



Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
(800) 451-6027
www.IN.gov/idem

TO: Interested Parties / Applicant
DATE: May 19, 2006
RE: J.W. Hicks / 141-22835-00022
FROM: Nisha Sizemore
Chief, Permits Branch
Office of Air Quality

Notice of Decision: Approval - Registration

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 4-21.5-3-4(d) this order is effective when it is served. When served by U.S. mail, the order is effective three (3) calendar days from the mailing of this notice pursuant to IC 4-21.5-3-2(e).

If you wish to challenge this decision, IC 4-21.5-3-7 requires 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
FN-REGIS.dot 03/23/06



Mitchell E. Daniels, Jr.
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Chad Tuttle
J. W. Hicks, Inc.
20 South Klockner Drive
Knox, Indiana 46534

May 19, 2006

Re: Registration Revision No.141-22835-00022,
Original Registration No. 141-11612-00022.

Dear Mr. Tuttle:

The application from J. W. Hicks, Inc., received on March 17th 2006, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-5.1, it has been determined that the following non-clay refractory manufacturing source, to be located at 20 South Klockner Drive, Indiana, is classified as registered:

Slidegate Plant:

- (a) Five (5) natural gas fired space heaters, identified as Reznor V-1, V-2, V-3, V-4, and V-5, with a heat input rate of 0.2 million British thermal units (MMBtu) per hour per heater, exhausting to five (5) stacks identified as V-1, V-2, V-3, V-4, and V-5, respectively.
- (b) One (1) natural gas fired drying oven, with three (3) chambers identified as Chamber 1, 2, and 3, with a heat input rate of one (1) MMBtu per hour per chamber, exhausting to three (3) stacks identified as V-7, V-8, and V-9, respectively.
- (c) One (1) natural gas fired kiln, identified as Kiln-1, with three (3) zones and six (6) burner units per zone, with each burner unit identified as Burner 1 through 18 and a heat input rate of 0.603 MMBtu per hour per burner, exhausting to three (3) stacks identified as S-1, S-2, and S-3.
- (d) One (1) pre-mixer, one (1) mixer, identified as Mixer 1, two (2) presses, and one (1) hopper controlled by two integral dust collectors exhausting inside the building.
- (e) One (1) machining center and one (1) band heater.
- (f) One (1) natural gas fired kiln, identified as Kiln-2, with three (3) zones and eight (8) burner units per zone, with each burner unit identified as Burner 1 through 24 and a combined heat input rate of 12.5 MMBtu per hour, exhausting to three (3) stacks identified as S-4, S-5 and S-6.
- (g) One gas-fired space heater, identified as SH V-6, rated at 0.58 MMBtu per hour exhausting to one (1) stack identified as V-6.

Lance Plant:

- (a) One (1) natural gas fired drying oven, identified as DO-2, rated at 1.00 MMBtu per hour, exhausting to one (1) stack identified as V-13.
- (b) Three gas-fired space heaters, identified as SH V-10, SH V-11 and SH V-12, respectively, each rated at 0.20 MMBtu per hour, exhausting to three (3) stacks, identified as V-10, V-11 and V-12, respectively.
- (c) One (1) enclosed mixing process, identified as Mixer 2, that exhausts inside the facility.

The following conditions shall be applicable:

- (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 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.
- (2) Pursuant to 326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes), the particulate matter (PM) from the refractory manufacturing process shall be limited by the following:

Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour; and} \\ P = \text{process weight rate in tons per hour}$$

Hopper:	E	= 4.10 (0.66) ^{0.67} = 3.1 lb PM/hr
Pre-Mixer:	E	= 4.10 (0.66) ^{0.67} = 3.1 lb PM/hr
Mixer 1:	E	= 4.10 (1.32) ^{0.67} = 4.9 lb PM/hr
Nozzle Press:	E	= 4.10 (1.35) ^{0.67} = 5.0 lb PM/hr
Plate Press:	E	= 4.10 (1.35) ^{0.67} = 5.0 lb PM/hr

The two integral dust collectors shall be in operation at all times the refractory manufacturing process is in operation, in order to comply with 326 IAC 2-5.5.

- (3) Pursuant to 326 IAC 2-5.5, the Permittee shall not allow emissions of particulate matter to exceed twenty-five (25) tons per year. Since the dust collectors are considered an integral part of the refractory production process, the potential emissions are determined after the dust collectors. In order to comply with 326 IAC 2-5.5, the process cannot operate without the use of the dust collectors.

- (4) The dust collectors shall operate at a pressure drop range of 2.0 to 2.5 inches of water and at a minimum actual collection efficiency of 99.97%.
- (5) In the event that a bag failure has been observed, the affected compartments, failed units and refractory production processes that vent to the dust collector shall be shut down immediately until the failed units have been repaired or replaced.

This registration is first air approval issued to this source. The source may operate according to 326 IAC 2-5.1.

An authorized individual shall provide an annual notice to the Office of Air Quality that the source is in operation and in compliance with this registration pursuant to 326 IAC 2-5.1-2(f)(3). The annual notice shall be submitted to:

**Compliance Data Section
Office of Air Quality
100 North Senate Avenue
Indianapolis, IN 46204-2251**

no later than March 1 of each year, with the annual notice being submitted in the format attached.

An application or notification shall be submitted in accordance with 326 IAC 2 to the Office of Air Quality (OAQ) if the source proposes to construct new emission units, modify existing emission units, or otherwise modify the source.

Sincerely,

Original Signed By:
Nisha Sizemore, Chief
Permits Branch
Office of Air Quality

GSN/EVP

cc: File - Starke County
Starke County Health Department
Air Compliance – David North
Permit Tracking
Compliance Data Section

Registration Annual Notification

This form should be used to comply with the notification requirements under 326 IAC 2-5.1-2(f)(3)

Company Name:	J. W. Hicks, Inc.
Address:	20 South Klockner Drive, Knox IN 46534
City:	Knox
Authorized individual:	James W. Hicks
Phone #:	219-736-2212
Registration #:	141-222835-00022

I hereby certify that J. W. Hicks, Inc. is still in operation and is in compliance with the requirements of Registration **141-222835-00022**.

Name (typed):
Title:
Signature:
Date:

Indiana Department of Environmental Management Office of Air Quality

Technical Support Document (TSD) for a Registration Revision

Source Background and Description

Source Name:	J. W. Hicks, Inc.
Source Location:	20 South Klockner Drive, Knox, IN 46534
County:	Starke
SIC Code:	3297
Registration No.:	149-11612-00022
Revision No.:	149-22835-00022
Permit Reviewer:	Ganesh Srinivasan/EVP

The Office of Air Quality (OAQ) has reviewed an application from J. W. Hicks, Inc. relating to the revision of their existing Registration permit.

New Emission Units and Pollution Control Equipment

Slidegate Plant:

- (a) One (1) natural gas fired kiln, identified as Kiln-2, with three (3) zones and eight (8) burner units per zone, with each burner unit identified as Burner 1 through 24 and a combined heat input rate of 12.5 MMBtu per hour, exhausting to three (3) stacks identified as S-4, S-5 and S-6.
- (b) One gas-fired space heater, identified as SH V-6, rated at 0.58 MMBtu per hour exhausting to one (1) stack identified as V-6.

Lance Plant:

- (c) One (1) natural gas fired drying oven, identified as DO-2, rated at 1.00 MMBtu per hour, exhausting to one (1) stack identified as V-13.
- (d) Three gas-fired space heaters, identified as SH V-10, SH V-11 and SH V-12, respectively, each rated at 0.20 MMBtu per hour, exhausting to three (3) stacks, identified as V-10, V-11 and V-12, respectively.
- (e) One (1) enclosed mixing process, identified as Mixer 2, which exhausts inside the facility.

Permitted Emission Units and Pollution Control Equipment

The source consists of the following new emission units and pollution control devices during this review process:

Slidegate Plant:

- (a) Five (5) natural gas fired space heaters, identified as Reznor V-1, V-2, and V-3, V-4 and V-5 with a heat input rate of 0.2 million British thermal units (MMBtu) per hour per heater, exhausting to five (5) stacks identified as V-1, V-2, V-3, V-4 and V-5, respectively.
- (b) One (1) natural gas fired drying oven, with three (3) chambers identified as Chamber 1, 2 and 3, with a heat input rate of one (1) MMBtu per hour per chamber, exhausting to three (3) stacks identified as V-7, V-8 and V-9, respectively.

- (c) One (1) natural gas fired kiln, identified as Kiln-1, with three (3) zones and six (6) burner units per zone, with each burner unit identified as Burner 1 through 18 and a heat input rate of 0.603 MMBtu per hour per burner, exhausting to three (3) stacks identified as S-1, S-2 and S-3.
- (d) One (1) pre-mixer, one (1) mixer, identified as Mixer 1, two (2) presses and one (1) hopper controlled by two integral dust collectors exhausting inside the building.
- (e) One (1) machining center and one (1) band heater.

Unpermitted Emission Units and Pollution Control Equipment

There are no unpermitted emission units operating at this source during this review process.

Enforcement Issue

There are no enforcement actions pending.

Air Pollution Control Justification as an Integral Part of the Process

The company has submitted the following justification such the dust collector be considered as an integral part of the refractory production process:

- (a) The two dust collectors are an integral part of the process due to the extreme cost of the material collected. The raw materials used in the refractory production process are a mixture of ceramic and mineral powders and a phenolic resin that is in the liquid and powdered form. This material must be returned to the process prior to pressing so that the product will meet stringent operational parameters.
- (b) The materials that are the most susceptible to becoming airborne and require dust collection are those that make up the minor additives that impart the qualities to our product that make its performance superior to the competition. These specific items are also the most costly. Loss of these items in material handling, mixing and the pressing process would severely compromise our product in the market place and increase the cost. It is necessary that the material that becomes airborne in these processes be captured and returned to the mix to prevent the aforementioned problems. The captured material accounts for 5.3% of the total cost of the mix which equals a potential cost savings of \$539,926.00 per year. The cost of installing the two dust collectors was \$32,575 and \$20,846. The annual operating cost for new filters and spare parts for the two dust collectors is approximately \$1,800 per dust collector.

IDEM, OAQ has evaluated the justifications and agreed that the two dust collectors will be considered as an integral part of the refractory production process. Therefore, the permitting level will be determined using the potential to emit after the dust collectors. Operating conditions in the proposed permit will specify that these dust collectors shall operate at all times when the refractory production process in in operation.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow rate (acfm)	Temperature (°F)
V-1, V-2, V-3, V-4, V-5	Space Heaters	Vaires	6"	65	N/a
V-6	Dust Collector	23'-6"	21 1/2 * 137/8	3000	Ambient
V-7, V-8 , V-9	Drying Oven	14' – 111/4	131/2 * 91/4	550	550

S-1, S-2, S-3	1600 C Kiln	30' * 11 1/2"	20"	4150	2912
S-4, S-5, S-6	Gas-fired Kiln	31	20	4150	2900
V-6	Space Heater	20	6	6	N/A
V-13	Drying Oven	15	13/9"	550	500
V-10, V-11, V-12	Space Heaters	12-24	6"	60	N/A

Recommendation

The staff recommends to the Commissioner that the operation 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 April 25, 2006.

Emission Calculations

See Appendix A of this document for detailed emission calculations (pages 1 through 7).

Potential to Emit of the Source After 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.”

Emission Unit	PM (tpy)	PM10 (tpy)	SO2 (tpy)	VOC (tpy)	CO (tpy)	NOx (tpy)	Single HAP (tpy)	Combined HAPs (tpy)
Existing Emission Units	0.54	0.50	0.00	14.80	5.80	6.90	4.32	9.34
Removed Emission Unit	0.01	0.03	0.00	0.02	0.33	0.40	0.00	0.00
New Emission Units	3.62	3.99	0.04	0.35	5.40	6.43	0.12	0.12
Total	4.15	4.46	0.04	15.13	10.87	12.93	4.44	9.48

- (a) The potential to emit NOx due to the proposed revision is greater than 10 tons per year (the exemption level as listed under 2-1.1-3) and source wide potential to emit of all regulated pollutants still remain within the ranges listed under 326 IAC 2-5.1-2 after revision. Therefore, the source will maintain the registration status and a registration revision will be issued.
- (b) Fugitive Emissions
 Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

County Attainment Status

The source is located in Starke County.

Pollutant	Status
PM-10	Attainment
PM-2.5	Attainment
SO ₂	Attainment
NO ₂	Attainment
1-hour Ozone	Attainment
8-hour Ozone	Attainment
CO	Attainment
Lead	Attainment

- (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. Starke County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NOx emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD) 326 IAC 2-2.
- (b) Starke County has been classified as attainment for PM2.5. U.S. EPA has not yet established the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 for PM 2.5 emissions. Therefore, until the U.S.EPA adopts specific provisions for PSD review for PM2.5 emissions, it has directed states to regulate PM10 emissions as surrogate for PM2.5 emissions.
- (c) Starke County has been classified as attainment or unclassifiable in Indiana for all other pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.
- (d) Fugitive Emissions
Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2 or 2-3 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

Source Status

New Source PSD Definition (emissions after controls, based on 8760 hours of operation per year at rated capacity and/or as otherwise limited):

- (a) This source is **not** a major stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or greater and it is not in one of the 28 listed source categories.

Part 70 Permit Determination

326 IAC 2-7 (Part 70 Permit Program)

This new source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons per year.

This is the second air approval issued to this source.

Federal Rule Applicability

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

State Rule Applicability – Entire Source

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.

State Rule Applicability – Individual Facilities

326 IAC 6-3-2 (Particulate Emission Limitations for Manufacturing Processes)

The particulate matter (PM) from the refractory manufacturing process shall be limited by the following:

Interpolation of the data for the process weight rate up to sixty thousand (60,000) pounds per hour shall be accomplished by use of the equation:

$$E = 4.10 P^{0.67} \quad \text{where } E = \text{rate of emission in pounds per hour; and} \\ P = \text{process weight rate in tons per hour}$$

Hopper:	E	= 4.10 (0.66) ^{0.67} = 3.1 lb PM/hr
Pre-Mixer:	E	= 4.10 (0.66) ^{0.67} = 3.1 lb PM/hr
Mixer 1:	E	= 4.10 (1.32) ^{0.67} = 4.9 lb PM/hr
Nozzle Press:	E	= 4.10 (1.35) ^{0.67} = 5.0 lb PM/hr
Plate Press:	E	= 4.10 (1.35) ^{0.67} = 5.0 lb PM/hr

The two integral dust collectors shall be in operation at all times the refractory manufacturing process is in operation, in order to comply with 326 IAC 2-5.5. The machining center will not produce PM emissions because the machining is a wet process.

Mixer 2 located at the Lance Plant is exempt from this rule since its potential emissions are less than 0.551 pounds per hour.

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

This rule applies to sources of indirect heating. The new combustion emission units being added in this revision and all existing combustion emission units are all direct-fired emission units. Hence, 326 IAC 6-2 does not apply to Kiln-2, SH V-6, V-13, SH V-10, SH V-11, SH V-12, V-1, V-2, V-3, V-4, V-5, and Kiln-1.

Conclusion

The operation of this refractory manufacturing operation shall be subject to the conditions of the Registration Revision No. 149-22835-00022.

Appendix A: Emissions Calculations

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klocker Drive, Knox, IN 46534
Permit Number: 149-22835-00022
Plt ID: 149-00022
Reviewer: GSN/EVP
Date: 05/01/06

Emission Unit	PM	PM10	SO2	VOC	CO	Nox	Single HAP	Combined HAPs
Existing Emission Units	0.54	0.50	0.00	14.80	5.80	6.90	4.32	9.34
Removed Emission Unit	0.01	0.03	0.00	0.02	0.33	0.40	0.00	0.00
New Emission Units	3.62	3.99	0.04	0.35	5.40	6.43	0.12	0.12
							(Hexane)	
Total	4.15	4.46	0.04	15.13	10.87	12.93	4.44	9.46

Appendix A: Emissions Calculations

Mixer 2

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klocker Drive, Knox, IN 46534
Permit Number: 149-22835-00022
Plt ID: 149-00022
Reviewer: GSN/EVP
Date: 05/01/06

Maximum Potential PM Emissions from Refractory Mixing Process

Maximum Throughput:	2,050.00 tons/yr
AP-42 Emission Factor ^a	0.524 lbs PM/ton
Maximum PM Generated (lbs/yr):	1,074.2 lbs PM/yr
Maximum Potential PM Emissions (tpy):	0.5 tons/yr
Maximum Potential PM Emissions (lb/hr):	0.1 lbs/hr

^a AP-42 Emission Factor for Mixer Loading of Cement/Sand/Aggregate in AP-42 Chapter 11 (Mineral Products - Concrete Batching) was used (SCC Code # of 30501109). This document is still in draft stage.

Methodology:

Maximum Potential PM Emissions (lbs PM/yr) = Maximum Throughput (tons/yr) * AP-42 Emission Factor (lbs PM/ton)

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

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klocker Drive, Knox, IN 46534
Permit Number: 149-22835-00022
Pit ID: 149-00022
Reviewer: GSN/EVP
Date: 05/01/06

Heat Input Capacity
MMBtu/hr
New Units

14.68

Potential Throughput
MMCF/yr
128.6

Emission Factor in lb/MMCF	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0	5.5	84.0
				**see below		
Potential Emission in tons/yr	0.12	0.49	0.04	6.43	0.35	5.40

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable 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 1-03-006-03 (SUPPLEMENT D 3/98)

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

See next page for HAPs emissions calculations.

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

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klocker Drive, Knox, IN 46534
Permit Number: 149-22835-00022
Pit ID: 149-00022
Reviewer: GSN/EVP
Date: 05/01/06

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	1.350E-04	7.716E-05	4.822E-03	1.157E-01	2.186E-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	Total
Potential Emission in tons/yr	3.215E-05	7.073E-05	9.002E-05	2.443E-05	1.350E-04	1.213E-01

Methodology is the same as previous page.

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

Mixer 1

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klocker Drive, Knox, IN 46534
Permit Number: 149-22835-00022
Plt ID: 149-00022
Reviewer: GSN/EVP
Date: 05/01/06

Potential to Emit* (PTE) from Refractory Manufacturing Process

Mass flow rate of particulate matter (PM) to dust collectors = 31.5 lb/hr
Efficiency of dust collectors = 99.97%
Mass flow rate of PM after dust collectors = $(31.5 \text{ lb/hr}) * (1 - 0.9997) = 0.00945 \text{ lb/hr}$
PTE of PM after dust collectors = $(0.00945 \text{ lb/hr}) * (8760 \text{ hr/yr}) * (1 \text{ ton}/2000 \text{ lb})$
0.04 ton PM/yr

*the dust collector is an integral part of the process, therefore PTE is calculated after controls

PTE from 1600°C Kiln

$(0.988 \text{ lb ethylene glycol/hour}) * (8760 \text{ hour/year}) * (1 \text{ ton}/2000 \text{ lb}) = 4.32 \text{ ton ethylene glycol/yr}$
 $(0.928 \text{ lb formaldehyde/hour}) * (8760 \text{ hour/year}) * (1 \text{ ton}/2000 \text{ lb}) = 4.06 \text{ ton formaldehyde/yr}$
 $(0.219 \text{ lb phenol/hour}) * (8760 \text{ hour/year}) * (1 \text{ ton}/2000 \text{ lb}) = 0.96 \text{ ton phenol/yr}$
 $(1.105 \text{ lb phenolic resin/hour}) * (8760 \text{ hour/year}) * (1 \text{ ton}/2000 \text{ lb}) = 4.84 \text{ ton phenolic resin/yr}$
 $(0.009 \text{ lb ammonia/hour}) * (8760 \text{ hour/year}) * (1 \text{ ton}/2000 \text{ lb}) = 0.04 \text{ ton ammonia/yr}$
 $(0.039 \text{ lb hexamethylenetetramine/hour}) * (8760 \text{ hour/year}) * (1 \text{ ton}/2000 \text{ lb}) = 0.17 \text{ ton hexa./yr}$

PTE for Hazardous Air Pollutants (HAPs)

PTE = $(4.32 \text{ ton ethylene glycol/yr}) + (4.06 \text{ ton formaldehyde/yr}) + (0.96 \text{ ton phenol/yr}) =$
= 9.34 ton HAP/yr

PTE for Volatile Organic Compounds (VOCs)

PTE = $(4.32 \text{ ton ethylene glycol/yr}) + (4.06 \text{ ton formaldehyde/yr}) + (0.96 \text{ ton phenol/yr}) + (4.84 \text{ ton phenolic resin/yr}) + (0.17 \text{ ton hexamethylenetetramine/yr})$
= 14.4 ton VOC/yr

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

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klockner Drive, Knox, IN 46534
Permit Number: 149-22835-00022
Pit ID: 149-00022
Reviewer: GSN/EVP
Date: 05/01/06

Heat Input Capacity
MMBtu/hr
Existing Units **15.8**

Potential Throughput
MMCF/yr
138.4

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.13	0.53	0.04	6.92	0.38	5.81

*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable 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 1-03-006-03 (SUPPLEMENT D 3/98)

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

See next page for HAPs emissions calculations.

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

Company Name: J. W. Hicks, Inc.
Address City IN Zip: 20 South Klocker Drive, Knox, IN 46534
Permit Number: 149-22835-00022
Pit ID: 149-00022
Reviewer: GSN/EVP
Date: 05/01/06

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	1.453E-04	8.304E-05	5.190E-03	1.246E-01	2.353E-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	Total
Potential Emission in tons/yr	3.460E-05	7.612E-05	9.689E-05	2.630E-05	1.453E-04	1.306E-01

Methodology is the same as previous page.

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