



# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

*We Protect Hoosiers and Our Environment.*

*Mitchell E. Daniels Jr.*  
Governor

*Thomas W. Easterly*  
Commissioner

100 North Senate Avenue  
Indianapolis, Indiana 46204  
(317) 232-8603  
Toll Free (800) 451-6027  
[www.idem.IN.gov](http://www.idem.IN.gov)

DATE: February 23, 2009

TO: Interested Parties / Applicant

RE: Shell Oil Products, US / R097-26384-00638

FROM: Matt Stuckey  
Permits Branch Chief  
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 501, 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 Indiana Department of Environmental Management, Office of Air Quality at (317) 233-2123.

Enclosures



# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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## REGISTRATION OFFICE OF AIR QUALITY

**Shell Oil Products, US  
Former Shell Service Station # 137294  
5071 East 10th Street  
Indianapolis, IN 46201**

Pursuant to 326 IAC 2-5.1 (Construction of New Sources: Registrations) and 326 IAC 2-5.5 (Registrations), (herein known as the Registrant) is hereby authorized to construct and operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this registration.

Registration No. R097-26384-00638	
Issued by:  Alfred C. Dumauval Permits Branch Section Chief Office of Air Quality	Issuance Date: February 23, 2009



## SECTION A

## SOURCE SUMMARY

This registration is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Quality (OAQ). The information describing the source contained in conditions A.1 and A.2 is descriptive information and does not constitute enforceable conditions. However, the Registrant 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 Registrant to obtain additional permits pursuant to 326 IAC 2.

### A.1 General Information

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The Registrant owns and operates a stationary a soil and groundwater remediation system.

Source Address:	Former Shell Service Station # 137294 5071 East 10th Street, Indianapolis, IN 46201
Mailing Address:	2977 Highway K # 307, O'Fallon, MO 63368
General Source Phone Number:	(317) 876-0357
SIC Code:	5541
County Location:	Marion County
Source Location Status:	Nonattainment for PM 2.5 standard Attainment for all other criteria pollutants
Source Status:	Registration

### A.2 Emission Units and Pollution Control Equipment Summary

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

- (a) One (1) Soil Vapor Extraction System (SVE), identified as Emission Unit EMU-01, at a maximum system flow capacity of 500 actual cubic feet per minute (acfm), constructed in 2008, using as control one (1) thermal oxidizer, identified as CE-01, fired by natural gas, with maximum capacity of one (1) million Btu/hr, and exhausting through Stack #1.
- (b) One (1) Air Stripper, used for groundwater treatment, identified as Emission Unit EMU-02, with maximum capacity of 140 acfm and water flow of 25 gallons per minute, constructed in 2008, and exhausting through Stack #2.
- (c) One (1) Product Drum, used for hydrocarbons storage, identified as Emission Unit EMU-03, with maximum capacity of 0.01 acfm, constructed in 2008, and exhausting through Vent #1.
- (d) Oil Water Separator, used for hydrocarbon separation, identified as Emission Unit EMU-04, with maximum capacity of 4.01 acfm, constructed in 2008, and exhausting through Vent #2.
- (e) Transfer Tank, used as an equalization tank, identified as Emission Unit EMU-05, with maximum capacity of 2.67 acfm, constructed in 2008, and exhausting through Vent #3.

## **SECTION B GENERAL CONDITIONS**

### **B.1 Definitions [326 IAC 2-1.1-1]**

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Terms in this registration shall have the definition assigned to such terms in the referenced regulation. In the absence of definitions in the referenced regulation, the applicable definitions found in the statutes or regulations (IC 13-11, 326 IAC 1-2 and 326 IAC 2-1.1-1) shall prevail.

### **B.2 Effective Date of Registration [IC 13-15-5-3]**

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Pursuant to IC 13-15-5-3, this registration 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.

### **B.3 Registration Revocation [326 IAC 2-1.1-9]**

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Pursuant to 326 IAC 2-1.1-9 (Revocation), this registration to operate may be revoked for any of the following causes:

- (a) Violation of any conditions of this registration.
- (b) Failure to disclose all the relevant facts, or misrepresentation in obtaining this registration.
- (c) Changes in regulatory requirements that mandate either a temporary or permanent reduction of discharge of contaminants. However, the amendment of appropriate sections of this registration shall not require revocation of this registration.
- (d) For any cause which establishes in the judgment of IDEM and OES, the fact that continuance of this registration is not consistent with purposes of this article.

### **B.4 Prior Permits Superseded [326 IAC 2-1.1-9.5]**

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- (a) All terms and conditions of permits established prior to Registration No. R097-26384-00638 and issued pursuant to permitting programs approved into the state implementation plan have been either:
  - (1) incorporated as originally stated,
  - (2) revised, or
  - (3) deleted.
- (b) All previous registrations and permits are superseded by this registration.

### **B.5 Annual Notification [326 IAC 2-5.1-2(f)(3)] [326 IAC 2-5.5-4(a)(3)]**

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Pursuant to 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3):

- (a) An annual notification shall be submitted by an authorized individual to the Office of Air Quality stating whether or not the source is in operation and in compliance with the terms and conditions contained in this registration.
- (b) The annual notice shall be submitted in the format attached no later than March 1 of each year to:

Indiana Department of Environmental Management  
Compliance Branch, Office of Air Quality  
100 North Senate Avenue

MC 61-53 IGCN 1003  
Indianapolis, IN 46204-2251

- (c) The notification shall be considered timely if the date postmarked on the envelope or certified mail receipt, or affixed by the shipper on the private shipping receipt, is on or before the date it is due. If the document is submitted by any other means, it shall be considered timely if received by IDEM, OAQ on or before the date it is due.

**B.6 Source Modification Requirement [326 IAC 2-5.5-6(a)]**

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Pursuant to 326 IAC 2-5.5-6(a), 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.

**B.7 Registrations [326 IAC 2-5.1-2(i)]**

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Pursuant to 326 IAC 2-5.1-2(i), this registration does not limit the source's potential to emit.

## SECTION C

## SOURCE OPERATION CONDITIONS

Entire Source

### Emission Limitations and Standards [326 IAC 2-5.1-2(g)] [326 IAC 2-5.5-4(b)]

#### C.1 Opacity [326 IAC 5-1]

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this registration:

- (a) Opacity shall not exceed an average of thirty percent (30%) in any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

#### C.2 Fugitive Dust Emissions [326 IAC 6-4]

The Registrant shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate 326 IAC 6-4 (Fugitive Dust Emissions).

**INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF AIR QUALITY  
COMPLIANCE BRANCH**

**REGISTRATION  
ANNUAL NOTIFICATION**

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

This form should be used to comply with the notification requirements under 326 IAC 2-5.1-2(f)(3) and 326 IAC 2-5.5-4(a)(3).

<b>Company Name:</b>	Shell Oil Products, US
<b>Address:</b>	Former Shell Service Station # 137294 5071 East 10th Street
<b>City:</b>	Indianapolis, Indiana 46201
<b>Phone Number:</b>	(317) 876-0357
<b>Registration No.:</b>	R097-26384-00638

I hereby certify that Shell Oil Products, US is :

still in operation.

I hereby certify that Shell Oil Products, US is :

no longer in operation.

in compliance with the requirements  
of Registration No. R097-26384-00638.

not in compliance with the requirements  
of Registration No. R097-26384-00638.

<b>Authorized Individual (typed):</b>
<b>Title:</b>
<b>Signature:</b>
<b>Phone Number:</b>
<b>Date:</b>

If there are any conditions or requirements for which the source is not in compliance, provide a narrative description of how the source did or will achieve compliance and the date compliance was, or will be achieved.

<b>Noncompliance:</b>

## Indiana Department of Environmental Management Office of Air Quality

### Technical Support Document (TSD) for a Registration

#### Source Description and Location

**Source Name:** Shell Oil Products, US  
**Source Location:** Former Shell Service Station # 137294  
 5071 East 10th Street, Indianapolis, IN 46201  
**County:** Marion  
**SIC Code:** 5541  
**Registration No.:** R097-26384-00638  
**Permit Reviewer:** Boris Gorlin

On April 7, 2008, the Indiana Department of Environmental Services (IDEM), Office of Air Quality (OAQ) received an application from Shell Oil Products, US related to the construction and operation of an unpermitted soil and groundwater remediation system at the site of the former Shell Service Station # 137294.

#### Existing Approvals

There have been no previous approvals issued to this source.

#### County Attainment Status

The source is located in Marion County.

Pollutant	Designation
SO <sub>2</sub>	Better than national standards.
CO	Attainment effective February 18, 2000, for the part of the city of Indianapolis bounded by 11 <sup>th</sup> Street on the north; Capitol Avenue on the west; Georgia Street on the south; and Delaware Street on the east. Unclassifiable or attainment effective November 15, 1990, for the remainder of Indianapolis and Marion County.
O <sub>3</sub>	Attainment effective November 8, 2007, for the 8-hour ozone standard. <sup>1</sup>
PM <sub>10</sub>	Unclassifiable effective November 15, 1990.
NO <sub>2</sub>	Cannot be classified or better than national standards.
Pb	Attainment effective July 10, 2000, for the part of Franklin Township bounded by Thompson Road on the south; Emerson Avenue on the west; Five Points Road on the east; and Troy Avenue on the north. Attainment effective July 10, 2000, for the part of Wayne Township bounded by Rockville Road on the north; Girls School Road on the east; Washington Street on the south; and Bridgeport Road on the west. The remainder of the county is not designated.
<sup>1</sup> Attainment effective October 18, 2000, for the 1-hour ozone standard for the Indianapolis area, including Marion County, and is a maintenance area for the 1-hour ozone National Ambient Air Quality Standards (NAAQS) for purposes of 40 CFR 51, Subpart X*. The 1-hour designation was revoked effective June 15, 2005. Basic Nonattainment effective April 5, 2005 for PM <sub>2.5</sub> .	

(a) Ozone Standards

- (1) On October 25, 2006, the Indiana Air Pollution Control Board finalized a rule revision to 326 IAC 1-4-1 revoking the one-hour ozone standard in Indiana.
- (2) On November 9, 2007, the Indiana Air Pollution Control Board finalized a temporary emergency rule to re-designate Boone, Clark, Elkhart, Floyd, LaPorte, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan, Shelby, and St. Joseph as attainment for the 8-hour ozone standard.
- (3) Volatile organic compounds (VOC) and Nitrogen Oxides (NO<sub>x</sub>) 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 NO<sub>x</sub> emissions are considered when evaluating the rule applicability relating to ozone. Marion County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO<sub>x</sub> emissions were reviewed pursuant to 326 IAC 2-2 (Prevention of Significant Deterioration (PSD) Requirements).

(b) PM2.5

Marion County has been classified as nonattainment for PM2.5 in 70 FR 943 dated January 5, 2005. On May 8<sup>th</sup>, 2008, U.S. EPA promulgated specific New Source Review rules for PM2.5 emissions, and the effective date of these rules was July 15<sup>th</sup>, 2008. Therefore, direct PM2.5 and SO<sub>2</sub> emissions were reviewed pursuant to the requirements of Nonattainment New Source Review, 326 IAC 2-1.1-5. See the State Rule Applicability – Entire Source section.

(c) Other Criteria Pollutants

Marion County has been classified as attainment or unclassifiable in Indiana for PM10, SO<sub>2</sub>, CO and Lead. Therefore, these emissions were reviewed pursuant to 326 IAC 2-2 (Prevention of Significant Deterioration (PSD) Requirements).

<b>Fugitive Emissions</b>
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The fugitive emissions of criteria pollutants and hazardous air pollutants are counted toward the determination of 326 IAC 2-5.1-2 (Registrations) applicability.

<b>Unpermitted Emission Units and Pollution Control Equipment</b>
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The source consists of the following unpermitted emission units and pollution control equipment:

- (a) One (1) Soil Vapor Extraction System (SVE), identified as Emission Unit EMU-01, at a maximum system flow capacity of 500 actual cubic feet per minute (acfm), constructed in 2008, using as control one (1) thermal oxidizer, identified as CE-01, fired by natural gas, with maximum capacity of one (1) million Btu/hr, and exhausting through Stack #1.
- (b) One (1) Air Stripper, used for groundwater treatment, identified as Emission Unit EMU-02, with maximum capacity of 140 acfm and water flow of 25 gallons per minute, constructed in 2008, and exhausting through Stack #2.
- (c) One (1) Product Drum, used for hydrocarbons storage, identified as Emission Unit EMU-03, with maximum capacity of 0.01 acfm, constructed in 2008, and exhausting through Vent #1.

- (d) Oil Water Separator, used for hydrocarbon separation, identified as Emission Unit EMU-04, with maximum capacity of 4.01 acfm, constructed in 2008, and exhausting through Vent #2.
- (e) Transfer Tank, used as an equalization tank, identified as Emission Unit EMU-05, with maximum capacity of 2.67 acfm, constructed in 2008, and exhausting through Vent #3.

**Enforcement Issues**

IDEM, OAQ is aware that equipment has been constructed and operated prior to receipt of the proper permit. IDEM, OAQ is reviewing this matter and will take the appropriate action. This proposed approval is intended to satisfy the requirements of the construction permit rules.

**Emission Calculations**

See Appendix A of this TSD for detailed emission calculations.

**Permit Level Determination – Registration**

The following table reflects the unlimited potential to emit (PTE) of the entire source before controls. Control equipment is not considered federally enforceable until it has been required in a federally enforceable permit.

Process/Emission Unit	Potential To Emit of the Entire Source (tons/year)								
	PM	PM10	PM2.5*	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	Combined HAP	Highest Single HAP
Soil Vapor Extraction System/EMU-01	0.01	0.03	0.03	0.00	0.44	14.62	0.37	9.24	3.06 (MTBE)
Air Stripper Discharge/EMU-02	0.00	0.00	0.00	0.00	0.00	7.47	0.00	3.70	2.10 (Toluene)
Product Storage Drum Discharge/EMU-03	0.00	0.00	0.00	0.00	0.00	0.001	0.00	1.8E-4	6.1E-5 (MTBE)
Oil Water Separator Discharge/EMU-04	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.07	0.025 (MTBE)
Transfer Tank Discharge/EMU-05	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.05	0.02 (MTBE)
Total PTE of Entire Source	0.01	0.03	0.03	0.00	0.44	22.53	0.37	13.07	3.63 (Toluene)
Exemption Levels	5	5	-	10	10	10	25	-	-
Registration Levels	25	25	-	25	25	25	100	-	-

\* PM2.5 emissions assumed equal to PM10 emissions.

- (a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of VOC is within the ranges listed in 326 IAC 2-5.5-1(b)(1). The PTE of all other regulated criteria pollutants are less than the ranges listed in 326 IAC 2-5.5-1(b)(1). Therefore, the source is subject to the provisions of 326 IAC 2-5.5 (Registrations). A Registration will be issued.
- (b) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of any single HAP is less than ten (10) tons per year and the PTE of a combination of HAPs is less than twenty-five

(25) tons per year. Therefore, this source is an area source under Section 112 of the Clean Air Act (CAA) and not subject to the provisions of 326 IAC 2-7.

#### **Federal Rule Applicability Determination**

- (a) There are no New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included 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 for this source.
- (c) NESHAP 40 CFR Part 63, Subpart GGGGG (National Emission Standards for Hazardous Air Pollutants for Site Remediation) is not included for this source since the source is not a major source of HAP emissions (PTE of any single HAP is less than ten (10) tons per year and/or PTE of a combination of HAPs is less than twenty-five (25) tons per year).

#### Compliance Assurance Monitoring (CAM)

- (d) Pursuant to 40 CFR 64.2, Compliance Assurance Monitoring (CAM) is not included in the permit, because the unlimited potential to emit of the source is less than the Title V major source thresholds and the source is not required to obtain a Part 70 or Part 71 permit.

#### **State Rule Applicability Determination**

The following state rules are applicable to the source:

- (a) 326 IAC 2-5.1-2 (Registrations)  
Registration applicability is discussed under the Permit Level Determination – Registration section above.
- (b) 326 IAC 2-1.1-5 (Non-attainment New Source Review)  
This source is not a major stationary source, under Nonattainment New Source Review (326 IAC 2-1.1-5), because the potential to emit PM<sub>2.5</sub> and SO<sub>2</sub> are each less than one hundred (100) tons per year. Therefore, pursuant to 326 IAC 2-1.1-5, the Nonattainment New Source Review requirements do not apply.
- (c) 326 IAC 2-2 (Prevention of Significant Deterioration (PSD) Requirements)  
This source is not major because the emissions are less than the PSD major source levels. Therefore, pursuant to 326 IAC 2-2, the PSD requirements do not apply.
- (d) 326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants - New source toxics control)  
This source is not a major source of HAP, and will emit less than ten (10) tons per year of a single HAP and twenty-five (25) tons per year of a combination of HAP. Therefore, 326 IAC 2-4.1 does not apply.
- (e) 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 this permit:
  - (1) Opacity shall not exceed an average of thirty percent (30%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
  - (2) 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.

- (f) 326 IAC 6-4 (Fugitive Dust Emissions Limitations)  
Pursuant to 326 IAC 6-4, the source shall not allow fugitive dust to escape beyond the property line or boundaries of the property, right-of-way, or easement on which the source is located, in a manner that would violate this regulation.
- (g) 326 IAC 6-5 (Fugitive Particulate Matter Emission Limitations)  
The source is not subject to the requirements of 326 IAC 6-5, because the source does not have potential fugitive particulate emissions greater than 25 tons per year. Therefore, 326 IAC 6-5 does not apply.
- (h) 326 IAC 6.5 (Particulate Matter Limitations Except Lake County)  
This source does not have potential particulate matter emissions greater than 100 tons per year and since potential PM emissions are less than 10 tons, then actual PM emission are less than 10 tons (see TSD Appendix A, page 8). Therefore, 326 IAC 6.5-1 does not apply.
- (i) 326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)  
Each of the emission units at this source is not subject to the requirements of 326 IAC 8-1-6, since the unlimited potential to emit of VOC from each emission unit is less than twenty-five (25) tons per year. Therefore, 326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities) does not apply to this source.
- (j) 326 IAC 12 (New Source Performance Standards)  
See Federal Rule Applicability Section of this TSD.
- (k) 326 IAC 20 (Hazardous Air Pollutants)  
See Federal Rule Applicability Section of this TSD.

### **Conclusion and Recommendation**

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant. An application for the purposes of this review was received on April 7, 2008, and additional information was received on July 10, 2008, October 3, 2008 and February 9, 2009.

The construction and operation of this source shall be subject to the conditions of the attached proposed Registration No. R097-26384-00638. The staff recommends to the Commissioner that this Registration be approved.

### **IDEM Contact**

- (a) Questions regarding this proposed permit can be directed to the Indiana Department of Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by phone at (317) 233-0178.
- (b) A copy of the findings is available on the Internet at: <http://www.in.gov/idem/4223.htm>.

Appendix A: Emissions Calculations						TSD Appendix A page 1 of 8
Soil Vapor Extraction System						
<b>Company Name:</b>		Shell Oil Product, US				
<b>Address City IN Zip:</b>		5071 East 10th Street, Indianapolis, IN 46201				
<b>Registration No.:</b>		R097-26384-00638				
<b>Reviewer:</b>		Boris Gorlin				
<b>Date:</b>		2/9/2009				
Pre Control Technology			Post Control Technology			
	mg/m <sup>3</sup>	lb/hr	ton/yr	efficiency	lb/hr	ton/yr
Benzene	279	0.523	2.290	99.5%	0.0026	0.0114
Toluene	184	0.345	1.510	99.5%	0.0017	0.0075
Ethylbenzene	128	0.240	1.050	99.5%	0.0012	0.0053
Xylene	162	0.304	1.329	99.5%	0.0015	0.0066
MTBE	373	0.699	3.061	99.5%	0.0035	0.0153
<b>HAPS</b>		<b>2.110</b>	<b>9.241</b>		<b>0.0105</b>	<b>0.0462</b>
	ppm <sub>v</sub>	lb/hr	ton/yr	efficiency	lb/hr	ton/yr
<b>VOC (PID)</b>	<b>798</b>	<b>1.227</b>	<b>5.375</b>	<b>99.5%</b>	<b>0.0061</b>	<b>0.0269</b>
<b>Pre Control Technology VOC Equations</b>						
lb/hr = ppm <sub>v</sub> * MW/24.02 * SCMM * constant						
constant = 1.323 * 10 <sup>-4</sup> [(60min/hr)(2.205lbs/kg)(kg/1000g)(g/1000mg)]						
MW = Molecular Weight of Calibration Gas (86 lb/lb-mole)						
SCMM = SCFM * 0.0283						
SCFM = ACFM * (460+70)/(460+T)						
T = Soil vapor extraction system temperature in degrees F						
tons/yr = (lb/hr * 24hr/day * 365 days/yr)/2000lb/ton						
<b>Pre Control Technology BTEXM Equations</b>						
lb/hr = (Concentration * Flow * 60 min/hr)/(35.3ft <sup>3</sup> /m <sup>3</sup> * 1000 mg/g * 453.59 g/lb)						
tons/yr = (lb/hr * 24hr/day * 365 days/yr)/2000lb/ton						
HAPS = Sum of BTEXM Discharges						
System Flow	500	acfm				
Concentrations based on maximum influent concentration (average between all operating wells) for individual components from laboratory data collected during EFR events during the last two years.						

Appendix A: Emissions Calculations			TSD Appendix A page 2 of 8
Air Stripper Discharge			
Company Name:	Shell Oil Product, US		
Address City IN Zip:	5071 East 10th Street, Indianapolis, IN 46201		
Registration No.:	R097-26384-00638		
Reviewer:	Boris Gorlin		
Date:	2/9/2009		
	ug/L	lb/hr	ton/yr
Benzene	9600	0.08	0.35
Toluene	57700	0.48	2.10
Ethylbenzene	7500	0.06	0.26
Xylene	27000	0.22	0.96
MTBE	630	0.01	0.02
<b>HAPS</b>		<b>0.85</b>	<b>3.70</b> (total HAP)
	ppm <sub>v</sub>	lb/hr	ton/yr
<b>VOC (PID)</b>	<b>86,000</b>	<b>0.86</b>	<b>3.77</b>
<b>VOC Equations</b>	VOC discharge concentrations from the QED Air Stripper Model		
	tons/yr = (lb/hr * 24hr/day * 365 days/yr)/2000lb/ton		
<b>BTEXM Equations</b>	Percentages of the VOCS based on the percentage in the groundwater samples		
	tons/yr = (lb/hr * 24hr/day * 365 days/yr)/2000lb/ton		
	HAPS = Sum of BTEXM Discharges		
System Flow	140	acfm	
Concentrations based on maximums for individual components from laboratory data collected during quarterly groundwater sampling.			

Product Storage Drum Discharge			
<b>Company Name:</b>	Shell Oil Product, US		
<b>Address City IN Zip:</b>	5071 East 10th Street, Indianapolis, IN 46201		
<b>Registration No.:</b>	R097-26384-00638		
<b>Reviewer:</b>	Boris Gorlin		
<b>Date:</b>	2/9/2009		
	mg/m3	lb/hr	ton/yr
Benzene	279	0.00001	0.000046
Toluene	184	0.00001	0.000030
Ethylbenzene	128	0.00000	0.000021
Xylene	162	0.00001	0.000027
MTBE	373	0.00001	0.000061
<b>HAPS</b>		<b>0.00004</b>	<b>0.00018</b>
	ppm <sub>v</sub>	lb/hr	ton/yr
<b>VOC (PID)</b>	<b>798</b>	<b>0.00011</b>	<b>0.00047</b>
<b>VOC Equations</b>			
lb/hr =	ppm <sub>v</sub> * MW/24.02 * SCMM * constant		
constant =	$1.323 * 10^{-4} [(60\text{min/hr})(2.205\text{lbs/kg})(\text{kg}/1000\text{g})(\text{g}/1000\text{mg})]$		
MW =	Molecular Weight of Calibration Gas (86 lb/lb-mole)		
SCMM =	SCFM * 0.0283		
SCFM =	ACFM * (460+70)/(460+T)		
T =	Stack Temperature in degrees F		
tons/yr =	(lb/hr * 24hr/day * 365 days/yr)/2000lb/ton		
<b>BTEXM Equations</b>			
lb/hr =	$(\text{Concentration} * \text{Flow} * 60 \text{ min/hr}) / (35.3\text{ft}^3/\text{m}^3 * 1000 \text{ mg/g} * 453.59 \text{ g/lb})$		
tons/yr =	$(\text{lb/hr} * 24\text{hr/day} * 365 \text{ days/yr}) / 2000\text{lb/ton}$		
HAPS =	Sum of BTEXM Discharges		
System Flow	0.01	acfm	
Concentrations based on maximum influent concentration (average between all operating wells) for individual components from laboratory data collected during EFR events during the last two years.			

Appendix A: Emissions Calculations				TSD Appendix A page 4 of 8			
Oil Water Separator Discharge							
<b>Company Name:</b>		Shell Oil Product, US					
<b>Address City IN Zip:</b>		5071 East 10th Street, Indianapolis, IN 46201					
<b>Registration No.:</b>		R097-26384-00638					
<b>Reviewer:</b>		Boris Gorlin					
<b>Date:</b>		2/9/2009					
	mg/m3	lb/hr	ton/yr				
Benzene	279	0.00	0.0184				
Toluene	184	0.00	0.0121				
Ethylbenzene	128	0.00	0.0084				
Xylene	162	0.00	0.0107				
MTBE	373	0.01	0.0245				
<b>HAPS</b>		<b>0.02</b>	<b>0.07</b>				
	ppm <sub>v</sub>	lb/hr	ton/yr				
<b>VOC (PID)</b>	<b>798</b>	<b>0.04</b>	<b>0.19</b>				
<b>VOC Equations</b>							
lb/hr = ppm <sub>v</sub> * MW/24.02 * SCMM * constant							
constant = $1.323 * 10^{-4} [(60\text{min/hr})(2.205\text{lbs/kg})(\text{kg}/1000\text{g})(\text{g}/1000\text{mg})]$							
MW = Molecular Weight of Calibration Gas (86 lb/lb-mole)							
SCMM = SCFM * 0.0283							
SCFM = ACFM * (460+70)/(460+T)							
T = Stack Temperature in degrees F							
tons/yr = (lb/hr * 24hr/day * 365 days/yr)/2000lb/ton							
<b>BTEXM Equations</b>							
lb/hr = (Concentration * Flow * 60 min/hr)/(35.3ft <sup>3</sup> /m <sup>3</sup> * 1000 mg/g * 453.59 g/lb)							
tons/yr = (lb/hr * 24hr/day * 365 days/yr)/2000lb/ton							
HAPS = Sum of BTEXM Discharges							
System Flow	4.01	acfm					
Concentrations based on maximum influent concentration (average between all operating wells) for individual components from laboratory data collected during EFR events during the last two years.							

<b>Appendix A: Emissions Calculations</b>				TSD Appendix A page 5 of 8			
<b>Transfer Tank Discharge</b>							
<b>Company Name:</b>	<b>Shell Oil Product, US</b>						
<b>Address City IN Zip:</b>	<b>5071 East 10th Street, Indianapolis, IN 46201</b>						
<b>Registration No.:</b>	<b>R097-26384-00638</b>						
<b>Reviewer:</b>	<b>Boris Gorlin</b>						
<b>Date:</b>	<b>2/9/2009</b>						
	mg/m3	lb/hr	ton/yr				
Benzene	279	0.00	0.0122				
Toluene	184	0.00	0.0081				
Ethylbenzene	128	0.00	0.0056				
Xylene	162	0.00	0.0071				
MTBE	373	0.00	0.0163				
<b>HAPS</b>		<b>0.01</b>	<b>0.05</b>				
	ppm <sub>v</sub>	lb/hr	ton/yr				
<b>VOC (PID)</b>	<b>798</b>	<b>0.03</b>	<b>0.13</b>				
<b>VOC Equations</b>							
lb/hr =	ppm <sub>v</sub> * MW/24.02 * SCMM * constant						
constant =	1.323 * 10 <sup>-4</sup> [(60min/hr)(2.205lbs/kg)(kg/1000g)(g/1000mg)]						
MW =	Molecular Weight of Calibration Gas (86 lb/lb-mole)						
SCMM =	SCFM * 0.0283						
SCFM =	ACFM * (460+70)/(460+T)						
T =	Stack Temperature in degrees F						
tons/yr =	(lb/hr * 24hr/day * 365 days/yr)/2000lb/ton						
<b>BTEXM Equations</b>							
lb/hr =	(Concentration * Flow * 60 min/hr)/(35.3ft <sup>3</sup> /m <sup>3</sup> * 1000 mg/g * 453.59 g/lb)						
tons/yr =	(lb/hr * 24hr/day * 365 days/yr)/2000lb/ton						
HAPS =	Sum of BTEXM Discharges						
System Flow	2.67	acfm					
Concentrations based on maximum influent concentration (average between all operating wells) for individual components from laboratory data collected during EFR events during the last two years							

**Appendix A: Emissions Calculations**

**Natural Gas Combustion Only**

**MM BTU/HR <100**

**Thermal Oxidizer**

**Company Name: Shell Oil Product, US**

**Address City IN Zip: 5071 East 10th Street, Indianapolis, IN 46201**

**Permit Number: R097-26384-00638**

**Reviewer: Boris Gorlin**

**Date: 2/9/2009**

Heat Input Capacity  
MMBtu/hr

Potential Throughput  
MMCF/yr

1.0

8.8

	Pollutant					
	PM*	PM10*	SO2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.01	0.03	0.00	0.44	0.02	0.37

\*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/yr) = 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**

**Thermal Oxidizer**

**HAPs Emissions**

**Company Name: Shell Oil Product, US**

**Address City IN Zip: 5071 East 10th Street, Indianapolis, IN 46201**

**Permit Number: R097-26384-00638**

**Reviewer: Boris Gorlin**

**Date: 2/9/2009**

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	9.198E-06	5.256E-06	3.285E-04	7.884E-03	1.489E-05

  

HAPs - Metals					
Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	2.190E-06	4.818E-06	6.132E-06	1.664E-06	9.198E-06

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  
Potential to Emit Summary**

TSD Appendix A page 8 of 8

**Company Name: Shell Oil Product, US**  
**Address City IN Zip: 5071 East 10th Street, Indianapolis, IN 46201**  
**Registration No.: R097-26384-00638**  
**Reviewer: Boris Gorlin**  
**Date: 2/4/2009**

	Soil Vapor Extraction System	Air Stripper Discharge	Product Storage Drum Discharge	Oil Water Separator Discharge	Transfer Tank Discharge	Total	
Benzene	2.290	0.350	0.0000458	0.01836	0.012227	2.671	
Toluene	1.510	2.102	0.0000302	0.01211	0.008063	<b>3.633</b>	<b>(Highest HAP)</b>
Ethylbenzene	1.050	0.263	0.0000210	0.00842	0.005609	1.327	
Xylene	1.329	0.964	0.0000266	0.01066	0.007099	2.311	
MTBE	3.061	0.022	0.0000612	0.02455	0.016346	3.124	
<b>HAPS (combined)</b>	<b>9.241</b>	<b>3.701</b>	<b>0.0001848</b>	<b>0.074</b>	<b>0.049</b>	<b>13.065</b>	
<b>VOC Emission - PID</b>	<b>5.375</b>	<b>3.772</b>	<b>0.0004685</b>	<b>0.18789</b>	<b>0.125101</b>	<b>9.460</b>	
<b>Total VOC, ton/yr</b>	<b>14.616</b>	<b>7.473</b>	<b>0.001</b>	<b>0.262</b>	<b>0.174</b>	<b>22.526</b>	