W. Lafayette, IN 47906
CP: 157-10005-00009
Reviewer: Nisha Sizemore

Heat Input Capacity Potential Throughput S = Weight % Sulfur
MMBtu/hr kgals/year
 1273.03597

Emission Factor in lb/kgal	Pollutant				
	PM	SO2	NOx	VOC	CO
	2.0	28.4 (142.0S)	20.0	0.20	5.0
Potential Emission in tons/yr	1.273	18.077	12.730	0.127	3.183

Methodology

1 gallon of No. 2 Fuel Oil has a heating value of 139,000 Btu

Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MM Btu

Emission Factors are from AP 42, Tables 1.3-2 and 1.3-4 (SCC 1-02-005-01/02/03)

Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton

Boiler #3

**Appendix A: Emissions Calculations
Industrial Boilers
#1 and #2 Fuel Oil**

Company Name: Indiana Veterans' Home
Address, City IN Zip: 3851 N. River Road, W. Lafayette, IN 47906
CP: 157-10005-00009
Reviewer: Nisha Sizemore

Heat Input Capacity
MMBtu/hr

Potential Throughput
kgals/year

S = Weight % Sulfur
0.5

20.2

1273.03597

Emission Factor in lb/kgal	Pollutant				
	PM	SO2	NOx	VOC	CO
	2.0	71 (142.0S)	20.0	0.20	5.0
Potential Emission in tons/yr	1.273	45.193	12.730	0.127	3.183

Methodology

1 gallon of No. 2 Fuel Oil has a heating value of 139,000 Btu

Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MM Btu

Emission Factors are from AP 42, Tables 1.3-2 and 1.3-4 (SCC 1-02-005-01/02/03)

Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton

Boiler #3**Appendix A: Emissions Calculations****Natural Gas Combustion Only****10 < MM BTU/HR <100****Small Industrial Boiler****Company Name: Indiana Veterans' Home****Address, City IN Zip: 3851 N. River Road, W. Lafayette, IN 47906****CP: 157-10005-00009****Reviewer: Nisha Sizemore**Heat Input Capacity
MMBtu/hrPotential Throughput
MMCF/yr

20.2

177.0

Pollutant

Emission Factor in lb/MMCF	PM	PM10	SO2	NOx	VOC	CO
	13.7	13.7	0.6	140.0	2.8	35.0
Potential Emission in tons/yr	1.2	1.2	0.1	12.4	0.2	3.1

Methodology

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Emission Factors for NOx: Uncontrolled = 140, Low NOx Burner = 81, Flue gas recirculation = 30

Emission Factors for CO: Uncontrolled = 35, Low NOx Burner = 61, Flue gas recirculation = 37

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, as amended 10/96, and 1.4-3, SCC #1-02-006-02

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

boiler #3

**Appendix A: Emissions Calculations
Commercial/Institutional/Residential Combustors
#2 Fuel Oil**

**Company Name: Indiana Veterans' Home
Address, City IN Zip: 3851 N. River Road, W. Lafayette, IN 47906
CP: 157-10005-00009
Reviewer: Nisha Sizemore**

Allowable PM emissions pursuant to 326 IAC 6-2-2 (Particulate Emission Limitations from Sources of Indirect Heating)

Heat Input Capacity
MMBtu/hr

$$Pt = \frac{1.09}{Q^{0.26}}$$

52.50

$$Pt = 0.39 \text{ lb/MMBtu}$$

$$0.39 \text{ lb/MMBtu} \times 52.50 \text{ MMBtu/hr} = 20.43 \text{ lbs/hr} = 89.50 \text{ tons/yr}$$

Allowable SO₂ emissions pursuant to 326 IAC 7-1 (Sulfur Dioxide Emission Limitations)

Heat Input Capacity
MMBtu/hr

20.20

$$\text{Limit} = 0.5 \text{ lbs/MMBtu}$$

$$0.50 \text{ lb/MMBtu} \times 20.20 \text{ MMBtu/hr} = 10.10 \text{ lbs/hr} = 44.24 \text{ tons/yr}$$

Company Name: Indiana Veterans' Home
Address, City IN Zip: 3851 N. River Road, W. Lafayette, IN 47906
CP: 157-10005-00009
Reviewer: Nisha Sizemore

Potential Emissions
(tons/year)

Facility	PM	PM10	SO2	NOx	VOC	CO
boiler 1	1.273	1.273	45.193	12.73	0.2	3.183
boiler 2	0.763	0.763	27.071	7.626	0.076	1.906
boiler 3	1.273	1.273	45.193	12.73	0.2	3.183
incinerator	8.98	8.98	3.2	6.66	3.96	13.27
Total	12.289	12.289	120.657	39.746	4.436	21.542