ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY
DIVISION OF AIR POLLUTION CONTROL

Summary Report Relative to Permit Application

Submitted By: Riceland Foods, Inc., Soya Division
Hwy 79 and Park Avenue
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Arkansas County
Contact Position: Environmental Engineer, Neil Washburn
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CSN: 01-0008 **Permit No.:** 908-AR-6 **Date Issued:** 10-18-96

Submittals: February 7, 1996

Summary

Riceland Foods, Inc. (Riceland) operates a soybean processing mill, rice bran oil extraction plant and a grain dryer in Stuttgart, Arkansas. Permit modifications include the addition of a gasification facility at Riceland and the incorporation of new AP-42 emission factors for grain handling and vegetable oil processing. Permitted emissions from the facility will consist of 231.1 tons per year of particulate matter, 1.4 tons per year of sulfur dioxide, 197.0 tons per year of nitrogen oxides, 47.6 tons per year of carbon monoxide and 640.0 tons per year of volatile organic compounds. This reflects a decrease in particulate matter, sulfur dioxide and volatile organic compound emissions and an increase in nitrogen oxides and carbon monoxide emissions.

Permitted emissions from this facility will also include various hazardous air pollutants. Hexane, diethyl ether and petroleum ether are used at Riceland. These sources were modeled to determine their impact on air quality. The results obtained did not exceed the levels of significance for any of the species.

Process Description

Dryer No. 4 Complex (SN-01 through SN-16, SN-76 and SN-77)

Dryer No. 4 handles rice, soybeans, wheat, corn and oats. The complex consists of two units. One unit is referred to as the "West End" and was the original dryer permitted on May 26, 1978, under permit 468-A. The other unit is designated as the "Annex" and was permitted under permit 469-A.

Reviewed By: Melissa J. Blumenthal **Approved By:** Keith A. Michaels
Applicable Regulation: Air Code SIP NSPS

The West End receives, cleans, dries, stores and loads out rice. The rice is scalped as it is received, placed into bins based on its moisture content and grade, dried and is then stored until it can be sent to Riceland's Stuttgart Rice Mill. Soybeans are also received, scalped and temporarily stored until they can be sent to the Soybean Terminal by conveyor. Also, wheat is received, dried and stored until loadout.

The Annex receives, cleans, dries, stores and loads out rice. The rice is scalped as it is received, binned by moisture content and grade, dried and stored until loadout to Riceland's Stuttgart Rice Mill. In addition, soybeans are received, scalped and stored. The Annex also receives oats and corn. The corn is dried, temporarily stored and then shipped from the facility. The oats require no processing and are placed in temporary storage upon receipt.

All grain movement is accomplished through the use of belt conveyors, screw conveyors, drag conveyors and elevator legs. The conveying equipment is aspirated by the nuisance dust systems. All other equipment such as receiving pits, grain dryers and grain cleaners have dedicated dust collection systems.

Terminal and Blending (SN-17 through SN-36)

The Blending Elevator at the Stuttgart Soybean Division of Riceland is used to receive soybeans from the Terminal Elevators. These beans are transported from the terminal to the blending elevator via a belt conveyor. The blending elevator also receives soybeans hauled by bulk transport trucks that are unloaded in the elevator dump pit.

After the beans are received, they are stored according to their type, grade and/or moisture content. The different grades of soybeans are dried, cleaned and/or blended in this elevator to achieve the desired quality of beans before sending them to Prep to begin processing.

The equipment used in the Blending and Terminal Elevators is simply grain drying, moving, handling and cleaning equipment such as dryers, belt and drag conveyors, cup elevators, scalperators and scales.

Preparation and Extraction (SN-37 through SN-42)

Preparation

Raw soybeans are conveyed from storage on a belt conveyor which discharges into an in-process scale hopper. The scale hopper discharges batch-wise into a gyratory screener (bean cleaner) which separates oversize material. The oversize material is aspirated both from the top surface of the screener and as it is discharged into the oversize outlet on the side of the machine the oversize material is aspirated into the cyclones where it is separated from the air stream and discharged through rotary valves into the top tray of the hull toaster.

Currently, soybeans are dried to 10% moisture and conveyed to the soybean preparation plant. This prep process removes the hulls from the beans and presses the bean meats into flakes that are ready for the solvent extraction process.

Soybeans are uniformly heated in the heater from ambient temperature to about 140°F. This brings moisture to the surface of the beans. The heated beans are then passed through the jet dryer. This elevates the surface temperature of the beans, releasing the bond adhering the hull to the meat and driving off moisture. The recirculated air stream is passed through a cyclone to remove fines and loose hulls before being reheated.

The hulloosenator splits the soybeans in half along the naturally existing bean division and rolls the soybean hull off the soybean meat. This separation is accomplished without the creation of fines. The split soybeans and loose hulls fall from the hulloosenator into the top of the aspirator. The spilt beans cascade downward through a countercurrent stream of air. The loosened hulls are aspirated out of the top of the aspirator into a cyclone and sent directly to grinding or toasting with no further separation needed.

The cracking rolls fracture the beans into an appropriate size for flaking. The cracked meats and remaining hulls drop into the conditioner. The meats cascade downwards, exiting at the base of the machine conditioned to the proper temperature and moisture content for flaking. Hulls and fines are aspirated out of the top of the conditioner by a counter-flow stream of air. This air-hull mixture is separated in a cyclone and the air is recirculated.

The hull screener separates the product aspirated from the conditioner. Large hulls are sent to hull toasting and grinding. Small hulls and small meats are sent to secondary aspiration. Fines pass through to the flaking rolls.

The secondary aspiration system separates the small hulls from the small meats. The small hulls are sent to grinding or toasting. The small meats are sent to the flaking rolls.

Conditioned beans discharge from the bottom of the bean conditioner into a leg which feeds the flaking mill feed screw. This screw conveyor discharges into six flaking mills which press the bean meats into flakes of thickness between ten thousandths (0.010) and sixteen thousandths (0.16) of an inch. The flakes fall out of the mills into a drag conveyor which moves them towards the extraction plant. Excess bean meats which do not feed into the flaking mill are conveyed into an overflow bin which feeds a screw conveyor returning them to the bean conditioner.

Extraction

Soybean flakes of thickness 0.010" to 0.016" are conveyed to the plant in an inclined drag conveyor. This conveyor discharges into a short plug screw conveyor which feeds the extractor. The extractor is designed to process flakes from 1500 tons per day of raw soybeans. The hot dehull system allows Riceland to process 1600 tons per day of raw soybeans.

As the flakes are conveyed through the extractor, oil is removed with a series of hexane washes. Each hexane wash stream has a different but fairly constant concentration of oil. The most concentrated hexane stream is called the full miscella and is pumped to the distillation section of the plant for oil separation and solvent recovery. This section of the plant will be discussed later in the description.

The fully extracted soybean flakes drop out of the extractor into a vapor-tight inclined drag conveyor. This conveyor discharges into a short plug screw conveyor which feeds the desolventizer-toaster-dryer-cooler (DTDC) vessel. This vessel consists of nine trays in a vertical arrangement. The flakes are held up for some time on each tray before being discharged to the tray below through a gate that opens and shuts to hold a constant level on each tray. On the upper three trays the flakes are heated indirectly with steam that is inside the steam chest of the tray. This drives the volatile hexane solvent and some of the moisture out of the flakes and into the large overhead vapor line. These three trays comprise the desolventizing section of the vessel.

The next two trays, or toaster section, also heat the flakes with indirect steam and serve to remove residual hexane, dry flakes further and kill any urease activity that remains on the flakes. The next tray is a sparge tray which distributes live steam into the vessel. The steam passes through holes in the upper five trays and helps to heat up the flakes so as to evaporate hexane and water.

The next two trays are the drying section of the vessel. Air is blown into the chest of these trays with an external fan and exits through holes that distributes air through the meal.

By this time the flakes are broken up through drying and handling and the product can be termed meal. Depending on ambient conditions, air is sometimes heated with steam coils before it enters the trays. The air exits the trays into two cyclones which remove meal dust and suspended particles before the air is discharged into the atmosphere.

The final tray serves to cool the meal before it is discharged from the vessel. Part of the air from the fan is diverted into the cooling tray. The air is not heated and it discharges into a cyclone before exiting into the atmosphere. The dried and cooled meal is conveyed back to the bean preparation building where it is ground before being conveyed to storage.

The full miscella (25-30% oil) is pumped into the tube side of the first stage evaporator. The first stage is a vertical shell and tube heat exchanger. The shell side heat source is the vapor stream from the overhead of the DTDC. The hexane vapors that are boiled off in the tube side of this evaporator go to the evaporator condenser where the hexane in condensed with cooling water and recovered. The shell side vapors that are not condensed in the first evaporator pass into the vapor contactor where they are partially condensed with a stream of direct contact hexane. Residual vapors from this vessel pass into the DT condenser where they are further condensed with cooling water. The concentrated liquid miscella from the first stage evaporator is preheated with product oil in a heat exchanger before being fed to the second stage evaporator. This evaporator uses steam as its heat source. The overhead vapors from this evaporator are also condensed in the evaporator condenser. The miscella that leaves this evaporator is 90% or above in oil concentration and is pumped to the oil stripper.

The oil stripper is a distillation column with disc and doughnut internal distributors. The column operates under a high vacuum and removes the remaining hexane from the oil with live stripping. The overhead vapors are condensed in the stripper condenser and recovered. The pure crude oil is pumped from the bottom of this column through a heat exchanger to be cooled and then transferred to the storage tanks.

Vapors from the DT condenser, work tank, solvent water separator, waste water reboiler, extractor column and mineral oil stripper are all routed to the vent condenser where they are cooled and condensed with cooling water.

Non-condensible and residual hexane from this condenser flow to the mineral oil absorber where hexane is absorbed from the mineral oil. The mineral oil is heated and pumped to the mineral oil stripper where the hexane is stripped back out of the mineral oil with live steam. The steam and hexane vapors are routed to the vent condenser for recovery. The small amount of gases that exit the mineral oil absorber are vented to the atmosphere. This stream is primarily air containing approximately 2% hexane.

Meal Handling (SN-43 through SN-48 and SN-75)

Soybean meal is a product of the grinding process and is stored in two locations (flat storage and meal storage). The meal that is routed from the grinding process directly to flat storage is carried by drag conveyors to an elevator. The meal is elevated to a drag conveyor on top of the meal storage facility. This conveyor also fills bins in meal storage and has a spout to feed flat storage. Meal coming to flat storage can be routed either to storage or directly to trucks for loadout.

Meal storage has a bag filter to minimize dust from the conveyors and elevators. Flat storage has a bag filter to minimize emissions from the conveyor, elevator and truck loadout. Bentonite is used in the meal handling operations to improve the flow characteristics and prevent meal from sticking to itself and equipment. The bentonite adds a slickness to the meal.

Boiler and Heaters (SN-49 through SN-52, SN-66 and SN-69)

Riceland employs the use of two boilers to generate steam for various processes throughout the soybean mill. These boilers (#3 and #4) are natural gas fired with no supplemental firing of fuel oil.

In the refinery two heaters are used for Dowtherm heating and recirculation. These heaters (#3 and #4) are natural gas fired. Dowtherm is also lost as a fugitive emission.

The gas plant has a natural gas fired reformer furnace. This furnace is used for the generation of hydrogen gas, which is used in the refinery.

Rice Bran Extraction Plant (SN-53 through SN-62)

The Bran Oil Extraction Plant takes stabilized bran (pellets) received from the bran plants and extracts the oil. This crude oil is then sent to the refinery for processing into the final product.

The stabilized bran is delivered to the extraction plant by truck. The trucks dump into the receiving pit and the bran is conveyed to the stabilized bran bin. The bran bin is outfitted with a bin vent filter to control particulate emissions that are generated during the bin filling operation. From the storage bin the bran will be to the oil extractor.

The extraction process produces hexane vapors, bran oil and solvent soaked (solventized) bran. The bran oil is collected and sent to the refinery for further processing, the hexane vapors are condensed and the hexane is reused in the extraction process. The solventized bran is transferred to the DTDC for further processing.

The solventized bran enters the DTDC where both steam and hot air are used to volatilize the excess solvent. The steam stage of the DTDC produces hexane vapors that are collected and condensed and the hexane is reused in the extraction process. The hot air stage of the DTDC produces emissions of bran particulate and hexane vapors. High efficiency cyclones are used to control the particulates generated from this process but the hexane emissions are uncontrolled. Once the bran leaves the DTDC it has had the oil removed, is dried and free of any solvent. This is known as defatted bran.

The defatted bran is conveyed to the defatted bran bin where it is stored until it can be loaded out for reuse in the by-products plant. The defatted bran bin has a bin vent to control emissions generated during the bin filling process and from the hammermill.

Hexane vapors generated from the extractor and the DTDC are sent a vapor condenser that generates liquid hexane and puts it back into the hexane storage tank. Vapors from the condenser that do not become liquefied enter a mineral oil absorber system. This system uses mineral oil to capture as much remaining solvent as possible. The mineral oil system also vents uncontrolled hexane vapors to the atmosphere.

Lecithin Plant (SN-63 through SN-65, SN-68 and SN-72)

Crude oil lecithin is received at the lecithin plant by truck. The crude lecithin is then fed to the extractors. Acetone is the solvent used in the extraction process. Crude oil rises to the top and the bottoms are pumped to a slurry tank for further separation. The slurry is routed to a filter drum, under vacuum, where a cake is pulled onto a cloth. This cloth is then dried and scraped off to recover lecithin. The cake has about 40% acetone which passes through a chute and on to the granulator.

The granules are then placed on a dryer bed. The dryer bed consists of two heating sections and conditioned air. Acetone vapors are pulled out of the dryer. Dry material is carried by screw conveyor and air to the rotex. The rotex grades out the granules as powder, granules and large. Each grade is drummed, sold and shipped by truck.

The acetone vapors are routed to the VIC system. The VIC system consists of three carbon vessels. Two are always absorbing while the third is under a steam cycle. The three rotate on this cycle. Condensed acetone is recirculated to the feed tank. The overhead crude oil from the extractor is sent to the settling tank. This is then sent to the evaporator. The first stage of the evaporator removes approximately 90% of the acetone. This acetone goes to the rework tank. The second stage removes the remainder of the acetone. Oil in the system is sent to an outside tank and on to the refinery.

An incline bag filter minimizes granule carry over from the dryer bed to the VIC system.

<u>Refinery (SN-70 and SN-71)</u>

The refinery receives various vegetable oils (soybean, rice bran, sunflower, peanut, etc.) from outside delivery and from within the facility itself. The purchased and manufactured crude oils are stored at the refinery.

Phosphoric acid is added to the oil to begin the process. The oil is then heated to a temperature range of 80 to 100°F. Caustic is added to the oil. The oil and caustic are then mixed in retention mixers. This mixture is then heated to about 180°F in the refinery heaters. Provided that the temperature and caustic levels are acceptable the oil is centrifuged.

Raw soap stock is drawn off, caustic added for saponification and sent to storage. From storage sulfuric acid is added in the acidulator. Acidulated soapstock is then stored.

The refined oil is sent through a wash water heater and then to the scale tanks. The free fatty acid content of the oil is then checked. Oil that meets specification is sent to the bleaching department and to storage. Rejected oil is reprocessed. From storage refined oil is processed in the converter. The converter hydrogenates the oil as necessary. The oil is then further cleaned, filtered and refined to its final product. Due to the extremely low vapor pressure of these oils, emissions are insignificant.

<u>Wastewater Treatment (SN-73 and SN-74)</u>

Emissions from the wastewater treatment system are negligible. Wastewater sources are Riceland's downtown parboil plant, soya boiler blowdown and the refinery. The lime tank bin vent does emit minimal particulate emissions.

Gasification - Cogeneration (SN-79 through SN-82)

Rice hulls are delivered to the facility by hopper trucks which are unloaded into a receiving hopper that is equipped with screw conveyors that deliver the hulls to a bucket elevator. The elevator conveys the hulls to another screw conveyor which will discharge the hulls into one of two storage tanks. Each storage tank will be equipped with a variable rate bin discharger that will deliver hulls to a second bucket elevator that will convey hulls to the gasifier metering bin. The system is designed to receive and store 75 tons per hour of hulls. The system can deliver up to 28 tons per hour to the gasification system.

The receiving hopper will be located in a drive-through type shed to minimize fugitive emissions from the unloading process and prevent rain from entering the hull conveying system,

The gasification metering bin provides the surge capacity necessary to compensate for the variations between the delivery and gasification rates. It is equipped with three variable speed screw conveyors that deliver hulls to the gasification unit in response to the output of the plant master controller.

The gasifier has three separate gasification units that convert the hulls to pyrolysis gas and ash. This is accomplished by the controlled application of air through the gasification unit grate as the hulls are agitated in the fuel bed maintained on the grate. Air is provided by the gasification air fan through a system of ducts and control dampers. Each gasification unit is a refractory lined, vertical steel chamber sized to provide the residence time required to complete the gasification process and minimize the quantity of particulate matter carried over with the pyrolysis gas.

Ash is discharged from the bottom of each gasification unit into water cooled screw conveyors that cool the ash. It is then transported to a pneumatic conveying system that is part of the ash conveying and storage system. Pyrolysis gas is discharged from the top of the gasification units to the S-TECS thermal energy conversion system (TECS). The gas produced from the rice hulls will then be used as a fuel.

The gasification system is designed to consume 52,200 pounds per hour of rice hulls and deliver 206.7 MMBtu per hour of high temperature pyrolysis gas to the TECS. The gas temperature will vary between 1100°F and 1500°F, depending on the desired ash quality. The quantity of ash produced will be approximately 16,000 pounds per hour at rated capacity.

The ash conveying and storage system includes pneumatic conveying systems that will receive ash from the cooling conveyor discharge on the three gasification units and transport it to three storage tanks. Each storage tank is equipped with a pneumatic receiver that will discharge ash to the storage tank and exhaust conveying air to a common header. The air will be directed through a fabric filter to control particulate emissions from the conveying system.

The storage tanks will be designed for unloading into trucks that will transport the ash to off-site utilization or disposal facilities. The system will be designed to load trucks at the rate of approximately 24 tons per hour. The truck loading area will be enclosed in a drive-through type shed to minimize fugitive emissions from the truck loading area.

Specific Conditions

1. Emissions shall not exceed the emission limits set forth in Table I of this permit. Emissions from any point source not specifically listed in Table 1 of this permit shall be considered a violation of this permit.

2. Visible emissions from each source shall not exceed the opacity limits specified in Table I of this permit as measured by EPA Reference Method 9.

3. No ground-level visible emissions that reasonably can be expected to become materially injurious to human, plant or animal life, or property; or which unreasonably interfere with enjoyment of life or use of property; shall be permitted beyond the facility property line.

4. Grain received at Riceland shall not exceed the limits set forth in the following table:

Description	Source Number	Grain	Yearly Limit - during any consecutive 12 month period (tons/yr)
Receiving Pit # 4, 5 and 6	01, 02 and 03	Rice Soybeans Wheat	64,800 80,400 12,300
Terminal End and Blending End Receiving	17, 18	Corn Milo Oats Rice Soybeans Wheat	15,000 9,000 2,000 45,000 525,000 33,000

Compliance with Specific Condition #4 shall be verified by maintaining monthly records of the amount of raw ingredients received over the previous 12 month period. These records shall be updated no later than the 15th day of the month following the month which the records represent. Records shall be kept on site and shall be made available to Department personnel upon request.

5. Pipeline quality natural gas shall be the only fuel used at this facility.

6. Natural gas usage shall not exceed 229 million standard cubic feet (scf) per month or 2,748 million scf during any consecutive 12 month period. The permittee shall maintain monthly natural gas records for the previous 12 month period, updated on a monthly basis. These records shall be updated no later than the 15th day of the month following the month which the records represent. Records shall be kept on site and made available to Department personnel upon request.

7. The permittee shall not receive in excess of 353,300 gallons of hexane per twelve consecutive months. The permittee shall maintain records of the amount of hexane received. Records shall be updated by the last day of the following month, kept on site and provided to Department personnel upon request.

8. The permittee shall not receive in excess of 130,000 gallons of acetone per twelve consecutive months. The permittee shall maintain records of the amount of acetone received. Records shall be updated by the last day of the following month, kept on site and provided to Department personnel upon request.

9. The permittee shall keep monthly and annual records of all hexane, diethyl ether and petroleum ether received and used at the facility on site. A yearly VOC usage report (Jan. - Dec.) shall be submitted to the Department at the address listed below. The next annual report shall be due by February 1, 1997.

   Arkansas Department of Pollution Control and Ecology
   Air Division
   Attn: Compliance Inspector Supervisor
   P.O. Box 8913
   Little Rock, AR 72219-8913

10. The gasifier hull receiving tanks (SN-80) shall not receive in excess of 245,280 tons of rice hulls per twelve consecutive months. The permittee shall maintain records of the amount of rice hulls received. Records shall be updated by the last day of the following month, kept on site and provided to Department personnel upon request.

11. The permittee shall not unload into trucks in excess of 24 tons of rice hull ash per hour from the gasifier ash loadout area (SN-82) or 70,080 tons of rice hull ash per twelve consecutive months. The permittee shall maintain records of rice hull ash loadout into trucks. Records shall be updated by the last day of the following month, kept on site and provided to Department personnel upon request.

12. The permittee shall comply with the applicable provisions of the *Arkansas Air Pollution Control Code* (Air Code) and the regulations of the *Arkansas Plan of Implementation for Air Pollution Control* (SIP).

13. The permittee shall comply with all regulations under the *New Source Performance Standards* (NSPS) of 40 CFR Part 60, Subpart DD - Standards of Performance for Grain Elevators.

14. Particulate emissions from any NSPS source, except grain dryers, shall not exceed 0.023 grams per dry standard cubic meter (0.01 grains per dry standard cubic foot) at any time.

15. The control equipment associated with this plant shall be maintained and operated in serviceable condition as prescribed by the manufacturer during operation of this plant.

16. The permittee shall modify this permit prior to making any changes in production or operation which would increase emissions above the allowable permit limits. Physical modifications, construction and reconstruction which results in emission changes not specifically allowed under Section 19.4(k) of Regulation 19 will require a full permit modification prior to their implementation.

17. Permit #908-AR-6 shall supersede all previously issued air permits. Permit #908-AR-5 is hereby revoked.

TABLE I

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
01	Receiving Pit #4	1958	Aspiration	PM/PM_{10} PM_{10}	2.3 0.6	0.3 0.1	Code	40	Fugitive Emissions
02	Receiving Pit #5	1958	Aspiration	PM/PM_{10} PM_{10}	2.3 0.6	0.3 0.1	Code	40	Fugitive Emissions
03	Receiving Pit #6	1958	Aspiration	PM/PM_{10} PM_{10}	2.3 0.6	0.3 0.1	Code	40	Fugitive Emissions
04	Scalperator Aspiration System	1990	Baghouse	PM/PM_{10} PM_{10}	0.6 0.2	0.1 0.1	NSPS	0	Pits #4 & #5
05	Upper Nuisance Dust System	1991	Baghouse	PM/PM_{10} PM_{10}	0.6 0.2	0.2 0.1	NSPS	0	
06	Pit #4 Multiclone	1960s	Cyclones	PM/PM_{10} PM_{10}	2.0 0.5	0.3 0.1	Code	40	2 Cyclones
07	Pit #5 Multiclone	1960s	Cyclones	PM/PM_{10} PM_{10}	2.0 0.5	0.3 0.1	Code	40	3 Cyclones
08	Pit #6 Multiclone	1960s	Deleted						3 Cyclones
09	Scalperator/Pit #6 Aspiration System	1995	Bag Filter	PM/PM_{10} PM_{10}	0.5 0.2	0.1 0.1	Code	40	

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
10	Upper & Lower Nuisance Dust System	1991	Baghouse	PM/PM_{10} PM_{10}	1.9 0.5	0.4 0.1	NSPS	0	
11	Trash Tank Pits #4 & #5	1970s	Bin Vent	PM/PM_{10} PM_{10}	0.1 0.1	0.1 0.1	Code	40	Fugitive Emissions
12	Trash Tank Pit #6	1970s	Bin Vent	PM/PM_{10} PM_{10}	0.1 0.1	0.1 0.1	Code	40	Fugitive Emissions
13	Annex Trash Tank	1980s	Bin Vent	PM/PM_{10} PM_{10}	0.1 0.1	0.1 0.1	Code	20	Fugitive Emissions
14	Loadout and Side Loadout	1958	None	PM/PM_{10} PM_{10}	3.3 0.9	0.4 0.1	Code	40	Fugitive Emissions
15	Small Shanzer Dryer	1990	Screens	PM/PM_{10} PM_{10} SO_2 NO_X CO VOC	1.6 0.6 0.1 2.1 0.6 0.1	1.2 1.0 0.1 9.2 2.3 0.4	NSPS	0	15 MMBtu/hr

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
16	Large Shanzer Dryer	1992	Screens	PM/PM_{10} PM_{10} SO_2 NO_X CO VOC	7.0 2.0 0.1 3.5 0.9 0.2	2.0 1.7 0.1 15.3 3.8 0.6	NSPS	0	25 MMBtu/hr
17	Terminal End Receiving	1958	Aspiration	PM/PM_{10} PM_{10}	6.8 1.7	3.0 0.8	Code	40	Fugitive Emissions
18	Blending End Receiving	1958	Aspiration	PM/PM_{10} PM_{10}	6.8 1.7	1.4 0.4	Code	40	Fugitive Emissions
19	Terminal Truck Dust System	1990	Baghouse	PM/PM_{10} PM_{10}	0.6 0.2	0.3 0.1	Code	10	
20	Terminal Basement	1989	Baghouse	PM/PM_{10} PM_{10}	2.9 0.8	1.9 0.5	NSPS	10	
21	Terminal Trash Tank	1970s	Bin Vent	PM/PM_{10} PM_{10}	0.1 0.1	0.1 0.1	Code	40	
22	Mill Run	1988	Bin Vent Filter	PM/PM_{10} PM_{10}	0.1 0.1	0.1 0.1	Code	20	Bin 521
23	Mill Run	1988	Bin Vent Filter	PM/PM_{10} PM_{10}	0.1 0.1	0.1 0.1	Code	20	Bin 519

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
24	Terminal Loadout	1958	None	PM/PM_{10} PM_{10}	4.2 1.1	0.7 0.2	Code	40	Fugitive Emissions
25	Blending Elevator - System A1	1982	Baghouse	PM/PM_{10} PM_{10}	0.9 0.3	1.9 0.5	NSPS	0	
26	Blending Elevator - System A2	1982	Baghouse	PM/PM_{10} PM_{10}	0.7 0.2	1.3 0.4	NSPS	0	
27	Blending Elevator - System B1	1982	Baghouse	PM/PM_{10} PM_{10}	0.3 0.1	0.2 0.1	NSPS	0	Scalperator #3
28	Blending Elevator - System B2	1982	Baghouse	PM/PM_{10} PM_{10}	0.3 0.1	0.2 0.1	NSPS	0	Scalperator #2
29	Blending Elevator - System C3	1982	Baghouse	PM/PM_{10} PM_{10}	0.3 0.1	0.2 0.1	NSPS	0	Scalperator #1
30	Blending Elevator - System B3	1982	Baghouse	PM/PM_{10} PM_{10}	0.9 0.3	0.5 0.2	NSPS	0	
31	Blending Elevator - System D1	1982	Baghouse	PM/PM_{10} PM_{10}	0.6 0.2	0.2 0.1	NSPS	0	
32	Blending Elevator - System D2	1982	Baghouse	PM/PM_{10} PM_{10}	0.1 0.1	0.1 0.1	NSPS	0	

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
33	Blending Elevator - System E1	1982	Baghouse	PM/PM_{10} PM_{10}	1.2 0.3	2.5 0.7	NSPS	0	
34	Blending Elevator - System E2	1982	Baghouse	PM/PM_{10} PM_{10}	1.2 0.3	2.5 0.7	NSPS	0	
35	Blending Elevator - System F	1982	Baghouse	PM/PM_{10} PM_{10}	1.2 0.3	2.5 0.7	NSPS	0	
36	Blending Elevator Trash Tank	1982	Bin Vent	PM/PM_{10} PM_{10}	2.0 0.5	3.4 0.9	NSPS	0	Fugitive Emissions
37	Hot Dehull System	1996	None	PM/PM_{10} PM_{10} SO_2 NO_X CO VOC	1.5 0.7 0.1 3.5 0.9 0.2	6.3 2.7 0.1 15.3 3.8 0.6	SIP	20	25 MMBtu/hr
38	Flaking Roller	1960s	Cyclone	PM/PM_{10} PM_{10}	2.5 0.7	11.0 2.8	SIP	40	
39	Hull Grinding	1960s	Cyclone	PM/PM_{10} PM_{10}	13.3 3.4	58.3 14.6	SIP	40	
40	Meal Dryers/Coolers	1977	Cyclone	PM/PM_{10} PM_{10} Hexane	1.2 0.3 11.3	5.3 1.4 49.5	SIP	20	

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
41	Soybean Solvent Extraction System	1977	Mineral Oil Vent	Hexane	34.7	151.9	SIP	20	
42	Soybean Solvent Extraction System	1977	None	Hexane	45.8	200.6	SIP	20	Fugitive Emissions
43	Meal Storage Receiver	1991	Cyclone / Baghouse	PM/PM_{10} PM_{10}	0.1 0.1	0.4 0.1	Code	20	
44	Meal Convey to Flat Storage/Loadout	1991	Baghouse	PM/PM_{10} PM_{10}	0.1 0.1	0.4 0.1	Code	20	
45	Meal to Flat Storage/Loadout	1991	Baghouse	PM/PM_{10} PM_{10}	0.1 0.1	0.4 0.1	Code	20	
46	Meal Dust System	1991	Baghouse	PM/PM_{10} PM_{10}	0.1 0.1	0.4 0.1	Code	20	
47	Fine Grind	1991	Cyclone	PM/PM_{10} PM_{10}	2.7 0.7	1.4 0.4	Code	20	
48	Meal Rail Loadout	1991	None	PM/PM_{10} PM_{10}	9.6 2.4	42.0 10.5	SIP	20	Fugitive Emissions

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
49	Boiler #3	1960s	None	PM/PM_{10} SO_2 NO_X CO VOC	1.0 0.1 9.4 2.4 0.4	4.0 0.2 41.1 10.3 1.7	SIP	40	67 MMBtu/hr
50	Boiler #4	1960s	None	PM/PM_{10} SO_2 NO_X CO VOC	1.4 0.1 14.0 3.5 0.6	6.0 0.3 61.3 15.3 2.5	SIP	40	100 MMBtu/hr
51	#3 Deodorizer Dowtherm Boiler	1960s	None	PM/PM_{10} SO_2 NO_X CO VOC	0.1 0.1 0.9 0.2 0.1	0.5 0.1 3.9 0.8 0.3	Code	40	8.8 MMBtu/hr
52	#4 Deodorizer Dowtherm Boiler	1960s	None	PM/PM_{10} SO_2 NO_X CO VOC	0.2 0.1 1.8 0.5 0.1	0.8 0.1 7.9 2.0 0.4	Code	40	12.9 MMBtu/hr
53	Stabilized Bran Loading/Unloading	1993	None	PM/PM_{10} PM_{10}	5.5 1.4	24.1 6.0	SIP	20	Fugitive Emissions

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
54	Bran Receiving Tank	1993	Bin Vent	PM/PM_{10} PM_{10}	0.3 0.1	1.3 0.4	Code	20	
55	Bran DTDC	1993	Cyclones	PM/PM_{10} PM_{10} Hexane	1.5 0.4 1.5	6.6 1.7 6.6	Code	20	3 Cyclones
56	Bran Solvent Extraction	1993	Mineral Oil Scrubber	Hexane	2.6	11.4	SIP	20	
57	Bran Solvent Extraction	1993	None	Hexane	47.7	208.9	SIP	20	Fugitive Emissions
58	Defatted Bran Storage Bin	1993	Bin Vent	PM/PM_{10} PM_{10}	0.3 0.1	1.3 0.4	Code	20	
59	Hexane Storage Tank	1960s	None	Hexane	0.3	1.2	Code	40	30,000 gal Soybean Plant
60	Hexane Storage Tank	1993	None	Hexane	0.1	0.5	Code	20	12,000 gal Rice Bran Extraction
61	Hexane Storage Tank	1993	None	Hexane	0.1	0.5	Code	20	12,000 gal Rice Bran Extraction
62	Hexane Receiving	1960s	None	Hexane	0.1	0.1	Code	40	Fugitive Emissions
63	Acetone Receiving	1970s	None	Acetone	0.1	0.1	Code	40	Fugitive Emissions
64	Acetone Tank	1970s	None	Acetone	0.1	0.5	Code	40	10,000 gal

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
65	Acetone Tank	1970s	None	Acetone	0.1	0.5	Code	40	10,000 gal
66	Dowtherm	1960s	None	Dowtherm	0.2	1.0	Code	40	Fugitive Emissions
67	Lab Emissions	1960s	None	Diethyl Ether Petroleum Ether Freon	0.1 0.1 0.1	0.3 0.1 0.2	Code	40	
68	Lecithin Plant VIC Emissions	1970s	None	Acetone	11.3	49.5	SIP	40	
69	Gas Plant Reformer Furnace	1970s	None	PM/PM_{10} SO_2 NO_X CO VOC	0.2 0.1 1.4 0.4 0.1	0.6 0.1 6.2 0.1 0.3	Code	40	10 MMBtu/hr
70	Bleaching Clay Tank	1990	Bag Filter	PM/PM_{10}	0.1	0.1	Code	20	
71	Bleaching Clay Pneumatic Receiver	1990	Bag Filter	PM/PM_{10}	0.1	0.1	Code	20	
72	Lecithin Plant	1970s	None	Acetone	64.0	280.5	SIP	40	Fugitive Emissions
73	Wastewater Treatment Ponds	1960s	None	VOC	0.1	0.4	Code	40	Fugitive Emissions

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
74	Lime Tank	1970s	Bin Vent	PM/PM_{10}	0.1	0.4	Code	40	
75	Bentonite Tank	1991	Bin Vent	PM/PM_{10}	0.1	0.4	Code	20	
76	Amarillo Dryer #1	1977	Screens	PM/PM_{10} PM_{10} SO_2 NO_X CO VOC	5.7 1.7 0.1 3.5 0.9 0.2	2.1 1.7 0.1 15.3 3.8 0.6	SIP	20	25 MMBtu/hr
77	Amarillo Dryer #2	1977	Screens	PM/PM_{10} PM_{10} SO_2 NO_X CO VOC	5.7 1.7 0.1 3.5 0.9 0.2	2.1 1.7 0.1 15.3 3.8 0.6	Code	20	25 MMBtu/hr
78	Blending Elevator Dryer	1950s	Screens	PM/PM_{10} PM_{10} SO_2 NO_X CO VOC	6.2 1.7 0.1 1.4 0.4 0.1	20.4 5.6 0.1 6.2 1.6 0.3	SIP	40	10 MMBtu/hr
79	Gasifier Hull Receiving Pit	1996	None	PM/PM_{10} PM_{10}	1.0 0.3	1.5 0.4	Code	20	Fugitive Emissions

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
80	Gasifier Hull Receiving Tanks	1996	None	PM/PM_{10} PM_{10}	1.6 0.4	2.5 0.7	Code	20	
81	Gasifier Ash Receiving Tanks	1996	None	PM/PM_{10} PM_{10}	0.2 0.1	0.7 0.2	Code	20	
82	Gasifier Ash Loadout	1996	None	PM/PM_{10} PM_{10}	0.3 0.1	0.4 0.1	Code	20	Fugitive Emissions
TOTAL ALLOWABLE EMISSIONS (including fugitive emissions)				PM/PM_{10} PM_{10} SO_2 NO_X CO VOC[1] Acetone Hexane Dowtherm Diethyl Ether Petroleum Ether Freon	120.8 37.2 1.1 45.0 11.6 146.8 75.6 144.2 0.2 0.1 0.1 0.1	231.1 75.5 1.4 197.0 47.6 640.0 331.1 631.2 1.0 0.3 0.1 0.2			

ALLOWABLE EMISSION RATES									
SN	Description	Date Installed	Control Equipment	Pollutant	Emission Rate		Regulation	% Opacity	Comments
					lb/hr	ton/yr			
TOTAL FUGITIVE EMISSIONS				PM/PM_{10}	46.7	81.5			
				PM_{10}	12.2	20.0			
				VOC[1]	93.6	409.6			
				Acetone	64.1	280.8			
				Hexane	93.6	409.6			
				Dowtherm	0.2	1.0			
TOTAL POINT SOURCE EMISSIONS				PM/PM_{10}	74.1	149.6			
				PM_{10}	25.0	55.5			
				SO_2	1.1	1.4			
				NO_X	45.0	197.0			
				CO	11.6	47.6			
				VOC[1]	53.2	230.4			
				Acetone	11.5	50.3			
				Hexane	50.6	221.6			
				Dowtherm	0	0			
				Diethyl Ether	0.1	0.3			
				Petroleum Ether	0.1	0.1			
				Freon	0.1	0.2			

[1]Total allowable VOC emissions (lb/hr and ton/yr) includes Diethyl Ether, Petroleum Ether and Hexane contributions.

CERTIFICATE OF SERVICE

I, Keith A. Michaels, hereby certify that a copy of this permit has been mailed by first class mail to Riceland Foods, Inc. - Soya Division, P. O. Box 927, Stuttgart, Arkansas 72160, on this 18 day of October, 1996.

Keith A. Michaels, Chief, Air Division