Louisiana Department of Environmental Quality
Office of Environmental Services

STATEMENT OF BASIS
For
Activity Number: PER20060002
Permit No. 2743-V2

Ethylene Unit – Activated Sludge Unit – Steam Unit
Lake Charles Chemical Complex
Agency Interest No. 3271
Sasol North America Inc.
Westlake, Calcasieu Parish, Louisiana

I. APPLICANT

Company

Sasol North America Inc.
2201 Old Spanish Trail
Westlake, Louisiana 70669

Facility

Ethylene Unit – Activated Sludge Unit – Steam Unit, Lake Charles Chemical Complex
2201 Old Spanish Trail, Westlake, Calcasieu Parish, Louisiana
UTM Coordinates: 473.00 kilometers East and 3346.13 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS

The Activated Sludge Unit (ASU) consists of equipment and systems used to handle, transfer, store, and treat wastewater generated throughout the SASOL Lake Charles Chemical Complex. The ASU equipment is broken down into three sections: the Quench System, the Collection System, and the Treatment System.

The quench system receives alkyls and unreacted solid aluminum, which has been diluted with LPA solvent, from the Alcohol Unit. The stream is reacted with water and steam in the quench reactor to form aluminum hydroxide, hydrocarbon gases, and hydrogen. Solvent is recycled to the Alcohol Unit. Hydrogen and hydrocarbon gases are routed to the Alcohol Unit fuel gas system. Water is sent to the Sand Filter Settling Basins and then the Holding Pond.

The collection system includes the holding pond, CPI, oily solids handling system, oil collection tanks, and DAF system. Oily wastewater from various units of the Lake Charles Chemical Complex and the ASU holding pond are routed to the CPI for water/oil/solids separation. Water is sent to the DAF system for further separation and then the ASU equalization tanks. Oil stream is routed to the black tanks while solids are pumped to a filter press.

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The treatment system received wastewater from the ASU DAF system and miscellaneous sources from the Ethylene Offsites, groundwater recovery operations, cooling tower and boiler blowdown, and Georgia Gulf VCM plant. Wastewater enters the equalization tank, pH adjustment tank, and then the activated sludge/biological treatment tanks. The water then flows into the clarification tanks for solid removal and the final finishing tank prior to being discharged.

The Ethylene Unit (ETH) consists of all equipment and system used to produce, transfer, and handle ethylene, such as, cracking furnace, compressor, quench system, caustic wash system, drying section, and fractionation section.

Ethane is thermally cracked in the presence of diluted steam in one of seven cracking furnaces. From the furnaces, the cracked gas is cooled in the quench section, compressed, purified in the caustic wash column, dehydrated, and then further cooled down. The gas is separated in a series of distillation columns to recover ethylene, co-products, and byproducts, including heavy aromatic distillate, light aromatic concentrate, methane off-gas, hydrogen off-gas, mixed propane and propylene, and mixed C4's. Ethylene product is transport by pipeline to the Alcohol Unit, to the offsite ethylene storage domes, or to customers.

The Steam Unit (STM) consists of the equipment and systems used to generate and deliver steam to process areas throughout the complex. It includes three boilers, a feedwater treatment system, a boiler blowdown drum, an atmospheric boiler blowdown flash drum, a fuel storage tank, fuel gas piping, and steam distribution piping.

Water is fed the boiler feedwater treatment system where hardness, alkalinity, and silica are removed from the water. The treated water may be combined with steam condensate from the process units before being fed to the boilers or other boiler feedwater users. The treated feedwater is typically pressurized from 25 psig and 850 psig by two turbine-driven pumps.

The boilers can combust natural gas, refinery fuel gas, ethane, distillate oil, or some combination of these fuels to generate the required process steam. Each of these fuels is delivered to the site by pipeline. Distillate fuel oil is stored on-site and is used only when the gaseous fuels are not available. When firing gaseous fuels, each boiler is designed to generate up to 230,000 pounds per hour of 625-psig steam superheated to 750 ^{O}F.

The Activated Sludge Unit is considered to be a part of the Lake Charles Chemical Complex, which is owned and operated by Sasol North America Inc. Active and pending permits for the complex are as follows:

Permit Number	Units or Sources	Date Issued
2325-V2	Ethoxylation Unit	August 17, 2004
2743-V1	Ethylene Unit	July 28, 2003
2825	Research and Development	November 26, 2002

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Permit Number	Units or Sources	Date Issued
2565-V4	Alumina Unit	April 11, 2008
2742-V0	Laboratories Unit	September 27, 2001
PSD-LA-644	Alumina Unit	September 19, 2000
2901-V0	Steam Generating Unit	January 5, 2005
2865-V1	Alcohol Unit	June 15, 2006
2894-V0	Linear Alkyl Benzene Unit	March 15, 2005
2896-V1	Normal Paraffins	June 14, 2007
2895-V0	Active Sludge Unit	January 23, 2006

III. PROPOSED PERMIT / PROJECT INFORMATION

Proposed Permit

A Part 70 operating permit application and Emission Inventory Questionnaire dated March 22, 2006 as well as additional information dated June 21, 2007 were submitted requesting a Part 70 operating permit.

A notice requesting public comment on the permit was published in *The Advocate*, Baton Rouge, and in the local newspaper. A copy of the public notice was mailed to concerned citizens listed in the Office of Environmental Services Public Notice Mailing List. The application and proposed permit were submitted to the Calcasieu Parish Library. The proposed permit was submitted to US EPA Region VI. All comments will be considered prior to the final permit decision.

Project description

SASOL North America requests a Part 70 operating permit for the Ethylene Unit. The Steam Unit and the Activated Sludge Unit are also included in this permit. SASOL also proposes a mass emission limit (cap) for the wastewater treatment system. Emissions from the units were recalculated using updated emissions factors, emissions calculation methods, and current operating parameters.

Permitted Air Emissions

Permitted emissions from the unit in tons per year are as follows:

Pollutant	Before	After	Change
PM_{10}	130.16	130.12	- 0.04
SO_2	377.83	377.83	-
NO_X	1530.38	1530.15	- 0.23
CO	561.36	563.09	+ 1.73
VOC, total	383.19	392.97	+ 9.78

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Prevention of Significant Deterioration (PSD) Applicability

Emissions of the criteria pollutants from the project will not increase more than their PSD significance levels. Therefore, PSD analysis was not required.

Maximum Achievable Control Technology (MACT) requirements

Vent gases from various sections of these units are either controlled by a flare system or are routed to the fuel gas system. Several tanks comply with LAC 33:III.2103. Fugitive components are controlled and monitored as required by LAC 33:III.2122. These control techniques are determined to be MACT.

Air Modeling Analysis

Emissions from these units are not expected to cause or to contribute to any National Ambient Air Quality Standards (NAAQS) or Ambient Air Standards (AAS) exceedances.

Dispersion Model Used: ISCST3

Pollutant	Averaging Period	Calculated Maximum Ground Level Concentration ($\mu g/m^3$)	Ambient Air Standard (AAS) ($\mu g/m^3$)
1,2-Dichloroethane	Annual	0.29	3.85
Benzene	Annual	11.9	12.0
Ammonia	8-hour	370	640

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 Section VIII of the proposed Part 70 permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the proposed Part 70 permit. The applicability of the appropriate regulations is straightforward and provided in the Facility 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 provided in the Facility Specific Requirements Section of the proposed permit.

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IV. PERMIT SHIELDS

The Permit does not include any Permit Shields

V. PERIODIC MONITORING

The Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions and standards are provided in the Facility Specific Requirements Section of the proposed permit.

VI. APLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS

The explanations for the non-applicability and exemptions of selected subject items are listed in Table XI of the proposed permit.

VII. STREAMLINED REQUIREMENTS

The Permit does not include any streamlined requirements.

VIII. GLOSSARY

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Black - A black colloidal substance consisting wholly or principally of amorphous carbon and used to make pigments and ink.

Carbon Monoxide (CO) – (Carbon monoxide) a colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Cooling Tower – A cooling system used in industry to cool hot water (by partial evaporation) before reusing it as a coolant.

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Continuous Emission Monitoring System (CEMS) – The total combined equipment and systems required to continuously determine air contaminants and diluent gas concentrations and/or mass emission rate of a source effluent.

Cyclone – A control device that uses centrifugal force to separate particulate matter from the carrier gas stream.

Duct Burner – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit.

Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Heat Recovery Steam Generator (HRSG) – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

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 action of acids on metallic sulfides, and is an important chemical reagent.

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.

NESHAP - National Emission Standards for Hazardous Air Pollutants –Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

NSPS - New Source Performance Standards – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

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.