



Joseph E. Kernan
Governor

Lori F. Kaplan
Commissioner

September 27, 2004

100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015
(317) 232-8603
(800) 451-6027
www.in.gov/idem

TO: Interested Parties / Applicant

RE: J.H. Rudolph & Company, Inc / 163-19126-03408

FROM: Paul Dubenetzky
Chief, Permits Branch
Office of Air Quality

Notice of Decision: Approval - Effective Immediately

Please be advised that on behalf of the Commissioner of the Department of Environmental Management, I have issued a decision regarding the enclosed matter. Pursuant to IC 13-15-5-3, this permit is effective immediately, unless a petition for stay of effectiveness is filed and granted according to IC 13-15-6-3, and may be revoked or modified in accordance with the provisions of IC 13-15-7-1.

If you wish to challenge this decision, IC 4-21.5-3 and IC 13-15-6-1 require that you file a petition for administrative review. This petition may include a request for stay of effectiveness and must be submitted to the Office of Environmental Adjudication, 100 North Senate Avenue, Government Center North, Room 1049, Indianapolis, IN 46204, **within eighteen (18) calendar days of the mailing of this notice**. The filing of a petition for administrative review is complete on the earliest of the following dates that apply to the filing:

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

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

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

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

Enclosures
FNPER.dot 9/16/03



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We make Indiana a cleaner, healthier place to live.

Joseph E. Kernan
Governor

September 27, 2004

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Commissioner

Mr. Ken Thomas
J.H. Rudolph & Company, Inc.
P.O. Box 5226
Evansville, Indiana 47716

Re: 163-19126-03408
First Significant Revision to
FESOP 163-14132-03408

Dear Mr. Thomas:

J.H. Rudolph & Company, Inc. was issued a permit on April 10, 2002 for a hot mix asphalt plant. A letter requesting changes to this permit was received on May 5, 2004. Pursuant to the provisions of 326 IAC 2-8-11.1 a significant permit revision to this permit is hereby approved as described in the attached Technical Support Document.

The modification consists of adding No. 4 virgin oil as a back up fuel to the existing aggregate drum-mix dryer burner.

Pursuant to 326 IAC 2-8-11.1, this permit shall be revised by incorporating the significant permit revision into the permit. All other conditions of the permit shall remain unchanged and in effect. Please attach a copy of this modification and the following revised permit pages to the front of the original permit.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter, please contact Alic Bent, c/o OAQ, 100 North Senate Avenue, P.O. Box 6015, Indianapolis, Indiana, 46206-6015, or call at (973) 575-2555, ext. 3206 or dial (800) 451-6027, and ask for extension 3-6878.

Sincerely,

Original Signed by
Paul Dubenetzky, Chief
Permits Branch
Office of Air Quality

Attachments

AB/EVP

cc: File – Vanderburgh County
U.S. EPA, Region V
Air Compliance Section Inspector – Scot Anslinger
Compliance Data Section
Administrative and Development
Technical Support and Modeling - Michelle Boner



Joseph E. Kernan
 Governor

Lori F. Kaplan
 Commissioner

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 Indianapolis, Indiana 46206-6015
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**FEDERALLY ENFORCEABLE STATE
 OPERATING PERMIT (FESOP)
 OFFICE OF AIR QUALITY
 AND THE
 EVANSVILLE ENVIRONMENTAL PROTECTION AGENCY**

**J. H. Rudolph & Company, Inc.
 3300 S. Green River Road
 Evansville, Indiana 47715**

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

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-8 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.: F163-14132-03408	
Issued by: Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: April 10, 2002 Expiration Date: April 10, 2007

First Significant Permit Revision 163-19126-03408	Pages Revised: 1, 5, 27, 28, 32-34, 42 and 43
Issued by: Original Signed by Paul Dubenetzky, Branch Chief Office of Air Quality	Issuance Date: September 27, 2004

SECTION A SOURCE SUMMARY

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

A.1 General Information [326 IAC 2-8-3(b)]

The Permittee owns and operates a hot drum-mix asphalt plant.

Authorized individual:	Alvin Evans, Chief Operating Officer
Source Address:	3300 S. Green River Road, Evansville, IN 47715
Mailing Address:	P.O. Box 5226, Evansville, IN 47715
SIC Code:	2951
Source Location Status:	Vanderburgh
County Status:	Basic Nonattainment for ozone under the 8-hour standard Attainment for all other criteria pollutants
Source Status:	Federally Enforceable State Operating Permit (FESOP) Minor Source, under PSD Minor Source, Section 112 of the Clean Air Act

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-8-3(c)(3)]

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

- (a) An alternate drying process, used to dry magnetite, with a maximum capacity of 50,000 tons per year;
- (b) One (1) six hundred fifty (650) tons per hour aggregate dryer, with a burner capacity of 116 million British thermal units per hour, exhausting through a baghouse at stack SV1. This dryer is fired by natural gas, including butane, #2 diesel, #4 waste oil and #4 virgin oil as backup fuel;

A.3 Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-8-3(c)(3)(I)]

This modification to this stationary source does not have any insignificant activities, as defined in 326 IAC 2-7-1(21):

SECTION D.1

ALTERNATIVE OPERATING SCENARIO TO SECTION D.2

Facility Description [326 IAC 2-8-4(10)]:

- (a) An alternate drying process, used to dry magnetite, with a maximum capacity of 50,000 tons per year;
- (b) One (1) six hundred fifty (650) tons per hour aggregate dryer, with a burner capacity of 116 million British thermal units per hour, exhausting through a baghouse at stack SV1. This dryer is fired by natural gas, including butane, #2 diesel, #4 waste oil and #4 virgin oil as backup fuel;
- (c) One (1) hot oil heater, fired by natural gas and rated at 2.10 million British thermal units per hour, and exhausting to stack SV2; and
- (d) One (1) baghouse with a total filter area of 13,149 ft².

(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 2-8-4(1)]

D.1.1 Particulate Matter Less Than 10 Microns (PM-10) [326 IAC 2-8-4] [326 IAC 2-2] [40 CFR 52.21]

Pursuant to 326 IAC 2-8-4, PM-10 emissions from the magnetite drying operation shall be limited to 2.3 pounds per ton, including both filterable and condensable fractions. Compliance with this limit shall limit the source's potential to emit of PM-10 to less than 100 tons per twelve (12) consecutive month period. Therefore, the Part 70 rules (326 IAC 2-7) do not apply.

D.1.2 Sulfur Dioxide (SO₂) [326 IAC 7-1] [326 IAC 7-2-1]

Pursuant to 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from the 135 million British thermal units per hour burner for the aggregate drum mix dryer shall be limited to 0.5 pound per MMBtu heat input when using distillate oils and 1.6 pound per MMBtu heat input when firing residual oils. This is equivalent to the following maximum allowable sulfur contents of the following fuels: No. 2 diesel fuel oil (0.5%), #4 waste oil (1.5%) and #4 virgin oil (1.5%).

Pursuant to 326 IAC 7-1.1-2, this sulfur dioxide limit applies at all times including periods of startup, shutdown, and malfunction. Pursuant to 326 IAC 7-2-1, compliance shall be demonstrated on a calendar month average. 326 IAC 7-1.1 and 326 IAC 7-2-1 are not federally enforceable.

D.1.3 No. 2 Fuel Usage and Equivalents [326 IAC 2-8]

- (a) When operating under this alternative operating scenario D.1.3 or operating scenario D.2.6, the source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:

- (1) 1 MMCF of natural gas burned = 7.678E-3 kgal of No. 2 diesel fuel oil.
- (2) 1 kgal of liquified petroleum gas (butane) burned = 0.00 kgal of no. 2 diesel fuel oil.
- (3) 1 kgal of waste oil (no. 4) (not to exceed 1.0% sulfur) burned = 1.9116 kgal of no. 2 diesel fuel oil.
- (4) 1 kgal of virgin oil (no. 4) (not to exceed 1.0% sulfur) burned = 1.9506 kgal of no. 2 diesel fuel oil.

- (b) Sulfur content of No. 4 waste oil and No. 4 virgin oil shall each not exceed 1.0% by weight.

These usage limits are required to limit the source's potential to emit sulfur dioxide (SO₂) to less than 100 tons per twelve (12) consecutive month period, based on the allowable fuel sulfur contents. Therefore, the requirements of 326 IAC 2-7 will not apply.

D.1.4 Natural Gas Usage and Equivalents [326 IAC 2-8] [326 IAC 2-1.1-5]

(a) When operating under this alternative operating scenario D.1.4 or operating scenario D.2.7, the usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NO_x emissions, shall be utilized:

- (1) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
- (2) 1 kgal of liquified petroleum gas (butane) burned = 0.1105 MMCF of natural gas.
- (3) 1 kgal of waste oil (no. 4) (not to exceed 1.0% sulfur) burned = 0.1000 MMCF of natural gas.
- (4) 1 kgal of virgin oil (no. 4) (not to exceed 1.0% sulfur) burned = 0.2474 MMCF of natural gas.

These usage limits are required to limit the source's potential to emit nitrogen oxide (NO_x) to less than 100 tons per twelve (12) consecutive month period, Therefore, the requirements of 326 IAC 2-7 and 326 IAC 2-1.1-5 (Non-attainment NSR) will not apply.

D.1.5 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

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

Compliance Determination Requirements

D.1.6 Particulate Matter (PM)

The baghouse for PM and PM₁₀ control shall be in operation at all times when the aggregate dryer and burner are in operation.

D.1.7 Sulfur Dioxide Emissions and Sulfur Content

Compliance with Condition D.1.2 shall be determined utilizing one of the following options.

- (a) Pursuant to 326 IAC 3-7-4, the Permittee shall demonstrate that the sulfur dioxide emissions do not exceed 0.5 pounds per million Btu heat input when firing No. 2 diesel fuel oil, and 1.6 pounds per million Btu heat input when firing #4 waste oil and #4 virgin oil:

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-8-4(10)]:

- (b) One (1) six hundred fifty (650) tons per hour aggregate dryer, with a burner capacity of 116 million British thermal units per hour, exhausting through a baghouse at stack SV1. This dryer is fired by natural gas, including butane, #2 diesel, #4 waste oil #4 virgin oil as backup fuel;
 - (c) One (1) hot oil heater, fired by natural gas and rated at 2.10 million British thermal units per hour, and exhausting to stack SV2; and
 - (d) One (1) baghouse with a total filter area of 13,149 ft².
- (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 2-8-4(1)]

D.2.1 General Provisions Relating to NSPS [326 IAC 12-1][40 CFR Part 60, Subpart A]

The provisions of 40 CFR Part 60, Subpart A - General Provisions, which are incorporated by reference in 326 IAC 12-1, apply to the facilities described in this section except when otherwise specified in 40 CFR Part 60, Subpart I.

D.2.2 Particulate Matter (PM) [326 IAC 12] [40 CFR 60.90, Subpart I] [326 IAC 2-2] [40 CFR 52.21]

Pursuant to 326 IAC 12, (40 CFR Part 60.90, Subpart I) "Standards of Performance for Hot Mix Asphalt Facilities", the particulate matter emissions from the mixing and drying operations shall not exceed 0.04 grains per dry standard cubic foot (gr/dscf). This is equivalent to a particulate matter emission rate of 8.53 pounds per hour. Compliance with this limit shall limit the source's potential to emit of PM to less than 100 tons per twelve (12) consecutive month period and make the requirements of 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) and 40 CFR 52.21 not applicable.

D.2.3 Opacity [326 IAC 12] [40 CFR 60.90, Subpart I]

Pursuant to 326 IAC 12, (40 CFR Part 60.92, Subpart I) "Standards of Performance for Hot Mix Asphalt Facilities", the mixing and drying operations shall not discharge or cause the discharge into the atmosphere any gases which exhibit 20 percent opacity or greater.

D.2.4 Particulate Matter Less Than 10 Microns (PM-10) [326 IAC 2-8-4] [326 IAC 2-2] [40 CFR 52.21]

Pursuant to 326 IAC 2-8-4, PM-10 emissions from the aggregate mixing and drying operation shall be limited to 0.05 pounds of PM-10 emitted per ton of asphalt produced, equivalent to 16.43 pounds per hour, including both filterable and condensable fractions. Compliance with this limit shall limit the source's potential to emit of PM-10 to less than 100 tons per twelve (12) consecutive month period. Therefore, the Part 70 rules (326 IAC 2-7) do not apply.

D.2.5 Sulfur Dioxide (SO₂) [326 IAC 7-1] [326 IAC 7-2-1]

Pursuant to 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from the 135 million British thermal units per hour burner for the aggregate drum mix dryer shall be limited to 0.5 pound per MMBtu heat input when using distillate oils and 1.6 pounds per MMBtu heat input when firing residual oils. This is equivalent to the following maximum allowable sulfur contents of the following fuels: No. 2 diesel fuel oil (0.5%), #4 waste oil (1.5%) and #4 virgin oil (1.5%).

Pursuant to 326 IAC 7-1.1-2, this sulfur dioxide limit applies at all times including periods of startup, shutdown, and malfunction. Pursuant to 326 IAC 7-2-1, compliance shall be demonstrated on a calendar month average. 326 IAC 7-1.1 and 326 IAC 7-2-1 are not federally enforceable.

D.2.6 No. 2 Fuel Usage and Equivalents [326 IAC 2-8]

- (a) When operating under this operating scenario D.2.6 or alternative operating scenario D.1.3, the source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
- (1) 1 MMCF of natural gas burned = 7.678E-3 kgal of No. 2 diesel fuel oil.
 - (2) 1 kgal of liquified petroleum gas (butane) burned = 0.00 kgal of no. 2 diesel fuel oil.
 - (3) 1 kgal of waste oil (no. 4) (not to exceed 1.0% sulfur) burned = 1.9116 kgal of no. 2 diesel fuel oil.
 - (4) 1 kgal of virgin oil (no. 4) (not to exceed 1.0% sulfur) burned = 1.9506 kgal of no. 2 diesel fuel oil.
- (b) Sulfur content of No. 4 waste oil and No. 4 virgin oil shall each not exceed 1.0% by weight.

These usage limits are required to limit the source's potential to emit sulfur dioxide (SO₂) to less than 100 tons per twelve (12) consecutive month period, based on the allowable fuel sulfur contents. Therefore, the requirements of 326 IAC 2-7 will not apply.

D.2.7 Natural Gas Usage and Equivalents [326 IAC 2-8] [326 IAC 2-1.1-5]

- (a) When operating under this operating scenario D.2.7 or alternative operating scenario D.1.4, the usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NO_x emissions, shall be utilized:
- (1) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
 - (2) 1 kgal of liquified petroleum gas (butane) burned = 0.1105 MMCF of natural gas.
 - (3) 1 kgal of waste oil (no. 4) (not to exceed 1.0% sulfur) burned = 0.1000 MMCF of natural gas.
 - (4) 1 kgal of virgin oil (no. 4) (not to exceed 1.0% sulfur) burned = 0.2474 MMCF of natural gas.

These usage limits are required to limit the source's potential to emit nitrogen oxide (NO_x) to less than 100 tons per twelve (12) consecutive month period, Therefore, the requirements of 326 IAC 2-7 and 326 IAC 2-1.1-5 (Non-attainment NSR) will not apply.

D.2.8 Preventive Maintenance Plan [326 IAC 2-8-4(9)]

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

Compliance Determination Requirements

D.2.9 Testing Requirements [326 IAC 2-8-5(a)(1), (4)] [326 IAC 2-1.1-11]

- (a) During the period between 30 and 36 months after issuance of this permit, in order to demonstrate compliance with Conditions D.2.2, D.2.3, and D.2.4, the Permittee shall perform PM and PM-10 testing utilizing methods per 40 CFR Part 60 Appendix A, Method 5 for PM and methods as approved by the Commissioner for PM-10. PM-10 includes filterable and condensable PM-10.
- (b) Opacity testing utilizing 40 CFR Part 60 Appendix A, Method 9, to demonstrate compliance with the opacity limitation of Condition D.2.4.

This test shall be repeated at least once every five (5) years from the date of this valid compliance demonstration. Testing shall be conducted in accordance with Section C- Performance Testing.

D.2.10 Particulate Matter (PM)

The baghouse for PM and PM10 control shall be in operation at all times when the aggregate dryer and burner are in operation.

D.2.11 Sulfur Dioxide Emissions and Sulfur Content

Compliance with Condition D.2.5 shall be determined utilizing one of the following options.

- (a) Pursuant to 326 IAC 3-7-4, the Permittee shall demonstrate that the sulfur dioxide emissions do not exceed 0.5 pounds per million Btu heat input when firing No. 2 diesel fuel oil, and 1.6 pounds per million Btu heat input when firing #4 waste oil and #4 virgin oil:
 - (1) Providing vendor analysis of fuel delivered, if accompanied by a vendor certification; or
 - (2) Analyzing the oil sample to determine the sulfur content of the oil via the procedures in 40 CFR 60, Appendix A, Method 19.
 - (A) Oil samples may be collected from the fuel tank immediately after the fuel tank is filled and before any oil is combusted; and
 - (B) If a partially empty fuel tank is refilled, a new sample and analysis would be required upon filling.
- (b) Compliance may also be determined by conducting a stack test for sulfur dioxide emissions from the 135 MMBtu per hour heater, using 40 CFR 60, Appendix A, Method 6 in accordance with the procedures in 326 IAC 3-6.

A determination of noncompliance pursuant to any of the methods specified in (a) or (b) above shall not be refuted by evidence of compliance pursuant to the other method.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR QUALITY
COMPLIANCE DATA SECTION
AND THE EVANSVILLE ENVIRONMENTAL PROTECTION AGENCY**

FESOP Quarterly Report

Source Name: J. H. Rudolph & Company, Inc.
Source Address: 3300 S. Green River Road, Evansville, IN 47715
Mailing Address: P.O. Box 5226, Evansville, IN 47715
FESOP No.: F163-14132-03408
Facility: 116 MMBtu per hour burner for the drum mix dryer
Parameter: SO2 fuel oil consumption limitations
Limit: The source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
(a) 1 MMCF of natural gas burned = 7.678E-3 kgal of no. 2 diesel fuel oil.
(b) 1 kgal of liquified petroleum gas burned = 0.00 kgal of no. 2 diesel fuel oil.
(c) 1 kgal of waste oil (no. 4) (not to exceed 1.0% sulfur) = 1.9116 kgal of no. 2 diesel fuel oil.
(d) 1 kgal of virgin oil (no. 4) (not to exceed 1.0% sulfur) = 1.9506 kgal of no. 2 diesel fuel oil.

YEAR: _____

Month	No.2 (+ equivalents) usage this month (gallons per month)	No.2 (+ equivalents) usage for previous 11 months (gallons)	No.2 (+ equivalents) usage for last 12 months (gallons)
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: _____

Attach a signed certification to complete this report.

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF AIR QUALITY
 COMPLIANCE DATA SECTION
 AND THE CITY OF EVANSVILLE ENVIRONMENTAL PROTECTION AGENCY**

FESOP Quarterly Report

Source Name: J. H. Rudolph & Company, Inc.
 Source Address: 3300 S. Green River Road, Evansville, IN 47715
 Mailing Address: P.O. Box 5226, Evansville, IN 47715
 FESOP No.: F163-14132-03408
 Facility: 116 MMBtu per hour burner for the drum mix dryer
 Parameter: NOx fuel oil consumption limitations
 Limit: The usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NOx emissions, shall be utilized:
 (a) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
 (b) 1 kgal of liquified petroleum gas burned = 0.1105 MMCF of natural gas.
 (c) 1 kgal waste oil (no. 4) (not to exceed 1.0% sulfur) = 0.1000 MMCF of natural gas.
 (d) 1 kgal virgin oil (no. 4) (not to exceed 1.0% sulfur) = 0.2474 MMCF of natural gas.

YEAR:

Month	Natural Gas (+ equivalents) usage this month (MMCF per month)	Natural Gas (+ equivalents) usage for previous 11 months (MMCF)	Natural Gas (+ equivalents) usage for last 12 months (MMCF)
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: _____

Attach a signed certification to complete this report.

**Indiana Department of Environmental Management
Office of Air Quality**

**Technical Support Document (TSD) for a Significant Permit Revision to a Federally
Enforceable State Operating Permit**

Source Background and Description

Source Name:	J.H. Rudolph & Company, Inc.
Source Location:	3300 S. Green River Road, Evansville, IN 47715
County:	Vanderburgh
SIC Code:	2951
Operation Permit No.:	F163-14132-03408
Operation Permit Issuance Date:	April 10, 2002
Permit Revision No.:	SPR163-19126-03408
Permit Reviewer:	Alic Bent / EVP

The Office of Air Quality (OAQ) has reviewed a revision application from J.H. Rudolph & Company, Inc. relating to the addition of a back up fuel to the existing 116 MMBtu per hour aggregate drum-mix dryer.

History

On May 5, 2004, J.H. Rudolph & Company, Inc. submitted an application to the OAQ requesting to add # 4 virgin oil as a back up fuel to the already permitted natural gas, butane, #2 diesel fuel oil and #4 waste oil that are used to fuel the 116 MMBtu per hour aggregate drum-mix dryer. J.H. Rudolph & Company, Inc. was issued a FESOP on April 10, 2002.

Existing Approvals

The source was issued a FESOP F163-14132-03408 on April 10, 2002.

Enforcement Issue

There are no enforcement actions pending.

Recommendation

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

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

A complete application for the purposes of this review was received on May 5, 2004.

Emission Calculations

See Appendix A (pages 1 through 14) of this document for detailed emission calculations.

Potential to Emit of Before Controls Due to Revision

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

Pollutant	Potential to Emit (tons/yr)
PM	25.40
PM-10	21.85
SO ₂	381.06
VOC	0.73
CO	18.15
NO _x	170.57

HAPs	Potential to Emit (tons/yr)
Formaldehyde	0.12
Nickel	0.31
Others	Negl.
Total	0.43

- (a) The potential to emit (as defined in 326 IAC 2-1.1-1(16)) of PM, SO₂ and NO_x from this modification are equal to or greater than 25 tons per year. Therefore, the FESOP is being revised through a Significant Permit Revision pursuant to 326 IAC 2-8-11.1.

The source has agreed to limit source-wide SO₂ and NO_x emissions to less than 100 tons per year. Therefore, the source will remain in compliance with 326 IAC 2-8.

Limited Potential to Emit of Entire Source

The table below summarizes the total potential to emit, reflecting all limits, of the significant emission units. Emission limits have been revised as follows:

Process/emission unit	Potential to Emit (tons/year)						
	PM	PM-10	SO ₂	VOC	CO	NO _x	HAPs
Aggregate Dryers and Burners ⁽¹⁾	40.14 ⁽²⁾	9.33 ⁽²⁾	< 98.99	20.46	43.36	98.08	2.488 (single HAP)
Magnetite Drying	57.68 ⁽³⁾	57.68 ⁽³⁾	--	--	--	--	--
Insignificant Activities**	90.92	27.1	0.0006	0.05	0.77	0.92	Negligible
Total PTE	188.74	94.11	99	20.51	44.13	96.23	11.353 (total HAPs)

Notes:

(1) Includes fuel usage limit for burner operations.

(2) Limited PM/PM10 PTE levels have been revised to reflect the permit limited PTE's rather than the controlled potential emissions.

(3) Limited PM/PM10 PTE levels are based on 326 IAC 6-3-2 allowable.

** Insignificant activities include conveying/handling, unpaved roads, storage and hot oil heater.

County Attainment Status

The source is located in Vanderburgh County.

Pollutant	Status
PM-10	Attainment
SO ₂	Attainment
NO ₂	Attainment
8-hour Ozone	Basic Non-Attainment
CO	Attainment
Lead	Unclassifiable

- (a) Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to the ozone standards. St. Joseph County has been designated as nonattainment for the 8-hour ozone standard. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for nonattainment new source review.
- (b) Vanderburgh County has been classified as attainment or unclassifiable for all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

Federal Rule Applicability

- (a) There are no New Source Performance Standards (NSPS)(326 IAC 12 and 40 CFR Part 60) applicable to this source.
- (b) There are no other National Emission Standards for Hazardous Air Pollutants (NESHAP)(326 IAC 14, 20 and 40 CFR Part 61, 63) applicable to this source.

State Rule Applicability – Entire Source

326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) and 326 IAC 2-1.1-5 (Non-attainment NSR)

This modification is not subject to the requirements of this rule. The existing source was an existing minor PSD source. As shown in the Potential to Emit of the Source including the Revision table on page 3 above, the allowable emissions of all regulated pollutants, except PM, are less than 100 tons per year after application of all federally enforceable emission limits. The allowable emissions of PM are less than 250 tons per year after application of all federally enforceable emission limits and this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2. Therefore the requirements of 326 IAC 2-2 (PSD) and 326 IAC 2-1.1-5 (Non-attainment NSR) do not apply.

326 IAC 2-6 (Emission Reporting)

Since this source is complying with 326 IAC 2-8 (FESOP) and is not required to have an operating permit under 326 IAC 2-7, Part 70 Permit Program and source-wide PM emissions are limited to less than 250 tons per year, this source is not subject to 326 IAC 2-6 (Emission Reporting).

326 IAC 2-4.1-1 (New Source Toxics Control)

This modification to the source is not subject to 326 IAC 2-4.1-1 (New Source Toxics Control) because no new or reconstructed facilities with a PTE of any single HAP at 10 tons per year or 25 tons per year of a combination of HAPs have been installed since. Therefore, 326 IAC 2-4.1-1 does not apply.

326 IAC 5-1 (Opacity Limitations)

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 the permit:

- (a) Opacity shall not exceed an average of forty percent (40%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

326 IAC 2-8-4 (FESOP)

This source is subject to 326 IAC 2-8-4 (FESOP). Pursuant to this rule:

- (a) When operating under this alternative operating scenario D.1.3 or operating scenario D.2.6, the source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
 - (1) 1 MMCF of natural gas burned = 7.678E-3 kgal of No. 2 diesel fuel oil.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.00 kgal of no. 2 diesel fuel oil.
 - (3) 1 kgal of waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.9558 kgal of no.

2 diesel fuel oil.

- (4) 1 kgal of virgin oil (no. 4) (not to exceed 1.5% sulfur) = 2.9259 kgal of no. 2 diesel fuel oil.

- (b) Sulfur content of No. 4 waste oil shall not exceed 0.5% by weight.

These usage limits are required to limit the source's potential to emit sulfur dioxide (SO₂) to less than 100 tons per twelve (12) consecutive month period, based on the fuel sulfur contents of Condition D.1.5. Therefore, the requirements of 326 IAC 2-7 will not apply.

- (c) When operating under this alternative operating scenario D.1.4 or operating scenario D.2.7, the usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NO_x emissions, shall be utilized:

- (1) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
(2) 1 kgal of liquified petroleum gas (butane) burned = 0.1105 MMCF of natural gas.
(3) 1 kgal waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.1000 MMCF of natural gas.
(4) 1 kgal virgin oil (no. 4) (not to exceed 1.5% sulfur) = 0.2474 MMCF of natural gas.

These usage limits are required to limit the source's potential to emit nitrogen oxide (NO_x) to less than 100 tons per twelve (12) consecutive month period. Therefore, the requirements of 326 IAC 2-7 and 326 IAC 2-1.1-5 (Non-attainment NSR) will not apply.

State Rule Applicability – Individual Facilities

326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations)

Pursuant to 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from the 116 million British thermal units per hour burner for the aggregate drum mix dryer shall be limited to 0.5 pound per MMBtu heat input when using distillate oils, and shall be limited to 1.6 pounds per million BTU heat input for residual oil combustion. This is equivalent to the following maximum allowable sulfur contents of the following fuels: No. 2 diesel fuel oil (0.5%), #4 waste oil (1.5%) and #4 virgin oil (1.5%), (see Appendix A: Emission Calculations, page 7 of 14). All fuels used by the aggregate dryer are in compliance with the aforementioned sulfur content limits, therefore the aggregate dryer is in compliance with this rule.

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

Pursuant to this rule, the source shall submit reports of calendar month average sulfur content, heat content, fuel consumption, and sulfur dioxide emission rate (pounds SO₂ per MMBtu), to the OAQ upon request.

Compliance Requirements

Permits issued under 326 IAC 2-8 are required to ensure that sources can demonstrate compliance with applicable state and federal rules on a more or less continuous basis. All state and federal rules contain compliance provisions, however, these provisions do not always fulfill the requirement for a more or less continuous demonstration. When this occurs IDEM, OAQ in conjunction with the source, must develop specific conditions to satisfy 326 IAC 2-8-4. As a result,

compliance requirements are divided into two sections: Compliance Determination Requirements and Compliance Monitoring Requirements.

Compliance Determination Requirements in Section D of the permit are those conditions that are found more or less directly within state and federal rules and the violation of which serves as grounds for enforcement action. If these conditions are not sufficient to demonstrate continuous compliance, they will be supplemented with Compliance Monitoring Requirements, also in Section D of the permit. Unlike Compliance Determination Requirements, failure to meet Compliance Monitoring conditions would serve as a trigger for corrective actions and not grounds for enforcement action. However, a violation in relation to a compliance monitoring condition will arise through a source's failure to take the appropriate corrective actions within a specific time period.

There are no new compliance monitoring requirements applicable to the source as a result of this significant permit revision.

Changes to the Permit

Bolded language has been added and the language with a line through it has been deleted:

1. On April 15, 2004, the United States Environmental Protection Agency (U.S. EPA) named 23 Indiana counties and one partial county nonattainment for the new 8-hour ozone standard. The designations became effective on June 15, 2004. Vanderburgh County has been designated as nonattainment for the 8-hour ozone standard. The following has been added to A.1 General Information:

A.1 General Information [326 IAC 2-8-3(b)]

The Permittee owns and operates a hot drum-mix asphalt plant.

Authorized individual: Alvin Evans, Chief Operating Officer
Source Address: 3300 S. Green River Road, Evansville, IN 47715
Mailing Address: P.O. Box 5226, Evansville, IN 47715
SIC Code: 2951
County Location: Vanderburgh
County Status: **Nonattainment for ozone under the 8-hour standard**
Attainment for all **other** criteria pollutants

2. Section A.2 has been updated to include the #4 virgin oil for the aggregate drum dryer.

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-8-3(c)(3)]

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

- (a) An alternate drying process, used to dry magnetite, with a maximum capacity of 50,000 tons per year;
- (b) One (1) six hundred fifty (650) tons per hour aggregate dryer, with a burner capacity of 116 million British thermal units per hour, exhausting through a baghouse at stack SV1. This dryer is fired by natural gas, including butane, #2 diesel, ~~and~~ #4 waste oil **and #4 virgin oil** as backup fuel;

3. Section D.1 has been revised to include the #4 virgin oil and associated requirements.

SECTION D.1 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-8-4(10)]:

- (a) An alternate drying process, used to dry magnetite, with a maximum capacity of 50,000 tons per year;
- (b) One (1) six hundred fifty (650) tons per hour aggregate dryer, with a burner capacity of 116 million British thermal units per hour, exhausting through a baghouse at stack SV1. This dryer is fired by natural gas, including butane, #2 diesel, ~~and #4 waste oil~~ **and #4 virgin oil** as backup fuel;

(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 2-8-4(1)]

D.1.2 Sulfur Dioxide (SO₂) [326 IAC 7-1.1-1] [326 IAC 7-2-1]

Pursuant to 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from the 116 million British thermal units per hour burner for the aggregate dryer shall be limited to 0.5 pound per MMBtu heat input when using distillate oils **and 1.6 pounds per MMBtu heat input when firing residual oils**. This is equivalent to the following maximum allowable sulfur contents of the following fuels: No. 2 diesel fuel oil (0.5%), ~~and #4 waste oil (1.5%)~~ **and #4 virgin oil (1.5%)**.

D.1.3 No. 2 Fuel Usage and equivalents [326 IAC 2-8]

- (a) When operating under this alternative operating scenario D.1.3 or operating scenario D.2.6, the source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, **with compliance determined at the end of each month**. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
 - (1) 1 MMCF of natural gas burned = 7.678E-3 kgal of no. 2 diesel fuel oil.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.00 kgal of no. 2 diesel fuel oil.
 - (3) 1 kgal of waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.9558 kgal of no. 2 fuel oil.
 - (4) **1 kgal virgin oil (no. 4) (not to exceed 1.5% sulfur) = 2.9259 kgal of no. 2 fuel oil.**

D.1.4 Natural Gas Usage and Equivalents [326 IAC 2-8] [326 IAC 2-1.1-5]

- (a) When operating under this alternative operating scenario D.1.4 or operating scenario D.2.7, the usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, **with compliance determined at the end of each month**. For the purposes of

calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NO_x emissions, shall be utilized:

- (1) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
- (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.1105 MMCF of natural gas.
- (3) 1 kgal waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.1000 MMCF of natural gas.
- (4) 1 kgal virgin oil (no. 4) (not to exceed 1.5% sulfur) = 0.2474 MMCF of natural gas.**

These usage limits are required to limit the source's potential to emit nitrogen oxide (NO_x) to less than 100 tons per twelve (12) consecutive month period. Therefore, the requirements of 326 IAC 2-7 **and 326 IAC 2-1.1-5 (Non-attainment NSR)** will not apply.

Compliance Determination Requirements

D.1.7 Sulfur Dioxide Emissions and Sulfur Content

Compliance with Condition D.1.2 shall be determined utilizing one of the following options:

- (a) Pursuant to 326 IAC 3-7-4, the Permittee shall demonstrate that the sulfur dioxide emissions do not exceed five-tenths (0.5) pound per million Btu heat input when firing No. 2 diesel fuel oil, and 1.6 pounds per million Btu heat input when firing #4 waste oil **and #4 virgin oil**:

4. Section D.2 has been revised to include the #4 virgin oil and associated requirements.

SECTION D.2 FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-8-4(10)]:

- (a) An alternate drying process, used to dry magnetite, with a maximum capacity of 50,000 tons per year;
- (b) One (1) six hundred fifty (650) tons per hour aggregate dryer, with a burner capacity of 116 million British thermal units per hour, exhausting through a baghouse at stack SV1. This dryer is fired by natural gas, including butane, #2 diesel, ~~and #4 waste oil~~ **and #4 virgin oil** as backup fuel;

(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 2-8-4(1)]

D.2.5 Sulfur Dioxide (SO₂) [326 IAC 7-1.1-1] [326 IAC 7-2-1]

Pursuant to 326 IAC 7-1.1 (Sulfur Dioxide Emission Limitations), sulfur dioxide emissions from the 116 million British thermal units per hour burner for the aggregate dryer shall be limited to 0.5 pound per MMBtu heat input when using distillate oils **and 1.6 pounds per MMBtu heat input when firing residual oils**. This is equivalent to the following maximum allowable sulfur contents of the following fuels: No. 2 diesel fuel oil (0.5%), ~~and #4 waste oil (1.5%)~~ **and #4 virgin oil (1.5%)**.

D.2.6 No. 2 Fuel Usage and equivalents [326 IAC 2-8]

- (a) When operating under this alternative operating scenario D.2.6 or operating scenario D.2.6, the source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, **with compliance determined at the end of each month**. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
- (1) 1 MMCF of natural gas burned = 7.678E-3 kgal of No. 2 diesel fuel oil.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.00 kgal of no. 2 diesel fuel oil.
 - (3) 1 kgal of waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.9558 kgal of no. 2 diesel fuel oil.
 - (4) **1 kgal virgin oil (no. 4) (not to exceed 1.5% sulfur) = 2.9259 kgal of no. 2 diesel fuel oil.**

D.2.7 Natural Gas Usage and Equivalents [326 IAC 2-8] [326 IAC 2-1.1-5]

- (a) When operating under this alternative operating scenario D.2.7 or operating scenario D.2.7, the usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, **with compliance determined at the end of each month**. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NO_x emissions, shall be utilized:
- (1) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.1105 MMCF of natural gas.
 - (3) 1 kgal waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.1000 MMCF of natural gas.
 - (4) **1 kgal virgin oil (no. 4) (not to exceed 1.5% sulfur) = 0.2474 MMCF of natural gas.**

These usage limits are required to limit the source's potential to emit nitrogen oxide (NO_x) to less than 100 tons per twelve (12) consecutive month period. Therefore, the requirements of 326 IAC 2-7 and **326 IAC 2-1.1-5 (Non-attainment NSR)** will not apply.

D.2.11 Sulfur Dioxide Emissions and Sulfur Content

Compliance with Condition D.2.5 shall be determined utilizing one of the following options:

- (a) Pursuant to 326 IAC 3-7-4, the Permittee shall demonstrate that the sulfur dioxide emissions do not exceed five-tenths (0.5) pound per million Btu heat input when firing No. 2 diesel fuel oil, and 1.6 pounds per million Btu heat input when firing #4 waste oil **and #4 virgin oil**:

5. The #4 virgin fuel oil equivalent has been added the reporting form for the annual No. 2 fuel oil usage limit.

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

FESOP Quarterly Report

Source Name: J. H. Rudolph & Company, Inc.
Source Address: 3300 S. Green River Road, Evansville, IN 47715
Mailing Address: P.O. Box 5226, Evansville, IN 47715
FESOP No.: F163-14132-03408
Facility: 116 MMBtu per hour burner for the drum mix dryer
Parameter: SO₂ fuel oil consumption limitations
Limit: The source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, **with compliance determined at the end of each month.** For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
 (a) 1 MMCF of natural gas burned = 7.678E-3 kgal of no. 2 diesel fuel oil.
 (b) 1 kgal of liquified petroleum gas burned = 0.00 kgal of no. 2 diesel fuel oil.
 (c) 1 kgal of waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.9558 kgal of no. 2 diesel fuel oil.
(d) 1 kgal of virgin oil (no. 4) (not to exceed 1.5% sulfur) = 2.9259 kgal of no. 2 diesel fuel oil.

 YEAR:

Month	No.2 (+ equivalents) usage this month (gallons per month)	No.2 (+ equivalents) usage for previous 11 months (gallons)	No.2 (+ equivalents) usage for last 12 months (gallons)
Month 1			
Month 2			
Month 3			

6. The #4 virgin fuel oil equivalent has been added the reporting form for the annual natural gas usage limit.

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

FESOP Quarterly Report

Source Name: J. H. Rudolph & Company, Inc.
Source Address: 3300 S. Green River Road, Evansville, IN 47715
Mailing Address: P.O. Box 5226, Evansville, IN 47715
FESOP No.: F163-14132-03408
Facility: 116 MMBtu per hour burner for the drum mix dryer
Parameter: NOx fuel oil consumption limitations
Limit: The usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, **with compliance determined at the end of each month.** For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NOx emissions, shall be utilized:
 (a) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
 (b) 1 kgal of liquified petroleum gas burned = 0.1105 MMCF of natural gas.
 (c) 1 kgal waste oil (no. 4) (not to exceed 0.5% sulfur) = 0.1000 MMCF of natural gas.
(d) 1 kgal of virgin oil (no. 4) (not to exceed 1.5% sulfur) = 0.2474 MMCF of natural gas.

 YEAR:

Month	Natural Gas (+ equivalents) usage this month (MMCF per month)	Natural Gas (+ equivalents) usage for previous 11 months (MMCF)	Natural Gas (+ equivalents) usage for last 12 months (MMCF)
Month 1			
Month 2			
Month 3			

Conclusion

The modification to the aggregate drum-mix dryer burner shall be subject to the conditions of the attached proposed Significant Permit Revision for a Federally Enforceable State Operating Permit No.: 163-19126-03408.

**Indiana Department of Environmental Management
Office of Air Quality**

**Addendum to the
Technical Support Document (TSD) for a Significant Permit Revision to a Federally
Enforceable State Operating Permit (FESOP)**

Source Background and Description

Source Name:	J.H. Rudolph & Company, Inc.
Source Location:	3300 S. Green River Road, Evansville, IN 47715
County:	Vanderburgh
SIC Code:	2951
Operation Permit No.:	SPR-163-19126-03408
Permit Reviewer:	Alic Bent/EVP

On August 7, 2004, the Office of Air Quality (OAQ) had a notice published in the Evansville Courier, Evansville, Indiana, stating that J.H. Rudolph & Company, Inc. had applied for a Significant Permit Revision to their aggregate drum-mix dryer. The notice also stated that OAQ proposed to issue a Significant Permit Revision for this operation and provided information on how the public could review the proposed Significant Permit Revision 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 Significant Permit Revision should be issued as proposed.

On September 8, 2004, Ken Thomas submitted a comment on behalf of J.H. Rudolph & Company, Inc. on the proposed Significant Permit Revision. The summary of the comment and corresponding responses is as follows (bolded language has been added and the language with a line through it has been deleted):

Comment 1

Due to the inconsistencies found in the Draft Permit of the Significant Permit Revision of the J.H. Rudolph & Company Asphalt Plant FESOP # 163-192-03408 regarding sulfur content of fuel oil, J.H. Rudolph request that virgin #4 fuel as well as waste oil both have a sulfur content limit of 1%. This would allow for single, combination or equivalent fuel usage of up to 1.794 million gallons of heavy fuel usage for the plant.

Response 1

Sections D.1.3, D.1.4, D.2.6 and D.2.7 have been revised to include a new sulfur content limit and new fuel equivalent limits for #4 waste oil and #4 virgin oil. The 326 IAC 7-1.1 rule allows for a maximum allowable sulfur content limit of 1.5% for both the #4 waste oil and #4 virgin oil. The source requested sulfur content limit of 1.0% is less than the 326 IAC 7-1.1 maximum allowable sulfur content limit of 1.5% for both #4 waste oil and #4 virgin oil, therefore the source will be in compliance with the rule. The fuel usage limit for #4 waste oil and #4 virgin oil will change as a result of the change in the sulfur content limit, therefore, the conversion factors used to calculate equivalent No. 2 diesel fuel oil consumption from #4 waste oil and #4 virgin oil, based on SO₂ emissions have been revised as follows (see Appendix A: pages 7 and 9 of 14 for revised calculations):

D.1.3 No. 2 Fuel Usage and equivalents [326 IAC 2-8]

- (a) When operating under this alternative operating scenario D.1.3 or operating scenario D.2.6, the source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
- (1) 1 MMCF of natural gas burned = 7.678E-3 kgal of no. 2 diesel fuel oil.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.00 kgal of no. 2 diesel fuel oil.
 - (3) 1 kgal of waste oil (no. 4) (not to exceed ~~0.5~~ **1.0%** sulfur) = ~~0.9558~~ **1.9116** kgal of no. 2 fuel oil.
 - (4) 1 kgal virgin oil (no. 4) (not to exceed ~~1.5~~ **1.0%** sulfur) = ~~2.9259~~ **1.9506** kgal of no. 2 fuel oil.
- (b) Sulfur content of No. 4 waste oil **and No. 4 virgin oil** shall **each** not exceed ~~0.5~~ **1.0%** by weight.

D.1.4 Natural Gas Usage and Equivalents [326 IAC 2-8] [326 IAC 2-1.1-5]

- (a) When operating under this alternative operating scenario D.1.4 or operating scenario D.2.7, the usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NO_x emissions, shall be utilized:
- (1) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.1105 MMCF of natural gas.
 - (3) 1 kgal waste oil (no. 4) (not to exceed ~~0.5~~ **1.0** % sulfur) = 0.1000 MMCF of natural gas.
 - (4) 1 kgal virgin oil (no. 4) (not to exceed ~~1.5~~ **1.0%** sulfur) = 0.2474 MMCF of natural gas.

D.2.6 No. 2 Fuel Usage and equivalents [326 IAC 2-8]

- (a) When operating under this alternative operating scenario D.2.6 or operating scenario D.2.6, the source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:
- (1) 1 MMCF of natural gas burned = 7.678E-3 kgal of No. 2 diesel fuel oil.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.00 kgal of no. 2 diesel fuel oil.

- (3) 1 kgal of waste oil (no. 4) (not to exceed ~~0.5~~ **1.0%** sulfur) = ~~0.9558~~ **1.9116** kgal of no. 2 diesel fuel oil.
- (4) 1 kgal virgin oil (no. 4) (not to exceed ~~4.5~~ **1.0%** sulfur) = ~~2.9259~~ **1.9506** kgal of no. 2 diesel fuel oil.
- (b) Sulfur content of No. 4 waste oil **and No. 4 virgin oil** shall **each** not exceed ~~0.5~~ **1.0%** by weight.

D.2.7 Natural Gas Usage and Equivalents [326 IAC 2-8] [326 IAC 2-1.1-5]

- (a) When operating under this alternative operating scenario D.2.7 or operating scenario D.2.7, the usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NOx emissions, shall be utilized:
 - (1) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
 - (2) 1 kgal of liquefied petroleum gas (butane) burned = 0.1105 MMCF of natural gas.
 - (3) 1 kgal waste oil (no. 4) (not to exceed ~~0.5~~ **1.0%** sulfur) = 0.1000 MMCF of natural gas.
 - (4) 1 kgal virgin oil (no. 4) (not to exceed ~~4.5~~ **1.0%** sulfur) = 0.2474 MMCF of natural gas.

The #4 virgin fuel oil and #4 waste oil fuel equivalents, and sulfur content limits have been revised as follows:

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

FESOP Quarterly Report

Source Name: J. H. Rudolph & Company, Inc.
Source Address: 3300 S. Green River Road, Evansville, IN 47715
Mailing Address: P.O. Box 5226, Evansville, IN 47715
FESOP No.: F163-14132-03408
Facility: 116 MMBtu per hour burner for the drum mix dryer
Parameter: SO2 fuel oil consumption limitations
Limit: The source shall limit input to the dryer burner of No. 2 diesel fuel oil (not to exceed 0.5% sulfur content) plus No. 2 diesel fuel equivalents, to 2,574,512 gallons per 12 consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent No. 2 diesel fuel oil consumption from back-up fuels, based on SO₂ emissions, the following conversion factors shall be utilized:

- (a) 1 MMCF of natural gas burned = 7.678E-3 kgal of no. 2 diesel fuel oil.
- (b) 1 kgal of liquified petroleum gas burned = 0.00 kgal of no. 2 diesel fuel oil.
- (c) 1 kgal of waste oil (no. 4) (not to exceed ~~0.5~~ **1.0%** sulfur) = ~~0.9558~~ **1.9116** kgal of no. 2 diesel fuel oil.

- (d) 1 kgal of virgin oil (no. 4) (not to exceed ~~4.5~~ **1.0%** sulfur) = ~~2.9259~~ **1.9506** kgal of no. 2 diesel fuel oil.

The #4 virgin fuel oil and #4 waste oil sulfur content limits have been revised as follows:

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

FESOP Quarterly Report

Source Name: J. H. Rudolph & Company, Inc.
Source Address: 3300 S. Green River Road, Evansville, IN 47715
Mailing Address: P.O. Box 5226, Evansville, IN 47715
FESOP No.: F163-14132-03408
Facility: 116 MMBtu per hour burner for the drum mix dryer
Parameter: NOx fuel oil consumption limitations
Limit: The usage of natural gas plus equivalent natural gas fuel usage from back-up fuels, shall be limited to 1030 million cubic feet (MMCF) per twelve (12) consecutive month period, with compliance determined at the end of each month. For the purposes of calculating equivalent natural gas consumption from back-up fuels, the following conversion factors, based on NOx emissions, shall be utilized:
(a) 1 kgal of # 2 diesel fuel oil = 0.4047 MMCF of natural gas.
(b) 1 kgal of liquified petroleum gas burned = 0.1105 MMCF of natural gas.
(c) 1 kgal waste oil (no. 4) (not to exceed ~~0.5~~ **1.0%** sulfur) = 0.1000 MMCF of natural gas.
(d) 1 kgal of virgin oil (no. 4) (not to exceed ~~4.5~~ **1.0%** sulfur) = 0.2474 MMCF of natural gas.

Upon further review, the OAQ has decided to make the following changes to the Significant Permit Revision. Bolded language has been added and the language with a line through it has been deleted.

1. On April 15, 2004, the United States Environmental Protection Agency (U.S. EPA) named 23 Indiana counties and one partial county nonattainment for the new 8-hour ozone standard. The designations became effective on June 15, 2004. Vanderburgh County has been designated as basic nonattainment for the 8-hour ozone standard. The following has been corrected to state that Vanderburgh County has been designated as basic nonattainment instead of nonattainment.

A.1 General Information [326 IAC 2-8-3(b)]

The Permittee owns and operates a hot drum-mix asphalt plant.

Authorized individual: Alvin Evans, Chief Operating Officer
Source Address: 3300 S. Green River Road, Evansville, IN 47715
Mailing Address: P.O. Box 5226, Evansville, IN 47715
SIC Code: 2951
County Location: Vanderburgh
County Status: **Basic** Nonattainment for ozone under the 8-hour standard
Attainment for all other criteria pollutants

2. The third sentence in paragraph (a) of County Attainment Status on page 3 of the Technical Support Document has been changed to read Vanderburgh County instead of St. Joseph County.

The OAQ prefers that the Technical Support Document reflect the permit that was on public notice. Changes to the permit or technical support material that occur after the public notice are documented in this Addendum to the Technical Support Document. This accomplishes the desired result of ensuring that these types of concerns are documented and part of the record regarding this permit decision.

- (a) Volatile organic compounds (VOC) and Nitrogen Oxides (NOx) are regulated under the Clean Air Act (CAA) for the purposes of attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for ozone. Therefore, VOC and NOx emissions are considered when evaluating the rule applicability relating to the ozone standards. **Vanderburgh** ~~St. Joseph~~ County has been designated as nonattainment for the 8-hour ozone standard. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for nonattainment new source review.

Company Name:	J. H. Rudolph & Company, Inc.
Plant Location:	3300 S. Green River Road, Evansville, IN 47715
County:	Vanderburgh
Permit Reviewer:	AB/EVP

**** hot oil heater****

The following calculations determine the amount of emissions created by natural gas combustion, from hot oil heating, based on 8,760 hours of operation and US EPA's AP-42, 5th Edition, Section 1.4 - Natural Gas Combustion, Tables 1.4-1, 1.4-2, and 1.4-3.

Criteria Pollutant:	$\frac{2.1 \text{ MMBtu/hr} * 8,760 \text{ hr/yr}}{1000 \text{ Btu/cf} * 2,000 \text{ lb/ton}}$	* Ef (lb/MMcf) = (ton/yr)
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P M:	1.9 lb/MMcf =	0.02 ton/yr
P M-10:	7.6 lb/MMcf =	0.07 ton/yr
S O 2:	0.6 lb/MMcf =	5.5E-03 ton/yr
N O x:	100.0 lb/MMcf =	0.92 ton/yr
V O C:	5.5 lb/MMcf =	0.05 ton/yr
C O:	84.0 lb/MMcf =	0.77 ton/yr

**** aggregate dryer burner****

The following calculations determine the amount of emissions created by natural gas combustion, from the aggregate dryer burner, based on 8,760 hours of operation and US EPA's AP-42, 5th Edition, Section 1.4 - Natural Gas Combustion, Tables 1.4-1, 1.4-2, and 1.4-3.

Criteria Pollutant:	$\frac{116 \text{ MMBtu/hr} * 8,760 \text{ hr/yr}}{1000 \text{ Btu/cf} * 2,000 \text{ lb/ton}}$	* Ef (lb/MMcf) = (ton/yr)
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P M:	1.9 lb/MMcf =	0.97 ton/yr
P M-10:	7.6 lb/MMcf =	3.86 ton/yr
S O 2:	0.6 lb/MMcf =	0.30 ton/yr
N O x:	190.0 lb/MMcf =	96.54 ton/yr
V O C:	5.5 lb/MMcf =	2.79 ton/yr
C O:	84.0 lb/MMcf =	42.68 ton/yr

The following calculations determine the amount of emissions created by the combustion of liquified petroleum gas @ 0.000008 % sulfur, from the aggregate dryer, based on 8,760 hours of use and US EPA's AP-42, 5th Edition, Section 1.5 - Liquefied Petroleum Gas Combustion, Table 1.5-1.

Criteria Pollutant:	$\frac{116 \text{ MMBtu/hr} * 8,760 \text{ hr/yr}}{94,000 \text{ Btu/gal} * 2,000 \text{ lb/ton}}$	* Ef (lb/1,000 gal) = (ton/yr)
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P M:	0.6 lb/1000 gal =	3.24 ton/yr
P M-10:	0.6 lb/1000 gal =	3.24 ton/yr
S O 2:	7.2E-08 lb/1000 gal =	3.9E-07 ton/yr
N O x:	21.0 lb/1000 gal =	113.51 ton/yr
V O C:	0.60 lb/1000 gal =	3.24 ton/yr
C O:	3.6 lb/1000 gal =	19.46 ton/yr

**** aggregate dryer burner****

The following calculations determine the amount of emissions created by the combustion of #2 distillate fuel oil
 @ 0.5 % sulfur, from the aggregate dryer burner, based on 8,760 hours of use and
 US EPA's AP-42, 5th Edition, Section 1.3 - Fuel Oil Combustion, Tables 1.3-2, 1.3-4, and 1.3-7.

Criteria Pollutant:	$\frac{116 \text{ MMBtu/hr} * 8,760 \text{ hr/yr}}{140,000 \text{ Btu/gal} * 2,000 \text{ lb/ton}}$	* Ef (lb/1,000 gal) = (ton/yr)
P M:	2.0 lb/1000 gal =	7.26 ton/yr
P M-10:	1.0 lb/1000 gal =	3.63 ton/yr
S O 2:	76.9 lb/1000 gal =	279.08 ton/yr
N O x:	24.0 lb/1000 gal =	87.10 ton/yr
V O C:	0.20 lb/1000 gal =	0.73 ton/yr
C O:	5.0 lb/1000 gal =	18.15 ton/yr

The following calculations determine the amount of emissions created by the combustion of waste oil (re-refined)
 @ 1.0 % sulfur, 0.33 % ash, based on 8760 hours of use and
 US EPA's AP-42, 5th Edition, Section 1.11 - Waste Oil Combustion, Tables 1.11-1, 1.11-2, and 1.11-3.

Criteria Pollutant:	$\frac{116 \text{ MMBtu/hr} * 8760 \text{ hr/yr}}{138,000 \text{ Btu/gal} * 2000 \text{ lb/ton}}$	* Ef (lb/1000 gal) = (ton/yr)
P M:	30.5 lb/1000 gal =	112.29 ton/yr
P M-10:	16.83 lb/1000 gal =	61.96 ton/yr
S O 2:	147 lb/1000 gal =	541.22 ton/yr
N O x:	19.0 lb/1000 gal =	69.95 ton/yr
V O C:	1.0 lb/1000 gal =	3.68 ton/yr
C O:	5.0 lb/1000 gal =	18.41 ton/yr

The following calculations determine the amount of emissions created by the combustion of #4 virgin oil
 @ 1.0 % sulfur, from the aggregate dryer burner, based on 8,760 hours of use and
 US EPA's AP-42, 5th Edition, Section 1.3 - Fuel Oil Combustion, Tables 1.3-2, 1.3-4, and 1.3-7.

Criteria Pollutant:	$\frac{116 \text{ MMBtu/hr} * 8,760 \text{ hr/yr}}{140,000 \text{ Btu/gal} * 2,000 \text{ lb/ton}}$	* Ef (lb/1,000 gal) = (ton/yr)
P M:	7.0 lb/1000 gal =	25.40 ton/yr
P M-10:	6.0 lb/1000 gal =	21.85 ton/yr
S O 2:	150.0 lb/1000 gal =	544.37 ton/yr
N O x:	47.0 lb/1000 gal =	170.57 ton/yr
V O C:	0.20 lb/1000 gal =	0.73 ton/yr
C O:	5.0 lb/1000 gal =	18.15 ton/yr

The maximum potential emissions from the aggregate dryer burner due to fuel combustion are the following:

Criteria Pollutant:	Worst Case Fuel
P M:	112.29 ton/yr Waste Oil
P M-10:	61.96 ton/yr Waste Oil
S O 2:	544.37 ton/yr No. 4 Virgin Oil
N O x:	170.57 ton/yr No. 4 Virgin Oil
V O C:	3.68 ton/yr Waste Oil
C O:	42.68 ton/yr Natural Gas

**** aggregate drying: drum-mix plant ****

The following calculations determine the amount of worst case emissions created by aggregate drying before controls, based on 8,760 hours of use and USEPA's AP-42, 5th Edition, Section 11.1 - Hot Mix Asphalt Plants, Tables 11.1-2 and 11.1-9 for a drum mix dryer which has the capability of combusting either fuel oil or natural gas:

Pollutant:	Ef	lb/ton x	650	ton/hr x	8,760 hr/yr
			2,000	lb/ton	

Criteria Pollutant:

P M:	28	lb/ton =	79,716.00 ton/yr
P M-10:	6.5	lb/ton =	18,505.50 ton/yr
VOC:	0.00619	lb/ton =	17.62 ton/yr

The VOC emission factor for aggregate drying includes HAP emissions which are assumed to be VOC.

**** magnetite drying: drum-mix plant ****

The following calculations determine the amount of worst case emissions created by aggregate drying before controls, based on 8,760 hours of use and USEPA's AP-42, 5th Edition, Section 11.1 - Hot Mix Asphalt Plants, Tables 11.1-2 and 11.1-9 for a drum mix dryer which has the capability of combusting either fuel oil or natural gas:

Pollutant:	Ef	lb/ton x	5.71	ton/hr x	8,760 hr/yr
			2,000	lb/ton	

Criteria Pollutant:

P M:	19.7	lb/ton =	492.69 ton/yr
P M-10:	19.7	lb/ton =	492.69 ton/yr

**** conveying / handling ****

The following calculations determine the amount of emissions created by material handling, based on 8,760 hours of use and AP-42, Section 13.2.4, Equation 1. The emission factor for calculating PM emissions is calculated as follows:

PM-10 Emissions:

$$E = k * (0.0032) * ((U/5)^{1.3}) / ((M/2)^{1.4})$$

$$= 5.23E-03 \text{ lb PM-10/ton}$$

$$1.11E-02 \text{ lb PM/ton}$$

where k = 0.35 (particle size multiplier for <10um)
 0.74 (particle size multiplier for <30um)

U = 12 mph mean wind speed
 M = 1.5 material moisture content (%)

$$\frac{650 \text{ ton/hr} * 8,760 \text{ hrs/yr} * \text{Ef (lb/ton of material)}}{2,000 \text{ lb/ton}} = (\text{ton/yr})$$

Total PM 10 Emissions:	14.89 tons/yr
Total PM Emissions:	31.47 tons/yr

**** unpaved roads ****

The following calculations determine the amount of emissions created by vehicle traffic on unpaved roads, based on 8,760 hours of use and AP-42, Ch 13.2.2.2

I. Tri-axle Truck

$$9 \text{ trip/hr} \times 0.3 \text{ mile/trip} \times 8,760 \text{ hr/yr} = 23,652 \text{ mile/yr}$$

$$E_f = k \cdot \left[\frac{s}{12} \right]^a \cdot \left[\frac{W}{3} \right]^b \cdot \left[\frac{M_{dry}}{0.2} \right]^c \cdot \left[\frac{365-p}{365} \right] \cdot \left(\frac{S}{15} \right)$$

$$= 5.77 \text{ lb PM/mile}$$

$$= 1.50 \text{ lb PM-10/mile}$$

- where k = 10 (particle size multiplier, PM30) (k= 2.6 for PM10)
- s = 4.8 mean % silt content of unpaved plant roads
- a = 0.8 Constant for PM30/PM-10
- W = 22.5 tons, average vehicle weight
- b = 0.5 Constant for PM30 (b = 0.4 for PM10)
- Mdry = 0.2 surface material moisture content, % (default 0.2 (dry conditions) when using rainfall parameter)
- c = 0.4 Constant for PM30 (c = 0.3 for PM10)
- p = 125 number of days with at least 0.01 in of precipitation per year
- S = 10 mph speed limit

$$\frac{5.77 \text{ lb/mi} \times 23,652 \text{ mi/yr}}{2000 \text{ lb/ton}} = 68.21 \text{ tons/yr}$$

$$\frac{1.50 \text{ lb/mi} \times 23,652 \text{ mi/yr}}{2000 \text{ lb/ton}} = 17.73 \text{ tons/yr}$$

II. Front End Loader

$$29 \text{ trip/hr} \times 0.112 \text{ mile/roundtrip} \times 8,760 \text{ hr/yr} = 28,452 \text{ mile/yr}$$

$$E_f = k \cdot \left[\frac{s}{12} \right]^a \cdot \left[\frac{W}{3} \right]^b \cdot \left[\frac{M_{dry}}{0.2} \right]^c \cdot \left[\frac{365-p}{365} \right] \cdot \left(\frac{S}{15} \right)$$

$$= 5.75 \text{ lb PM/mile}$$

$$= 1.50 \text{ lb PM-10/mile}$$

- where k = 10 (particle size multiplier, PM30) (k= 2.6 for PM10)
- s = 4.8 mean % silt content of unpaved plant roads
- a = 0.8 Constant for PM30/PM-10
- W = 35 tons, average vehicle weight
- b = 0.5 Constant for PM30 (b = 0.4 for PM10)
- Mdry = 0.2 surface material moisture content, % (default 0.2 (dry conditions) when using rainfall parameter)
- c = 0.4 Constant for PM30 (c = 0.3 for PM10)
- p = 125 number of days with at least 0.01 in of precipitation per year
- S = 8 mph speed limit

$$\frac{5.75 \text{ lb/mi} \times 28,452 \text{ mi/yr}}{2000 \text{ lb/ton}} = 81.87 \text{ tons/yr}$$

$$\frac{1.50 \text{ lb/mi} \times 28,452 \text{ mi/yr}}{2000 \text{ lb/ton}} = 21.29 \text{ tons/yr}$$

Total PM Emissions From Unpaved Roads = 150.08 tons/yr
Total PM-10 Emissions From Unpaved Roads = 39.02 tons/yr

**** storage ****

The following calculations determine the amount of emissions created by wind erosion of storage stockpiles, based on 8,760 hours of use and USEPA's AP-42 (Pre 1983 Edition), Section 11.2.3.

Material	Silt Content (wt %)	Pile Size (acres)	Storage Capacity (tons)	P M Emissions tons/yr	P M-10 Emissions tons/yr
Sand	1.1	0.490	15,000	0.11	0.04
Stone	1.1	1.160	30,000	0.27	0.09
RAP	0.8	0.470	15,000	0.08	0.03
Total				0.46	0.16

Sample Calculation:

$$E_f = 1.7 \cdot (s/1.5) \cdot (365-p) / 235 \cdot (f/15)$$

= 1.27 lb/acre/day
 where s = 1.1 % silt
 p = 125 days of rain greater than or equal to 0.01 inches
 f = 15 % of wind greater than or equal to 12 mph

$$E_p (\text{storage}) = \frac{E_f \cdot (\text{Pile Size in acres}) \cdot (365 \text{ day/yr})}{(2,000 \text{ lb/ton})}$$

Pile Size = 0.49 acres

PM = 0.11 tons/yr

P M-10: 35% of PM =

0.04 tons/yr

**** summary of source emissions before controls ****

Criteria Pollutants:

- P M:** 80,010.33 ton/yr
- P M-10:** 18,621.60 ton/yr
- S O 2:** 544.38 ton/yr
- N O x:** 171.49 ton/yr
- V O C:** 21.36 ton/yr
- C O:** 43.45 ton/yr

(VOCs include HAPs from aggregate drying operation)

**** source emissions after controls ****

In order to qualify for the FESOP program, this source must limit SO₂ and NO_x emissions to 99.0 tons per year. Consequently, SO₂ and NO_x emissions from the aggregate dryer must be limited to 98.99 tons per year (99.0 ton/yr - 0.0055 ton/yr from the hot oil heater), and 98.08 tons per year (99.0 tpy - 0.92 tpy from the hot oil heater), respectively.

* Emissions of PM and PM-10 from aggregate drying operations are controlled with a 99.924 % control efficiency.

The following calculations determine the amount of emissions created by natural gas combustion based on a fuel usage limitation of 1.03E+09 cf

Natural Gas: $\frac{1,032.421 \text{ MMcf/yr}}{2,000 \text{ lb/ton}}$ * Ef (lb/MMcf) = (ton/yr)

P M:	1.9 lb/MMcf =	7.46E-04 ton/yr *
P M-10:	7.6 lb/MMcf =	2.98E-03 ton/yr *
S O 2:	0.6 lb/MMcf =	0.31 ton/yr
N O x:	190.0 lb/MMcf =	98.08 ton/yr
V O C:	5.5 lb/MMcf =	2.84 ton/yr
C O:	84.0 lb/MMcf =	43.36 ton/yr

The following calculations determine the amount of emissions created by liquified petroleum gas @ 0.0000008 % sulfur based on the maximum unit capacity of 9,340,952 gal/yr:

Liquified Petroleum Gas $\frac{9,340,952 \text{ gal/yr}}{2,000 \text{ lb/ton}}$ * Ef (lb/1,000 gal) = (ton/yr)

P M:	0.6 lb/1000 gal =	2.13E-03 ton/yr *
P M-10:	0.6 lb/1000 gal =	2.13E-03 ton/yr *
S O 2:	7.2E-08 lb/1000 gal =	3.36E-07 ton/yr
N O x:	21.0 lb/1000 gal =	98.08 ton/yr
V O C:	0.6 lb/1000 gal =	2.80 ton/yr
C O:	3.6 lb/1000 gal =	16.81 ton/yr

The following calculations determine the amount of emissions created by No. 2 distillate fuel oil @ 0.5 % sulfur based on a fuel usage limitation of 2,574,512 gal/yr:

No. 2 Distillate Oil: $\frac{2,574,512 \text{ gal/yr}}{2,000 \text{ lb/ton}}$ * Ef (lb/1,000 gal) = (ton/yr)

P M:	2.0 lb/1000 gal =	1.96E-03 ton/yr *
P M-10:	1.0 lb/1000 gal =	9.79E-04 ton/yr *
S O 2:	76.9 lb/1000 gal =	98.99 ton/yr
N O x:	24.0 lb/1000 gal =	30.89 ton/yr
V O C:	0.2 lb/1000 gal =	0.26 ton/yr
C O:	5.0 lb/1000 gal =	6.44 ton/yr

**** source emissions after controls ****

The following calculations determine the amount of emissions created by waste oil @
 based on a fuel usage limitation of 1,346,803 gal/yr:

1.0 % sulfur

Waste Oil: $\frac{1,346,803 \text{ gal/yr}}{2000 \text{ lb/ton}}$ * Ef (lb/1000 gal) = (ton/yr)

P M:	30.5 lb/1000 gal =	0.02 ton/yr *
P M-10:	16.8 lb/1000 gal =	0.01 ton/yr *
S O 2:	147.0 lb/1000 gal =	98.99 ton/yr
N O x:	19.0 lb/1000 gal =	12.79 ton/yr
V O C:	1.0 lb/1000 gal =	0.67 ton/yr
C O:	5.0 lb/1000 gal =	3.37 ton/yr

The following calculations determine the amount of emissions created by No. 4 virgin oil @
 based on a fuel usage limitation of 1,319,867 gal/yr:

1.0 % sulfur

No. 4 Virgin Oil: $\frac{1,319,867 \text{ gal/yr}}{2000 \text{ lb/ton}}$ * Ef (lb/1000 gal) = (ton/yr)

P M:	7.0 lb/1000 gal =	0.00 ton/yr *
P M-10:	6.0 lb/1000 gal =	0.00 ton/yr *
S O 2:	150.0 lb/1000 gal =	98.99 ton/yr
N O x:	47.0 lb/1000 gal =	31.02 ton/yr
V O C:	0.2 lb/1000 gal =	0.13 ton/yr
C O:	5.0 lb/1000 gal =	3.30 ton/yr

PM:	0.02 ton/yr	Waste Oil
P M-10:	0.01 ton/yr	Waste Oil
S O 2:	98.99 ton/yr	# 2 Fuel Oil
N O x:	98.08 ton/yr	Natural Gas
V O C:	2.84 ton/yr	Natural Gas
C O:	43.36 ton/yr	Natural Gas

**** source emissions after controls ****

Fuel Usage Limitations

Primary Fuel: Natural Gas

$$\frac{98.08 \text{ tons NOx/year limited}}{96.54 \text{ tons NOx/year potential}} * 1016.16 \frac{\text{MMCF}}{\text{year potential}} = 1032.421 \frac{\text{MMCF}}{\text{year limited}}$$

Backup Fuel: #2 distillate oil

$$\frac{98.99 \text{ tons SO2/year limited}}{279.08 \text{ tons SO2/year potential}} * 7,258 \frac{\text{Kgals}}{\text{year potential}} = 2574.512 \frac{\text{Kgals}}{\text{year limited}}$$

Fuel equivalence limit for natural gas based on NOx emissions from #2 distillate fuel oil:

$$\frac{96.54 \text{ n.g. potential emis. (ton/yr)}}{1182.6 \text{ n.g. potential usage (MMCF/yr)}} / \frac{279.08 \text{ #2 F.O. potential emissions (ton/yr)}}{8447.14 \text{ #2 F.O. potential usage (kgal/yr)}} = 2.471\text{E}+00 \frac{\text{No. 2 distillate fuel oil}}{\text{MMCF n.g. burned}}$$

Fuel equivalence limit for natural gas based on SO2 emissions from # 2 distillate oil:

$$\frac{0.3 \text{ n.g. potential emis. (ton/yr)}}{1016.16 \text{ n.g. potential usage (MMCF/yr)}} / \frac{279.08 \text{ #2 F.O. potential emissions (ton/yr)}}{7258.29 \text{ #2 F.O. potential usage (kgal/yr)}} = 7.678\text{E}-03 \frac{\text{No. 2 distillate fuel oil}}{\text{MMCF n.g. burned}}$$

Backup Fuel: LPG

Fuel equivalence limit for liquified petroleum gas based on NOx emissions from natural gas:

$$\frac{113.5072 \text{ LPG potential emis. (ton/yr)}}{10810.21 \text{ LPG potential usage (kgal/yr)}} / \frac{96.54 \text{ n.g. potential emissions (ton/yr)}}{1016.16 \text{ n.g. potential usage (MMCF/yr)}} = 1.105\text{E}-01 \frac{\text{MMCF n.g.}}{\text{Kgal LPG burned}}$$

Fuel equivalence limit for liquified petroleum gas based on SO2 emissions from # 2 distillate oil:

$$\frac{0.0000 \text{ LPG potential emis. (ton/yr)}}{10810.21 \text{ LPG potential usage (kgal/yr)}} / \frac{279.08 \text{ #2 F.O. potential emissions (ton/yr)}}{7258.29 \text{ #2 F.O. potential usage (kgal/yr)}} = 0.000\text{E}+00 \frac{\text{No. 2 distillate fuel oil}}{\text{Kgal LPG burned}}$$

**** source emissions after controls ****

	aggregate drying:	nonfugitive	
P M:	79,716 ton/yr x	0.08% emitted after controls =	60.63 ton/yr
P M-10:	18,506 ton/yr x	0.08% emitted after controls =	14.08 ton/yr
	conveying & handling:	fugitive	
P M:	31.26 ton/yr x	50% emitted after controls =	15.63 ton/yr
P M-10:	14.89 ton/yr x	50% emitted after controls =	7.44 ton/yr
	unpaved roads:	fugitive	
P M:	150.08 ton/yr x	50% emitted after controls =	75.04 ton/yr
P M-10:	39.02 ton/yr x	50% emitted after controls =	19.51 ton/yr
	storage piles:	fugitive	
P M:	0.46 ton/yr x	50% emitted after controls =	0.23 ton/yr
P M-10:	0.16 ton/yr x	50% emitted after controls =	0.08 ton/yr

**** summary of source emissions after controls ****

Criteria Pollutant:	Non-Fugitive	Fugitive	Total
PM:	65.65 ton/yr	90.90 ton/yr	156.55 ton/yr
PM-10:	14.15 ton/yr	27.03 ton/yr	41.19 ton/yr
S O 2:	99.00 ton/yr	0.00 ton/yr	99.00 ton/yr
N O x:	99.00 ton/yr	0.00 ton/yr	99.00 ton/yr
V O C:	20.51 ton/yr	0.00 ton/yr	20.51 ton/yr
C O:	44.13 ton/yr	0.00 ton/yr	44.13 ton/yr

**** miscellaneous ****

326 IAC 7 Compliance Calculations:

The following calculations determine the maximum sulfur content of distillate fuel oil (No. 2 Oil) allowable by 326 IAC 7:

$$\begin{array}{rcl}
 0.5 \text{ lb/MMBtu} \times & 140,000 \text{ Btu/gal} = & 70 \text{ lb/1000gal} \\
 70 \text{ lb/1000gal} / & 142 \text{ lb/1000 gal} = & 0.5 \%
 \end{array}$$

Sulfur content must be less than or equal to 0.5% to comply with 326 IAC 7.

The following calculations determine the maximum sulfur content of residual oil (Waste Oil) allowable by 326 IAC 7:

$$\begin{array}{rcl}
 1.6 \text{ lb/MMBtu} \times & 138,000 \text{ Btu/gal} = & 220.8 \text{ lb/1000gal} \\
 220.8 \text{ lb/1000gal} / & 150 \text{ lb/1000 gal} = & 1.5 \%
 \end{array}$$

Sulfur content must be less than or equal to 1.5% to comply with 326 IAC 7.

The following calculations determine the maximum sulfur content of residual oil (Virgin Oil) allowable by 326 IAC 7:

$$\begin{array}{rcl}
 1.6 \text{ lb/MMBtu} \times & 140,000 \text{ Btu/gal} = & 224 \text{ lb/1000gal} \\
 224 \text{ lb/1000gal} / & 150 \text{ lb/1000 gal} = & 1.5 \%
 \end{array}$$

Sulfur content must be less than or equal to 1.5% to comply with 326 IAC 7.

326 IAC 6-3-2 Compliance Calculations:

The following calculations determine compliance with 326 IAC 6-3-2 for process weight rates in excess of 30 tons per hour:

$$\text{limit} = 55 * (650 ^{0.11}) - 40 = 72.15 \text{ lb/hr or } 316.00 \text{ ton/yr}$$

PM emissions from the aggregate dryer are controlled to 40.11 tons per year < 294.17 tons per year (will comply)

Since this emission limit exceeds both the Subpart I allowable PM emission limits (see next page), the requirements of 326 IAC 6-3-2 shall not apply, pursuant to 326 IAC 6-3-1(b). The source shall comply with the PM limit pursuant to 40 CFR 60, Subpart I, as the more stringent limit. Compliance with Subpart I shall also limit source wide PM to less than 250 tons per year and therefore, the requirements of 326 IAC 2-2 (PSD) shall not apply.

**** miscellaneous ****

PM-10 Emission Limit:

(99.0 tons PM10/yr - 27.05 tons PM10/yr for non-dryer emissi 14.27 tons / year
 = 3.26 lb/hr, based on 8,760 hr/yr
 = 0.01 lb PM10/ton asphalt, based on 650 tons asphalt /hr

PM10 emissions from the aggregate dryer are controlled to 14.08 tons per year < 14.27 tons per year (will comply)

40 CFR Part 60.90, Subpart I (Standards of Performance for Hot Mix Asphalt Plants) Compliance Calculations:

The following calculations determine compliance with NSPS, which limits stack emissions from asphalt plants to 0.04 gr/dscf:

$$\frac{60.63 \text{ ton/yr} * 2000 \text{ lb/ton} * 7000 \text{ gr/lb}}{525,600 \text{ min/yr} * 24,877 \text{ dscf/min}} = 0.06 \text{ gr/dscf} \quad (\text{will not comply})$$

Allowable particulate emissions under NSPS equate to 37.36 tons per year. 8.53 lbs/hr

Note:

$$\begin{aligned} \text{SCFM} &= 34,865 \text{ acfm} * (460 + 68) / (460 + 280) \\ &= 24,877 \text{ scfm} \end{aligned}$$

Hazardous Air Pollutants (HAPs)

**** aggregate dryer burner****

The following calculations determine the amount of HAP emissions created by the combustion of residual oil before & after controls, from the aggregate dryer burner, based on 8760 hours of use and US EPA's AP-42, 5th Edition, Section 1.3 - Fuel Oil Combustion, Table 1.3-11.

Hazardous Air Pollutants (HAPs)	$\frac{116 \text{ MMBtu/hr} * 8760 \text{ hr/yr}}{2,000 \text{ lb/ton}}$	* Ef (lb/10 ¹² Btu) = (ton/yr)	
		Potential To Emit	Limited Emissions
Antimony:	46 lb/10 ¹² Btu =	2.34E-02 ton/yr	1.78E-05 ton/yr
Arsenic:	114 lb/10 ¹² Btu =	5.79E-02 ton/yr	4.41E-05 ton/yr
Beryllium:	4.2 lb/10 ¹² Btu =	2.13E-03 ton/yr	1.62E-06 ton/yr
Cadmium:	211 lb/10 ¹² Btu =	1.07E-01 ton/yr	8.15E-05 ton/yr
Chromium:	128 lb/10 ¹² Btu =	6.50E-02 ton/yr	4.95E-05 ton/yr
Cobalt:	121 lb/10 ¹² Btu =	6.15E-02 ton/yr	4.68E-05 ton/yr
Lead:	194 lb/10 ¹² Btu =	9.86E-02 ton/yr	7.50E-05 ton/yr
Manganese:	74 lb/10 ¹² Btu =	3.76E-02 ton/yr	2.86E-05 ton/yr
Mercury:	32 lb/10 ¹² Btu =	1.63E-02 ton/yr	1.24E-05 ton/yr
Nickel:	2330 lb/10 ¹² Btu =	1.18E+00 ton/yr	9.00E-04 ton/yr
Selenium:	38 lb/10 ¹² Btu =	1.93E-02 ton/yr	1.47E-05 ton/yr
	Total HAPs =	1.63E+00 ton/yr	1.24E-03 ton/yr

**** aggregate drying: drum-mix plant ****

The following calculations determine the amount of HAP emissions created by aggregate drying before & after controls, based on 8,760 hours of use and USEPA's AP-42, 5th Edition, Section 11.1 - Hot Mix Asphalt Plants, Table 11.1-9 for a drum mix dryer which can be fired with either fuel oil or natural gas. The HAP emission factors represent the worst case emissions (natural gas combustion).

Pollutant:	Ef	lb/ton x	650	ton/hr x	8760 hr/yr
			2000	lb/ton	
Hazardous Air Pollutants (HAPs):					
				Potential To Emit	Limited Emissions
Acetaldehyde:	1.30E-03	lb/ton =		3.70 ton/yr	3.70 ton/yr
Acrolein:	2.60E-05	lb/ton =		0.07 ton/yr	0.07 ton/yr
*Benzene:	4.10E-04	lb/ton =		1.17 ton/yr	1.17 ton/yr
Ethylbenzene:	3.80E-04	lb/ton =		1.08 ton/yr	1.08 ton/yr
*Formaldehyde:	2.40E-03	lb/ton =		6.83 ton/yr	6.83 ton/yr
Methyl Ethyl Ketone:	2.00E-05	lb/ton =		0.06 ton/yr	0.06 ton/yr
Quinone:	1.60E-04	lb/ton =		0.46 ton/yr	0.46 ton/yr
Toluene:	7.50E-04	lb/ton =		2.14 ton/yr	2.14 ton/yr
**Total Polycyclic Organic Matter (POM):	5.810E-04	lb/ton =		1.65 ton/yr	1.65 ton/yr
*Xylene:	1.60E-04	lb/ton =		0.46 ton/yr	0.46 ton/yr
				Total HAPs =	15.50 ton/yr

* The emission factor for formaldehyde from fuel oil firing (0.0032 lb/ton) exceeds the formaldehyde emission factor from natural gas firing (0.00086 lb/ton). Consequently, the worst case emissions for formaldehyde are 1.75 ton/yr. However, since the VOC emissions from natural gas combustion exceed the VOC emissions from fuel oil firing, the natural gas emission factor was used to avoid overestimating total VOC emissions.

**** summary of source HAP emissions potential to emit ****

Hazardous Air Pollutants (HAPs):	
Acetaldehyde:	3.701 ton/yr
Acrolein:	0.074 ton/yr
Antimony:	0.023 ton/yr
Arsenic:	0.058 ton/yr
Benzene:	1.167 ton/yr
Beryllium:	0.002 ton/yr
Cadmium:	0.107 ton/yr
Chromium:	0.065 ton/yr
Cobalt:	0.061 ton/yr
Ethylbenzene:	1.082 ton/yr
Formaldehyde:	6.833 ton/yr
Lead:	0.099 ton/yr
Manganese:	0.038 ton/yr
Mercury:	0.016 ton/yr
Nickel:	1.184 ton/yr
Quinone:	0.057 ton/yr
Selenium:	0.019 ton/yr
Toluene:	0.456 ton/yr
Total Polycyclic Organic Matter:	2.135 ton/yr
Xylene:	1.654 ton/yr
Total	18.832 ton/yr

**** summary of source HAP limited emissions ****

Hazardous Air Pollutants (HAPs):

Acetaldehyde:	3.701 ton/yr
Acrolein:	0.074 ton/yr
Antimony:	0.000 ton/yr
Arsenic:	0.000 ton/yr
Benzene:	1.167 ton/yr
Beryllium:	0.000 ton/yr
Cadmium:	0.000 ton/yr
Chromium:	0.000 ton/yr
Cobalt:	0.000 ton/yr
Ethylbenzene:	1.082 ton/yr
Formaldehyde:	6.833 ton/yr
Lead:	0.000 ton/yr
Manganese:	0.000 ton/yr
Mercury:	0.000 ton/yr
Nickel:	0.001 ton/yr
Quinone:	0.057 ton/yr
Selenium:	0.000 ton/yr
Toluene:	0.456 ton/yr
Total Polycyclic Organic Matter:	2.135 ton/yr
Xylene:	1.654 ton/yr
	<hr/>
	17.160 ton/yr