



Jeb Bush  
Governor

# Department of Environmental Protection

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Colleen M. Castille  
Secretary

April 19, 2005

## CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Elizabeth Foeller, P.E.  
Environmental Superintendent  
Mosaic Fertilizer, LLC  
4390 C.R. 640 West  
Bartow, Florida 33830

Re: Green Bay Plant  
Sulfuric Acid Plant #5

Dear Ms. Foeller:

The Department has reviewed the letter dated March 23, 2005 requesting or supporting a determination that a construction permit is not required for certain work to be performed on Sulfuric Acid Plant 5 (SAP 5) at the Green Bay Plant in Bartow. The specific work described and to be performed during the upcoming periodic "turn-around" of SAP 5 in March 2006 consists of the following:

1. Replacement of the SAP 5 water tube Waste Heat Boiler;
2. Replacement of the Sulfur Burner to Waste Heat Boiler transition duct;
3. Replacement of the gas duct from the Boiler to the Burner jug valve;
4. Replacement of the gas duct from the Boiler outlet duct to the OD Economizer;
5. Replacement of the gas duct from the OD Economizer to the Boiler outlet duct;
6. Elevation of the Steam Drum requiring modifications to the boiler feed water piping, riser pipes, downcomers, the steam piping and the support structure and access platforms; and
7. Replacement of the Kentube Superheater 1B.

The stated purpose of items 1 through 7 is "to restore or improve the heat recovery capability of the unit." According to your December 22, 2004 letter, "the changes will occur on the steam side of the plant, as opposed to the sulfuric acid production side of the plant."

The existing Waste Heat Boiler has a history of tube leaks. The Boiler is a shell and tube type heat exchanger, with the water inside the tubes and the gas on the shell side. The horizontal run of the outer row of tubes causes the partially filled tubes to boil to dryness, leaving a scale deposit containing corrosive products and water treating chemicals on the top surface of the horizontal runs. The combination of the scale deposits and high tube wall temperatures has caused tube failures in the Boiler. Eliminating the horizontal runs by using diagonal runs will result in a taller Boiler, which in turn requires the Steam Drum to be elevated.

Following review of the information provided by Mosaic, it is the Department's conclusion as elaborated in the attached Technical Evaluation that such installation is within the scope of **routine**

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maintenance, repair and replacement for this specific sulfuric acid plant. This conclusion is based on the following facts:

- The new Waste Heat Boiler and 1B Superheater will not allow daily sulfuric acid production to increase. The changes only affect the "steam" side of the plant. However, a longer time between plant turnarounds may result. No production rate increase is requested.
- The described work will not be conducted on a key piece of process equipment such as the sulfur furnace, drying tower, main compressor, absorption towers, converters, etc.
- The emissions will remain within the short-term limits and the existing long-term potential-to-emit.
- The planned changes to SAP 5 are estimated to cost approximately \$4.5 million. By comparison, a comparable new sulfuric acid plant of the same capacity as SAP 5 would cost about \$30 million to construct today. Therefore, the planned changes represent less than 15 percent of a comparable new facility.

Because the described work is considered as routine maintenance, repair or replacement in this case, it is not a physical change or change in method of operation. Therefore it is not a modification as defined in Rule 62-210.200, F.A.C. (definitions) and is not subject to pre-construction review under Rule 62-212, F.A.C. Furthermore the work will not change the description of the plant or its components as presently permitted.

Please note that this determination is applicable only for the specified work at Green Bay Plant SAP 5. There are many different configurations of SAPs and relevant circumstances (such as whether electricity is produced in addition to heat and steam) that could affect a decision at other installations. If the described work is part of a larger modernization project, the Department can aggregate this work with future work and come to a different conclusion.

A person whose substantial interests are affected by the proposed decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner, the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate; (e) A concise statement of the ultimate facts

alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and (g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency's proposed action.

A petition that does not dispute the material facts upon which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

In addition to the above, a person subject to regulation has a right to apply for a variance from or waiver of the requirements of particular rules, on certain conditions, under Section 120.542 F.S. The relief provided by this state statute applies only to state rules, not statutes, and not to any federal regulatory requirements. Applying for a variance or waiver does not substitute or extend the time for filing a petition for an administrative hearing or exercising any other right that a person may have in relation to the action proposed in this notice of intent.

The application for a variance or waiver is made by filing a petition with the Office of General Counsel of the Department, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. The petition must specify the following information: (a) The name, address, and telephone number of the petitioner; (b) The name, address, and telephone number of the attorney or qualified representative of the petitioner, if any; (c) Each rule or portion of a rule from which a variance or waiver is requested; (d) The citation to the statute underlying (implemented by) the rule identified in (c) above; (e) The type of action requested; (f) The specific facts that would justify a variance or waiver for the petitioner; (g) The reason why the variance or waiver would serve the purposes of the underlying statute (implemented by the rule); and (h) A statement whether the variance or waiver is permanent or temporary and, if temporary, a statement of the dates showing the duration of the variance or waiver requested.

The Department will grant a variance or waiver when the petition demonstrates both that the application of the rule would create a substantial hardship or violate principles of fairness, as each of those terms is defined in Section 120.542(2) F.S., and that the purpose of the underlying statute will be or has been achieved by other means by the petitioner.

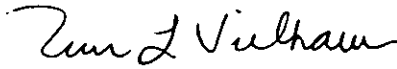
Persons subject to regulation pursuant to any federally delegated or approved air program should be aware that Florida is specifically not authorized to issue variances or waivers from any requirements of any such federally delegated or approved program. The requirements of the program remain fully enforceable by the Administrator of the EPA and by any person under the Clean Air Act unless and until the Administrator separately approves any variance or waiver in accordance with the procedures of the federal program.

This letter constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition which conforms to Rule 62-110.106, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department.

If either a petition for administrative hearing or a request for extension of time is not timely filed with the Department, then this letter shall constitute final agency action. Any party to this order would then have the right to seek judicial review pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with

the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice of appeal must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.



Trina L. Vielhauer, Chief  
Bureau of Air Regulation

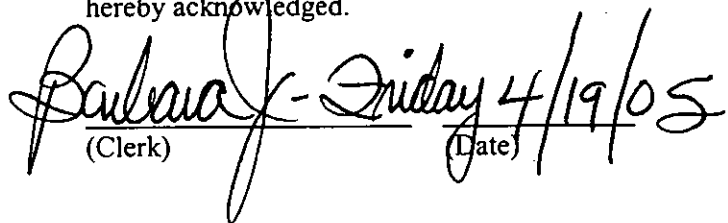
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this letter was sent by certified mail (\*) and copies were mailed by U.S. Mail before the close of business on 4/19/05 to the person(s) listed:

Elizabeth Foeller, Mosaic Fertilizer, LLC \*  
Gregg Worley, EPA Region IV  
John Bunyak, NPS  
Jerry Kissel, DEP SWD  
David Buff, P.E., Golder Associates, Inc.

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

  
(Clerk) Friday 4/19/05 (Date)

SENDER: COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none"> <li>Complete Items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.</li> <li>Print your name and address on the reverse so that we can return the card to you.</li> <li>Attach this card to the back of the mailpiece, or on the front if space permits.</li> </ul>	<p>A. Signature  <i>Kate Pack</i> <input type="checkbox"/> Agent <input type="checkbox"/> Addressee</p>	
<p>1. Article Addressed to:</p> <p>Ms. Elizabeth Foeller, P.E.  Environmental Superintendent  Mosaic Fertilizer, LLC  4390 C.R. 640 West  Bartow, Florida 33830</p>	<p>B. Received by (Printed Name)</p>	<p>C. Date of Delivery  8-21-05</p>
	<p>D. Is delivery address different from item 1? <input type="checkbox"/> Yes  If YES, enter delivery address below: <input type="checkbox"/> No</p>	
<p>2. Article Number  (Transfer from service label) 7000 2870 0000 7028 2140</p>	<p>3. Service Type  <input checked="" type="checkbox"/> Certified Mail <input type="checkbox"/> Express Mail  <input type="checkbox"/> Registered <input type="checkbox"/> Return Receipt for Merchandise  <input type="checkbox"/> Insured Mail <input type="checkbox"/> C.O.D.</p>	
	<p>4. Restricted Delivery? (Extra Fee) <input type="checkbox"/> Yes</p>	
<p>PS Form 3811, August 2001 Domestic Return Receipt 102595-02-M-1540</p>		

U.S. Postal Service <b>CERTIFIED MAIL RECEIPT</b> (Domestic Mail Only; No Insurance Coverage Provided)		
Ms. Elizabeth Foeller, P.E. U S E		
Postage	\$	Postmark Here
Certified Fee		
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		
<b>Total Postage &amp; Fees</b>	\$	
<p>Sent To  Ms. Elizabeth Foeller, P.E.  Street, Apt. No.; or PO Box No.  4390 C.R. 640 West  City, State, ZIP+4  Bartow, Florida 33830</p>		
PS Form 3800, May 2000		See Reverse for Instructions

7000 2870 0000 7028 2140

## TECHNICAL EVALUATION

### 1.0 APPLICATION INFORMATION

#### 1.1 Applicant Name and Address

Mosaic Fertilizer, LLC  
Green Bay Plant  
4390 C.R. 640 West  
Bartow, Florida 33830

Representative:  
Ms. Elizabeth Foeller, P.E.  
Environmental Superintendent

#### 1.2 Reviewing and Process Schedule

12-23-04: Date of Receipt of Request  
01-24-05: DEP's Completeness Request  
03-28-05: Applicant's response to DEP's completeness request. Application Complete

### 2.0 FACILITY INFORMATION

#### 2.1 Facility Location: Green Bay Plant located at 4390 C.R. 640 West, Bartow, Polk County

#### 2.2 Standard Industrial Classification Code (SIC)

Major Group No.	28	Chemicals and Allied Products
Group No.	287	Agricultural Chemicals
Industry No.	2874	Phosphatic Fertilizers

#### 2.3 Existing Facility/Emission Unit Description

This facility is a phosphate fertilizer manufacturing facility that produces sulfuric acid, phosphoric acid, DAP (diammonium phosphate), and MAP (monoammonium phosphate).

#### 2.4 Regulatory Classification

The facility is classified as a major Title V source of air pollution because emissions of at least one regulated air pollutant, such as sulfur dioxide, exceed 100 tons per year. The facility is also classified as a major source of air pollution with respect to Rule 62-212.400, the Prevention of Significant Deterioration (PSD) of Air Quality.

### 3. PERMITTING STATUS

This facility is currently operating under Title V Operation Permit 1050053-032-AV.

### 4. PRESENT APPLICATION AND DEPARTMENT PROPOSED ACTIONS

On December 23, 2004 the Department received a notification from Mosaic Fertilizer (Mosaic) of some planned activities to be undertaken during the March 2006 turnaround

at the Sulfuric Acid Plant No. 5 (SAP 5) located at its Green Bay phosphate fertilizer plant. The activities involved changes to the Waste Heat Boiler and the 1B Superheater within the SAP 5. Mosaic believed these changes represent routine replacement which will not increase production from the plant and will not affect emissions from the unit. A more detailed description of the planned activities is provided below.

#### Waste Heat Boiler

SAP 5 has a Waste Heat Boiler as an integral part of the sulfuric acid manufacturing process. In the SAP 5, molten sulfur is burned in sulfur burners to create a sulfur dioxide (SO<sub>2</sub>) rich gas stream. The temperature of the SO<sub>2</sub> laden-gas from the Sulfur Burner is higher than is allowed for inlet to the SO<sub>2</sub>-SO<sub>3</sub> conversion system; therefore the gas is first cooled in the Waste Heat Boiler, which recovers the surplus heat as high pressure saturated steam. A gas-side bypass controls gas temperature out of the Boiler. The Boiler steam temperature is a function of the Boiler steam pressure. The Boiler is a shell and tube type heat exchanger with the water inside the tubes and the gas on the shell side. No fuel is fired in the Boiler.

The existing Waste Heat Boiler has a history of tube leaks. This is a result of the outer row of tubes having horizontal runs at the top. The horizontal runs cause the partially filled tubes to boil to dryness, leaving a scale deposit containing corrosion products and water treating chemicals on the top surface of the horizontal runs. The combination of the scale deposits and high tube wall temperatures has caused tube failures in the Waste Heat Boiler. Eliminating the horizontal runs by using diagonal runs will result in a taller Boiler, which in turn requires the Steam Drum to be elevated.

The planned activities at the SAP 5 involve the following (refer to the attached diagram):

- Replacement of the SAP 5 water tube Waste Heat Boiler;
- Replacement of the Sulfur Burner to Waste Heat Boiler transition duct;
- Replacement of the gas duct from the Boiler to the Burner jug valve;
- Replacement of the gas duct from the Boiler outlet duct to the 0D Economizer;
- Replacement of the gas duct from the 0D Economizer to the Boiler outlet duct;
- The project will also require the existing Steam Drum be elevated, necessitating modifications to the boiler feed water piping, riser pipes, downcomers, the steam piping and the support structure and access platforms.

#### 1B Superheater

From the Waste Heat Boiler, the SO<sub>2</sub>-laden gas stream flows to the first pass of the converter where a portion of the SO<sub>2</sub> is converted to SO<sub>3</sub> in the presence of vanadium pentoxide catalyst. The conversion reaction is exothermic. The gas must be cooled to improve the yield of SO<sub>3</sub> in the next catalyst pass. Therefore, the hot gases leaving the first pass flow to a Superheater where the gases are cooled by heating the saturated steam leaving the Waste Heat Boiler. The temperature of the gas exiting the Superheater is controlled in the proper range by bypassing a portion of the hot gas around the Superheater. The cooled gas stream flows from the Superheater to the second Converter pass. The Superheater is also a shell and tube type heat exchanger with the steam inside the tubes and the gas on the shell side.

Mosaic plans to replace the existing Kentube Superheater 1B with a new unit in SAP 5. The 1B Superheater is one of two superheaters within SAP 5. The replacement 1B Superheater will be installed during the scheduled turnaround in March 2006. The 1B Superheater is being replaced because of poor thermal performance, excessive pressure drop, age of the equipment, and recurring problems with leaks at the vessel casing. To avoid similar leak failures, Mosaic would like to have a round, cylindrical casing for the vessel casing for the replacement 1B Superheater. Mosaic has a unit of this same concept installed in SAP 8 at Riverview, which is working well mechanically. The project also involves replacing the gas duct from the Converter to the Superheater. A new bypass duct will also be required.

#### Affects on SAP 5

Mosaic is not requesting any increase in permitted sulfuric acid production rate for SAP 5. The new waste Heat Boiler and 1B Superheater will not allow daily sulfuric acid production to increase. The changes only affect the "steam" side of the plant. However, a longer time between plant turnarounds may result. The planned changes should have no effect on emissions from SAP 5. Neither the Waste Heat Boiler nor the 1B Superheater fires any fuel.

#### Cost Impacts

The planned changes to SAP 5 are estimated to cost approximately \$4.5 million. By comparison, a comparable new sulfuric acid plant of the same capacity as SAP 5 would cost about \$30 million to construct today. Therefore, the planned changes represent less than 15 percent of a comparable new facility.

#### Summary

A summary of the project is presented in the attached Table. The summary addresses EPA's Five-Factor test for determining if a project represents routine maintenance, repair, or replacement (RMRR). The Department believes the project does meet the test of RMRR. The changes only affect the "steam" side of the plant, will not increase production at the plant, and will not affect emissions from the plant.

## 5. CONCLUSION

The planned activities to be undertaken during the March 2006 turnaround at SAP 5 provides reasonable assurance to the Department that there will be no production increase at the plant and will not affect emissions from the plant.

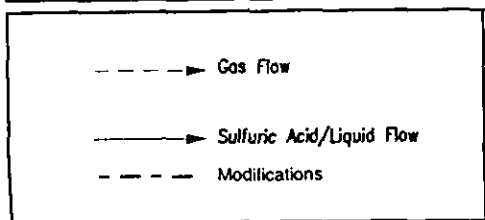
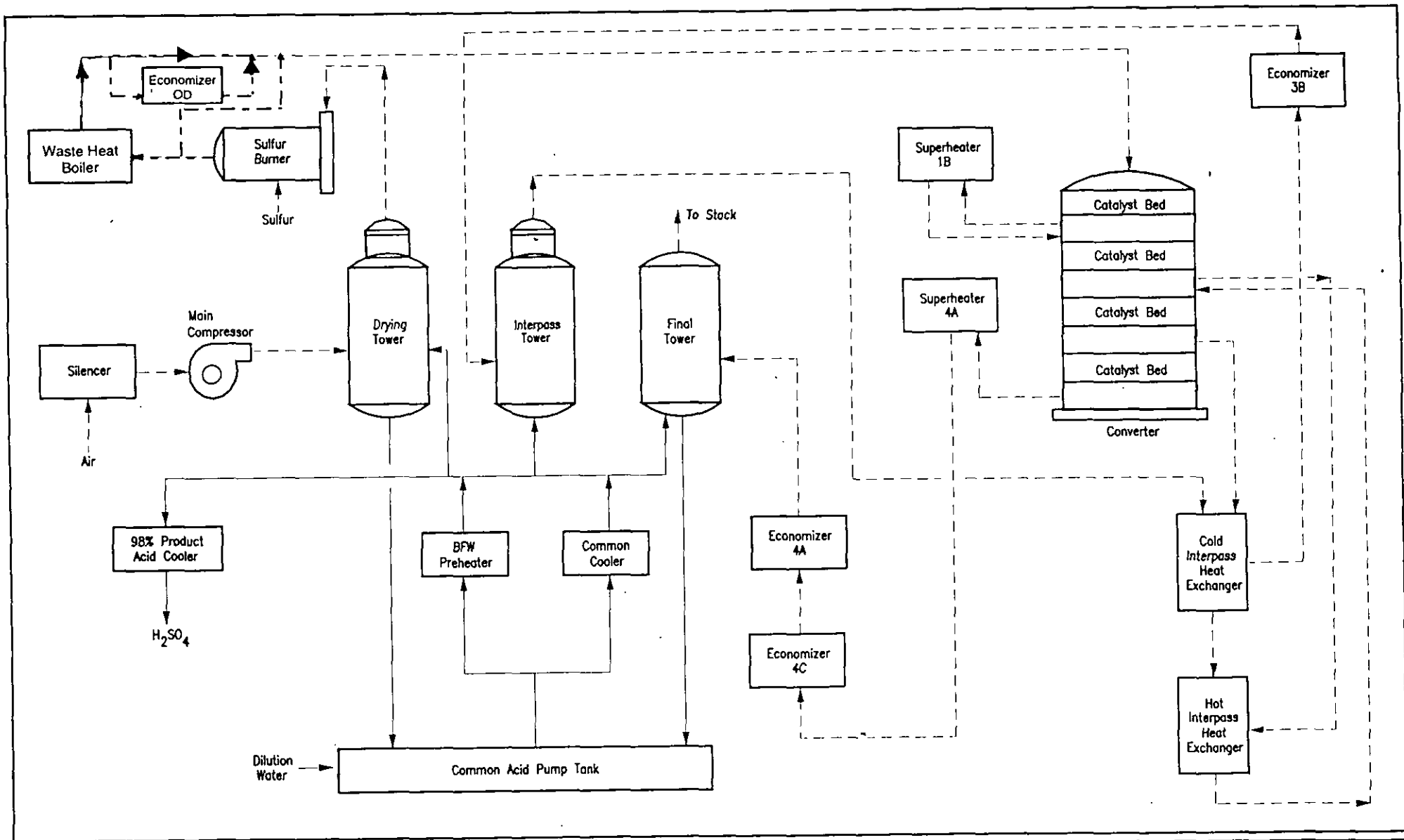
Syed Arif , P.E II  
North Permitting Section



## Routine Replacement for SAP 5

Criteria Based on EPA Guidance	SAP 5 Project
<b>Nature</b>	Replacement of the existing Waste Heat Boiler and Superheater and associated ductwork
1. Whether major components of the facility are being modified or replaced	1. The Waste Heat Boiler and Superheater are relatively important components of the facility. However, these components are on the steam generating side of the facility and therefore do not affect the sulfuric acid production side.
2. Whether the unit is of considerable size, function, or importance to the operation of the facility.	2. The SAP No. 5 is one of the three SAP's at the facility. It is relatively important to the facility.
3. Whether the source itself has characterized the change as non-routine.	3. Mosaic considers the project to be routine: the Waste Heat Boiler and Superheater already exist, but certain components have deteriorated and need to be replaced.
4. Whether the change could be performed during full functioning of the facility or while it was in full working order.	4. The replacements can be accomplished during a planned outage of the facility.
5. Whether the materials, equipment and resources necessary to carry out the planned activity are already on site.	5. Due to the nature of the replacements, additional parts are required.
<b>Extent</b>	
1. Whether an entire emissions unit will be replaced.	1. The SAP No. 5 is not being replaced: only the Waste Heat Boiler and the Superheater, which are not necessary to the production of sulfuric acid.
2. Whether the change will take significant time to perform.	2. The change can occur within a short amount of time. The components will be replaced during the same time period when regular scheduled maintenance on the SAP 5 is performed.
3. Whether the collection of activities, taken as a whole, constitutes a non-routine effort, notwithstanding that individual elements could be routine.	3. Waste Heat Boilers and Superheaters, including steam tubes, are dismantled, repaired, and re-installed periodically (this is common for the industry). When these components are repaired, Mosaic looks at similar facilities it operates to improve the design.
4. Whether the change requires the addition of parts to existing equipment.	4. There will be no additional parts required. All parts will be replacements.
<b>Purpose</b>	
1. Whether the purpose of the effort is to extend the useful life of the units; similarly, whether the source proposes to replace a unit at the end of its useful life.	1. The purpose is to improve the efficiency of the unit and to reduce maintenance costs and downtime. The replacement will have no effect upon the life of the unit. The purpose is not to "extend the useful life" of the SAP No. 5. The replacement is necessitated due to tube failures and leaks from the Waste Heat Boiler and the Superheater.
2. Whether the modification will keep the unit operating in its present condition, or whether it will allow enhanced operation (e.g., will it permit increased capacity, operating rate, utilization, or fuel adaptability).	2. The replacement will not allow enhanced operation of the SAP No. 5. The process will become more efficient, and steam savings will result, with less downtime for maintenance. The SAP No. 5 will experience no increase in air emissions.

<b>Frequency</b>	
1. Whether the change is performed frequently in a typical unit's life.	1. Although entire waste heat boilers are normally not replaced, boiler tubes are dismantled, repaired and re-installed periodically (this is common for the industry). Superheaters have been replaced in the industry.
<b>Cost</b>	
1. Whether the change will be costly, both in absolute terms and relative to the cost of replacing the unit.  2. Whether a significant amount of the cost of the change is included in the source's capital expenses, or whether the change can be paid for out of the operating budget (i.e., whether the costs are reasonably reflective of the costs originally projected during the source's or unit's design phase as necessary to maintain the day-to-day operation of the source)	1 & 2. Estimated cost is \$4.5 million for the entire project. The cost of a comparable new sulfuric acid plant is estimated at \$30 million, making the replacement only 15% of the total replacement cost. 100% of the cost is to be capitalized.



**Sulfuric Acid Plant No. 5**  
**Process Flow Diagram**  
**Mosaic Fertilizer - Green Bay**

EMISSION UNIT:	H <sub>2</sub> SO <sub>4</sub> Plants
PROCESS AREA:	H <sub>2</sub> SO <sub>4</sub> Production
FILENAME:	0337506/4/4.1/L022305/SAP5_Flow Diagram.pdf
LATEST REVISION:	02/23/05