



FINAL DETERMINATION

FOR

Trademark Nitrogen Corporation

Hillsborough County

Construction Permit

Application Number

0570025-008-AC

Environmental Protection Commission of

Hillsborough County

Tampa, FL

October 2, 2013

## FINAL DETERMINATION

The Environmental Protection Commission of Hillsborough County mailed a public notice package on August 26, 2013 that included an Intent to Issue Air Construction Permit No. 0570025-008-AC to Trademark Nitrogen Corporation. The facility is located at 51216 Old Hopewell Road, Tampa, FL 33619. The air construction permit authorizes an increase in the hours of operation of the nitric acid plant from 8,400 hours/year to 8,760 hours/year. The increase in hours of operation increases the potential NOx emissions from 75.1 tons/year to 78.1 tons/year.

The Public Notice of Intent to Issue was published in The Tampa Tribune on September 17, 2013.

### COMMENTS/CHANGES

No comments were received from the applicant or the public.

### CONCLUSION

The final action of the Environmental Protection Commission of Hillsborough County is to issue the permit as drafted.

ENVIRONMENTAL PROTECTION COMMISSION OF  
HILLSBOROUGH COUNTY, as Delegated by

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF PERMIT

O. A. Bourassa  
Technical Manager  
Trademark Nitrogen Corporation  
1216 Old Hopewell Road  
Tampa, FL 33619

Dear Mr. Bourassa:

Enclosed is Permit No. 0570025-008-AC to increase the hours of operation of the nitric acid plant. This permit is issued pursuant to Section 403.087, Florida Statutes.

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the EPC in the Legal Department at 3629 Queen Palm Dr, Tampa, FL 33619; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the clerk of the EPC.

Executed in Tampa, Florida.

Sincerely,

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Richard D. Garrity, Ph.D.  
Executive Director

RDG/LAW/law

cc: Florida Department of Environmental Protection (via email)  
Ken Given, P.E. – Air Testing & Consulting, Inc.

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on \_\_\_\_\_ to the listed persons.

Clerk Stamp

FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated clerk, receipt of which is hereby acknowledged.

\_\_\_\_\_  
Clerk

\_\_\_\_\_  
Date

PERMITTEE:  
Trademark Nitrogen Corp.  
1216 Old Hopewell Road  
Tampa, FL 33619

PERMIT/CERTIFICATION  
Permit No.: 0570025-008-AC  
County: Hillsborough  
Expiration Date: May 26, 2014  
Project: Nitric Acid Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 62-204, 62-210, 62-212, 62-296, 62-297, and 62-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the EPC and made a part hereof and specifically described as follows:

This permit authorizes an increase in the hours of operation of the nitric acid plant at a nitrogen fertilizer production plant. The manufacturing plant is comprised of the following sources: a nitric acid plant with a maximum design capacity of 143 tons/day (nominal 125-ton/day), an ammonium nitrate plant with a maximum design capacity of 179 tons/day (nominal 150-ton/day), a magnesium nitrate solutions plant with a magnesium oxide silo, and a nitrogen-phosphorous-potassium blend plant (NPK liquid fertilizer). In addition, the facility operates a 200 HP natural gas fired boiler, a 4.5 MMBtu/hr natural gas fired water heater, a 150 kW natural gas fueled emergency generator, and a bulk storage warehouse with railcar unloading, truck loading, and an integral bagging machine.

### **Nitric Acid Plant**

The nitric acid plant consists of two absorption towers (primary and secondary) that operate in series. In the process, atmosphere air is compressed, heated, and mixed with hot ammonia. The mixture is passed through a catalyst to produce nitrogen oxides (NO<sub>2</sub>). The oxides are passed through a series of heat exchangers, coolers and through a primary absorber where the oxides are absorbed in water to produce nitric acid. The remaining oxides are passed through the secondary absorber acting as a control device to reduce NO<sub>x</sub> emissions prior to being discharged through a stack to the atmosphere. The following is a more detailed description of the nitric acid plant operation.

The production of nitric acid involves three basic steps: (1) Oxidation of ammonia to nitric oxide, (2) oxidation of nitric oxide to nitrogen dioxide, and (3) absorption of nitrogen dioxide in water to nitric acid. The process begins with liquid ammonia entering the ammonia vaporizer and then

entering the ammonia superheater where steam heats the ammonia vapors. The hot ammonia vapor stream is then directed to the ammonia-air mixer where a variable  $\text{NH}_3/\text{air}$  ratio is produced. Once past the ammonia-air mixer, the gas stream enters a converter which contains a platinum gauze catalyst. The converter operates at a temperature of approximately 1650 °F. The catalyst does not at any time participate in the oxidation of the  $\text{NH}_3$ , it simply allows the reaction to take place faster.

The converter has three major parts: a catalyst holder unit, a cover, and the combination of a waste heat boiler preheat tee section and a turbine gas heater. The oxidation of the ammonia/air mixture to nitric oxide (NO) in the converter is a heat releasing reaction (exothermic), consequently, no outside heat is required except during start-up. There is a potential of forming an explosive mixture at higher converter temperatures. To control the converter temperature, the hot process gas stream containing NO,  $\text{NO}_2$ , water and  $\text{N}_2$  is passed through a turbine gas heater and then through a waste heat recovery boiler.

The hot process gas flows through the boiler, in which the heat exchange from the gas to the water generates 150 psi steam in the boiler. The cooling of the process gas is further accomplished by passing the hot gas through two more heat exchange units, the first of which is the air pre-heater. The hot process gas, going through the tubes of the air pre-heater, heats the process air to 600°F that had been previously filtered to remove particulate matter. This hot process air is used in the ammonia/air mixer. The last heat exchange unit is the tail gas heater. Here, the heat exchange is accomplished with the process gas flowing through the tail gas exiting the primary absorber. The process gas exiting this heat exchange unit is approximately 400 °F. The nitrogen dioxide/nitrogen tetroxide mixture (referred to as  $\text{NO}_2/\text{dimer}$  mixture) process gas from the tail gas heater flows through a platinum filter unit. This platinum filter unit is removed periodically for recovery of platinum that has been entrapped in the filter material.

The NO formed during the ammonia oxidation must be oxidized. In this process, the process gas flows from the platinum filter to the cooler condenser where it is further cooled, to 100 °F or less at pressures up to 116 lbs/in<sup>2</sup>, by water circulating around tubes through which the process gas passes. During the nitric oxidation process, the nitric oxide reacts noncatalytically with residual oxygen to form  $\text{NO}_2$  and nitrogen tetroxide ( $\text{N}_2\text{O}_4$ ). Operating at low temperatures and high pressures promotes maximum production of  $\text{NO}_2$  within a minimum reaction time. The final step introduces the  $\text{NO}_2/\text{dimer}$  mixture into the absorption process after being cooled. The condensed water vapors from the oxidation reaction are combined with the oxides of nitrogen to form weak nitric acid.

The remaining gas and weak acid then pass to the weak acid separator where the weak acid is drained off and the gas continues into the primary absorber. The separated weak acid is then pumped into the weak acid trays in the primary absorber. The cooled gas from the cooler condenser enters the bottom of the absorber above the bleaching trays, while liquid nitrogen tetroxide is added at a higher point. Weak acid from the abatement absorber is added at the top of the primary absorber in the correct amount to correspond to the oxidation rate to produce 53-55% acid. Both liquids flow countercurrent to the  $\text{NO}_2/\text{dimer}$  gas mixture. The weak acid passes downward through the primary absorber and continues to pick up strength until it exits the bleaching section with a concentration of 56%. Oxidation takes place in the free space between the trays, while absorption occurs on the trays.

The bleaching section of the primary absorber consists of five trays at the bottom of the column. Air is

introduced into this section to strip out dissolved oxides of nitrogen and to assist re-oxidation of the nitric acid in the absorption tower. The amount of air added is kept as low as possible, consistent with satisfactory bleaching. Normally an excess of oxygen of 1% to 2% in the tail gas is desirable. The tail gas from the top of the primary absorber contains combinations of NO, NO<sub>2</sub> and N<sub>2</sub>O<sub>4</sub> that has not been absorbed. This gas is fed to the bottom of the abatement absorber. The nitrogen dioxide is absorbed from the gas by a countercurrent flow of condensate.

Emissions from the nitric acid manufacture consists of NO, NO<sub>2</sub>, HNO<sub>3</sub> mist, and NH<sub>3</sub>. The major source of NO<sub>x</sub> is the tailgas from the acid absorption tower. The control of NO<sub>x</sub> emissions is accomplished by the abatement absorber. The tailgas from the top of the primary absorber that contains combinations of NO, NO<sub>2</sub> and N<sub>2</sub>O<sub>4</sub> enters the abatement absorber where it is stripped of the oxides of nitrogen by the absorption process. This absorber has seventeen perforated trays. The efficiency of the abatement absorber is increased by increasing the number of absorber trays, operating the absorber at higher pressures or cooling the weak acid liquid in the absorber.

The nitric acid formed in the abatement absorber flows from the bottom of the tower on a level control basis to the primary absorber. The acid leaving the abatement absorber will have a concentration from 2% to 4%. The gas exits the abatement absorber and passes through a mist separator where any entrained acid is removed and sent back to the nitric acid storage tanks. The gas then passes through the tail gas steam pre-heater where it is preheated to 260 °F. It then enters the tail gas preheater where it is preheated to 400 °F before it enters the turbine gas heater. The gas leaves the turbine gas heater (870 °F to 910 °F) and goes through the power recovery turbine and then to the atmosphere.

The NO<sub>x</sub> emissions are continuously monitored by the Rosemount NGA Model 2000 NO<sub>x</sub> analyzer, which utilizes chemiluminescence for monitoring oxides of nitrogen. The analyzer is situated on the compressor floor by the compressor panel board.

The primary absorption tower specifications are as follows:

Manufacturer	Blaw-Knox Corp.
Serial Number	15383
Shell Working Pressure	125 psi
Temperature	100 °F
Date Manufactured	1962
Tower Diameter	6.75 ft
Heat Removed	4,738,254 Btu/hr

Location: 1216 Old Hopewell Road, Tampa, Hillsborough County

UTM: 17-367.3 E 3092.6 N

NEDS NO: 0025

Emission Unit ID: 001 - 143 TPD Nitric Acid Plant with 2 Absorption Towers

References Permit No.: 0570025-007-AC

Replaces Permit No.: NA

PERMITTEE:  
Trademark Nitrogen Corporation

PERMIT/CERTIFICATION NO.: 0570025-008-AC  
PROJECT: Nitric Acid Plant

SPECIFIC CONDITIONS:

1. A part of this permit is the attached 15 General Conditions. [Rule 62-4.160, F.A.C.]
2. All applicable rules of the Environmental Protection Commission of Hillsborough County including design discharge limitations specified in the application shall be adhered to. The permit holder may also need to comply with county, municipal, federal, or other state regulations prior to construction. [Rule 62-4.070(7), F.A.C.]
3. Issuance of this permit does not relieve the permittee from complying with applicable emission limiting standards or other requirements of Chapters 62-204, 62-210, 62-212, 62-296 and 62-297, F.A.C., or any other requirements under federal, state, or local law. [Rule 62-210.300, F.A.C.]
4. This nitric acid plant is permitted to operate a maximum of 8,760 hours per year. [Rules 62-4.070(3) and 62-210.200(PTE), F.A.C.]
5. In order to limit the potential to emit, the production rate from the nitric acid plant shall not exceed 5.96 tons of 100% HNO<sub>3</sub> per hour and 143 tons per day. [Rules 62-4.070(3), 62-210.200(PTE), and 62-296.408, F.A.C., 40 CFR 60.72(a)(1), and Permit Nos. 0570025-004-AC and 0570025-007-AC]
6. Visible emissions from the nitric acid plant shall not exceed 5% opacity. [Rule 62-4.070(3), F.A.C. and Chapter 1-3.53(1)(b), Rules of the Hillsborough County Environmental Protection Commission]  
{NOTE: This visible emission limitation for the nitric acid plant is more restrictive than, and therefore meets the requirements of, the NSPS Subpart G, 40 CFR 60.72(a)(2), and Rule 62-296.408(1), F.A.C. limitations of 10% opacity.}
7. In order to limit the potential to emit, the Nitrogen Oxide (NO<sub>x</sub>) emissions from the nitric acid plant shall not exceed any of the following emission limits: [Rules 62-4.070(3), 62-210.200(PTE), and 62-296.408, F.A.C., and 40 CFR 60.72(a)(1)]
  - A) 3.0 pounds per ton of 100% HNO<sub>3</sub> produced (NSPS Subpart G limitation)
  - B) 78.3 tons per year
8. [Reserved]
9. The permittee shall not cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor. [Rule 62-296.320, F.A.C.]
10. Test the emissions from the nitric acid plant for visible emissions (VE), at the point of highest opacity, once every federal fiscal year with a target date of April 7th of each year. Test the emissions from the nitric acid plant for nitrogen oxides (NO<sub>x</sub>) every five years by no later than 90 days prior the application due date for renewal of the operating permit. A report of the test data shall be submitted to the air Compliance Section of the Environmental Protection Commission of Hillsborough County within 45 days of the testing. Testing procedures shall be consistent with the requirements of Rule 62-297.310,

PERMITTEE:  
Trademark Nitrogen Corporation

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SPECIFIC CONDITIONS:

F.A.C. [Rules 62-4.070(3), and 62-297.310, F.A.C.]

11. Compliance with the visible emission limitations of Specific Condition No. 6 shall be determined using EPA Method 9 contained in 40 CFR 60, Appendix A and adopted by reference in Rule 62-297, F.A.C. The visible emissions test shall be conducted by a certified observer and shall be a minimum of thirty (30) minutes in duration. The test observation period shall include the period during which the highest opacity can reasonably be expected to occur. The minimum requirements for stationary point source emissions test procedures and reporting shall be in accordance with Rule 62-297, F.A.C. and 40 CFR 60, Appendix A. [Rule 62-297.310, F.A.C.]

12. Compliance with the NO<sub>x</sub> emission limitations of Specific Condition No. 7 shall be determined in accordance with 40 CFR 60.74 using EPA Methods 7, 7A, 7C or 7D contained in 40 CFR 60, Appendix A and adopted by reference in Rule 62-297, F.A.C. In accordance with 40 CFR 60.74(b)(4), the production rate of nitric acid during the test shall be based on daily production records and confirmed by material balance over the production system. The minimum requirements for stationary point source emissions test procedures and reporting shall be in accordance with Rule 62-297, F.A.C. and 40 CFR 60, Appendix A. [Rules 62-297.310 and 62-296.408, F.A.C. and 40 CFR 60.74]

13. Testing of emissions shall be conducted with the source operating at capacity. Capacity is defined as 90-100% of the rated capacity of 5.96 tons of 100% HNO<sub>3</sub> per hour produced in the nitric acid plant. If it is impracticable to test at permitted capacity, then the source may be tested at less than capacity; in this case subsequent source operation is limited to 110% of the test load until a new test is conducted. Once the unit is so limited, then operation at higher capacities is allowed for no more than fifteen days for purposes of additional compliance testing to regain the rated capacity in the permit, with prior notification to the EPC. Failure to submit the input rates and actual operating conditions may invalidate the test. [Rules 62-4.070(3) and 62-297.310(2)(b), F.A.C.]

14. The permittee shall notify the Air Compliance Section of the Environmental Protection Commission of Hillsborough County at least 15 days prior to the date on which each formal compliance test is to begin of the date, time, and place of each such test, and the contact person who will be responsible for coordinating and having such test conducted. [Rule 62-297.310(7)(a)9., F.A.C.]

15. The permittee shall operate, maintain, and calibrate a continuous emission monitoring system for measuring and recording NO<sub>x</sub> emissions. The span value for calibration checks shall be 500 ppm of NO<sub>2</sub>. [Rule 62-4.070(3), F.A.C. and Permit No. 0570025-007-AC]

16. Monitoring data shall be converted into the units of the 40 CFR 60 NSPS Subpart G standard (pounds/ton of 100% HNO<sub>3</sub>) through use of an established conversion factor in accordance with 40 CFR 60.73(b). The conversion factor shall be re-established during any performance test required by 40 CFR 60.8 or any continuous monitoring system performance evaluation required by 40 CFR 60.13(c). The conversion factor shall be established and reported with each NO<sub>x</sub> compliance stack test report. All monitoring data shall be retained for at least a two year period. [40 CFR 60.73(a) and 60.74(d)]

PERMITTEE:  
Trademark Nitrogen Corporation

PERMIT/CERTIFICATION NO.: 0570025-008-AC  
PROJECT: Nitric Acid Plant

SPECIFIC CONDITIONS:

17. In accordance with 40 CFR 60.7(c) and 40 CFR 60.73(e), quarterly excess emission reports shall be submitted to the Air Compliance Section of the Environmental Protection Commission of Hillsborough County. Excess emissions are defined as any 3-hour period during which the average (arithmetic average of 3 continuous 1-hour periods) NO<sub>x</sub> emissions, as measured by the NO<sub>x</sub> continuous emission monitoring system, exceed the standards contained in Specific Condition No. 7.A) or 7.B). The quarterly reports shall include the following:

- A) The date and time of commencement and completion of each time period of excess emissions, the magnitude of excess emissions computed in accordance with 40 CFR 60.13(h), and any conversion factors used.
- B) Specific identification of excess emissions that occur during startups, shutdowns, and malfunctions of the affected source. This shall include the nature and cause of any malfunctions (if known) and the corrective action taken or preventative measures adopted.
- C) The date and time identifying each period during which the NO<sub>x</sub> continuous emissions monitoring system was inoperative (not including zero and span checks), and the nature of system repairs or adjustments.
- D) When no excess emissions have occurred or the continuous emission monitoring system has not been inoperative, repaired or adjusted, such information shall be stated in the report.
- E) A notification of any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies, unless that change is specifically exempted under an applicable subpart or in 40 CFR 60.14(e). This notice shall be postmarked 60 days or as soon as practicable before the change is commenced and shall include information describing the precise nature of the change, present and proposed emission control systems, productive capacity of the facility before and after the change, and the expected completion date of the change. The EPC may request additional relevant information subsequent to this notice. [40 CFR 60.7(a)(4)]
- F) The permittee shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative. [40 CFR 60.7(b)]
- G) The permittee shall maintain a file of all measurements, including performance testing measurements and all other information required by this part recorded in a permanent form suitable for inspection. The file shall be retained for at least two years following the date of such measurements, maintenance, reports, and records. [40 CFR 60.7(f)]
- H) The opacity standards set forth in this permit shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard. [40 CFR 60.11(c)]
- I) At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the EPC which may

PERMITTEE:  
Trademark Nitrogen Corporation

PERMIT/CERTIFICATION NO.: 0570025-008-AC  
PROJECT: Nitric Acid Plant

SPECIFIC CONDITIONS:

include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. [40 CFR 60.11(d)]

- J) No owner or operator subject to the provisions of this part shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere. [40 CFR 60.12]

18. In order to demonstrate compliance with the requirements of Specific Condition Nos. 4, 5, and 7, the permittee shall maintain daily records. The records shall be maintained onsite for at least three years and shall be made available to any local, state, or federal air pollution agency. The records shall include, but not be limited to, the following: [40 CFR 60.73(c), Rules 62-4.070(3) and 62-4.160(14), F.A.C.]

- A) Day, Month, Year
- B) Nitric acid plant production rate (in tons/day of 100% HNO<sub>3</sub>)
- C) Ammonium nitrate production rate (in tons/day)
- D) Hours of operation for the nitric acid plant and the ammonium nitrate plant
- E) Monthly and 12-month rolling NO<sub>x</sub> emissions from the nitric acid plant

19. Submit to the Environmental Protection Commission of Hillsborough County each calendar year on or before April 1, completed DEP Form 62-210.900(5), "Annual Operating Report for Air Pollutant Emitting Facility", for the preceding calendar year. [Rule 62-210.370(3), F.A.C.]

20. If the permittee wishes to transfer this permit to another owner, an "Application for Transfer of Air Permit" (DEP Form 62-210.900(7)) shall be submitted, in duplicate, to the Environmental Protection Commission of Hillsborough County within 30 days after the sale or legal transfer of the permitted facility. [Rule 62-4.120, F.A.C.]

ENVIRONMENTAL PROTECTION COMMISSION  
OF HILLSBOROUGH COUNTY

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Richard D. Garrity, Ph.D.  
Executive Director

