

SYNTHETIC MINOR OPERATING PERMIT

PERMITTEE: LINDE GAS NORTH AMERICA, LLC
FACILITY NAME: LINDE GAS NORTH AMERICA, LLC
LOCATION: DECATUR, ALABAMA

<u>PERMIT NUMBER</u>	<u>DESCRIPTION OF EQUIPMENT, ARTICLE OR DEVICE</u>
712-0072-X007	No. 2 Hydrogen Gas Generation Plant

In accordance with and subject to the provisions of the Alabama Air Pollution Control Act of 1971, as amended, Ala. Code §§22-28-1 to 22-28-23 (2006 Rplc. Vol. and 2007 Cum. Supp.) (the "AAPCA") and the Alabama Environmental Management Act, as amended, Ala. Code §§22-22A-1 to 22-22A-15 (2006 Rplc. Vol. and 2007 Cum. Supp.), and rules and regulations adopted there under, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to construct, install and use the equipment, device or other article described above.

ISSUANCE DATE: Draft

Linde Gas North America, LLC
Decatur, ALABAMA
(PERMIT NO. 712-0072-X007)
PROVISOS

1. This permit is issued on the basis of Rules and Regulations existing on the date of issuance. In the event additional Rules and Regulations are adopted, it shall be the permit holder's responsibility to comply with such rules.
2. This permit is not transferable. Upon sale or legal transfer, the new owner or operator must apply for a permit within 30 days.
3. A new permit application must be made for new sources, replacements, alterations or design changes which may result in the issuance of, or an increase in the issuance of, air contaminants, or the use of which may eliminate or reduce or control the issuance of air contaminants.
4. The permittee shall keep this permit under file or on display at all times at the site where the facility for which the permit is issued is located and shall make the permit readily available for inspection by any or all persons who may request to see it.
5. Each point of emission, which requires testing, will be provided with sampling ports, ladders, platforms, and other safety equipment to facilitate testing performed in accordance with procedures established by Part 60 of Title 40 of the Code of Federal Regulations, as the same may be amended or revised.
6. In the event there is a breakdown of equipment in such a manner as to cause increased emission of air contaminants for a period greater than **1 hour**, the person responsible for such equipment shall notify the Air Division within an additional 24 hours and provide a statement giving all pertinent facts, including the duration of the breakdown. The Air Division shall be notified when the breakdown has been corrected.
7. This process, including all air pollution control devices and capture systems for which this permit is issued, shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.
8. This permit expires and the application is cancelled if construction has not begun within 24 months of the date of issuance of the permit.
9. Submittal of other reports regarding monitoring records, fuel analyses, operating rates, and equipment malfunctions may be required as authorized in the Department's air pollution control rules and regulations. The Department may require stack emission testing at any time.
10. Additions and revisions to the conditions of this Permit will be made, if necessary, to ensure that the Department's air pollution control rules and regulations are not violated.

11. Nothing in this permit or conditions thereto shall negate any authority granted to the Air Division pursuant to the Alabama Environmental Management Act or regulations issued thereunder.
12. The Air Division must be notified in writing at least 10 working days in advance of all emission tests to be conducted and submitted as proof of compliance with the Department's air pollution control rules and regulations.

To avoid problems concerning testing methods and procedures, the following shall be included with the notification letter:

- (a) The date the test crew is expected to arrive, the date and time anticipated of the start of the first run, how many and which sources are to be tested, and the names of the persons and/or testing company that will conduct the tests.
- (b) A complete description of each sampling train to be used, including type of media used in determining gas stream components, type of probe lining, type of filter media, and probe cleaning method and solvent to be used (if test procedure requires probe cleaning).
- (c) A description of the process(es) to be tested, including the feed rate, any operating parameter used to control or influence the operations, and the rated capacity.
- (d) A sketch or sketches showing sampling point locations and their relative positions to the nearest upstream and downstream gas flow disturbances.

A pretest meeting may be held at the request of the source owner or the Department. The necessity for such a meeting and the required attendees will be determined on a case-by-case basis.

All test reports must be submitted to the Air Division within 30 days of the actual completion of the test, unless an extension of time is specifically approved by the Air Division.

15. Any performance tests required shall be conducted and data reduced in accordance with the test methods and procedures contained in each specific permit condition unless the Director (1) specifies or approves, in specific cases, the use of a reference method with minor changes in methodology, (2) approves the use of an equivalent method, or (3) approves the use of an alternative method, the results of which he has determined to be adequate for indicating whether a specific source is in compliance.
16. This permit is issued with the condition that, should obnoxious odors arising from the plant operations be verified by Air Division inspectors, measures to abate the odorous emissions shall be taken upon a determination by the Alabama Department of Environmental Management that these measures are technically and economically feasible.

17. Precautions shall be taken to prevent fugitive dust emanating from plant roads, grounds, stockpiles, screens, dryers, hoppers, ductwork, etc.
18. Precautions shall be taken by the permittee and its personnel to ensure that no person shall ignite, cause to be ignited, permit to be ignited, or maintain any open fire in such a manner as to cause the Department's rules and regulations applicable to open burning to be violated.
19. The permittee shall not use as a defense in an enforcement action that maintaining compliance with conditions of this permit would have required halting or reducing the permitted activity.
20. The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.
21. In accordance with ADEM Admin. Code. r. 335-3-4-.01(1), any source of particulate emissions shall not discharge more than one 6-minute average opacity greater than 20% in any 60-minute period. At no time shall any source discharge a 6-minute average opacity of particulate emissions greater than 40%. Opacity shall be determined by 40 CFR Part 60, Appendix A, Method 9.
22. In accordance with the requirements of ADEM Admin. Code r. 335-3-4-.03, emissions of particulate matter from each combustion source shall not exceed the amount determined by use of the following equation:

$$E = 1.38(H)^{-0.44}$$

Where,

E = Emissions in lb/million Btu

H = Heat Input in millions of Btu/hr

23. In accordance with the requirements of ADEM Admin. Code r. 335-3-5-.01, the sulfur dioxide (SO₂) emissions from each combustion source shall not exceed 1.8 lb/MMBtu
24. The No. 2 hydrogen reformer shall be limited to the use of natural gas and pressure swing absorption (PSA) offgas as fuel.
25. The No. 2 Hydrogen Reformer shall be limited to a maximum heat input of 874.56 MMBtu/day.
26. The NO_x emissions from the No. 2 Hydrogen Reformer shall not exceed the limit of 0.06 lb/MMBtu heat input.

27. In order to remain classified as a synthetic minor source, the NO_x emissions from the No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler and the No. 2 Hydrogen Gas Generation Plant combined shall not exceed 99 tons per year (TPY) as calculated on a 12-month rolling total.
28. Relief valves associated with this source shall be routed to the emergency flare for control.
29. The emergency flare shall meet the minimum design requirements as listed in 40 CFR 60.18.
30. Compliance with the opacity requirements for this unit shall be determined by Reference Method 9 in Appendix A of 40 CFR 60 (latest edition). Alternate test methods may be used provided prior approval by the Department is granted.
31. Compliance with the nitrogen oxide (NO_x) emission requirements for this unit shall be determined by Reference Method 7E in Appendix A of 40 CFR 60 (latest edition). Alternate test methods may be used provided prior approval by the Department is granted.
32. Compliance with the heat input limit shall be demonstrated by fuel calculations. The following heat input content factors shall be used to calculate the heat input.
 - PSA Offgas – 199.2 Btu/scf
 - Natural Gas – 947 Btu/scf
33. The total daily input to the No. 2 Hydrogen Reformer shall be calculated on a daily basis.
34. The total NO_x emissions for the No. 2 Hydrogen Reformer shall be calculated based on a 12-month rolling total.
35. The total NO_x emissions for each emission unit (No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler and the No. 2 Hydrogen Gas Generation Plant) shall be calculated based on a 12-month rolling total.
36. The calculations of the daily total heat input to the No. 2 Hydrogen Reformer shall be recorded and maintained in a permanent form suitable for inspection for a period of at least five (5) years.
37. Records of the 12-month rolling total NO_x emissions for the No. 2 Hydrogen Gas Generation Plant shall be maintained in a form suitable for inspection for a period of at least five (5) years.

38. Records of the sum of the 12-month rolling total NO_x emissions for each emission unit (the No.1 Hydrogen Gas Generation Plant with Low Pressure Boiler and No. 2 Hydrogen Gas Generation Plant) shall be maintained in a form suitable for inspection for a period of five (5) years. The sum of the 12-month rolling total NO_x emissions for all emission units shall be calculated utilizing the 12-month rolling total NO_x emissions calculated for each individual unit.
39. Should the 12-month rolling total NO_x emissions exceed 99 TPY, the facility shall notify the Department with a written report within one (1) business day.
40. A report on the 12-month rolling total NO_x emissions, NO_x emission monitoring system operations, and flow rate monitoring system operation shall be submitted to the Department within thirty (30) days following the end of each semiannual period.
41. A written report of excess NO_x emissions shall be submitted to the Department thirty (30) days following the end of each semiannual period. The reports shall include the following information:
 - The date and time of commencement and completion of each time period of process upset or malfunction.
 - The nature and cause of the process upset or malfunction and the corrective action taken or preventative measures adopted.
 - The date and time identifying each period during which the monitoring system(s) was inoperative (except for zero and span checks) and the nature of the repairs and adjustments.
 - Equations used to convert NO_x emissions data as monitored to the required reporting standard shall be included in the report.

When no excess emissions have occurred and the monitoring system(s) was inoperative or did not require repair adjustment, such information shall be stated in the report.

Draft
Date

SYNTHETIC MINOR OPERATING PERMIT

PERMITTEE: LINDE GAS NORTH AMERICA, LLC
FACILITY NAME: LINDE GAS NORTH AMERICA, LLC
LOCATION: DECATUR, ALABAMA

<u>PERMIT NUMBER</u>	<u>DESCRIPTION OF EQUIPMENT, ARTICLE OR DEVICE</u>
712-0072-X006	No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler

In accordance with and subject to the provisions of the Alabama Air Pollution Control Act of 1971, as amended, Ala. Code §§22-28-1 to 22-28-23 (2006 Rplc. Vol. and 2007 Cum. Supp.) (the "AAPCA") and the Alabama Environmental Management Act, as amended, Ala. Code §§22-22A-1 to 22-22A-15 (2006 Rplc. Vol. and 2007 Cum. Supp.), and rules and regulations adopted there under, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to construct, install and use the equipment, device or other article described above.

ISSUANCE DATE: Draft

Linde Gas North America, LLC
Decatur, ALABAMA
(PERMIT NO. 712-0072-X006)
PROVISOS

1. This permit is issued on the basis of Rules and Regulations existing on the date of issuance. In the event additional Rules and Regulations are adopted, it shall be the permit holder's responsibility to comply with such rules.
2. This permit is not transferable. Upon sale or legal transfer, the new owner or operator must apply for a permit within 30 days.
3. A new permit application must be made for new sources, replacements, alterations or design changes which may result in the issuance of, or an increase in the issuance of, air contaminants, or the use of which may eliminate or reduce or control the issuance of air contaminants.
4. The permittee shall keep this permit under file or on display at all times at the site where the facility for which the permit is issued is located and shall make the permit readily available for inspection by any or all persons who may request to see it.
5. Each point of emission, which requires testing, will be provided with sampling ports, ladders, platforms, and other safety equipment to facilitate testing performed in accordance with procedures established by Part 60 of Title 40 of the Code of Federal Regulations, as the same may be amended or revised.
6. In case of shutdown of air pollution control equipment for scheduled maintenance for a period greater than **1 hour**, the intent to shut down shall be reported to the Air Division at least 24 hours prior to the planned shutdown, **unless accompanied by the immediate shutdown of the emission source.**
7. In the event there is a breakdown of equipment in such a manner as to cause increased emission of air contaminants for a period greater than **1 hour**, the person responsible for such equipment shall notify the Air Division within an additional 24 hours and provide a statement giving all pertinent facts, including the duration of the breakdown. The Air Division shall be notified when the breakdown has been corrected.
8. This process, including all air pollution control devices and capture systems for which this permit is issued, shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.
9. This permit expires and the application is cancelled if construction has not begun within 24 months of the date of issuance of the permit.

10. Submittal of other reports regarding monitoring records, fuel analyses, operating rates, and equipment malfunctions may be required as authorized in the Department's air pollution control rules and regulations. The Department may require stack emission testing at any time.
11. Additions and revisions to the conditions of this Permit will be made, if necessary, to ensure that the Department's air pollution control rules and regulations are not violated.
12. Nothing in this permit or conditions thereto shall negate any authority granted to the Air Division pursuant to the Alabama Environmental Management Act or regulations issued thereunder.
13. The Air Division must be notified in writing at least 10 working days in advance of all emission tests to be conducted and submitted as proof of compliance with the Department's air pollution control rules and regulations.

To avoid problems concerning testing methods and procedures, the following shall be included with the notification letter:

- (a) The date the test crew is expected to arrive, the date and time anticipated of the start of the first run, how many and which sources are to be tested, and the names of the persons and/or testing company that will conduct the tests.
- (b) A complete description of each sampling train to be used, including type of media used in determining gas stream components, type of probe lining, type of filter media, and probe cleaning method and solvent to be used (if test procedure requires probe cleaning).
- (c) A description of the process(es) to be tested, including the feed rate, any operating parameter used to control or influence the operations, and the rated capacity.
- (d) A sketch or sketches showing sampling point locations and their relative positions to the nearest upstream and downstream gas flow disturbances.

A pretest meeting may be held at the request of the source owner or the Department. The necessity for such a meeting and the required attendees will be determined on a case-by-case basis.

All test reports must be submitted to the Air Division within 30 days of the actual completion of the test, unless an extension of time is specifically approved by the Air Division.

15. Any performance tests required shall be conducted and data reduced in accordance with the test methods and procedures contained in each specific permit condition unless the Director (1) specifies or approves, in specific cases, the use of a reference method with minor changes in methodology, (2) approves the use of an equivalent method, or (3) approves the use of an alternative method, the results of which he has determined to be adequate for indicating whether a specific source is in compliance.
16. This permit is issued with the condition that, should obnoxious odors arising from the plant operations be verified by Air Division inspectors, measures to abate the odorous emissions shall be taken upon a determination by the Alabama Department of Environmental Management that these measures are technically and economically feasible.
17. Precautions shall be taken to prevent fugitive dust emanating from plant roads, grounds, stockpiles, screens, dryers, hoppers, ductwork, etc.
18. Precautions shall be taken by the permittee and its personnel to ensure that no person shall ignite, cause to be ignited, permit to be ignited, or maintain any open fire in such a manner as to cause the Department's rules and regulations applicable to open burning to be violated.
19. The permittee shall not use as a defense in an enforcement action that maintaining compliance with conditions of this permit would have required halting or reducing the permitted activity.
20. The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.
21. In accordance with ADEM Admin. Code. r. 335-3-4-.01(1), any source of particulate emissions shall not discharge more than one 6-minute average opacity greater than 20% in any 60-minute period. At no time shall any source discharge a 6-minute average opacity of particulate emissions greater than 40%. Opacity shall be determined by 40 CFR Part 60, Appendix A, Method 9.
22. In accordance with the requirements of ADEM Admin. Code r. 335-3-4-.03, emissions of particulate matter from each combustion source shall not exceed the amount determined by use of the following equation:

$$E = 1.38(H)^{-0.44}$$

Where,

E = Emissions in lb/million Btu

H = Heat Input in millions of Btu/hr

23. In accordance with the requirements of ADEM Admin. Code r. 335-3-5-.01, the sulfur dioxide (SO₂) emissions from each combustion source shall not exceed 1.8 lb/MMBtu
24. The No. 1 Steam Methane Reformer shall be limited to the use of adiponitrile flasher tails (AFT), natural gas, and pressure swing absorption (PSA) offgas as fuel.
25. The Low Pressure Boiler shall be limited to the use of natural gas as fuel.
26. The Low Pressure Boiler shall be limited to a maximum daily average heat input of 25.2 MMBtu/hr.
27. A selective non-catalytic reduction (SNCR) unit shall be operated on the common stack of the exhaust streams of the No. 1 Steam Methane Reformer and Low Pressure Boiler for control of NO_x emissions.
28. In order to remain classified as a synthetic minor source, the NO_x emissions from the No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler and the No. 2 Hydrogen Gas Generation Plant combined shall not exceed 99 tons per year (TPY) as calculated on a 12-month rolling total.
29. Relief valves associated with this source shall be routed to the emergency flare for control.
30. The emergency flare shall meet the minimum design requirements as listed in 40 CFR 60.18.
31. Compliance with the opacity requirements for this unit shall be determined by Reference Method 9 in Appendix A of 40 CFR 60 (latest edition). Alternate test methods may be used provided prior approval by the Department is granted.
32. Compliance with the nitrogen oxide (NO_x) emission requirements shall be determined by a continuous emissions rate monitoring system (CERMS). The CERMS shall include, but not be limited to, a device to measure the flow rate of the exhaust stream from the SNCR and a monitor to measure the concentration of NO_x from the outlet of the SNCR stream.
33. The monitoring system(s) shall meet the requirements of 40 CFR 60 Appendix F. The results of the Relative Accuracy Test Audit (RATA) shall be calculated using units of pounds of NO_x per hour.
34. The NO_x continuous emission rate monitoring system (CERMS) shall be audited quarterly according to the requirements of Section 5.1.2 of 40 CFR 60 Appendix F (Cylinder Gas Audit (CGA)).
35. Compliance with the heat input limit for the low pressure boiler shall be demonstrated by fuel calculations. The heat input to the boiler shall be calculated utilizing 947 Btu/scf as the heating value for natural gas.

36. The total NO_x emissions for the No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler shall be calculated based on a 12-month rolling total.
37. The total NO_x emissions for each emission unit (No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler and the No. 2 Hydrogen Gas Generation Plant) shall be calculated based on a 12-month rolling total.
38. The daily calculations of the hourly heat input to the Low Pressure Boiler shall be recorded and maintained in a permanent form suitable for inspection for a period of at least two (2) years.
39. The daily amount of fuel fired in the Low Pressure Boiler shall be recorded and maintained in a permanent form suitable for inspection for a period of at least two (2) years as indicated in 40 CFR 60.48c(g).
40. Records of the daily amount of fuel burned in each combustion source shall be kept in a permanent form suitable for inspection for a period of at least two (2) years.
41. Records of the 12-month rolling total NO_x emissions for the No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler shall be maintained in a form suitable for inspection for a period of at least five (5) years.
42. Records of the sum of the 12-month rolling total NO_x emissions for each emission unit (the No. 1 Hydrogen Gas Generation Plant with Low Pressure Boiler and the No. 2 Hydrogen Gas Generation Plant) shall be maintained in a form suitable for inspection for a period of at least five (5) years. The sum of the 12-month rolling total NO_x emissions for all emission units shall be calculated utilizing the 12-month rolling total NO_x emissions for each individual emission unit.
43. All the original charts, performance evaluations, calibration checks, adjustment and maintenance records, and other information regarding the monitoring system(s) shall be maintained in a permanent form suitable for inspection. All other files shall be retained for at least two (2) years following the date of such measurements, maintenance, reports, and records.
44. Should the 12-month rolling total NO_x emissions exceed 99 TPY, the facility shall notify the Department with a written report within one (1) business day.
45. A report on the 12-month rolling total NO_x emissions, NO_x emission monitoring system operations, and flow rate monitoring system operation shall be submitted to the Department within thirty (30) days following each semiannual period.
46. A written report of excess NO_x emissions shall be submitted to the Department thirty (30) days following the end of the semiannual period. The reports shall include the following information:

- The date and time of commencement and completion of each time period of process upset or malfunction.
- The nature and cause of the process upset or malfunction and the corrective action taken or preventative measures adopted.
- The date and time identifying each period during which the monitoring system(s) was inoperative (except for zero and span checks) and the nature of the repairs and adjustments.
- Equations used to convert NO_x emissions data as monitored to the required reporting standard shall be included in the report.

When no excess emissions have occurred and the monitoring system(s) was inoperative or did not require repair adjustment, such information shall be stated in the report.

Draft
Date