

**PART 70 OPERATING PERMIT  
SIGNIFICANT SOURCE MODIFICATION  
OFFICE OF AIR QUALITY**

**BP Whiting Refinery  
2815 Indianapolis Blvd.  
Whiting, IN 46394-2197**

(herein known as the Permittee) is hereby authorized to construct and operate subject to the conditions contained herein, the emission units described in Section A (Source Summary) of this approval.

This approval 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.: 089-14630-00003	
Original signed by Paul Dubenetzky Issued by: Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: November 30, 2001

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## SECTION A

## SOURCE SUMMARY

This approval is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the emission units 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 approval 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(15)]

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The Permittee owns and operates a petroleum refinery.

Responsible Official: Mr. Askhok K. Jhawar  
Source Address: 2815 Indianapolis Boulevard, Whiting, IN 46394-2197  
Mailing Address: 2815 Indianapolis Boulevard, Whiting, IN 46394-2197  
Phone Number: 219-473-3179  
SIC Code: 2911  
County Location: Lake  
County Status: Nonattainment for PM<sub>10</sub>, Ozone and SO<sub>2</sub>  
Attainment for all other criteria pollutants  
Source Status: Part 70 Permit Program  
Major Source, under Emission Offset Rules;  
Major Source, Section 112 of the Clean Air Act

### A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)] [326 IAC 2-7-5(15)]

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This source modification involves the following emission units and pollution control devices:

- (a) The #12 Pipe Still (12 PS), rated at 336,000 barrels per day, which includes:
- (1) Process Heaters H-1AN and H-1AS, each with a burner capacity of 121.5 million Btu per hour.
  - (2) Process Heater H-1B, with a burner capacity of 243 million Btu per hour.
  - (3) Process Heater H-2, with a burner capacity of 174 million Btu per hour.
  - (4) Process Heaters H-1CN and H-1CS, each with a burner capacity of 120 million Btu per hour.
  - (5) Process Heater H-1CX, with a burner capacity of 410 million Btu per hour.
  - (6) One (1) atmospheric separation tower, identified as the "Primary Tower."
  - (7) One (1) vacuum separation tower, identified as the "Vacuum Tower."
  - (8) One (1) vacuum hot well.
  - (9) Associated valves, flanges, compressors, pumps, and transfer lines.
- (b) The Catalytic Feed Hydrotreating Unit (CFHU), rated at 100,000 barrels per day, which includes:
- (1) Preheater Furnace F-801 A/B, with a burner capacity of 66.5 million Btu per hour, exhausting to Stack 171-01.

- (2) Preheater Furnace F 801 C, with a burner capacity of 60.0 million Btu per hour, exhausting to Stack 171-02.
- (3) One hydrogen system with four (4) compressors:
  - (A) Compressors K-801 A, B, and C, each rated at 40 million standard cubic feet per day.
  - (B) Compressor K-801 D, rated at 30 million standard cubic feet per day.
- (4) One hydraulics system with pipes, pumps, and associated equipment.

A.3 Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

This source modification does not involve insignificant activities, as defined in 326 IAC 2-7-1(21).

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

## **SECTION B GENERAL CONDITIONS**

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

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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 Effective Date of the Permit [IC13-15-5-3]**

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Pursuant to IC 13-15-5-3, this approval becomes effective upon its issuance.

### **B.3 Revocation of Permits [326 IAC 2-1.1-9(5)][326 IAC 2-7-10.5(i)]**

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Pursuant to 326 IAC 2-1.1-9(5)(Revocation of Permits), the Commissioner may revoke this approval 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.

### **B.4 Significant Source Modification [326 IAC 2-7-10.5(h)]**

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This document shall also become the approval to operate pursuant to 326 IAC 2-7-10.5(h) 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 Quality (OAQ), Permit Administration & Development Section, verifying that the emission units were constructed as proposed in the application. The emissions units covered in the Significant Source Modification approval may begin operating on the date the affidavit of construction is postmarked or hand delivered to IDEM if constructed as proposed.
- (b) If actual construction of the emissions units differs from the construction proposed in the application, the source may not begin operation until the source modification has been revised pursuant to 326 IAC 2-7-11 or 326 IAC 2-7-12 and an Operation Permit Validation Letter is issued.
- (c) 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.
- (d) The Permittee shall receive an Operation Permit Validation Letter from the Chief of the Permit Administration & Development Section and attach it to this document.
- (e) In the event that the Part 70 application is being processed at the same time as this application, the following additional procedures shall be followed for obtaining the right to operate:
  - (1) If the Part 70 draft permit has not gone on public notice, then the change/addition covered by the Significant Source Modification will be included in the Part 70 draft.
  - (2) If the Part 70 permit has gone through final EPA proposal and would be issued ahead of the Significant Source Modification, the Significant Source Modification will go through a concurrent 45 day EPA review. Then the Significant Source Modification will be incorporated into the final Part 70 permit at the time of issuance.

- (3) If the Part 70 permit has gone through public notice, but has not gone through final EPA review and would be issued after the Significant Source Modification is issued, then the Modification would be added to the proposed Part 70 permit, and the Title V permit will issued after EPA review.

#### B.5 NSPS Reporting Requirement

Pursuant to the New Source Performance Standards (NSPS), Part 60.7(a), 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 Quality  
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, OAQ. The requirements of 40 CFR Part 60 are also federally enforceable.

**SECTION C GENERAL OPERATION CONDITIONS**

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

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- (a) Where specifically designated by this permit or required by an applicable requirement, any application form, report, or compliance certification submitted shall contain certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.
- (b) One (1) certification shall be included, using the attached Certification Form, with each submittal requiring certification.
- (c) A responsible official is defined at 326 IAC 2-7-1(34).

**C.2 Preventive Maintenance Plan [326 IAC 2-7-5(1),(3) and (13)] [326 IAC 2-7-6(1) and (6)] [326 IAC 1-6-3]**

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- (a) If required by specific condition(s) in Section D of this permit, the Permittee shall prepare and maintain Preventive Maintenance Plans (PMPs) when operation begins, 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 Branch, Office of Air Quality  
100 North Senate Avenue, P. O. Box 6015  
Indianapolis, Indiana 46206-6015

The PMP and the PMP extension notification do not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

- (b) The Permittee shall implement the PMPs as necessary to ensure that failure to implement a PMP does not cause or contribute to a violation of any limitation on emissions or potential to emit.
- (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 contributes to any violation. The PMP does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).
- (d) Records of preventive maintenance shall be retained for a period of at least five (5) years. These records shall be kept 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.

C.3 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  
Permits Branch, Office of Air Quality  
100 North Senate Avenue, P.O. Box 6015  
Indianapolis, Indiana 46206-6015

Any such application shall be certified by the "responsible official" as defined by 326 IAC 2-7-1(34).

(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)]

C.4 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 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.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 Operation of Equipment [326 IAC 2-7-6(6)]

Except as otherwise provided by statute or rule, or in this permit, all air pollution control equipment listed in this permit and used to comply with an applicable requirement shall be operated at all times that an emission unit vented to the control equipment is in operation.

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

#### **C.7 Performance Testing [326 IAC 3-6][326 IAC 2-1.1-11]**

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- (a) Compliance testing on new emission units shall be conducted within 60 days after achieving maximum production rate, but no later than 180 days after initial start-up, if specified in Section D of this approval. All testing shall be performed according to the provisions of 326 IAC 3-6 (Source Sampling Procedures), except as provided elsewhere in this approval, utilizing any applicable procedures and analysis methods specified in 40 CFR 51, 40 CFR 60, 40 CFR 61, 40 CFR 63, 40 CFR 75, or other procedures approved by IDEM, OAQ.

A test protocol, except as provided elsewhere in this approval, shall be submitted to:

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

no later than thirty-five (35) days prior to the intended test date. The protocol submitted by the Permittee does not require certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

- (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 certification by the "responsible official" as defined by 326 IAC 2-7-1(34).
- (c) Pursuant to 326 IAC 3-6-4(b), all test reports must be received by IDEM, OAQ within forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAQ if the source submits to IDEM, OAQ, a reasonable written explanation within five (5) days prior to the end of the initial forty-five (45) day period.

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

#### **C.8 Compliance Requirements [326 IAC 2-1.1-11]**

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The commissioner may require stack testing, monitoring, or reporting at any time to assure compliance with all applicable requirements. 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.9 Compliance Monitoring [326 IAC 2-7-5(3)] [326 IAC 2-7-6(1)]**

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If required by Section D, all monitoring and record keeping requirements shall be implemented when operation begins. The Permittee shall be responsible for installing any necessary equipment and initiating any required monitoring related to that equipment.

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

#### **C.10 Emergency Provisions [326 IAC 2-7-16]**

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- (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, except as provided in 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 health-based or 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 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 Section), or  
Telephone Number: 317-233-5674 (ask for Compliance Section)  
Facsimile Number: 317-233-5967

- (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 Branch, Office of Air Quality  
100 North Senate Avenue, P. O. Box 6015  
Indianapolis, Indiana 46206-6015

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 the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

- (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) IDEM, OAQ may require that the Preventive Maintenance Plans required under 326 IAC 2-7-4-(c)(10) 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) Operations may continue during an emergency only if the following conditions are met:
  - (1) 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.
  - (2) If an emergency situation causes a deviation from a health-based limit, the Permittee may not continue to operate the affected emissions facilities unless:
    - (A) The Permittee immediately takes all reasonable steps to correct the emergency situation and to minimize emissions; and
    - (B) Continued operation of the facilities is 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.

Any operation shall continue no longer than the minimum time required to prevent the situations identified in (g)(2)(B) of this condition.

C.11 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 take appropriate response actions. The Permittee shall submit a description of these response actions to IDEM, OAQ, within thirty (30) days of receipt of the test results. The Permittee shall take appropriate action to minimize excess emissions from the affected facility while the response actions are being implemented.
- (b) A retest to demonstrate compliance shall be performed within one hundred twenty (120) days of receipt of the original test results. Should the Permittee demonstrate to IDEM, OAQ that retesting in one-hundred and twenty (120) 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 documents submitted pursuant to this condition do not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

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

C.12 General Record Keeping Requirements [326 IAC 2-7-5(3)][326 IAC 2-7-6]

- (a) Records of all required data, reports and support information shall be retained for a period of at least five (5) years from the date of monitoring sample, measurement, report, or application. These records shall be kept 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, all record keeping requirements not already legally required shall be implemented within ninety (90) days of permit issuance.

C.13 General Reporting Requirements [326 IAC 2-7-5(3)(C)]

- (a) The reports required by conditions in Section D of this permit shall be submitted to:

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

- (b) 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.
- (c) Unless otherwise specified in this permit, all reports required in Section D of this permit shall be submitted within thirty (30) days of the end of the reporting period. All reports do require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).
- (d) The first report shall cover the period commencing on the date of issuance of this permit and ending on the last day of the reporting period. Reporting periods are based on calendar years.

## SECTION D.6 FACILITY OPERATION CONDITIONS

### Facility Description [326 IAC 2-7-5(15)]

The #12 Pipe Still (12 PS), rated at 336,000 barrels per day, which includes:

- (a) Process Heaters H-1AN and H-1AS, each with a burner capacity of 121.5 million Btu per hour.
- (b) Process Heater H-1B, with a burner capacity of 243 million Btu per hour.
- (c) Process Heater H-2, with a burner capacity of 174 million Btu per hour.
- (d) Process Heaters H-1CN and H-1CS, each with a burner capacity of 120 million Btu per hour.
- (e) Process Heater H-1CX, with a burner capacity of 410 million Btu per hour.
- (f) One (1) atmospheric separation tower, identified as the "Primary Tower."
- (g) One (1) vacuum separation tower, identified as the "Vacuum Tower."
- (h) One (1) vacuum hot well.
- (i) Associated valves, flanges, compressors, pumps, and transfer lines.

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

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

#### D.6.1 Lake County PM<sub>10</sub> Emission Limitations [326 IAC 6-1-10.1]

Pursuant to 326 IAC 6-1-10.1:

- (a) PM<sub>10</sub> emissions from Heaters H-1AN, H-1AS, H-1B and H-2 shall not exceed 0.025 pounds per million Btu heat input and a total of 16.348 pounds per hour. The limit of 0.025 pounds per million Btu heat input is the more stringent requirement; it equates to a potential to emit 53.22 tons of PM<sub>10</sub> per year for the total of heaters.
- (b) PM<sub>10</sub> emissions from Heaters H-1CN and H-1CS shall not exceed 0.004 pounds per million Btu heat input and 0.444 pounds per hour for each heater. The limit of 0.444 pounds per hour is the more stringent requirement; it equates to a potential to emit 1.94 tons of PM<sub>10</sub> per year for each heater.
- (c) PM<sub>10</sub> emissions from Heater H-1CX shall not exceed 0.004 pounds per million Btu heat input and 0.924 pounds per hour. The limit of 0.924 pounds per hour is the more stringent requirement; it equates to a potential to emit 4.05 tons of PM<sub>10</sub> per year.

#### D.6.2 Lake County Sulfur Dioxide Emission Limitations [326 IAC 7-4-1.1]

Pursuant to 326 IAC 7-4-1.1:

- (a) Sulfur dioxide emissions from Heaters H-1AN, H-1AS, H-1B and H-2 shall not exceed 0.32 pounds per million Btu heat input. This limit equates to a potential to emit 574.66 tons of sulfur dioxide per year for the total of heaters.

- (b) Sulfur dioxide emissions from Heaters H-1CN, H-1CS and H-1CX shall not exceed 0.033 pounds per million Btu heat input. This limit equates to a potential to emit 17.34 tons of sulfur dioxide per year for each of Heaters H-1CN and H-1CS, and 59.26 tons of sulfur dioxide per year for Heater H-1CX.

**D.6.3 Petroleum Refineries [326 IAC 8-4-2]**

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Pursuant to 326 IAC 8-4-2, the vacuum tower shall not emit any noncondensable VOC from condensers, hot wells or accumulators.

**D.6.4 New Source Performance Standards [326 IAC 12] [40 CFR 60]**

---

Pursuant to 326 IAC 12 (40 CFR 60, Subpart J) the Permittee shall not burn in the process heaters any fuel gas that contains hydrogen sulfide (H<sub>2</sub>S) in excess of 0.10 gr/dscf.

- (a) The fuel gas burned by Heater H-1CX shall comply with this condition on and after permit issuance.
- (b) The fuel gas burned by all other process heaters shall comply with this condition on and after December 31, 2001.

**D.6.5 Preventive Maintenance Plan [326 IAC 2-7-5(13)]**

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A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for this facility and its control devices.

**Compliance Determination Requirements**

**D.6.6 Legal Consent Decree**

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Pursuant to Consent Decree 2:96 CV 095 RL:

- (a) Fuel oil shall not be used as fuel for the #12 Pipe Still.
- (b) Nitrogen oxide emissions from Heater H-2 shall be controlled by low-NO<sub>x</sub> burners having an emission rate of 0.044 pounds per million Btu or less. This limit equates to a potential to emit 33.53 tons of nitrogen oxides per year for Heater H-2.

**D.6.7 Testing Requirements [326 IAC 2-7-6(1),(6)][326 IAC 2-1.1-11]**

---

Within 60 days after achieving the maximum production rate at which this facility will be operated, but not later than 180 days after the issuance of this permit, the Permittee shall conduct performance tests for H<sub>2</sub>S concentration in the fuel gas and furnish the Commissioner a written report of the results of such performance tests.

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

**D.6.8 Continuous Monitoring System Required [326 IAC 12] [40 CFR 60.105(a)(4)]**

---

A continuous monitoring system shall be installed and shall be operated at all times when a process heater is in operation. The monitoring system shall continuously measure and record the concentration, on a dry basis, of hydrogen sulfide in fuel gases before being burned.

**D.6.9 Leaks from Petroleum Refineries; Monitoring; Reports [326 IAC 8-4-8]**

---

Pursuant to 326 IAC 8-4-8, the emission source shall develop and conduct a monitoring program addressing the guidelines contained in 326 IAC 8-4-8 (c) through (m).

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

### **D.6.10 Record Keeping Requirements [326 IAC 3-5-6]**

---

The Permittee shall retain records of all recording/monitoring data and support information for a period of five (5) years, or longer if specified elsewhere in this permit, from the date of the monitoring sample, measurement, or report. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit.

D.6.11 Reporting of Excess Emissions [40 CFR 60.7] [326 IAC 3-5-7]

For the purpose of reports under 40 CFR 60.7, periods of excess emissions shall be determined as all rolling 3-hour periods during which the average concentration of H<sub>2</sub>S as measured by the H<sub>2</sub>S continuous monitoring system exceeds 0.10 gr/dscf. The rolling 3-hour average shall be determined as the arithmetic average of three contiguous 1-hour averages.

D.6.12 Record Keeping Requirements [326 IAC 7-4-1.1(c)(2)(CC)]

- (a) To document compliance with Condition D.6.2, the Permittee shall maintain daily records of the following:
- (1) each fuel type used,
  - (2) average sulfur content for each fuel type,
  - (3) average fuel gravity for each fuel type, and
  - (4) total fuel usage for each type.
- (b) To document compliance with Condition D.6.9, the Permittee shall maintain records for the leak monitoring program. These records shall include, at a minimum, the data in 326 IAC 8-4-8(k);
- (c) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.6.13 Reporting Requirements [326 IAC 7-4-1.1(c)(2)(CC)]

- (a) Pursuant to 326 IAC 7-4-1.1(c)(2)(CC), the Permittee shall submit reports of the following:
- (1) the average daily sulfur dioxide emission rate for the pipe still, and
  - (2) the total daily fuel usage for each fuel type.
- (b) A quarterly summary of the information to document compliance with this condition shall be submitted to the address listed in this permit in Section C - General Reporting Requirements using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the period being reported. The report submitted by the Permittee does require the certification by the "authorized individual" as defined by 326 IAC 2-1.1-1(1).

## SECTION D.7 FACILITY OPERATION CONDITIONS

### Facility Description [326 IAC 2-7-5(15)]

The Catalytic Feed Hydrotreating Unit (CFHU), rated at 100,000 barrels per day, which includes:

- (a) Preheater Furnace F-801 A/B, with a burner capacity of 66.5 million Btu per hour, exhausting to Stack 171-01.
- (b) Preheater Furnace F-801 C, with a burner capacity of 60.0 million Btu per hour, exhausting to Stack 171-02.
- (c) One hydrogen system with four (4) compressors:
  - (1) Compressors K-801 A, B, and C, each rated at 40 million standard cubic feet per day.
  - (2) Compressor K-801 D, rated at 30 million standard cubic feet per day.
- (d) One hydraulics system with pipes, pumps, and associated equipment.

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

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

#### D.7.1 Lake County PM<sub>10</sub> Emission Limitations [326 IAC 6-1-10.1]

Pursuant to 326 IAC 6-1-10.1, PM<sub>10</sub> emissions from the CFHU shall not exceed 0.004 pounds per million Btu heat input and 0.246 pounds per hour.

#### D.7.2 Lake County Sulfur Dioxide Emission Limitations [326 IAC 7-4-1.1]

Pursuant to 326 IAC 7-4-1.1(c)(U), sulfur dioxide emissions from the CFHU shall not exceed 0.035 pounds per million Btu heat input.

#### D.7.3 New Source Performance Standards [326 IAC 12] [40 CFR 60]

Pursuant to 326 IAC 12 (40 CFR 60, Subpart J), the Permittee shall not burn in the preheater furnaces any fuel gas that contains hydrogen sulfide (H<sub>2</sub>S) in excess of 0.10 gr/dscf.

#### D.7.4 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for this facility and its control devices.

### Compliance Determination Requirements

#### D.7.5 Legal Consent Decree / Emission Offset [326 IAC 2-3]

Pursuant to Consent Decree 2:96 CV 095 RL:

- (a) Fuel oil shall not be used as fuel for the CFHU.
- (b) Nitrogen oxide emissions from Furnace F-801C shall be controlled by ultra low-NOx burners having an emission rate of 0.040 pounds per million Btu or less. This limit will allow the burners to meet the requirements of "current generation" ultra low NOx burners in Paragraph 15.D(i) of the Consent Decree. This limit also renders the requirements of Emission Offset as not applicable.

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

#### **D.7.6 Continuous Monitoring System Required [326 IAC 12] [40 CFR 60.105(a)(4)]**

A continuous monitoring system shall be installed and shall be operated at all times when this facility is in operation. The monitoring system shall continuously measure and record the concentration, on a dry basis, of hydrogen sulfide in fuel gases before being burned in the preheater furnaces.

#### **D.7.7 Testing Requirements [326 IAC 2-7-6(1),(6)][326 IAC 2-1.1-11]**

Within 60 days after achieving the maximum production rate at which Preheater Furnace F 801 C will be operated, but not later than 180 days after initial startup, the Permittee shall conduct performance tests for

- (a) H<sub>2</sub>S concentration in the fuel gas, and
- (b) Nitrogen oxide emissions from Preheater Furnace F-801 C

and furnish the Commissioner a written report of the results of such performance tests.

#### **D.7.8 Leaks from Petroleum Refineries; Monitoring; Reports [326 IAC 8-4-8]**

Pursuant to 326 IAC 8-4-8, the emission source shall develop and conduct a monitoring program addressing the guidelines contained in 326 IAC 8-4-8 (c) through (m).

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

#### **D.7.9 Record Keeping Requirements [326 IAC 3-5-6]**

The Permittee shall retain records of all recording/monitoring data and support information for a period of five (5) years, or longer if specified elsewhere in this permit, from the date of the monitoring sample, measurement, or report. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit.

#### **D.7.10 Reporting of Excess Emissions [40 CFR 60.7]**

For the purpose of reports under 40 CFR 60.7, periods of excess emissions shall be determined as all rolling 3-hour periods during which the average concentration of H<sub>2</sub>S, as measured by the H<sub>2</sub>S continuous monitoring system, exceeds 0.10 gr/dscf. The rolling 3-hour average shall be determined as the arithmetic average of three contiguous 1-hour averages.

#### **D.7.11 Record Keeping Requirements [326 IAC 7-4-1.1(c)(2)(CC)]**

- (a) Pursuant to 326 IAC 7-4-1.1(c)(2)(CC), the Permittee shall maintain daily records of the following for the CFHU:
  - (1) each fuel type used,
  - (2) average sulfur content for each fuel type,
  - (3) average fuel gravity for each fuel type.
- (b) To document compliance with Condition D.7.8, the Permittee shall maintain records for the leak monitoring program. These records shall include, at a minimum, the data in 326 IAC 8-4-8(k);
- (c) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.7.12 Reporting Requirements [326 IAC 7-4-1.1(c)(2)(CC)]

- (a) Pursuant to 326 IAC 7-4-1.1(c)(2)(CC), the Permittee shall submit reports of the average daily sulfur dioxide emission rate for the CFHU.
  
- (b) A quarterly summary of the information to document compliance with this condition shall be submitted to the address listed in this permit in Section C - General Reporting Requirements using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the period being reported. The report submitted by the Permittee does require the certification by the "authorized individual" as defined by 326 IAC 2-1.1-1(1).

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

**PART 70 OPERATING PERMIT  
CERTIFICATION**

Source Name: BP Whiting Refinery  
Source Address: 2815 Indianapolis Blvd., Whiting, IN 46394-2197  
Mailing Address: P.O. Box 710, Whiting, IN 46394-0710  
Permit No.: 089-14630-00003

**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:

- 9 Annual Compliance Certification Letter
- 9 Test Result (specify) \_\_\_\_\_
- 9 Report (specify) \_\_\_\_\_
- 9 Notification (specify) \_\_\_\_\_
- 9 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:

Date:

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF AIR QUALITY  
COMPLIANCE DATA SECTION  
P.O. Box 6015  
100 North Senate Avenue  
Indianapolis, Indiana 46206-6015  
Phone: 317-233-5674  
Fax: 317-233-5967**

**PART 70 OPERATING PERMIT  
EMERGENCY/DEVIATION OCCURRENCE REPORT**

Source Name: BP Whiting Refinery  
Source Address: 2815 Indianapolis Blvd., Whiting, IN 46394-2197  
Mailing Address: P.O. Box 710, Whiting, IN 46394-0710  
Permit No.: 089-14630-00003

**This form consists of 2 pages**

**Page 1 of 2**

Check either No. 1 or No.2	
<input checked="" type="radio"/>	1. This is an emergency as defined in 326 IAC 2-7-1(12) c The Permittee must notify the Office of Air Quality (OAQ), within four (4) business hours (1-800-451-6027 or 317-233-5674, ask for Compliance Section); and c The Permittee must submit notice in writing or by facsimile within two (2) days (Facsimile Number: 317-233-5967), and follow the other requirements of 326 IAC 2-7-16
<input checked="" type="radio"/>	2. This is a deviation, reportable per 326 IAC 2-7-5(3)(C) c The Permittee must submit notice in writing within ten (10) calendar days

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/Deviation:
Describe the cause of the Emergency/Deviation:

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

**Page 2 of 2**

Date/Time Emergency/Deviation started:
Date/Time Emergency/Deviation was corrected:
Was the facility being properly operated at the time of the emergency/deviation?    Y    N Describe:
Type of Pollutants Emitted: TSP, PM-10, SO <sub>2</sub> , VOC, NO <sub>x</sub> , CO, Pb, other:
Estimated amount of pollutant(s) emitted during emergency/deviation:
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 DATA SECTION

### Part 70 Monthly Report

Source Name: BP Whiting Refinery  
 Source Address: 2815 Indianapolis Blvd., Whiting, IN 46394-2197  
 Mailing Address: P.O. Box 710, Whiting, IN 46394-0710  
 Permit No.: 089-14630-00003

Facility: #12 Pipe Still  
 Parameter: Average daily sulfur dioxide emission rate and total daily fuel usage for each fuel type  
 Limit: Quarterly reports are required under 326 IAC 7-4-1.1

Month: \_\_\_\_\_ Year: \_\_\_\_\_ Fuel Type: \_\_\_\_\_

Day	Average SO <sub>2</sub> Emission Rate	Total Fuel Usage	Day	Average SO <sub>2</sub> Emission Rate	Total Fuel Usage
1			17		
2			18		
3			19		
4			20		
5			21		
6			22		
7			23		
8			24		
9			25		
10			26		
11			27		
12			28		
13			29		
14			30		
15			31		
16					

- 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 QUALITY COMPLIANCE DATA SECTION

### Part 70 Monthly Report

Source Name: BP Whiting Refinery  
 Source Address: 2815 Indianapolis Blvd., Whiting, IN 46394-2197  
 Mailing Address: P.O. Box 710, Whiting, IN 46394-0710  
 Permit No.: 089-14630-00003

Facility: Catalytic Feed Hydrotreating Unit (CFHU)  
 Parameter: Average daily sulfur dioxide emission rate  
 Limit: Quarterly reports are required under 326 IAC 7-4-1.1

Month: \_\_\_\_\_ Year: \_\_\_\_\_

Day	Average SO <sub>2</sub> Emission Rate	Day	Average SO <sub>2</sub> Emission Rate
1		17	
2		18	
3		19	
4		20	
5		21	
6		22	
7		23	
8		24	
9		25	
10		26	
11		27	
12		28	
13		29	
14		30	
15		31	
16			

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 QUALITY  
 COMPLIANCE DATA SECTION**

**PART 70 OPERATING PERMIT  
 QUARTERLY COMPLIANCE MONITORING REPORT**

Source Name: BP Whiting Refinery  
 Source Address: 2815 Indianapolis Blvd., Whiting, IN 46394-2197  
 Mailing Address: P.O. Box 710, Whiting, IN 46394-0710  
 Permit No.: 089-14630-00003

**Months:** \_\_\_\_\_ **to** \_\_\_\_\_ **Year:** \_\_\_\_\_

This report is an affirmation that the source has met all the compliance monitoring requirements stated in this permit. This report shall be submitted quarterly. Any deviation from the compliance monitoring requirements and the date(s) of each deviation must be reported. Additional pages may be attached if necessary. This form can be supplemented by attaching the Emergency/Deviation Occurrence Report. If no deviations occurred, please specify in the box marked "No deviations occurred this reporting period".

**9 NO DEVIATIONS OCCURRED THIS REPORTING PERIOD.**

**9 THE FOLLOWING DEVIATIONS OCCURRED THIS REPORTING PERIOD.**

Compliance Monitoring Requirement (e.g. Permit Condition D.1.3)	Number of Deviations	Date of each Deviation

Form Completed By: \_\_\_\_\_  
 Title/Position: \_\_\_\_\_  
 Date: \_\_\_\_\_  
 Phone: \_\_\_\_\_

Attach a signed certification to complete this report.

## Indiana Department of Environmental Management Office of Air Quality

### Addendum to the Technical Support Document (TSD) for a Significant Source Modification to a Part 70 Operating Permit

#### Source Background and Description

<b>Source Name:</b>	<b>BP Whiting Refinery</b>
<b>Source Location:</b>	<b>2815 Indianapolis Blvd., Whiting, IN 46394-2197</b>
<b>County:</b>	<b>Lake</b>
<b>SIC Code:</b>	<b>2911</b>
<b>Operation Permit No.:</b>	<b>089-6741-00453</b>
<b>Revision No.:</b>	<b>089-14630-00003</b>
<b>Permit Reviewer:</b>	<b>Allen R. Davidson</b>

On October 15, 2001, the Office of Air Quality (OAQ) had a notice published in the *Gary Post Tribune* stating that BP Whiting Refinery had applied for a Significant Source Modification to a Part 70 Permit. The application involves changes at the Catalytic Feed Hydrotreating Unit (CFHU), to increase the rated capacity to 100,000 barrels per day. A preheater furnace will be added and three hydrogen system compressors will be modified to increase the capacity. This application also requests that the changes to the #12 Pipe Still, approved by OAQ in Exemption 089-14450-00003, be made federally enforceable.

The notice also stated that OAQ proposed to issue a permit for this operation and provided information on how the public could review the proposed permit and other documentation. Finally, the notice informed interested parties that there was a period of thirty (30) days to provide comments on whether or not this permit should be issued as proposed.

Lori Washington of BP Whiting Refinery submitted comments on the proposed FESOP. The summary of the comments is as follows:

#### Comment 1:

In Condition A.1, change the responsible official and phone number.

#### Response 1:

Condition A.1 has been amended to read as follows:

#### A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

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The Permittee owns and operates a petroleum refinery.

Responsible Official:	<del>Ms. Maureen McGrath</del> <b>Mr. Askhok K. Jhavar</b>
Source Address:	2815 Indianapolis Boulevard, Whiting, IN 46394-2197
Mailing Address:	2815 Indianapolis Boulevard, Whiting, IN 46394-2197
Phone Number:	<del>219-473-3234</del> <b>219-473-3179</b>
SIC Code:	2911
County Location:	Lake
County Status:	Nonattainment for PM <sub>10</sub> , Ozone and SO <sub>2</sub> Attainment for all other criteria pollutants
Source Status:	Part 70 Permit Program Major Source, under Emission Offset Rules; Major Source, Section 112 of the Clean Air Act

**Comment 2a:**

In Condition A.2, change "80,000" to "100,000".

**Comment 2b:**

Under the scope of the project, a separate exhaust stack will be constructed for the new heater F-801C. IDEM forms PI-01, CD-01 and CE-05 have been revised to reflect this change.

**Response 2:**

This modification involves changes at the CFHU to increase the rated capacity from 80,000 barrels per day to 100,000 barrels per day. Condition A.2 has been amended to read as follows:

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)]  
[326 IAC 2-7-5(15)]

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This source modification involves the following emission units and pollution control devices:

- (a) The #12 Pipe Still (12 PS), rated at 336,000 barrels per day, which includes:
  - (1) Process Heaters H-1AN and H-1AS, each with a burner capacity of 121.5 million Btu per hour.
  - (2) Process Heater H-1B, with a burner capacity of 243 million Btu per hour.
  - (3) Process Heater H-2, with a burner capacity of 174 million Btu per hour.
  - (4) Process Heaters H-1CN and H-1CS, each with a burner capacity of 120 million Btu per hour.
  - (5) Process Heater H-1CX, with a burner capacity of 410 million Btu per hour.
  - (6) One (1) atmospheric separation tower, identified as the "Primary Tower."
  - (7) One (1) vacuum separation tower, identified as the "Vacuum Tower."
  - (8) One (1) vacuum hot well.
  - (9) Associated valves, flanges, compressors, pumps, and transfer lines.
  
- (b) The Catalytic Feed Hydrotreating Unit (CFHU), rated at ~~80,000~~ **100,000** barrels per day, which includes:
  - (1) Preheater Furnace F-801 A/B, with a burner capacity of 66.5 million Btu per hour, exhausting to Stack 171-01.
  - (2) Preheater Furnace F 801 C, with a burner capacity of 60.0 million Btu per hour, exhausting to Stack ~~171-01~~ **171-02**.
  - (3) One hydrogen system with four (4) compressors:
    - (A) Compressors K-801 A, B, and C, each rated at 40 million standard cubic feet per day.
    - (B) Compressor K-801 D, rated at 30 million standard cubic feet per day.
  - (4) One hydraulics system with pipes, pumps, and associated equipment.

Also, the facility description in Section D.7 has been amended to read similarly.

**Comment 3:**

In the facility description in Section D.6, include lower heating value (LHV) references.

**Response 3:**

"Lower heating value" refers to the minimum amount of heat provided per unit of fuel. The process heaters in Section D.6 typically use refinery process gas, which has a lower heating value than natural gas. When fuel of a lower heating value is used, more fuel must be used to achieve a given fuel firing capacity.

The burner capacities of fuel combustion units are listed in the permit independent of fuel type and heating value. OAQ believes that including references to lower heating value are unnecessary.

**Comment 4:**

In Condition D.6.1 and D.6.2, include a ton per year limit for PM<sub>10</sub> and SO<sub>2</sub>. This will serve to address any future Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR) issues that may arise.

**Response 4:**

OAQ will express the limits as they exist in the referenced regulation, but will include ton per year equivalents into the permit as descriptive information. Conditions D.6.1 and D.6.2 have been amended to read as follows:

**D.6.1 Lake County PM<sub>10</sub> Emission Limitations [326 IAC 6-1-10.1]**

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Pursuant to 326 IAC 6-1-10.1:

- (a) PM<sub>10</sub> emissions from Heaters H-1AN, H-1AS, H-1B and H-2 shall not exceed 0.025 pounds per million Btu heat input and a total of 16.348 pounds per hour. **The limit of 0.025 pounds per million Btu heat input is the more stringent requirement; it equates to a potential to emit 53.22 tons of PM<sub>10</sub> per year for the total of heaters.**
- (b) PM<sub>10</sub> emissions from Heaters H-1CN and H-1CS shall not exceed 0.004 pounds per million Btu heat input and 0.444 pounds per hour for each heater. **The limit of 0.444 pounds per hour is the more stringent requirement; it equates to a potential to emit 1.94 tons of PM<sub>10</sub> per year for each heater.**
- (c) PM<sub>10</sub> emissions from Heater H-1CX shall not exceed 0.004 pounds per million Btu heat input and 0.924 pounds per hour. **The limit of 0.924 pounds per hour is the more stringent requirement; it equates to a potential to emit 4.05 tons of PM<sub>10</sub> per year.**

**D.6.2 Lake County Sulfur Dioxide Emission Limitations [326 IAC 7-4-1.1]**

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Pursuant to 326 IAC 7-4-1.1:

- (a) Sulfur dioxide emissions from Heaters H-1AN, H-1AS, H-1B and H-2 shall not exceed 0.32 pounds per million Btu heat input. **This limit equates to a potential to emit 574.66 tons of sulfur dioxide per year for the total of heaters.**
- (b) Sulfur dioxide emissions from Heaters H-1CN, H-1CS and H-1CX shall not exceed 0.033 pounds per million Btu heat input. **This limit equates to a potential to emit 17.34 tons of sulfur dioxide per year for each of Heaters H-1CN and H-1CS, and 59.26 tons of sulfur dioxide per year for Heater H-1CX.**

**Comment 5:**

After December 31, 2001, all heaters shall be considered affected facilities under NSPS and shall comply with Condition D.6.4.

**Response 5:**

Condition D.6.4 has been amended to read as follows:

**D.6.4 New Source Performance Standards [326 IAC 12] [40 CFR 60]**

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Pursuant to 326 IAC 12 (40 CFR 60, Subpart J) the Permittee shall not burn in the process heaters any fuel gas that contains hydrogen sulfide (H<sub>2</sub>S) in excess of 0.10 gr/dscf.

- (a) The fuel gas burned by Heater H-1CX shall comply with this condition on and after permit issuance.
- (b) The fuel gas burned by all other process heaters shall comply with this condition on and after ~~the date of the required performance tests~~ **December 31, 2001**.

**Comment 6:**

In Condition D.6.6(b), include a ton per year limit for Heater H-2. This will serve to address any future Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR) issues that may arise.

**Response 6:**

**D.6.6 Legal Consent Decree**

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Pursuant to Consent Decree 2:96 CV 095 RL:

- (a) Fuel oil shall not be used as fuel for the #12 Pipe Still.
- (b) Nitrogen oxide emissions from Heater H-2 shall be controlled by low-NO<sub>x</sub> burners having an emission rate of 0.044 pounds per million Btu or less. **This limit equates to a potential to emit 33.53 tons of nitrogen oxides per year for Heater H-2.**

**Comment 7:**

Change the Technical Support Document to read "Part of this application is being sought in order to comply with a consent decree between BP Exploration & Oil Company, Amoco Oil Company, and Atlantic Richfield Company and the U.S. EPA and nine states including Indiana."

**Response 7:**

OAQ acknowledges there were other defendants listed in the Consent Decree. This fact has no effect on the permit itself.

# Indiana Department of Environmental Management Office of Air Quality

## Technical Support Document (TSD) for a Significant Source Modification

### Source Background and Description

**Source Name:** BP Whiting Refinery (f.k.a. Amoco Whiting Refinery)  
**Source Location:** 2815 Indianapolis Blvd., Whiting, IN 46394-2197  
**County:** Lake  
**SIC Code:** 2911  
**Application No.:** 089-14630-00003  
**Permit Reviewer:** Allen R. Davidson

On May 24, 2001, the Office of Air Quality (OAQ) received an application from BP Whiting Refinery relating changes at the Catalytic Feed Hydrotreating Unit (CFHU), to increase the rated capacity to 100,000 barrels per day. A preheater furnace will be added and three hydrogen system compressors will be modified to increase the capacity.

This CFHU involves the following equipment:

- (a) Preheater Furnace F-801 A/B, with a burner capacity of 66.5 million Btu per hour, exhausting to Stack 171-01.
- (b) Preheater Furnace F 801 C, with a burner capacity of 60.0 million Btu per hour, exhausting to Stack 171-01.
- (c) One hydrogen system with four (4) compressors:
  - (1) Compressors K-801 A, B, and C, each rated at 40 million standard cubic feet per day.
  - (2) Compressor K-801 D, rated at 30 million standard cubic feet per day.
- (d) One hydraulics system with pipes, pumps, and associated equipment.

This application also requests that the changes to the #12 Pipe Still, approved by OAQ in Exemption 089-14450-00003, be made federally enforceable.

### History

Amoco Whiting Refinery submitted a Part 70 permit application (089-6741-00003) for a petroleum refinery on September 30, 1996. This application shall be incorporated in the submitted Part 70 application.

The pending Part 70 application has since received six revisions:

- (a) Minor Source Modification 089-11960-00003, which involved replacing storage tank #3705, was issued on June 6, 2000.
- (b) Minor Source Modification 089-11984-00003, which acknowledged removal of the Lubes Unit for an emission reduction credit, was issued on July 20, 2000.
- (c) Minor Source Modification 089-14239-00003, which involved a steam sharing plan with Whiting Clean Energy, was issued on May 11, 2001
- (d) Significant Source Modification 089-13846-00003, which involved an additional tail gas unit at its Sulfur Recovery Unit, was issued on June 27, 2001.

- (e) Exemption 089-14450-00003, which involved changes to the operation of the #12 Pipe Still and an additional tower for the VRU 300 Mercox Treating Section, was issued on July 18, 2001.
- (f) Significant Source Modification 089-14210-00453, which involved the addition of two (2) soil remediation units at the south tank field, was issued on September 13, 2001. This modification is also an Emission Offset Permit pursuant to 326 IAC 2-3.

This application will be the seventh revision to the Part 70 application.

### **Enforcement Issues**

Part of this application is being sought in order to comply with a consent decree between BP Exploration & Oil Company, Amoco Oil Company, and Atlantic Richfield Company and the U.S. EPA and nine states including Indiana. Among other requirements, the consent decree:

- (a) requires all Claus trains at the sulfur recovery plant be subject to NSPS Subpart J. (This item was addressed in Significant Source Modification 089-13846-00003.)
- (b) requires all fuel gas fired heaters and boilers be subject to NSPS Subpart J, on or before December 31, 2001. (This item will be addressed in this application.)
- (c) requires installation of a supplemental tail gas unit in order to achieve continuous compliance. (This item was addressed in Significant Source Modification 089-13846-00003.)
- (d) requires installation and monitoring of a SO<sub>2</sub> CEMS on the stack of the bypass incinerator.
- (e) requires elimination of all fuel oil burning at the heaters and boilers, on or before June 1, 2003. (This item was addressed in Significant Source Modification 089-13846-00003 and Exemption 089-14450-00003, and will be addressed in this application.)
- (f) requires at least 30% of the heat input capacity for all heaters and boilers greater than 40 million Btu per hour use NO<sub>x</sub> emission control technologies approved in the consent decree. (This item will be addressed in this application.)
- (g) places limits and restrictions on Fluidized Catalytic Cracking Units 500 and 600. (Those requirements will be addressed in future modifications.)

### **Stack Summary**

Stack information will be unchanged as a result of this application.

### **Recommendation**

The staff recommends to the Commissioner that the application be approved as a significant source modification. This recommendation is based on the following facts and conditions:

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

An application for the purposes of this review was received on July 2, 2001.

## Emission Calculations

The potential to emit VOC from Exemption 089-14450-00003 is 0.15 tons per year. See Exemption 089-14450-00003 for a detailed summary of the #12 Pipe Still.

### *Increased Utilization of Existing Facilities*

The CFHU project is being done as part of a clean fuels program (fuels with lower than 30 ppm of sulfur by weight). The hydrotreating process lowers the sulfur content of the gas oil feed from 1%-2% to about 0.1% sulfur (1000 ppm by weight) so that other sulfur-removing processes work easier. Expanding the hydrotreating capacity of the CFHU reroutes a portion of the feed presently going directly from the Pipe Stills to the Fluidized Catalytic Cracking Units, allowing that rerouted portion to be hydrotreated before going to the Fluidized Catalytic Cracking Units.

Increased utilization is not expected for anything other than the CFHU. The applicant is increasing maximum capacity of the CFHU from 80,000 barrels/day to 100,000 barrels/day in this permit. Production records indicate that actual use of the CFHU averaged 68,623 barrels/day. Including increased utilization of 14.22% for the existing CFHU furnace does not have any effect on rule applicability.

See Appendix A of this document for detailed emissions calculations regarding the CFHU (4 pages).

## Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as “the maximum capacity of a stationary source 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.”

The following table reflects the existing source potential to emit. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit:

Pollutant	Potential To Emit (tons/year)
PM	4,900
PM-10	4,900
SO <sub>2</sub>	15,000
VOC	5,500
CO	361,800
NO <sub>x</sub>	10,200

  

HAP's	Potential To Emit (tons/year)
Single	>10
TOTAL	>25

The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of criteria pollutants is equal to or greater than 100 tons per year. The potential to emit a single hazardous air pollutant (HAP) is equal to or greater than ten (10) tons per year and the potential to emit a combination of HAP is greater than or equal to twenty-five (25) tons per year. Therefore, the source is subject to the provisions of 326 IAC 2-7.

This existing source is a major source for Prevention of Significant Deterioration, 326 IAC 2-2. It is in one of the 28 source categories and pollutants have the potential to emit at a rate of 100 tons per year or more.

The revision's potential to emit, before controls, is as follows:

Pollutant	Potential To Emit (tons/year)
PM	2.5
PM-10	2.5
SO <sub>2</sub>	10.2
VOC	2.1
CO	28.4
NO <sub>x</sub>	33.7
<b>HAPs</b>	
<b>Potential To Emit (tons/year)</b>	
TOTAL	negligible

The potential to emit (as defined in 326 IAC 2-1.1-1(16)) nitrogen oxides (NO<sub>x</sub>) is greater than 25 tons per year. Therefore, the revision is classifiable as a significant source modification under 326 IAC 2-7-10.5.

Emissions of nitrogen oxides will be controlled by federally enforceable conditions. Pursuant to PSD and Emission Offset, the revision's potential to emit is follows:

Pollutant	Potential To Emit (tons/year)	PSD/Offset Significant Level (tons/yr)
PM	2.5	25
PM-10	2.5	15
SO <sub>2</sub>	10.2	40
VOC	2.1	25
CO	28.4	100
NO <sub>x</sub>	15.1	40
<b>HAP</b>		
<b>Potential To Emit (tons/year)</b>		
<b>PSD Significant Level (tons/yr)</b>		
TOTAL	negligible	n/a

The following table lists the applicable project emissions during the last five (5) years and changes in the potential to emit each pollutant as well as the effective date, the permit number and changes in the emissions bank.

### Applicable Project Emissions

Pollutant Area Status Banked Emissions	tons per year							Effective Date	CP Number
	PM SIP	PM <sub>10</sub> NSR	SO <sub>2</sub> NSR	VOC NSR	NO <sub>x</sub> NSR	NO <sub>2</sub> PSD	CO PSD		
New F-100 Furnace-Docks	0.3	0.3	0.0	0.3	4.4	4.4	1.9	11/19/1997	089-9003-00003
TK 6125	0.0	0.0	0.0	0.1	0.7	0.7	0.2	1/1/1998	(a)
TK 3602 Conversion				0.4				1/22/1998	(a)
TK 6126	0.0	0.0	0.0	0.1	0.7	0.7	0.2	1/1/1999	(a)
Alky Splitter				1.2				3/1/1999	(a)
TK3604 Conversion				0.3				8/23/2000	(a)
TK 6127	0.0	0.0	0.0	0.1	0.5	0.5	0.2	9/30/2000	(a)
SRU: SBS Tail Gas Unit	3.7	3.7	39.4	3.6	17.8	17.8	14.7	6/27/2001	089-13846-00003
Steam Sharing: 3 SPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5/11/2001	089-14239-00003
VRU 300: Tower T-391	0.0	0.0	0.0	0.2	0.0	0.0	0.0	7/18/2001	089-14450-00003
Soil Remediation: IC Engines	0.3	0.3	1.6	4.0	8.9	8.9	5.4	9/13/2001	089-14210-00453
CFHU: Furnace F-801 C	2.2	2.2	10.2	1.6	10.5	10.5	24.5	Pending	089-14630-00003
Total Increases	6.5	6.5	51.2	11.9	43.5	43.5	47.1		

(a) Records are not readily available.

The net VOC emissions increases over the past five consecutive year period will be 11.9 tons per year. This increase is classifiable as "de minimis" under 326 IAC 2-3-1(l).

This application is not a major modification for Emission Offset, 326 IAC 2-3, because the increase in potential to emit is less than the Emission Offset significant levels. Therefore, pursuant to 326 IAC 2-3, the Emission Offset requirements do not apply.

### County Attainment Status

The source is located in Lake County.

Pollutant	Status
PM-10	nonattainment (moderate)
SO <sub>2</sub>	nonattainment (primary)
NO <sub>2</sub>	attainment
Ozone	nonattainment (severe)
CO	attainment
Lead	attainment

Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Lake County has been designated as nonattainment for ozone. VOC emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.

Lake County has also been classified as non-attainment for sulfur dioxide (SO<sub>2</sub>) and particulate matter less than 10 microns in diameter (PM-10). Therefore, these emissions were reviewed pursuant to the requirements for Emission Offset, 326 IAC 2-3.

Lake County has been classified as attainment for carbon monoxide (CO) and oxides of nitrogen (NOx) . Therefore, CO and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.

### **Federal Rule Applicability - Entire Source**

#### 40 CFR Part 60, Subpart J (Petroleum Refineries)

This source is subject to the New Source Performance Standards, 326 IAC 12 (40 CFR 60, Subpart J) - Standards of Performance for Petroleum Refineries. See "State Rule Applicability" for the requirements as they pertain to individual facilities.

There are no National Emission Standards for Hazardous Air Pollutants (NESHAP)(326 IAC 14 and 40 CFR Part 63) applicable to this application.

### **State Rule Applicability - Entire Source**

#### 326 IAC 2-6 (Emission Reporting)

This source is subject to 326 IAC 2-6 (Emission Reporting), because it is located in one of the eight counties listed in the rule and it has the potential to emit more than ten (10) tons per year of volatile organic compounds or nitrogen oxides. Pursuant to this rule, the source must annually submit an emission statement for the source. The annual statement must contain the minimum requirement as specified in 326 IAC 2-6-4. The submittal should cover the period defined in 326 IAC 2-6-2(8)(Emission Statement Operating Year).

#### 326 IAC 5-1 (Visible Emissions Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following:

- (a) Opacity shall not exceed an average of twenty percent (20%) 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.

#### 326 IAC 8-4-8 (Leaks from Petroleum Refineries; Monitoring; Reports)

Pursuant to 326 IAC 8-4-8, the emission source shall develop and conduct a monitoring program addressing the guidelines contained in 326 IAC 8-4-8 (c) through (m).

### **State Rule Applicability - Heaters H-1AN, H-1AS, H-1B and H-2**

#### 326 IAC 6-1-10.1 (Lake County PM<sub>10</sub> Emission Requirements)

Pursuant to 326 IAC 6-1-10.1, PM<sub>10</sub> emissions from Heaters H-1AN, H-1AS, H-1B and H-2 shall not exceed 0.025 pounds per million Btu heat input.

#### 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations)

Pursuant to 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from Heaters H-1AN, H-1AS, H-1B and H-2 shall not exceed 0.32 pounds per million Btu heat input.

### 326 IAC 12 (New Source Performance Standards)

These heaters predate the applicability of 326 IAC 12 and 40 CFR Part 60 (New Source Performance Standards (NSPS) ) Subpart J - Standards of Performance for Petroleum Refineries.

### **State Rule Applicability - Heaters H-1CN, H-1CS and H-1CX**

#### 326 IAC 6-1-10.1 (Lake County PM<sub>10</sub> Emission Requirements)

Pursuant to 326 IAC 6-1-10.1, PM<sub>10</sub> emissions from Heaters H-1CN, H-1CS and H-1CX shall not exceed 0.004 pounds per million Btu heat input.

#### 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations)

Pursuant to 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from Heaters H-1CN, H-1CS and H-1CX shall not exceed 0.033 pounds per million Btu heat input.

### 326 IAC 12 (New Source Performance Standards)

Heater H-1CX is subject to 326 IAC 12 and 40 CFR Part 60 (New Source Performance Standards (NSPS) ) Subpart J - Standards of Performance for Petroleum Refineries. Pursuant to these rules, the Permittee shall not burn in Heater H-1CX any fuel gas that contains hydrogen sulfide (H<sub>2</sub>S) in excess of 0.10 gr/dscf.

Heaters H-1CN and H-1CS predate the applicability of 326 IAC 12 and 40 CFR Part 60 (New Source Performance Standards (NSPS) ) Subpart J.

### **State Rule Applicability - Vacuum Tower**

#### 326 IAC 8-4-2 (Petroleum Refineries)

Pursuant to 326 IAC 8-4-2 (Petroleum Refineries) this facility shall not emit any noncondensable VOC from condensers, hot wells or accumulators.

### **State Rule Applicability - Catalytic Feed Hydrotreating Unit (CFHU)**

#### 326 IAC 6-1-10.1 (Lake County PM<sub>10</sub> Emission Requirements)

Pursuant to 326 IAC 6-1-10.1, PM<sub>10</sub> emissions from this facility shall not exceed 0.004 pounds per million Btu heat input.

#### 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations)

Pursuant to 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from this facility shall not exceed 0.035 pounds per million Btu heat input.

### 326 IAC 12 (New Source Performance Standards)

Both furnaces are subject to 326 IAC 12 and 40 CFR Part 60 (New Source Performance Standards (NSPS) ) Subpart J - Standards of Performance for Petroleum Refineries. Pursuant to these rules, the Permittee shall not burn in these furnaces any fuel gas that contains hydrogen sulfide (H<sub>2</sub>S) in excess of 0.10 gr/dscf.

### 326 IAC 2-3 (Emission Offset)

Nitrogen oxide emissions from Furnace F-801C shall be controlled by ultra low-NO<sub>x</sub> burners having an emission rate of 0.040 pounds per million Btu or less. This limit will render the requirements of Emission Offset as not applicable.

### **Conclusion**

These changes shall be subject to the conditions of the attached Significant Source Modification, No. 089-14630-00003.

**Appendix A: Emissions Calculations**

**Fuel Gas Combustion**

**MM BTU/HR <100**

**Company Name:** BP Whiting Refinery  
**Address City IN Zip:** 2815 Indianapolis Blvd., Whiting, IN 46394  
**ID:** 089-14630-00003  
**Reviewer:** Allen R. Davidson  
**Date:** 12/03/01

Heat Input Capacity MMBtu/hr	Heating Value Btu/CF (MMBtu/MMCF)	Potential Throughput MMCF/yr
60.000	901.79	582.8

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.6	2.2	0.2	29.1	1.6	24.5

\*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.

\*\*Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

**HAPs - Organics**

	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	6.120E-04	3.497E-04	2.186E-02	5.246E-01	9.908E-04

**HAPs - Metals**

	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	1.457E-04	3.206E-04	4.080E-04	1.107E-04	6.120E-04

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

**Methodology**

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

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, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98).

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

Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factor: confirm that the correct factor is used (i.e., condensable included/not included).

**Appendix A: Emissions Calculations**

**Fuel Gas Combustion**

**MM BTU/HR <100**

**Company Name:** BP Whiting Refinery  
**Address City IN Zip:** 2815 Indianapolis Blvd., Whiting, IN 46394  
**ID:** 089-14630-00003  
**Reviewer:** Allen R. Davidson  
**Date:** 12/03/01

Heat Input Capacity MMBtu/hr	Heating Value Btu/CF (MMBtu/MMCF)	Potential Throughput MMCF/yr
66.500	901.79	646.0

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.6	2.5	0.2	32.3	1.8	27.1

\*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.

\*\*Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

**HAPs - Organics**

	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
	Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00
Potential Emission in tons/yr	6.783E-04	3.497E-04	2.186E-02	5.246E-01	9.908E-04

**HAPs - Metals**

	Lead	Cadmium	Chromium	Manganese	Nickel
	Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04
Potential Emission in tons/yr	1.457E-04	3.206E-04	4.080E-04	1.107E-04	6.120E-04

The five highest organic and metal HAPs emission factors are provided above.

Additional HAPs emission factors are available in AP-42, Chapter 1.4.

**Methodology**

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

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, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98).

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

Note: Check the applicable rules and test methods for PM and PM10 when using the above emission factors to confirm that the correct factor is used (i.e., condensable included/not included).

The following calculations determine the increase in production capacity:

1998:	70032 barrels/day
1999:	67214 barrels/day
Average:	68623 barrels/day
New Max:	100000 barrels/day
Difference:	31377 barrels/day

Year 2000 data was judged by OAQ to unrepresentative of normal production.

The following calculations determine present utilization of Furnace 801A/B:

$$\frac{68623 \text{ barrels/day}}{80000 \text{ barrels/day}} = 85.78\% \text{ utilized, } 14.22\% \text{ available}$$

Since only unused capacity of Furnace F 801 A/B is being included, its emissions are as follows:

	PM	PM10	SO2	NOx	VOC	CO
Potential Emission in tons/yr	0.1	0.3	0.0	4.6	0.3	3.9

The following calculations determine sulfur dioxide from Furnace 801 C under 326 IAC 7-4-1.1:

$$\frac{0.035 \text{ lb SO}_2^*}{\text{MMBtu}} \times \frac{66.5 \text{ MMBtu}}{\text{hr}} = 2.3275 \text{ lb SO}_2/\text{hr}$$

$$\frac{2.3275 \text{ lb/hr}^* \times 8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 10.194 \text{ ton SO}_2/\text{yr}$$

The following calculations determine average heating value of fuel gas:

1998:	843 Btu/cu.ft *	254.93 million cu. ft	214906 million Btu
1999:	976 Btu/cu.ft *	201.94 million cu. ft	197093.4 million Btu
		456.87 million cu. ft	411999.4 million Btu

$$\text{Average: } \frac{411999.4 \text{ million Btu}}{456.87 \text{ million cu. ft}} = 901.787 \text{ Btu/cu.ft}$$

The following calculations determine potential fuel usage for Furnace 801C:

$$\frac{60 \text{ million Btu}}{\text{hr}} \times \frac{\text{cu. ft}}{901.787 \text{ Btu}} \times \frac{8760 \text{ hr}}{\text{yr}} = 582.84 \text{ million cu. ft yr}$$

The following calculations determine nitrogen oxide emissions for Furnace 801C after federally enforceable controls:

$$\frac{0.04 \text{ lb NO}_x^*}{\text{million Btu}} \times \frac{901.787 \text{ Btu}}{\text{cu. ft}} = 36.071 \frac{\text{lb}}{\text{million cu. ft}}$$

$$\frac{582.84 \text{ million cu. ft}^*}{\text{yr}} \times \frac{36.07 \text{ lb}}{\text{million cu. ft}} \times \frac{\text{ton}}{2000 \text{ lb}} = 10.51 \frac{\text{ton NO}_x}{\text{yr}}$$

The following calculations determine equivalent ton/year limits for given lb/hr limits:

$$\frac{16.348 \text{ lb PM}^*}{\text{hr}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 71.60 \text{ ton PM/yr}$$

$$\frac{0.444 \text{ lb PM}^*}{\text{hr}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 1.94 \text{ ton PM/yr}$$

$$2 \text{ units}^* \times 1.9447 \text{ ton PM/yr} = 3.89 \text{ ton PM/yr}$$

$$\frac{0.924 \text{ lb PM}^*}{\text{hr}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 4.05 \text{ ton PM/yr}$$

The following calculations determine equivalent ton/year limits for given lb/MMBtu limits:

$$\frac{486 \text{ MMBtu}^*}{\text{hr}} \times \frac{0.025 \text{ lb PM}^*}{\text{MMMBtu}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 53.22 \frac{\text{ton PM}}{\text{yr}}$$

$$\frac{120 \text{ MMBtu}^*}{\text{hr}} \times \frac{0.004 \text{ lb PM}^*}{\text{MMMBtu}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 2.10 \frac{\text{ton PM}}{\text{yr}}$$

$$\frac{410 \text{ MMBtu}^*}{\text{hr}} \times \frac{0.004 \text{ lb PM}^*}{\text{MMMBtu}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 7.18 \frac{\text{ton PM}}{\text{yr}}$$

$$\frac{410 \text{ MMBtu}^*}{\text{hr}} \times \frac{0.32 \text{ lb SO}_2^*}{\text{MMMBtu}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 574.66 \frac{\text{ton SO}_2}{\text{yr}}$$

$$\frac{120 \text{ MMBtu}^*}{\text{hr}} \times \frac{0.033 \text{ lb SO}_2^*}{\text{MMMBtu}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 17.34 \frac{\text{ton SO}_2}{\text{yr}}$$

$$\frac{410 \text{ MMBtu}^*}{\text{hr}} \times \frac{0.033 \text{ lb SO}_2^*}{\text{MMMBtu}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 59.26 \frac{\text{ton SO}_2}{\text{yr}}$$

$$\frac{174 \text{ MMBtu}^*}{\text{hr}} \times \frac{0.044 \text{ lb NO}_x^*}{\text{MMMBtu}} \times \frac{8760 \text{ hr}^*}{\text{yr}} \times \frac{\text{ton}}{2000 \text{ lb}} = 33.53 \frac{\text{ton NO}_x}{\text{yr}}$$