



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

TO: Interested Parties / Applicant

DATE: April 27, 2010

RE: King Oil Company, Inc. / 015-29132-00036

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



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Brian King
King Oil Company, Inc.
P.O. Box 371
516 North Main Street
Walton, IN 46994-4117

April 27, 2010

Re: Exempt Construction and Operation Status,
015-29132-00036

Dear Mr. King:

The application from King Oil Company, Inc., received on April 1, 2010, 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) and air stripping process for the remediation of soil and groundwater contaminated with petroleum hydrocarbons, located at 809 East Columbia Street, Flora, Indiana 46929, is classified as exempt from air pollution permit requirements:

- (a) One (1) high vacuum dual phase extraction remediation system equipped with an air stripping unit, identified as DPE-1, approved for construction in 2010, with a maximum airflow rate of 300 acfm and a maximum water flow rate of 5 gpm, and exhausting to Stack 1.

The system provides hydraulic control in fine grain soil and exposes normally saturated soil to air flow by lowering the water table. As the air rises, hydrocarbons are stripped from saturated, impacted soil and groundwater into the passing air stream. The waste stream is then removed from a network of vertical extraction wells and piped to a centralized equipment compound where it is separated into vapor and water phases and treated prior to discharge.

- (b) Fugitive emissions from paved roads.

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

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,



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

ACD/MWJ

cc: File - Carroll County
Carroll County Health Department
Compliance and Enforcement Branch
Permit Administration and Support Section
Billing, Licensing and Training Section

Indiana Department of Environmental Management Office of Air Quality

Technical Support Document (TSD) for an Exemption

Source Description and Location

Source Name:	King Oil Company, Inc.
Source Location:	809 East Columbia Street, Flora, Indiana 46929-1412
County:	Carroll
SIC Code:	5541
Exemption No.:	015-29132-00036
Permit Reviewer:	Meredith W. Jones

On April 1, 2010, the Office of Air Quality (OAQ) received an application from King Oil Company, Inc. related to the construction and operation of a new stationary Dual Phase Extraction (DPE) remediation system and air stripping process for the remediation of soil and groundwater contaminated with petroleum hydrocarbons.

Existing Approvals

There have been no previous approvals issued to this source.

County Attainment Status

The source is located in Carroll County.

Pollutant	Designation
SO ₂	Better than national standards.
CO	Unclassifiable or attainment effective November 15, 1990.
O ₃	Unclassifiable or attainment effective June 15, 2004, for the 8-hour ozone standard. ¹
PM ₁₀	Unclassifiable effective November 15, 1990.
NO ₂	Cannot be classified or better than national standards.
Pb	Not designated.
¹ Unclassifiable or attainment effective October 18, 2000, for the 1-hour ozone standard which was revoked effective June 15, 2005. Unclassifiable or attainment effective April 5, 2005, for PM _{2.5} .	

- (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. Carroll 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_{2.5}*
 Carroll County has been classified as attainment for PM_{2.5}. On May 8, 2008, U.S. EPA promulgated the requirements for Prevention of Significant Deterioration (PSD) for PM_{2.5} emissions, and the effective date of these rules was July 15, 2008. Indiana has three years from the publication of these rules to revise its PSD rules, 326 IAC 2-2, to include those requirements. The May 8, 2008 rule revisions require IDEM to regulate PM₁₀ emissions as a surrogate for PM_{2.5} emissions until 326 IAC 2-2 is revised.

- (c) *Other Criteria Pollutants*
 Carroll 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 King Oil Company, Inc. on April 1, 2010, 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) high vacuum dual phase extraction remediation system equipped with an air stripping unit, identified as DPE-1, approved for construction in 2010, with a maximum airflow rate of 300 acfm and a maximum water flow rate of 5 gpm, and exhausting to Stack 1.

The system provides hydraulic control in fine grain soil and exposes normally saturated soil to air flow by lowering the water table. As the air rises, hydrocarbons are stripped from saturated, impacted soil and groundwater into the passing air stream. The waste stream is then removed from a network of vertical extraction wells and piped to a centralized equipment compound where it is separated into vapor and water phases and treated prior to discharge.

- (b) Fugitive emissions from paved roads.

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.

<i>Process/ Emission Unit</i>	Potential To Emit of the Entire Source (tons/year)								
	<i>PM</i>	<i>PM₁₀*</i>	<i>PM_{2.5}</i>	<i>SO₂</i>	<i>NO_x</i>	<i>VOC</i>	<i>CO</i>	<i>Total HAPs</i>	<i>Worst Single HAP</i>
Dual Phase Extraction (DPE) System	-	-	-	-	-	5.17	-	2.10	0.742 (toluene)
Fugitive Emissions (paved roads)	1.14	0.22	0.22	-	-	-	-	-	-
Total PTE of Entire Source	1.14	0.22	0.22	-	-	5.17	-	2.10	0.742 (toluene)

Process/ Emission Unit	Potential To Emit of the Entire Source (tons/year)								
	PM	PM ₁₀ *	PM _{2.5}	SO ₂	NO _x	VOC	CO	Total HAPs	Worst Single HAP
Exemption 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 ₁₀), 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

The following state rules are applicable to the source:

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 (HAP))

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

326 IAC 6-4 (Fugitive Dust Emissions Limitations)

The source is subject to the requirements of 326 IAC 6-4, because the paved roads have 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)

Each of the emission units at this source is not subject to the requirements of 326 IAC 8-1-6 since the unlimited potential VOC emissions from each emission unit are less than twenty-five (25) tons per year.

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 1, 2010.

The construction and operation of this source shall be subject to the conditions of the attached proposed Exemption No. 015-29132-00036. 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

Company Name: King Oil Company, Inc.

Address: 809 East Columbia Street, Flora, Indiana 46929

Exemption No.: 015-29132-00036

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

Date: 4/13/2010

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

Uncontrolled Potential Emissions (tons/yr)

	<u>Criteria Pollutants</u>					
	<i>PM</i>	<i>PM₁₀/PM_{2.5}</i>	<i>SO_x</i>	<i>NO_x</i>	<i>VOC</i>	<i>CO</i>
Dual Phase Extraction (DPE) System	-	-	-	-	5.17	-
Paved Roads	1.14	0.22	-	-	-	-
Total	1.14	0.22	0.00	0.00	5.17	0.00

HAPs

Benzene =	0.164	tons/yr
Toluene* =	0.742	tons/yr
Ethylbenzene =	0.109	tons/yr
Xylenes =	0.455	tons/yr
MTBE =	0.432	tons/yr
Naphthalene =	0.144	tons/yr
Isopropyl-benzene =	0.058	tons/yr
Total HAPs =	2.10	tons/yr

*Highest single HAP

Company Name: King Oil Company, Inc.

Address: 809 East Columbia Street, Flora, Indiana 46929

Exemption No.: 015-29132-00036

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

Date: 4/13/2010

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

1) Free Product*

Free Product		
<i>Constants</i>		
Volume Conversion	7.48	gal/ft ³
Product Density	6.8	lbs/gal
<i>Input</i>		
Plume Area (ft ²)	Thickness (ft)	Soil Porosity
0	0	30%
Free Product Plume Volume =	0	ft ³
Free Product Volume =	0	ft ³ ,
	0	gal
Free Product Mass =	0	lbs

*Free product has not been detected at this site.

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 (ft³) = Plume Area (ft²) * Thickness (ft)

Free Product Volume (ft³) = Free Product Plume Volume (ft³) * Soil Porosity

Free Product Volume (gal) = Free Product Volume (ft³) * (7.48 gal/ft³)

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

Company Name: King Oil Company, Inc.
Address: 809 East Columbia Street, Flora, Indiana 46929
Exemption No.: 015-29132-00036
Reviewer: Calculations submitted by King Oil Company and reviewed by Meredith W. Jones
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****Contaminant Mass Calculations for Dual Phase Extraction (DPE) System (continued)****

2) Dissolved Phase Contaminant Mass

Dissolved Phase Gasoline				Dissolved Phase Diesel and/or Kerosene			
<i>Constants</i>				<i>Constants</i>			
Volume Conversion	7.48	gal/ft ³		Volume Conversion	7.48	gal/ft ³	
Water Density	8.35	lbs/gal		Water Density	8.35	lbs/gal	
<i>Input</i>				<i>Input</i>			
Plume Area (ft ²)	Thickness (ft)	Soil Porosity	Contaminant Concentrations (ppb)	Plume Area (ft ²)	Thickness (ft)	Soil Porosity	Contaminant Concentrations (ppb)
20,670	24	30%	50,056	19,790	24	30%	14,261
Total Plume Volume = 496,080 ft ³				Total Plume Volume = 474,960 ft ³			
Impacted Groundwater Volume = $\frac{148,824 \text{ ft}^3}{1,113,204 \text{ gal}}$				Impacted Groundwater Volume = $\frac{142,488 \text{ ft}^3}{1,065,810 \text{ gal}}$			
Impacted Groundwater Mass = 9,295,249 lbs				Impacted Groundwater Mass = 8,899,516 lbs			
Dissolved Phase Hydrocarbon Mass for Gasoline =		465	lbs	Dissolved Phase Hydrocarbon Mass for Gasoline =		127	lbs

Assumptions

- Plume Area values are based on the maximum extent of the historical estimated gasoline range organics and diesel range organics contaminant plumes in groundwater.
- Thickness of groundwater contamination is estimated to correspond to the depth of impacted soil in the boring observed to have the deepest soil impacts (Boring B-18). Soil is considered impacted if PID readings exceed 100.
- A typical soil porosity of 30% (0.30) is utilized.
- The contaminant concentration is the average of the historical maximum GRO or ERO concentration as measured in the six (6) monitoring wells located within the ERO and GRO groundwater plumes (MW-1, MW-2S, MW-2D, MW-3, MW-4, and MW-6S).

Methodology

Total Plume Volume (ft³) = Treated Area (ft²) * Thickness (ft)

Impacted Groundwater Volume (ft³) = Total Plume Volume (ft³) * Soil Porosity

Impacted Groundwater Volume (gal) = Impacted Groundwater Volume (ft³) * (7.48 gal/ft³)

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

Dissolved Phase Hydrocarbon Mass for Gasoline/Diesel (lbs) = Contaminant Concentrations (ppb) * (1 billion/10⁹) * Impacted Groundwater Mass (lbs)

Company Name: King Oil Company, Inc.
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Exemption No.: 015-29132-00036
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****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 ³		Solid Mineral Density (quartz)	165.4	lbs/ft ³	
<i>Input</i>				<i>Input</i>			
Influence Area (ft ²)	Thickness (ft)	Soil Porosity	Contaminant Concentrations (ppb)	Influence Area (ft ²)	Thickness (ft)	Soil Porosity	Contaminant Concentrations (ppb)
4,600	19.5	30%	1,618	4,600	19.5	30%	1,313
Total Impacted Soil Volume = 89,700 ft ³				Total Impacted Soil Volume = 89,700 ft ³			
Soil Mineral Volume = 62,790 ft ³				Soil Mineral Volume = 62,790 ft ³			
Soil Mineral Mass = 10,385,466 lbs				Soil Mineral Mass = 10,385,466 lbs			
Adsorbed Hydrocarbon Mass for Gasoline = 16,804 lbs				Adsorbed Hydrocarbon Mass for Diesel = 13,636 lbs			

Assumptions

- The influence area is based on the total vacuum radius of influence of the high vacuum remediation system.
- The contaminated thickness was estimated by summing the total thickness of all soil sample intervals exhibiting soil vapor concentrations greater than 100 parts per million (ppm) as measured by a MiniRae 2000 photoionization detector (PID). For calculations, the impacted soil thickness value used is the average thickness seen in borings within the remediation system radius of influence that were advanced through the full depth of the impacted zone (B-18, B-19, and B-20).
- A typical soil porosity of 30% (0.30) is utilized.
- The GRO contaminant concentration is the average of the maximum GRO concentration measured in each boring located within the remediation system vacuum radius of influence.
- Since ERO was not historically analyzed in soil samples at the most impacted depth intervals, the average ERO concentration was estimated using an ERO to GRO ratio of 0.81 as observed in soil sample B-18 @ 20-21'. The ERO to GRO ratio was multiplied by the average GRO concentration to estimate an average ERO concentration.

Methodology

- Total Impacted Soil Volume (ft³) = Treated Area (ft²) * Thickness (ft)
- Soil Mineral Volume (ft³) = Total Impacted Soil Volume (ft³) * (1 - Soil Porosity)
- Soil Mineral Mass (lbs) = Soil Mineral Volume (ft³) * Solid Mineral Density (lbs/ft³)
- Adsorbed Hydrocarbon Mass for Gasoline/Diesel (lbs) = Contaminant Concentrations (ppb) * (1 billion/1C⁹) * Soil Mineral Mass (lbs)

Company Name: King Oil Company, Inc.

Address: 809 East Columbia Street, Flora, Indiana 46929

Exemption No.: 015-29132-00036

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

Date: 4/13/2010

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

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

Free Product Mass (lbs) =	0
Potential Gasoline Range Mass (lbs) =	17,269
Potential Extended Range Mass (lbs) =	13,763
Total Hydrocarbon Mass (lbs) =	31,032

System Operational Period =	3	yrs
Total VOC Potential to Emit =	5.17	tons/yr

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) = Dissolved Phase Hydrocarbon Mass for Diesel (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: King Oil Company, Inc.

Address: 809 East Columbia Street, Flora, Indiana 46929

Exemption No.: 015-29132-00036

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

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****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%	846.18	1%	137.63	983.81	0.164
Toluene	25.0%	4317.24	1%	137.63	4454.87	0.742
Ethylbenzene	3.0%	518.07	1%	137.63	655.70	0.109
Xylenes	15.0%	2590.35	1%	137.63	2727.98	0.455
MTBE	15.0%	2590.35	0%	0.00	2590.35	0.432
Naphthalene	5.0%	863.45	0.01%	1.38	864.82	0.144
Isopropyl-benzene	2.0%	345.38	0%	0.00	345.38	0.058

Total = 2.10

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: King Oil Company, Inc.
Address: 809 East Columbia Street, Flora, Indiana 46929
Exemption No.: 015-29132-00036
Reviewer: Calculations submitted by King Oil Company and reviewed by Meredith W. Jones
Date: 4/13/2010

****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)	900.0	1.0	900.0	5.0	4500.0	250.0	0.047	42.6	15,554.0
Vehicle leaving plant (one-way trip)	900.0	1.0	900.0	5.0	4500.0	250.0	0.047	42.6	15,554.0
Total			1800.0		9000.0			85.2	31,108.0

Average Vehicle Weight per Trip = tons/trip
 Average Miles per Trip = 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 ₁₀ /PM _{2.5}	
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 ²

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) = days
 N = days/yr

	PM	PM ₁₀ /PM _{2.5}	
Unmitigated Emission Factor (EF) =	0.08	0.02	lb/mi
Mitigated Emission Factor (Eext) =	0.07	0.01	lb/mi

	Unmitigated PTE (tons/yr)		Mitigated PTE (tons/yr)	
	PM	PM ₁₀ /PM _{2.5}	PM	PM ₁₀ /PM _{2.5}
Vehicle entering plant (one-way trip)	0.62	0.12	0.57	0.11
Vehicle leaving plant (one-way trip)	0.62	0.12	0.57	0.11
Total	1.25	0.24	1.14	0.22

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 PTE (tons/yr) = Unmitigated Emission Factor (EF) * Maximum One-way Miles (mi/yr) * (1 ton/2000 lbs)
 Mitigated PTE (tons/yr) = Mitigated Emission Factor (Eext) * Maximum One-way Miles (mi/yr) * (1 ton/2000 lbs)

Abbreviations

EF = emission factor
 PM = particulate matter
 PM₁₀ = particulate matter (<10 um)
 PM_{2.5} = particulate matter (<2.5 um)
 PTE = potential to emit



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels Jr.
Governor

Thomas W. Easterly
Commissioner

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Toll Free (800) 451-6027
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SENT VIA U.S. MAIL: CONFIRMED DELIVERY AND SIGNATURE REQUESTED

TO: Brian King
King Oil Company, Inc.
P.O. Box 371, 516 N Main Street
Walton, IN 46994

DATE: April 27, 2010

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

SUBJECT: Final Decision
Exemption
015-29132-00036

Enclosed is the final decision and supporting materials for the air permit application referenced above. Please note that this packet contains the original, signed, permit documents.

The final decision is being sent to you because our records indicate that you are the contact person for this application. However, if you are not the appropriate person within your company to receive this document, please forward it to the correct person.

A copy of the final decision and supporting materials has also been sent via standard mail to:
Brian Walton - VP
Nathaniel Canady - Creek Run, LLC Environmental Engineering
OAQ Permits Branch Interested Parties List

If you have technical questions regarding the enclosed documents, please contact the Office of Air Quality, Permits Branch at (317) 233-0178, or toll-free at 1-800-451-6027 (ext. 3-0178), and ask to speak to the permit reviewer who prepared the permit. If you think you have received this document in error, please contact Joanne Smiddie-Brush of my staff at 1-800-451-6027 (ext 3-0185), or via e-mail at jbrush@idem.IN.gov.

Final Applicant Cover letter.dot 11/30/07

Mail Code 61-53

IDEM Staff	GHOTOPP 4/27/2010 King Oil Company, Inc. 015-29132-00036 Final		Type of Mail: CERTIFICATE OF MAILING ONLY	AFFIX STAMP HERE IF USED AS CERTIFICATE OF MAILING
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1		Brian King King Oil Company, Inc. PO Box 371, 516 N Main St Walton IN 46994-4117 (Source CAATS) confirmed delivery										
2		Brian Walton VP King Oil Company, Inc. PO Box 371, 516 N Main St Walton IN 46994-4117 (RO CAATS)										
3		Carroll County Commissioners 101 West Main Street Delphi IN 46923 (Local Official)										
4		Carroll County Health Department 101 W. Main, Courthouse Delphi IN 46923-1566 (Health Department)										
5		Mr. Steve Offitt 6304 West 175 South Kewanna IN 46939 (Affected Party)										
6		Mr. Robert Kelley 2555 S 30th Street Lafayette IN 44909 (Affected Party)										
7		Flora Town Council 27 W. Main Street Flora IN 46929 (Local Official)										
8		Nathaniel Canady Creek Run LLC Environmental Engineering P.O. Box 114 Montpelier IN 47359 (Consultant)										
9		Gail Ennis Flora Community Park 907 East Columbia Street Flora IN 46929 (Affected Party)										
10		Terri Sink First Financial Bank 817 East Columbia Street Flora IN 46929 (Affected Party)										
11		Darrell Yoder 818 Sunset Drive Flora IN 46929 (Affected Party)										
12		Tom Hesler Auto Express Car Wash 807 East Columbia Street Flora IN 46929 (Affected Party)										
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