



## 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: 072010-001 Project Number: 2009-12-025

Parent Company: DeBruce Grain Company Inc.

Parent Company Address: 4100 North Mulberry, Kansas City, MO 64166

Installation Name: DeBruce Grain Company Inc.

Installation Number: 005-0020

Installation Address: 21799 East Avenue, Rock Port, MO 64482

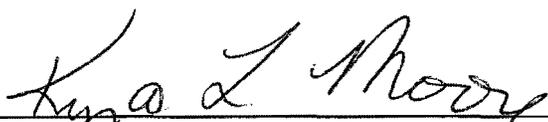
Location Information: Atchison County, S26&35, T65N, R42W

Application for Authority to Construct was made for:  
a new grain elevator. This review was conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

JUL - 1 2010

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 within 30 days of actual startup. 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 Missouri 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."*

DeBruce Grain Company Inc.  
Atchison County, S26&35, T65N, R42W

1. Emission Limitation
  - A. DeBruce Grain Company Inc. shall emit less than 15.0 tons of particulate matter less than ten (10) microns in diameter (PM<sub>10</sub>) in any consecutive 12-month period from the entire installation as defined in Table 1.
  - B. Attachment A or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 1.A.
2. Control Device Requirement-Baffles
  - A. DeBruce Grain Company Inc. shall install and operate one way gravity flow baffles on all receiving pits.
3. Control Device Requirement-Baghouses
  - A. DeBruce Grain Company Inc. shall control emissions from internal handling equipment (EU-05) listed below using baghouses as specified in the permit application.
    - 1) Receiving legs/bucket elevators
    - 2) Wet dryer leg
    - 3) Dry dryer leg
    - 4) Shipping leg
    - 5) Shipping scale
  - B. The baghouses shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources employees may easily observe them.
  - C. Replacement filters for the baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

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#### SPECIAL CONDITIONS:

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

- D. DeBruce Grain Company Inc. shall monitor and record the operating pressure drop across the baghouses at least once every 24 hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
- E. DeBruce Grain Company Inc. shall maintain an operating and maintenance log for the baghouses which shall include the following:
  - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
  - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
- 4. Operational Limitation
  - A. DeBruce Grain Company Inc. shall receive no more than 5.0% of grain received by truck via straight trucks in any consecutive 12-month period.
  - B. Attachment B or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 4.A.
- 5. Haul Roads Requirement
  - A. DeBruce Grain Company Inc. shall control fugitive emissions from all of the haul roads at this site by applying a chemical dust suppressant (such as magnesium chloride, calcium chloride, lignosulfonates, etc.) to unpaved areas.
  - B. The quantities of the chemical dust suppressant shall be applied and maintained in accordance with the manufacture's recommendation (if available) and in sufficient quantities to achieve control of fugitive emissions from these areas while the plant is operating.
  - C. The operator shall record the time, date, and the amount of material applied for each application of the chemical dust suppressant agent on the above areas.
- 6. Record Keeping and Reporting Requirements
  - A. DeBruce Grain Company Inc. shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets (MSDS) for all materials used.

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**SPECIAL CONDITIONS:**

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

- B. DeBruce Grain Company Inc. shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

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

Project Number: 2009-12-025  
Installation ID Number: 005-0020  
Permit Number:

DeBruce Grain Company Inc.  
21799 East Avenue  
Rock Port, MO 64482

Complete: December 16, 2009

Parent Company:  
DeBruce Grain Company Inc.  
4100 North Mulberry  
Kansas City, MO 64166

Atchison County, S26&35, T65N, R42W

REVIEW SUMMARY

- DeBruce Grain Company Inc. has applied for authority to construct a new grain elevator.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are from the combustion of natural gas.
- None of the New Source Performance Standards (NSPS) apply to the installation. NSPS Subpart DD does not apply as the installation is a grain terminal elevator with permanent storage capacity (2,279,700 bushels) less than 2.5 million bushels.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation. None of the currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Baffles, baghouses, and enclosures are being used to control PM and PM<sub>10</sub> emissions from receiving and internal handling. Chemical dust suppressants are being used to control PM and PM<sub>10</sub> emissions from haul roads.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of PM<sub>10</sub> are conditioned below de minimis levels. Potential emissions of PM are conditioned to minor levels.
- This installation is located in Atchison County, an attainment area for all criteria pollutants.

- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed for this review.
- Emissions testing is not required for the equipment.
- No Operating Permit is required for this installation.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

No permits have been issued to DeBruce Grain Company Inc. from the Air Pollution Control Program.

### PROJECT DESCRIPTION

DeBruce Grain Company Inc. herein referred to as DeBruce proposes to construct a new grain elevator in Atchison County near Rock Port, Missouri. The installation will consist of 4 truck receiving pits, 1 rail receiving pit, a natural gas fueled grain dryer, storage of less than 2.5 million bushels, truck and rail shipping, unpaved haul roads, and associated sampling, weighing, and conveying equipment. Internal handling equipment is vented to baghouses. Chemical dust suppressants are applied to haul roads. Most grain is received by hopper truck. Most grain is shipped by rail.

**Table 1. Installation Defined**

Emission Unit	Description	Maximum Hourly Design Rate (tons)	Bottlenecked Maximum Hourly Design Rate (tons)
EU-01	Straight Truck Receiving	<sup>1</sup> <2,250	108
EU-02	Hopper Truck Receiving	<sup>1</sup> <2,250	2,052
EU-03	Rail Receiving	600	0.0
EU-04	Grain Drying	210	210
EU-04b	Grain Drying Combustion	<sup>2</sup> 0.0715	0.0715
EU-05	Internal Handling	2,250	2,160
EU-06	Storage Bin Vents	2,250	2,160
EU-07	Shipping (Truck)	675	342
EU-08	Shipping (Rail)	1,800	1,800
EU-09	Receiving Haul Road	2,250	2,160
EU-10	Shipping Haul Road	675	342

<sup>1</sup> Straight and Hopper Truck Receiving Combined MHDR of 2,250 tons per hour.

<sup>2</sup> MHDR in units of million cubic feet of natural gas per hour.

## EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis for grain processes were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 9.9.1, "Grain Elevators and Processes" May 2003.

DeBruce will have the ability to receive different types of grain at different test weights and moisture contents (densities). Without placing limits on the amount of each grain received, calculations were performed at all grain having the density of 60 pounds per bushel.

DeBruce will have the flexibility to receive grain through a combination of hopper truck, straight truck, or rail. Emission factors are 0.0078, 0.0590, and 0.0078 pounds of PM<sub>10</sub> per ton of grain, respectively. Hopper truck receiving has a lower emission factor compared to straight truck receiving because emissions decrease with decreasing grain free fall height, and the amount of air entrained per unit volume of grain decreases with increasing grain flow rate. Hopper dump trucks typically unload grain at a faster rate than a straight truck, and closer to the receiving pit. Rail receiving will share the same leg with one lane of truck receiving. Truck and rail cannot simultaneously unload to this leg. Although the PM<sub>10</sub> emission factors are the same, there are no haul road emissions associated with rail receiving. Haul road emissions are inherent to truck receiving, making truck receiving the greater potential to emit. Therefore, emissions from rail receiving were not considered in this review. Ninety-five percent of all grain received by truck will be from hopper trucks. One way gravity flow baffles associated with receiving are being used as control devices.

The basis of the emission factor for internal handling, 0.034 pounds of PM<sub>10</sub> per ton of grain, is from traditional elevators. Traditional elevators use a centralized headhouse building where all grain is routed. Most conveyors or legs are exposed and located inside the headhouse building. DeBruce is a modern country elevator, where a traditional headhouse building is not used. The legs and conveyors are enclosed in sheet metal with some being routed outdoors. Enclosing the conveyors is not expected to contribute to the possibility of explosion, due to their self-cleaning design, and being vented to baghouses. A control efficiency of 99 percent is applied to the internal handling emission factor, for enclosure and baghouses. All grain will encounter some form of internal handling, therefore 100 percent capture efficiency is applied.

Internal handling and subsequently storage bin vent emissions are limited to the bottlenecked MHDR of the receiving rate, which originates from one 950 bushel truck unloading every 3 minutes (including repositioning) in each of the three larger pits (each rated at 20,000 bushel per hour) summed with the full MHDR of the one smaller pit (rated at 15,000 bushel per hour). The combined bottlenecked MHDR of hopper and straight truck receiving is 2,160 tons per hour.

The emission factors and control efficiencies used in this analysis for natural gas combustion were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, "Natural

Gas Combustion” May 2003. The dryer is rated 7,000 bushels per hour, but actual rates will vary depending on the initial moisture and desired final moisture of the grain. No control devices are directly associated with drying emissions at this installation.

The bottlenecked MHDR for shipping via truck assumes filling one 950 bushel truck every 5 minutes, including repositioning. According to DeBruce, the bottlenecked MHDR for shipping via rail assumes filling one (5,150 cubic foot, 124 net tons) railcar every 3 minutes, also with repositioning time included. The rail shipping process includes screening to remove foreign material and weighing. These processes are enclosed and their emissions are included in internal handling per AP-42. No control devices are associated with truck or rail shipping at this installation. Receiving and shipping haul roads are unpaved with chemicals/surfactants as controls.

Installation Unconditioned Potential represents the potential of the new installation, assuming continuous operation (8,760 hours per year), with controls. The Installation Conditioned Potential represents the voluntary de minimis limit to avoid PM<sub>10</sub> dispersion modeling. Table 2 provides an emissions summary for this project.

**Table 2: Emissions Summary (tons per year)**

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2008 EIQ)	Installation Unconditioned Potential	Installation Conditioned Potential
PM <sub>10</sub>	15.0	N/A	N/A	308.70	<15.0
PM	25.0	N/A	N/A	1,266.95	61.56
SO <sub>x</sub>	40.0	N/A	N/A	0.19	N/A
NO <sub>x</sub>	40.0	N/A	N/A	31.30	N/A
VOC	40.0	N/A	N/A	1.72	N/A
CO	100.0	N/A	N/A	26.30	N/A
HAPs	10.0/25.0	N/A	N/A	0.59	N/A

N/A = Not Applicable

### 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 PM<sub>10</sub> are conditioned below de minimis levels. Potential emissions of PM are proportionately conditioned to minor levels.

### APPLICABLE REQUIREMENTS

DeBruce Grain Company Inc. 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.

## 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 June 1 for the previous year's emissions.
- *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
- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-3.060

## 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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David Little  
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 December 09, 2009, received December 11, 2009, designating DeBruce Grain Company Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Kansas City Regional Office Site Survey, dated January 4, 2010.
- Missouri Department of Natural Resources Air Pollution Control Program Policy Memo, *Particulate Matter Clarification*, dated April 27, 1998.

## Attachment A - PM<sub>10</sub> Compliance Worksheet

DeBruce Grain Company Inc.  
 Atchison County, S26&35, T65N, R42W  
 Project Number: 2009-12-025  
 Installation ID Number: 005-0020  
 Permit Number: \_\_\_\_\_

This sheet covers the month of \_\_\_\_\_.  
 (month, year)

Emission Description	Throughput (tons)	Emission Factor (pounds of PM <sub>10</sub> per ton)	<sup>4</sup> Emissions
Grain Received by Straight Truck		0.0295	
Grain Received by Hopper Truck		0.0039	
Receiving Haul Road, Handling, Bins	<sup>1</sup>	0.0143	
Grain Dried		0.0550	
Natural Gas Combustion	<sup>2</sup>	<sup>3</sup> 7.6000	
Grain Shipping by Truck		0.0364	
Grain Shipping by Rail		0.0022	
<b><sup>5</sup>Monthly PM<sub>10</sub> Emissions (pounds)</b>			
<b><sup>6</sup>Monthly PM<sub>10</sub> Emissions (tons)</b>			
<b><sup>7</sup>Cumulative PM<sub>10</sub> Emissions (tons)</b>			

<sup>1</sup> Receiving Haul Road, Handling, Bins Throughput is the sum of this month's Throughputs for Grain Received by Straight and Hopper Trucks.

<sup>2</sup> Throughput in units of million cubic feet of natural gas.

<sup>3</sup> Emission Factor in units of pounds of PM<sub>10</sub> per million cubic feet of natural gas.

<sup>4</sup> Emissions calculated by multiplying the Throughput by the respective Emission Factor.

<sup>5</sup> Monthly PM<sub>10</sub> Emissions in pounds calculated by summing the four Emissions.

<sup>6</sup> Monthly PM<sub>10</sub> Emissions in tons calculated by dividing the Monthly PM<sub>10</sub> Emissions in pounds by 2,000.

<sup>7</sup> Cumulative PM<sub>10</sub> Emissions calculated by summing this month's PM<sub>10</sub> Emissions in tons with the previous eleven month's PM<sub>10</sub> Emissions in tons. A total of less than 15.0 tons is necessary for compliance.

