

217/782-2113

JOINT CONSTRUCTION AND OPERATING PERMIT

PERMITTEE

A. E. Staley Manufacturing Company  
Attn: James Hoyt  
2200 East Eldorado Street  
Decatur, Illinois 62521

Application No.: 00110048

I.D. No.: 115015ABX

Applicant's Designation: NEW 14-01

Date Received: November 8, 2000

Subject: Gluten Meal Dryer Replacement Project

Date Issued:

Operating Permit Expiration

Date:

Location: 2200 East Eldorado Street, Decatur

Permit is hereby granted to the above-designated Permittee to CONSTRUCT and OPERATE emission unit(s) and/or air pollution control equipment consisting of a Gluten Meal Flash Dryer and scrubber as described in the above-referenced application. Operation of emission units contained in construction permit 95060239 (dated October 16, 1997) is incorporated into this permit. This Permit is subject to standard conditions attached hereto and the following special conditions

1. Description

A. E. Staley Manufacturing Company has requested a construction permit for the replacement of the existing rotary gluten meal dryer with a new Gluten Meal Flash Dryer (14-01) in its Decatur corn-wet mill. The dryer produces dry gluten meal used primarily for poultry feed. The new gluten meal dryer will utilize an existing natural gas-fired furnace as a source of hot drying air. The particulate matter emissions of new dryer will be controlled by a wet scrubber which will exhaust through a new 180 foot high "gluten dryer" stack.

The new gluten meal dryer will be supplied with wet gluten cake by the existing corn wet mill, which will not be modified per this project. The new dryer would only facilitate a significant increase in the throughput of the mill if other changes were made to increase the mill's capacity. The existing gluten meal dryer will be shutdown upon startup of the new dryer so that the net increase in emissions will not be significant and will not trigger PSD applicability.

This construction permit also relies upon other improvements to the corn wet mill that would further reduce the already scrubbed emissions from the existing feed dryers (154-1, -2,-3,-4) and the feed cooler (154-5). The feed dryers, which are steam heated, produce feed used primarily as

cattle feed. Emissions would be reduced by routing the exhaust of these units during normal operation through the new gluten meal dryer and associated control equipment. At other times, these units would continue to exhaust through the existing 80 foot high "feed dryers stacks".

2. List of Emission Units and Pollution Control Equipment

Emission Unit	Description	Emission Control Equipment
14-01	(New) Gluten Meal Flash Dryer Including 8 Product Collector Cyclones and Existing Furnace (Former Waste Heat Boiler)	Wet Scrubber
154-01, 154-02, 154-03, 154-04	Feed Rotary Steam Tube Dryers (RSTD) 1-4*	Wet Scrubbers (One Per RSTD Pair) and Thermal Incinerator
154-05	Rotary Feed Cooler*	Cyclone & Wet Scrubber
154-06	Hammermill Collection Conveyor*	Cyclone & Wet Scrubber
154-07	Corn Cleanings (Former 9A-10)*	Baghouse
154-08	Light Steepwater Tank*	None
154-09	Boilout Materials Tank*	None
155-01	Fiber Filtrate Tank*	None

\* Construction covered by Permit 95060239.

3. Applicability Provisions

- a. An "affected emissions unit" for the purpose of these unit-specific conditions, is each piece of equipment as described in Condition 2 unless otherwise stated in the following conditions as unit specific, i.e. 14-01 or 154-01, etc.
- b. The affected emissions units are subject to 35 IAC 212.321(a), which provides that no person shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from any new process emission unit, either alone or in combination with the emission of particulate matter from all other similar process emission units for which construction or modification commenced on or after April 14, 1972, at a source or premises, exceeds the allowable emission rates specified in subsection (c) of 35 IAC 212.321, [35 IAC 212.321(a)].
  - i. The emissions of particulate matter into the atmosphere in any one hour period from the affected emission units shall not exceed the allowable emission rates specified in the following equation:

$$E = A(P)^B$$

Where:

P = Process weight rate; and,  
E = Allowable emission rate; and,

- 1. For process weight rates up to 408 MG/hr (450 T/hr):

	<u>Metric</u>	<u>English</u>
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	1.214	2.54
B	0.534	0.534

2. For process weight rates in excess of 408 MG/hr (450 T/hr):

	<u>Metric</u>	<u>English</u>
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	11.42	24.8
B	0.16	0.16

Where:

P = Process weight rate in metric or English tons per hour, and

E = Allowable emission rate in kilograms or pounds per hour. [35 IAC 212.321]

- c. No person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission unit to exceed 2000 PPM, [35 IAC 214.301].
4. Non-Applicability of Regulations of Concern

N/A

5. Operational Limits and Work Practices

- a. Operation of equipment shall not exceed the following limitation:

Item of Equipment	Input Rate		Material
	(Tons/Hour)	(Million Tons/Year)	
14-01 Gluten Meal Dryer Furnace	135	1.183	Wet Gluten Meal and Dry Recycle
154-01, 154-02, 154-03, 154-04 Feed Dryers 1-4	160	1.401	Wet Gluten Feed

- b. The Permittee shall operate, maintain, and repair affected emission units and their respective control systems in a manner assuring compliance with applicable emission standards.
- c. Operating Procedures for Control System: Written operating procedures shall be developed and maintained for affected emission units describing normal air pollution control equipment operation including establishment of target levels for the following operating parameters:

- i. Combustion zone temperature operating range for the Gluten Meal Dryer Furnace;
- ii. Scrubbant recirculation flow range for the Gluten Meal Flash Dryer scrubber; Feed Units scrubbers (2), Feed Cooler scrubber and Hammermill Collection Conveyor scrubber;

- iii. Pressure drop operating range for the Gluten Meal Flash Dryer scrubber, Feed Dryers Units scrubbers (2);
- iv. pH operating range for the Gluten Meal Dryer scrubber and Feed Dryer Units scrubbers (2).

Such procedures shall include inspection and maintenance practices and may incorporate manufacturers recommended operational instructions.

- d. Inspections: External visual inspections of affected emission units and associated control equipment shall be conducted on at least a weekly basis.
- e. Repairs: Prompt repairs of affected emission units and associated control equipment shall be made upon identification of need either as a consequence of formal inspections or other observations in conformance with good air pollution control practice.
- f. Records: Records of inspection, maintenance, and repair activities for affected emission units and associated control equipment shall be kept on site and shall include as a minimum:
  - i. Date of inspection, maintenance, and repair activities.
  - ii. Description of maintenance or repair activity if not routine preventative maintenance.
  - iii. Probable cause for requiring maintenance or repair if not routine or preventative.

6. Emission Limitations

- a. i. Except as allowed by the alternative operating scenario address by Condition 6(a)(i), the Units 1-4 and the Feed Cooler shall vent through the gluten meal dryer furnace, through the gluten meal dryer and discharge through the gluten stack. Emissions of these units that discharge through the gluten stack shall not exceed the following limits:

Emission Unit	PM <sub>10</sub> (Lb/Hr)	SO <sub>2</sub> (Lb/Hr)	NO <sub>x</sub> (Lb/Hr)	CO (Lb/Hr)	VOM (Lb/Hr)
Total Gluten Stack	17.6	12.1	32	9.6	71.7
Total Feed Stack	0	0	0	0	0

- ii. For up to 864 hours in any 12-month period of, the Feed Units 1-4 and feed cooler the feed may discharge directly to the atmosphere through the feed stack. The gluten meal flash dryer scrubber shall vent to the gluten stack if operational. Emissions shall not exceed the following limits during this alternative operating scenario:

Emission Unit	PM <sub>10</sub> (Lb/Hr)	SO <sub>2</sub> (Lb/Hr)	NO <sub>x</sub> (Lb/Hr)	CO (Lb/Hr)	VOM (Lb/Hr)
Total Gluten Stack	17.5	16.8	32	9.6	85.4
Total Feed Stack	7.6	7.3	--	---	36.9

- iii. In no event shall combined emissions exceed the following limits:

Emission Unit	PM <sub>10</sub> (T/Yr)	SO <sub>2</sub> (T/Yr)	NO <sub>x</sub> (T/Yr)	CO (T/Yr)	VOM (T/Yr)
Total Gluten and Feed Stack	84.1	56.7	140	42	327.4

- iv. These requirements become effective 180 days after initial startup of the new meal dryer.
- b. Emissions of PM10 from the Hammermill Collection Conveyor shall not exceed 0.83 lb/hr and 3.64 tons/yr.
- c.
  - i. This permit is issued based on the new gluten meal flash dryer not constituting a major modification subject to 40 CFR 52.21, Prevention of Significant Deterioration, PSD. The Permittee has addressed the applicability of PSD, demonstrating that the operation of the new dryer will not result in a significant increase in emissions, subject to the limitations in Conditions 5 and 6.
  - ii. The existing meal dryers shall be shut down within 180 days of the initial startup of the new meal dryers. This period may be extended by the Illinois EPA if additional time is reasonably needed for shakedown of the new dryer.
- d. This permit does not authorize changes to the corn wet mill that are unrelated to the new gluten meal flash dryer that would increase the mill's capacity.

7. Emission Testing Requirements

- a. The Permittee shall have emission measurements performed at its expense by an approved testing service during conditions which are representative of maximum emissions to verify compliance with the requirements of this permit as follows:
  - i. Within 180 days of startup of the new gluten meal dryer, the Permittee shall have PM, SO<sub>2</sub>, and VOM emissions measured from the Gluten Stack under the operating configuration described in Condition 6(a)(i) and under alternative operating scenario described under Condition 6(a)(i) during conditions which are representative of maximum emissions to verify compliance with the requirements of this permit. The Permittee shall also have VOM emissions measured from the Feed Stack simultaneous to the testing of the Gluten Stack under alternative operating conditions described under Condition 6(a)(i).

- ii. Emission measurements shall also be conducted upon written request from Illinois EPA.

- b. The following testing methods and procedures shall be used. Refer to 40 CFR 60, Appendix A for USEPA test methods.

Location of sample points	USEPA Method 1
Gas Flow and Velocity	USEPA Method 2
Flue Gas Weight	USEPA Method 3
Moisture	USEPA Method 4
Particulate Matter (PM*)	USEPA Method 5
Sulfur Dioxide (SO <sub>2</sub> )	USEPA Method 6 or 6C
VOM	USEPA Method 25

\* Due to high moisture levels in the exhaust from the dryers, USEPA PM<sub>10</sub> test methods are not considered reliable and are not being required to measure PM<sub>10</sub>. Particulate matter results will be assumed to be 100% PM<sub>10</sub>.

- c. The Permittee shall submit a written test plan to Illinois EPA for review and comment for the initial testing and if a significant change in the procedures for this testing is planned from the procedures followed in the previous test. This plan shall be submitted at least 30 days prior to the actual date of testing and include the following information as a minimum:

A description of the planned test procedures.

The person(s) who will be performing sampling and analysis and their experience with similar tests.

The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of maximum emissions.

The specific points at which samples will be taken for a pollutant if sampling will be conducted at an alternative point, and the approach being taken for showing compliance.

- d. The Permittee shall notify the Illinois EPA prior to conducted these measurements to enable the Illinois EPA to observe testing. Notification for the expected date of testing shall be submitted a minimum of 30 days prior to the expected date. Notification of the actual date and expected time of testing shall be submitted a minimum of 5 working days prior to the actual date of the test. The Illinois may accept a shorter advance notice if it does not interfere with Illinois EPA's ability to observe testing.
- e. Copies of the Final Report(s) for these tests shall be submitted to Illinois EPA within 30 days after the test results are compiled and finalized. These reports shall included as a minimum:

- i. General information, i.e. date of test, names of testing personnel, and names of Illinois EPA observers.
- ii. A summary of the results, e.g. PM, SO<sub>2</sub>, and VOM emissions, i.e. lb/hr, gr/scf, ppm, etc.

- iii. Detailed description of operating conditions of the dryer(s), including:
  - A. Process information, e.g. feed and meal production rate, gluten meal cake rate, moistures of meal cake and dry meal, meal recycle rate
  - B. Control system operating parameters during testing.
- iv. Data and calculations

8. Monitoring

- a. The Permittee shall install, maintain and operate continuous monitors on the Gluten Meal Dryer scrubber that supply continuous readings and store average hourly values for the following parameters:
  - i. Pressure drop
  - ii. Scrubbant recirculation rate (gallons/minute)
  - iii. Recirculated Scrubbant pH
- b. The Permittee shall install, maintain and operate continuous monitors on the Gluten Meal Dryer furnace that supply continuous readings and store average hourly values for the following parameters:
  - i. Combustion zone temperature (degrees F)
  - ii. Feed stack damper position (% open)
  - iii. Gas flow rate to furnace from feed dryers and feed cooler (acfm)
  - iv. An equivalent alternative parameter may be accepted by the Illinois EPA in lieu of stack gas flow rate stated in Condition 8(b)(iii) provided a correlation between the alternative parameter and flow rate has been established (i.e. damper position on furnace inlet duct and on furnace quench air duct versus actual flow rate measurements)

9. Recordkeeping

- a. The Permittee shall maintain the following records for the Gluten Meal Dryer. This data shall be recorded whenever a new measurement is taken or an item is changed except as specified below:

- i. Dryer throughput based on the daily grind rate, daily natural gas firing rate (cfm or mmBtu/hr) and daily average meal product moisture levels, recorded at least once per shift;

- ii. Desired flow rate and pH values of the control system recycled scrubbant.
- b. The Permittee shall maintain the following records for the Feed Dryers, Feed Cooler and Hammermill Conveyor. This data shall be recorded whenever a new measurement is taken or an item is changed except as specified below:
  - i. Dryers throughput based on the daily grind rate and feed moisture levels (dryer feed and production % moisture) recorded at least once per shift;
  - ii. Desired flow rate and pH values of the feed dryer recycled scrubbant;
  - iii. Desired flow rate of the feed cooler recycled scrubbant; and
  - iv. Desired flow rate of the hammermill conveyor recycled scrubbant.
- c. The Permittee shall maintain records of the following operating parameters for the Gluten Meal Dryer. These parameters shall be manually recorded at least once every hour, if automatic measurement and recording device(s) are not in service for more than two hours.
  - i. Pressure drop across the scrubber
  - ii. Scrubbant recirculation rate (gallons/minute)
  - iii. Recirculated Scrubbant pH
  - iv. Combustion zone temperature (deg F)
  - v. Gas flow rate to the furnace from feed dryers and feed cooler (or alternative per Condition 8(b)(iv))
- d. The Permittee shall maintain records of the following operating parameters for the Feed Dryers. These parameters shall be manually recorded at least once every hour, if automatic measurement and recording device(s) are not in service for more than two hours.
  - i. Pressure drop across each scrubber
  - iii. Scrubbant recirculation rate for each scrubber (gallons/minute)
  - iii. Recirculated Scrubbant pH for each scrubber
  - iv. Feed stack damper position (% open)

- e. The Permittee shall maintain records of the following operating parameters for the feed cooler and hammermill conveyors. These parameters shall be manually recorded at least once every hour, if automatic measurement and recording device(s) are not in service for more than two hours.
  - i. Scrubbant recirculation rate for each scrubber (gallons/minute or pump amps).

- f. The Permittee may substitute, in lieu of scrubbant recirculation pump flow rate (gallons/hr), monitoring and recording of scrubbant recirculation pump amps to comply with the requirements of Condition 8 and Condition 9 provided a desired operating range has been documented per Condition 5(c)(ii).
- g. The Permittee shall keep records of all emission measurements and readings conducted pursuant to Condition 7 and Condition 8(b)(iv).
- h. The Permittee shall maintain records for any period during which the exhaust from the Feed Dryers and Feed Cooler bypasses the Gluten Meal Dryer (Alternative Operating Scenario).
- i. The Permittee shall maintain records for any period during which an affected emission unit was in operation when its air pollution control equipment was not in operation or was not operating properly.
  - i. These records shall include each period of time when an operating parameter of a control system, as recorded above, deviated outside the level set as good air pollution control practice (date, duration, and description of the incident).
  - ii. These records shall include the cause for pollution control equipment not operating properly or being out of normal service, for incidents when control equipment failed to operate properly and shall identify the corrective actions that were taken, the repairs that were made, and the steps that were taken to prevent any such reoccurrence.
  - iii. These records shall also identify any such periods during which an emission unit exceeded the requirements of this permit, including applicable emission limits. This record shall include the cause for noncompliance, if known and the corrective action(s) and preventative measures taken to prevent any such reoccurrence if any.
- j. The Permittee shall keep emission records for the Gluten Meal Dryer, Feed Dryers, Feed Cooler, and Hammermill Conveyor as follows:
  - i. PM emission rate, in lb/hr, determined for each configuration and condition as described in Condition 6 for the dryers and cooler, based on test data and other engineering estimates with supporting explanations and calculations. Until emission testing is conducted, this determination shall be based on design data.
  - ii. Number of hours operated at each emission rate identified above on a monthly basis, with explanation.

- iii. Monthly emissions of PM, SO<sub>2</sub>, VOM, NO<sub>x</sub>, and CO determined as the summation of the product of the above records.
- iv. Annual emissions of PM, SO<sub>2</sub>, VOM, NO<sub>x</sub>, and CO.

10. Records Retained

- a. The Permittee shall retain all records required by this permit at the source for at least five years, at a location where the records are readily accessible for inspection by the Illinois EPA.
- b. The Permittee shall make all records required by this permit available for inspection at the source by the Illinois EPA, providing copies of records to Illinois EPA upon request. For this purpose, the Permittee may keep records in a computerized data system, provided that, upon request by Illinois EPA during the source's normal working hours, requested information is retrieved and available prior to inspection completion to the Illinois EPA.

11. Notification

- a. The Permittee shall notify Illinois EPA within 30 days of the initial startup of the New Gluten Meal Dryer
- b. The Permittee shall permanently shutdown the existing Rotary Gluten Meal Dryer system after a reasonable shakedown period for the New Gluten Meal Flash Dryer not to exceed 180 days after startup of the new dryer. Records, per Condition 8(a)(i), shall be kept for both dryer systems during the shakedown period.
- c. If there is an exceedance of the emission limits of this permit as determined by the records required by this permit or by other means, the Permittee shall submit a report to the Illinois EPA's Compliance Section in Springfield, Illinois within 30 days after the exceedance. The report shall include the emission released in accordance with the recordkeeping requirements, a copy of the relevant records, and a description of the exceedance or violation and efforts to reduce emissions and future occurrences.

12. Illinois EPA Addresses

Any required reports and notifications concerning equipment operation, emissions testing, or a monitoring system, shall be sent to the Illinois EPA at the following address unless otherwise indicated:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
Compliance Section (#40)  
P. O. Box 19276  
Springfield, Illinois 62794-9276

Telephone: 217/782-5811

Fax: 217/524-4710

A copy of all required reports and notifications, except the Annual Emission Report required by 35 IAC Part 201.302, shall also be sent to the Illinois EPA at the following address:

Illinois Environmental Protection Agency  
Division of Air Pollution Control  
2009 Mall Street  
Collinsville, Illinois 62234

Telephone: 618/346-5120

13. Other Requirements

This permit does not relieve the Permittee of the responsibility to comply with all applicable local, state and federal requirements which are part of the Illinois State Implementation Plan, as well as other applicable local, state and federal requirements.

If you have any questions concerning this permit, please contact Kevin Smith at 217/782-2113.

Donald E. Sutton, P.E.  
Manager, Permit Section  
Division of Air Pollution Control

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cc: Region 3

Attachment 1

PSD Applicability

Table I - Past Actual Emissions of Feed and Gluten Meal Area (Tons/Year)

<u>CO</u>	<u>SO<sub>2</sub></u>	<u>VOM</u>	<u>NO<sub>x</sub></u>	<u>PM<sub>10</sub></u>
47.5	25.3	55.0	128.7	78.8

Table II - Future Allowable Emissions With New Gluten Meal Dryer (Tons/Year)

<u>CO</u>	<u>SO<sub>2</sub></u>	<u>VOM</u>	<u>NO<sub>x</sub></u>	<u>PM<sub>10</sub></u>
42	16.2	74.7	140	77.1

Table III - Net Emissions Change for This Project (Tons/Year)

	<u>CO</u>	<u>SO<sub>2</sub></u>	<u>VOM</u>	<u>NO<sub>x</sub></u>	<u>PM<sub>10</sub></u>
Table I	47.5	25.3	55.0	128.7	78.8
Table II	<u>42</u>	<u>16.2</u>	<u>74.7</u>	<u>140</u>	<u>77.1</u>
Totals	- 5.5	- 9.1	19.7	11.3	- 1.7

Table IV - Contemporaneous Emission Changes (Tons/Year)

Previous Projects 1995 - 2000

<u>CO</u>	<u>SO<sub>2</sub></u>	<u>VOM</u>	<u>NO<sub>x</sub></u>	<u>PM</u>
8.2	22.9	- 3.8	- 62.8	- 28

Gluten Meal Dryer Replacement Project

<u>CO</u>	<u>SO<sub>2</sub></u>	<u>VOM</u>	<u>NO<sub>x</sub></u>	<u>PM</u>
- 5.5	- 9.1	19.7	11.3	- 28.7
Totals: 2.7	13.8	15.9	- 15.5	- 28.7

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