STATE OF MISSISSIPPI
AIR POLLUTION CONTROL PERMIT

TO CONSTRUCT AIR EMISSIONS EQUIPMENT

THIS CERTIFIES THAT

Terra Mississippi Nitrogen Inc
4612 Highway 49 East
Yazoo City, Mississippi
Yazoo County

has been granted permission to construct air emissions equipment to comply with the emission limitations, monitoring requirements and other conditions set forth herein. This permit is issued in accordance with the provisions of the Mississippi Air and Water Pollution Control Law (Section 49-17-1 et. seq., Mississippi Code of 1972), and the regulations and standards adopted and promulgated thereunder.

MISSISSIPPI ENVIRONMENTAL QUALITY PERMIT BOARD

AUTHORIZED SIGNATURE
MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

Issued: SEP 27 2012

Permit No.: 3020-00010

2269 PER20120002

Part I.

A. GENERAL CONDITIONS

1. This permit is for air pollution control purposes only. (Ref.: APC-S-2, Section I.D)

2. Any activities not identified in the application are not authorized by this permit. (Ref.: Miss. Code Ann. 49-17-29 1.b)

3. The knowing submittal of a permit application with false information may serve as the basis for the Permit Board to void the permit issued pursuant thereto or subject the applicant to penalties for operating without a valid permit pursuant to State Law. (Ref.: APC-S-2, Section II.B.5)

4. It is the responsibility of the applicant/permittee to obtain all other approvals, permits, clearances, easements, agreements, etc., which may be required including, but not limited to, all required local government zoning approvals or permits. (Ref.: APC-S-2, Section I.D.6)

5. The issuance of a permit does not release the permittee from liability for constructing or operating air emissions equipment in violation of any applicable statute, rule, or regulation of state or federal environmental authorities. (Ref.: APC-S-2, Section II.B.7)

6. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit, unless halting or reducing activity would create an imminent and substantial endangerment threatening the public health and safety of the lives and property of the people of this state. (Ref.: APC-S-2, Section II.B.15(a))

7. The permit and/or any part thereof may be modified, revoked, reopened, and reissued, or terminated for cause. Sufficient cause for a permit to be reopened shall exist when an air emissions stationary source becomes subject to Title V. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition. (Ref.: APC-S-2, Section II.B.15(b))

8. The permit does not convey any property rights of any sort, or any exclusive privilege. (Ref.: APC-S-2, Section II.B.15(c))

9. The permittee shall furnish to the DEQ within a reasonable time any information the DEQ may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the DEQ copies of records required to be kept by the permit or, for information claimed to be confidential, the permittee shall furnish such records to the DEQ along with a claim of confidentiality.

The permittee may furnish such records directly to the Administrator along with a claim of confidentiality. (Ref.: APC-S-2, Section II.B.15(d))

10. Design and Construction Requirements: The stationary source shall be designed and constructed so as to operate without causing a violation of an Applicable Rules and Regulations, without interfering with the attainment and maintenance of State and National Ambient Air Quality Standards, and such that the emission of air toxics does not result in an ambient concentration sufficient to adversely affect human health and well-being or unreasonably and adversely affect plant or animal life beyond the stationary source boundaries. (Ref.: APC-S-2, Section V.A)

11. Solids Removal: The necessary facilities shall be constructed so that solids removed in the course of control of air emissions may be disposed of in a manner such as to prevent the solids from becoming windborne and to prevent the materials from entering State waters without the proper environmental permits. (Ref.: Miss. Code Ann. 49-17-29)

12. Diversion and Bypass of Air Pollution Controls: The air pollution control facilities shall be constructed such that diversion from or bypass of collection and control facilities is not needed except as provided for in Regulation APC-S-1, "Air Emission Regulations for the Prevention, Abatement, and Control of Air Contaminants", Section 10. (Ref.: APC-S-1, Section 10)

13. Fugitive Dust Emissions from Construction Activities: The construction of the stationary source shall be performed in such a manner so as to reduce fugitive dust emissions from construction activities to a minimum. (Ref.: APC-S-2, Section V.A.4)

14. Right of Entry: The permittee shall allow the Mississippi Department of Environmental Quality Office of Pollution Control and the Mississippi Environmental Quality Permit Board and/or their representatives upon presentation of credentials:

    a) To enter upon the permittee's premises where an air emission source is located or in which any records are required to be kept under the terms and conditions of this permit; and

    b) At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect any monitoring equipment or monitoring method required in this permit; and to sample any air emissions. (Ref.: Miss. Code Ann. 49-17-21)

15. Permit Modification or Revocation: After notice and opportunity for a hearing, the Permit Board may modify the permit or revoke it in whole or in part for good cause shown including, but not limited to:

    a) Persistent violation of any of the terms or conditions of this permit;

b) Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

c) A change in federal, state, or local laws or regulations that require either a temporary or permanent reduction or elimination of previously authorized air emission.

(Ref.: APC-S-2, Section II.C)

16. Public Record and Confidential Information: Except for data determined to be confidential under the Mississippi Air & Water Pollution Control Law, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Mississippi Department of Environmental Quality, Office of Pollution Control. (Ref.: Miss. Code Ann. 49-17-39)

17. Permit Transfer: This permit shall not be transferred except upon approval of the Permit Board. (Ref.: APC-S-2, Section XVI.B)

18. Severability: The provisions of this permit are severable. If any provision of the permit, or the application of any provision of the permit to any circumstances, is challenged or held invalid, the validity of the remaining permit provisions and/or portions thereof or their application to other persons or sets of circumstances, shall not be affected thereby. (Ref. APC-S-2, Section I.D.7)

19. Permit Expiration: The permit to construct will expire if construction does not begin within eighteen (18) months from the date of issuance or if construction is suspended for eighteen (18) months or more. (Ref.: APC-S-2, Section V.C.1)

20. Certification of Construction: A new stationary source issued a Permit to Construct cannot begin operation until certification of construction by the permittee. (Ref.: APC-S-2, Section V.D.3)

21. Beginning Operation: Except as prohibited in Part I, Condition 24 of this permit, after certification of construction by the permittee, the Permit to Construct shall be deemed to satisfy the requirement for a permit to operate until the date the application for issuance or modification of the Title V Permit or the application for issuance or modification of the State Permit to Operate, whichever is applicable, is due. This provision is not applicable to a source excluded from the requirement for a permit to operate as provided by APC-S-2, Section XIII.G. (Ref.: APC-S-2, Section V.D.4)

22. Application for a Permit to Operate: Except as otherwise specified in Part I, Condition 24 of this permit, the application for issuance or modification of the State Permit to Operate or the Title V Permit, whichever is applicable, is due twelve (12) months after beginning operation or such earlier date or time as specified in the Permit to Construct. The Permit Board may specify an earlier date or time for submittal of the application. Beginning operation will be assumed to occur upon

certification of construction, unless the permittee specifies differently in writing. (Ref.: APC-S-2, Section V.D.5)

23. Operating Under a Permit to Construct: Except as otherwise specified in Part I, Condition 24 of this permit, upon submittal of a timely and complete application for issuance or modification of a State Permit to Operate or a Title V Permit, whichever is applicable, the applicant may continue to operate under the terms and conditions of the Permit to Construct and in compliance with the submitted application until the Permit Board issues, modifies, or denies the Permit to Operate. (Ref.: APC-S-2, Section V.D.6)

24. Application Requirements for a Permit to Operate for Moderate Modifications: For moderate modifications that require contemporaneous enforceable emissions reductions from more than one emission point in order to "net" out of PSD/NSR, the applicable Title V Permit to Operate or State Permit to Operate must be modified prior to beginning operation of the modified facilities. (Ref.: APC-S-2, Section V.D.7)

25. Compliance Testing: Regarding compliance testing:

    a) The results of any emissions sampling and analysis shall be expressed both in units consistent with the standards set forth in any Applicable Rules and Regulations or this permit and in units of mass per time.

    b) Compliance testing will be performed at the expense of the permittee.

    c) Each emission sampling and analysis report shall include but not be limited to the following:

        (1) detailed description of testing procedures;

        (2) sample calculation(s);

        (3) results; and

        (4) comparison of results to all Applicable Rules and Regulations and to emission limitations in the permit.

    (Ref.: APC-S-2, Section VI.B.3, 4, and 6)

B. GENERAL NOTIFICATION REQUIREMENTS

1. Within fifteen (15) days of beginning actual construction, the permittee must notify DEQ in writing that construction has begun. (Ref.: APC-S-2, Section V.C.2)

2. The permittee must notify DEQ in writing when construction does not begin within eighteen (18) months of issuance or if construction is suspended for eighteen (18) months or more. (Ref.: APC-S-2, Section V.C.3)

3. Upon the completion of construction or installation of an approved stationary source or modification, the applicant shall notify the Permit Board that construction or installation was performed in accordance with the approved plans and specifications on file with the Permit Board. (Ref.: APC-S-2, Section V.D.1)

4. The Permit Board shall be promptly notified in writing of any change in construction from the previously approved plans and specifications or permit. If the Permit Board determines the changes are substantial, it may require the submission of a new application to construct with "as built" plans and specifications. Notwithstanding any provision herein to the contrary, the acceptance of an "as built" application shall not constitute a waiver of the right to seek compliance penalties pursuant to State Law. (Ref.: APC-S-2, Section V.D.2)

EMISSION LIMITATIONS AND MONITORING REQUIREMENTS

Beginning upon permit issuance, the permittee is authorized to modify air emissions equipment for the emission of air contaminants from Emission Point AD-001, the No.3 (Kellogg) Ammonia Plant's Carbon Dioxide (CO_2) Vent and from Emission Point AD-005, the Primary Reformer, as result of a combination of maintenance, debottleneck, and optimization projects known as the 2012 Ammonia Plant Turnaround.

The air emissions equipment shall be constructed and operated to comply with the emission limitation and monitoring requirements specified below.

LIMITATIONS

Permittee accepts the following federally enforceable operating limit on the No.3 (Kellogg) Ammonia Plant's Carbon Dioxide (CO_2) Vent, AD-001; the Primary Reformer, AD-005; and the Urea Plant to avoid a significant net increase of greenhouse gas emissions, expressed as carbon dioxide equivalent, CO_2e, (**PSD Avoidance Limit**) from the 2012 Ammonia Plant Turnaround.

The permittee shall limit the total combined CO_2e emissions, $\mathbf{(CO_2e)_{NH3/Urea}}$, from AD-001 and AD-005, offset by the CO_2 consumed in the Urea Plant, to 1,059,339 tons/year as determined by the following equation.

$$\mathbf{(CO_2e)_{NH3/Urea} = 995{,}091 + (CO_2e)_{NH3\ Plant\ Vent} + (CO_2e)_{Reformer} - (CO_2e)_{Urea\ Plant}}$$

Where:

$\mathbf{(CO_2e)_{NH3/Urea}}$ is the CO_2e emissions (tons/year) associated with the production of ammonia and urea. $\mathbf{(CO_2e)_{NH3/Urea}}$ is determined by adding the pre-Turnaround baseline CO_2e emissions of 995,091 tons/year, the Ammonia Plant's CO_2 Vent (AD-001) emissions and the Reformer (AD-005) combustion emissions, then subtracting the CO_2 consumed in the production of urea.

$\mathbf{(CO_2e)_{NH3\ Plant\ Vent}}$ shall be determined by multiplying the natural gas process feedstock to the Ammonia Plant Reformer (MMscf) by the factor 59.21 ton CO_2/MMscf.[1]

$\mathbf{(CO_2e)_{Reformer}}$ shall be determined by multiplying the natural gas fuel combusted in the Ammonia Plant Reformer (MMscf) by the factor 60.12 ton CO_2e/MMscf.[2]

[1] The factor 59.21 ton CO_2/MMscf is derived from Eq. G-1 of 40 CFR 98.73(b)(1), where the following values for natural gas are assumed: CCn = 0.725 kg C/kg feedstock and MW = 17.155 kg/kg-mole.

[2] The factor 60.12 tons CO_2e/MMscf was derived from EPA default factors in U.S. EPA, 40 CFR 98, Subpart A, Table A-1 and Subpart C, Tables C-1 and C-2 for natural gas, December 2010. Emissions were

$(CO_2e)_{Urea\ Plant}$ shall be determined by multiplying the urea production (tons) by the factor 0.7328 ton CO_2 consumed/ton urea produced.[3]

MONITORING REQUIREMENTS

To demonstrate compliance with the CO_2e emission limit, permittee shall calculate the **$(CO_2e)_{NH3/Urea}$** emissions (in tons CO_2e/year) for each consecutive 12-month period.

RECORDKEEPING REQUIREMENTS

The permittee shall record the following process parameters at the frequency indicated below when the sources are operating. Process parameter data shall be summed for each day and each month.

Parameter	Units	Monitoring Frequency
Natural gas process feedstock to Ammonia Plant Reformer	MMscf	Hourly
Natural gas fuel combusted in the Ammonia Plant Reformer	MMscf	Hourly
Urea Production	Tons	Daily

The permittee shall maintain records of the **$(CO_2e)_{NH3/Urea}$** emissions (in tons CO_2e/year) for each consecutive 12-month period, along with all raw data and supporting calculations.

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then converted from kilograms to short tons, and the heating value of natural gas (1028 Btu/scf) was used to convert MMBtu to MMscf.

[3] The factor 0.7328 tons CO_2 consumed/ton urea produced is a ratio of the molecular weight of carbon dioxide (44.01) to urea (60.06), which corresponds to the stoichiometry of the urea reaction where exactly one mole of carbon dioxide is consumed for every mole of urea produced.

PART II.
EMISSION LIMITATIONS AND MONITORING REQUIREMENTS

Beginning upon permit issuance, the permittee is authorized to modify air emissions equipment for the emission of air contaminants from Emission Point AD-005, the Primary Reformer, as a result of a combination of maintenance, debottleneck, and optimization projects known as the 2012 Ammonia Plant Turnaround.

The air emissions equipment shall be constructed and operated to comply with the emission limitations and monitoring requirements specified below.

LIMITATIONS

Permittee accepts the following federally enforceable fuel firing limits on the Primary Reformer, AD-005, to avoid a significant net increase of NOx emissions (**PSD Avoidance Limit**) from the 2012 Ammonia Plant Turnaround.

Primary and Tunnel Burners	
• Natural Gas Firing	5,885,444 MMBtu/year
• Purge Gas Firing	483,490 MMBtu/year
Auxiliary Boiler and Superheat Burners (natural gas)	919,324 MMBtu/year

MONITORING REQUIREMENTS

To demonstrate compliance with the fuel firing limits, permittee shall calculate the heat input (in MMBtu/year) for each fuel to each of the above burner types for each consecutive 12-month period.

RECORDKEEPING REQUIREMENTS

The permittee shall record the fuel firing rate of each fuel to each of the above burner types at least once each hour when the source is firing fuel. Fuel firing data shall be summed for each day and each month.

The permittee shall maintain records of the heat input for each fuel to each of the above burner types, the heat input for each consecutive 12-month period, along with all raw data and supporting calculations.

PART II.
EMISSION LIMITATIONS AND MONITORING REQUIREMENTS

According to the schedules listed below, the following permit limitations and requirements will become effective for both the No.9 Nitric Acid Plant (AE-006) and the No.10 Nitric Acid Plant (AE-007).

LIMITATIONS

Description	Limit (lb NOx/ton 100% nitric acid)	Compliance Deadline
Short-Term NOx Limit [4]	1.0	March 31, 2012
Long-Term NOx Limit [5]	0.6	March 31, 2013

Effective June 6, 2011, permittee shall be subject to and in compliance with all applicable provisions of Standards of Performance for Nitric Acid Plants (40 CFR 60, Subpart G) and Standards of Performance for New Stationary Sources, General Provisions (40 CFR 60, Subpart A).

MONITORING REQUIREMENTS

Effective March 31, 2012, the monitoring requirements established in the applicable CEMS Plan (attached) shall be implemented.

[4] Short-Term NOx Limit shall mean a 3-hour rolling average NOx emission limit (rolled hourly) expressed in terms of pounds of NOx emitted per ton of 100% Nitric Acid produced. The short-term NOx limit shall be calculated in accordance with the applicable CEMS Plan (attached).

[5] Long-Term NOx Limit shall mean a 365-day rolling average NOx emission limit (rolled daily) expressed in terms of pounds of NOx emitted per ton of 100% Nitric Acid produced. The long-term NOx limit shall be calculated in accordance with the applicable CEMS Plan (attached).

PART III.
OTHER REQUIREMENTS

Records:
The permittee shall maintain on-site records of all required monitoring data and support information required by this permit for a period of at least five (5) years from the date of the monitoring sample, measurement, report, or application. These records shall be made available for review upon request from DEQ personnel.

Reporting Deviations:
The permittee shall report any deviations from the permit requirements, including deviations attributable to upsets, within five (5) working days of such deviation. The report shall also include the cause of the deviation(s) and any corrective action(s) or preventive measure(s) taken. A copy of the report shall be maintained in accordance with the Records provisions of this Part.

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A T T A C H M E N T

CEMS Plan

CEMS Plan from
Consent Decree.pdf