



# 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)

TO: Interested Parties / Applicant

DATE: May 11, 2009

RE: Ricker Oil Company / 097-27752-00659

FROM: Matthew Stuckey, Branch Chief  
Permits Branch  
Office of Air Quality

## Notice of Decision – Approval

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 326 IAC 2, this approval was effective immediately upon submittal of the application.

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, Suite N 501E, Indianapolis, IN 46204, **within eighteen (18) calendar days from 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-AM.dot12/3/07



# INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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Kermit Mathews  
Ricker Oil Company  
30 West 11th Street  
Anderson, IN 46016

May 11, 2009

Re: Exempt Construction and Operation Status,  
097-27752-00659

Dear Mr. Mathews:

The application from Ricker Oil Company, received on April 8, 2009, has been reviewed. Based on the data submitted and the provisions in 326 IAC 2-1.1-3, it has been determined that the following stationary Dual Phase Extraction (DPE) remediation system for the removal of VOCs from groundwater, located at 4906 Kentucky Avenue, Indianapolis, Indiana 46221, is classified as exempt from air pollution permit requirements:

- (a) One (1) dual phase extraction remediation system equipped with an air stripping unit, identified as DPE-1, approved for construction in 2009, with a maximum airflow rate of 300 acfm, using a Falco 300 catalytic oxidizer (CATOX-1) as control, and exhausting to stack DPE-1.
- (b) Fugitive emissions from one (1) paved parking lot with public access.

The following conditions shall be applicable:

1. **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:
  - (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.
2. **326 IAC 6-4 (Fugitive Dust Emissions Limitations)**  
Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions Limitations), 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 326 IAC 6-4.

This exemption is the first air approval issued to this source. A copy of the Exemption is available on the Internet at: <http://www.in.gov/ai/appfiles/idem-caats/>. For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: [www.idem.in.gov](http://www.idem.in.gov)

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. If you have any questions on this matter, please contact Meredith Jones, OAQ, 100

North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana, 46204-2251, at 317-234-5176 or at 1-800-451-6027 (ext 4-5176).

Sincerely,

A handwritten signature in black ink that reads "Alfred C. Dumauval". The signature is written in a cursive style with a large, looping initial "A".

Alfred C. Dumauval, Ph. D., Section Chief  
Permits Branch  
Office of Air Quality

ACD/MWJ

cc: File - Marion County  
Marion County Health Department  
Compliance and Enforcement Branch  
Billing, Licensing and Training Section

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

Technical Support Document (TSD) for an Exemption

<b>Source Description and Location</b>
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<b>Source Name:</b>	<b>Ricker Oil Company</b>
<b>Source Location:</b>	<b>4906 Kentucky Avenue, Indianapolis, Indiana 46221</b>
<b>County:</b>	<b>Marion</b>
<b>SIC Code:</b>	<b>4959</b>
<b>Exemption No.:</b>	<b>097-27752-00659</b>
<b>Permit Reviewer:</b>	<b>Meredith W. Jones</b>

On April 8, 2009, the Office of Air Quality (OAQ) received an application from Ricker Oil Company related to the construction and operation of a stationary Dual Phase Extraction (DPE) remediation system.

<b>Existing Approvals</b>
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There have been no previous approvals issued to this source.

<b>County Attainment Status</b>
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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 designation, effective federally April 5, 2005, for PM <sub>2.5</sub> .	

- (a) *Ozone Standards*  
 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 ozone. Marion 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) **PM<sub>2.5</sub>**  
Marion County has been classified as nonattainment for PM<sub>2.5</sub> in 70 FR 943 dated January 5, 2005. On May 8, 2008, U.S. EPA promulgated specific New Source Review rules for PM<sub>2.5</sub> emissions, and the effective date of these rules was July 15, 2008. Therefore, direct PM<sub>2.5</sub> 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 all other criteria pollutants. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

### **Fugitive Emissions**

The fugitive emissions of criteria pollutants and hazardous air pollutants are counted toward the determination of 326 IAC 2-1.1-3 (Exemptions) applicability.

### **Background and Description of Emission Units and Pollution Control Equipment**

The Office of Air Quality (OAQ) has reviewed an application, submitted by Ricker Oil Company on April 8, 2009, relating to the construction and operation of a stationary Dual Phase Extraction (DPE) remediation system.

The following is a list of the new emission units and pollution control device:

- (a) One (1) dual phase extraction remediation system equipped with an air stripping unit, identified as DPE-1, approved for construction in 2009, with a maximum airflow rate of 300 acfm, using a Falco 300 catalytic oxidizer (CATOX-1) as control, and exhausting to stack DPE-1.
- (b) Fugitive emissions from one (1) paved parking lot with public access.

### **Enforcement Issues**

There are no pending enforcement actions related to this source.

### **Emission Calculations**

See Appendix A of this TSD for detailed emission calculations.

**Permit Level Determination – Exemption**

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	PM <sub>10</sub> *	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	VOC	CO	Total HAPs	Worst Single HAP
Dual Phase Extraction System (DPE-1)	-	-	-	-	-	9.20	-	1.01	0.359 (toluene)
Fugitive Emissions (paved roads)	0.81	0.15	0.15	-	-	-	-	-	-
<b>Total PTE of Entire Source</b>	<b>0.81</b>	<b>0.15</b>	<b>0.15</b>	<b>0.00</b>	<b>0.00</b>	<b>9.20</b>	<b>0.00</b>	<b>1.01</b>	<b>0.359 (toluene)</b>
Exemptions Levels	5	5	5	10	10	5 or 10	25	25	10

negl. = negligible  
 \* Under the Part 70 Permit program (40 CFR 70), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>), not particulate matter (PM), is considered as a "regulated air pollutant".

- (a) The potential to emit (PTE) (as defined in 326 IAC 2-1.1-1(16)) of all regulated criteria pollutants are less than the levels listed in 326 IAC 2-1.1-3(e)(1). Therefore, the source is subject to the provisions of 326 IAC 2-1.1-3 (Exemptions).
- (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**

New Source Performance Standards (NSPS)

- (a) There are no New Source Performance Standards (NSPS) (326 IAC 12 and 40 CFR Part 60) included in the permit.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- (b) The requirements of the National Emission Standards for Hazardous Air Pollutants: Site Remediation, 40 CFR 63, Subpart GGGGG (326 IAC 20-87), are not included in the permit since the soil remediation system is not co-located with any other stationary sources that emit hazardous air pollutants (HAPs) and meet an affected source definition specified for a source category that is regulated by another subpart under 40 CFR Part 63, and is not a major source of HAPs.
- (c) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) (326 IAC 14, 326 IAC 20 and 40 CFR Part 63) included in the permit.

### 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

### **326 IAC 2-1.1-3 (Exemptions)**

Exemption applicability is discussed under the Permit Level Determination – Exemption section above.

### **326 IAC 2-4.1 (Major Sources of Hazardous Air Pollutants (HAPs))**

The potential to emit of any single HAP is less than ten (10) tons per year and the potential to emit 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 2-4.1.

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

Pursuant to 326 IAC 2-6-1, this source is not subject to this rule because it is not required to have an operating permit under 326 IAC 2-7 (Part 70), it is not located in Lake, Porter, or LaPorte County, and it does not emit lead into the ambient air at levels equal to or greater than 5 tons per year. Therefore, 326 IAC 2-6 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 this permit:

- (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.

### **326 IAC 6-4 (Fugitive Dust Emissions Limitations)**

The source is subject to the requirements of 326 IAC 6-4 because the one (1) paved parking lot with public access has the potential to emit fugitive particulate emissions. Pursuant to 326 IAC 6-4 (Fugitive Dust Emissions Limitations), 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 326 IAC 6-4.

### **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.

### **326 IAC 8-1-6 (VOC Rules: General Reduction Requirements for New Facilities)**

The one (1) dual phase extraction remediation system equipped with an air stripping unit, identified as DPE-1, is not subject to the requirements of 326 IAC 8-1-6 since the unlimited potential VOC emissions from this emission unit are less than twenty-five (25) tons per year.

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

See Federal Rule Applicability Section of this TSD.

### **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 8, 2009.

The construction and operation of this source shall be subject to the conditions of the attached proposed Exemption No. 097-27752-00659. The staff recommends to the Commissioner that this Exemption be approved.

### IDEM Contact

- (a) Questions regarding this proposed permit can be directed to Meredith Jones at the Indiana Department Environmental Management, Office of Air Quality, Permits Branch, 100 North Senate Avenue, MC 61-53 IGCN 1003, Indianapolis, Indiana 46204-2251 or by telephone at (317) 234-5176 or toll free at 1-800-451-6027 extension 4-5176.
- (b) A copy of the findings is available on the Internet at: <http://www.in.gov/ai/appfiles/idem-caats/>
- (c) For additional information about air permits and how the public and interested parties can participate, refer to the IDEM's Guide for Citizen Participation and Permit Guide on the Internet at: [www.idem.in.gov](http://www.idem.in.gov)

**Company Name: Ricker Oil Company**

**Address: 4906 Kentucky Avenue, Indianapolis, Indiana 46221**

**Exemption No.: 097-27752-00659**

**Reviewer: Calculations submitted by Ricker Oil Company and reviewed by Meredith W. Jones**

**Date: 4/29/2009**

**\*\*Potential to Emit Summary\*\***

**Criteria Pollutants (tons/yr)**

	<i>PM</i>	<i>PM<sub>10</sub></i>	<i>SO<sub>x</sub></i>	<i>NO<sub>x</sub></i>	<i>VOC</i>	<i>CO</i>
Dual Phase Extraction (DPE) System	-	-	-	-	9.20	-
Paved Roads	0.81	0.15	-	-	-	-
<b>Total</b>	<b>0.81</b>	<b>0.15</b>	<b>0.00</b>	<b>0.00</b>	<b>9.20</b>	<b>0.00</b>

**HAPs (tons/yr)**

Benzene =	0.072	tons/yr
Toluene* =	0.359	tons/yr
Ethylbenzene =	0.045	tons/yr
Xylenes =	0.216	tons/yr
MTBE =	0.214	tons/yr
Naphthalene =	0.071	tons/yr
Isopropyl-benzene =	0.029	tons/yr
<b>Total HAPs =</b>	<b>1.01</b>	<b>tons/yr</b>

\*Highest single HAP

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**Reviewer: Calculations submitted by Ricker Oil Company and reviewed by Meredith W. Jones**

**Date: 4/29/2009**

**\*\*Contaminant Mass Calculations for Dual Phase Extraction (DPE) System\*\***

**1) Free Product**

Free Product		
<i>Constants</i>		
Volume Conversion	7.48	gal/ft <sup>3</sup>
Product Density	6.8	lbs/gal
<i>Input</i>		
Plume Area (ft <sup>2</sup> )	Thickness (ft)	Soil Porosity
600	4.97	30%
Free Product Plume Volume =	2982	ft <sup>3</sup>
Free Product Volume =	895	ft <sup>3</sup> ;
	6692	gal
<b>Free Product Mass =</b>	<b>45,503</b>	<b>lbs</b>

**Assumptions**

- The Plume area is the free product area located within the radius of influence of the remediation system.
- A free product thickness of 4.97, as measured in well MW-4 in February 2009, is utilized.
- A typical soil porosity of 30% (0.30) is utilized.

**Methodology**

Free Product Plume Volume (ft<sup>3</sup>)= Plume Area (ft<sup>2</sup>) \* Thickness (ft)

Free Product Volume (ft<sup>3</sup>) = Free Product Plume Volume (ft<sup>3</sup>) \* Soil Porosity

Free Product Volume (gal) = Free Product Volume (ft<sup>3</sup>) \* (7.48 gal/ft<sup>3</sup>)

Free Product Mass (lbs) = Free Product Volume (gal) \* Product Density (lbs/gal)

**Company Name: Ricker Oil Company**

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**Date: 4/29/2009**

**\*\*Contaminant Mass Calculations for Dual Phase Extraction (DPE) System (continued)\*\***

**2) Dissolved Phase Contaminant Mass**

<b>Dissolved Phase Gasoline</b>			
<i>Constants</i>			
Volume Conversion	7.48	gal/ft <sup>3</sup>	
Water Density	8.35	lbs/gal	
<i>Input</i>			
Treated Area (ft <sup>2</sup> )	Thickness (ft)	Soil Porosity	Contaminant Concentrations (ppb)
20,550	6	30%	9787
Total Plume Volume =		123,300	ft <sup>3</sup>
Impacted Groundwater Volume =		36,990	ft <sup>3</sup> ;
		276,685	gal
Impacted Groundwater Mass =		2,310,321	lbs
<b>Dissolved Phase Hydrocarbon Mass for Gasoline =</b>		<b>23</b>	<b>lbs</b>

**Assumptions**

- Treated Area value is based on the maximum extent of the radius of influence of the dual phase extraction system.
- Thickness of groundwater contamination is estimated conservatively at six (6) feet based on the fact that petroleum hydrocarbons have a specific gravity of less than one (1) and will therefore tend to float on the groundwater surface instead of distributing evenly within the water column.
- A typical soil porosity of 30% (0.30) is utilized.
- The contaminant concentration is the average of the most recent total BTEX; MTBE; naphthalene; n-propylbenzene; 1,2,4-trimethylbenzene; and 1,3,5-trimethylbenzene concentrations (Table 2) as measured in the seven (7) monitoring wells located within the radius of influence of the proposed remediation system (OW-2, OW-4, OW-10, OW-11, OW-12, OW-14, AND OW-15) as provided in the application.

**Methodology**

Total Plume Volume (ft<sup>3</sup>) = Treated Area (ft<sup>2</sup>) \* Thickness (ft)

Impacted Groundwater Volume (ft<sup>3</sup>) = Total Plume Volume (ft<sup>3</sup>) \* Soil Porosity

Impacted Groundwater Volume (gal) = Impacted Groundwater Volume (ft<sup>3</sup>) \* (7.48 gal/ft<sup>3</sup>)

Impacted Groundwater Mass (lbs) = Impacted Groundwater Volume (gal) \* Water Density (lbs/gal)

Dissolved Phase Hydrocarbon Mass for Gasoline (lbs) = Contaminant Concentrations (ppb) \* (1 billion/10<sup>9</sup>) \* Impacted Groundwater Mass (lbs)

**Company Name:** Ricker Oil Company  
**Address:** 4906 Kentucky Avenue, Indianapolis, Indiana 46221  
**Exemption No.:** 097-27752-00659  
**Reviewer:** Calculations submitted by Ricker Oil Company and reviewed by Meredith W. Jones  
**Date:** 4/29/2009

**\*\*Contaminant Mass Calculations for Dual Phase Extraction (DPE) System (continued)\*\***

**3) Adsorbed Hydrocarbon Mass (hydrocarbons adsorbed to soil above and below water table)**

Soil Adsorbed Gasoline				Soil Adsorbed Diesel and/or Kerosene			
<i>Constants</i>				<i>Constants</i>			
Solid Mineral Density (quartz)	165.4	lbs/ft <sup>3</sup>		Solid Mineral Density (quartz)	165.4	lbs/ft <sup>3</sup>	
<i>Input</i>				<i>Input</i>			
Treated Area (ft <sup>2</sup> )	Thickness (ft)	Soil Porosity	Contaminant Concentrations (ppb)	Treated Area (ft <sup>2</sup> )	Thickness (ft)	Soil Porosity	Contaminant Concentrations (ppb)
20,550	5	30%	718	17,775	5	30%	110
Total Impacted Soil Volume = 102,750 ft <sup>3</sup>				Total Impacted Soil Volume = 88,875 ft <sup>3</sup>			
Soil Mineral Volume = 71,925 ft <sup>3</sup>				Soil Mineral Volume = 62,213 ft <sup>3</sup>			
Soil Mineral Mass = 11,896,395 lbs				Soil Mineral Mass = 10,289,948 lbs			
<b>Adsorbed Hydrocarbon Mass for Gasoline = 8542 lbs</b>				<b>Adsorbed Hydrocarbon Mass for Diesel = 1132 lbs</b>			

**Assumptions**

- Treated Area values are based on the maximum extent of the radius of influence of the dual phase extraction system.
- Thickness of groundwater contamination was estimated by summing the total thickness of all available soil sample intervals exhibiting soil vapor concentrations greater than 100 parts per million (ppm) as measured by a MiniRae 2000 photoionization detector (PID) or a Photovac MicroFID (FID) (Table 1). For calculations, the impacted soil thickness value used is the average thickness seen in all borings within the radius of influence of the SVE system (SB-1, SB-2, SB-3, SB-4, SB-7, SB-8, SB-9, SB-10, SB-11, SB-15, SB-16, SB-21, SB-24, SB-25, OW-11, SB-26, and SB-28).
- A typical soil porosity of 30% (0.30) is utilized.
- The contaminant concentration is the average of the maximum GRO or DRO concentration (Table 3) measured in each boring located within the radius of influence of the DPE system. The minimum detection limit is utilized in cases where the results are non-detect.

**Methodology**

- Total Impacted Soil Volume (ft<sup>3</sup>) = Treated Area (ft<sup>2</sup>) \* Thickness (ft)
- Soil Mineral Volume (ft<sup>3</sup>) = Total Impacted Soil Volume (ft<sup>3</sup>) \* (1 - Soil Porosity)
- Soil Mineral Mass (lbs) = Soil Mineral Volume (ft<sup>3</sup>) \* Solid Mineral Density (lbs/ft<sup>3</sup>)
- Adsorbed Hydrocarbon Mass for Gasoline/Diesel (lbs) = Contaminant Concentrations (ppb) \* (1 billion/10<sup>9</sup>) \* Soil Mineral Mass (lbs)

**Company Name: Ricker Oil Company**

**Address: 4906 Kentucky Avenue, Indianapolis, Indiana 46221**

**Exemption No.: 097-27752-00659**

**Reviewer: Calculations submitted by Ricker Oil Company and reviewed by Meredith W. Jones**

**Date: 4/29/2009**

**\*\*Contaminant Mass Calculations for Dual Phase Extraction (DPE) System (continued)\*\***

**4) Total Volatile Organic Compounds (VOC) Potential to Emit**

Free Product Mass (lbs) =	45,503
Potential Gasoline Range Mass (lbs) =	8564
Potential Extended Range Mass (lbs) =	1132
<b>Total Hydrocarbon Mass (lbs) =</b>	<b>55,199</b>

System Operational Period =	3	yrs
<b>Total VOC Potential to Emit =</b>	<b>9.2</b>	<b>tons/yr</b>

**Assumptions**

- System Operational Period is the estimated time that will be required to reduce petroleum impacts at this site to below IDEM closure levels.
- It is assumed that all potential hydrocarbons that can be captured and emitted by the remediation system are composed of 100% VOC.

**Methodology**

Potential Gasoline Range Mass (lbs) = Dissolved Phase Hydrocarbon Mass for Gasoline (lbs) + Adsorbed Hydrocarbon Mass for Gasoline (lbs)

Potential Extended Range Mass (lbs) = Adsorbed Hydrocarbon Mass for Diesel (lbs)

Total VOC Potential to Emit (tons/yr) = Total Hydrocarbon Mass (lbs) \* (1 ton/2000 lbs) / System Operational Period (yrs)

**Company Name: Ricker Oil Company**

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**Exemption No.: 097-27752-00659**

**Reviewer: Calculations submitted by Ricker Oil Company and reviewed by Meredith W. Jones**

**Date: 4/29/2009**

**\*\*Contaminant Mass Calculations for Dual Phase Extraction (DPE) System (continued)\*\***

**5) Hazardous Air Pollutants (HAPs) Potential to Emit**

HAP	Gasoline		Diesel		Total Hydrocarbon Mass	
	HAP Concentration	Total Mass PTE (lbs)	HAP Concentration	Total Mass PTE (lbs)	lbs	tons/yr (for 3 yrs)
Benzene	4.9%	419.65	1%	11.32	430.97	0.072
Toluene	25.0%	2141.06	1%	11.32	2152.37	0.359
Ethylbenzene	3.0%	256.93	1%	11.32	268.25	0.045
Xylenes	15.0%	1284.63	1%	11.32	1295.95	0.216
MTBE	15.0%	1284.63	0%	0.00	1284.63	0.214
Naphthalene	5.0%	428.21	0.01%	0.11	428.32	0.071
Isopropyl-benzene	2.0%	171.28	0%	0.00	171.28	0.029

**Total = 1.01**

**Assumptions**

-Maximum percentages of benzene, toluene, ethylbenzene, xylene, and MTBE in gasoline are based on MSDS submitted with the application. Maximum concentrations in gasoline of other HAP constituents detected at the site (naphthalene and isopropyl-benzene) are assumed.

-Maximum percentage of naphthalene in diesel is based on MSDS submitted with the application. Maximum concentrations in diesel of other HAP constituents detected at the site (benzene, toluene, ethylbenzene, and xylenes) are assumed.

**Methodology**

-Gasoline Total Mass PTE (lbs) = HAP Concentration \* Potential Gasoline Range Mass (lbs)

-Diesel Total Mass PTE (lbs) = HAP Concentration \* Potential Extended Range Mass (lbs)

-Total Hydrocarbon Mass (tons/yr) = Total Hydrocarbon Mass (lbs) \* (1 ton/2000 lbs) / System Operational Period (yrs)

**Company Name:** Ricker Oil Company  
**Address:** 4906 Kentucky Avenue, Indianapolis, Indiana 46221  
**Exemption No.:** 097-27752-00659  
**Reviewer:** Calculations submitted by Ricker Oil Company and reviewed by Meredith W. Jones  
**Date:** 4/29/2009

**\*\*Fugitive Dust Emissions: Paved Roads at Industrial Site\*\***

The following calculations determine the amount of annual emissions generated by paved roads, based on 8760 hours of use and emission factors from U.S. EPA's AP 42, Chapter 13.2.1 (12/03).

Vehicle Information (provided by the Permittee)

	Maximum Number of Vehicles	Number of One-way Trips per Day per Vehicle	Maximum Number of Trips per Day	Maximum Vehicle Weight (tons/trip)	Total Weight Driven per Day (tons/day)	Maximum One-way Distance (ft/trip)	Maximum One-way Distance (mi/trip)	Maximum One-way Miles (mi/day)	Maximum One-way Miles (mi/yr)
Vehicle entering plant (one-way trip)	400.0	1.0	400.0	5.0	2000.0	400.0	0.076	30.3	11,060.6
Vehicle leaving plant (one-way trip)	400.0	1.0	400.0	5.0	2000.0	400.0	0.076	30.3	11,060.6
<b>Total</b>			<b>800.0</b>		<b>4000.0</b>			<b>60.6</b>	<b>22,121.2</b>

Average Vehicle Weight per Trip = 

5.0
-----

 tons/trip  
 Average Miles per Trip = 

0.08
------

 mi/trip

Unmitigated Emission Factor (EF) =  $k * (sL/2)^{0.65} * (W/3)^{1.5} - C$  (Equation 1 from AP 42, Chapter 13.2.1)

where:

	PM	PM <sub>10</sub>	
k (particle size multiplier; from AP 42, Table 13.2.1-1) =	0.082	0.016	lb/mi
W (average vehicle weight; provided by the Permittee) =	5.0	5.0	tons
C (EF for vehicle exhaust, brake wear, and tire wear; from AP 42, Table 13.2.1-2) =	0.00047	0.00047	lb/mi
sL (Ubiquitous Baseline Silt Loading Value of paved roads for summer months; from AP 42, Table 13.2.1-3) =	0.6	0.6	g/m <sup>2</sup>

Mitigated Emission Factor (Eext) =  $EF * [1 - (p/4N)]$  (This emission factor takes natural mitigation due to precipitation into consideration.)

where:

p (days with rainfall greater than or equal to 0.01 inches; from AP 42, Fig. 13.2.1-2) = 

125
-----

 days  
 N = 

365
-----

 days/yr

	PM	PM <sub>10</sub>	
Unmitigated Emission Factor (EF) =	0.08	0.02	lb/mi
Mitigated Emission Factor (Eext) =	0.07	0.01	lb/mi

	Unmitigated PM PTE (tons/yr)	Unmitigated PM <sub>10</sub> PTE (tons/yr)	Mitigated PM PTE (tons/yr)	Mitigated PM <sub>10</sub> PTE (tons/yr)
Vehicle entering plant (one-way trip)	0.44	0.08	0.41	0.08
Vehicle leaving plant (one-way trip)	0.44	0.08	0.41	0.08
<b>Total</b>	<b>0.89</b>	<b>0.17</b>	<b>0.81</b>	<b>0.15</b>

**Methodology**

Total Weight Driven per Day (tons/day) = Maximum Number of Trips per Day \* Maximum Vehicle Weight (tons/trip)  
 Maximum One-way Distance (mi/trip) = Maximum One-way Distance (ft/trip) \* (1 mile/5280 ft)  
 Maximum One-way Miles (mi/day) = Maximum Number of Trips per Day \* Maximum One-way Distance (mi/trip)  
 Average Vehicle Weight per Trip (tons/trip) = Total Weight Driven per Day (tons/day) / Maximum Number of Trips per Day  
 Average Miles per Trip (mi/trip) = Maximum One-way Miles (mi/day) / Maximum Number of Trips per Day  
 Unmitigated PM PTE (tons/yr) = Unmitigated Emission Factor (EF) \* Maximum One-way Miles (mi/yr) \* (1 ton/2000 lbs)  
 Unmitigated PM<sub>10</sub> PTE (tons/yr) = Mitigated Emission Factor (Eext) \* Maximum One-way Miles (mi/yr) \* (1 ton/2000 lbs)

**Abbreviations**

EF = emission factor  
 PM = particulate matter  
 PM<sub>10</sub> = particulate matter (<10 um)  
 PTE = potential to emit