



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 012013-002

Project Number: 2012-09-047
Installation Number: 097-0007

Parent Company: Dyno Nobel Inc.

Parent Company Address: 2975 E. Cottonwood Parkway, Suite 500, Salt Lake City, UT 84121

Installation Name: Dyno Nobel Inc.

Installation Address: 17562 Gum Road, Carthage, MO 64836

Location Information: Jasper County, S13, T28N, R32W

Application for Authority to Construct was made for:
A sodium nitrate manufacturing operation. This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060 *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

JAN 04 2013

EFFECTIVE DATE

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. The permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit, and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

Page No.	3
Permit No.	
Project No.	2012-09-047

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060(12)(A)10. "Conditions required by permitting authority."

Dyno Nobel Inc.
Jasper County, S13, T28N, R32W

1. Production Limitation
 - A. The annual production of sodium nitrate shall not exceed 8,095 tons in any consecutive 12-month period.
 - B. Attachment A or an equivalent form, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance.
2. Control Device Requirement - Demister
 - A. The permittee shall control particulate emissions from EP-20 R400 SN Reactor using a demister as specified in the permit application.
 - B. The demister and any related instrumentation or equipment shall be operated and maintained in accordance with the manufacturer's specifications. Manufacturer's specifications shall be retained onsite.
 - C. The permittee shall maintain an operating and maintenance log for the demister which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

Page No.	4
Permit No.	
Project No.	2012-09-047

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

3. Record Keeping and Reporting Requirements
 - A. The permittee shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
 - B. The permittee shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit indicate an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2012-09-047
Installation ID Number: 097-0007
Permit Number:

Dyno Nobel Inc
17562 Gum Road
Carthage, MO 64836

Complete: November 27, 2012

Parent Company:
Dyno Nobel Inc
2975 E. Cottonwood Parkway, Suite 500
Salt Lake City, UT 84121

Jasper County, S13, T28N, R32W

REVIEW SUMMARY

- The permittee has applied for authority to construct a sodium nitrate manufacturing operation.
- HAP emissions are not expected from the proposed equipment.
- 40 CFR Part 60, Subpart Kb – *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984* is not applicable to the installation and has not been applied within this permit. None of the tanks being installed have a design capacity greater than 75 m³; therefore, they do not meet the applicability requirements of §60.110b.
- 40 CFR Part 60, Subpart Ga – *Standards of Performance for Nitric Acid Plants for Which Construction, Reconstruction, or Modification Commenced After October 14, 2011* is not applicable to the installation and has not been applied within this permit. This regulation does not apply to the sodium nitrate manufacturing operation being installed under this permit. Nitric acid is already being stored and processed at the installation by the PETN Nitrator, NG Nitrator, Mixed Acid, and Nitrate Ammonium Liquor (NAL).
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- A demister is being used to control the particulate emissions from EP-20 R400 SN Reactor.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060 *Construction Permits Required*. Controlled potential emissions of each pollutant are below de minimis levels.

- This installation is located in Jasper County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment.
- A Part 70 Operating Permit application is required for this installation within one year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Dyno Nobel Inc – Carthage is an existing major source that manufactures explosives in Carthage, Missouri. The installation is currently operating under the Part 70 Operating Permit OP2007-066. The Air Pollution Control Program received a Part 70 Operating Permit renewal application, Project 2012-06-019, from the installation on June 6, 2012. The installation shall continue to operate under OP2007-066 until the issuance of their new operating permit. The installation shall either amend their Part 70 Operating Permit renewal application, Project 2012-06-019, or amend their new operating permit within one year of equipment startup, as applicable.

The following permits have been issued to the installation from the Air Pollution Control Program:

Table 1: Project History

Permit Number	Description
0587-007	Incinerator
1187-003	Acid Mixing Facility
0889-014	Nitration System
0290-011	Emulsion Manufacturing
0491-012	Boiler
1292-009	Paperwrap Emulsion
0395-006	PETN and Ammonium Nitrate
0997-036	Two Kettles, Ammonium Nitrate Graining Process
062008-008	RES Biofuel Combustion
NPR	Baghouse
NPR	Sodium Nitrate Plant
NPR	Two Rework Kettles

NPR = No Permit Required Determination

PROJECT DESCRIPTION

On April 8, 2009 the Air Pollution Control Program issued a No Permit Required Determination (NPR), Project 2009-03-001, to Dyno Nobel Inc – Carthage for the installation of a Sodium Nitrate Plant.

The Sodium Nitrate Plant combines nitric acid and sodium carbonate (soda ash) in EP-20 R400 SN Reactor. Soda ash is purchased in 2,000 pound super sacks. The super sacks are mechanically lifted to a bin which feeds into an auger. The auger introduces soda ash into EP-20 R400 SN Reactor. The operation is also capable of using aqueous sodium hydroxide instead of soda ash.

Reaction products consist of sodium nitrate, carbon dioxide (CO₂), and water. After reaction completion, the sodium nitrate solution is combined with nitrate ammonia liquor (NAL) to reduce the evaporation temperature of water. The solution is then sent to EP-21 SN Plant Evaporator to remove excess water. Exhaust from EP-21 SN Plant Scrubber is vented to a venturi scrubber. Once the desired sodium nitrate concentration is reached, the solution is pumped to one of four 10,200 gallon oxidizer tanks. The operation is designed to produce 8,095 tons of sodium nitrate per year using 6,000 tons of 42 – 46 percent nitric acid and 5,048 tons of soda ash per year.

Steam for the evaporation process is obtained from the installation's existing boilers EP-02 Superior Boiler and EP-03 Keeler Boiler. Steam from the Chub Emulsion Facility's existing EP-08 Kewanee Boiler is employed to maintain the temperature of the solution in the oxidizer tanks. One of the oxidizer tanks is an existing tank at the Chub Emulsion Facility, the other three oxidizer tanks are new tanks being installed as part of this project.

The installation purchases 98 percent nitric acid for use in their PETN Nitrator. After nitration of pentaerythritol (PE) to produce PETN (pentaerythritol tetranitrate) the concentration of the nitric acid is reduced to 42 – 46 percent, some of the 42 – 46 percent nitric acid is used by the Ammonium Nitrate Plant, some will be used in the SN Process. NAL is produced by the Ammonium Nitrate Plant.

After startup of the Sodium Nitrate Plant, the installation noticed NO_x and PM emissions in excess of those used in the NPR calculations. Stack testing was performed on EP-20 in August of 2012 and on EP-21 in July of 2012. Stack testing results indicated the need for a construction permit; therefore, the installation reapplied.

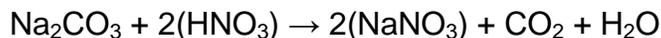
The Air Pollution Control Program has reviewed the stack testing results. Emissions of PM₁₀ have been determined to exceed the de minimis level; therefore, the NPR, Project 2009-03-001, is no longer valid and is being replaced by this permit.

EMISSIONS/CONTROLS EVALUATION

PM and NO_x emissions from EP-20 R400 SN Reactor were obtained from stack testing conducted in August of 2012. Stack testing results indicate that prior to control 4.4271 pounds of PM and 0.0605 pounds of NO_x are emitted per ton of sodium nitrate

produced. Stack testing did not include a particle size distribution; therefore, to be conservative, all of the PM was assumed to be PM_{2.5}. The installation is required by Special Condition #2 to install a demister on this emission unit. A minimum control efficiency of 70 percent was used in emission calculations based upon the minimum control efficiency stated by EPA's Clean Air Technology Center in their Fiber-Bed Scrubber Fact Sheet available at: <http://www.epa.gov/ttn/catc/dir1/fiberbed.pdf>.

CO₂ emissions from EP-20 R400 SN Reactor were calculated using stoichiometry. The chemical reaction occurring in the reactor is:



PM emissions from EP-21 SN Plant Evaporator were obtained from stack testing conducted in July of 2012. Stack testing indicates that prior to control 0.007502 pounds of PM are emitted per ton processed. The MHDR of EP-21 SN Plant Evaporator has increased since the NPR to 6.65 tons per hour. EP-21 has a higher MHDR than stated in the NPR as the NPR neglected the increased throughput due to the addition of nitrate ammonia liquor and the evaporation duration exceeding an hour. Stack testing did not include a particle size distribution; therefore, to be conservative, all of the PM was assumed to be PM_{2.5}. The installation does operate a venturi scrubber on this emission unit; however, the venturi scrubber is not required by this permit and has not been used in emissions calculations. The installation may continue to operate the venturi scrubber; however, the installation shall not claim control efficiency for the venturi scrubber when reporting actual emissions.

The following table provides an emissions summary for this project. Existing potential emissions were taken from Construction Permit 062008-008. Existing actual emissions were taken from the installation's 2011 EIQ. Uncontrolled Project Potential Emissions and Controlled Project Potential Emissions represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2011 EIQ)	Uncontrolled Project Potential Emissions	Controlled Project Potential Emissions
PM	25.0	N/D	N/A	18.14	5.59
PM ₁₀	15.0	>15.0	3.91	18.14	5.59
PM _{2.5}	10.0	N/D	0.37	18.14	5.59
SO _x	40.0	N/D	0.44	N/A	N/A
NO _x	40.0	>40.0	7.92	0.24	0.24
VOC	40.0	>40.0	1.32	N/A	N/A
CO	100.0	>100.0	1.94	N/A	N/A
GHG (CO ₂ e)	75,000	N/D	N/A	2,095.43	2,095.43
GHG (mass)	250.0	N/D	N/A	2,095.43	2,095.43
HAPs	10.0/25.0	<10/25	N/A	N/A	N/A

N/A = Not Applicable; N/D = Not Determined

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060 *Construction Permits Required*. Potential emissions of each pollutant are below de minimis levels.

APPLICABLE REQUIREMENTS

The permittee shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

GENERAL REQUIREMENTS

- 10 CSR 10-6.065 *Operating Permits*
- 10 CSR 10-6.110 *Submission of Emission Data, Emission Fees and Process Information*
- 10 CSR 10-6.165 *Restriction of Emission of Odors*
- 10 CSR 10-6.170 *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*
- 10 CSR 10-6.220 *Restriction of Emission of Visible Air Contaminants*

SPECIFIC REQUIREMENTS

- 10 CSR 10-6.400 *Restriction of Emission of Particulate Matter From Industrial Processes*
 - The 10 CSR 10-6.400(3)(A)1 limit for EP-20 SN Reactor is 3.89 lb/hr.
 - Special Condition #2 requires the use of a demister to control PM emissions.
 - Controlled emissions from EP-20 are 1.23 lb/hr.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060 *Construction Permits Required*, I recommend this permit be granted with special conditions.

Alana L. Rugen, EIT
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 13, 2012, received September 17, 2012, designating Dyno Nobel Inc as the owner and operator of the installation.
- U.S. EPA's Clean Air Technology Center Fiber-Bed Scrubber Fact Sheet available at: <http://www.epa.gov/ttn/catc/dir1/fiberbed.pdf>.
- August 2012 stack testing results for EP-20 R400 SN Reactor.
- July 2012 stack testing results for EP-21 SN Plant Evaporator.

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs National Emissions Standards for Hazardous Air Pollutants
CFR	Code of Federal Regulations	NO_x	nitrogen oxides
CO	carbon monoxide	NSPS	New Source Performance Standards
CO₂	carbon dioxide	NSR	New Source Review
CO_{2e}	carbon dioxide equivalent	PM	particulate matter
COMS	Continuous Opacity Monitoring System	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
CSR	Code of State Regulations	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
dscf	dry standard cubic feet	ppm	parts per million
EQ	Emission Inventory Questionnaire	PSD	Prevention of Significant Deterioration
EP	Emission Point	PTE	potential to emit
EPA	Environmental Protection Agency	RACT	Reasonable Available Control Technology
EU	Emission Unit	RAL	Risk Assessment Level
fps	feet per second	SCC	Source Classification Code
ft	feet	scfm	standard cubic feet per minute
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	tph	tons per hour
hr	hour	tpy	tons per year
hp	horsepower	VMT	vehicle miles traveled
lb	pound	VOC	Volatile Organic Compound
lbs/hr	pounds per hour		
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Steven K. Burgin
Plant Manager
Dyno Nobel Inc
17562 Gum Road
Carthage, MO 64836

RE: New Source Review Permit - Project Number: 2012-09-047

Dear Mr. Burgin:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your NSR permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Alana Rugen, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:arl

Enclosures

c: Southwest Regional Office
PAMS File: 2012-09-047

Permit Number: