

STATE OF MISSOURI



**DEPARTMENT OF NATURAL RESOURCES**

**MISSOURI AIR CONSERVATION COMMISSION**

**PERMIT TO CONSTRUCT**

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **012009-009** Project Number: 2007-05-066

Parent Company: First Missouri Energy

Parent Company Address: County Highway 307, Scott City, MO 63780

Installation Name: First Missouri Energy

Installation Address: County Highway 307, Scott City, MO 63780

Location Information: Scott County (S27, T30N, R14E)

Application for Authority to Construct was made for:

The construction of a new 68,250,000 gallons per year denatured ethanol plant. This review was conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

- Standard Conditions (on reverse) are applicable to this permit.
- Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JAN 27 2009

EFFECTIVE DATE

  
\_\_\_\_\_  
DIRECTOR OR DESIGNEE  
DEPARTMENT OF NATURAL RESOURCES

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

**You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review.** In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources' Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, Attention: Construction Permit Unit.

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

First Missouri Energy  
 Scott County (S27, T30N, R14E)

1. Truck Type and Truck Traffic Limitations
  - A. First Missouri Energy shall limit the daily number of trucks going through each haul road as specified in Table 1. No other raw material or product truck traffic is authorized at this plant.

**Table 1: Daily Truck Limits**

Haul Road Type	Daily Truck Limit
Grain	73 trucks
Denatured Ethanol	24 trucks
Denaturant (Gasoline)	2 Trucks
DDGS	23 Trucks
Vendor and Misc.	25 Trucks

- B. First Missouri Energy shall limit the annual number of trucks going though each haul road as specified in Table 2. No other raw material or product truck traffic is authorized at this plant. The annual limit is based on the number of trucks per calendar year and is not a 12-month rolling total.

**Table 2: Yearly Truck Limits**

Haul Road Type	Yearly Truck Limit
Grain	26,473 Trucks
Denatured Ethanol	8,531 Trucks
Denaturant (Gasoline)	406 Trucks
DDGS	8,273 Trucks
Vendor and Misc.	9,125 Trucks

- C. To show compliance with Special Conditions 1.A. and 1.B., First Missouri Energy shall keep a record of the daily and the annual truck traffic for each type of truck on each haul road. Attachment A, *Daily Truck Traffic Tracking Record*, or equivalent form(s), shall be used for daily truck traffic record keeping. Attachment B, *Annual Truck Traffic Tracking Record*, or equivalent form(s), shall be used for annual truck traffic record keeping.

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- D. First Missouri Energy shall report to the Air Pollution Control Program's Enforcement Section (P. O. Box 176, Jefferson City, MO 65102) no later than ten (10) days after the end of the month during which the records required by Special Condition 1.C. show that the truck traffic limits have been exceeded.
2. Ethanol Production Limits
- A. First Missouri Energy shall limit its annual denatured ethanol production rate to 68,250,000 gallons per twelve (12) consecutive month period.
  - B. To demonstrate compliance with Special Condition 2.A., First Missouri Energy shall keep a record of the amount of ethanol produced per twelve (12) consecutive month period. Attachment C, or equivalent forms, shall be used for this purpose.
  - C. First Missouri Energy shall report to the Air Pollution Control Program's Enforcement Section (P.O. Box 176, Jefferson city, MO 65102) no later than ten (10) days after the end of the month during which the records required by Special Condition 2.B. show that the ethanol production limitations have been exceeded.
3. Emission Limitations
- A. Emission Limit of Particulate Matter Less than Ten Microns in Diameter (PM<sub>10</sub>).
    - 1.) First Missouri Energy shall not discharge PM<sub>10</sub> into the atmosphere in excess of the listed amounts in Table 3.
    - 2.) The emission rates in Table 3 shall be verified through performance testing as detailed in Special Conditions 11 and 12.

**Table 3: Emission Rate Limits for PM<sub>10</sub>**

Stack ID	Stack Description	Pounds per Hour (lbs/hr)
SV01	Grain Receiving, Grain Handling, Hammermills	1.95
SV02	CO <sub>2</sub> Scrubber	0.04
SV03	Regenerative Thermal Oxidizer	4.13
SV04	Boilers #1 and #2	1.48
SV06	Cooling Tower Cell 1	0.15
SV07	Cooling Tower Cell 2	0.15
SV08	Cooling Tower Cell 3	0.15

- B. Emission Limit of Nitrogen Oxides (NO<sub>x</sub>)
  - 1.) First Missouri Energy shall not discharge NO<sub>x</sub> into the atmosphere in excess of the listed amounts in Table 4.

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- 2.) The emission rates in Table 4 shall be verified through performance testing as specified in Special Conditions 11 and 12.

**Table 4: Emission Rate Limits for NO<sub>x</sub>**

Stack ID	Stack Description	Pounds per Hour (lbs/hr)
SV03	Regenerative Thermal Oxidizer	11.94
SV04	Combined Boiler Stack	7.92

**C. Emission Limit of Sulfur Oxides (SO<sub>x</sub>)**

- 1.) First Missouri Energy shall not discharge SO<sub>x</sub> into the atmosphere in excess of the listed amounts in Table 5.
- 2.) The emission rates in Table 5 shall be verified through performance testing as specified in Special Conditions 11 and 12.

**Table 5: Emission Rate Limits for SO<sub>x</sub>**

Stack ID	Stack Description	Pounds per Hour (lbs/hr)
SV03	Regenerative Thermal Oxidizer	3.49
SV04	Combined Boiler Stack	0.11

**D. Emission Limit of Carbon Monoxide (CO)**

- 1.) First Missouri Energy shall not discharge CO into the atmosphere in excess of the listed amounts in Table 6.
- 2.) The emission rates in Table 6 shall be verified through performance testing as specified in Special Conditions 11 and 12.

**Table 6: Emission Rate Limits for CO**

Stack ID	Stack Description	Pounds per Hour (lbs/hr)
SV03	Regenerative Thermal Oxidizer	13.42
SV04	Combined Boiler Stack	7.92

**E. Emission Limit of Hazardous Air Pollutants (HAPs)**

- 1.) First Missouri Energy shall emit less than twenty-five (25.0) tons of combined HAPs from this installation in any consecutive twelve (12) month period. Attachment D, *Total Annual HAPs Emissions Tracking Record*, or equivalent form(s), shall be used to demonstrate compliance.
- 2.) First Missouri Energy shall emit less than ten (10.0) tons of individual HAPs (with the exception of acetaldehyde and formaldehyde) from this installation in any consecutive twelve (12) month period. Attachment E, *Monthly Individual HAPs Emissions Tracking Record*, or equivalent form(s), shall be used to

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- demonstrate compliance.
- 3.) First Missouri Energy shall emit less than nine (9) tons of acetaldehyde and two (2) tons of formaldehyde from this installation in any consecutive twelve (12) month period. Attachment E, *Monthly Individual HAPs Emissions Tracking Record*, or equivalent form(s) shall be used to demonstrate compliance.
- 4.) First Missouri Energy shall not discharge acrolein into the atmosphere in excess of the listed amounts in Table 7. The emission rates shall be verified through performance testing as specified in Special Conditions 11 and 12.

**Table 7: Emission Rate Limits for Acrolein**

Stack ID	Stack Description	Pounds per Hour (lbs/hr)
SV2	Scrubber Stack	0.008
SV3	Regenerative Thermal Oxidizer	0.03

- 5.) First Missouri Energy shall report to the Air Pollution Control Program's Enforcement Section (P. O. Box 176, Jefferson City, MO 65102) no later than ten (10) days after the end of the month during which the records required by Special Condition 3.E.1.3.E.2., and 3.E.3. show that the combined and Individual HAPs limits have been exceeded.
4. Control Measure – Buildings and Enclosures
- A. Grain unloading and handling operations
    - 1.) The grain unloading operations (both truck and rail unloading) shall be located in building(s) and exhausted to baghouses.
    - 2.) The grain unloading building(s) shall be kept under negative pressure to demonstrate 100% capture efficiency. First Missouri Energy shall demonstrate negative pressure by using visual indicators such as streamers, talc puff test, negative pressure gauges, etc. at each of the openings of the building (i.e. doors, windows, etc) that are not closed during normal operations. Each opening must indicate the presence of negative pressure for compliance.
    - 3.) The truck entrance and exit doors shall be closed at all times except during truck entry and exit.
    - 4.) It is not feasible to require that the train entrances and exits be closed during grain unloading. However, the train entrances and exits shall be maintained under negative pressure as specified in special condition 4.A.2. The train entrances and exits shall be closed at all times when train unloading is not being used.
    - 5.) The grain handling equipment shall be fully enclosed and vented to

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## SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- baghouses. Underground handling equipment shall be considered fully enclosed.
- 6.) No visible emissions shall be present at the grain unloading building and any grain handling equipment except those gases being drawn into the baghouse intakes. No visible emissions are indicated by zero percent (0%) opacity. First Missouri Energy shall perform a visible emissions check on the building and the handling equipment at least once in every twenty-four (24) hour period. Results should be kept in a log.
- B. DDGS loading operation (EU46), DDGS storage silo (EU12), and DDGS handling equipment (EU11)
- 1.) The DDGS storage silos and DDGS handling equipment shall be totally enclosed and vented to a baghouse. Underground handling equipment shall be considered fully enclosed.
- 2.) The DDGS loadout operations shall be located in building(s) and vented to a fabric sock.
- C. Hammermills (EU09 and EU10)
- 1.) The hammermills shall be enclosed by ductwork and exhausted to baghouses.
- 2.) The enclosures shall be maintained under negative pressure to demonstrate 100% capture efficiency.
- 3.) First Missouri Energy shall demonstrate negative pressure by using visual indicators such as streamers, talc puff test, negative pressure gauges, etc. at openings that are not closed during normal operations. Each openings must indicate the presence of negative pressure for compliance.
- 4.) The negative pressure should be maintained such that no visible emissions are allowed to occur except those gases being drawn into the baghouse intakes. No visible emissions is indicated by zero percent (0%) opacity.
- 5.) First Missouri Energy shall perform a visible emissions check and a visual indicator check on the enclosures at least once in every twenty-four (24) hour period. Results shall be kept in a log.
5. Control Equipment – Baghouses and Fabric Socks
- A. Baghouses must be in use at all times when the following equipment are in operation:

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

**Table 8: Equipment to be Controlled by Baghouses**

Emission Units	Emission Unit Description
EU01, EU02	Truck Grain Unloading
EU03	Rail Grain Unloading
EU04, EU05, EU06	Grain Handling Equipment
EU07, EU08	Grain Silos
EU09, EU10	Hammermills
EU11	DDGS Handling
EU12	DDGS Silo

- B. A fabric sock must be in use at all times when the following equipment is in operation.

**Table 9: Equipment to be Controlled by a Fabric Sock**

Emission Units	Emission Unit Description
EU46	DDGS Loadout

- C. The baghouses and fabric sock and any related instrumentation or equipment shall be operated and maintained in accordance with the manufacturer's specifications. The baghouses and fabric sock shall be equipped with gauges or meters, which indicate the pressure drop across them. These gauges or meters shall be located such that Department of Natural Resources' employees may easily observe them.
- D. Replacement bags and socks shall be kept on hand at all times. The bags and socks shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
- E. First Missouri Energy shall monitor and record, in an operating and maintenance log, the operating pressure drop across the baghouses and fabric sock at least once every 24 hours. Either paper copy or electronic formats of the log are acceptable. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty. If the pressure drop reading shall fall outside of this normal operating range, then the associated equipment shall be shut down as quickly as is feasible and corrective action taken to address the cause of the pressure drop problem. The problem shall be corrected and the baghouse shall be operational before restarting the equipment.
- F. First Missouri Energy shall maintain an operating and maintenance log for

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The permittee is authorized to construct and operate subject to the following special conditions:

the baghouses and fabric sock which shall include the following:

- 1.) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions
- 2.) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
- 3.) A record of regular inspection schedule, the date and results of all inspections, including any actions or maintenance activities that result from the inspections. Either paper copy or electronic formats are acceptable.

6. Control Equipment – Wet Scrubber

- A. The wet scrubber must be in use at all times when the following equipment are in operation:

**Table 10: Equipment to be Controlled by Wet Scrubbers**

<b>Emission Unit</b>	<b>Emission Unit Description</b>
EU13	Slurry Tank
EU14	Liquefaction Tank #1
EU15	Liquefaction Tank #2
EU16	Fermenter #1
EU17	Fermenter #2
EU18	Fermenter #3
EU19	Fermenter #4
EU20	Beer Well
EU21	Beer Stripper
EU22	Rectifyer
EU23	Side Stripper
EU24	Molecular Sieve #1
EU25	Molecular Sieve #2
EU26	Evaporator System
EU27	Yeast Tank
EU28	190 Proof Rundown Tank
EU29	Whole Stillage Tank
EU30	Centrifuge#1
EU31	Centrifuge #2
EU32	Thin Stillage Tank
EU33	Syrup Tank

- B. The scrubber and any related instrumentation or equipment shall be operated and maintained in accordance with the manufacturer's specifications. The scrubber shall be equipped with a gauge or meter that indicates the pressure drop across the scrubber and with a flow meter that indicates the flow through the scrubber. These gauges and meters shall be located in such a way they may be easily observed by Department of Natural Resources' personnel.

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### SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- C. First Missouri Energy shall monitor and record the operating pressure drop across the scrubber at least once every twenty-four (24) hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
  - D. First Missouri Energy shall monitor and record the flow rate through the scrubber at least once every twenty-four (24) hours. The flow rate shall be maintained within the design conditions specified by the manufacturer's performance warranty and conditions established in special conditions 11 and 12.
  - E. First Missouri Energy shall maintain an operating and maintenance log for the scrubber, which shall include the following.
    - 1.) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions.
    - 2.) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
    - 3.) A record of regular inspection schedule, the date and results of all inspections, including any actions or maintenance activities that result from the inspection. Either paper copy or electronic formats are acceptable.
7. Control Equipment – Dryer Cyclone (EU36)
- A. The dryer cyclone must be in use at all times when the DDGS Dryer (EU35) and the DDGS Cooler (EU34) are in operation. The dryer cyclone shall be vented to the Regenerative Thermal Oxidizer at all times when it is in operation. The cyclone shall be operated and maintained in accordance with the manufacturer's specifications.
  - B. The dryer cyclone shall be equipped with a gauge or meter that indicates the pressure drop across the cyclone. First Missouri Energy shall monitor and record the operating pressure drop across the cyclone at least once every twenty-four (24) hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
  - C. First Missouri Energy shall maintain an operating and maintenance log for the cyclone, which shall include the following:
    - 1.) Incidents of malfunction, with impact on emissions, durations of event, probable cause, and corrective actions; and
    - 2.) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
    - 3.) A written record of regular inspection schedule, the date and results

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

of all inspections include any actions or maintenance activities that result from that inspection.

8. Control Equipment – Regenerative Thermal Oxidizer (RTO)  
 A. The regenerative thermal oxidizer must be in use at any time when the following equipment are in operation.

**Table 11: Equipment to be Controlled by RTOs**

Emission Unit	Emission Point Description
EU34	DDGS Cooler
EU35	DDGS Dryer
EU36	Dryer Cyclone

- B. The regenerative thermal oxidizer shall be operated and maintained in accordance with the manufacturer’s specifications.
- C. Emission rates of PM<sub>10</sub>, VOC, HAPs, CO and NO<sub>x</sub> shall be tested, as detailed in Special Condition 11 and 12, to verify that the thermal oxidizer is operating as assumed.
- D. The operating temperature of the regenerative thermal oxidizer shall be continuously monitored and recorded during operations. The operating temperature of the thermal oxidizer shall be maintained on a rolling 3-hour average to be no less than 50 degrees Fahrenheit below the average temperature of the oxidizer recorded during the compliance test specified in Special Condition 11, which demonstrated compliance with the emission limits. The acceptable temperature range may be reestablished by performing a new set of emission tests.
- E. First Missouri Energy shall maintain an operating and maintenance log for regenerative thermal oxidizers which shall include the following:
- 1.) Incidents of malfunction, with impact on emissions, duration of events, probable cause, and corrective actions taken.
  - 2.) Maintenance activities, with inspection schedules, repair actions, and replacements.
  - 3.) A record of regular inspection schedule, the date and results of all inspections, including any actions or maintenance activities that result from the inspections. Either paper copy or electronic formats are acceptable.
9. Control Equipment – Flare  
 A. A flare must be in use at all times during denatured ethanol truck loadout (EU40), denatured ethanol rail loadout (EU41) and denatured ethanol barge loadout (EU42) to control emissions.  
 B. The flare shall be operated and maintained in accordance with the

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The permittee is authorized to construct and operate subject to the following special conditions:

manufacturer's specifications.

- C. First Missouri Energy shall maintain an operating and maintenance log for the flare, which shall include the following.
    - 1.) Incidents of malfunction, with impact on emissions, duration of events, probable cause, and corrective actions taken.
    - 2.) Maintenance activities, with inspection schedules, repair actions, and replacements.
    - 3.) A record of regular inspection schedule, the date and results of all inspections, including any actions or maintenance activities that result from the inspections. Either paper copy or electronic formats are acceptable.
  - D. The flare must be operated in accordance with 40 CFR Part 60.18, *General Control Device Requirements*. First Missouri Energy shall maintain records that sufficiently indicate compliance with 40 CFR Part 60.18.
10. Haul Road Emissions Limitations
- A. First Missouri Energy shall limit its haul road emissions to below 0.15 pounds per vehicle miles traveled (lbs/VMT).
  - B. The emission rate in Special Condition 10.A. shall be verified through performance testing as specified in Special Conditions 11 and 12.
11. Performance Testing
- A. First Missouri Energy shall conduct performance tests to verify the emission rates as follows:
    - 1.) The stacks listed in Special Conditions 3.A. Table 3 shall be tested to determine the PM<sub>10</sub> emission rates. These emission rates shall not exceed the amounts listed in Table 3.
    - 2.) The stacks listed in Special Conditions 3.B. Table 4 shall be tested to determine the NO<sub>x</sub> emission rates. These emission rates shall not exceed the amounts listed in Table 4.
    - 3.) The stacks listed in Special Condition 3.C. Table 5 shall be tested to determine the SO<sub>x</sub> emission rates. These emission rates shall not exceed the amounts listed in Table 5.
    - 4.) The stacks listed in Special Condition 3.D. Table 6 shall be tested to determine the CO emission rates. These emission rates shall not exceed the amounts listed in Table 6.
    - 5.) The following stacks shall be tested to determine total HAP emission rates when all equipment controlled by these devices are in operation: The CO<sub>2</sub> scrubber (SV02) and the regenerative thermal oxidizer (SV03). These emission rates shall be used to

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

- 6.) demonstrate compliance with Special Conditions 3.E.1. The following stacks shall be tested to determine the emission rates of acetaldehyde, formaldehyde, and methanol when all equipment controlled by these devices are in operation: The CO<sub>2</sub> scrubber (SV02) and the regenerative thermal oxidizer (SV03). These emission rates shall be used to demonstrate compliance with Special Condition 3.E.2. and 3.E.3.
- 7.) The following stacks shall be tested to determine the emission rates of acrolein when all equipment controlled by these devices are in operation: The CO<sub>2</sub> scrubber (SV02) and the regenerative thermal oxidizer (SV03). These emission rates shall be used to demonstrate compliance with Special Condition 3.E.4.
- 8.) A summary of stack testing requirements from special conditions 11.A.1 to 11.A.7. are given below in Table 12. The emission rates for the pollutants listed shall be determined in the units specified in Column D and used to demonstrate compliance with special conditions from column F.

**Table 12: Summary of Stack Tests**

Column A Emission Point	Column B Description	Column C Pollutant	Column D Units	Column E Attachments	Column F Special Conditions
SV01	DDGS, Hammermill, Grain Handling Baghouses	PM <sub>10</sub>	lb of pollutant/hr	N/A	3.A.1 and 3.A.2
SV02	Wet Scrubber	PM <sub>10</sub> , HAPs	lb of pollutant/hr, lbs of pollutant/1,000 gallons of ethanol	D and E	3.A.1 and 3.A.2 3.E.1, 3.E.2, 3.E.3, 3.E.4. and 3.E.5
SV03	RTO	PM <sub>10</sub> , NO <sub>x</sub> , SO <sub>x</sub> , CO, HAPs	lb of pollutant/hr lbs of pollutant/1,000 gallons of ethanol	D and E	3.A.1 and 3.A.2 3.B.1 and 3.B.2 3.C.1 and 3.C.2 3.D.1 and 3.D.2 3.E.1, 3.E.2, 3.E.3, 3.E.4. and 3.E.5
SV04	Boilers #1 and #2	PM <sub>10</sub> , NO <sub>x</sub> , SO <sub>x</sub> , CO	lb of pollutant/hr	N/A	3.A.1 and 3.A.2, 3.B.1, and 3.B.2 3.C.1 and 3.C.2 3.D.1 and 3.D.2
SV06	Cooling Tower Cell #1	PM <sub>10</sub>	lb of pollutant/hr	N/A	3.A.1 and 3.A.2
SV07	Cooling Tower Cell #2	PM <sub>10</sub>	lb of pollutant/hr	N/A	3.A.1 and 3.A.2
SV08	Cooling Tower Cell #2	PM <sub>10</sub>	lb of pollutant/hr	N/A	3.A.1 and 3.A.2

N/A – Not Applicable

- B. The haul road emissions (in lbs/VMT) shall be determined using the

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The permittee is authorized to construct and operate subject to the following special conditions:

Exposure Profiling Test Method as outlined in the *Emission Tests of Paved Road Traffic at ADM's Marshall, Minnesota Facility, Test Report*, submitted with the application. The emission rate shall be used to demonstrate compliance with special condition 10.A. The operating parameters (i.e. truck speed, truck weight, etc.) at which the test is conducted shall be used in actual operations of the plant. These operating parameters shall be determined and agreed upon by the Air Pollution Control Program's Enforcement Section and First Missouri Energy before the start of the test.

- C. The operating parameters (i.e. water flowrate, pH level, amount of additives, temperature, pressure, etc.) at which the stack tests are conducted shall be used to set the appropriate values used in actual operations of the following control devices.
- 1.) The wet scrubber.
  - 2.) The regenerative thermal oxidizer.
- The values of the operating parameters to be used during the test shall be agreed upon by the Air Pollution Control Program's Enforcement Section and First Missouri Energy before the start of the performance tests. The values of the operating parameters to be used during the test and during the actual operation of the plant shall be determined and agreed upon by the Air Pollution Control Program's Enforcement Section and First Missouri Energy.
- D. Since the dryer cyclone (EU36) is vented to the regenerative thermal oxidizer, the performance of the regenerative thermal oxidizer is dependent upon the performance of the dryer cyclone. The cyclone must be in use when the performance tests for the RTO are being performed. The parameters (i.e. pressure drop, gas flow rate, etc.) at which the cyclone operated during the stack test for the RTO shall be used to set appropriate values used in actual operations of the plant. The values of the operating parameters to be used during the test and during the actual operation of the plant shall be determined and agreed upon by the Air Pollution Control Program's Enforcement Section and First Missouri Energy.
- E. The operating parameters discussed in Special Condition 11.C. and 11.D. shall be recorded and be made available to Department of Natural Resources personnel upon request. The frequency of the record keeping is dependent upon the parameters being kept and should be determined and agreed upon by the Air Pollution Control Program's Enforcement Section and First Missouri Energy before the start of the performance

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**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

tests.

- F. The performance tests for the wet scrubbers (CE04, SV02) shall be conducted for one of the following time periods
- 1.) A complete fermentation cycle, defined as the time period between load-in and load-out of material. For the fermentation process, where many fermenters are used, the time period to be tested is the complete cycle for one fermenter.

**Or**

- 2.) During period(s) of maximum emissions. First Missouri Energy shall submit, in the proposed test plan outlined in Special Condition 12, sufficient data to determine the point(s) of maximum emissions. These points must be approved by the Air Pollution Control Program's enforcement section prior to conducting the tests. If sufficient data is not supplied supporting these maximum emission points, First Missouri Energy must conduct testing for the time period outlined in Special Condition 11.F.1.
- G. The testing required may be limited to conducting tests on a representative piece(s) of each type of equipment upon approval by the Director. In addition, an alternate method(s) of quantifying the emission rates of criteria air pollutants from these sources may be used in place of the above testing requirement if requested by First Missouri Energy and approved by the Director.
- H. All performance tests required shall be performed within sixty (60) days after achieving the maximum production rate of the installation, but no later than 180 days after initial start-up for commercial operation.
- I. All performance tests required shall be conducted in accordance with the stack test procedures outlined in Special Condition 12.
- J. First Missouri Energy shall conduct performance tests to verify the emission rates as indicated in Special Condition 11.A. and 11.B. once every five (5) years from the date of the most recent performance tests, except for the baghouse stack (SV01). The baghouse stack shall be tested once upon startup in accordance with Special Condition 11.H. No further testing will be necessary for the baghouses unless the tests do not show compliance with limits in this permit or the facility modifies the equipment or the process that could cause a change in emission rates

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Project No.	2007-05-066

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

from these sources.

**12. Proposed Test Plan and Final Test Report**

- A. A completed proposed test plan form must be submitted to the Air Pollution Control Program thirty (30) days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The proposed test plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing.
- B. Two (2) copies of a written report of the performance test results shall be submitted to the Director within thirty (30) days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U. S. EPA Method for at least one (1) sample run.
- C. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations.
- D. If the performance testing required by Special Condition 11 of this permit indicates that any of the emission limits specified in this permit are being exceeded, First Missouri Energy must propose a remedial plan to the Air Pollution Control Program within thirty (30) days of submitting the performance test results. This plan must demonstrate how First Missouri Energy will reduce the emission rates to show compliance with specified limits in this permit. First Missouri Energy must implement any such plan immediately upon its approval by the Director and conduct stack testing.

**13. Cooling Tower Requirements**

- A. The cooling tower(s) shall be operated and maintained in accordance with the manufacturer's specifications. Manufacturer's specifications shall be kept onsite and made readily available to Department of Natural Resources' Employees.
- B. The cooling water circulation rate shall not exceed 30,000 gallons per minute.
- C. First Missouri Energy shall keep records of the monthly and 12-month rolling averages of the amount of water circulated.

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#### SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- D. The drift loss from the towers shall not exceed 0.002 percent of the water circulation rate. Verification of drift loss shall be by manufacturer's guaranteed drift loss and shall be kept onsite and be made readily available to Department of Natural Resources' employees upon request.
  - E. The total dissolved solids (TDS) concentration in the circulated cooling water shall not exceed a TDS concentration of 1,500 parts per million (ppm). A TDS sample shall be collected and the results recorded monthly to verify the TDS concentration.
  - F. The requirements for TDS Sample collection may be eliminated or the frequency reduced upon written approval by the Air Pollution Control Program if TDS sampling results demonstrate compliance for twenty-four (24) consecutive months.
14. Emergency Equipment Requirements
- A. The amount of time used for maintenance and readiness testing of the emergency fire pump shall not exceed one (1) hour in any twenty-four (24) hour period and 100 hours in any consecutive 12-month period. To facilitate the record keeping for this condition, the emergency fire pump shall be equipped with a non-resettable running time meter.
  - B. Attachment F and Attachment G, or equivalent form(s), shall be used to record the daily and annual hours of operation to show compliance with Special Condition 14.A.
  - C. First Missouri Energy shall report to the Air Pollution Control Program's Enforcement Section at P.O. Box 176, Jefferson City, MO, 65102, no later than ten (10) days after the end of the month during which the records from Special Condition 14.B. indicate that the source exceeds the Special Condition 14.A..
15. Method to Restrict Public Access to Barge Area
- A remote monitoring surveillance system (i.e. surveillance cameras) capable of providing for the monitoring of the barge loadout area and at least hourly observation of the surveillance monitors for the presence of unescorted and/or unauthorized persons shall be installed. The observations shall be conducted by personnel specifically trained to be aware of trespassers and to initiate actions for the removal of trespassers upon discovery.
16. Operating Permit Requirements

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Project No.	2007-05-066

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

First Missouri Energy shall apply for and receive a Basic Operating Permit from the Air Pollution Control Program for this installation.

17. **Requirements for Future Emission Alterations**  
If the emissions from this installation as permitted, ever increase above 250 tons per year for PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, VOC or CO, when the production capacity is at or below 68,250,000 gallons denatured ethanol per year, then First Missouri Energy will be required to conduct a New Source Review in accordance with 10 CSR 10-6.060(8).
18. **Record Keeping Requirements**  
All records required by this permit shall be kept onsite for no less than five (5) years and shall be made available to any Department of Natural Resources' personnel upon request.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (6) REVIEW

Project Number: 2007-05-066  
Installation ID Number: 201-0122  
Permit Number:

First Missouri Energy  
County Highway 307  
Scott City, MO 63780

Complete: February 27, 2008

Scott County (S27, T30N, R14E)

REVIEW SUMMARY

- First Missouri Energy has applied for authority to construct a new 68.25 million gallons per year denatured ethanol plant.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are acetaldehyde, acrolein, formaldehyde and methanol.
- The following New Source Performance Standards (NSPS) **apply** to this installation:
  - 40 CFR Part 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels*, applies to the storage tanks.
  - 40 CFR Part 60, Subpart VVa, *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Manufacturing Industry for Which Construction Reconstruction, or Modification Commenced After November 7, 2006* apply to the installation.
  - 40 CFR Part 60, Subpart IIII, *Standards of Performance for Compression Ignition Internal Combustion Engines* apply to the emergency firewater pump.
  - 40 CFR Part 60 Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional-Steam Generating Units* apply to the boilers.
- The following New Source Performance Standards (NSPS) **do not apply** to this installation.
  - 40 CFR Part 60, Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*, does not apply to the boilers because the boilers have design rates less than 100 MMBTU/hr. .
  - 40 CFR Part 60, Subpart DD, *Standards of Performance for Grain Elevators*, does not apply to the grain storage and milling operation because the operation does not fit the definition of a grain storage elevator or a grain terminal elevator.
  - 40 CFR, Subpart III, *Standards of Performance for VOC Emissions from SOCM I Air Oxidation Unit Processes* does not apply to this installation because it does not produce any chemicals listed in §60.617 of the subpart as a product, co-product, by-product, or intermediate.
  - 40 CFR, Subpart NNN, *Standards of Performance for VOC Emissions from SOCM I Distillation Operations* does not apply to this installation because the EPA did not consider bio-processes in the development of this subpart.

- 40 CFR, Subpart RRR, *Standards of Performance for VOC Emissions from SOCFI Reactor Processes* does not apply to this installation because the EPA did not consider bio-processes in the development of this subpart.
  - 40 CFR, Subpart XX, *Standards of Performance for Bulk Gasoline Terminals*, does not apply to this installation since the fuel ethanol manufactured by the installation does not satisfy the Subpart XX definition of gasoline.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to the proposed equipment.
  - Subpart ZZZZ, *National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, of the Maximum Achievable Control Technology (MACT) applies to the emergency fire pumps.
  - Baghouses, wet scrubbers, and regenerative thermal oxidizers are being used to control the PM<sub>10</sub>, VOC, NO<sub>x</sub>, CO and HAP emissions from the equipment in this permit.
  - This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of pollutants are below major source levels.
  - This installation is located in Scott County, an attainment area for all criteria air pollutants.
  - This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].
  - Ambient air quality modeling was performed to determine the ambient impacts of PM<sub>10</sub>, SO<sub>x</sub>, NO<sub>x</sub>, CO and acrolein.
  - Emissions testing is required for the source.
  - A Basic Operating Permit is required for this installation within 30 days of equipment startup.
  - Approval of this permit is recommended with special conditions.

#### INSTALLATION DESCRIPTION

First Missouri Energy is proposing to construct a new ethanol plant with a maximum production capacity of 68,250,000 gallons per year of denatured ethanol. The installation will use corn (grain) to produce denatured ethanol. The installation will also produce dried distillers grain with solubles (DDGS) as byproduct of the ethanol production process. No wet distiller grain with solubles (WDGS) will be produced, except in the case when the DDGS dryers have to be shut down due to malfunction and the WDGS that are not dried need to be stored and shipped offsite.

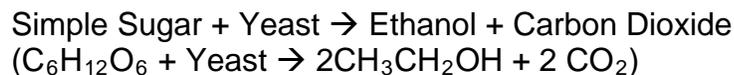
This installation is a minor source and the permit is issued under 10 CSR 10-6.060 (6). A basic operating permit is required for this installation.

## PROJECT DESCRIPTION

First Missouri Energy has applied for authority to construct a 68,250,000 gallons per year denatured ethanol plant. The installation purchases corn (grain) and hauls it to the facility by truck and/or railcars. The truck and rail loading pits are located in a building with overhead doors at each end of the receiving area. After unloading, the grain is transferred to silos (EU07, EU08) for storage. The dump pits and associated grain transfer points are controlled by a baghouse (CE01). The transfer equipment are fully enclosed and vented to this baghouse.

The grain is transferred from the silos to hammermills (EU09, EU10) to be crushed. The hammermills are enclosed and vented to a baghouse. After grinding by hammermills, the grain is transferred to the process area where water is added to the grain to create a slurry. The slurry is cooked, liquefacted with enzymes, and cooled. The mash is then mixed with yeast and more enzymes in the fermenters (EU16, EU17, EU18, EU19).

The chemical equation occurring during fermentation is



After approximately forty-eight (48) hours of fermentation, the resultant liquid (beer) will contain 11% to 15% ethanol by weight. The emissions from the forming of slurry, the liquefaction process and the fermentation process are controlled by a CO<sub>2</sub> scrubber (CE04) vented to the atmosphere.

The beer is distilled in a three-column distillation process to produce 190-proof ethanol (95% ethanol, 5% water) and whole stillage consisting of solids and water. Using molecular sieves, the remaining 5% water is removed to produce 200-proof ethanol (100% ethanol). The 200-proof ethanol is then combined with up to 5% natural gasoline (denaturant) to produce denatured ethanol. The denatured ethanol is unloaded into trucks, rail cars, or barges for shipping off-site.

The stillage consisting of solids and water is sent to centrifuges (EU30, EU31) where water is removed. The removed water is evaporated until syrup remains. The syrup is combined with the centrifuged wet spent grain and dried in a natural gas fired dryer. The spent grains product is an animal feed called Dry Distiller Grains with Solubles (DDGS). The DDGS is then conveyed to a storage silo. The DDGS and fuel ethanol are loaded into trucks, railcars or barges for loadout.

Steam is required for the process. The installation uses two (2) natural gas fired boilers with a maximum capacity of 99 mmBTU/hr each (EU38, EU39). There is one diesel-powered emergency firewater pump. The pump shall be limited to operating a maximum of 100 hours per year and one (1) hour per day for maintenance and

readiness testing purposes. There is a cooling tower at the installation and the recirculating water shall be limited to 1,500 parts per million (ppm) of total dissolved solids (TDS) concentration.

### EMISSIONS/CONTROLS EVALUATION

The pollutants of concern for this review are PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, VOCs, CO and HAPs. The following tables provide the emissions summary for this project.

**Table 8: Emissions Summary (tons per year)**

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Application	*New Installation Conditioned Potential
PM <sub>10</sub>	15.0	N/A	N/A	36.40	N/A
SO <sub>x</sub>	40.0	N/A	N/A	16.04	N/A
NO <sub>x</sub>	40.0	N/A	N/A	90.86	N/A
VOC	40.0	N/A	N/A	126.77	N/A
CO	100.0	N/A	N/A	94.30	N/A
HAPs	10.0/25.0	N/A	N/A	13.10	<10.0/25.0

The sources of these emissions are discussed below.

#### *Grain Hauling*

The PM<sub>10</sub> emissions from the haul roads were estimated by using an emission rate of 0.15 lbs/VMT. This number is proposed by First Missouri Energy and First Missouri Energy shall conduct performance tests to ensure that this number is not exceeded.

#### *Grain Handling and Storage*

PM<sub>10</sub> will be emitted from the grain receiving, handling, storage, and milling processes. All of these processes occur in buildings and/or enclosures. PM<sub>10</sub> emissions from these sources will be controlled by baghouses (CE01, CE02) which are given a PM<sub>10</sub> emission rate of 0.003 gr/dscf each (from manufacturer's guarantee). The emissions from the baghouses are combined and vented through one stack. The combined emissions from this stack are calculated to be 1.95 lbs/hr. First Missouri Energy shall perform stack tests to ensure that this number is not exceeded. 100% capture efficiency is given for the grain unloading building and for grain handling, storage, and milling processes. First Missouri Energy shall install visual devices, such as vacuum pressure gauges, on all openings to ensure that negative pressure can be achieved.

#### *Liquefaction, Fermentation, Distillation, DDGS Production*

Emissions from liquefaction, fermentations, and distillation will be controlled by a scrubber. PM<sub>10</sub>, VOCs, and HAPs emissions are expected from these processes. The emission rates used in the permit analysis are rates submitted by First Missouri Energy, and the company shall conduct stack tests to ensure compliance with the submitted

numbers.

### *DDGS Storage and Loadout*

The DDGS will be conveyed to silos for storage. The conveyors and the silo will be enclosed and vented through a baghouse (CE03). These DDGS handling equipment were given 100% capture efficiency and First Missouri Energy shall install visual indicators, such as vacuum pressure gauges, to ensure that negative pressure can be achieved. The emissions from the DDGS handling baghouse will be vented through the same stack as emissions from grain receiving, handling, and milling. The DDGS will be loaded into trucks, rail cars, or barges. The DDGS loading into trucks and rail cars will occur in the same building as the grain unloading and the emissions from this process will be controlled by a fabric sock. The fabric sock is given 75% overall control efficiency.

### *Storage Tanks and Ethanol Loadout*

VOCs will be emitted from the storage tanks and truck/rail loadout. Storage tank emissions were calculated using TANKS 4.0. Emissions from ethanol loadout are controlled by a smokeless, open flare. Loadout VOC Emissions were determined using AP-42, Section 5.2, *Transportation and Marketing of Petroleum Liquids* and giving a capture efficiency of 90% and a flare control efficiency of 98%. The PM<sub>10</sub> emissions were considered negligible since the flare is of a smokeless design. Emissions of other pollutants from the flare were calculated using emission factors from AP-42, Section 13.5, *Industrial Flares*. Since performance tests are difficult for open flares, none are required for the flare to show emissions compliance. However, First Missouri Energy shall operate the flare in accordance with 40 CFR 60.18 *General Control Device Requirements* and maintain records sufficient to show compliance with 40 CFR 60.18.

### *Fugitive Emissions from Equipment Leaks*

Fugitive VOC emissions will occur from plant piping, such as valves and pumps in light and heavy service, gas valves, compressor seals, pressure relief valves, sampling connections, and connectors. First Missouri Energy will perform Leak Detection and Repair (LDAR) in accordance with NSPS, Subpart VV (40 CFR 60.480 through 60.489). Fugitive emissions from the components within the plant piping system were estimated based on EPA's Synthetic Organic Chemical Manufacturing Industry (SOCMI) emission factors in EPA document 453/R-95-017, *Protocol for Equipment Leak and Emission Estimates*.

### *Steam Generation*

Steam is required for the ethanol production process. First Missouri Energy will use two (2) natural gas fired boilers with a maximum capacity of 99.0 MMBTU/hr each. SO<sub>x</sub>, PM<sub>10</sub>, and VOC emissions were calculated by using emission factors from AP-42, Section 1.4, *Natural Gas Combustion*. Since the sulfur emission factor in AP-42 is based on fuel sulfur content of 2,000 grains/mmscf, First Missouri Energy shall not use natural gas with higher sulfur content. NO<sub>x</sub> and CO emissions were based on

manufacturer's guarantee for natural gas combustion using low NO<sub>x</sub> burners. First Missouri Energy shall perform stack tests to ensure that all the emission rates will not be exceeded.

#### *Non-Contact Cooling Tower*

PM<sub>10</sub> emissions from the cooling tower were calculated with a mass balance approach using drift loss (0.002%), total dissolved solids (TDS) concentration in the recirculating water (1,500 ppm), and water circulation rate (30,000 gallons per minute) as suggested by AP-42, Section 13.4, *Cooling Towers*.

#### *Emergency Firewater Pump*

A diesel-powered emergency firewater pump is permitted for the plant. Potential emissions of criteria pollutants from the pump were estimated using emission factors from AP-42, Section 3.3, *Gasoline and Diesel Industrial Engines* and based on 100 hours of operation per year for maintenance and readiness testing. For the twenty-four (24) hour averaging time PM<sub>10</sub> modeling, the emission rate used is based on one hour of operation per day.

### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of pollutant are above de minimis levels.

### APPLICABLE REQUIREMENTS

First Missouri Energy shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. The installation is required to apply for an operating permit within thirty days after startup of equipment. This operating permit, once issued will have a complete list of applicable requirements for your installation.

#### GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110  
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

#### SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006*, 40 CFR Part 60, Subpart VVa.
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*, 40 CFR Part 60, Subpart Kb.
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines*, 40 CFR Part 60, Subpart IIII.
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Db.
- *Maximum Achievable Control Technology Regulations*, 10 CSR 10-6.075 – *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ.
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating, 10 CSR 10-3.060*

### AMBIENT AIR QUALITY IMPACT ANALYSIS

Preliminary modeling analyses were performed on CO, NO<sub>x</sub>, SO<sub>x</sub> and PM<sub>10</sub> to determine whether a full impact modeling analysis is necessary. Results show that for these pollutants, the ambient impacts from the installation will be below their respective significance levels, and therefore, a full impact modeling analysis is not necessary. Acrolein emissions are expected to be greater than the Screen Modeling Action Level of 0.04 tons per year, and ambient air quality impact analysis was performed to demonstrate compliance with the acrolein Risk Assessment Levels (RALs). Results show that the ambient impact for acrolein will be below the RALs for all averaging times. Please see the attached memo from the Air Pollution Control Program modeling unit, dated June 4, 2008, for detailed information on the analysis. Modeling was based on site-specific information such as emission rates and daily truck traffic patterns. First Missouri Energy must abide by the limits set in this permit and any information submitted in the application for this project in order to ensure the accuracy and integrity of the modeling analysis.

### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Chia-Wei Young  
Environmental Engineer

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Date

### PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated 5/8/2007, designating First Missouri Energy, LLC as the owner and operator of the installation.
- The revised Application for Authority to Construct form, received 2/27/2008.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Ambient Impact Analysis Memorandum, dated June 4, 2008.

**Attachment A – Daily Truck Tracking Sheet.**

First Missouri Energy, LLC  
 Scott County (S27, T30N, R14E)  
 Project Number: 2007-05-066  
 Installation ID Number: 201-0122  
 Permit Number:

This sheet covers truck traffic during \_\_\_\_\_  
 (Date)

Type of Truck	<sup>1</sup> Truck Tally	<sup>2</sup> Daily Total (by Type)
1. Grain		
2. Ethanol		
3. Denaturant (Gasoline)		
4. DDGS		
5. Misc. Chemicals		

**Notes**

- (1)The “Truck Tally” column is for marking the trucks as they arrive.
- (2)The “Daily Total” column is for the day’s total number of trucks that were counted. The following numbers of trucks indicate compliance: Grain (**73**), Ethanol (**24**), Denaturant (**2**), DDGS (**23**) and Misc. Chemicals (**25**).

**Attachment B – Total Monthly and Annual Truck Traffic**

First Missouri Energy, LLC  
 Scott County (S27, T30N, R14E)  
 Project Number: 2007-05-066  
 Installation ID Number: 201-0122  
 Permit Number:

This sheet covers truck traffic during \_\_\_\_\_  
 (month, year)

Type of Truck	Current Monthly Total	Total from the Beginning of the Calendar Year to Current Month	<sup>1</sup> Current Annual Totals (by Type)	Annual Permit Limits
1. Grain				26,473
2. Ethanol				8,531
3. Denaturant (Gasoline)				406
4. DDGS				8,273
5. Misc. Chemicals				9,125

**Note**

(1)The “Current Annual Total” is the total number of trucks during a calendar year. It is **not** a 12-month rolling total. (i.e. if the “Current Monthly Total” is from July, the “Current Annual Total” is the number of trucks from January through July). It can be calculated by adding the “Current Monthly Total” and the “Total from the Beginning of the Calendar Year to Current Month.” .

**Attachment C – Total Annual Denatured Ethanol Production**

First Missouri Energy, LLC  
 Scott County (S27, T30N, R14E)  
 Project Number: 2007-05-066  
 Installation ID Number: 201-0122  
 Permit Number:

This sheet covers ethanol production from \_\_\_\_\_ through \_\_\_\_\_.  
 (Day/Mo/Yr) (Day/Mo/Yr)

Month	Monthly Denatured Ethanol Production (Gallons)	<sup>1</sup> Annual Denatured Ethanol Production (Gallons/Yr)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

**Note**

(1)The 12-month ethanol totals (gallons) are a rolling total calculated by adding the month’s ethanol production to the monthly ethanol production of the previous eleven (11) months. A total of **68,250,000** gallons indicate compliance.

**Attachment D – Total Annual HAPs Emissions Tracking Record**

First Missouri Energy, LLC  
 Scott County (S27, T30N, R14E)  
 Project Number: 2007-05-066  
 Installation ID Number: 201-0122  
 Permit Number:

This sheet covers ethanol production from \_\_\_\_\_ through \_\_\_\_\_  
 (Day/mo/yr) (Day/mo/yr)

Emission Points	Description	Amount Processed This Month	Emission Factor	<sup>1</sup> Total Monthly Emissions (tons/month)
<b><sup>2</sup>Total Monthly Facility HAP Emissions (Tons) =</b>				
<b><sup>3</sup>Total Annual (12-Month) Facility-Wide HAP Emissions (tons) =</b>				

**Notes**

- (1) Monthly Emissions from each emission point is calculated by multiplying the amount processed by the emission factors. The emission factors can be obtained from three (3) sources where applicable: Stack testing results, EPA document AP-42, or DENCO.
- (2) Total HAP emissions for this month calculated by summing the monthly emissions from each emission point.
- (3) Total Annual (12-Month) Facility-Wide HAP emissions calculated by summing the total monthly HAP emission from the previous 12 months.

**A 12-Month Total HAP emissions of less than 25 tons indicates compliance**

**Attachment E – Monthly Individual HAPs Emission Tracking Record**

First Missouri Energy, LLC  
 Scott County (S27, T30N, R14E)  
 Project Number: 2007-05-066  
 Installation ID Number: 201-0122  
 Permit Number:

This sheet covers ethanol production from \_\_\_\_\_ through \_\_\_\_\_  
 (Day/mo/yr) (Day/mo/yr)

Emission Points	Description	Amount Processed This Month	Emission Factor	Total Monthly Emissions (tons/month)	<sup>1</sup> HAP Species

**Speciated Monthly and Annual HAPs Emissions Summary Table**

HAP Species	Total Emissions This Month (Tons)	Monthly Emission in the Same Month of Prior Year (tons)	<sup>2</sup> Prior Month Annual Emissions (tons/yr)	<sup>3</sup> Current Annual Emissions (tons/yr)

**Notes**

- (1) Each species is compiled individually.
- (2) Prior 12-Month Individual HAP emissions total can be taken from last month's Attachment E.
- (3) Current 12-Month individual HAP emissions can be calculated by the following: *[(total species emissions for this month) – (species emissions from same month of prior year) + (Prior month's annual species emissions)]*

**A 12-Month Individual HAP emissions total (except acetaldehyde and formaldehyde) of less than 10 tons indicates compliance. A 12-Month Individual HAP emission of less than 2 tons of formaldehyde and 9 tons of acetaldehyde indicate compliance.**





Mr. Richard Coonrod  
President  
First Missouri Energy  
4868 Nash Rd.  
Cape Girardeau, MO 63702

RE: New Source Review Permit - Project Number: 2007-05-066

Dear Mr. Hamari:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files.

Operation in accordance with these conditions and your new source review permit application is necessary for continued compliance. This facility is required to submit an operating permit application. Operation in accordance with the future operating permit is also necessary for continued compliance.

The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please contact Chia-Wei Young at the department's Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or telephone (573) 751-4817. Thank you for your time and consideration.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale  
New Source Review Unit Chief

KBH: cwyl

Enclosures

c: Southeast Regional Office  
PAMS File 2007-05-066  
Permit Number: