Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Taminco Higher Amines, Inc.
St. Gabriel Plant
St. Gabriel, Iberville Parish, Louisiana
Agency Interest Number: 3263
Activity Number: PER20080002
Proposed Permit Number: 1280-00031-V5

I. APPLICANT

Company:
Taminco Higher Amines, Inc.
P.O. Box 1
St Gabriel, Louisiana 70776-0001

Facility:
Taminco Higher Amines. Inc.
3790 Hwy 30
St. Gabriel, Iberville Parish, Louisiana
Approximate geographic coordinates are Latitude 30° 14' 52" and Longitude 91° 05' 09".

II. FACILITY AND CURRENT PERMIT STATUS

Taminco Higher Amines, Inc. – St Gabriel Plant is designed to manufacture higher alkylamines from ammonia and appropriate alcohols via two continuous process trains. Each train is divided into a reaction and distillation operation. In each reaction operation, the raw materials are vaporized, reacted in the gas phase over fixed beds of catalysts, and cooled to separate non-condensable by-products. In the distillation process, the desired amine product is separated from unreacted raw material and light and heavy by-products.

Taminco Higher Amines Inc is a designated Part 70 source that has only one Title V permit for the entire facility.

Permit No.	Unit or Source	Date Issued
1280-00031-V4	St. Gabriel Plant	05/21/2007

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III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application was submitted on February 29, 2008 requesting a Part 70 operating permit modification for the St. Gabriel Plant. Additional information dated April 14, 2008, April 18, 2008, June 12, 2008, August 22, 2008 and October 8, 2008 were also submitted.

Project

Taminco is proposing to reconcile emission source Sump No. 3 and to permit the following five technically and economically independent projects:

Sump No. 3

Sump No. 3 is located in the loading area (Source 9-76). During normal operations, the loading emissions are routed to either T-112 Low Pressure Absorber (Source 40-96) or T-107 Low Pressure Absorber (Source 10-76). However, during times when both absorbers are down, emissions are routed to Sump No. 3. As part of the Renewal application submitted in June 2006, Taminco combined all components of the wastewater system under one source (WW-06). Since Sump No. 3 is part of the wastewater system, it was included in the wastewater system source WW-06. Therefore, Taminco is reconciling the Sump No. 3 emissions and deleting Source 9-76.

However, due to the necessity to keep the loading requirement under a loading source as opposed to placing these requirements under the wastewater system, a new source – Truck and Car Loading was added strictly to contain the loading requirements. This source has no emissions as the emissions are routed to control equipment as stated above.

DEHA Project

Taminco is proposing to manufacture diethylhydroxylamine (DEHA) in which the unit process equipment will be moved from another facility and installed at the St. Gabriel Plant. The DEHA manufacturing process consists of reacting triethylamine (TEA) and aqueous hydrogen peroxide which will produce an intermediate, triethylamine oxide (TEAO), stripping the stream of excess TEA and water and finally producing DEHA and ethylene via pyrolysis. This process is designed as a combination batch and continuous operation. The front end of the process where the intermediate is generated and the first stripping step, where excess TEA is recovered, are both batch processes while the subsequent stripping, pyrolysis, decanting, concentration, and purification steps are all continuous. The total production volume will be 5,500,000 pounds of DEHA per year sold as an 85% solution or as anhydrous DEHA.

Three storage tanks will be brought on site to store the hydrogen peroxide; two will be 10,500 gallons and the other will be 550 gallons. A 140 ton refrigeration unit charged with R-22 will be installed as well. The ethylene byproduct contaminated by DEHA will be routed to one of two boilers (Sources 2-76 and 2-76A) for incineration. The DEHA generated through pyrolysis is in an aqueous form and separates into 85% and 35% solution layers. The 85% layer may either be directly stored for sale or sent to a distillation column to produce the anhydrous form. The 35% layer is concentrated in another distillation column to recover more of the 85% product.

Taminco is also requesting the flexibility to treat the DEHA waste streams in the existing wastewater system or to store the wastewater in the new DEHA Tank prior to shipping offsite for treatment. The DEHA tank is currently proposed as part of the Wastewater System (WW-06) but also as a separate emission point for instances where Taminco elects not to treat the waste onsite.

Amietol Project

Taminco is proposing to produce alkylalkanolamines (or amietols) in which the installation of the new amietol plant will require a new reactor and associated equipment, four distillation columns, two water scrubbers and a rededication of existing tanks. The basic reaction will occur in a back mix reactor between alkyl amines and ethylene oxide. Ethylene oxide will be transferred via a new positive displacement pump into the back mix reactor. The plant will be operated in campaign mode to produce an estimated 138,592,000 pounds of amietols per year.

Reactor effluent will be transferred to the amietol distillation train for product purification and recovery. The distillation process includes de-amination for recovery and recycle and unreacted amine, dehydration for removal of waste water, and recovery of alkylakanolamine product from heavy residue. One water scrubber will be recycled to the de-amination column and the other will control vents from the dehydration column vacuum system. The co-production of N-methylethanolamine and N-methyldiethanolamine will require a fourth distillation column to recover the N-methylethanolamine product.

Following each campaign, the reactor and distillation train will be cleaned with steam and water to prepare for the next family of amietols. Wash water will be stored in either fixed or mobile railcar storage for use during the next campaign. These crudes will be used to inventory the distillation train at the beginning of a campaign, thus recovering the organics.

Amietol products M12 and M21 will be added as products that tanks TK-217, TK-210, TK-203 and TK-220 can store. TK-217 is currently routed to absorber T-112; however, Taminco is requesting the flexibility to route emissions from this tank to

the atmosphere when storing M12 and M21 due to their low vapor pressures. Diethylamine will be added as a product that TK-208 can store and TK-210 will be placed into N-(dimethylamino) ethanol service. A new cooling water tower (Amietol Cooling Tower) will be constructed as well as a counter-flow packed bed scrubber using 10% sulfuric acid as the scrubbing media.

Wastewater will be routed to the wastewater system. Vents and residue from the water scrubbers as well as vents from purification columns' vacuum systems will be sent to the boilers for destruction. Residue from distillation of products will be sent to a tank prior to being shipped off-site. The emissions from this residue tank will also be routed to the boilers. A pressure bullet tank will be installed to feed ethylene oxide to the process and will be vented to the Amietol Acid Scrubber.

Drumming Project

The drumming facility will be designed to handle a series of alkyl amine products and derivatives and have the ability to fill up to 240,000 drums per year. The products for drumming will arrive via direct pipeline from the plant, via tank trucks, or via railcar. Product will be drummed in a specially designed facility that purges, fills, and caps the drums in one single unit and it will be housed in a completely enclosed, climate-controlled warehouse. Vents from drumming MMA, DMA, and TMA and their derivatives will be routed to the dedicated Drumming Acid Scrubber (Source ID 17-08) during normal operations. Vents from drumming products native to the St. Gabriel facility will be recovered, sent to Sump No. 3 (which is included in Source ID WW-06), or routed to the boilers for destruction. Vapors from drumming non-native and non-methyls products will either be sent to Sump No. 3 or the boilers for destruction.

Butyls Project

Taminco is proposing to produce n-butylamines utilizing the existing ethyls unit. The process will use the same distillation equipment but will require a new reactor. This project is intended to maximize plant efficiency and manufacture product while ethyls are not being produced. Two new emission sources will be added with this project, TK-219 and TK-220 (Source IDs 8-76A and 1-87). Both Tanks currently exist; however, TK-219 has stored only rainwater and TK-220 was part of the wastewater system. Taminco would like to add the flexibility of having the current NH3 Bullets (D-201/202) store Isopropanol (IPOH).

Ethoxylates Project

Taminco is proposing to manufacture ethoxylates, or alkylalkanolamines, by reacting higher amines with ethylene oxide in a plug flow reactor. The process equipment will be relocated from another facility and installed at the St. Gabriel Plant. The ethoxylates unit will be operated in campaign mode to produce a maximum of 78,475,000 pounds of product per year.

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The installation of the specialty ethoxylates plant requires a reactor and associated equipment, four distillation columns, new process vessels, rededication of existing tanks, and new storage tanks. Railcars or storage tanks will be used to store shutdown crude. The new emission points proposed due to this project include product receiver tanks, product storage tanks, an ethoxylates process scrubber vent, and the DEHA Tank.

Following each campaign, the reactor and distillation train will be cleaned with steam and a mixture of water and butanol. Wash water will be collected in a tank and, depending on composition, will either be treated in the site wastewater system or disposed of offsite. Crude material from the process will be stored in railcar storage or fixed storage tanks for use during the next campaign. Crude material will be disposed of offsite if not reworked through the process.

Ethylene oxide will be utilized from the same storage source as the Amietols project. The ethylene oxide will be transferred to the plug flow reactor from the storage tank and the reactor effluent will enter the distillation train for product purification and recovery. The process includes de-amination for recovery and recycle of unreacted higher amine, dehydration for removal of waste water, and recovery of alkylalkanolamine product from heavy residue. One campaign will co-produce butylethanolamine (BAE) and butyldiethanolamine (BDEA), requiring a fourth distillation column to recover the butyldiethanolamine product.

Taminco is proposing to have the flexibility to send process wastewater to the DEHA tank before shipping offsite, or treating the waste stream onsite in the existing wastewater system. The DEHA tank is currently proposed to be part of the wastewater system (WW-06) but is also proposed as a separate emission point for instances where Taminco elects not to treat the waste onsite.

The ethoxylates project will affect three existing emission points, the Amietol Cooling Tower (Source ID 15-08), the Amietol Acid Scrubber (Source ED 16-08) and the DEHA Tank (Source ID 37-08).

Proposed Permit

Permit 1280-00031-V5 will be the modification of Part 70 operating permit 1280-00031-V4 issued on May 21, 2007 for the St. Gabriel Plant.

A notice requesting public comment on the proposed permit was published in The *Advocate*, Baton Rouge, Louisiana and *The Post/South*, St. Gabriel, Louisiana. The public notice was sent to persons included in the Office of Environmental Services Public Notice Mailing List and was also submitted to US EPA Region VI. All comments will be considered prior to the final permit decision.

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Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	15.46	17.47	+2.01
SO_2	0.48	0.48	-
NO_X	115.84	115.84	-
CO	3.32	3.32	-
VOC	69.56	116.30	+46.74 *

*These emissions represent the net increase of these individual projects. Even though this total is above the NNSR Significant Net Increase limit, the NNSR analysis was conducted separately for each technically and economically independent project (i.e. no process equipment is shared between projects). Therefore, no offsets are required

Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before	After	Change
Ammonia	9.49	8.70	-0.79
Acetaldehyde	0.21	0.47	+0.26
n-Butyl Alcohol	-	4.32	+4.32
Chlorine	0.02	0.02	-
Ethylene Glycol	0.70	1.46	+0.76
Ethylene Oxide	<0.01	1.81	+1.81
Sulfuric Acid	<0.001	<0.01	-
Triethylamine	3.94	4.81	+0.87
Total	14.36	21.59	+7.23

IV REGULATORY ANALYSIS

The applicability of the appropriate regulations is straightforward and provided in the Specific Requirements section of the proposed permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are also provided in the Specific Requirements section of the proposed permit.

Applicability and Exemptions of Selected Subject Items

See Proposed Permit.

Prevention of Significant Deterioration/Nonattainment Review

This permit was reviewed for compliance with 40 CFR 70, the Louisiana Air Quality Regulations and New Source Performance Standards (NSPS). National Emission Standards for Hazardous Air Pollutants (NESHAP) and Prevention of Significant Deterioration (PSD) do not apply.

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Streamlined Equipment Leak Monitoring Program

See Appendix A of briefing sheet for consolidated fugitives program.

MACT Requirements

None

Air Quality Analysis

Emissions associated with the proposed modification were reviewed by the Air Quality Assessment Division to ensure compliance with the NAAQS and AAS. LDEQ did not require the applicant to model emissions.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to the Section VIII – General Condition XVII Activities of the proposed permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

Per 40 CFR 70.6(f) and LAC 33:III.507.I, permit shields have been determined for the proposed permit. The details of the permit shield are given in the Permit Shield section of the proposed permit.

VI. PERIODIC MONITORING

See Specific Requirements

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VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: $\geq$ 10 tons per year of any toxic air pollutant; $\geq$ 25 tons of total toxic air pollutants; and $\geq$ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient

Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO_2) – An oxide of sulfur.

Sulfuric Acid (H_2SO_4) – A highly corrosive, dense oily liquid. It is a regulated toxic air pollutant under LAC 33:III.Chapter 51.

Title V Permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) – Any organic compound, which participates in atmospheric photochemical reactions; that is, any organic compound other than those, which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.