

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

**BP Whiting Refinery
2815 Indianapolis Boulevard
Whiting, IN 46394**

(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.

First Significant Source Modification 089-13846-00003

Issued by: Original signed by
Paul Dubenetzky, Branch Chief
Office of Air Quality

Issuance Date: June 27, 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)]

The Permittee owns and operates a petroleum refinery.

Responsible Official: Ms. Maureen McGrail
Source Address: 2815 Indianapolis Boulevard, Whiting, IN 46394-2197
Mailing Address: 2815 Indianapolis Boulevard, Whiting, IN 46394-2197
Phone Number: 219-473-3234
SIC Code: 2911
County Location: Lake
County Status: Nonattainment for PM₁₀, Ozone and SO₂
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)]

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

- (a) The Sulfur Recovery Unit (SRU), rated at 600 long tons per day, which includes:
- (1) Three (3) three-stage Claus units, identified as the "A," "B" and "C" trains.
 - (2) One (1) Beavon-Stretford tail gas unit, a reduction system with a burner capacity of 24.3 MMBtu per hour, identified as "B/S TGU."
 - (3) One (1) tail gas unit, an oxidization system with a burner capacity of 40 MMBtu per hour, identified as "SBS TGU." Sulfur dioxide emissions are controlled by one (1) caustic soda scrubbing tower, which produces sodium bisulfite as a byproduct. Sodium bisulfite is removed from the exhaust stream by a cooling tower rated at 4200 gallons per minute, identified as the "SBS cooling tower", equipped with a high-efficiency mist eliminator.
 - (4) Gas quenching and cooling towers other than the SBS cooling tower.
 - (5) One (1) quench separator with mist eliminators.
 - (6) One (1) gas cooler and water condenser with sulfur dioxide stripper.
 - (7) Caustic soda storage tanks and sodium bisulfite storage tanks, and handling 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 also includes the following insignificant activities, as defined in 326 IAC 2-7-1(21):

- (a) One (1) heat exchanger rated at 24 million BTU per hour, utilizing waste heat from the SBS TGU for heat input.

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]

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]

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)]

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)]

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 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.

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)]

- (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]

- (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]

- (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, OAM 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, OAM within forty-five (45) days after the completion of the testing. An extension may be granted by IDEM, OAM if the source submits to IDEM, OAM, 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]

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)]

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]

- (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.3 FACILITY OPERATION CONDITIONS

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

The Sulfur Recovery Unit (SRU), rated at 600 long tons per day, which includes:

- (a) Three (3) three-stage Claus units, identified as the "A," "B" and "C" trains.
- (b) One (1) Beavon-Stretford tail gas unit, a reduction system with a burner capacity of 24.3 MMBtu per hour, identified as "B/S TGU."
- (c) One (1) tail gas unit, an oxidization system with a burner capacity of 40 MMBtu per hour, identified as "SBS TGU." Sulfur dioxide emissions are controlled by one (1) caustic soda scrubbing tower, which produces sodium bisulfite as a byproduct. Sodium bisulfite is removed from the exhaust stream by a cooling tower rated at 4200 gallons per minute, identified as the "SBS cooling tower", equipped with a high-efficiency mist eliminator.
- (d) Gas quenching and cooling towers other than the SBS cooling tower.
- (e) One (1) quench separator with mist eliminators.
- (f) One (1) gas cooler and water condenser with sulfur dioxide stripper.
- (g) Caustic soda storage tanks and sodium bisulfite storage tanks, and handling equipment.

Main Operating Scenario:

Approximately 80% of tail gases from the three trains are sent to the B/S TGU, with the remainder sent to the SBS TGU.

Alternate Operating Scenario #1:

One train and the B/S TGU are not operated. Tail gases from the other two trains are sent to the SBS TGU.

Alternate Operating Scenario #2:

The B/S TGU is not operated. Tail gases from the three trains are sent to the SBS TGU.

(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.3.1 Particulate Matter [326 IAC 6-1-2]

Pursuant to 326 IAC 6-1-2, particulate matter emissions from the SBS TGU and the SBS cooling tower shall not exceed 0.03 grains per dry standard cubic foot.

D.3.2 Lake County PM₁₀ Emission Limitations [326 IAC 6-1-10.1]

Pursuant to 326 IAC 6-1-10.1, PM₁₀ emissions from the B/S TGU shall not exceed 0.11 pounds per ton of feed material and 0.103 pounds per hour (0.45 tons per year).

D.3.3 Emission Offset [326 IAC 2-3]

- (a) Pursuant to Construction Permit 089-3323-00003, issued on December 14, 1994, emissions of total reduced sulfur measured as sulfur dioxide from the B/S TGU shall be limited to 232.6 tons per 12-month period.

Furthermore, the following emission units shall remain inoperative unless new approval is obtained:

- (1) Propane Dewaxing Unit
 - (2) #1, #2 and #3 Asphalt Oxidizers
 - (3) The Butamer Unit
 - (4) The F-7 Furnace to the Isomerization Unit
 - (5) The #1 Power Station Boiler #1
- (b) Emissions of total reduced sulfur measured as sulfur dioxide from the SBS TGU shall be limited to 39.4 tons per 12-month period.

This condition renders the requirements of Emission Offset as not applicable for sulfur dioxide.

D.3.4 Lake County Sulfur Dioxide Emission Limitations [326 IAC 7-4-1.1]

- (a) Pursuant to 326 IAC 7-4-1.1(c), sulfur dioxide emissions from the B/S TGU shall not exceed 18.83 pounds per ton of feed material. This requirement is superseded by more stringent sulfur dioxide conditions elsewhere in this permit.
- (b) Pursuant to 326 IAC 7-4-1.1(a), the SBS TGU shall only burn natural gas as fuel.

D.3.5 New Source Performance Standards [326 IAC 12] [40 CFR 60]

Pursuant to 326 IAC 12 (40 CFR 60, Subpart J):

- (a) Emissions of sulfur dioxide from the SBS TGU shall not exceed 250 parts per million (ppm) by volume, on a dry basis corrected to 0% excess air.
- (b) Emissions of reduced sulfur compounds from the B/S TGU, measured as sulfur dioxide, shall not exceed 300 ppm by volume, on a dry basis corrected to 0% excess air.
- (c) Emissions of hydrogen sulfide from the B/S TGU, measured as sulfur dioxide, shall not exceed 10 ppm by volume, on a dry basis corrected to 0% excess air.

Compliance Determination Requirements

D.3.6 Determination for Particulate Matter [326 IAC 6-1-2]

The SBS cooling tower will be deemed in compliance with 326 IAC 6-1-2 provided that the total dissolved solids (TDS) in the cooling tower water do not exceed 3300 ppm.

D.3.7 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 the SBS TGU will be operated, but not later than 180 days after initial startup, the Permittee shall conduct performance tests for sulfur dioxide emissions from the SBS TGU and furnish the Administrator a written report of the results of such performance tests.

D.3.8 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 Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.3.9 Continuous Emission Monitoring System (CEMS) Required [326 IAC 3-5] [326 IAC 12]

- (a) A continuous emission monitoring system shall be installed and shall be operated at all times when the SBS TGU is in operation. The CEMS shall continuously measure and record the concentration of reduced sulfur emissions, on a dry basis corrected to 0% excess air. The CEMS shall also include an oxygen monitor for correcting the data for excess air, and a continuous flow meter for calculating the sulfur dioxide emission rate per month and per 12-month period.
- (b) A continuous emission monitoring system shall be installed and shall be operated at all times when the B/S TGU is in operation. The CEMS shall continuously measure and record the concentration of reduced sulfur emissions, on a dry basis corrected to 0% excess air. The CEMS shall also include an oxygen monitor for correcting the data for excess air.

D.3.10 Standard Operating Procedures [326 IAC 3-5-4]

Within 90 days after CEMS installation, the Permittee shall submit to OAQ standard operating procedures (SOP). If revisions are made to the SOP, updates shall be submitted biennially. At a minimum, the SOP shall describe procedures and operations as listed in 326 IAC 3-5-4(a).

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

D.3.11 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.3.12 Reporting of Excess Emissions [40 CFR 60.7] [326 IAC 3-5-7]

- (a) For the purpose of reports under 40 CFR 60.7, periods of excess emissions shall be determined and reported as follows:
 - (1) All 12-hour periods during which the average concentration of SO₂, as measured by the continuous monitoring system on the SBS TGU, exceeds 250 ppm (dry basis, zero percent excess air).
 - (2) All 12-hour periods during which the average concentration of SO₂, as measured by the continuous monitoring system on the B/S TGU, exceeds 300 ppm (dry basis, zero percent excess air).

- (b) For the purpose of reports under 326 IAC 3-5-7, periods of excess emissions shall be determined and reported as follows:
 - (1) All 3-hour periods during which the average concentration of SO₂, as measured by the continuous monitoring system on the SBS TGU, exceeds 250 ppm (dry basis, zero percent excess air).
 - (2) All 3-hour periods during which the average concentration of SO₂, as measured by the continuous monitoring system on the B/S TGU, exceeds 300 ppm (dry basis, zero percent excess air).
- (c) The periods shall end at 03:00, 06:00, 09:00, 12:00, 15:00, 18:00, 21:00, and 24:00 hours

D.3.13 Reporting Requirements [326 IAC 3-5-7]

A quarterly summary of the information to document compliance with Conditions D.3.3, D.3.4, D.3.6 and D.3.9 shall be submitted to the address listed 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 quarter being reported.

**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.: 089-13846-00003

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

Please check what document is being certified:

- 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.: 089-13846-00003

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) 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 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) 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 ₂ , VOC, NO _x , 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 Quarterly 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
Part 70 Permit No.: 089-13846-00003

Facility: Sodium Bisulfite (SBS) Tail Gas Unit
Parameter: Sulfur Dioxide
Limit: 39.4 tons per 12-month period

MONTHS _____ TO _____ YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	This Month	Previous 11 Months	12 Month Total
Month 1			
Month 2			
Month 3			

- 9 No deviation occurred in this quarter.
- 9 Deviation/s occurred in this quarter.
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.: 089-13846-00003

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

Technical Support Document (TSD) for a Modification to a Part 70 Operating Permit

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.: 089-13846-00003
Permit Reviewer: Allen R. Davidson

On January 29, 2001, the Office of Air Quality (OAQ) received an application from BP Whiting Refinery relating to the construction of an additional tail gas unit at its Sulfur Recovery Unit (SRU), rated at 600 long tons per day.

The following equipment will be added to the plant:

- (a) One (1) tail gas unit, an oxidization system with a burner capacity of 40 MMBtu per hour, identified as "SBS TGU." Sulfur dioxide emissions are controlled by one (1) caustic soda scrubbing tower, which produces sodium bisulfite as a byproduct. Sodium bisulfite is removed from the exhaust stream by a cooling tower rated at 4200 gallons per minute, identified as the "SBS cooling tower", equipped with a high-efficiency mist eliminator.
- (b) Gas quenching and cooling towers other than the SBS cooling tower.
- (c) One (1) quench separator with mist eliminators.
- (d) One (1) gas cooler and water condenser with sulfur dioxide stripper.
- (e) Caustic soda storage tanks and sodium bisulfite storage tanks, and handling equipment.
- (f) One (1) heat exchanger rated at 24 million BTU per hour, utilizing waste heat from the SBS TGU for heat input, classifiable as an insignificant activity under 326 IAC 2-7-1(21).

The following equipment is existing but will be affected by this application:

- (g) Three (3) three-stage Claus units, identified as the "A," "B" and "C" trains.
- (h) One (1) Beavon-Stretford tail gas unit, a reduction system with a burner capacity of 24.3 MMBtu per hour, identified as "B/S TGU."

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 emission source has since received two modifications:

- (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.

This application will be the third modification to the Part 70 application.

Enforcement Issues

This application is being sought in order to comply with the first stages of a consent decree between BP Exploration & Oil Company and the U.S. EPA and nine states. This consent decree requires the following:

- (a) that all trains at the sulfur recovery plant be subject to NSPS Subpart J.
- (b) installation of a supplemental tail gas unit in order to achieve continuous compliance.
- (c) installation and monitoring of a SO₂ CEMS on the stack of the bypass incinerator.

The consent decree also places limits and restrictions on Fluidized Catalytic Cracking Units 500 and 600. Those requirements, which are part of later stages of the consent decree, will be addressed in future modifications.

Stack Summary

ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
162-04	Sodium Bisulfite Tail Gas Unit	120	3	29200	118
162-05	SBS Cooling Tower	27	12	259000	72

Recommendation

The staff recommends to the Commissioner that the revision 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 January 29, 2001.

Emission Calculations

See Appendix A of this document for detailed emissions calculations. (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 ₂	15,000
VOC	5,500
CO	361,800
NO _x	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 is as follows:

Pollutant	Potential To Emit (tons/year)
PM	7.5
PM-10	7.5
SO ₂	217.6
VOC	1.0
CO	14.7
NO _x	17.5

HAPs	Potential To Emit (tons/year)
TOTAL	negligible

The potential to emit (as defined in 326 IAC 2-1.1-1(16)) sulfur dioxide (SO₂) 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 sulfur dioxide will be controlled to less than 40 tons per year 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	7.5	25
PM-10	7.5	15
SO ₂	39.4	40
VOC	1.0	40
CO	14.7	exempt
NO _x	17.5	40

HAP	Potential To Emit (tons/year)	PSD Significant Level (tons/yr)
TOTAL	negligible	n/a

This modification qualifies as a "pollution control project" under 326 IAC 2-1.1-1(13). As a result, for Prevention of Significant Deterioration (PSD), 326 IAC 2-2, it is expressly excluded from the definition of "Major PSD Modification" under 326 IAC 2-2-1(o)(2)(H). Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the PSD requirements do not apply.

No "pollution control project" exclusion exists in the case of Emission Offset, 326 IAC 2-3. This revision is not a major modification for Emission Offset because the increase in potential to emit every nonattainment pollutant is less than the Emission Offset significant levels. Therefore, pursuant to 326 IAC 2-2, and 40 CFR 52.21, the Emission Offset requirements do not apply.

Actual Emissions

The following table shows the actual emissions from the source. This information reflects 1999, the most recent emission data submitted to OAQ by the source:

Pollutant	Actual Emissions (tons/year)
PM-10	849
SO ₂	7650
VOC	1440
CO	6791
NO _x	10,087

County Attainment Status

The source is located in Lake County.

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

Volatile organic compounds (VOC) and oxides of nitrogen (NOx) 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. Lake County has been designated as nonattainment for ozone. VOC and NO_x 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 (SO₂) 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. Therefore, carbon monoxide 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.

40 CFR Part 60, Subpart Dc (Steam Generating Units)

The heat exchanger does not conform to the definition of a "steam generating unit" under 40 CFR 60.41c because it does not combust any fuel. Therefore, 326 IAC 12 (40 CFR 60 Subpart Dc) does not apply.

40 CFR Part 60, Subpart Kb (Volatile Organic Storage Vessels)

Neither caustic soda nor sodium bisulfite are classified as volatile organic liquids. Therefore, 326 IAC 12 (40 CFR Part 60, Subpart Kb) is not applicable to those storage vessels.

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.

State Rule Applicability - SBS TGU

326 IAC 12 (New Source Performance Standards)

This facility 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, sulfur dioxide emissions shall not exceed 250 parts per million by volume (ppmv), on a dry basis, corrected to 0% excess air.

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

This facility is subject to 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations). Pursuant to this rule, this facility shall use only natural gas as fuel.

326 IAC 6-1-2 (Particulate Emission Limitations)

This facility is subject to 326 IAC 6-1-2. Pursuant to 326 IAC 6-1-2 (Particulate Emission Limitations), particulate matter emissions from this facility shall not exceed 0.03 grains per dry standard cubic foot. For a gas flow rate of 20,335 actual cubic feet per minute at 118°F, this condition equates to a limit of 0.48 pounds of particulate per hour.

326 IAC 2-3 (Emission Offset)

Emissions of total reduced sulfur measured as sulfur dioxide from the SBS TGU shall be limited to 39.4 tons per 12-month period. A continuous emissions monitoring system will be installed to provide direct measurements to demonstrate compliance with the limit.

This requirement renders the requirements of Emission Offset as not applicable for sulfur dioxide.

State Rule Applicability - B/S TGU

326 IAC 6-1-2 (Particulate Emission Limitations)

This rule is not applicable to this facility since 326 IAC 6-1-7 applies.

326 IAC 6-1-7 (Scope)

This rule requires sources and facilities in any of ten counties to comply with facility emission limits listed in 326 IAC 6-1-8.1 through 326 IAC 6-1-18.

326 IAC 6-1-10.1 (Lake County PM₁₀ Emission Limitations)

Pursuant to 326 IAC 6-1-10.1, PM₁₀ emissions from the B/S TGU (the tail gas unit that was newest on the rule's applicability date) shall not exceed 0.11 pounds per ton of feed material and 0.103 pounds per hour (0.45 tons per year).

326 IAC 12 (New Source Performance Standards)

This facility 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, sulfur dioxide emissions shall not exceed 300 parts per million by volume (ppmv), on a dry basis, corrected to 0% excess air.

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

This facility is subject to 326 IAC 7-4-1.1 (Lake County Sulfur Dioxide Emission Limitations). Pursuant to this rule, sulfur dioxide emissions shall not exceed 18.83 pounds per ton of feed material.

326 IAC 2-3 (Emission Offset)

Pursuant to Construction Permit 089-3323-00003, issued on December 14, 1994, emissions of total reduced sulfur measured as sulfur dioxide from the B/S TGU shall be limited to 53.1 pounds per hour (232.6 tons per 12-month period). Furthermore, the following emission units shall remain inoperative unless new approval is obtained:

- (1) Propane Dewaxing Unit
- (2) #1, #2 and #3 Asphalt Oxidizers
- (3) The Butamer Unit
- (4) The F-7 Furnace to the Isomerization Unit
- (5) The #1 Power Station Boiler #1

This requirement renders the requirements of Emission Offset as not applicable for sulfur dioxide.

State Rule Applicability - SBS Cooling Tower

326 IAC 6-1-2 (Particulate Emission Limitations)

This facility is subject to 326 IAC 6-1-2. Pursuant to 326 IAC 6-1-2 (Particulate Emission Limitations), particulate matter emissions from this facility shall not exceed 0.03 grains per dry standard cubic foot. For a gas flow rate of 236,100 actual cubic feet per minute at 72°F, this condition equates to a limit of 6.03 pounds of particulate per hour.

The applicant has proposed a limit on the total dissolved solids (TDS) in the cooling tower water of 3300 ppm. OAQ has determined that this limit will comply with the rule. The mist eliminator is not required to comply with this limit.

State Rule Applicability - Heat Exchanger

There are no state rules applicable to this facility.

State Rule Applicability - Caustic Soda / Sodium Bisulfite Storage Tanks

There are no state rules applicable to this facility.

Conclusion

The construction and operation of these facilities shall be subject to the conditions of the attached Significant Source Modification, No 089-13846-00003.

Mail to: Permit Administration & Development Section
Office Of Air Quality
100 North Senate Avenue
P. O. Box 6015
Indianapolis, Indiana 46206-6015

BP Whiting Refinery
P.O. Box 710
Whiting, IN 46394-0710

Affidavit of Construction

I, _____, being duly sworn upon my oath, depose and say:
(Name of the Authorized Representative)

1. I live in _____ County, Indiana and being of sound mind and over twenty-one (21) years of age, I am competent to give this affidavit.
2. I hold the position of _____ for BP Whiting Refinery.
(Title)
3. By virtue of my position with BP Whiting Refinery, I have personal knowledge of the representations contained in this affidavit and am authorized to make these representations on behalf of BP Whiting Refinery.
4. I hereby certify that BP Whiting Refinery, 2815 Indianapolis Blvd., Whiting, IN 46394-2197, has constructed the SBS tail gas unit and its associated equipment in conformity with the requirements and intent of the permit application that was received by the Office of Air Quality on January 29, 2001; and as permitted pursuant to **Significant Source Modification No. 089-13846-00003**, issued on _____

Further Affiant said not.

I affirm under penalties of perjury that the representations contained in this affidavit are true, to the best of my information and belief.

Signature

Date

STATE OF INDIANA)
)SS

COUNTY OF _____)

Subscribed and sworn to me, a notary public in and for _____ County and State of
Indiana on this _____ day of _____, 20 _____.

My Commission expires: _____

Signature

Name (typed or printed)

**Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100**

Company Name: BP Whiting Refinery
Address City IN Zip: 2815 Indianapolis Blvd. Whiting IN 46394
ID: 089-13846-00003
Reviewer: Allen R. Davidson
Date: 06/28/01

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
40.000	350.4

	Pollutant					
Emission Factor in lb/MMCF	PM* 1.9	PM10* 7.6	SO2 0.6	NOx 100.0 **see below	VOC 5.5	CO 84.0
Potential Emission in tons/yr	0.3	1.3	0.1	17.5	1.0	14.7

*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

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 1-04-006-02 (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).

See Page 2 for HAPs emissions calculations.

**Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100**

HAPs Emissions

Company Name: BP Whiting Refinery
Address City IN Zip: 2815 Indianapolis Blvd. Whiting IN 46394
ID: 089-13846-00003
Reviewer: Allen R. Davidson
Date: 12/18/00

HAPs - Organics

Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	3.679E-04	2.102E-04	1.314E-02	3.154E-01	5.957E-04

HAPs - Metals

Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	8.760E-05	1.927E-04	2.453E-04	6.658E-05	3.679E-04

Methodology is the same as Page 1.

The five highest organic and metal HAPs emission factors are provided above.
 Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Appendix A: Emissions Calculations
 Natural Gas Combustion Only
 MM BTU/HR <100

Company Name: BP Whiting Refinery
 Address City IN Zip: 2815 Indianapolis Blvd. Whiting IN 46394
 ID: 089-13846-00003
 Reviewer: Allen R. Davidson
 Date: 06/28/01

The following calculations determine limits in existing permits:

435 lb/hr *	8760 hr/yr /	2000 lb/ton =	1905.3 tons/year
53.1 lb/hr *	8760 hr/yr /	2000 lb/ton =	232.578 tons/year
0.103 lb/hr *	8760 hr/yr /	2000 lb/ton =	0.45114 tons/year
18.83 lb/ton *	600 ton/hr	11298 lb/hr	
11298 lb/hr *	8760 hr/yr /	2000 lb/ton =	49485.24 tons/year

The only emission points are the main SBS scrubber stack and the cooling tower.
 The following calculations determine emissions from natural gas combustion (tons/yr):

	PM-10	SO2	NOx	VOC	CO
SBS TGU	1.33	0.11	17.52	0.96	14.72

Conversion factors used (from EPA document AP-42 Appendix A)

SO ₂ :	1 ppmv =	2610 ug/m ³
H ₂ S:	1 ppmv =	1390 ug/m ³
	1 ug/m ³ =	6.24E-11 lb/ft ³

The following calculations determine the level of sulfur dioxide and hydrogen sulfide from B/S TGU based on NSPS limits:

B/S TGU	Sulfur Dioxide				
300 ppmv *	2610 ug/m ³ *	6.24E-11 lb/ft ³ *	20335 ft ³ *	60 min =	59.61 lb/hr
	ppmv	ug/m ³	min	hr	
		59.61 lb/hr *	8760 hr/yr /	2000 lb/ton =	261.105 ton/yr

B/S TGU	Hydrogen Sulfide				
60 ppmv *	1390 ug/m ³ *	6.24E-11 lb/ft ³ *	20335 ft ³ *	60 min =	6.35 lb/hr
	ppmv	ug/m ³	min	hr	
		6.35 lb/hr *	8760 hr/yr /	2000 lb/ton =	27.8112 ton/yr

The following calculations determine the level of sulfur dioxide from SBS TGU based on NSPS limits:

SBS TGU	Sulfur Dioxide				
250 ppmv *	2610 ug/m ³ *	6.24E-11 lb/ft ³ *	20335 ft ³ *	60 min =	49.68 lb/hr
	ppmv	ug/m ³	min	hr	
		49.68 lb/hr *	8760 hr/yr /	2000 lb/ton =	217.588 ton/yr

The following calculations determine the level of particulate matter emissions from SBS TGU cooling tower, based on EPA document AP-42, Chapter 13.4:

$$\frac{4200 \text{ gal}^*}{\text{min}} \times \frac{1.7 \text{ lb drift}^*}{1000 \text{ gal}} \times \frac{3300 \text{ parts TDS}^*}{1000000 \text{ parts water}} \times \frac{60 \text{ min}}{\text{hr}} = 1.41372 \text{ lb/hr}$$

$$1.41 \text{ lb/hr}^* \times 8760 \text{ hr/yr} / 2000 \text{ lb/ton} = 6.19209 \text{ ton/yr}$$

The following calculations determine the level of particulate matter emissions allowed for the SBS cooling tower under 326 IAC 6-1-2:

$$\frac{236100 \text{ acf/min}^*}{(460 + 528 \text{ deg. R}) \text{ deg.R}^*} \times \frac{(100 - 0) \% \text{ moisture}}{100 \% \text{ moisture}} = 234324.81 \text{ dscf/min}$$

$$\frac{0.003 \text{ gr}^*}{\text{dscf}} \times \frac{234325 \text{ ft}^3^*}{\text{min}} \times \frac{\text{lb}^*}{7000 \text{ gr}} \times \frac{60 \text{ min}}{\text{hr}} = 6.03 \text{ lb/hr}$$

$$6.03 \text{ lb/hr}^* \times 8760 \text{ hr/yr} / 2000 \text{ lb/ton} = 26.3917 \text{ ton/yr (will comply)}$$

The following calculations determine the level of particulate matter emissions allowed for the SBS cooling tower under 326 IAC 6-1-2:

$$\frac{20335 \text{ acf/min}^*}{(460 + 528 \text{ deg. R}) \text{ deg.R}^*} \times \frac{(100 - 0) \% \text{ moisture}}{100 \% \text{ moisture}} = 18575.917 \text{ dscf/min}$$

$$\frac{0.003 \text{ gr}^*}{\text{dscf}} \times \frac{18576 \text{ ft}^3^*}{\text{min}} \times \frac{\text{lb}^*}{7000 \text{ gr}} \times \frac{60 \text{ min}}{\text{hr}} = 0.48 \text{ lb/hr}$$

$$0.48 \text{ lb/hr}^* \times 8760 \text{ hr/yr} / 2000 \text{ lb/ton} = 2.09218 \text{ ton/yr (will comply)}$$

Since both control devices can operate simultaneously on the same stream, the increase in potential to emit (before limits) is as follows:

PM-10	SO2	NOx	VOC	CO
7.52	217.69	17.52	0.96	14.72

limited sulfur dioxide emissions:

The applicant has stated that the SBS TGU has a design factor of 60 ppmv SO2 and will operate at 9450 scfm in the main scenario.

SBS TGU Sulfur Dioxide

$$\frac{60 \text{ ppmv}^*}{\text{ppmv}} \times \frac{2610 \text{ ug/m}^3^*}{\text{ug/m}^3} \times \frac{6.24E-11 \text{ lb/ft}^3^*}{\text{ug/m}^3} \times \frac{9450 \text{ ft}^3^*}{\text{min}} \times \frac{60 \text{ min}}{\text{hr}} = 5.54 \text{ lb/hr}$$

$$5.54 \text{ lb/hr}^* \times 8760 \text{ hr/yr} / 2000 \text{ lb/ton} = 24.268 \text{ ton/yr}$$

The applicant has agreed to install a continuous flow meter, in addition to the monitoring system required by NSPS, so direct measurement of sulfur dioxide emissions is possible. This will eliminate the need to require specific concentrations and fan velocities in each scenario.

When in the other scenarios, there are no emissions from the B/S TGU. Since 250 ppmv < 300 ppmv, overall emissions are reduced from present levels.