Statement of Basis
Linde Gas North America, LLC
Morgan County
712-0072

Linde Gas North America, LLC (Linde) has applied for a Major Source Operating Permit No. 712-0072. This proposed Title V Major Source Operating Permit is issued under the provisions of ADEM Admin. Code R. 335-3-16. The above named applicant has requested authorization to perform the work or operate the facility shown on the application and drawings, plans and other documents attached hereto or on file with the Air Division of the Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit.

Background

This facility is a hydrogen gas generation plant with a liquid carbon dioxide recovery unit. The facility consists primarily of a low pressure boiler (LPB) and two hydrogen reformers. The emissions from the LPB and the reformers are combined into a common exhaust, which vents through a Selective Catalyst Reduction (SCR) unit (This unit is still present, however, the SCR has been decommissioned and no longer operates). Prior to combining with the LPB exhaust, the emissions from the reformers are vented to a selective non-catalytic reduction (SNCR) unit.

Linde previously held a Title V permit (issued September 11, 2006) until returning to Synthetic Minor status on February 22, 2010. Based on the Title V permit application, this facility is a major source for CO_2e. However, the facility currently has no specific CO2e emission limitations.

No. 1 Hydrogen Gas Generation Plant

The LPB is subject to the Federal New Source Performance Standard (NSPS) contained in 40 CFR Part 60, Subpart Dc.

The reformers are permitted to burn Adiponitrile Flasher Tails (AFT), natural gas, and Pressure Swing Absorption (PSA). As Best Available Control Technology (BACT), a selective non-catalytic reduction (SNCR) unit is installed on the exhaust streams of the reformers for control of NOx emissions. The ammonia injection rate for the SNCR shall be at least 1.2 lb/100 lb AFT burned.

The low pressure boiler is permitted to burn natural gas. This unit is subject to the requirements of NSPS, Subpart Dc. The low pressure boiler is limited to a maximum daily average heat input of 25.2 MMBTU/hr.

The facility also has an emergency flare. The emergency flare would be used to control emissions from the plant relief valves.

Periodic Monitoring:

Periodic monitoring for the NOx emissions would be the continuous emission rate monitoring system (CERMS). The CERMS measures the flow rate of the exhaust stream from the SCR and monitor the concentration of NOx in the outlet streams from the SNCR at the outlet of the common header from the Reformers and LP Boiler. Periodic monitoring for the fuel usage and heat input would consist of records of the amount of each fuel burned and the heat input of the LPB.

State Regulations:

- 335-3-14-.04; NOx
- 335-3-4-.01; Opacity
- 335-3-5; SO_2
- 335-3-11-.06; Particulate

Control Equipment:
Emergency Flare; SNCR

Emission Limits and Proposed Periodic Monitoring:

Pollutant	**Emission Limit**	**Basis**	**Periodic Monitoring**
Particulate	$E = 1.38H^{-0.44}$	State	Fuel Use records; Visual observation
SO_2	$\leq$4lb/MMBtu	State	N/A
Opacity	$\leq$20 percent with one six-minute period up to 40 percent in any one hour period	State	Fuel Use Records; Visual observations
NOx	$\leq$ 99 tpy;	PSD Avoidance	Fuel Records; Hourly Heat Input; Amonia Injection Rate; CERMS; Good Combustion Practices

<u>No. 2 Hydrogen Gas Generation Plant</u>

The hydrogen gas generation plant is subject to a synthetic minor limit for Nitrogen Oxides (NOx). The NOx emissions from the reformer shall not exceed 0.06 lb/MMBtu heat input as determined by Referenc method 7E or an alternate test method that has been preapproved by the Department. This unit is also limited to a firing rate of 874.56 MMBtu/day.

The reformer is permitted to burn natural gas, and PSA off-gas.

This unit can vent to the existing Emergency Flare.

Periodic Monitoring:
Periodic monitoring for NOx emissions would consist of records of the amount of each fuel burned and the heat input.

State Regulations:

- 335-3-14-.04; NOx
- 335-3-4-.01; Opacity
- 335-3-5; SO_2
- 335-3-11-.06; Particulate

Control Equipment:
Emergency Flare

Emission Limits and Proposed Periodic Monitoring:

Pollutant	**Emission Limit**	**Basis**	**Periodic Monitoring**
Particulate	$E = 1.38H^{-0.44}$	State	Fuel Use records; Visual observation
SO_2	$\leq$4lb/MMBtu	State	N/A
Opacity	$\leq$20 percent with one six-minute period up to 40 percent in any one hour period	State	Fuel Use Records; Visual observations
NOx	$\leq$ 0.06 lb/MMBtu; $\leq$ 874.56 MMBtu/day	PSD Avoidance	Fuel Records; Heat Input;

CAM

In accordance with Section 64.5 (a)(2), CAM submittals are required for significant permit revisions, including Title V renewals, for pollutant-specific emissions units that use a control device to comply with an applicable standard or emission limitation and are units with a PTE at or greater than 100 percent of the major source threshold for a given pollutant without taking into account emissions reductions achieved by air pollution control devices. The CAM rule requires facilities to monitor compliance indicators for emission units to provide reasonable assurance for compliance with regulatory emission limitations. This facility currently has units subject to CAM.

- No. 1 Hydrogen Gas Generation Plant (NO_x)

The only pollutant which would be subject to CAM would be NO_x since this unit is subject to emission limitations, utilize control devices (SNCR) to control NO_x emissions, and the pre-controlled potential to emit NO_x is greater than the major source threshold. However, the CERMS is a compliance determiner for NOx. According to Part 64.2(b)(vi), emission limits for which a continuous compliance determination method is specified are exempted from the applicable requirements. Therefore, CAM would not be applicable.

Recommendations

Since it appears that Linde Gas North America, LLC would be capable of meeting state and federal requirements, I recommend that the facility be issued the attached Major Source Operating Permit, 712-0072.

Paul D. Hansen
Chemical Branch
Air Division

October 8, 2013
Date