



DuPont Titanium Technologies  
Edge Moor Plant  
104 Hay Road  
Edge Moor, DE 19809

December 20, 2010

Mr. Kevin Coyle  
Principal Planner  
Office of the Secretary  
Department of Natural Resources & Environmental Control  
State of Delaware  
89 Kings Highway  
Dover, DE 19901

**Subject:** Coastal Zone Act Permit Application  
Project Name: Installation of Two (2) Natural Gas Fired Boilers  
DuPont Edge Moor  
104 Hay Road  
Edge Moor, DE 19809

Dear Mr. Coyle:

Enclosed are One (1) Original, Eight (8) copies and One (1) electronic copy of the Coastal Zone Permit Application. Also attached is a check for \$3,000 payable to "State of Delaware" to cover the Application fee.

DuPont Edge Moor is proposing to install Two Natural Gas fired Boilers each rated at 48.16 MMBTU/hr. The Boilers will be equipped with Low NOx burners and Flue Gas Recirculation.

DuPont Edge Moor files the application, in part, based on discussions with DNREC personnel regarding the applicable requirements. DuPont Edge Moor intends to cooperate with DNREC in connection with the permit process. DuPont Edge Moor also reserves the right to contest the legality of the permit requirements should the need arise.

Should you have any questions, please call me at 302-761-2298 or Mr. Tushar Durve at 302-761-2302.

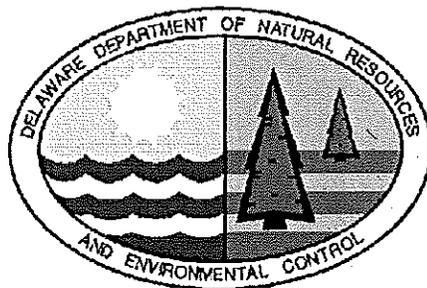
Best Regards,

Vimal Vijaykumar  
Environmental Consultant

cc W. Smith  
P. Jann  
S. Rahaim

Enclosure

File # 3001



## **APPLICATION FOR A COASTAL ZONE ACT PERMIT**

**State of Delaware  
Department of Natural Resources & Environmental Control  
Office of the Secretary**

Date of submission: 12/20/2010  
Project name: Installation of Two Natural Gas Fired Boilers  
Applicant's name: DuPont Edge Moor

## Table of Contents

Part 1.	Certification by Applicant.....	3
Part 2.	Applicant Information and Site Identification.....	4
Part 3.	Project Summary.....	5
Part 4.	Project Property Record, and Evidence of Local Zoning and Planning Approval .....	8
Part 5.	Project Operations.....	9
Part 6a.	Environmental Impacts.....	13
Part 6b.	Environmental Offset Reduction Claim.....	25
Part 6c.	Environmental Offset Proposed.....	26
Part 7.	Economic Effects.....	28
Part 8.	Supporting Facilities Requirements .....	30
Part 9.	Aesthetic Effects.....	31
Part 10.	Effects on Neighboring Land Uses.....	32
Part 11.	Attachments or Appendices (figures, tables, maps, forms, etc.).....	33

PART 1

CERTIFICATION BY APPLICANT

Under the penalty of perjury pursuant to 11 Delaware Code §1221-1235, I hereby certify that all the information contained in this Delaware Coastal Zone Act Permit Application and in any attachments is true and complete to the best of my belief.

I hereby acknowledge that any falsification or withholding of information will be grounds for denial of a Coastal Zone Permit.

I also hereby acknowledge that all information in this application will be public information subject to the Delaware Freedom of Information Act, except for clearly identified proprietary information agreed to by the Secretary of the Department of Natural Resources & Environmental Control.

Michael K. Welch

Print Name of Applicant



Signature of Applicant

Plant Manager

Title

12/13/2010

Date

PART 2

APPLICANT INFORMATION AND SITE IDENTIFICATION

2.1 Identification of the applicant:

**Company Name: E. I DuPont De Nemours & Company, Inc.**  
**Address: 104 Hay Road, Edge Moor, DE 19809**  
**Telephone: 302-761-2298**  
**Fax: 302-761-2357**

2.2 Primary contact: Please list the name, phone number and email of a preferred contact within your company in case the DNREC needs to contact you regarding this permit application.

**Permit Application Contact Name: Vimal Vijaykumar**  
**Phone: 302-761-2298**  
**Email: vimal.vijaykumar@usa.dupont.com**

2.3 , Authorized agent (if any): ,

Name:  
Address:  
Telephone:  
Fax:

*If you have an authorized agent for this permit application process, provide written authorization from client for being the authorized agent.*

2.4 Project property location (street address):

**104 Hay Road, Edge Moor, DE 19809**

2.5 In a separate attachment, provide a general map of appropriate scale to clearly show the project site.

**See Attachment A.**

2.6 Is the applicant claiming confidentiality in any section of their application?

YES

**NO**

If yes, see instructions on page 3.

## PART 3

### PROJECT SUMMARY

*Provide a one-page summary describing the proposed project. Include a brief quantitative description of the anticipated environmental impacts, and how the Environmental Offset Proposal will "clearly and demonstrably" more than offset any negative impacts.*

Since 1984 Edge Moor has been supplied with 100% of its steam needs from the neighboring coal fired power plant, Calpine's (Conectiv) Hay Road steam generation facility. Prior to that time, Edge Moor provided its own steam generation.

Due to a combination of low consumer electrical demand, lower plant efficiency, newer power stations and lower natural gas prices, the Calpine site has not been able to compete in the open market for electricity sales. The Calpine coal-fired boilers would be down most of the time if not for the requirement to make steam for export to DuPont. Calpine Corporation recently purchased the Conectiv business, the previous owner, and announced they will not burn coal at the Hay Road steam generating station in the future. This will result in the power plant that is supporting our steam needs being less competitive and rarely picked up on the PJM grid to produce electricity. The steam that is presently generated for DuPont is using a 26 years old steam to steam reboiler and requires the large coal boilers to be in operation to provide steam for the reboiler operation.

When it is necessary for a Calpine boiler to run solely to make steam for DuPont, a 'displaced energy' fee is billed in accordance to the Steam Supply Agreement contract. This arrangement with Calpine is not productive for DuPont Edge Moor and there is no guarantee that Calpine will extend DuPont Edge Moor's current contract for steam beyond year 2014. This leaves DuPont Edge Moor's operational viability in jeopardy.

DuPont Edge Moor is proposing to install two natural gas fired packaged boilers (48.16 MMBTU/hr each). By proposing to install natural gas fired units at the site, DuPont Edge Moor will be using a cleaner fuel alternative and will have reduced emissions as compared to traditional coal fired boilers.

DuPont Edge Moor chose to install natural gas fired boilers to ensure negligible impact on the environment.

The steam generated from the boilers will be used for process heating and comfort heating. The raw material used to generate steam will be purchased water. The condensate from the boiler will be treated with additives which offer descaling and anti-corrosion properties.

The proposed installation will emit\* the following criteria pollutants,

NOx = 16.45 tons/yr  
CO = 16.88 tons/yr  
VOC = 2.27 tons/yr  
PM = 3.14 tons/yr  
SO2 = 0.25 tons/yr

\* Please note that the above emissions are potential emission (24 x7) estimates. The actual emission will be lower since the site does not anticipate 24 x 7 operation on both boilers.

The following offsets will be provided by giving up the fuel oil burning capacity on the Ore roaster.

Pollutant	Emission Offset (Tons/Yr)	Offset Ratio
NOx	24.68	1:1.5
CO	25.31	1:1.5
VOC	3.41 (NOx substitute)	1:1.5
PM	4.72	1:1.5
SO2	0.37	1:1.5

The boiler operation will also generate blowdown at the rate of 24 gal/min. This will be routed to the waste water treatment plant. The following new additives will be added to the condensate:

Softening Salt : 7 gallons/min  
Amines : 4-8 gallons/day

The site expects an increase of 0.14 ppm of BOD in the water discharge. This is a very conservative estimate since degradation in the waste water treatment plant is not being considered.

DuPont Edge Moor believes that this new BOD loading is inconsequential. It is the sites understanding that DNREC's policy is to normally seek a 1:1.3 offset ratio for environmental impacts. DuPont Edge Moor is offering a 1:1.5 offset ratio for criteria pollutants. By providing a higher offset ratio than DNREC's policy, the site believes that the current proposal will more than offset negative environmental impact in all medias.

**PART 4**

**PROJECT PROPERTY RECORD AND  
EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL**

**PROJECT PROPERTY RECORD**

4.1 Name and address of project premises owner(s) of record:

**E. I. DuPont De Nemours & Company, Inc.  
Edge Moor Plant  
104 Hay Road  
Edge Moor, DE 19809**

4.2 Name and address of project premises equitable owner(s):

**The property is owned by DuPont.**

4.3 Name and address of lessee(s):

**Property is not leased.**

4.4 Is the project premises under option by permit applicant?

**No.**

4.5 What is the present zoning of the land for this entire project site?

**HI (Heavy Industrial)**

EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL

I, \_\_\_\_\_, for \_\_\_\_\_  
(Name of County, City of Town)

do hereby affirm that the project proposed by \_\_\_\_\_  
(Name of Applicant)

located at \_\_\_\_\_, in  
(Address)

the \_\_\_\_\_ zoning district is in  
full compliance with the zoning code as it applies to this project.

The above named applicant's project is in compliance with the adopted comprehensive development plan for the geographic area within which the project will be located.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Date)

*This part is essential for a complete Coastal Zone Act Permit Application. No application will be considered administratively complete without it. While the applicant is strongly advised to use this form, the local zoning jurisdiction may utilize a different form or document to demonstrate "evidence of local zoning approval," provided such documents are signed and dated by the proper official.*

**(Please Refer Attachment E)**

## PART 5

### PROJECT OPERATIONS

5.1 Describe the characteristics of the manufactured product and all the process and/or assembly operations utilized by the proposed project. Include in the description (use attachments if necessary):

- a. the raw materials, intermediate products, by-products and final products and characteristics of each. Review any materials' risk of carcinogenicity, toxicity, mutagenicity and/or the potential to contribute to the formation of smog. Provide material safety data sheets (MSDS) if available;

The two natural gas fired boilers will use purchased water to generate steam for process and comfort heating. The condensate from the boiler will be treated with additives which offer descaling and anti-corrosion properties.

Purchased water or additives do not present an unusual risk of carcinogenicity, toxicity, mutagenicity.

Material Safety Data Sheet for the amine and salt is attached. (Attachment B)

- b. the step-by-step procedures or processes for manufacturing and/or assembling the product(s). Provide a flow diagram to illustrate procedures;

Please refer attachment for specifications and flow diagram. (Attachment C)

- c. the nature of the materials mentioned above in 4.1(a) as to whether or not the materials require special means of storage or handling;

Purchased water will be stored in the existing water tower at the site. Additives will be stored in 250-300 gallon returnable totes.

- d. list the machinery (new and/or existing) to be utilized by this project;

Two packaged natural gas fired boilers and associated piping will be installed. Both boilers will be housed in the existing Power House building. The installation will not take any significant additional footprint.

- e. list any new buildings or other facilities to be utilized;

**The project does not include the construction of any new buildings or facilities. The site currently occupies 123 acres and the new installation will be housed in an existing building.**

- f. list the size and contents of any anticipated aboveground or underground storage tank systems that may be constructed or utilized in support of facility operations;

**None.**

- g. if this project represents an increase or decrease in production at an already existing facility, what will be the new rate of maximum production?

**This project will not change current plant capacity nor will it change the maximum production rate.**

- h. if this project represents a totally new facility at a new or existing site, what will be the maximum production rate?

**This project is proposed at an existing facility.**

- 5.2 Describe daily hours of plant operations and the number of operating shifts.

**The Plant operates twenty four hours per day. There are two twelve hour shifts each day.**

- 5.3 Provide a site plan of this project with:

- a. a north arrow;

**See Attachment A.**

- b. a scale of not less than one inch to 200 feet;

**See Attachment A**

- c. identity of the person responsible for the plan, including any licenses and their numbers;

**Jim Whitney, Project Engineering Consultant, DuPont is responsible for the Plan. He is a registered Professional Engineer [P.E. 8591] in the State of Delaware.**

- d. the acreage of the applicant's entire property and acreage of the proposed project;

**The existing plant occupies 123 acres. The proposed installation would be contained within the existing footprint occupying less than 10,000 square feet of land. Please note that the boilers will be housed in the existing power house building.**

- e. property lines of entire property;

**See Attachment A**

- f. lines designating the proposed project area for which application is being made, clearly distinguished from present facilities and operating areas (if any);

**See Attachment A**

- g. existing and proposed roads, railroads, parking and loading areas, piers, wharfs, and other transportation facilities;

**No new roads, railroads, parking lots, piers, wharfs or other transportation facilities would be built.**

- h. existing water bodies and wetlands and proposed dredge and fill areas, and;

**See Attachment A. The project does not include any proposed dredge or fill area.**

- i. existing and proposed drainage ways, gas, electric, sewer, water, roads, and other rights-of-way.

**The boiler blowdown will be discharged to the onsite wastewater treatment plant.**

5.4 How many acres of land in total are required for this proposed project?

Existing/ currently utilized/ developed land: 123 acres.

New land: 0 acres.

**The company will not buy new land for this project. Please note that the proposed project will be housed in the existing powerhouse building.**

- 5.5 Has the property been involved with a state or federal site cleanup program such as Superfund, Brownfields, HSCA Voluntary Cleanup Program, RCRA Corrective Action, Aboveground or Underground Storage Tank Cleanup Programs? If so please specify which program.

**Yes. RCRA Corrective Action.**

- 5.6 With regards to environmental cleanup actions, has a Uniform Environmental Covenant, Final Plan of Remedial Action, or no further action letter been issued by the Department? If so are the planned construction activities consistent with the requirements or conditions stated in these documents?

**Phase II Remedial Facility Investigation (RFI) is currently being conducted in accordance with the RCRA Corrective Action Permit.**

PART 6A

ENVIRONMENTAL IMPACTS

Air Quality

6.1 Describe project emissions (new, as well as any increase or decrease over current emissions) by type and amount under maximum operating conditions:

Pollutant	Existing Emissions		Net Increase/Decrease		New Total Emissions		Percent Change (compare tons/year)
	Lbs/day	Tons/year	Lbs/day	Tons/year	Lbs/day	Tons/year	
NOx	172.64	31.51	90.16	16.45	262.80	47.96	52.22
CO	13,634.47	2,488.29	92.47	16.88	13,726.93	2,505.17	0.68
VOC	597.86	109.11	12.46	2.27	610.33	111.38	2.08
PM	130.30	23.78	17.22	3.14	147.53	26.92	13.22
SO2	151.07	27.57	1.36	0.25	152.43	27.82	0.90

6.2 Describe how the above emissions change in the event of a mechanical malfunction or human error.

The boilers are equipped with automatic interlocks in the event of malfunction. The boiler control system will have two independent Allen Bradley Control Logix PLCs overseeing all combustion safeguards as well as boiler process controls. One PLC is dedicated to safety interlocks (high pressure trip, low water level etc.) while the second PLC is dedicated for combustions and general boiler controls.

There are three potential major malfunctions that could occur:

- 1.) High pressure in steam drum,
- 2.) Loss of water level in the steam drum, and
- 3.) Burner flameout.

For the high pressure excursion the boiler is equipped with high high pressure sensor which interlocks the main gas closed(double block and bleed system) as well as two mechanical relief devices set at 345 psig and 350 psig protecting the boiler designed for 375 psig. Low water level is another significant event to be safeguarded against. The low water level case is protected by dual independent level devices and low low water level interlocks that trips the main gas closed. The last major malfunction protected against is the loss or lack of flame (stop introduction of natural gas) which is protected by redundant 'FireEye' scanners which safeguard the

burner during normal operation as well as prevent the main gas from being introduced without the pilot flame on. It should be noted that the air/fuel ratio is maintained with proper excess air through the entire firing range by way of a mechanical control valve.

A screening Process Hazard Analysis was also completed for the proposed installation. Two additional PHAs will be completed on the proposed project. These PHA's will contain more details. Please refer Attachment D.

- 6.3 Describe any pollution control measures to be utilized to control emissions to the levels cited above in 5.1.

The proposed installation incorporates Low NOx Boilers and Flue Gas Recirculation. DNREC Air Quality Division accepts this as the Best Available Control Technology to control emissions from the proposed boilers.

- 6.4 Show evidence that applicant has, or will have, the ability to maintain and utilize this equipment listed in 5.3 in a consistently proper and efficient manner. (For example, provide college transcripts and/or records of training courses and summary of experience with this pollution control equipment of person(s) responsible for pollution control equipment, and/or provide copies of contracts with pollution control firms to be responsible for maintaining and utilizing this equipment.)

The facility has trained personnel covering operations twenty four hours per day, seven days per week. Employees have training in pollution control measures as well as training in emergency response and leak detection. The plant also has a preventive maintenance plan for all critical equipment.

## Water Quality

- 6.5 Describe wastewater discharge (new, as well as any increase or decrease over current discharge levels) due to project operations:

Pollutant	Current Discharge Concentration (ppm)	New or Changed Discharge Concentration (ppm)	Current Discharge		Net Increase/Decrease		New Total Emissions	
			Lbs/day	Tons/year	Lbs/day	Tons/year	Lbs/day	Tons/year
BOD	<3.37	0.14	<97.48	<17.79	6.18	1.13	<103.66	<18.92

The estimated BOD loading for the proposed project is conservative. It does not account for degradation in the waste water treatment system. The new loading is inconsequential and will not have a significant impact on the environment.

The Site believes that the new total BOD discharge will be less than 3.51 ppm even after the potential new loading. The salt loading from the project will increase the total specific conductivity by 0.7  $\mu$ S/cm. This new loading will be approximately 0.002% of the existing loading. DuPont Edge Moor believes that this is inconsequential.

The proposed project will not increase the waste water discharge from 001 Outfall above the existing permit limits. The proposed project will not cause any violation of DuPont's NPDES Permit.

DuPont Edge Moor is not requesting any additional flow increases over the current NPDES Permit.

- 6.6 Describe the current method of employee sanitary wastewater disposal and any proposed changes to that system due to this proposed project.

The Plant utilizes New Castle County Sanitary Sewer System for discharging sanitary wastewater. This system discharges to the Wilmington Treatment Plant. No changes to this system would result from the proposed project.

- 6.7 Identify the number, location, and name of receiving water outfall(s) of any and all process wastewater discharge (new or current) affected by this proposed project. Provide NPDES Permit Numbers for each discharge affected.

No new Outfall will result from this project. Treated wastewater flow will be discharged from Outfall 001.

- 6.8 If any effluent is discharged into a public sewer system, is there any pretreatment program? If so, describe the program.

**No effluents are discharged into a public sewer except for the sanitary sewer.**

- 6.9 Stormwater:

- a. Identify the number, location, and name of receiving waters of stormwater discharges. Provide permit number for each discharge.

**As per the existing NPDES Permit, the following Outfalls are dedicated for stormwater:**

**003, 004, 006, 007, 008, 009 (Discharges to Delaware River)  
005, 010 (Discharges to Shellpot Creek)**

**Please note that all stormwater discharges at the site is in accordance with the Stormwater Plan. The proposed project will be housed in the existing powerhouse building.**

- b. Describe the sources of stormwater run-off (roofs, storage piles, parking lots, etc).

**Stormwater runoff comes from pavement, parking lots and roofs. The proposed project will not increase stormwater flow at the site.**

- c. Describe the amount of stormwater run-off increase over current levels that will result from the proposed project.

**The site expects a loading of only 0.01 ppm of amines via stormwater. This loading is inconsequential.**

- d. Describe any pollutants likely to be in the stormwater.

**The content of the stormwater is clean and is analyzed for Total Organic Carbon, Dissolved Organic Carbon, Total Suspended Solids, Dioxin Furans and PCBs. The proposed project will add amines at the concentration of 0.01 ppm. The stormwater at the site is managed in accordance with the current Stormwater Plan.**

- e. Describe any pollution control device(s) or management technique(s) to be used to reduce the amount of stormwater generated, and devices to improve the quality of the stormwater run-off prior to discharge.

**The current stormwater management practice at the site is sufficient. The site adheres to Best Management Practices laid out in the Stormwater Plan.**

- f. Describe any new or improved stormwater drainage system required to safely carry off stormwater without flooding project site or neighboring areas down gradient.

**No new or improved drainage system is required to safely carry off stormwater without flooding the project site or neighboring areas down gradient. There would be no land erosion impact from this project.**

- 6.10 Will this project use a new water intake device, or increase the use (flow) from an existing intake device?

YES

**NO**

**The proposed project will use purchased water from United Water Company. The site estimates an average use of 92 gals/min of intake water.**

If yes, state:

- a. the volume of water to be withdrawn, and;
- b. describe what will be done to prevent entrainment and/or entrapment of aquatic life by the intake device.

- 6.11 Will this proposed project result in a thermal discharge of water, or an increase in the flow or temperature of a current thermal discharge?

**YES**

NO

**The discharge from the proposed project will meet the existing NPDES temperature limit. The proposed project will discharge 24 gal/min (max) of blowdown to the wastewater treatment plant.**

**The Site will meet the current NPDES permit limit of 5.2 MGD.**

If yes, state:

- a. the volume of the new flow or increase from the existing thermal discharge, both in flow and amount of heat;

**The proposed project will discharge 24 gal/min (max) to the onsite wastewater treatment plant. The maximum potential thermal**

discharge to the wastewater treatment plant will be 1.6 MMBTU/min. The proposed project will meet the current NPDES permit limit for wastewater discharge temperature (112 ° F).

- b. how warm will the water be when it is discharged into a receiving waterway, discharge canal, or ditch, and what will be the difference in discharge temperature and ambient temperature (delta T) at various seasons of the year after all cooling water mechanisms have been applied to the hot water?

The wastewater discharge will be at a temperature of less than 112° F. Meeting this temperature limit will keep the site in compliance with the current NPDES Permit.

- c. the equipment and/or management techniques that will be used to reduce the thermal load of the discharge water.

The proposed project will utilize the existing polishing pond to cool the discharge below the NPDES permit limit of 112 ° F.

- 6.12 Will any proposed new discharge or change in existing discharge, cause, or have potential to cause, or contribute to, the exceedence of applicable criteria appearing in the "State of Delaware Surface Water Quality Standards"?

YES

NO

If yes, explain:

- 6.13 Describe any oils discharged to surface waters due to this proposed project.

No Oil will be discharged to the surface waters as a result of this proposed project.

- 6.14 Describe any settleable or floating solid wastes discharged to surface waters due to this project.

No settleable or floating solid wastes would be discharged to surface waters due to the proposed project.

- 6.15 Show evidence that the applicant has, or will have, the ability to maintain and utilize any water pollution control equipment listed in questions 5.5 through 5.14 in a consistently proper and efficient manner. (For example, provide operator license numbers, college transcripts and/or training courses and summary of prior experience with this pollution control equipment of person(s) responsible for pollution control equipment, and/or provide copies of contracts with pollution control firms.)

The facility currently has State Licensed Supervisors and Operators responsible for the wastewater treatment operations at the facility. It also employs other trained personnel who have several years of experience operating the existing facility.

- 6.16 Estimate the amount of water to be used for each specified purpose including cooling water. State daily and maximum water use in the unit of gallons per day for each purpose and source of water. State if water use will vary with the seasons, time of day, or other factors.

The proposed project will use 92 gal/min (Max)

Boiler blowdown will be 24 gal/min (Max)

The Boilers are rated at 48.16 MMBTU/hr each (Max)

Excess steam generated as part of the process is discharged into steam traps under an existing UIC Permit.

- 6.17 Identify the source of water needed for the proposed project, including potable water supplies.

Purchased water for the proposed project will be provided by United Water Company.

- 6.18 Are wells going to be used?

YES

NO

If yes:

- a. Identify the aquifer to be pumped and the depth, size and pumping capacity of the wells.
- b. Has a permit been applied for to do this?
- c. How close is the proposed well(s) to any well(s) on adjacent lands?

## Solid Waste

6.19 Will this project result in the generation of any solid waste?

YES

NO

If yes, describe each type and volume of any solid waste (including biowastes) generated by this project, and the means used to transport, store, and dispose of the waste(s).

**The proposed project will use amines for controlling pH of the condensate that is discharged to the steam traps. This will account for only 0.009 ppm of amines.**

6.20 Will there be any on-site recycling, re-use, or reclamation of solid wastes generated by this project?

YES

NO

If yes, describe:

6.21 Will any waste material generated by this project be destroyed on-site?

YES

NO

If yes, how will that be done?

## Hazardous Waste

- 6.22 Will this proposed project result in the generation of any hazardous waste as defined by the "Delaware Regulations Governing Hazardous Waste"?

YES  
 NO

If yes, identify each hazardous waste, its amount, and how it is generated:

- 6.23 Describe the transport of any hazardous waste and list the permitted hazardous waste haulers that will be utilized.

**No hazardous waste will be generated as a result of the proposed project.**

- 6.24 Will the proposed project cause the applicant to store, treat, and/or dispose of hazardous waste?

YES  
 NO

If yes, describe;

- 6.25 Does the applicant currently generate any hazardous waste at this site?

YES  
NO

If yes, describe:

**Typical hazardous waste streams generated at the site are:**

- Ferric Chloride Waste - K178
- Waste Solvent - D001
- Waste Aerosol Cans - D001

**Hazardous waste generated at the site is managed and disposed in accordance with RCRA regulations. The Site also has a comprehensive Preparedness, Prevention and Contingency Plan for managing/shipping hazardous waste and responding to spill scenarios.**

• **Habitat Protection**

6.26 What is the current use of the land that is to be used for the proposed project?

**The current use of the land is same as that of the proposed use.**

6.27 Will the proposed project result in the loss of any wetland habitat?

YES

NO

If yes, describe:

6.28 Will any wastewater and/or stormwater be discharged into a wetland?

YES

NO

If yes, will the discharge water be of the same salinity as the receiving wetlands?

6.29 Will the proposed project result in the loss of any undisturbed natural habitat or public use of tidal waters?

YES

NO

If yes, how many acres?

6.30 Do threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act) exist at the site of the proposed project, or immediately adjacent to it?

YES

NO

If yes, list each species:

6.31 Will this proposed project have any effect on these threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act).

YES

NO

If yes, explain:

- 6.32 What assurances can be made that no threatened or endangered species exist on the proposed project site?

**A site inspection would reveal that there are no endangered or threatened species at the facility.**

- 6.33 Describe any filling, dredging, or draining that may affect nearby wetlands or waterways.

**The proposed project will not require any filling, dredging or draining.**

- 6.34 If dredging is proposed, how much will occur and where will the dredged materials go for disposal?

**No dredging is proposed.**

## Other Environmental Effects

- 6.35 Describe any noticeable effects of the proposed project site including: heat, glare, noise, vibration, radiation, electromagnetic interference, odors, and other effects.

**The existing process would not change in any significant way so as to cause any noticeable effects related to heat, glare, noise, vibration, radiation, electromagnetic interference or odors. The operation takes place in an industrial area and the project would not have any significant off-site impact.**

- 6.36 Describe what will be done to minimize and monitor such effects.

**The proposed project will be built per applicable federal and state regulations and according to the standards established for such work by DuPont.**

- 6.37 Describe any effect this proposed project will have on public access to tidal waters.

**The proposed project would not have an impact on the public access to tidal waters.**

- 6.38 Provide a thorough scenario of the proposed project's potential to pollute should a major equipment malfunction or human error occur, including a description of backup controls, backup power, and safety provisions planned for this project to minimize any such accidents.

**A screening Process Hazard Analysis was completed by DuPont Edge Moor on the proposed project. The site will also adhere to NFPA standards and K6R (Combustion Safeguard System) DuPont Standard.**

- 6.39 Describe how the air, water, solid and hazardous waste streams, emissions, or discharge change in the event of a major mechanical malfunction or human error.

**Please refer to Part 6 A, Environmental Impacts 6.2.**

**A screening Process Hazard Analysis (PHA) was completed for the proposed project. Two additional PHAs will be completed on the proposed project. These PHA's will contain more details. A copy of the screening PHA is attached. (Attachment D)**

PART 6B

ENVIRONMENTAL OFFSET PROPOSAL REDUCTION CLAIM

Is applicant claiming the right to have a reduced offset proposal due to past voluntary improvements as defined in the "Regulations Governing Delaware's Coastal Zone"?

YES

NO

**Note: DuPont Edge Moor invested \$25 Million in 2007 to reduce the amount of dioxins generated at the site. Dioxin reduction of over 90% was achieved as a result of this project.**

*If yes, provide an attachment to the application presenting sufficient tangible documentation to support your claim.*

## PART 6C

### ENVIRONMENTAL OFFSET PROPOSAL

If the applicant or the Department finds that an Environmental Offset Proposal is required, the proposed offset project shall include all the information needed to clearly establish:

- A. A qualitative and quantitative description of how the offset project will “clearly and demonstrably” more than offset the negative impacts from the proposed project.

The following table summarizes the emissions and offsets that will be provided:

Pollutant	Proposed Project Emission (Tons/Yr)	Emission Offset (Tons/Yr)	Offset Ratio
NOx	16.45	24.68	1:1.5
CO	16.88	25.31	1:1.5
VOC	2.27	3.41 (NOx substitute)	1:1.5
PM	3.14	4.72	1:1.5
SO2	0.25	0.37	1:1.5

As of now, the Ore Roaster has the capacity to burn natural gas and fuel oil. DuPont Edge Moor will give up its capacity to use fuel oil on the Ore Roaster. A significant reduction in emissions can be achieved by switching to only natural gas usage on the Ore Roaster.

As discussed in Part 6A, Environmental Impacts, Water Quality & Solid Waste, the water discharge and solid waste generated from the proposed project is minimal. DuPont Edge Moor is providing a 1:1.5 offset for air criteria pollutants to more than offset the overall environmental impact as a result of the proposed project including such minimal impacts.

- B. How and in what period of time the offset project will be carried out.

On approval of this permit the site will implement the offset project.

- C. What environmental benefits will be and when they will be achieved.

On approval of this permit the site will have reduced emissions.

- D. What scientific evidence there is concerning the efficacy of the offset project in producing its intended results.

**This is a direct emission reduction. EPA AP-42 emission factors and stack test results were used to estimate emissions.**

- E. How the success or failure of the offset project will be measured in both the short and long term.

**Monthly emission calculations are completed to demonstrate compliance with the current Title V Permit.**

- F. What, if any, negative impacts are associated with the offset project.

**None.**

- G. How the offset will impact the attainment of the Department's environmental goals for the Coastal Zone and the environmental indicators used to assess long-term environmental quality within the Coastal Zone.

**The offset project will decrease potential emissions from another source at the site.**

## PART 7

### ECONOMIC EFFECTS

#### Construction

- 7.1 Estimate the total number of workers for project construction and the number to be hired in Delaware.

**Twenty three project construction workers will be used on the construction job over a six month period.**

- 7.2 Estimate the weekly construction payroll.

**The weekly payroll will be \$52,440/week.**

- 7.3 Estimate the value of construction supplies and services to be purchased in Delaware.

**The estimated local field material purchases is \$300,000**

- 7.4 State the expected dates of construction initiation and completion.

**Construction will begin in April 2010 (anticipated month) and the site anticipates completion by August 2010.**

- 7.5 Estimate the economic impact from the loss of natural habitat, or any adverse economic effects from degraded water or air quality from the project on individuals who are directly or indirectly dependent on that habitat or air or water quality (e.g. commercial fishermen, waterfowl guides, trappers, fishing guides, charter or head boat operators, and bait and tackle dealers).

**There would be no loss of natural habitat or degraded water or air quality and therefore no economic impact from such loss or degradation.**

## Operations

- 7.6 State the number of new employees to be hired as a direct result of this proposed project and how many of them will be existing Delaware residents and how many will be transferred in from other states.

**At this time, the site believes that one operator will be hired. Existing shift operators will monitor the operation on shifts. DuPont is an equal opportunity employer and does not require employees to be Delaware residents.**

- 7.7 If employment attributable to the proposed project will vary on a seasonal or periodic basis, explain the variation and estimate the number of employees involved.

**Employment will not vary due to this project.**

- 7.8 Estimate the percent distribution of annual wages and salaries (based on regular working hours) for employees attributable to this project:

<u>Wage/salary</u>	<u>Percent of employees</u>
<\$10,000	
\$10,000-14,999	
\$15,000-24,999	
\$25,000-34,999	
\$35,000-49,999	
\$50,000-64,999	100 (One Operator)
\$65,000-74,999	
\$75,000-99,999	
>\$100,000	

- 7.9 Estimate the annual taxes to be paid in Delaware attributable to this proposed project:

State personal income taxes:	\$3,950
State corporate income taxes	\$
County and school district taxes:	\$
Municipal taxes:	\$

**The current estimated property tax is \$361,000 (Oct 1, 2010 to September 30, 2011)**

## PART 8

### SUPPORTING FACILITIES REQUIREMENTS

Describe the number and type of new supporting facilities and services that will be required as a result of the proposed project, including, but not limited to:

- a. Roads
- b. Bridges
- c. Piers and/or docks
- d. Railroads
- e. Microwave towers
- f. Special fire protection services not now available
- g. Traffic signals
- h. Sewer expansion
- i. Energy related facilities expansion
- j. Pipelines: **One 4" x 150' long natural gas supply line will be added. The powerhouse building will consist of interconnecting pipes between the boilers.**

## PART 9

### AESTHETIC EFFECTS

- 9.1 Describe whether the proposed project will be located on a site readily visible from a public road, residential area, public park, or other public meeting place (such as schools or cultural centers).

**The proposed project will be housed in an existing building; hence critical equipment won't be visible from a public area.**

- 9.2 Is the project site location within a half mile of a place of historic or scenic value?

**The proposed project is located in an industrial area along the Delaware River. The project would not impact any place of historic or scenic value.**

- 9.3 Describe any planned attempt to make the proposed facility aesthetically compatible with its neighboring land uses. Include schematic plans and/or drawings of the proposed project after it is complete, including any landscaping and screening.

**The proposed project would be aesthetically compatible with its neighboring land use. The proposed project would not differ from the existing use.**

PART 10

EFFECTS ON NEIGHBORING LAND USES

- 10.1 How close is the nearest year-round residence to the site of this proposed project?

**The nearest year-round residence to the site, located in the Edge Moor Industrial Park is less than 0.5 miles.**

- 10.2 Will this proposed project interfere with the public's use of existing public or private recreational facilities or resources?

**The proposed project would not interfere with the public's use of existing public or private recreational facilities or resources because it's contained within an existing building at the site and an existing footprint of the plant.**

- 10.3 Will the proposed project utilize or interfere with agricultural areas?

**The proposed project would not utilize or interface with agricultural areas.**

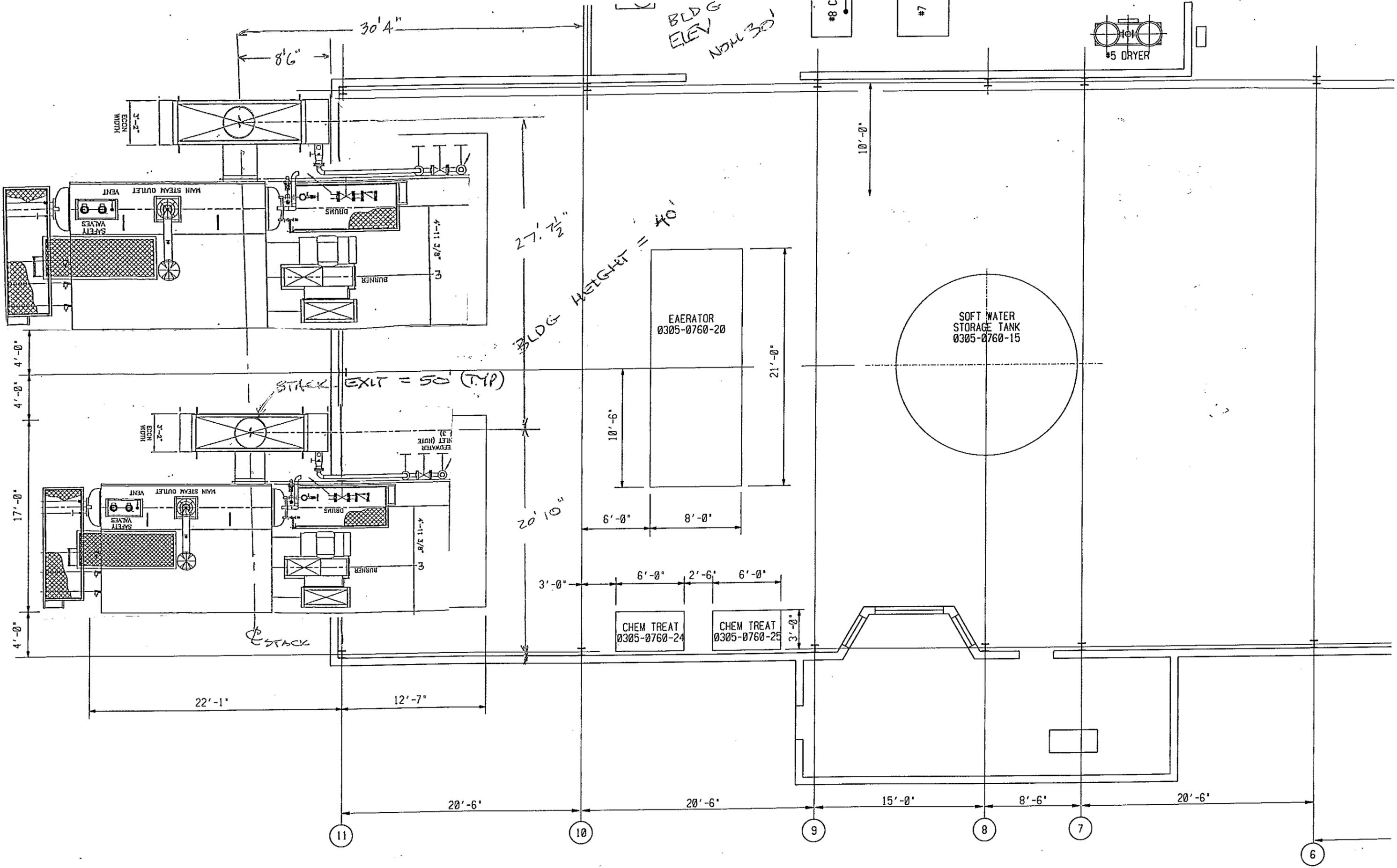
- 10.4 Is there any possibility that the proposed project could interfere with a nearby existing business, commercial or manufacturing use?

**There is no possibility that the proposed project could interfere with a nearby existing business, commercial or manufacturing use.**

**END OF APPLICATION**

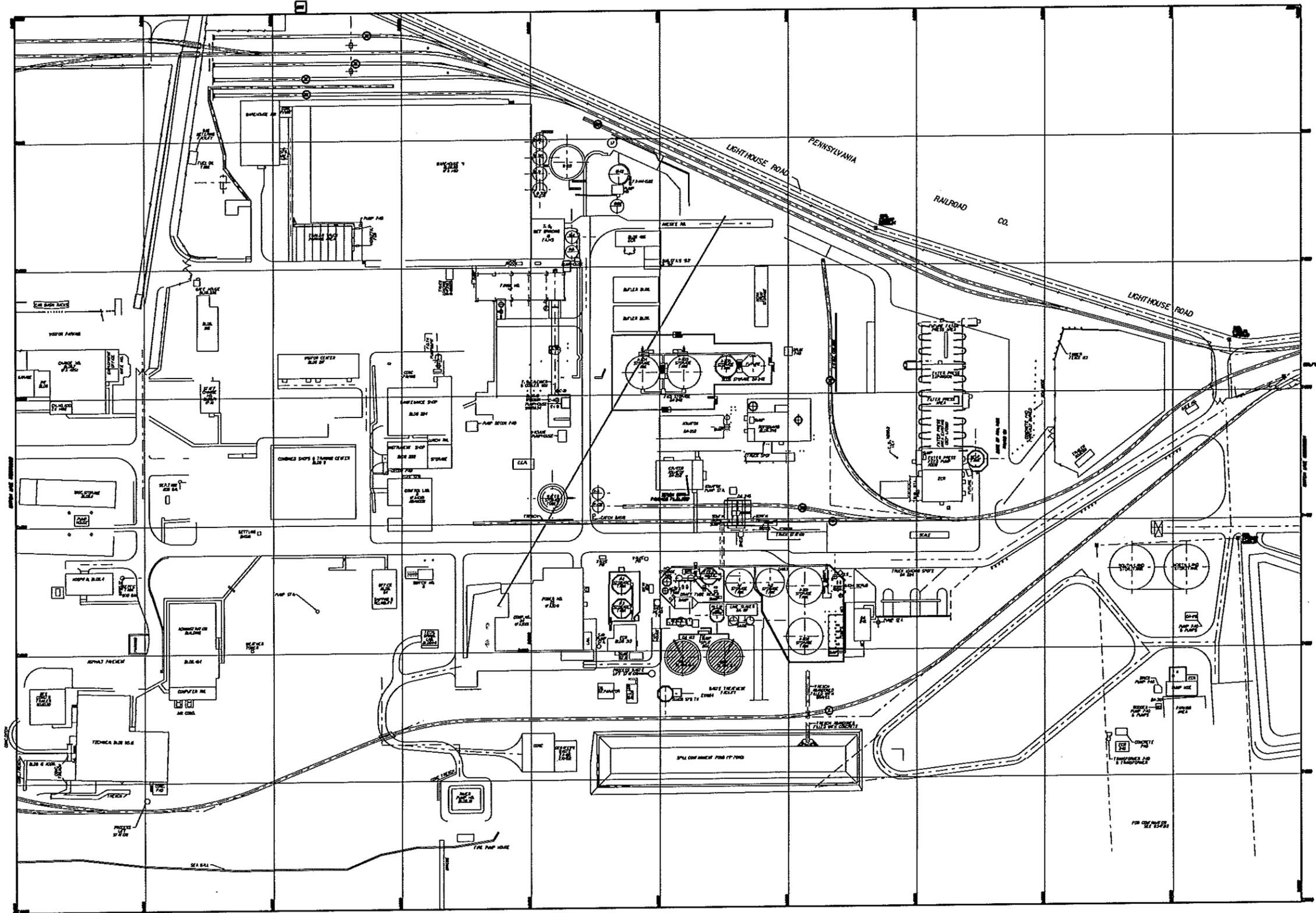
**ATTACHEMENTS TO FOLLOW**

**ATTACHMENT A: SITE MAP & BOILER DESIGN**



SKETCH 1





SKETCH 3

**ATTACHMENT B: MATERIAL SAFETY DATA SHEET**



# SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : Tri-ACT® 1820

APPLICATION : CORROSION INHIBITOR

COMPANY IDENTIFICATION :  
Nalco Company  
1601 W. Diehl Road  
Naperville, Illinois  
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 3/3 FLAMMABILITY : 2/2 INSTABILITY : 0/0 OTHER :

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme \* = Chronic Health Hazard

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Cyclohexylamine	108-91-8	10.0 - 30.0
Diethylethanolamine	100-37-8	5.0 - 10.0
Morpholine	110-91-8	5.0 - 10.0

## 3. HAZARDS IDENTIFICATION

### \*\*EMERGENCY OVERVIEW\*\*

#### DANGER

Corrosive. Combustible. May cause tissue damage. Harmful if absorbed through skin. Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting. Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Keep away from sources of ignition - No smoking. Keep away from heat. Keep container tightly closed and in a well-ventilated place. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing. Wear a face shield. Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin, Inhalation



## SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### HUMAN HEALTH HAZARDS - ACUTE :

#### EYE CONTACT :

Corrosive. Will cause eye burns and permanent tissue damage. Exposure to low vapor concentrations can result in foggy or blurred vision, objects appearing bluish and appearance of a halo around lights. These symptoms are temporary.

#### SKIN CONTACT :

May cause severe irritation or tissue damage depending on the length of exposure and the type of first aid administered. Harmful if absorbed through skin.

#### INGESTION :

Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach.

#### INHALATION :

Irritating, in high concentrations, to the eyes, nose, throat and lungs. Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting.

#### SYMPTOMS OF EXPOSURE :

##### Acute :

A review of available data does not identify any symptoms from exposure not previously mentioned.

##### Chronic :

A review of available data does not identify any symptoms from exposure not previously mentioned.

#### AGGRAVATION OF EXISTING CONDITIONS :

A review of available data does not identify any worsening of existing conditions.

## 4. FIRST AID MEASURES

#### EYE CONTACT :

PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT. Immediately flush eye with water for at least 15 minutes while holding eyelids open. Get immediate medical attention.

#### SKIN CONTACT :

Immediately flush with plenty of water for at least 15 minutes. For a large splash, flood body under a shower. Remove contaminated clothing. Wash off affected area immediately with plenty of water. Get immediate medical attention. Contaminated clothing, shoes, and leather goods must be discarded or cleaned before re-use.

#### INGESTION :

DO NOT INDUCE VOMITING. If conscious, washout mouth and give water to drink. Get immediate medical attention.

#### INHALATION :

Remove to fresh air, treat symptomatically. Get medical attention.

#### NOTE TO PHYSICIAN :

Probable mucosal damage may contraindicate the use of gastric lavage. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.



## SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### 5. FIRE FIGHTING MEASURES

FLASH POINT : 131 °F / 55 °C ( PMCC )

**EXTINGUISHING MEDIA :**

Dry powder, Carbon dioxide, Foam, Other extinguishing agent suitable for Class B fires, For large fires, use water spray or fog, thoroughly drenching the burning material.

Keep containers cool by spraying with water.

**FIRE AND EXPLOSION HAZARD :**

Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :**

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

### 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Remove sources of ignition. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

**METHODS FOR CLEANING UP :**

**SMALL SPILLS:** Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

**ENVIRONMENTAL PRECAUTIONS :**

Do not contaminate surface water.

### 7. HANDLING AND STORAGE

**HANDLING :**

Do not get in eyes, on skin, on clothing. Do not take internally. Do not breathe vapors/gases/dust. Use with adequate ventilation. Avoid generating aerosols and mists. Keep away from acids and oxidizing agents. Do not use, store, spill or pour near heat, sparks or open flame. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

**STORAGE CONDITIONS :**

Store the containers tightly closed. Store away from heat and sources of ignition. Use proper grounding procedures. Store separately from acids. Store separately from oxidizers. Amine and sulphite products should not be stored within close proximity or resulting vapors may form visible airborne particles.



## SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

SUITABLE CONSTRUCTION MATERIAL :

Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

Country/Source	Substance(s)	Category:	ppm	mg/m3
	Cyclohexylamine	ACGIH/TWA	10	
	Diethylethanolamine	ACGIH/TWA	2	
		ACGIH/Skin*		
		OSHA Z1/PEL	10	50
		OSHA Z1/Skin*		
	Morpholine	ACGIH/TWA	20	
		ACGIH/Skin*		
		OSHA Z1/PEL	20	70
		OSHA Z1/Skin*		

\* A skin notation refers to the potential significant contribution to overall exposure by the cutaneous route, including mucous membranes and the eyes.

ENGINEERING MEASURES :

General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :

Where concentrations in air may exceed the limits given in this section, the use of a half face filter mask or air supplied breathing apparatus is recommended. A suitable filter material depends on the amount and type of chemicals being handled. Consider the use of filter type: Multi-contaminant cartridge, with a Particulate pre-filter. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :

Butyl gloves Most glove materials are of low chemical resistance. Replace gloves regularly.

SKIN PROTECTION :

Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :

Wear a face shield with chemical splash goggles. Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS :

Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.



## SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### HUMAN EXPOSURE CHARACTERIZATION :

Based on our recommended product application and personal protective equipment, the potential human exposure is:  
Low

## 9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow
ODOR	Amine
SPECIFIC GRAVITY	0.98 - 0.99 @ 77 °F / 25 °C
DENSITY	8.1 - 8.2 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	12.0 - 13.0
VISCOSITY	5 cps @ 77 °F / 25 °C
FREEZING POINT	27 °F / -3 °C
VAPOR PRESSURE	6 mm Hg @ 68 °F / 20 °C
VOC CONTENT	40 % EPA Method 24

Note: These physical properties are typical values for this product and are subject to change.

## 10. STABILITY AND REACTIVITY

### STABILITY :

Stable under normal conditions.

### HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

### CONDITIONS TO AVOID :

Heat and sources of ignition including static discharges.

### MATERIALS TO AVOID :

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Avoid contact with SO<sub>2</sub> or acidic bisulfite products, which may react to form visible airborne amine salt particles. Certain amines in contact with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations may produce N-nitrosamines, many of which are cancer-causing agents to laboratory animals.

### HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of nitrogen

## 11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

**SAFETY DATA SHEET**

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

**ACUTE ORAL TOXICITY :**

Species: Rat  
LD50: 779 mg/kg  
Test Descriptor: Similar Product

**ACUTE DERMAL TOXICITY :**

Species: Rabbit  
LD50: 2,055 mg/kg  
Test Descriptor: Similar Product

**ACUTE INHALATION TOXICITY :**

Species: Rat  
LD50: > 12000 PPM (8 hrs)  
Test Descriptor: Similar Product

**SENSITIZATION :**

This product is not expected to be a sensitizer.

**CARCINOGENICITY :**

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

**HUMAN HAZARD CHARACTERIZATION :**

Based on our hazard characterization, the potential human hazard is: High

**12. ECOLOGICAL INFORMATION****ECOTOXICOLOGICAL EFFECTS :**

The following results are for the product.

**ACUTE FISH RESULTS :**

Species	Exposure	LC50	Test Descriptor
Inland Silverside	96 hrs	500.0 mg/l	Product
Fish		650 mg/l	Product
Sheepshead Minnow	96 hrs	454 mg/l	Product
Fathead Minnow	96 hrs	75 mg/l	Product
Rainbow Trout	96 hrs	130 mg/l	Product

**ACUTE INVERTEBRATE RESULTS :**

Species	Exposure	LC50	EC50	Test Descriptor
Mysid Shrimp (Mysidopsis bahia)	96 hrs	131 mg/l		Product



**SAFETY DATA SHEET**

**PRODUCT**

**Tri-ACT® 1820**

**EMERGENCY TELEPHONE NUMBER(S)**

**(800) 424-9300 (24 Hours) CHEMTREC**

Daphnia magna	48 hrs	190 mg/l	Product
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**AQUATIC PLANT RESULTS :**

Species	Exposure	EC50/LC50	Test Descriptor
Algae		5,000 mg/l	Product

**AQUATIC MICROORGANISM RESULTS :**

Species	Exposure	EC50/LC50	Test Descriptor
Pseudomonas putida		7,500 mg/l	Product

**PERSISTENCY AND DEGRADATION :**

Chemical Oxygen Demand (COD) : 563,000 mg/l

The organic portion of this preparation is expected to be readily biodegradable.

**MOBILITY :**

The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface), Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.

If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

**BIOACCUMULATION POTENTIAL**

This preparation or material is not expected to bioaccumulate.

**ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION**

Based on our hazard characterization, the potential environmental hazard is: Moderate

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

**13. DISPOSAL CONSIDERATIONS**

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D001, D002



## SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

### 14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

#### LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, DIETHYLAMINOETHANOL, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II
Flash Point :	55 °C / 131 °F

#### AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, DIETHYLAMINOETHANOL, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II
IATA Cargo Packing Instructions :	812
IATA Cargo Aircraft Limit :	30 L (Max net quantity per package)

#### MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	CORROSIVE LIQUID, FLAMMABLE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, MORPHOLINE
UN/ID No :	UN 2920
Hazard Class - Primary :	8
Hazard Class - Secondary :	3
Packing Group :	II



## SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

### 15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Cyclohexylamine : Corrosive, Flammable  
Diethylethanolamine : Combustible., Corrosive  
Morpholine : Corrosive, Flammable

CERCLA/SUPERFUND, 40 CFR 117, 302 :

Notification of spills of this product is not required. Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :

This product contains the following substance(s) which is listed in Appendix A and B as an Extremely Hazardous Substance. Listed below are the statutory Threshold Planning Quantity (TPQ) for the substance(s) and the Reportable Quantity (RQ) of the product. If a reportable quantity of product is released, it requires notification to your State Emergency Response Commission. You may also be required to notify the National Response Center - See CERCLA/SUPERFUND, above.

<u>Extremely Hazardous Substance</u>	<u>TPQ</u>	<u>RQ</u>
Cyclohexylamine	10,000 lbs	40,000 lbs

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
X	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :

This product does not contain substances on the List of Toxic Chemicals.



**SAFETY DATA SHEET**

**PRODUCT**

**Tri-ACT® 1820**

**EMERGENCY TELEPHONE NUMBER(S)**

**(800) 424-9300 (24 Hours) CHEMTREC**

**TOXIC SUBSTANCES CONTROL ACT (TSCA) :**

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

**FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :**

When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 173.310 Boiler Water Additives

The following limitations apply:

Maximum dosage

45 PPM

Limitation

as product in the steam

This product can not be used where the steam produced will contact milk or milk products.

**NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :**

NSF Registration number for this product is : 062362

This product is acceptable for use in meat, poultry, and other food processing areas as a Boiler Treatment Product (G6), for treating boiler and steam lines where the steam produced may contact edible products. Acceptable usage shall be in accordance with the dosage limitations specified on the product label!

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

**FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :**

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

**CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :**

This product contains the following substances listed in the regulation. Additional components may be unintentionally present at trace levels.

Substance(s)	Citations
• Morpholine	Sec. 111
• Cyclohexylamine	Sec. 111

**CALIFORNIA PROPOSITION 65 :**

Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

**MICHIGAN CRITICAL MATERIALS :**

Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

**SAFETY DATA SHEET****PRODUCT****Tri-ACT® 1820****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****STATE RIGHT TO KNOW LAWS :**

The following substances are disclosed for compliance with State Right to Know Laws:

Cyclohexylamine	108-91-8
Morpholine	110-91-8
Diethylethanolamine	100-37-8

**NATIONAL REGULATIONS, CANADA :****WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS CLASSIFICATION :**

B3 - Combustible Liquids, E - Corrosive Material

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :**

The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

**AUSTRALIA**

All substances in this product comply with the National Industrial Chemicals Notification &amp; Assessment Scheme (NICNAS).

**CHINA**

All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

**EUROPE**

The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

**JAPAN**

All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

**KOREA**

All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

**PHILIPPINES**

All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals &amp; Chemical Substances (PICCS).

**16. OTHER INFORMATION**

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:



## SAFETY DATA SHEET

PRODUCT

Tri-ACT® 1820

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

\* The human risk is: Low

\* The environmental risk is: Moderate

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

### REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department



**SAFETY DATA SHEET**

PRODUCT

**Tri-ACT® 1820**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

Date issued : 07/31/2009  
Version Number : 1.13



## Material Safety Data Sheet

### 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**Chemical Product Name** Sodium Chloride (Salt)  
**Chemical Family** Alkali Metal/Halide  
**Chemical Name** Sodium Chloride, Calcium Phosphate Tribasic, Silicon Dioxide, Sodium Silicoaluminate, Sodium Ferrocyanide Decahydrate  
**Formula** NaCl,  $3\text{Ca}_3(\text{PO}_4)_2 \cdot \text{Ca}(\text{OH})_2$ ,  $\text{SiO}_2$ ,  $\text{Na}_2\text{O} \cdot \text{Al}_2\text{O}_3 \cdot 13.2\text{SiO}_2$ ,  $\text{Na}_4\text{Fe}(\text{CN})_6 \cdot 10\text{H}_2\text{O}$   
**Molecular Weight** 58.44, 1004.7, 60.09, 957.05, 484.06  
**Commercial Name** Diamond Crystal<sup>®</sup> Salt Sense<sup>®</sup> Plain Salt, Diamond Crystal<sup>®</sup> Plain Table Salt, Diamond Crystal<sup>®</sup> Plain Salt (Box), Diamond Crystal<sup>®</sup> Restaurant Plain Salt, Diamond Crystal<sup>®</sup> Salt for Canning, Pickling and Table Use (Box), Leslie<sup>®</sup> Plain Table Salt, Colonial<sup>®</sup> Plain Table Salt, Sterling<sup>®</sup> Plain Table Salt, Red Cross<sup>®</sup> Plain Table Salt, Private Brand Plain Table Salt

**Manufacturer/Distributor**  
Cargill Incorporated  
Salt Division  
P. O. Box 5621  
Minneapolis, MN 55440

**Emergency Telephone Numbers**  
CHEMTREC (800) 424-9300

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Description**  
White crystalline solid.

Ingredient Name	Exposure Limits	Concentration (%)
CAS Number		
Sodium Chloride (Salt) 7647-14-5		99.0 - 99.9987
Calcium Phosphate Tribasic 1306-06-05		)*
Silicon Dioxide 7631-86-9		)*
Sodium Silicoaluminate 1344-00-9		0.0 - 0.75
Sodium Ferrocyanide Decahydrate 13601-19-9		0.0 - 0.0013
		*0.0 - 1.0

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW

None - GRAS Substance (Generally Recognized As Safe)

HMIS Health: 1, Flammability: 0, Reactivity: 0, Protective Equipment: A

#### Potential Health Effects

Route(s) Of Entry: Ingestion, skin/eye contact, inhalation.

Human Effects and Symptoms of Overexposure:

**Acute Inhalation:** Irritation of the respiratory tract.

**Chronic Inhalation:** No applicable information found for chronic systemic effects

**Acute Skin Contact:** Large amounts can cause irritation and if applied to damaged skin, absorption can occur with effects similar to those via ingestion.

**Chronic Skin Contact:** No applicable information found for chronic systemic effects.

**Acute Eye Contact:** Irritation with burning and tearing (salt concentrations greater than the normal saline present).

**Chronic Eye Contact:** No applicable information found for chronic systemic effects.

**Acute Ingestion:** Intake of large amounts has generally occurred for deliberate reasons: suicide, absorption, and to induce vomiting. The following effects were observed; nausea and vomiting, diarrhea, cramps, restlessness, irritability, dehydration, water retention, nose bleed, gastrointestinal tract damage, fever, sweating, sunken eyes, high blood pressure, muscle weakness, dry mouth and nose, shock, cerebral (fluid on brain) or pulmonary edema (fluid in lungs), blood cell shrinkage, and brain damage (due to dehydration of brain cells). Death is generally due to cardiovascular collapse or CNS damage. Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

**Chronic Ingestion:** No applicable information found for chronic systemic effects.

**Carcinogenicity**

**NTP:** Not listed as a carcinogen or mutagen.

**IARC:** Not listed as a carcinogen or mutagen.

**OSHA:** Not listed as a carcinogen or mutagen.

**Medical Conditions Aggravated by Exposure:** In some cases of confirmed hypertension, ingestion may result in elevated blood pressure.

**4. FIRST AID MEASURES**

**First Aid For Eyes:** For eye contact, flush with water immediately, lifting eyelids occasionally.

**First Aid For Skin:** Remove clothing from affected area. Wash skin thoroughly. Rinse carefully.

**First Aid For Inhalation:** If person breathes large quantities, remove to fresh air at once. If breathing stops, apply artificial respiration immediately.

**First Aid For Ingestion:** Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

**5. FIRE AND MEASURES**

**Flash Point:** N/A

**Extinguishing Media:** N/A. This product is nonflammable.

**Special Fire Fighting Procedures:** N/A.

**6. ACCIDENTAL RELEASE MEASURES**

**Spill or Leak Procedures:** Contain spills to prevent contamination of water supply or sanitary sewer system.

Vacuum or sweep into containers for proper disposal.

## 7. HANDLING AND STORAGE

**Storage Temperature (min./max.):** Avoid humid or wet conditions as product will cake and become hard.

**Special Sensitivity:** Avoid contact with strong acids.

**Handling and Storage Precautions:** Becomes hygroscopic at 70% Relative Humidity

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Eye Protection Requirements:** Eyeglasses or goggles should be worn in dusty areas.

**Skin Protection Requirements:** Protective clothing may be worn in dusty areas, but is generally not required.

**Respiratory/Ventilation Requirements:** NIOSH/MSHA approved respirator for particulates.

**Exposure Limits:** Not listed.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical Form:** White crystalline solid with slight halogen odor.

**Color:** White crystalline solid

**Odor:** Halogen odor

**Boiling Point (760mm Hg) (°C):** 760 mm Hg. 1465 degrees C.

**Melt Point/Freeze Point (°C):** 801 degrees C.

**PH:** 6.7 - 7.3

**Solubility In Water (g/cc, %):** 26.4%

**Specific Gravity (H<sub>2</sub>O=1):** 2.16 (H<sub>2</sub>O)

**Bulk Density:** 53-83 Lbs/Ft<sup>3</sup>

**% Volatile By Weight:** N/A

**Vapor Pressure (mm Hg/747°C):** = 2.4

**Vapor Density (Air=1):** (Air=1) N/A

## 10. REACTIVITY

**Stability:** Stable

**Incompatibilities:** Avoid contact with strong acids. Becomes corrosive to metals when wet.

**Decomposition Products:** May evolve chlorine gas when in contact with strong acids.

## 11. TOXICOLOGICAL INFORMATION

**Description:** Not Listed

**12. ECOLOGICAL INFORMATION**

Ecotoxicity: Not Listed.

Environmental Degradation: Not Listed.

**13. DISPOSAL CONSIDERATIONS**

Waste Disposal Method: Follow applicable Federal, state and local regulations.

**14. TRANSPORTATION INFORMATION**

D.O.T. Shipping Name: Not Listed

Technical Shipping Name: Not Listed

D.O.T Hazard Class: Not Listed

U.N./N.A. Number: Not Listed

Product Rq (lbs.): N/A

D.O.T. Label: Not Listed

D.O.T. Placard: N/A

Freight Class Bulk: N/A

Freight Class Package: N/A

Product Label: N/A

**15. REGULATORY INFORMATION**

OSHA Status: Not Listed

TSCA Status: Listed as non hazardous.

Cercla reportable Quantity

SARA Title III

Section 302 Extremely

Hazardous Substances: Not Listed

Section 311/312

Hazard categories: Not Listed

Section 313

Toxic Chemicals: Not Listed

RCRA Status: Not Listed

HMIS: 1 0 0 A

**State Regulatory Information**

Component Name

/CAS Number  
N/A

Concentration

State-Code

## 16. OTHER INFORMATION

**Reason For Issue:** Regulatory Compliance

**Prepared By:** Steve Karl

**Approved By:** Dave Merriweather

**Title:** Director-Quality Administration

**Approval Date:** May 2007

**Supersedes Date:** February 2005

**MSDS Number:** P1

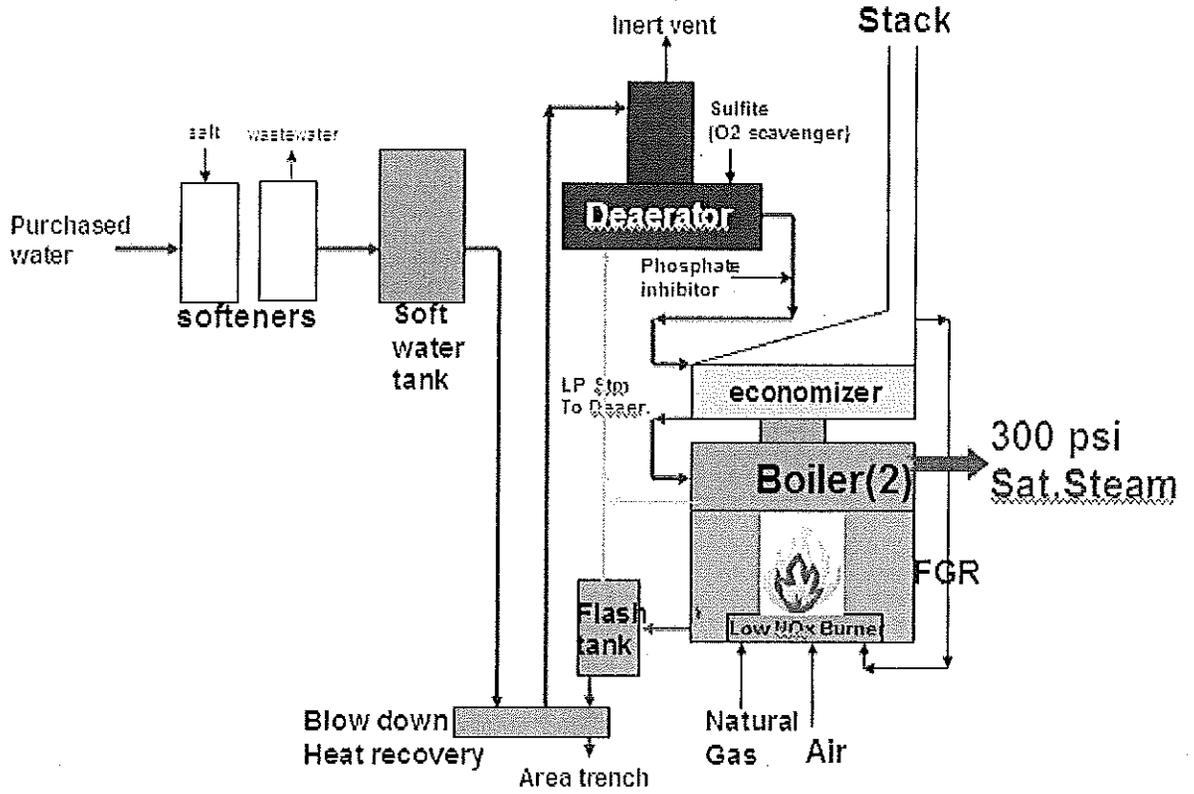
**Disclaimer:** All statements, technical information and recommendations contained herein are, the best of our knowledge, reliable and accurate; however no warranty, either expressed or implied is made with respect thereto, nor will any liability be assumed for damages resultant from the use of the material described.

It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations. It is also the responsibility of the user to maintain a safe workplace. The user should consider the health hazards and safety information provided herein as a guide and should take the necessary steps to instruct employees and to develop work practice procedures to ensure a safe work environment.

This information is not intended as a license to operate under, or a recommendation to practice or infringe upon any patent of this Company or others covering any process, composition of matter or use.

**ATTACHMENT C: FLOW DIAGRAM**

# Process Diagram



**ATTACHMENT D : PROCESS HAZARD ANALYSIS**

**EDGE MOOR PLANT PROCESS HAZARD ANALYSIS****REVIEW NO: 2010-17****Screening PHA****COMPLETION DATE: 9/8/10**

Title: C-5694 Edge Moor Package Boiler

NUMBER OF RECOMMENDATIONS: 0

**PROCESS REVIEW COMMITTEE:**

This report represents the consensus of the PHA team. Based on the information analyzed in this study, to the best of our ability, we believe the process is safe to operate in its present condition.

NAME & JOB FUNCTION	YEARS OF SERVICE		SIGNATURE / DATE
	PROCESS	DUPONT	
Adam Macklin, PHA Resource, Project Team Leader	<u>4</u>	<u>10</u>	_____
Ken Pineault, R&D ATO, Environmental Area	<u>20</u>	<u>30</u>	_____
David Potter, DTT Instrument Reliability Network Leader	<u>23</u>	<u>23</u>	_____
Ralph Chiaravolloti, Area Manager, Environmental Area	<u>5</u>	<u>5</u>	_____
John Owen, Project Engineer	<u>37</u>	<u>37</u>	_____

MANAGEMENT RESPONSE TO RECOMMENDATIONS

The staff recognizes the effort and work done by your committee and commends you for the contributions made in completing the process hazards analysis.

The management response to the recommendations are shown below (as is, modified as shown, or rejected):

1. ??

PROCESS HAZARDS ANALYSIS AUTHORIZATION

PROCESS HAZARDS ANALYSIS ELEMENT CHAMPION:

Stephen W. Oldiges \_\_\_\_\_

OPERATIONS AREA MANAGER:

Ralph Chiravolloti \_\_\_\_\_

OPERATIONS UNIT MANAGER:

Ned C. Darkow \_\_\_\_\_

## TABLE OF CONTENTS

Summary	4
Recommendations	4
Description of PHA SCOPE and Boundaries	4
Summary of PHA Team Training	4
Process Description	6
Process Technology	6
Hazards List & Chemical Interaction Matrix	7
Previous Incidents Review	7
Previous PHA Review	7
Management of Change Review	7
Consequence Analysis	8
Field Trip	8
Facility Siting	8
Electrical Classification	8
Human Factors and Ergonomic Review	5
Review Failure of Engineering and Administrative Controls	5
Inherently Safer Process Review	8
Interlock Classification Review	8
Relief Devices and Safety Systems	9
Review of Applicable Business or Corporate Standards	9
Review of Waste Streams	9
Statement of PHR Methodology Used and Why It Was Chosen	9
Statement of Recommended PHA Frequency	9
APPENDIX	9

## Summary

This project involves the installation of two 40,000 lb/hr natural gas, low NOx package boilers with an economizer at the powerhouse. Water treatment, feed pumps, chemical treatment and deaerating equipment will also be provided.

## Recommendations

- 1) Complete a stack dispersion model to ensure there is no impact on personnel or breathing air intakes (Ken Pineault, ECD: 1/11)
- 2) Complete K6R, and K12R checklists and ensure the design complies with these standards. (Project Team, ECD: 12/10)
- 3) Complete a consequence analysis and facility siting analysis for the package boiler (Ken Pineault/DuET, ECD: 12/10)
- 4) Complete interlock classification review. (Project Team, ECD: 12/10)
- 5) Review other DTT boiler incidents (Project Team, ECD 12/10)

## Description of PHA Scope and Boundaries

The boundary of this PHA consists of the package boilers, associated equipment, piping and instrumentation as follows:

The main process (or steam generation) facilities are listed below:

6.1 Two (2) 40,000 pph natural gas fired water tube boilers with LoNOx burner and flue gas recirculation.

The boilers shall be self contained package units with all accessories including forced draft fan and motor, burner safeguard management system, economizer, LoNOx burner and flue gas recirculation.

Additionally boiler steam and feedwater trim packages, relief devices and a non-return valve shall be part of the overall boiler package.

Economizer support is included.

A stub stack to 50' elevation is included with each boiler package.

Instrumentation for the boiler operation shall be packaged with the boiler including feedwater, steam, combustion safeguards and controls using steam pressure as the common control element.

The boiler mud drums shall be provided with 30 psig steam heating coils to maintain temperature in the drums for off line protection and increased startup timing. The coils will be provided with the boilers. This condensate shall be trapped and dumped to drain.

The two boilers and ancillaries will be on parallel power from different substations.

6.2 Boiler blowdown will be designed at a maximum of 15% and shall be taken to a blowdown flash tank where the 5 psig flash shall provide deaerating heater steam and the bottoms shall flow to a blowdown heat exchanger for energy recovery.

6.2.1 The blowdown flash tank shall be 36" dia by 72" high carbon steel 50 psig design and equipped with a sight glass and relief valve. (Standard K12C page 4 for details)

6.2.2 The blowdown heat exchanger provided with use blowdown bottoms liquid to preheat incoming makeup water. The blowdown heat exchanger shall be a 125 square foot carbon

steel shell and tube heat exchange unit and be equipped with a relief valve. All equipment shall be insulated as per Insulation Specification 7453.

6.3 Vent Silencer will be provided in accordance with K6C Table 1 for startup and blow-to-air conditions

#### 6.4 Deaeration and Boiler Feedwater Pumps

6.4.1 Treated water shall be provided to the deaerating heater where 5 psig steam will be used to deaerate and preheat the water. The deaerating heater shall be mounted on a storage tank. The bottom of the storage tank shall be at least 15' above pump suction.

6.4.2 Boiler feedwater pump suction is taken from the deaerator storage tank and recirculation is returned to the tank.

6.4.3 The deaerating heater, storage tank and feedwater pumps can be purchased as a fully skidded package or packages based on size. Interconnecting piping shall be provided with the skidded package and is included in the pricing.

Deaeration facilities shall be rated for a 100,000 pph flow at 5 psig for the deaerating heater and storage tank. It shall be complete with gauge glass.

The storage tank shall be provided with 10 minutes hold up as a minimum.

Sample coolers will be provided for the boiler feedwater and blowdown. Sample lines shall be bundled and run to a lab in Building 25.

Two (2) full load boiler feedwater pumps with motors shall be provided. Each pump shall be capable of pumping 200 gpm at 750 ft TDH. (60 HP motor)

Auxiliaries provided for the boiler feedwater pump system shall include a recirculating orifice and strainer for each pump.

No uninstalled feedwater pump shall be provided.

#### Water Treatment Facilities.

The water treatment facilities shall consist of a storage tank, pumps with motors and two sodium zeolite softeners. Plant purchased water will flow through one of the two softeners and then as softened water will flow to a 2 hour storage tank storage tank. The soft water storage tank discharge pumps will take the soft water and feed, as makeup water, the deaerating heater after having passed through the blowdown heat exchanger.

Provide two sodium zeolite softeners capable of softening 200 gpm of purchase water.

Regeneration shall be required every 24 hours for the 200 gpm flow rate with sodium chloride being used as the softening medium. The units will typically run with one on line and one in regeneration as each unit will be sized to take the entire flow.

Softeners shall be provided with all necessary interconnecting piping, instrumentation, accessories, and controls. All controls will be part of the softener package.

Brine shall be provided from a vendor supplied brine tank with the brine pump or eductor provided as part of the softener regeneration package.

Bag salt will be provided by DuPont and manually loaded in the brine tank. A rental Bulk brine maker shall be considered as an option.

The soft water treatment system shall be skidded in either one unit.

The soft water tank shall provide up to two hours storage of treated soft water. The tank shall be sized for up to 24,000 gallons of working storage. Available tanks shall be viewed for use on site possibly affecting the soft water storage volume. The feed of water to the deaerator can be met in a short time need with purchased water stored in the water tower flowing directly to the soft water storage tank and blending with the stored soft water. We will not run out of water and will only be short of softened water and can keep an eye on boiler performance by checking the feedwater and blowdown sample coolers.

A target level gauge shall be provided.

The tank shall be flat bottomed FRP design and sit inside on the building 25 floor.

#### Soft Water Pumps

To feed softened water to the deaerating heater, two pumps shall be provided to pump 200 gpm each at 75' TDH. Both pumps shall be motor-driven. (10 HP)

No uninstalled spare pump shall be provided.

#### Boiler chemical treatment

Chemical treatment for the boiler shall consist of typical sulfite and phosphate injection into the deaerator discharge and the steam drum respectively. Phosphate will be used for chemical softening for the small amount of hardness that passes into the boiler plus it is also used as a sludge conditioner. Sodium sulfite is used to remove the small amounts of oxygen not removed by the deaeration step.

The boiler chemical treatment system shall be skid mounted. (one skid for each system)

For the sulfite feed system, a mix tank of 55 gallon or tote capacity shall be provided with a mixing basket, half-hinged top and agitator hole. A 1/3 hp agitator shall be mounted on the mix tank.

Sulfite pump suction shall be provided by a small metering pump with motor that will be equipped with a relief device and relieve back to the tank.

For the phosphate feed system, a mix tank of 55 gallon or tote bin capacity shall be provided with a mixing basket, half-hinged top and agitator hole. A 1/3 hp agitator shall be mounted on the mix tank.

Phosphate pump suction shall be provided by a small metering pump with motor that will be equipped with a relief device and relieve back to the tank.

Chemicals for the sulfite and phosphate systems can be stored in drums on pallets in the building 25 complex.

#### Summary of PHA Team Training

The PHA team will be trained on what if's and K6R and K12R standards.

#### Process Description

From SJP PH-11:

300# steam supplied by Conectiv enters the powerhouse through a 10" header and is reduced to the needed operating pressure of 30-40 psig through two separate pressure reducing station 8" takeoffs detailed below. 300# steam feeds the Superheater Tube Bundle directly in Purification, all other steam sources onsite utilize either 30# steam from the Powerhouse let-down station or 150# steam from the Reaction let-down station.

As a result of this project, the 300# steam will be supplied by the on-site package boiler units instead of Conectiv (now Calpine).

## Process Technology

W1727234	Flow Sheet
W1727235	Flow Tabulation
W1727236	Boiler #1 Diagram
W1727237	Boiler #2 Diagram
W1727238	Boiler Feedwater Pumps Diagram
W1727239	Boiler Blowdown Diagram
W1727240	Boiler #1 Natural Gas & Air Diagram
W1727241	Boiler #2 Natural Gas & Air Diagram
W1727242	
W1727243	
W1727244	Deaerator Diagram
W1727245	Soft water system Diagram
W1727246	Water Treatment Diagram
W1727247	Chemical Treatment Diagram
W1727248	300 psig Steam Header Diagram
D1015783	Steam Trap Header Diagram
W1064419	Vertical Air Receiver
W1240230	OSOH sheet 12
W1284731	OSOH- south
W1240219	OSOH- north
W1305452	Purchased Water Diagram
W1495723	High Pressure Steam Diagram

## Hazards List & Chemical Interaction Matrix

**THERMAL/PERSONNEL EXPOSURE** - 300# Steam

**EXPLOSION/FIRE HAZARD** - Natural Gas, overpressure

**CHEMICAL HAZARDS** – Salt for water softener, sulfite for oxygen scavenging in the deaerator, and phosphate inhibitor in the steam drum.

**STACK DISCHARGE** – Current plan is to have a 50' stack just above the existing power house roof line. There is possible personnel exposure and contamination of air intake into the power house.

## Previous Incident Review

This does not apply as Edge Moor does not currently generate its own steam. A boiler has not been operated on site since 1984. It is generated offsite by Conectiv (now Calpine).

## Previous PHA Review

Edge Moor does not currently generate its own steam and therefore no recent PHAs have been conducted for this process. PHAs from other sites and the Edge Moor site burner PHA will be reviewed for learnings that can be leveraged on this project.

## Management of Change Review

The standard PSM procedures (PCR, SCR, PSSR, etc...) for the package boiler project will be followed.

## **Consequence Analysis**

A consequence analysis was not completed as part of this review. A recommendation will be to complete a consequence analysis.

## **Field Trip**

The package boilers will be located at their original location in the powerhouse.

## **Facility Siting**

Facilities siting will be completed as part of consequence analysis.

## **Electrical Classification**

This equipment is general purpose corrosive.

## **Human Factors and Ergonomic Review**

Need to complete a human factors and ergonomic review as part of the PHA.

## **Review Failure of Engineering and Administrative Controls**

This project installs two 40,000 lb/hr boilers with associated support equipment and piping. A Pre-Start Up Safety review will be conducted before start-up to ensure the equipment, alarms and interlocks work properly. Written procedures (SJPs) will be generated for the operation and maintenance of these boilers and preventative maintenance checks will be generated and performed to ensure reliable performance.

## **Inherently Safer Process**

Utilize current site burner reviews and modify as necessary. Search other sites for the steam side.

## **Interlock Classification Review**

Need to complete an interlock classification review as part of the detailed PHA.

## **Relief Devices and Safety Systems**

Need to identify the relief devices that will be used for this system and document design bases and relief calculations.

## **Review of Applicable Business or Corporate Standards**

The package boilers at Edge Moor will comply with K6R and K12R, ISA84 and NFPA standards for burners.

## **Review of Waste Streams**

There will be softener brine backwash and boiler blow down. A preliminary assessment has been completed with the plant environmental group.

## **Statement of PHR Methodology Used and Why It Was Chosen**

General checklist was completed as part of the screening review. The boiler checklist was reviewed and the team agreed it was not appropriate and it will be completed in a later PHA as part of the project. K6R and K12R checklists will also be completed in the detailed PHA.

## **Statement of Recommended PHA frequency**

This PHA will be reviewed during the next circuit PHA for site burners.

## **APPENDIX**

**ATTACHMENT E: ZONING CERTIFICATION REQUEST**



Department of Land Use

November 22, 2010

In reply, refer to:  
2010-0749-V  
104 Hay Road

Vimal Vijaykumar  
DuPont Edgemoor Plant  
104 Hay Road  
Wilmington, DE 19809

Dear Mr. Vijaykumar:

The New Castle County Department of Land Use is in receipt of your request for a verification of zoning and use for tax parcel number 06-153.00-006, which is located at 104 Hay Road, Edgemoor, Delaware. A review of the Official Zoning Map of New Castle County indicates the subject parcel is zoned HI (Heavy Industrial), which permits heavy industrial uses, including the manufacturing of titanium dioxide (NAICS 325188), pursuant to Table 40.03.110 of the *New Castle County Code*. NAICS 325, chemical manufacturing is included within the definition of heavy industrial uses in Section 40.33.270 C of the *New Castle County Code*.

Please be advised that this letter only verifies whether the type of use that exists, or is proposed, on the site -- to the extent you described it in your zoning verification application -- is permitted, not permitted, or permitted under limited circumstances in the zoning district. This letter is not a permit and does not offer any guarantee that any other required plans, applications, certifications, or variances for your project will be approved.

If your project involves an expansion of the existing use, a change of use, alterations to the building or site, demolition, or new construction, one or more permits may be needed before you can initiate the use. Following, is a summary of Department of Land Use permits, certificates, and plans that may be required for your project:

Any new use or change of use in an existing building may require:

1. **Limited Use Permit.** If the existing or proposed use is identified as a "limited use" on the first page of this letter you will need to apply for a Limited Use Permit. This application must be accompanied by a site plan, or other supporting documentation, demonstrating that the special standards for that use are met. Refer to Chapter 40 of the *New Castle County Code* (UDC), Articles 3 and 31 for additional information.

2. **Certificate of Use.** To either institute a new use, or expand an existing use, in an existing building you must obtain a Certificate of Use. The Department will determine whether the building meets the building code requirements for such use. Refer to Chapter 6, Article 2 of the *New Castle County Code* (Building Code) for additional information.

Any new construction, or alteration or expansion of existing buildings and features on the site may require:

1. **Major or Minor Land Development Plan.** If your project will subdivide land or add more than 1,000 square feet of gross floor area, you must submit a major or minor land development plan. The plan will be reviewed for compliance with the land development criteria outlined in Chapter 40 of the *New Castle County Code* (UDC). During review of the plan, the Department may hold public hearings and may identify other applications, plans, studies, or permits that need to be submitted before development can commence. Refer to Chapter 40, Article 31 for general requirements.
2. **Parking Plan.** If your project requires installation, expansion, or reconfiguration of a parking lot, you will need to submit a parking plan. Refer to Chapter 40, Articles 3 and 31 of the *New Castle County Code* (UDC) for general requirements.
3. **Building Permit / Demolition Permit / Sign Permit.** If your project will involve altering or enlarging a building (including mechanical systems), demolishing all or part of a building, or installing new signs, you must obtain permits for those activities. During the review of these applications, the Department may identify other applications, plans, studies, or permits that need to be submitted before development can commence. Before the new or improved building can be inhabited, a **Certificate of Occupancy** must be secured from the Department. Refer to Chapter 6, Article 2 of the *New Castle County Code* (Building Code) for additional information.

This summary of Department of Land Use permit applications is intended only for general informational purposes and is not intended to be inclusive of the comprehensive requirements contained in the *New Castle County Code*. Please be advised that some of the review processes described above may also require recommendations or decisions from County boards (Planning Board, Historic Review Board, Board of Adjustment, and Resource Protection Area Technical Advisory Committee) or outside agencies. New Castle County must abide by regulations imposed on it by a variety of State and Federal agencies. Accordingly, any of the County permits described above may be subject to additional review processes that address environmental concerns; resource protection; public health, safety, and welfare; and a variety of other issues. In some cases, landowners may need to address the requirements of those agencies independently.

2010-0749-V

November 22, 2010

Page 3

Landowners contemplating a change of use, future development, or alterations to buildings and land are encouraged to engage the services of an engineer, land surveyor, and/or attorney for advice on any physical constraints that may limit development of the property, and guidance on what permits may be needed to commence a new use or development.

General questions regarding the plan review process; building, demolition, and sign permits; and Certificates of Use/Occupancy, can be answered by the Department at 395-5400. Thank you for your attention to this matter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kenneth R. Bieri".

Kenneth R. Bieri  
Assistant Planning Manager

ATTACHEMNT F: OFFSET MATRIX

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Applicant:  
Project:  
CZA Offset Review Reference: (DNREC Only)

Page 1 of 1  
Application Date:  
Amendments:  
Offset Review Date: (DNREC Use Only)  
Matrix Amended:

ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO.	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL <sup>1</sup>	PAGE NO.	(DNREC Use Only) OFFSET SUFFICIENCY Yes, No or N/A
Air Quality (Applicant to List Below by Parameter)					
NOx	16.45 tons/yr	6, 26	24.68 tons/yr (1:1.5 Offset ratio)	6, 26	
CO	16.88 tons/yr		25.31 tons/yr (1:1.5 Offset ratio)		
VOC	2.27 tons/yr		3.41 tons/yr (1:1.5 Offset Ratio)		
PM	3.14 tons/yr		4.72 tons/yr (1:1.5 Offset Ratio)		
SO2	0.25 tons/yr		0.37 tons/yr (1:1.5 Offset Ratio)		
Water Quality					
Surface					
BOD	0.14 ppm	6,15	The environmental impact is inconsequential. The Site is offering a 1:1.5 offset ratio for other criteria pollutants. This more than offsets any negative environmental impact.	6,15, 26	
Groundwater	No Impact		N/A	N/A	
Water Quantity					
Surface					
BOD	6.18 lbs/day	6,15	The environmental impact is inconsequential. The Site is offering a 1:1.5 offset ratio for other criteria pollutants. This more than offsets any negative environmental impact.	6,15, 26	
Groundwater	No Impact		N/A	N/A	
Water Use For:	Purchased water will be used to feed the boilers (proposed project).	19	N/A	N/A	
Processing					
Cooling					
Effluent Removal					
Solid Waste					
Amines	The Site will discharge only 0.009 ppm of amines into steam traps.	20	The environmental impact is inconsequential. The Site is offering a 1:1.5 offset ratio for other criteria pollutants. This more than offsets any negative environmental impact.	6, 26	
Hazardous Waste	No Hazardous waste will be generated as a result of the proposed project.	21	N/A	N/A	
Habitat					
Wetlands	No wetlands impacted	22	N/A	N/A	
Flora Fauna	No Flora Fauna impacted	N/A	N/A	N/A	
Drainage/Flood Control	Boiler blowdown will be discharged to the onsite wastewater treatment plant.	17	N/A	N/A	
Erosion <sup>2</sup>	The proposed operation will be inside an existing building.	17	N/A	N/A	
Land Use Effects		24	N/A	N/A	
Glare	None	24	N/A	N/A	
Heat	None	24	N/A	N/A	
Noise	None	24	N/A	N/A	
Odors	None	24	N/A	N/A	
Vibration	None	24	N/A	N/A	
Radiation	None	24	N/A	N/A	
Electro-Magnetic Interference	None	24	N/A	N/A	
Other Effects	None	24	N/A	N/A	
Threatened & Endangered Species	None	22	N/A	N/A	
Impacts From:		9	N/A	N/A	
Raw Material	None	9	N/A	N/A	
Intermediate Products	None	9	N/A	N/A	
By-Products	None	9	N/A	N/A	
Final Products	None	9	N/A	N/A	

<sup>1</sup> See paragraph I.1.b in "Secretary Assessment"

<sup>2</sup> Construction and normal operation

ATTACHMENT G: CALCULATIONS

**DUPONT EDGE MOOR PLANT**  
**TOTAL POTENTIAL EMISSIONS FROM BOILER INSTALLATION**

Low Nox  
 Burner/FGR

48.16

mmBTU/hr

Pollutants	Emission Factor (Ref: EPA AP-42 Factors Table 1.4-2)	Emission Factor (Ref: EPA AP-42 Factors Table 1.4-2)	Emissions	Annual Emissions	Number of Boilers	Total Emissions		
	(Lb/106 scf)	(Lb/mmBTU)	(Lbs/hr)	(Tons/yr)		(Lbs/hr)	(Lbs/day)	(Tons/yr)
NOX	---	0.039	1.88	8.23	2	3.76	90.16	16.45
CO	---	0.040	1.93	8.44		3.85	92.47	16.88
VOC	5.5	0.005	0.26	1.14		0.52	12.46	2.27
PM	7.6	0.007	0.36	1.57		0.72	17.22	3.14
SO2	0.6	0.001	0.03	0.12		0.06	1.36	0.25

*Note: NOx and CO emission factors were provided by Cleaver Brooks.*

## DUPONT EDGE MOOR PLANT

### EMISSION REDUCTION AT THE SITE - OFFSET PROPOSAL

Ore Roaster Burner

45 MMBTU/hr

1 cu ft of nat gas =

1020 BTU

1 mmcu ft =

1020 MMBTU

Pollutants	Emission Factor <sup>1</sup>		Emission Factor <sup>2</sup>		Netting (Tons/yr)	Offset Ratio	Offsets Provided (Tons)
	RX-1 #5 Fuel Oil Combustion (lb/MMBTU)	Emissions (Tons/yr)	RX-1 Natural Gas Combustion (lb/MMBTU)	Emissions (Tons/yr)			
NOX	0.49	96.90	0.26	50.82	46.08	1:1.5	24.68
CO	0.84	166.36	0.59	118.91	49.46	1:1.5	25.31
VOC	0.00	0.39	0.01	1.06	-0.68	1:1.5	3.41
PM	0.10	20.40	0.05	10.12	10.28	1:1.5	4.72
SO2	0.72	141.28	0.00	0.12	141.16	1:1.5	0.37

Note: <sup>1</sup> Emission factors obtained from stack test on 1/13/2004. VOC emission factor from AP-42

<sup>2</sup> PM emission factor obtained from stack test on 01/08/08. All other emission factors obtained from AP-42.

NOx offsets will be provided for VOC.

E. I. DUPONT DE NEMOURS & COMPANY  
 DuPont Payment Services  
 P. O. Box 80040  
 Wilmington, DE 19880-0040

11/10/10

STATE OF DELAWARE  
 30 S AMERICAN AVE  
 DOVER, DE 19901-7346

DOCUMENT NO.	INVOICE NO.	DATE	GROSS	DISCOUNT	NET
1500992830	MM1070206	11/09/10	3,000.00	0.00	3,000.00
<b>TOTALS</b>			<b>\$3,000.00</b>	<b>0.00</b>	<b>\$3,000.00</b>

Questions regarding faster deposits through Electronic Funds Transfers, Please e-mail  
 DPS.Wilm@USA.Dupont.com; For payment questions, please e-mail AP2@USA.DuPont.com

Attachment  
 Check # 3000118654

THE FACE OF THIS CHECK IS PRINTED BLUE. THE BACK CONTAINS A SIMULATED WATERMARK



E. I. DUPONT DE NEMOURS & COMPANY  
 DuPont Payment Services  
 P. O. Box 80040  
 Wilmington, DE 19880-0040

No. 3000118654

62-20  
 311

PAY TO  
 THE ORDER OF

STATE OF DELAWARE  
 30 S AMERICAN AVE  
 DOVER, DE 19901-7346

11/10/10

\*\*\*\*\*\$3,000.00

*Three thousand and 00/100 Dollars*

CITIBANK N.A.  
 A SUBSIDIARY OF CITICORP  
 ONE PENN'S WAY  
 NEW CASTLE, DE 19720

*E. I. DuPont de Nemours*  
 D001



⑈ 3000 1 18654 ⑈ ⑆ 03 1 100 209 ⑆ 38640863 ⑈