Title V Air Operation Permit Renewal
Permit No. 1050046-027-AV

APPLICANT

The applicant for this project is Mosaic Fertilizer, LLC. The applicant's responsible official and mailing address are: Jeff Golwitzer, Plant Manager, Mosaic Fertilizer, LLC, Bartow Facility, 13830 Circa Crossing Drive, Lithia, FL 33547.

FACILITY DESCRIPTION

The applicant operates the Mosaic Bartow Facility, which is located at 3200 Highway 60 West and 4390 CR 640 West, Bartow, Polk County.

This existing facility consists of one phosphoric acid plant (two trains), one monoammonium phosphate/ diammonium phosphate (MAP/DAP) plant, one DAP fertilizer plant, three sulfuric acid plants, two fertilizer shipping plants, one auxiliary boiler, and a molten sulfur storage and handling system.

Phosphate rock is the primary feed for the phosphoric acid plant. This emission unit is regulated under National Emission Standards for Hazardous Air Pollutants (NESHAP) - 40 CFR 63, Subpart A – Combined General Provisions; 40 CFR 63, Subpart AA - NESHAP From Phosphoric Acid Manufacturing Plants, adopted and incorporated by reference in Rule 62-204.800, F.A.C.; Administrative Order No. 03-C-AP for alternative MACT monitoring plan; Rule 62-212.300, F.A.C., General Preconstruction Review Requirements; Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD); and Rule 62-296.403, F.A.C., Phosphate Processing. Fluoride emissions from this source are controlled by three separate scrubbers; one venturi scrubber and two cross flow packed scrubbers.

Phosphoric acid is the feed for the Fertilizer (DAP/MAP) Plant. It consists of a reactor, granulator, dryer, cooler, mills, screens and ancillary equipment. The dryer is fired with natural gas, or fuel oil. The facility maintains records of the fuel oil supplier's sulfur content analysis. This emission unit is regulated under New Source Performance Standard (NSPS) - 40 CFR 60, Subpart V, Standards of Performance of Phosphate Fertilizer Industry: Diammonium Phosphate Plants; and NESHAP – 40 CFR 63, Subpart A – Combined General Provisions; 40 CFR 63, Subpart BB – NESHAP From Phosphate Fertilizers Production Plants, adopted and incorporated by reference in Rule 62-204.800, F.A.C.; Rule 62-212.300, F.A.C., General Preconstruction Review Requirements; Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD); Rule 62-296.320, F.A.C., General Pollutant Emission Limiting Standards; Rule 62-296.403, F.A.C., Phosphate Processing. Emissions from this source are controlled by the scrubbers.

Molten sulfur is the feed for the sulfuric acid plants. These emission units are regulated under NSPS - 40 CFR 60, Subpart H, Standards of Performance for Sulfuric Acid, adopted and incorporated by reference in Rule 62-204.800(7)(b)10., F.A.C.; Rule 62-212.300, F.A.C., General Preconstruction Review Requirements; Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD); Rule 62-296.320, F.A.C., General Pollutant Emission Limiting Standards; and Rule 296.402, F.A.C., Sulfuric Acid Plants. Sulfur dioxide from each sulfuric acid plant is controlled by a dual absorption tower, and acid mist is controlled by high volume (HV) and high efficiency (HE) mist eliminator. These units utilize continuous emission monitors (CEMs) for sulfur dioxide (SO_2) emissions.

The facility has two Fertilizer Shipping Plants that include material conveyors, transfer points, truck and rail car shipping bins and loadout spouts. All material transfer points are located inside the material handling building and are covered to minimize fugitive emissions. The truck and rail car loading operations are beneath the building and enclosed on two sides. Loading is done via chute feeders. These emissions units are regulated under Rule 62-296.320, F.A.C., General Pollutant Emission Limiting Standards. Emission is controlled by dust suppressant.

The facility has one Package Water tube Boiler that is used during cold start-up of the sulfuric acid plant(s) and for make-up steam during times the sulfuric acid plant(s) are operating below capacity and is routinely fired for maintenance purposes. This boiler is fired with natural gas as the primary fuel with new No. 5 fuel oil or better grade of fuel oil as the back-up fuel. The facility maintains records of the fuel oil supplier's sulfur content analysis. This emissions unit is regulated under Rule 62-296.406, F.A.C., Fossil Fuel Steam Generators with less than 250 Million Btu per Hour Heat Input, New and Existing Emissions Units.

The molten sulfur storage and handling system consists of the following: a rail and truck unloading system, one 3,000 ton molten sulfur storage tank, one 6,000 ton molten sulfur storage tank, one 200 ton molten sulfur truck/railcar unloading pit (Pit A), one 300 ton railcar unloading pit (Pit B), and all of the associated transfer pumps and piping. These emissions units are regulated under Rule 62-212.300, F.A.C., General Preconstruction Review Requirements; Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD); Rule 62-296.320, F.A.C., General Pollutant Emission Limiting Standards; and Rule 62-296.411, F.A.C., Sulfur Storage and Handling Facilities. The pits A and B are evacuated by two ejectors (Venturi Exhausters) to individual stacks.

The facility has two new emergency stationary compression ignition (CI) reciprocating internal combustion engines (RICE) that are subject to NSPS 40 CFR 60, Subpart A – General Provisions and Subpart IIII, Set K – Owner/Operator pre-2007 non-fire pump emergency, less than 10L per cylinder. The facility also has ten existing emergency and nine existing non-emergency CI RICE that are subject to 40 CFR 63, Subpart A – General Provisions and Subpart ZZZZ - NESHAP for Stationary RICE. NSPS applicability 40 CFR 60, Subpart IIII, Set K and NESHAP applicability for Stationary RICE tables are made a part of this project.

Also included in this permit are miscellaneous unregulated emissions units and/or activities and insignificant activities. Mosaic Green Bay Phosphogypsum Stacks I & II are included in the Mosaic Bartow Facility as unregulated emission units.

PROJECT DESCRIPTION

The purpose of this permitting project is to renew the existing Title V Air Operation Permit 1050046-018-AV, incorporate the terms of Air Construction Permits 1050046-023-AC, 1050046-024-AC, and 1050046-025-AC through Title V Air Operation Permit Revision Project No. 1050046-026-AV for the above referenced facility. The Project No. 1050046-026-AV is incorporated to this permit. This permit incorporates a total of twenty one stationary compression ignition (CI) reciprocating internal combustion engines (RICE) as a requirement per 40 CFR 63, Subpart ZZZZ. This permit also incorporates gypstacks I and II of Mosaic Green Bay Facility as a part of unregulated emission units at Mosaic Bartow Facilities.

Mosaic Green Bay facility applied for a Title V Air Operation Permit Renewal (Project No. 1050053-044-AV) to include the E.U. Nos. 040 and 044 only and make all other emission units inactive. EU 040 and 044 are the gypstacks I and II in the Green Bay Facility. The Green Bay facility stopped production longtime back and kept the gypstacks I and II active for water management purpose including water management for the Bartow Facility. SWD discussed this matter with DARM and reached the conclusion to include the Green Bay gypstacks as a part of Mosaic Bartow Facility unregulated emission units. The facility consented to the proposal and allowed the Green Bay Title V Air Operation Permit to expire. The Green Bay Facility will be made inactive upon issuance of this permit 1050046-027-AV (Final).

PROCESSING SCHEDULE AND RELATED DOCUMENTS

Initial Title V Air Operation Permit issued 10/06/1998
Title V Air Operation Permit Revision issued 04/07/2004
Title V Air Operation Permit Administrative Correction issued 11/06/2004
Renewal Title V Air Operation Permit issued 09/30/2005

Application for a Title V Air Operation Permit Renewal received 02/17/2010
Additional Information Request dated 04/13/2010
Additional Information Response received 07/12/2010
Additional Information Request dated 08/09/2010
Additional Information Response received 11/05/2010
Notice of Intent to Issue Air Permit issued 4/1/2011
Public Notice Published 4/8/2011

PRIMARY REGULATORY REQUIREMENTS

Title III: The facility is identified as a major source of hazardous air pollutants (HAP).

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 62-213, Florida Administrative Code (F.A.C.).

PSD: The facility is a Prevention of Significant Deterioration (PSD)-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility does operate units subject to the New Source Performance Standards (NSPS) of 40 Code of Federal Regulations (CFR) 60.

NESHAP: The facility does operate units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 63.

CAIR: The facility is not subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.

SITING: No Unit was originally certified pursuant to the power plant siting provisions of Chapter 62-17, F.A.C.

CAM: Compliance Assurance Monitoring (CAM) does not apply to any of the units at the facility. Pollutants sulfur dioxide (SO_2), sulfuric acid mist (SAM), and particulate matter (PM) are controlled by final absorption tower, mist eliminator, and baghouse. These control equipments are considered inherent process equipment (IPE) for CAM purposes. Fluoride (F) emission is controlled by scrubbers. The pollutant (F) is subject to national emission standards for hazardous air pollutants (NESHAP) and the equipment is considered inherent process equipment for the purpose of CAM.

PROJECT REVIEW

The Title V Air Operation Permit Renewal includes the incorporation of three construction permit Nos. 1050046-023-AC, 1050046-024-AC and 1050046-025-AC. The construction permit No. 1050046-023-AC was to change the scrubbing system in the No. 3 fertilizer plant, 1050046-024-AC was to replace two fans with two ejectors in the molten sulfur storage pits, and 1050046-025-AC was for modification to the Phosphoric Acid Plant (U-Train).

Discussion of the reasons for the changes made as part of this project:

1. Construction Permit No. 1050046-023-AC: The construction permit authorizes the modification in the scrubbing system is to eliminate the return of the effluent from the scrubber to the process water pond. The modification is done in order to comply with the resource conservation and recovery act (RCRA) requirement that the effluent from the scrubber can't be returned to the process water pond without proper treatment.

   The scrubbing system re-circulates a portion of the effluent of RGCV and Dryer tailgas scrubbers and uses the rest as scrubbing liquid in the Cooler scrubber in addition to the DAP pond water and re-use water. The Cooler scrubber effluent will be is returned to the DAP pond instead of to the Process water pond. This way the use of Process pond water in the Cooler scrubber with the effluent returning to Process water pond is eliminated.

2. Construction Permit No. 1050046-024-AC: The construction permit authorizes to modify the molten sulfur storage system pits A and B. The modification is done in order to improve the fume evacuation system by replacing two forced draft fans with two venture exhausters.

The molten sulfur storage pits (Pit A and Pit B) are under induced draft with the total maximum ventilation rate of 1,500 actual cubic feet per minute (acfm) from Pit A and 3,000 acfm from Pit B. Pit A and Pit B each has a 25 foot tall stack.

3. Construction Permit No. 1050046-025-AC: The construction permit authorizes to modify the phosphoric acid plant No. 5 – U-Train. The modification is done in order to improve sulfate control and stability. This will reduce the foam-over events and therefore, decrease fugitive fluoride emissions from the reactor.

   The Phosphoric Acid Plant No. 5 – U Train Reactor has been modified to improve sulfur control and stability. The modifications are itemized as follows:

   1. Lowered Reactor Liquid Level – The liquid level in the reactor was lowered, increasing the freeboard (headspace) volume in the reactor. This allows more room for foaming during process fluctuations, without the foam overflowing the reactor vessel.
   2. Repositioned Sulfuric Acid Sparger – The sulfuric acid sparger was moved into the bulk flow of the reactor (in Compartment No.4 / No.5 Sideflow) to aid in mixing and improve the reaction and sulfate control.
   3. Relocated Trim Sulfuric Acid Line – The trim sulfuric acid line was relocated in Compartment No. 5 to aid in sulfate stability and control. The trim line was previously located in Compartment No. 11.
   4. Installed Fume Arch in No.5/No.4 Passageway – This modification to Compartment No. 4 and No.5 allows air pressure equalization in the reactor compartments and decrease the amount of foam-over events.
   5. Modified Flash Cooler Suction Piping – Modifying the flash cooler suction piping helps maintain reactor circulation at design specifications for a longer period of time, which improves reactor stability.

   The changes mentioned above will reduce foam-over events and therefore, decrease fugitive fluoride emissions from the reactor.

4. Two new and nineteen existing stationary CI RICE were added to the Title V Air Operation Permit 1050046-027-AV in sections J and K.

CONCLUSION

This project revises and renews Title V air operation permit No. 1050046-018-AV, which was issued on September 30, 2005. This Title V air operation permit renewal is issued under the provisions of Chapter 403, Florida Statues (F.S.), and Chapters 62-4, 62-210 and 62-213, F.A.C.