

## AIR EMISSION SOURCE CONSTRUCTION PERMIT

**Source ID No.:** 0630019

**Effective Date:** December 27, 2011

**Source Name:** Western Plains Energy, LLC

**SIC Code:** 2869, Industrial Organic Chemicals Not Elsewhere Classified

**NAICS Code:** 325193, Ethyl Alcohol Manufacturing

**Source Location:** 3022 County Road 18  
Oakley, KS 67748

**Mailing Address:** 3022 County Road 18  
Oakley, KS 67748

**Contact Person:** Aaron Betz  
Safety Director  
Telephone Number (785) 672-8810

This permit is issued pursuant to K.S.A. 65-3008 as amended.

### **I. Description of Activity Subject to Air Pollution Control Regulations**

Western Plains Energy, LLC is proposing to construct an anaerobic digester for the production of biogas which will be utilized by their ethanol manufacturing facility located in Oakley, Kansas. The anaerobic digestion process will convert feedstock, such as cattle feedlot manure, food waste, thin stillage, grain dust, livestock slaughter waste, or other biomass products, into biogas.

Emissions of nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), particulate matter (PM), PM with an aerodynamic diameter less than or equal to 10 micrometers (PM<sub>10</sub>), volatile organic compounds (VOC), a single hazardous air pollutant (HAP), combined HAPs, and greenhouse gases (GHG) (not including biogenic carbon dioxide (CO<sub>2</sub>) emissions) were evaluated as part of the review process. This project is subject to the provisions of **K.A.R. 28-19-300 (Construction permits and approvals; applicability)** because the potential-to-emit (PTE) of PM, PM<sub>10</sub>, SO<sub>2</sub>, and NO<sub>x</sub> exceeds 25 tons per year, 15 tons per year, 40 tons per year, and 40 tons per year, respectively.

Western Plains Energy, LLC is operating under a Class II Operating Permit that limits the facility's PTE below the major source thresholds. The operating permit is being modified simultaneously with this document to ensure that the facility continues to operate as a synthetic minor source. Therefore, the proposed project will not result in an increase in emissions from the facility.

## II. Significant Applicable Air Pollution Control Regulations

The project, as proposed, is subject to Kansas Administrative Regulations, relating to air pollution control. The following state regulations were determined to be applicable to this source:

- A. K.A.R. 28-19-30 through K.A.R. 28-19-32, Indirect Heating Equipment Emissions
- B. K.A.R. 28-19-650(a)(3), Emissions Opacity Limits

## III. Air Emission Unit Technical Specifications

The following equipment/operation or equivalent is approved:

- A. Anaerobic digester including a receiving building for feedstock handling and fugitive operations
- B. Flare (C65)
- C. Paved roads
- D. Biogas combustion in existing equipment (thermal oxidizer and boiler)

## IV. Air Emissions Estimates from the Facility

Pollutant Type	Estimated Operating <sup>1</sup> <i>Permit issued on 6/14/2010</i>	Potential-to-Emit <sup>2</sup> <i>Facility including Proposed Activity</i>
	(Tons Per Year)	
NO <sub>x</sub>	44.1	98.7
SO <sub>2</sub>	19.1	78.8
CO	49.6	98.6
PM <sub>10</sub>	58.4	83.1
PM	85.3	99.95
VOC	83.4	99.7
Single HAP (Hydrochloric Acid/Acetaldehyde)	Not Applicable/9.95	9.98/8.90

<sup>1</sup> Estimated operating emissions are those emissions from a stationary source based on expected conditions and hours of operation.

<sup>2</sup> Potential-to-emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on a capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

Pollutant Type	Estimated Operating1 <i>Permit issued on 6/14/2010</i>	Potential-to-Emit2 <i>Facility including Proposed Activity</i>
	(Tons Per Year)	
Combined HAPs	18.7	24.4
GHG (CO <sub>2</sub> e)	Not Applicable	< 100,000

**V. Air Emission Limitations**

- A. K.A.R. 28-19-31(a): Aggregated emissions of particulate matter from indirect heating equipment shall not exceed those specified in Table H-1 or for equipment having intermediate heat input between 10(10<sup>6</sup>) BTU/hr and 10,000(10<sup>6</sup>) BTU/hr, the allowable emission rate may be determined by the equation provided in K.A.R. 28-19-31(a).
- B. K.A.R. 28-19-31(b)(2): Opacity of visible emissions from indirect heating equipment is limited to less than 20 percent.
- C. K.A.R. 28-19-650(a)(3): Opacity of visible emissions from equipment/operations other than indirect heating equipment is limited to 20 percent or less.

**VI. Revocation of Limitation in Previous Permit(s) or Approval(s)**

The Air Emission Source Construction Permit dated June 14, 2010 included VOC and HAP emission limitations for the thermal oxidizer (dryer system plus TO) (C10), Type II Cooling Cyclone (C70), and CO<sub>2</sub> scrubber (C40). These emission limitations are impacted by the proposed project and must be updated to ensure that the facility continues to operate as a synthetic minor source.

The following Permit Limitation Requirement #1 on page 3 of the Air Emission Source Construction Permit dated June 14, 2010 is revoked by this permit:

- Measured as specified in a performance test protocol approved by the department, combined emissions from the thermal oxidizer (dryer system plus TO)(C10), Type II Cooling Cyclone (C70) and CO<sub>2</sub> Scrubber (C40) shall contain no greater than 64.0 tons of VOC, no greater than 17.64 tons of total HAPs and no greater than 9.29 tons of the HAP acetaldehyde during any consecutive 12 month period.

This requirement is updated accordingly in the Class II Operating Permit modified December 27, 2011.

**VII. Permit Conditions**

- A. Waste gas from the anaerobic digestion process and biogas when not directed to the thermal oxidizer or boiler due to plant upset shall be directed to the flare (C65).
- B. A written air pollution control equipment maintenance plan for the flare shall be developed, implemented, and maintained.

### **VIII. Recordkeeping Requirements**

The owner or operator shall maintain a log showing the date of all routine or other maintenance, malfunction or repair of the control equipment (flare), the nature of the action taken on such date, and any corrective action or preventative measures taken.

### **IX. Notification**

Notify the Air Program Field Staff at the Northwest District Office in Hays at (785) 625-5663 when the proposed project is complete so that an evaluation can be conducted.

### **X. General Provisions**

- A. This document shall become void if the construction or modification has not commenced within 18 months of the effective date, or if the construction or modification is interrupted for a period of 18 months or longer.
- B. A construction permit or approval must be issued by KDHE prior to commencing any construction or modification of equipment or processes which results in potential-to-emit increases equal to or greater than the thresholds specified at K.A.R. 28-19-300.
- C. Upon presentation of credentials and other documents as may be required by law, representatives of the KDHE (including authorized contractors of the KDHE) shall be allowed to:
  - 1. enter upon the premises where a regulated facility or activity is located or conducted or where records must be kept under conditions of this document;
  - 2. have access to and copy, at reasonable times, any records that must be kept under conditions this document;
  - 3. inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this document; and
  - 4. sample or monitor, at reasonable times, for the purposes of assuring compliance with this document or as otherwise authorized by the Secretary of the KDHE, any substances or parameters at any location.
- D. The emission unit or stationary source which is the subject of this document shall be operated in compliance with all applicable requirements of the Kansas Air Quality Act and the federal Clean Air Act.
- E. This document is subject to periodic review and amendment as deemed necessary to fulfill the intent and purpose of the Kansas Air Quality Statutes and Regulations.
- F. This document does not relieve the permittee of the obligation to obtain other approvals, permits, licenses, or documents of sanction which may be required by other federal, state, or local agencies.

**Permit Writer**



Rasha S. Allen  
Environmental Scientist  
Air Permitting Section

12/27/11  
Date Signed

RSA:saw  
c: Shelly Briley, NWDO  
C-9819



## AIR EMISSION SOURCE CLASS II OPERATING PERMIT

**Source ID No.:** 0630019

**Effective Date:** August 11, 2005 (Modified January 5, 2007, November 13, 2008, April 27, 2009, January 19, 2010, June 14, 2010, December 27, 2011)

**Expiration Date:** Valid until modified, revoked, or otherwise determined invalid

**Source Name:** Western Plains Energy, LLC

**SIC Code:** 2869, Industrial Organic Chemicals Not Elsewhere Classified

**NAICS Code:** 325193, Ethyl Alcohol Manufacturing

**Source Location:** 3022 County Road 18  
Oakley, KS 67748

**Mailing Address:** 3022 County Road 18  
Oakley, KS 67748

**Contact Person:** Aaron Betz  
Safety Director  
Telephone Number (785) 672-8810

**This permit is issued pursuant to K.S.A. 65-3008 as amended.**

**I. Summary of Amended Requirements, Conditions, Standards, or Limitations issued on December 27, 2011**

The current Class II Operating Permit Modification incorporates changes at the facility impacted by the construction of an anaerobic digester for the production of biogas which will be utilized by the ethanol manufacturing facility. Primary changes to the permit include updating facility-wide emissions and requirements and adding operational requirements associated with the biogas anaerobic digestion process.

## II. Description of Activity Subject to Air Pollution Control Regulations

An air construction permit was issued to Western Plains Energy, LLC (Western Plains) by KDHE on July 11, 2005 to operate a forty-eight (48) million gallon per year ethanol plant located near Oakley, Kansas. The plant was constructed as proposed and is currently in operation. The facility increased its limit of denatured ethanol production to 50.35 million gallons per year with the Class II Operating Permit issued on August 11, 2005.

The Class II Operating Permit Modification issued on January 5, 2007 approved the installation and operation of a Superior 25 MMBtu per hour boiler. The potential-to-emit emission of carbon monoxide (CO) from the new boiler increased facility emissions of carbon monoxide to above the 100 tons/year major source threshold. Western Plains, based upon performance stack testing results, then requested a limitation on CO emissions from the thermal oxidizer (C10) to not exceed 52.53 tons during each consecutive twelve (12) month period. The thermal oxidizer CO restriction resulted in a facility-wide CO emissions totaling 78.8 tons/year and allowed Western Plains to continue operating as a minor source under this Class II Operating Permit.

The Class II Operating Permit Modification issued on November 13, 2008 updated facility-wide equipment. The changes included updating that only one dryer is used at the facility, that the equipment related to the biomethanator had been disconnected and that another loading terminal has been added so that product could be loaded simultaneously to truck and rail. These changes decreased the potential to emit for CO, PM/PM<sub>10</sub>, VOC, nitrogen oxides and sulfur oxides.

The Class II Operating Permit Modification issued on April 27, 2009 approved an increase in the denatured ethanol production limit from 50.53 to 52.0 million gallons per year (MMGal/yr). The permit also increased the limit in the amount of grains used in the manufacturing process from 505,300 tons/yr to 520,000 tons/yr. In addition, the amount of distiller dried grains with solubles (DDGS) produced was reduced from 94,744 tons/yr to 82,977 tons/yr. No plant equipment changes were required to implement the proposed production changes.

The Class II Operating Permit Modification issued on January 19, 2010 incorporated recent equipment changes at the facility including the addition of grain handling equipment and a baghouse on July 2009 and the approval to store up to 250,000 bushels of grain either in a storage pile or the DDGS storage building on November 2009. Additionally, the facility is requesting to update the silt loading factor on the haul roads from 0.4 g/m<sup>2</sup> to 1.0 g/m<sup>2</sup>. The emissions increase resulting from these two projects and the updated silt loading value on the haul roads have been accounted for in the current permit. Other operational changes that are not expected to raise emissions include a CO<sub>2</sub> Scrubber packing modification on October 2009, the replacement of urea for anhydrous ammonia as the nitrogen source for the fermenters on November 2009, the addition of a new fermenter approved in the Construction Response issued on January 4, 2010 and a slurry grinder modification on January 18, 2010.

The requirements on the control equipment have also been updated to match the standard Class II language currently being used. Performance testing of particulate matter with an aerometric diameter equal to or less than ten (10) microns (PM<sub>10</sub>) has also been added to the baghouses and Type II Cooling System. Also, a PM<sub>10</sub> limit value has been added to the Dryer System (with the thermal oxidizer).

The Class II Operating Permit Modification issued on June 14, 2010 incorporated changes at the facility that impact the VOC and HAP emissions associated with the fermentation CO<sub>2</sub> scrubber. Western Plains Energy has grown from a 45 MMgpy construction permitted ethanol plant in 2003 to a 52 MMgpy plant in 2010. Recent CO<sub>2</sub> scrubber performance test results have shown the need to establish combined emissions limits on the thermal oxidizer (dryer system plus TO), Type II Cooling Cyclone and

CO2 scrubber for VOC, total HAPs and the HAP acetaldehyde. The combined emission limits for VOCs, total HAPs and acetaldehyde on the thermal oxidizer (dryer system plus TO), Type II Cooling Cyclone and CO2 scrubber will ensure Western Plains continues operating as a minor source under this Class II Operating Permit.

**III. Permit Intent**

The purpose of this permit is to limit the potential-to-emit to below major source thresholds in accordance with K.A.R. 28-19-540. For this facility, emissions of carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), volatile organic compounds (VOC), particulate matter (PM<sub>10</sub>), hazardous air pollutants (HAPs), and greenhouse gases (GHG) (not including biogenic carbon dioxide (CO<sub>2</sub>) emissions) were evaluated in determining the potential-to-emit. This permit includes restrictions that will limit the potential-to-emit of these pollutants with the exception of GHG to below major source thresholds.

To assist in demonstrating that the emission limitations imposed in this permit are not being exceeded, performance testing requirements are detailed in the permit. Attachment A (Performance Test Protocol) is provided for guidance purposes only, the final performance testing protocol must be approved by the Compliance and Enforcement Section of the Bureau of Air.

**IV. Air Emission Estimates from the Facility**

Pollutants Reviewed	Potential-to-Emit <sup>1</sup> (Tons per Year)	
	Pre-permit	Post-permit
Carbon Monoxide (CO)	> 100	98.6
Nitrogen Oxides (NO <sub>x</sub> )	> 100	98.7
Sulfur Dioxide (SO <sub>2</sub> )	> 100	78.8
Volatile Organic Compounds (VOC)	> 100	99.7
PM <sub>10</sub>	> 100	83.1
Single HAP (Hydrochloric Acid/Acetaldehyde)	> 10	9.98/8.90
Combined HAPs	> 25	24.4
GHG (CO <sub>2</sub> e)	< 100,000	< 100,000

<sup>1</sup> Potential-to-emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on a capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

## V. Permit Limitation Requirements

For the duration of this permit:

- A. Denatured ethanol production shall be no greater than 52.0 million gallons during each consecutive twelve (12) month period.
- B. The amount of grain used in the alcohol manufacturing process shall be no greater than 520,000 tons during each consecutive 12 month period.
- C. The dryer (P10A) shall have a maximum heat input rate of 30MM BTU per hour. The dryer shall be designed to process no more than 12,173 tons of distillers dried grain and solubles (DDGS) during each consecutive 12 month period.
- D. The fire water pump diesel engine shall be operated no more than 100 hours during each consecutive 12 month period.
- E. The thermal oxidizer (TO)(C10) shall be equipped with a monitoring device to continuously measure and record the thermal oxidizer's combustion temperature. The combustion chamber temperature shall be maintained at a temperature no lower than ten (10) percent below the minimum combustion chamber temperature at which the thermal oxidizer operated at during a successful performance test.
- F. The exhaust emissions from the dryer (P10A) and the process vent, which shall include emissions from the mixer, slurry tank, yeast tank, and the distillation and molecular sieve condensers, shall be directed to the thermal oxidizer whenever the ethanol plant is operating. Exhaust emissions from the thermal oxidizer will pass through a waste heat recovery boiler prior to discharge to the atmosphere.
- G. The emissions from the thermal oxidizer (dryer system plus thermal oxidizer) (C10), including emissions from natural gas/biogas combustion, shall contain no greater than 24.16 tons of PM<sub>10</sub>, no greater than 63.46 tons of SO<sub>2</sub>, no greater than 75.71 tons of NO<sub>x</sub>, no greater than 61.72 tons of CO, no greater than 13.20 tons of VOC, no greater than 10.36 tons of total HAPs, and no greater than 7.97 tons of the HAP hydrochloric acid during each consecutive 12 month period. Compliance with these emission limits shall be determined in accordance with performance tests conducted as approved by KDHE. See Attachment A.
- H. The combined emissions of PM<sub>10</sub> from the two (2) grain unloading baghouses, the two (2) hammermill baghouses, and the Type II cooling system shall contain no greater than 9.71 tons during each consecutive 12 month period. Compliance with this emission limit shall be determined in accordance with performance tests conducted as approved by KDHE. See Attachment A.
- I. The combined emissions from the Type II Cooling Cyclone (C70) and fermentation CO<sub>2</sub> scrubber (C40) shall contain no greater than 57.08 tons of VOC, no greater than 8.59 tons of total HAPs, and no greater than 7.11 tons of the HAP acetaldehyde during each consecutive 12 month period. Compliance with these emission limits shall be determined in accordance with performance tests conducted as approved by KDHE. See Attachment A.

- J. The emissions from natural gas/biogas combustion in the boiler shall contain no greater than 21.09 tons of PM<sub>10</sub>, no greater than 15.33 tons of SO<sub>2</sub>, no greater than 18.36 tons of NO<sub>x</sub>, no greater than 14.53 tons of CO, no greater than 3.02 tons of VOC, no greater than 2.39 tons of total HAPs, and no greater than 2.01 tons of the HAP hydrochloric acid during each consecutive 12 month period. Compliance with these emission limits shall be determined in accordance with performance tests conducted as approved by KDHE. See Attachment A.
- K. The fermentation CO<sub>2</sub> scrubber (C40) must be continuously operated to control emissions of VOC from the fermenters and the beer-well, whenever the ethanol plant is in operation.
- L. Exhaust from the truck loading/unloading terminal shall be directed to the flare (C50) whenever product ethanol is being loaded into a truck.
- M. Waste gas from the anaerobic digestion process and biogas when not directed to the thermal oxidizer or boiler due to plant upset shall be directed to the flare (C65).
- N. A written air pollution control equipment maintenance plan shall be developed, implemented, and maintained for all equipment used to control PM<sub>10</sub>, VOC, and HAP emissions within 180 days of startup of the plant. The maintenance plan shall also include procedures necessary to ensure that the structural integrity of all plant roads is preserved.
- O. All roads on plant property shall be paved. The plant roads shall be constructed, operated, and maintained to minimize generation of PM<sub>10</sub>. Maintenance shall be performed on all plant roads, as necessary, to ensure that the structural integrity of the paved roads is preserved.
- P. The four hammermills shall be vented to baghouses C30A and C30B to control PM<sub>10</sub> emissions.
- Q. The emissions from the grain unloading and grain processing (corn day bin) shall be vented to baghouses C20 and C21 to control PM<sub>10</sub> emissions.
- R. All air pollution control equipment must be properly installed, operated and maintained at all times whenever the emissions source that it is designated to control is operating. Maintenance shall be conducted according to the written air pollution control equipment maintenance plan that was developed and implemented for all equipment used to control PM<sub>10</sub>, VOC, and HAP emissions of the plant.

## VI. Performance Testing Protocol

The owner or operator shall prepare and submit a performance testing protocol to the department at least thirty (30) days in advance of a performance test meeting required by this permit. **The protocol shall be prepared in accordance with Attachment A to this permit.** Attachment A (Performance Test Protocol) is provided for guidance purposes only, the final performance testing protocol must be approved by the Compliance and Enforcement Section of the Bureau of Air.

## **VII. Performance Test Meeting**

The owner or operator shall arrange a performance test meeting with the department, either in person, or via a telephone conference call, at least thirty (30) days in advance of the date that the performance testing required by this permit is to be conducted. The purpose of the meeting shall be to outline and discuss the schedule and implementation plans for conducting the performance testing required by this permit. The department may elect to have an observer(s) on-site at the facility during any or all performance testing required by this permit.

## **VIII. Performance Test Requirements**

- A. All performance testing, notifications, reporting of results and performance test compliance time-frames shall be conducted/deadlines met in accordance with the requirements of 40 CFR 60.8.
- B. Performance testing required by this permit shall be conducted annually. These tests must be completed no less than nine (9) and no greater than twelve (12) months apart. Upon completion of three (3) consecutive tests (including an initial performance test), the frequency of testing may be reduced to once during each three (3) year period thereafter, so long as each test is completed successfully. In the event that a performance test is not completed successfully, the frequency of testing shall return to once annually. Three (3) consecutive successful annual tests shall be demonstrated to reduce the frequency of testing to once during each three (3) year period.
- C. For the purpose of the permit, a *successful performance test* means a test completed in accordance with a performance test protocol approved by the department, during which all of the emissions limitations required by this permit were met.
- D. Performance testing shall be conducted in accordance with a performance test protocol approved by the department to verify compliance with the emission limitations, conditions and requirements of this permit. Attachment A (Performance Test Protocol) is provided for guidance purposes only, the final performance testing protocol must be approved by the Compliance and Enforcement Section of the Bureau of Air.

## **IX. Permit Recordkeeping Requirements**

- A. The owner or operator shall maintain at the stationary source records demonstrating that the operating limitations imposed have not been exceeded. All records shall be in units of the Permit Limitation Requirements and shall reflect totals for the most recent 12 month period.
  - 1. For **Permit Limitation Requirements A, B, C, D, and E** which relate to operation processing, production rates, and operating hours, records shall be updated monthly, no later than the last day of the following calendar month [K.A.R 28-19-501(c)]. Each record required by this section shall be maintained on-site for a period of at least of two (2) years from the date of the record.

2. For **Permit Limitation Requirements G, H, I, and J** which relate to emission rates, performance test records shall be maintained to estimate actual air emissions for the source. Each record required by this section shall be maintained on-site for a period of at least two (2) years from the date of the record during the once annually frequency of testing period. If the testing period increases to a frequency of once each three (3) years, each record required by this section shall be maintained on-site for a period of at least six (6) years from the date of the record.
- B. The owner or operator shall maintain a log showing the date of all routine or other maintenance, malfunction or repair of the control equipment, the nature of the action taken on such date, and any corrective action or preventative measures taken. Each record required by this section shall be maintained on-site for a period of at least of two (2) years from the date of the record.

**X. Permit Reporting Requirements**

- A. In accordance with K.A.R. 28-19-546(a), the owner or operator shall submit all operating or relevant information to estimate actual air emissions for the source for the preceding calendar year to KDHE. This information shall be submitted on forms provided or approved by KDHE. If forms and instructions have not been received 30 days prior to the date specified under K.A.R. 28-19-546(a), the owner or operator should contact KDHE.
- B. If, at any time, the facility's actual operations exceed 85% of the operational limitations of this permit (i.e. 44.2 million gallons per year denatured ethanol), the owner or operator shall submit a report to KDHE within 45 days of the last day of the month following the conclusion of the calendar quarter [K.A.R 28-19-501(c)(1)]. Quarterly reporting may be waived if the facility submits a letter to KDHE stating that they will be operating above the 85% limit on a continuous basis.
- C. If, at any time, the facility's actual operations exceed the operational limitations of this permit, the owner or operator shall:
1. notify KDHE in writing of any operational exceedance. This notification shall be mailed or delivered the first working day following discovery of the exceedance.
  2. submit to KDHE a compliance plan stating those actions being taken by the owner or operator to assure future compliance with the operational limitations. This plan shall be submitted within 60 days of discovering the exceedance. This plan will clearly state if an application for a Class II permit modification or if an application for a Class I operating permit will be submitted. Any such application will be filed within 180 days of discovering the exceedance.

Submitting any or all of these reports does not shield the owner or operator from enforcement action for exceeding the permit limitations or for other violations of the Kansas Air Quality Act or Regulations.

## **XI. Permit Modification**

- A. The owner or operator must submit a complete application for modification of this permit if there is any increase of the potential-to-emit (PTE) for the pollutants limited in this permit or if there is an increase in PTE for any regulated pollutant above the major source threshold. This application for modification must be submitted within 180 days of the initial startup of the modification.
- B. A construction permit or approval must be issued by KDHE prior to commencing any construction or modification of equipment or processes which results in potential emission increases equal to or greater than the thresholds specified in K.A.R. 28-19-300.

## **XII. General Provisions**

- A. Upon presentation of credentials and other documents as may be required by law, representatives of KDHE (including authorized contractors of the KDHE) shall be allowed by the permittee to:
  - 1. enter upon the premises where a regulated facility or activity is located or conducted or where records must be kept under conditions of this document;
  - 2. have access to and copies of, at reasonable times, any records that must be kept under conditions of this document;
  - 3. inspect at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this document; and
  - 4. sample or monitor, at reasonable times, for the purposes of assuring compliance with this document or as otherwise authorized by the Secretary of the KDHE, any substances or parameters at any location.
- B. The emission unit or stationary source which is the subject of this document shall be operated in compliance with all applicable requirements of the Kansas Air Quality Act and the Federal Clean Air Act, and all applicable regulations promulgated under the Kansas Air Quality Act and the Federal Clean Air Act.
- C. This document is subject to periodic review and amending as deemed necessary to fulfill the intent and purpose of the Kansas Air Quality Statutes and the Kansas Air Quality Regulations.
- D. This document does not relieve the permittee of the obligation to obtain other approvals, permits, licenses, or documents of sanction which may be required by other federal, state, or local government agencies.

**Permit Writer**



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Rasha S. Allen  
Environmental Scientist  
Air Permitting Section

12/27/11

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Date Signed

RSA:saw  
c: Shelly Briley, NWDO  
O-9820

## Permit Addendum

The following equipment and operations were evaluated to calculate the potential-to-emit for the facility:

### 1) Grain/Feedstock Processing/Handling Facilities:

- a) Receiving and unloading equipment, seven (7) elevator legs, six (6) steel bins with a combined capacity of 622,658 bushels, one (1) concrete silo with a capacity of 257,917 bushels, two (2) steel bins with a combined capacity of 500,000 bushels, two (2) McPherson concrete silos with a combined capacity of 238,300 bushels, two (2) day bins with a combined capacity of 10,000 bushels and four (4) hammermills.
- b) Equipment necessary for loading distillers dried grain and solubles (DDGS) into trucks for shipment off-site.
- c) Anaerobic digester including a receiving building for feedstock handling and fugitive operations.

### 2) One (1) Ethanol Manufacturing Plant: storage tanks, various pumps, piping and valves, fermentation process vessels, a carbon dioxide scrubber, distillation units, a molecular sieve, condensers, centrifuges, evaporators and DDGS dryer.

#### Specific plant equipment:

- a) Two (2) Tanks (T61 & T62) - 500,000 Gallons (1,892.6 cubic meters) each for the purpose of storing product grade denatured ethanol. The tanks are equipped with an interior floating roof and seal system that meets the applicable requirements of 40 CFR Part 60, Subpart Kb.
- b) One (1) Tank (T63) 100,000 Gallon (378.5 cubic meters) for the purpose of storing 200 proof (100%) ethanol. The tank is equipped with an interior floating roof and seal system that meets the applicable requirements of 40 CFR Part 60, Subpart Kb.
- c) One (1) Tank (T64) - 100,000 Gallon (378.5 cubic meters) for the purpose of storing denaturant (natural gasoline). The tank is equipped with an interior floating roof and seal system that meets the applicable requirements of 40 CFR Part 60, Subpart Kb.
- d) One (1) Tank (T65) 100,000 Gallon (378.5 cubic meters) for the purpose of storing 190 proof (95%) ethanol. The tank is equipped with an interior floating roof and seal system that meets the applicable requirements of 40 CFR Part 60, Subpart Kb.
- e) One (1) Fuel Additive Tank (T66) 1,460 Gallon (5.53 cubic meters) for the purpose of storing corrosion inhibitor for tank cars.
- f) Piping, Pumps and Valves: approximately 20 pumps and 465 valves in light liquid service. All piping, pumps and valves are constructed, operated and maintained in accordance with the applicable requirements of 40 CFR Part 60, Subpart VV.

- g) One (1) Dryer (P10A) for the purpose of drying the wet distillers grain (WDG). The dryer is designed for a maximum heat input rate of 30 MM Btu per hour and a maximum processing rate of approximately seven tons of DDGS per hour.
- h) One (1) Waste Heat Recovery Boiler for the purpose of supplying process steam to the ethanol plant operations. The heat input necessary for operation of the waste heat recovery boiler shall be provided by the thermal oxidizer (C10). The waste heat recovery boiler is to have a maximum design heat input rate of 99 MM Btu per hour, including the heat input provided by all gas streams directed to the thermal oxidizer (C10).
- i) One (1) Superior Boiler Works Boiler for the purpose of supplying process steam to the ethanol plant operations. The Boiler is model 6-x-3000-s200-iccf-g natural gas/biogas fired and is to have a maximum design heat input rate of 25 MM Btu per hour.
- j) Two (2) Tank Loading/Unloading Terminals (P50 and P51) for the purpose of transferring denatured ethanol to trucks (P50) and railcars (P51) for shipment off-site.
- k) One (1) cooling tower with a design water circulation rate of 1,200,000 gallons per hour.
- l) Emergency Equipment One (1) 300 horsepower diesel powered reciprocating engine for the purpose of driving an emergency fire water pump.
- m) Plant roads: All roads on plant property are paved.

### **Air Pollution Control Equipment**

All air pollution control equipment must be properly installed, operated and maintained at all times whenever the emissions source that it is designated to control is operating.

- 1) One (1) Thermal Oxidizer (C10): The thermal oxidizer is natural gas/bigogas fired and designed for a maximum heat input rate of 99 MMBtu per hour. The exhaust emissions from the dryer (P10A) and the process vent, which shall include emissions from the mixer, slurry tank, yeast tank and the distillation and molecular sieve condensers are to be directed to the thermal oxidizer whenever the ethanol plant is operating. Exhaust emissions from the thermal oxidizer will pass through a waste heat recovery boiler prior to discharge to the atmosphere.
- 2) Two (2) Fabric Filter Baghouses (Emission point C20 and C21) for the purpose of controlling particulate matter emissions from the grain unloading and grain processing (corn day bin). The unit is designed for a 40,000 cubic foot per minute flow rate while operating at 60 degrees Fahrenheit.
- 3) One (1) Fabric Filter Baghouse (Emission point C30A) for the purpose of controlling particulate emissions from operation of two hammermills. The unit is designed for a 14,500 cubic foot per minute flow rate while operating at 60 degree Fahrenheit.

- 4) One (1) Baghouse (Emission point C30B) for the purpose of controlling particulate emissions from operation of two hammermills. The unit is designed for a 14,500 cubic foot per minute flow rate while operating at 60 degree Fahrenheit.
- 5) One (1) flare (C50) for the purpose of controlling exhaust from the truck loading/unloading terminal.
- 6) One (1) Packed Bed Scrubber (C40) for the purpose of removing VOCs from the carbon dioxide by-product stream. Under normal operating conditions, the water flow rate to the scrubber is designed for 25 to 60 gallons per minute and the ammonium bisulfite injection feed rate is set for a minimum rate of 1.0 gallon per hour.
- 7) One (1) Cyclone Collector (C70) for the purpose of cooling and separating the dried distillers grain and solubles prior to storage and load-out areas as well as controlling particulate emissions from DDGS loading. The cyclone is designed to operate at inlet and outlet gas flow rates of 24,000 cubic feet per minute at 85 degrees Fahrenheit at a pressure drop of 3.5 inches of water.
- 8) One (1) flare (C65) for the purpose of flaring waste gas from the anaerobic digestion process and biogas when not directed to the thermal oxidizer or boiler due to plant upset.

## Attachment A

### Western Plains Energy Test Protocol Western Plains Energy, LLC Oakley, Kansas Facility

A detailed performance test protocol, describing all test equipment, procedures, and quality assurance (QA) measures is to be prepared. The protocol must describe the specific sample collection method(s), analytical method(s), facility operating conditions, and parameters to be measured/monitored during the each performance test required by this permit. The following outline identifies the required elements of the performance test protocol. The current Performance Test Protocol is provided for guidance purposes only, the final performance testing protocol must be approved by the Compliance and Enforcement Section of the Bureau of Air.

#### Project Description

The project description should provide a general description of the proposed project and the testing to be performed. Where appropriate, the following shall be included:

- a. Description of plant processes and control equipment, including flow diagrams
- b. Proposed operation ranges (production rate(s) temperature(s), flow rate(s), etc.) for the major plant equipment/processes and air pollution control equipment during the stack test program. Performance testing shall be conducted while the plant/processes/air pollution control equipment is operating at conditions representative of how the plant is expected to be operated on an everyday basis, but no less than at 90% of the maximum design rate, unless approved otherwise by the department.
- c. List of operation and emission parameters to be measured during the test and typical operating ranges for these parameters.
- d. Proposed schedule for conducting the performance testing.

#### Project Organization and Responsibility

A table or chart that identifies the plant and stack testing personnel responsible for conducting the performance test, showing each person's responsibilities and the chain of command.

#### Quality Assurance Objectives for Measuring Data

Data quality objectives shall be determined and presented the report submitted to the department for each measurement to ensure that the data collected is appropriate the intended use.

## General Sampling Procedure

For each monitored parameter, a description of the sampling procedures to be used shall be provided. Officially approved EPA procedures and Reference Methods must be used where applicable. The general description shall include the following:

- a. Stack diagram showing test ports, their distances from upstream and downstream disturbances, the stack diameter, planned sampling equipment and monitoring locations.
- b. The proposed method for the determination of the presence and degree of cyclonic flow.
- c. The proposed number of sampling traverse points, sampling time at each point, and total sampling volume.
- d. A detailed description of all sampling, sample recovery, and analytical procedures. The entire procedure in the case of nonstandard procedures or modifications should be described with justifications and necessary data for backup. Options offered by the Reference Method should be selected and justified.
- e. Any special conditions for the preparation of the sampling equipment and containers to avoid sample contamination.
- f. Samples of forms to be used to record sample history, sampling conditions, and plant operating conditions.
- g. Methodology for measurement of plant and pollution control device operating conditions.
- h. If more than one sampling train is to be used, detailed description of the relevant sequencing and logistics.
- i. If Continuous Emission Monitors (CEMs) are to be used, detailed description of the operating and data logging procedures.

## Specific Sampling Procedures

1. Performance testing for the **Thermal Oxidizer/DDGS dryer stack (Emission point C10)** shall include the following tests:

Test Method	Parameter/Pollutant
USEPA Method 1	Sampling Location and Cyclonic Flow Determination
USEPA Method 2	Determination of Stack Gas Velocity and Volumetric Flow Rate
USEPA Method 3	Determination of Stack Gas Molecular Weight
USEPA Method 4	Determination of Stack Gas Moisture Content
USEPA Method 5	Determination of Particulate Matter Emission Rate
USEPA Method 6	Determination of Sulfur Dioxide Emission Rate
USEPA Method 7	Determination of Nitrogen Oxides Emission Rate
USEPA Method 9	Opacity
USEPA Method 10	Carbon Monoxide Emission Rate
USEPA Method 18	GC/FID analysis with on site testing required (acetaldehyde, acetic acid, acrolein, ethanol, formaldehyde, formic acid, lactic acid, and methanol)
USEPA Method 25A	Determination of Total VOC Emissions
USEPA Method 202	Determination of Condensable Particulate Matter Emission Rate
US EPA Method 320 (can be used in place of Methods 18 and 25A)	Measurement Of Vapor Phase Organic And Inorganic Emissions By Extractive Fourier Transform Infrared (FTIR) Spectroscopy

2. Performance testing for **Baghouses C20, C21, C30A, C30B, and Type II DDGS Cooling Cyclone(C70)** shall include the following tests:

Test Method	Parameter/Pollutant
USEPA Method 1	Sampling Location and Cyclonic Flow Determination
USEPA Method 2	Determination of Stack Gas Velocity and Volumetric Flow Rate
USEPA Method 3	Determination of Stack Gas Molecular Weight
USEPA Method 4	Determination of Stack Gas Moisture Content
USEPA Method 5	Determination of Particulate Matter Emission Rate
USEPA Method 9	Opacity

3. Performance tests for the **Fermentation CO2 Scrubber (C40)** shall include the following:

Test Method	Parameter/Pollutant
USEPA Method 18	GC/FID analysis with on site testing required (acetaldehyde, acetic acid, acrolein, ethanol, formaldehyde, formic acid, lactic acid, and methanol)
USEPA Method 25A	Determination of Total VOC Emissions
US EPA Method 320 (can be used in place of Methods 18 and 25A)	Measurement Of Vapor Phase Organic And Inorganic Emissions By Extractive Fourier Transform Infrared (FTIR) Spectroscopy

4. Performance tests for the **Type II DDGS Cooling Cyclone (C70)** shall include the following:

Test Method	Parameter/Pollutant
USEPA Method 18	GC/FID analysis with on site testing required (acetaldehyde, acetic acid, acrolein, ethanol, formaldehyde, formic acid, lactic acid, and methanol)
USEPA Method 25A	Determination of Total VOC Emissions
US EPA Method 320 (can be used in place of Methods 18 and 25A)	Measurement Of Vapor Phase Organic And Inorganic Emissions By Extractive Fourier Transform Infrared (FTIR) Spectroscopy

5. Performance tests for the **Boiler** shall include the following:

Test Method	Parameter/Pollutant
USEPA Method 1	Sampling Location and Cyclonic Flow Determination
USEPA Method 2	Determination of Stack Gas Velocity and Volumetric Flow Rate
USEPA Method 3	Determination of Stack Gas Molecular Weight
USEPA Method 4	Determination of Stack Gas Moisture Content
USEPA Method 5	Determination of Particulate Matter Emission Rate
USEPA Method 6	Determination of Sulfur Dioxide Emission Rate
USEPA Method 7	Determination of Nitrogen Oxides Emission Rate
USEPA Method 9	Opacity
USEPA Method 10	Carbon Monoxide Emission Rate
USEPA Method 18	GC/FID analysis with on site testing required
USEPA Method 25A	Determination of Total VOC Emissions
USEPA Method 202	Determination of Condensable Particulate Matter Emission Rate
US EPA Method 320 (can be used in place of Methods 18 and 25A)	Measurement Of Vapor Phase Organic And Inorganic Emissions By Extractive Fourier Transform Infrared (FTIR) Spectroscopy

#### Detection Limits

The limits of detection for each targeted pollutant shall be calculated and presented in the performance test report submitted to the department.

#### Sample Custody

The following sample custody procedures shall be addressed in the performance test protocol:

- a. Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters and absorbing reagents).
- b. Procedures and forms for recording the exact location and specific considerations associated with sample acquisitions.
- c. Prepared sample labels containing all information necessary for effective sample tracking.

## Calibration Procedures and Frequency

Calibration procedures are to be identified and the information provided for each measurement device, including coefficients, by reference to a standard method or by providing a written description. The frequency planned for recalibration during the test shall be provided and a list of all calibration standards, including their source and traceability. Equipment to be calibrated includes: dry gas meters, orifice meters, Pitot-tubes, thermometers/thermocouples, nozzles, flow meters and may include various process parameter monitors.

## Documentation

Sample copies of all data log sheets shall be provided and examples of any calculations that are to be performed on the raw data. Note: copies of all raw data sheets, including manually and automatically recorded data (strip charts and data logger or computer printouts) should be submitted with the performance test report and copies must be available at the end of each day's testing.