N00174.AR.000977
NSWC INDIAN HEAD
5090.3a

PART B PERMIT APPLICATION FOR 40 CFR SUBPART X MISCELLANEOUS UNITS NSWC INDIAN HEAD MD

11/1/1988

TECH INTERNATIONAL, INC

TABLE OF CONTENTS

TABLE OF CONTENTS

SECTION B

FACILITY DESCRIPTION

B-1 General Description

The Naval Ordnance Station (NAVORDSTA), is located at Indian Head on the Maryland shore of the Potomac River, approximately 25 miles south of Washington, D.C. This activity occupies approximately 3,5ØØ acres of land and is situated on two peninsulas adjacent to the Potomac River in the west-central portion of Charles County, Maryland. NAVORDSTA-Indian Head is located on the larger peninsula, which occupies approximately 25ØØ acres between the Potomac River and Mattawoman Creek. The smaller peninsula is located just downstream between the Potomac River and Chicamuxen Creek and is designated as the Naval Ordnance Station, Stump Neck Annex. The Naval Explosive Ordnance Disposal Technology Center (NAVEODTECHCEN), a NAVORDSTA tenant command, functions as operator at the Stump Neck Annex. This permit application addresses only the NAVORDSTA-Indian Head facility.

Figure A-1 (USGS quadrangle, Indian Head, Maryland) provides an overview of NAVORDSTA-Indian Head for orientation purposes. Figure A-2 is a detailed "Map of Reservation" (showing property lines, gates, fencing, etc.). Figure B-1 presents the geographic site location.

The principal mission of NAVORDSTA is the research, development, and production of propellants and explosives for the United States Navy. The scope of these operations range from laboratory research to full-scale production. The operations of the Station produce explosives, propellants and explosive/propellant-contaminated scrap.

Site operations at NAVORDSTA-Indian Head utilize explosive materials and generate wastes which are explosive and/or contaminated with explosives and must be thermally treated to render them safe. These wastes, which are regulated under Subpart X of 4Ø CFR Part 264, are thermally treated at three (3) open burning (OB) areas at NAVORDSTA. In addition, a tenant command operation, generates explosives/propellant-contaminated wastes. This tenant operation is permitted separately for the management of explosives/propellant-contaminated wastes by thermal treatment.

Figure B-2 shows the existing groundwater wells at NAVORDSTA, as well as those within a one-half mile radius of the Reservation.

After classification, packaging, and staging at each generating facility, the explosive wastes and explosive/propellant-contaminated wastes are transported to one of the three thermal treatment areas. This is handled either by the Public Works Department, with coordination from the Supply Department and/or the Safety Department, depending on the nature of the wastes involved. Container handling/transportation is conducted according to Navy standard operation procedures and the Station safety manual.

D-3 Description of Thermal Treatment Locations/Operations

The three thermal treatment areas have been in use since well before the promulgation of regulations under the Resource Conservation and Recovery Act (RCRA). The sites were selected based on human safety considerations and remoteness from other Station operations. Their remoteness provides a safety buffer zone from surrounding properties and human activity and allows for containment of any accidental fire resulting from the thermal treatment operations.

Since a detonation is always possible during the burning of explosive and explosive/propellant-contaminated wastes, this buffer zone also minimizes any damage due to possible explosive shock waves. Station safety regulations require operating personnel to verify that there are no boats present in the adjacent waterways (within 1/2 mile) or low flying planes in the area immediately prior to ignition of the materials.

On occasion the Safety Thermal Treatment Point and the Production Thermal Treatment Point are the site for testing activities unrelated to thermal treament operations.

D-3a Safety Thermal Treatment Point

The Safety Thermal Treatment Point (STTP) is located on a small peninsula at the confluence of Mattawoman Creek and the Potomac River. Figure D-1 shows significant planimetric and topographic features within 1000 feet of this location/operation. Figure D-2 is a photograph of the STTP.

Operation of this facility is the responsibility of the Safety Department. In general, explosive and explosive/propellant-contaminated wastes requiring a greater level of care or safety compared to the operation at the Production Thermal Treatment Point (PTTP) are treated at the STTP. A list of the typical waste types and amounts thermally treated at the STTP is included in Table C-1. The STTP is typically used for thermal treatment of these wastes on a weekly basis during the day shift.

There are also four hog-out pans located at the ATTP. The pans are constructed of 1/4" steel and each measure approximately 1Ø' x 4' x 8" (depth). These containment devices are used to thermally treat the moist solid constituents from motor propellant. These pans also have legs and are situated on a clay-like soil or concrete secondary containment pad.

Explosive-contaminated dumpsters and other containers are also thermally treated at the ATTP on a secondary containment system with clay-like soils. The containers are considered to be the primary containment devices. These containers are reused after decontamination.

Some explosive/propellant-contaminated items, such as rocket motors, are too large to place in a burn pan for thermal treatment.

These items are placed on a concrete or clay-like soil pad which serves as the secondary containment system. As the contaminants are trapped in the item, and are not subject to disengagement from the item by gravity, the item itself is considered to be the primary containment system. Additionally, as in the case of rocket motors, it may be necessary to attach the item to a concrete block typically a 3Ø-inch cube with eyelets on top and a restraining brackets on the side to prevent the item from unrestrained movement from the pad.

The PTTP and its operation are the responsibility of the Cast Division of the Ordnance Department. The explosive wastes and explosive/propellant-contaminated wastes which are thermally treated at this location consist mainly of off-specification production materials, residues, droppings, scrapings, and other by-products. In addition, occasional outdated ordnance and fleet returned overages may also be thermally treated. A list of typical wastes treated at the PTTP is included in Table C-1. The maximum quantity of wastes that are thermally treated at the PTTP is 9ØØØ lbs. per event at each location on the PTTP. In many instances, it is necessary to add supplemental fuel, such as NO.2 fuel oil or wooden, items, to the waste in order to assist in initiating and sustaining effective thermal treatment of the waste.

OB operations are not to be initiated if the wind speed is greater than 3Ø mph, based on surface anemometer measurements at the PTTP. Wind speeds in excess of 2Ø mph require special permission from the Cast Division Director prior to commencing thermal treatment operations. Additional precautionary measures taken to protect operating personnel and to prevent accidents, injuries, etc. at the PTTP are extensively described in the SJP and are reflected in Section F of this permit application.

D-3c Caffee Road Thermal Treatment Point

The Caffee Road Thermal Treatment Point occupies approximately 1.25 acres and is located at the terminus of Caffee Road along the shoreline of Mattawoman Creek. Figure D-5 shows the significant planimetric and topographic details within 1,ØØØ feet of the area. Figure D-6 is a photograph of the facility for orientation purposes.

Operation of the CRTTP is the responsibility of the Supply Department (Code 11), which maintains the operating records of the quantity of material treated and salvaged as scrap at this location. The operation at CRTTP is conducted in accordance with SJPs and consists of OB thermal treatment of explosive/propellant-contaminated scraps from Station operations (mostly bulk scrap metal parts). No explosive waste is received at CRTTP. The typical contaminated bulk metal materials which are taken to the CRTTP include:

- o Decommissioned/scrapped components from production facilities (piping, vessels, structural supports, machinery, etc.).
- o Spent rocket motors.
- o Empty metal containers.
- o Empty ammunition containers.
- o Scrap metal from the Safety and Production Thermal Treatment Points.

In addition, certain other explosive/propellant-contaminated scraps of a nonmetallic nature are also thermally treated at this location (i.e. packing materials, wooden/cardboard-type containers and scrap materials, etc.). A list of typical scraps that are thermally treated at the CRTTP is included in Table C-1. The decontaminated scrap (metals) is sold or salvaged through a Defense Reutilization and Marketing Office (DRMO) contractor.

D-6 Ignitable, Reactive or Incompatible Wastes

NAVORDSTA has a Hazardous Materials Safety Program, as described in NAVSEA OP 5, applicable Special Job Procedures, and Safety Department directives, that stipulates procedures for properly labeling and packaging explosive and explosive/propellant-contaminated wastes. These documents definitely address the methods for handling the wastes in a safe manner to protect Station personnel and the environment in the immediate vicinity of the three thermal treatment areas. NAVORDSTA maintains and enforces the program for all operating departments that use or handle such hazardous substances and manage explosive and explosive/propellant contaminated wastes. The policy for safe handling of this type of waste is set by the Safety Department. The safety program is monitored by Safety Department, Environmental Protection Division, the Supply Department Material Division, and all operating department supervisors.

D-7 Noise Considerations

Environmental noise considerations are not a concern of the thermal treatment areas due to the nature of the noise created by OB operations and the remote location of the areas from human activity. This has been demonstrated by conducting a test under typical operating conditions to measure the level of noise from a safe distance away. The test was performed at a point about 700 feet away from a typical thermal treatment event at the NAVORDSTA Production Thermal Treatment Point in which approximately 5000 lbs. of explosive waste was burned on September 22, 1988. The peak meter reading for this event was 75 decibels, which is well below the trigger level for required use of ear protection.

NAVORDSTA is located on a peninsula and is surrounded by a combination of water i.e., the Potomac River and Mattawoman Creek, and fences that are barriers to unauthorized entry to the installation. The fences are approximately 7 feet high and made of galvanized metal. There is at least one, and normally two, armed guards at the main entrance, Gate 1, 24 hours/day, 7 days/week. Proper credentials must be presented at the gate to enter and exit NAVORDSTA. All visitors or contractors must receive a visitor's pass from the Pass Office adjacent to Gate 1. This pass is to be returned to security personnel before departure. Visitors to the thermal treatment open burning areas must be escorted by a Station employee knowledgeable of the hazards pertaining to the area and the required safety precautions.

Gate 2 is used to control access to the restricted areas. No smoking, matches, or lighters are permitted beyond this gate, which is monitored by a guard. Smoking is strictly prohibited beyond Gate 2, except at specifically marked areas. Red lines painted on the road designate areas within the second gate security area where radio transmission is forbidden. The locations of Gate 1 and Gate 2 are shown in Figure A of this application.

F-1a(2) Barrier and Means to Control Entry

F-1a(2)(a) Barrier

There is a 7-foot fence around the restricted area, except along the shoreline.

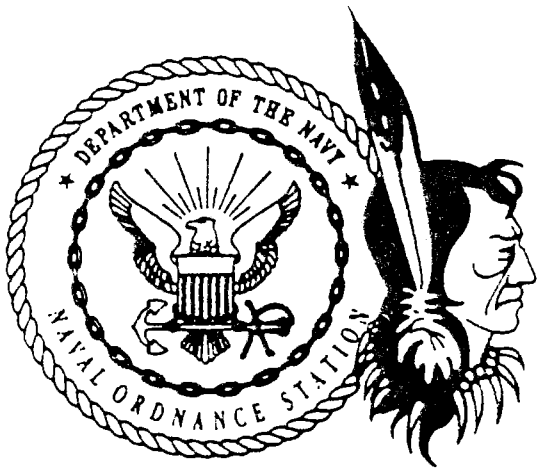
Access to the Safety Thermal Treatment Point (STTP) and the Production Thermal Treatment Point (PTTP) is further restricted by wire cables across their entrance. These wire cables are kept locked and keys are provided only to authorized personnel for access, when necessary. Wastes are stored for only a short period of time (less than a day) at the STTP and PTTP. Therefore no further barriers are provided.

The Caffee Road Thermal Treatment Plant (CRTTP) has an 8-foot high cyclone fence. There is no admittance to CRTTP without permission from the Property Disposal Officer.

F-1a(2)(b) Means to Control Entry

As discussed in Subsection F-1a(1), entry to NAVORDSTA is controlled by two armed guards stationed at the main entrance gate. Employees are required to show identification cards when reporting for work, and visitors and contractors entering the Station must sign a log sheet (see Figure F-1) and obtain a visitor's pass. The person to be visited is telephoned to verify that the visitor is expected.

Part B
Permit Application
for
40 CFR Subpart X
Miscellaneous Units



Department of the Navy
Naval Ordnance Station
Indian Head, Maryland

Submitted to:
Environmental Protection Agency
Region III

November 1988

Prepared by:

TECH International, Inc.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

TABLE OF CONTENTS (Cont.)

A — Part A Permit Application

SECTION A

PART A PERMIT APPLICATION

The Naval Ordnance Station (NAVORDSTA) submitted Part A of a Resource Conservation and Recovery Act (RCRA) permit application to the U.S. Environmental Protection Agency (EPA) in November 1980 for designation as a hazardous waste management facility with interim status. EPA acknowledged receipt of the Part A application in January 1981.

In July 1985, NAVORDSTA submitted a controlled hazardous substance (CHS) permit application to the State of Maryland for the management of CHS in its storage facilities. As a matter of clarification, the Maryland designation of "controlled hazardous substances" is synonymous with the EPA designation of "hazardous wastes." After review by the Maryland Department of the Environment (MDE) and completion of the public hearing process, MDE issued CHS Permit No. A-223 on April 14, 1988 for the storage (in tanks and containers) facilities at NAVORDSTA.

The permit application contained in this document addresses the management of explosive waste and explosive/propellant-contaminated wastes which are treated by open burning (OB) at NAVORDSTA. Treatment of such wastes is regulated under Subpart X of 40 CFR Part 264, which covers miscellaneous units not regulated under the standards for specific types of treatment, storage, and disposal (TSD) units. Regulations for Subpart X facilities were promulgated by EPA on December 10, 1987 (FR 52, page 46946). The submission of this permit application to EPA prior to November 8, 1988 maintains the interim status of the OB thermal treatment units at NAVORDSTA.

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: F M D 4 1 7 0 0 2 4 1 0 9 (PLAN C) 0

LABEL ITEMS

I. EPA I.D. NUMBER

II. FACILITY NAME

III. FACILITY MAILING ADDRESS

IV. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (*the area to the left of the label space lists the information that should appear*), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (*except VI-B which must be completed regardless*). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility (*either existing or proposed*) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		
D. Is this a proposed facility (*other than those described in A or B above*) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP: NAVAL ORDNANCE STATION

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 WOO THOMAS ENVIRONMENTAL COORD	301 743 4320

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 CODE 0431

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 INDIANHEAD	MD	20640-5000

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 ROUTE 210 INDIAN HEAD HIGHWAY

B. COUNTY NAME

HARLES

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 INDIAN HEAD	MD	20640	- 5000

EPA Form 3510-1 (6-80)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST
2869 (specify) Propellants for missiles solid, organic

B. SECOND
2892 (specify) Manufacture of explosives

C. THIRD
911 (specify) Engineering-industrial, civil elec, chem, mech aerospace des.

D. FOURTH
3662 (specify) Weapons Simulators

VIII. OPERATOR INFORMATION

A. NAME
UNITED STATES NAVY

B. Is the name listed in Item VIII-A also the owner? YES NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)
F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC (other than federal or state), O = OTHER (specify)
F (specify)

D. PHONE (area code & no.)
A 301 743 4320

E. STREET OR P.O. BOX
ROUTE 210 INDIAN HEAD HIGHWAY

F. CITY OR TOWN
INDIAN HEAD

G. STATE
MD

H. ZIP CODE
20640

IX. INDIAN LAND
Is the facility located on Indian land? YES X NO

X. EXISTING ENVIRONMENTAL PERMITS

B. NPDES (Discharges to Surface Water)
N MD0031758

C. RCRA (Hazardous Wastes)
R NA

D. UIC (Underground Injection of Fluids)
U NA

E. OTHER (specify)
9 57 9 08 4 6 9A E B (specify) Sewage Sludge disposal

E. OTHER (specify)
9 A223 (specify) Attached

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements. (Continued on page A-4)

XII. NATURE OF BUSINESS (provide a brief description)

Provide material and technical support for assigned weapons systems, weapons or components and perform additional tasks as directed by the Naval Sea System Command including research and development, engineering, production, and quality surveillance in the fields of weapons systems, propulsion, unconventional explosives, cartridge and propellant activated devices and chemicals.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
T. Wendt tain, USN-Commanding Officer		

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (6-80) REVERSE

Please print or type in the unshaded areas only
(fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

C 8 — YR. — MO. — DAY

☐ 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR. — MO. — DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

☒ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
RFACE IMPOUNDMENT	S04	GALLONS OR LITERS
sposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C — DUP — T/A — 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S02	600	G		5				
X-2	T03	20	E		6				
	T04	8.5	D		7				
					8				
3					9				
4					10				

Continued from the front.

III. PROCESSES *(continued)*

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES *(code "T04")*. FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

T04 - Thermal treatment via Open Burning up to 17000 lbs./day based on single event safety limitations, except under conditions requiring special approval.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER – Enter the four–digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four–digit number*(s)* from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY – For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non–listed waste*(s)* that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE – For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous waste: For each listed hazardous waste entered in column A select the code*(s)* from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non–listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code*(s)* from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non–listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code*(s)*.
2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B,C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV *(shown in line numbers X-1, X-2, X-3, and X-4 below)* – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non–listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
	0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
WMD417002410 9 1	W DUP 2 DUP

V. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	D001	1,200,000	P	T04	
2	D002	2,000	P	T04	
3	D003	3,600,000	P	T04	
4	D004	1,000	P	T04	
5	D005	1,000	P	T04	
6	D006	50	P	T04	
7	D007	1,000	P	T04	
8	D008	1,000	P	T04	
9	D009	50	P	T04	
10	D010	50	P	T04	
11	D011	50	P	T04	
12	F001	3,000	P	T04	
13	F002	3,000	P	T04	
14	F003	1,250,000	P	T04	
15	F004	50,000	P	T04	
16	F005	500,000	P	T04	
17	K044	20,000	P	T04	
18	K045	240,000	P	T04	
19	K046	5,000	P	T04	
20	K047	42,000	P	T04	
21	K086	5,000	P	T04	
22	P009	50	P	T04	
23	P119	10	P	T04	
	P054	10	P	T04	
25	P067	10	P	T04	
26	P077	10	P	T04	

EPA Form 3510-3 (6-80)

CONTINUE ON REVER

(enter "A", "B", "C", etc. behind the "3" to identify photocopied pages)

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S30004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
WMD417002410 9 1	W DUP 2 DUP

V. DESCRIPTION OF HAZARDOUS WASTES (continued)

NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	P068	10	P	T04	
2	P081	1,000	P	T04	
3	P075	4,200	P	T04	
4	P105	10,000	P	T04	
5	P112	1,000	P	T04	
6	U001	1,000	P	T04	
7	U002	74,000		T04	
8	U003	3,300	P	T04	
9	U008	1	P	T04	
10	U009	100	P	T04	
11	U012	20,000	P	T04	
12	U018	1	P	T04	
13	U094	1	P	T04	
14	U019	5,000	P	T04	
15	U070	1	P	T04	
16	U071	1	P	T04	
17	U072	1	P	T04	
18	U169	1	P	T04	
19	U234	1	P	T04	
20	U021	10	P	T04	
21	U197	10	P	T04	
22	U225	1	P	T04	
23	U031	10	P	T04	
24	U211	200	P	T04	
25	U037	1	P	T04	
26	U044	1,300	P	T04	

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
W M D 4 1 7 0 0 2 4 1 0 9 — 1	W DUP — 2 DUP

V. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	U050	10	P	T04	
2	U052	1	P	T04	
3	U053	10	P	T04	
4	U056	100	P	T04	
5	U057	100	P	T04	
6	U063	1	P	T04	
7	U069	1,000	P	T04	
8	U088	1	P	T04	
9	U092	1	P	T04	
10	U094	1	P	T04	
11	U098	10	P	T04	
12	U105	1	P	T04	
13	U106	1	P	T04	
14	U108	1	P	T04	
15	U076	1,000	P	T04	
16	U077	1,000	P	T04	
17	U112	530,000	P	T04	
18	U117	300,000	P	T04	
19	U359	1	P	T04	
20	U122	500	P	T04	
21	U123	4,100	P	T04	
22	U133	100	P	T04	
23	U140	1,400	P	T04	
24	U144	1	P	T04	
25	U151	50	P	T04	
26	U080	600	P	T04	

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)														FOR OFFICIAL USE ONLY											
W	M	D	4	1	7	0	0	2	4	1	0	9	1	W				D	U	P		2	D	U	P

V. DESCRIPTION OF HAZARDOUS WASTES (continued)

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	U154	3,700	P	T 0 4	
2	U159	7,000	P	T 0 4	
3	U160	1	P	T 0 4	
4	U161	1	P	T 0 4	
5	U168	20	P	T 0 4	
6	U171	300	P	T 0 4	
7	U182	1,000	P	T 0 4	
8	U188	1,000	P	T 0 4	
9	U190	200	P	T 0 4	
10	U196	500	P	T 0 4	
11	U201	5	P	T 0 4	
12	U202	1	P	T 0 4	
13	U213	4,500	P	T 0 4	
14	U220	300,000	P	T 0 4	
15	U221	1	P	T 0 4	
16	U223	1	P	T 0 4	
17	U239	800	P	T 0 4	
18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA Form 3510-3 (6-80)

CONTINUE ON REVER

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. *(enter from page 1)*

F	MD	4	1	7	0	0	2	4	1	0	9	T/A	6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground—level)* that clearly delineate all existing structures; existing storage, ment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

FACILITY GEOGRAPHIC LOCATION

LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*
38 33 04.5	077 12 00.3

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. *(area code & no.)*
E	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
G. F. Wendt CAPTAIN, USN-Commanding Officer		

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME *(print or type)*	B. SIGNATURE	C. DATE SIGNED
G. F. Wendt CAPTAIN, USN		

Form Approved OMB No. 158-S80004

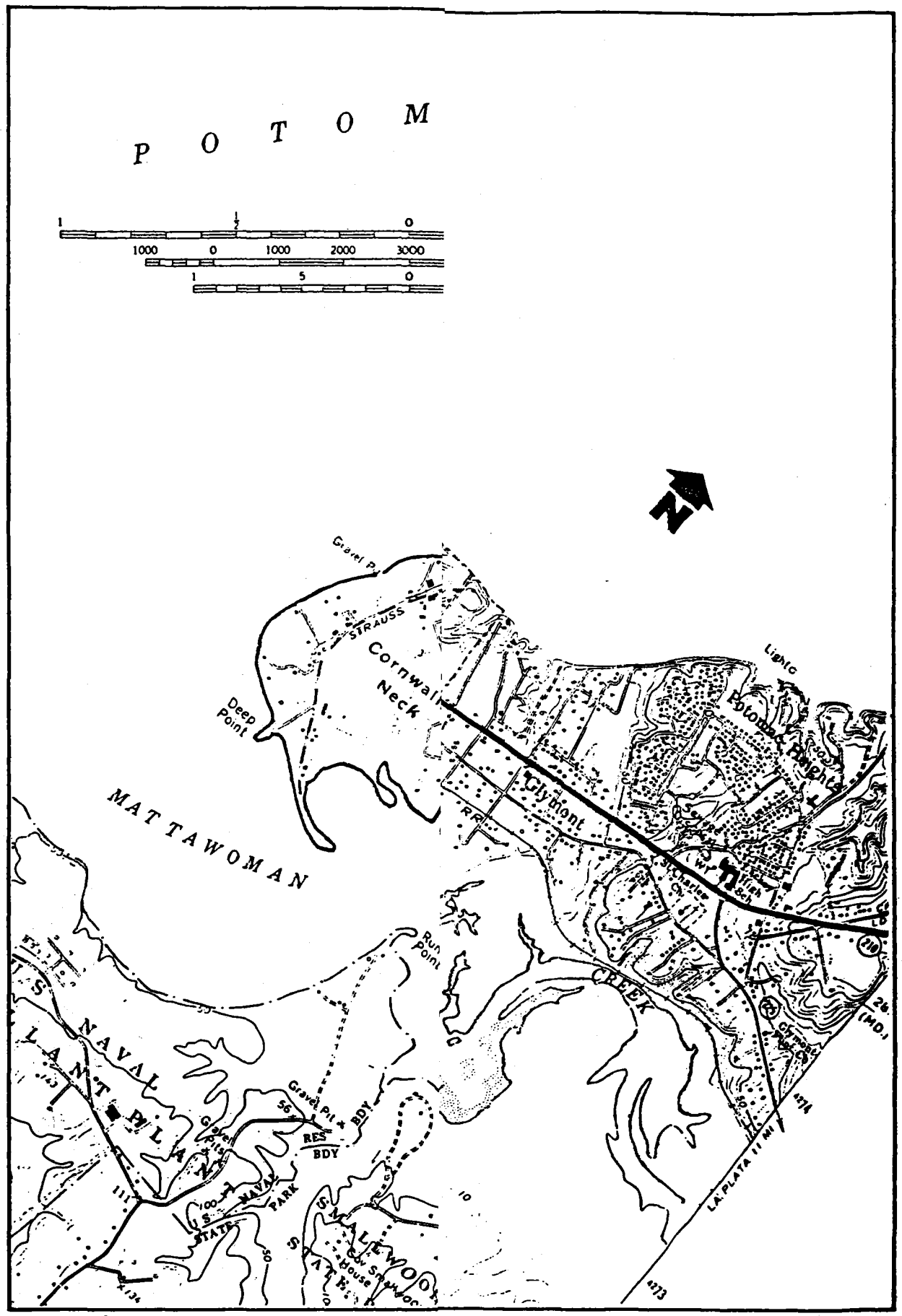
V. FACILITY DRAWING *(see page 4)*

The required Facility Topographic Map (Figure A-1) and Facility Drawing (Drawing #15551A) follow this page. Facility photographs required by Item VI can be found in Section D of the accompanying permit Application. Drawings for each of the individual thermal treatment areas are also provided in Section D.

ITEM X. (Continued)

Additional Environmental Permits

Water Appropriation and Use Permit (8/24/81 - 7/10/91)	#CHF1GAP005 (MD DNR)
Oil Operation Permit (8/19/88 - 8/19/93)	#89-OP-0666 (MDE)
Air permit for open burning of propellants, explosives, pyrotechnics and explosive - contaminated waste.	#AP-88-317 (Charles Ctny. Health Dept.)
Powerhouse (at NAVORDSTA - Indian Head) Operating Permit (5/1/88 - 4/30/89)	#08-00040-00063 (MDE) #08-00040-00064 (MDE) #08-00040-00065 (MDE)
NPDES (Industrial) Renewal application submitted, authorized to operate under 1/87 permit on 4/1/88.	#MD0003158 (MDE)
NPDES (Sanitary) (5/1/88 - 4/30/93)	#MD0020885 (MDE) #88-DP-2528 (MDE)
Earth Fill Discharge (9/5/80 - N/A)	#NABOP-FR (ACOE) (Naval Ordnance Station) 79-1025
CHS Facility Perrmit (4/14/88 - 4/13/91)	#A-223 (MDE)



FROM WESTON DATED 1985

FIGURE A-1 FACILITY TOPOGRAPHIC MAP NAVORDSTA, INDIAN HEAD, MD

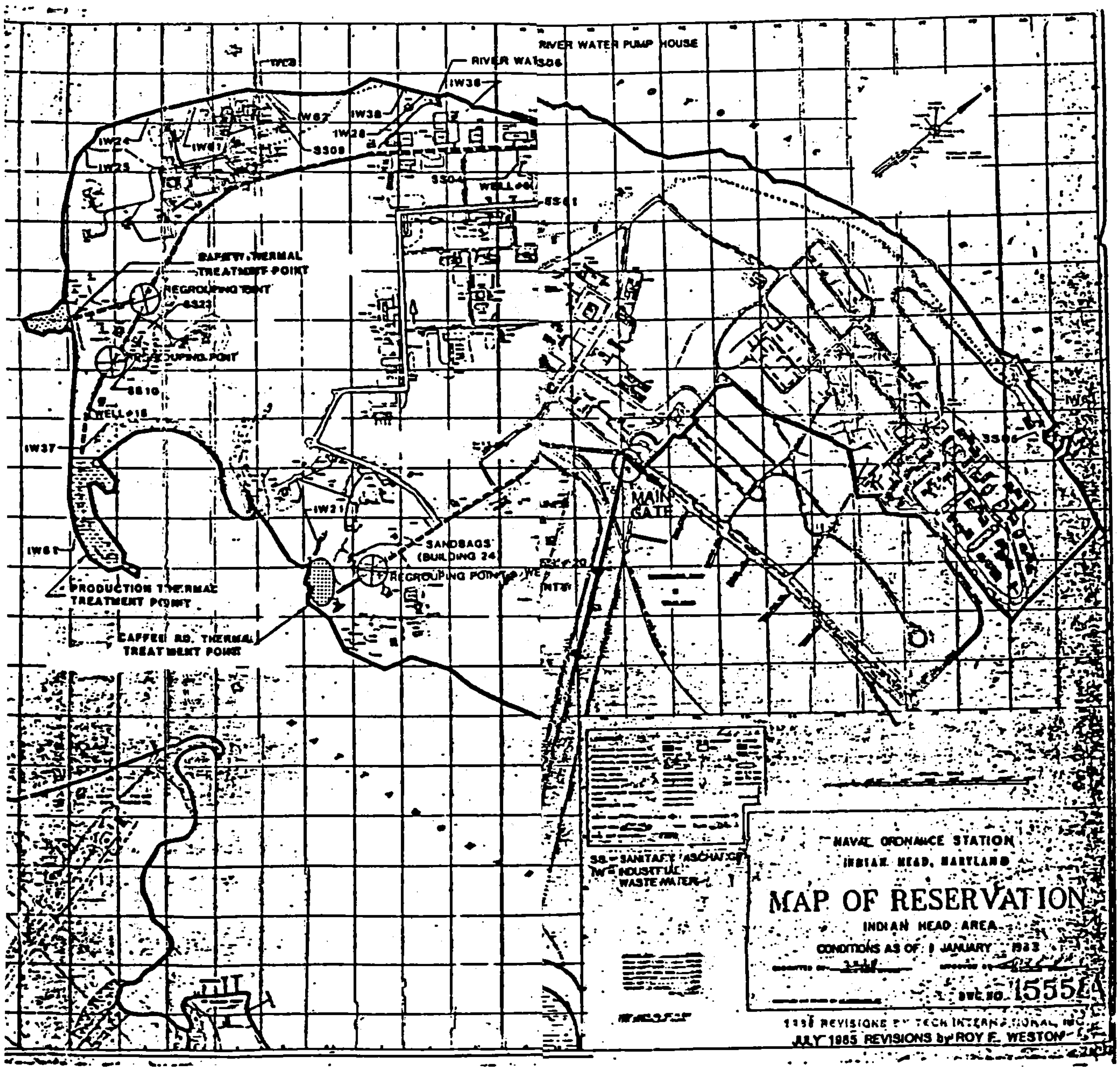

RIVER WATER PUMP HOUSE
IW36
IW38
IW28
IW24
IW25
IW61
SS04
TREATMENT POINT
REGROUPING POINT
SS10
IW37
IW61
PRODUCTION THERMAL
TREATMENT POINT
CAFFEE RD. THERMAL
TREATMENT POINT
SANDBAGS
(BUILDING 24)
IW21
MAIN
GATE
SS = SANITARY DISCHARGE
IW = INDUSTRIAL
WASTE WATER
NAVAL ORDNANCE STATION
INDIAN HEAD, MARYLAND
MAP OF RESERVATION
INDIAN HEAD AREA
JULY 1985 REVISIONS by ROY F. WESTON

FIGURE A-2

B — Facility Description

SECTION B

FACILITY DESCRIPTION

B-1 General Description

The Naval Ordnance Station (NAVORDSTA), is located at Indian Head on the Maryland shore of the Potomac River, approximately 25 miles south of Washington, D.C. This activity occupies approximately 3,500 acres of land and is situated on two peninsulas adjacent to the Potomac River in the west-central portion of Charles County, Maryland. NAVORDSTA-Indian Head is located on the larger peninsula, which occupies approximately 2500 acres between the Potomac River and Mattawoman Creek. The smaller peninsula is located just downstream between the Potomac River and Chicamuxen Creek and is designated as the Naval Ordnance Station, Stump Neck Annex. The Naval Explosive Ordnance Disposal Technology Center (NAVEODTECHCEN), a NAVORDSTA tenant command, functions as operator at the Stump Neck Annex. This permit application addresses only the NAVORDSTA-Indian Head facility.

Figure A-1 (USGS quadrangle, Indian Head, Maryland) provides an overview of NAVORDSTA-Indian Head for orientation purposes. Figure A-2 is a detailed "Map of Reservation" (showing property lines, gates, fencing, etc.). Figure B-1 presents the geographic site location.

The principal mission of NAVORDSTA is the research, development, and production of propellants and explosives for the United States Navy. The scope of these operations range from laboratory research to full-scale production. The operations of the Station produce explosives, propellants and explosive/propellant-contaminated scrap.

Site operations at NAVORDSTA-Indian Head utilize explosive materials and generate wastes which are explosive and/or contaminated with explosives and must be thermally treated to render them safe. These wastes, which are regulated under Subpart X of 40 CFR Part 264, are thermally treated at three (3) open burning (OB) areas at NAVORDSTA. In addition, a tenant command operation, generates explosives/propellant-contaminated wastes. This tenant operation is permitted separately for the management of explosives/propellant-contaminated wastes by thermal treatment.

Figure B-2 shows the existing groundwater wells at NAVORDSTA, as well as those within a one-half mile radius of the Reservation.

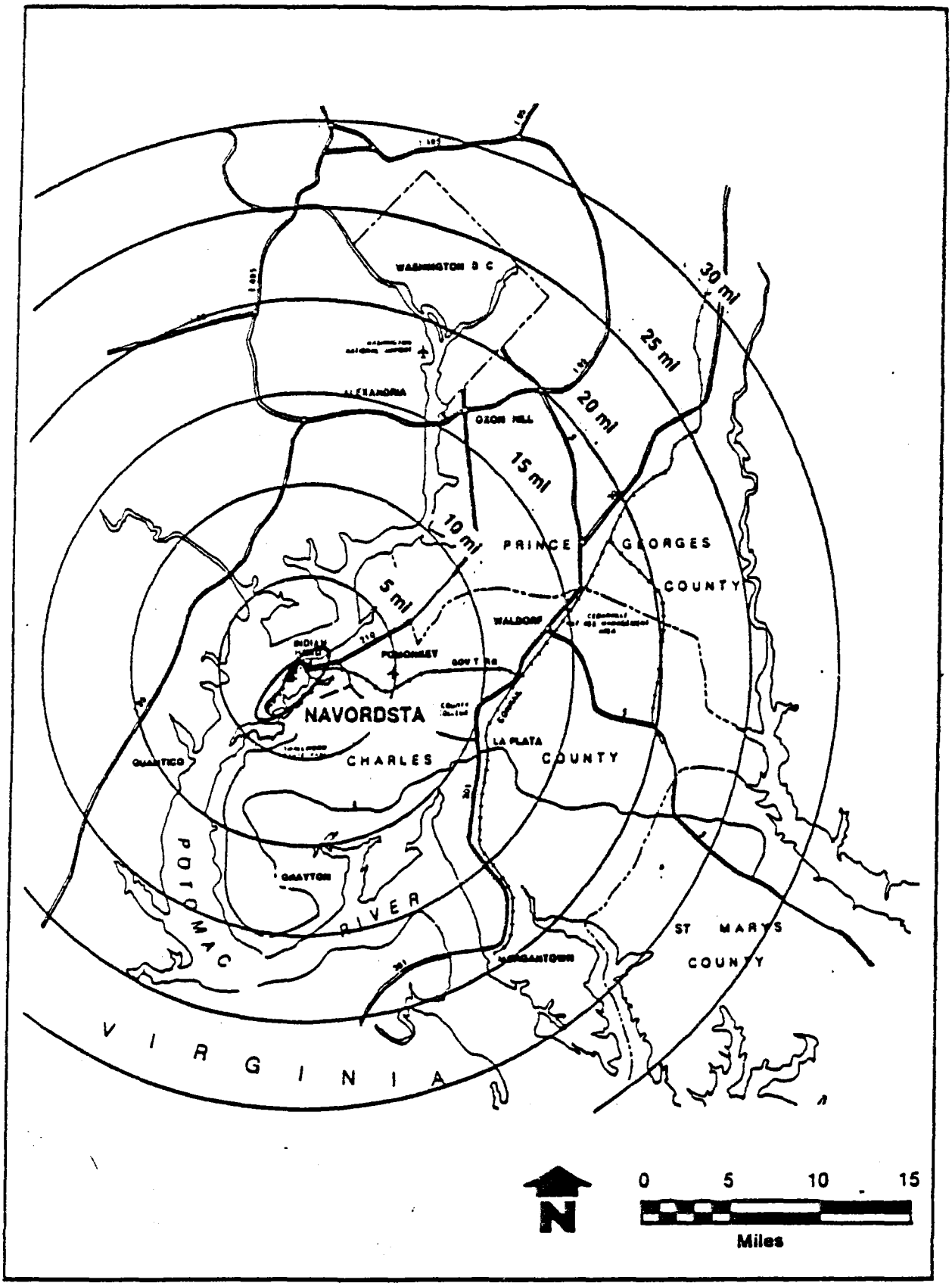


FIGURE B-1 GEOGRAPHIC LOCATION MAP
NAVAL ORDNANCE STATION
INDIAN HEAD, MARYLAND

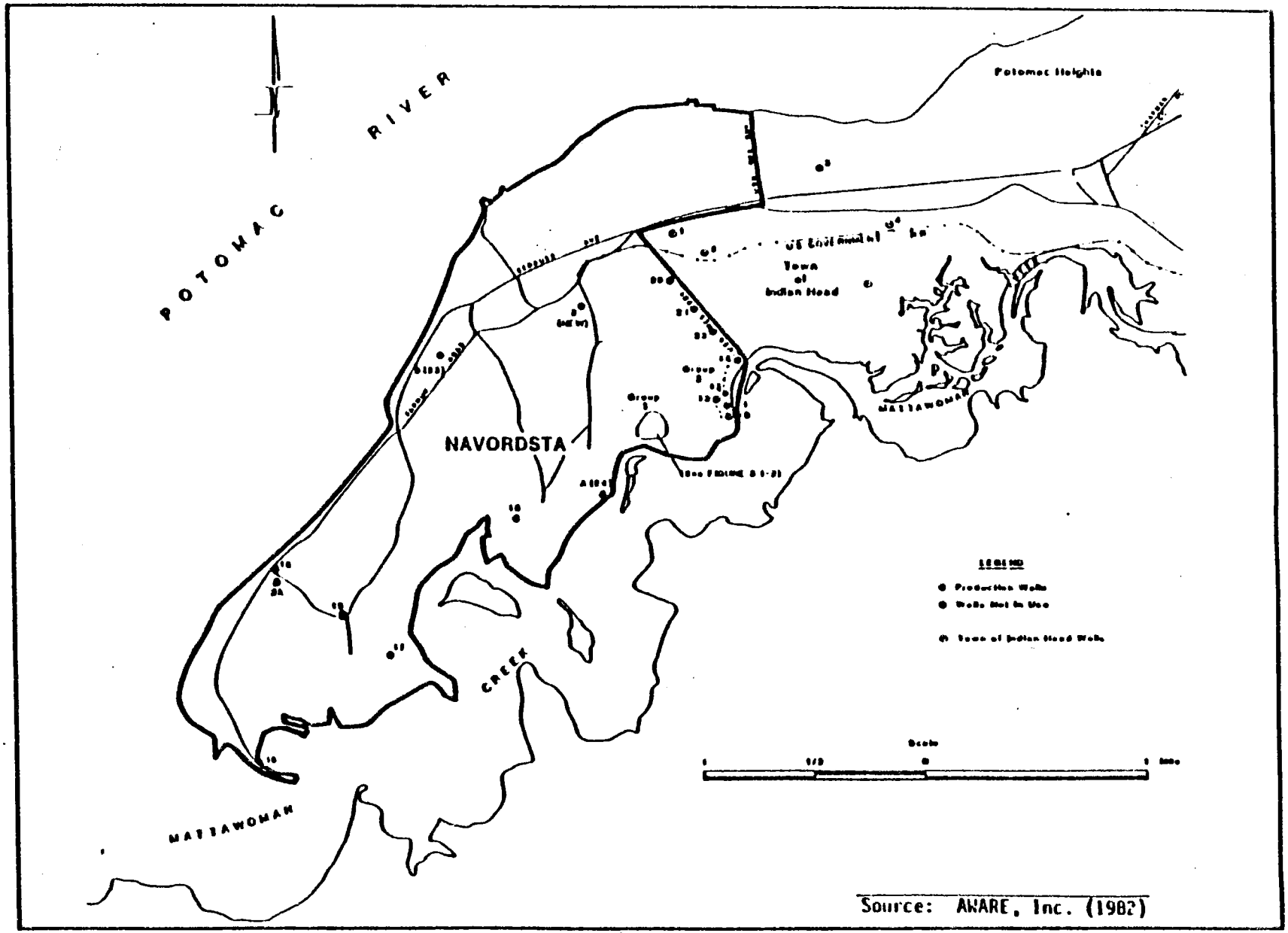


FIGURE B-2 WELL LOCATION MAP
NAVORDSTA, INDIAN HEAD, MARYLAND

Figure B-3 shows the locations of the three (3) thermal treatment areas covered under this permit application and the limits of the 1ØØ-year flood plain.

The thermal treatment areas, which are operated for the treatment of explosive wastes and explosive/propellant-contaminated wastes, covered under this permit application are:

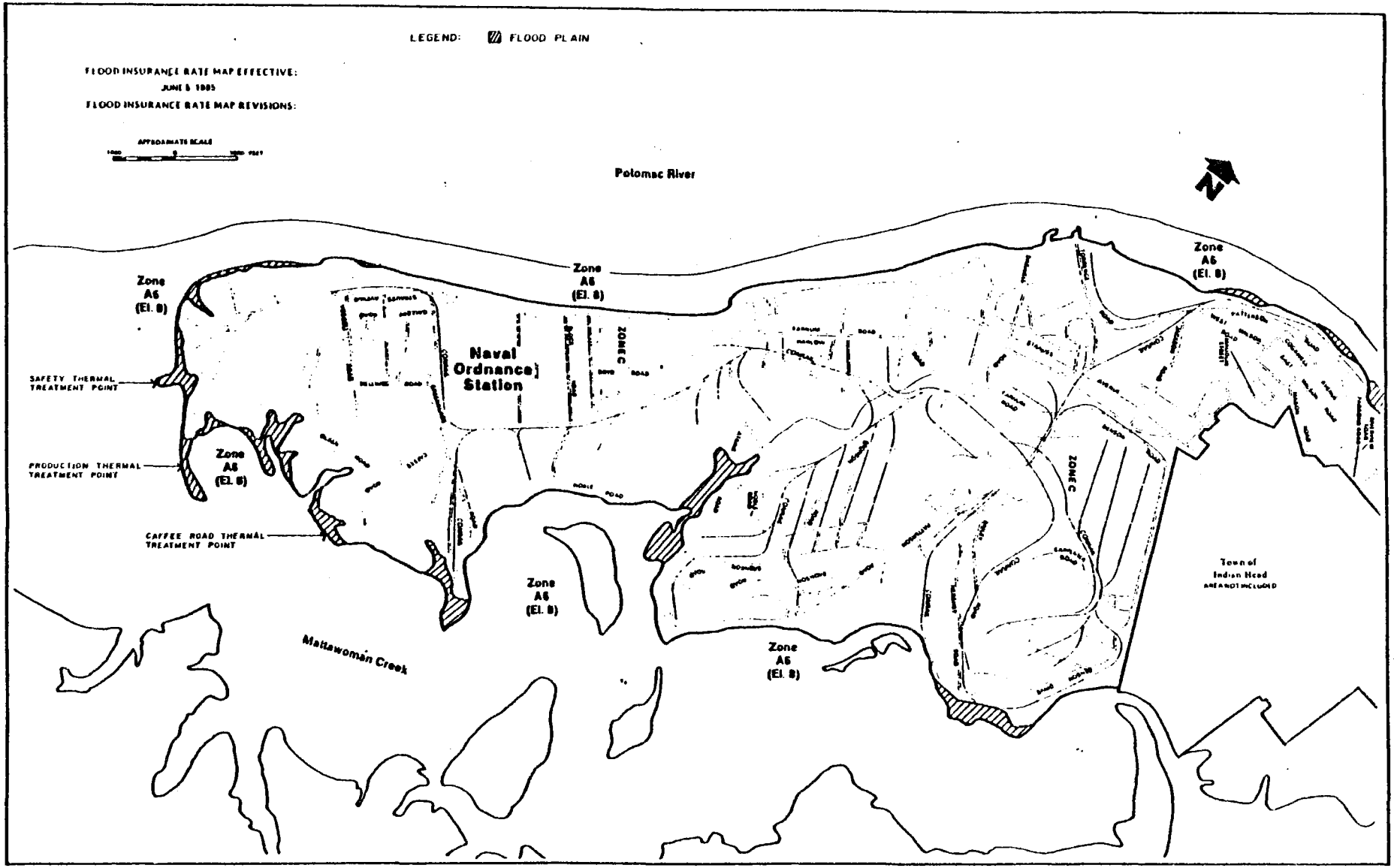
- o Production Thermal Treatment Point at the end of Strauss Avenue.
- o Safety Thermal Treatment Point near the Production Thermal Treatment Point, adjacent to Strauss Avenue.
- o Caffee Road Thermal Treatment Point at the end of Caffee Road adjacent to Mattawoman Creek.

Detailed information and drawings for each of these facilities can be found in Section D, Process Information.

The chain-of-command/organizational chart for NAVORDSTA is shown in Figure B-4. The Safty Department, Environmental Protection Division is responsible for monitoring the environmental program and the management of permits at NAVORDSTA, including explosive and explosive/propellant-contaminated wastes and the thermal treatment areas. Each department that generates explosives/propellant-contaminated wastes is responsible for properly packaging, labeling, dating, and manifesting any wastes regulated under Subpart X of 4Ø CFR 264. Transportation of these wastes within the Station is provided and directed by the Public Works Department. The Production Thermal Treatment Point is operated by the Cast Division of the Ordnance Department. The Safety Thermal Treatment Point is operated by the Safety Department. The Caffee Road Thermal Treatment Point is operated by the Supply Department.

B-2 Topographic Maps, Existing Utilities, and Appurtenant Information

Figure B-3 delineates the locations of the three thermal treatment areas. Individual plans of each thermal treatment area (scale: 1 inch = 1ØØ feet), showing topographic and planimetric features, along with the locations of existing utilities (sanitary sewer, water, and storm sewer) within 1,ØØØ feet of each thermal treatment area, are provided in Section D.



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FROM WESTON ORIGINAL DATED 1985

FIGURE B-3 THERMAL TREATMENT AREAS
LOCATION MAP
NAVORDSTA, INDIAN HEAD, MD

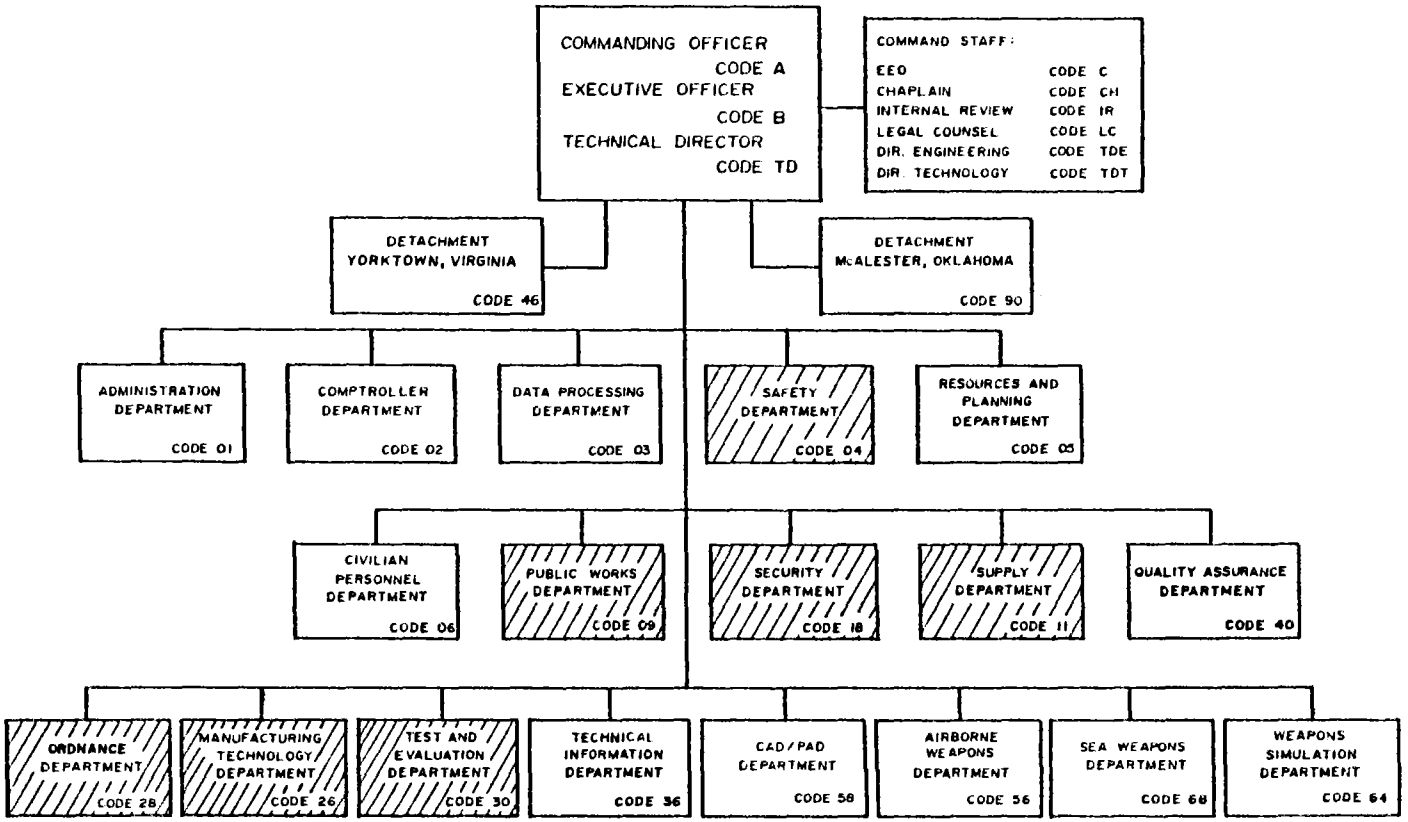


FIGURE B-4. NAVAL ORDNANCE STATION, INDIAN HEAD, MD, ORGANIZATION CHART

LEGEND:

▨ SIGNIFICANT INVOLVEMENT WITH THERMAL TREATMENT OF EXPLOSIVE & EXPLOSIVE / PROPELLANT CONTAMINATED WASTE

The source of potable water and power plant operations water (Goddard Power Plant) at NAVORDSTA is groundwater. Three 6-inch diameter wells (130,000 to 250,000 gallons/day) and one 4-inch diameter well (35,000 gallons/day) supply low-silica groundwater to feed the Goddard Power Plant boiler. Cooling water is collected in Buildings 143 and/or 128. Seven 4-inch diameter wells (approximately 175,000 gallons/day capacity each) supply high-silica groundwater for the Station's drinking water requirements. All 11 production wells are 300 to 550 feet deep. Table B-1 summarizes all known wells at NAVORDSTA. Fire-fighting water and various other cooling water applications on-Station are provided through a river water pumping and distribution system.

NAVORDSTA has a sanitary sewage treatment plant. A gravity/force main collection system conveys sewage flows throughout the Station to the treatment plant. The storm sewer system consists of a series of gravity-draining pipes and ditches/swales to direct runoff from roadways and around the bases of buildings or other facilities.

The existing utilities systems (operations water, sanitary sewer, potable water lines, and storm sewer) are shown on the facility topographic maps in Section D. Current surrounding land uses and population statistics are shown in Figure B-5.

The wind rose for NAVORDSTA is presented in Figure B-6. The winds of greatest velocity are generally from the northwest at 17 to 21 knots. Median wind velocity is indicated as about 5 knots, most frequently from the south or northwest. The wind rose was developed from data obtained at the U.S. Marine Corps Base in Quantico, Virginia, which is located approximately 6 miles downstream and across the Potomac River from NAVORDSTA.

Vehicular and personnel access control into NAVORDSTA is strictly monitored by Navy personnel via guarded gates/entrances and internal check points. Figure A-2 shows the locations and means of access control via chain-link fencing with three strands of barbed-wire (7 feet high, average) around and within the NAVORDSTA reservation. Fencing is not provided along the shorelines of the Potomac River and Mattawoman Creek. However, several large warning signs are posted along the banks of these two waterways that forbid trespassing and warn of danger. These signs state, "**Danger-Unauthorized Personnel Keep Out,**" and are legible from a distance of at least 25 feet. The shoreline is inspected for security/safety concerns associated with unauthorized personnel, by operational personnel during the course of routine operations. In addition, nightly inspections are performed by Station security guards.

Table B-1

Wells Located at NAVORDSTA

Well	Status	Depth	Screen Interval	Location (grid)	Date Installed	Remarks
1A	abandoned	437	-	-	1952	NCU
1	abandoned	388	-	-	1900(est)	NCU
2	abandoned	-	-	-	1900(est)	NCU
3	abandoned; cemented	-	-	-	1900(est)	Could not be located by AWARE
4	abandoned	-	-	-	1900(est)	NCU
5	abandoned	395	-	-	1910(est)	NCU
6	in use	398	252-259; 301-311; 377-397	P31	1915	
7	in use	419	255-265; 305-314; 375-396	P31	1915	
8	abandoned	319	-	-	1900(est)	NCU
9	available for use	390	185-195; 235-245; 284-294; 355-376	P30	1918	
10	abandoned	396	-	-	1930s	NCU
11	abandoned; cemented	409	-	-	1930s	NCU
12	available for use	390	unknown	T35	1930s	
13	abandoned; cemented	-	-	-	1930s	Could not be located by AWARE
14	available for use	480	unknown	S36	1930s	Being considered for use
15A	abandoned; cemented	-	-	-	1900(est)	Could not be located by AWARE
15	in use	280	191-206; 230-234; 240-244; 268-280	H1	1953	Borehole drilled to 623'
16	available for use	242	85-93; 123-133; 144-152; 221-229; 234-242	C11	1952	
17	in use	295	259-295	L11	1954	Borehole drilled to 452'
18	in use	302	208-220; 274-302	N22	1954	Borehole drilled to 605'
19	"test well"[A]	400	154-167	H11	Unknown	Insufficient yield NCU
20	"test well"	542	-	-	1952	Insufficient yield NCU
21	"test well"	450	-	-	1952	Insufficient yield NCU
22	"test well"	258	-	-	1952	Insufficient yield NCU
23(B)	in use	294	240-294	D27	1957	

Source: Initial Assessment Study (1983)

Table B-1
(continued)

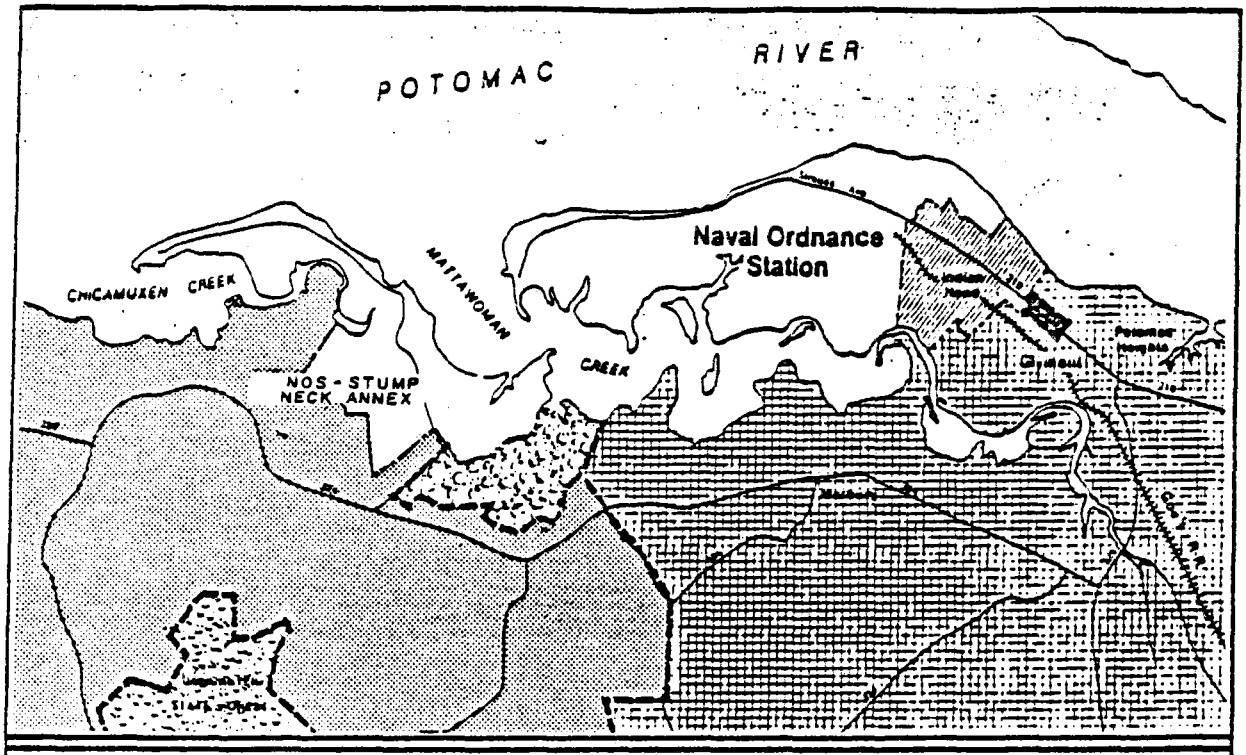
Well	Status	Depth	Screen Interval	Location (grid)	Date Installed	Remarks
24(A)	in use	290	228-239; 269-286	Q26	1957	
2A (2 new)	in use	380	270-380	I34	1970	
3A	available for use	232	217-232	D11	1970	

Notes:

NCU = not considered usable (by AWARE, Inc. study)

* = USGS uses well 19 as a water level monitoring station

est = estimated



Legend

- Incorporated Town
- Residential Single Family
- Residential Agriculture
- Commercial Retail
- Parks and Recreational Areas

0 1 2 miles

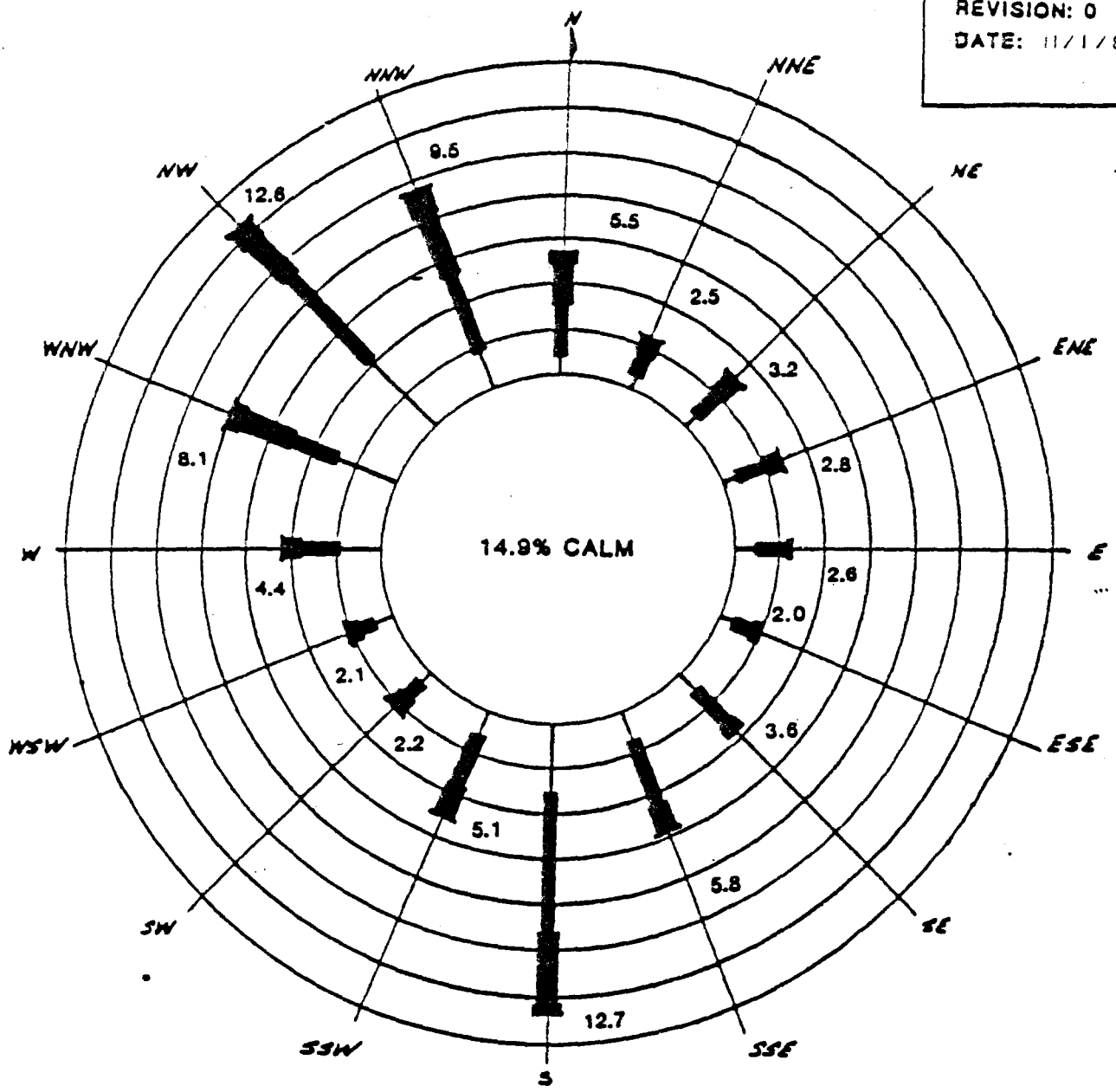
1988 REVISIONS BY TECH INTERNATIONAL INC FROM WESTON ORIGINAL DATED 1985

POPULATION CHANGES 1940-1980

	Town Of Indian Head		Pomonkey Elect. Dist. 7		Charles County		Maryland State	
	Pop.	% Change	Pop.	% Change	Pop.	% Change	Pop.	% Change
1940	1,140	-----	3,142	----	17,612	----	1,672,803	----
1950	491	-56.8	6,761	115	23,415	32	2,343,000	28.6
1960	780	58.8	9,252	36.8	32,572	39.6	3,100,689	32.3
1970	1,350	73.1	10,667	15.5	47,678	47.3	3,946,861	27.3
1980	1,500	11.1	11,822	10.8	68,640	43.9	4,373,786	10.8
1981	-----	-----	------	----	71,525	----	----------	----

Note: Population density = 161 people/sq. mi. (U.S. Census Bureau - 1984)

FIGURE B-5 SURROUNDING LAND USES AND POPULATION
NAVAL ORDNANCE STATION (NOS), INDIAN HEAD, MARYLAND



(A) OBTAINED FROM NAVAL WEATHER SERVICE DETACHMENT, ASHEVILLE, N.C. FOR QUANTICO, VA. STATION. DISTANCE TO NAVAL ORDNANCE STATION: 6 MILES.

(B) PERIOD: 1969-71, 1973-78. BASED ON 20811 OBSERVATIONS.

FIGURE B-6 WIND ROSE

The legal boundaries (property lines) of NAVORDSTA are shown in Figure B-3.

B-3 Location/Information

B-3a Environmental Information

The local geology is typical of the low-lying Coastal Plain region. Soils are unconsolidated sediments varying in classification from clays to sands. Interbedded coarser-graded materials generally overlie extensive layers of fine-grained clay. In some areas a hard dense fragipan layer exists in the subsoil, which restricts the downward movement of water.

Potable water wells are located in the Magothy Aquifer, Patuxent, Raritan, and Patapsco Formations that underlie the region at depths of about 200 to 600 feet. Moisture from the shallow water-bearing zone, which is present in the surficial deposits, is expected to move laterally downgradient towards nearby sea level surface waters, namely the Potomac River and Mattawoman Creek. There are no known production wells located in the shallow water zone. Section E further describes the hydrogeology in the vicinity of NAVORDSTA.

B-3b Flood Plain Standard

B-3b(1) Flood Plain Standard

The Potomac River and its tributaries (including Mattawoman Creek) in the vicinity of NAVORDSTA are characterized as an estuary, which is subject to tidal action/saltwater intrusion. The mean river level for the Potomac is approximately 0.5 foot above mean sea level (MSL), with mean high water at about 1.5 feet above MSL, and mean low water at about 0.5 foot below MSL. MSL is essentially equivalent to the National Geodetic Vertical Datum (NGVD). Low-lying marsh areas at NAVORDSTA are subject to periodic flooding. Some areas of the Station (estimated at over 100 acres) are located within the flood plain. The contours of the 100-year flood plain have been calculated by the Federal Emergency Management Agency (FEMA) in the NAVORDSTA area. The flood insurance maps of Charles County, Maryland, dated 5 June 1985, show a Zone A6, 100-year flood elevation, at elevation 8± MSL around NAVORDSTA as referenced in Figure B-3.

B-3b(2) Flood Plain Waiver

The extent of the flood plain at each of the thermal treatment areas is shown in the figures presented in Section D. A waiver relative to the flood plain standard is requested based on the following:

- o Use of the planned containment systems with periodic removal of residual and ash materials from the bedding material within the containment systems at each of the thermal treatment areas.

- o Relatively short duration (few hours per day) of the thermal treatment events.

- o Procedure for monitoring weather conditions and providing advance notice to operating departments of potential flood warning.

- o Operating flexibility to schedule thermal treatment events to avoid potential flood conditions at the thermal treatment areas.

- o The capability to remove the explosives/propellant-contaminated waste from the Caffee Road Thermal Treatment Point from the flood plain in the event of a flood warning.

The plan of operation in response to flood conditions at NAVORDSTA will include the following:

1. Flood Warning

   a. A flood warning will be received by teletype at the NAVORDSTA Communications Center, Building 20 (telephone 734-4144/4543). Such a warning is likely to come from the Naval Polar Oceanographic Center, Suitland, Maryland (telephone 763-1111). Other alternate forecasts are available from the National Weather Service. The forecasts will generally include a prediction of the flood elevation and the approximate time flooding will occur.

   b. During duty hours, the NAVORDSTA Communications Center will call the Emergency Coordinator (EC) to relay the flood warning message. Routine forecasts are distributed through the Station's Mail and File Branch, with daily delivery at the EC's office.

   c. After duty hours the NAVORDSTA Communications Center will inform the Command Duty Officer (CDO). The CDO will notify the Executive Officer (XO) and the EC.

d. The EC (or the alternate EC) will review the forecasted flood/high tide predictions to determine if flood control actions are required at the thermal treatment areas. If necessary, the EC will consult with the XO and determine an appropriate course of action to prevent thermal treatment operations from being conducted during the flood warning and to remove explosives/propellant-contaminated waste from the flood plain at the Caffee Road Thermal Treatment Point.

2. Response Operations

a. Concept of operations: All explosives/propellant-contaminated waste will be removed expediently from the Caffee Road Thermal Treatment Point to prevent encounter with floodwaters. Removal actions may be necessary at the Production Thermal Treatment Point and/or the Safety Thermal Treatment Point only if an event has already been initiated at one or both of these OB areas. However, the short duration, typically less than two (2) hours, of OB events at these two areas make it highly unlikely that expedited removal will be necessary, rather than completing the normal OB event and expediently removing the residuals from the containment system.

b. Postponement of thermal treatment operations: Based on the flood warning information, the EC will advise the cognizant department heads (Codes 04, 11, and 20),to delay any imminent or planned thermal treatment operations until the flood warning has been lifted. This decision will be reconsidered at least daily until normal operations can be resumed.

c. Removal operations: A working party, consisting of the necessary operating and supervisory personnel from the Public Works Department, will be assembled at the Caffee Road Thermal Treatment Point. The working party will use a crane and the necessary ancillary equipment to move the explosives/propellant-contaminated waste to the designated area out of the flood plain.

d. Replacement operations: After the flood situation has passed, the material relocated from the Thermal Treatment Point due to the flood warning will be returned to the appropriate location at the thermal treatment area.

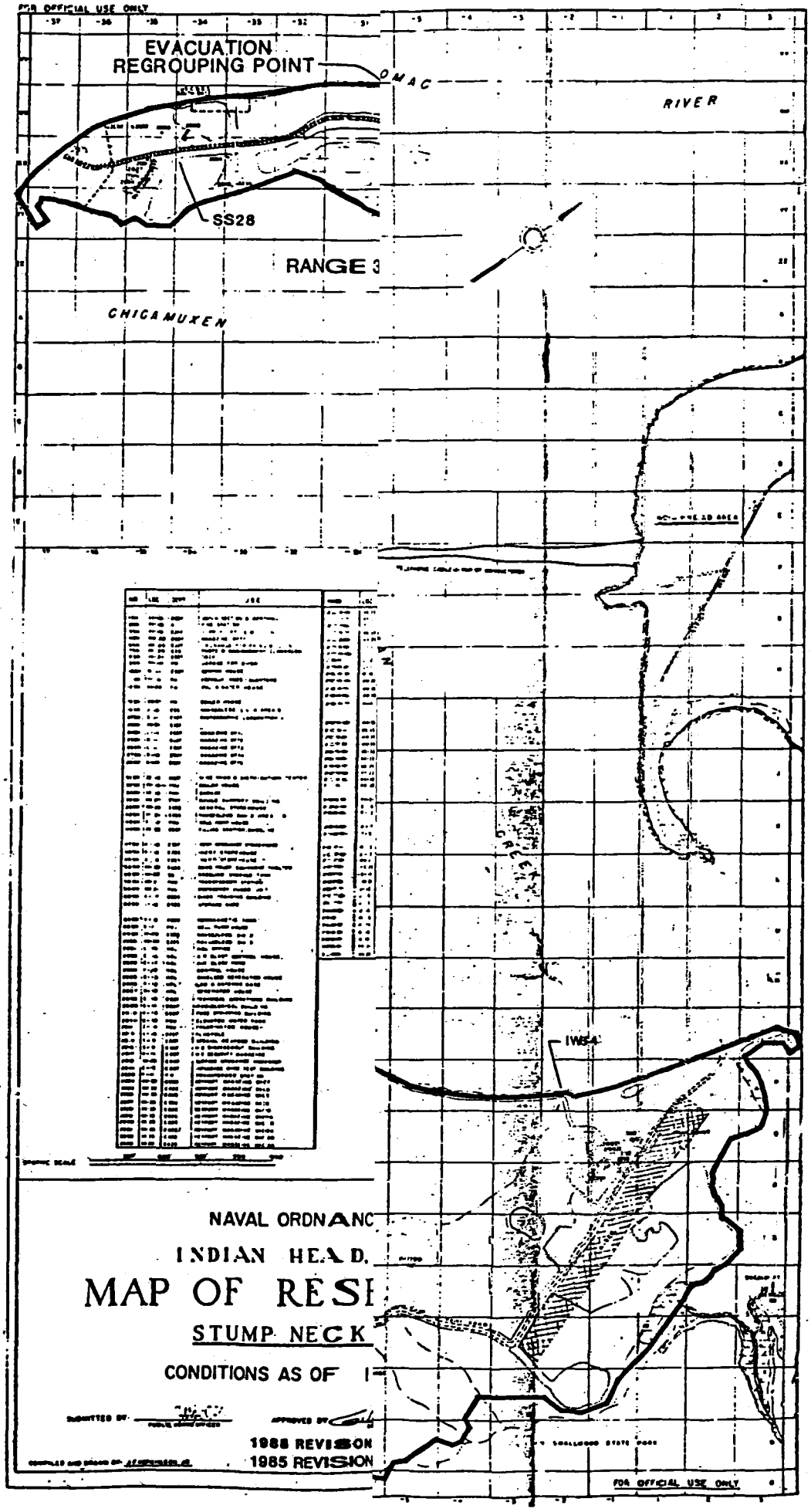
B-4 Traffic Information

Internal traffic circulation associated with the transport of explosive wastes and explosives/propellant-contaminated wastes is depicted in Figure A-2. The maximum legal gross weight for vehicles entering NAVORDSTA is 79,800 pounds. The internal roadway system has been designed and constructed to be structurally acceptable for supporting the weight of such vehicles (which includes the vehicles transporting explosive and explosives/propellant-contaminated waste). The speed limit on the Station is less than or equal to 25 mph.

Intersections within the Station where such wastes are transported provide clear visibility and adequate vehicle turning distances. Minimal steep roadway slopes exist, and the road widths range up to 20 feet. Access to and from the thermal treatment areas is adequate for the minimal traffic (estimated at less than 30 trips per week per OB area) involving explosive waste and explosives/propellant-contaminated waste movement. The average daily traffic volume (ADT) on Strauss Avenue is approximately 3,500 vehicles/day (two-way volume) per the traffic engineering study of NAVORDSTA conducted by the Military Traffic Management Command, Transportation Engineering Agency (dated June 1984, MTMC report TE83-6a-55).

There are no measurable impacts on surrounding road networks associated with explosives/propellant-contaminated waste movement from NAVORDSTA, particularly since any waste (e.g. recycled scrap metal) which leaves the Station, has already been decontaminated of explosive/propellant materials by thermal treatment prior to shipment from NAVORDSTA.

Traffic control devices consist of signs (yield signs, stop signs, etc.) that control traffic throughout the Station. In addition to being located inside two security control gates, barriers are located at the approach roads to the Production Thermal Treatment Point and Safety Thermal Treatment Point. The Caffee Road Thermal Treatment Point is located within a fenced area with a locking gate. All three OB areas are located at the end of the roadways leading to them.


FOR OFFICIAL USE ONLY
EVACUATION
REGROUPING POINT
POTOMAC
RIVER
SS28
RANGE 3
CHICAMUXEN
IWS-4
NAVAL ORDNANC
INDIAN HEAD,
MAP OF RESI
STUMP NECK
CONDITIONS AS OF
1988 REVISION
1985 REVISION
FOR OFFICIAL USE ONLY

C — Waste Characteristics

SECTION C

WASTE CHARACTERISTICS

This section describes the chemical and physical characteristics of the explosives waste and explosive-contaminated wastes generated and thermally treated at NAVORDSTA. The Waste Analysis Plan (WAP) for sampling, testing, and evaluating such waste is included to ensure safe handling pertaining to the thermal treatment operations regulated as miscellaneous treatment units under the Resource Conservation and Recovery Act (RCRA). This information is submitted in accordance with the requirements of 40 CFR 270.14(b)(3) and 264.13(b). Other wastes regulated under RCRA which are stored and/or shipped off-site for disposition are covered by a separate permit issued by the State of Maryland in April 1988 to NAVORDSTA.

C-1 Chemical and Physical Analysis

NAVORDSTA may generate a wide variety of explosive and explosive/propellant contaminated wastes in the course of its operational, production, educational, and experimental activities. Most of the wastes historically generated at the facility have been ordnance-related wastes, explosive wastes, small quantities of used solvents, excess reagents, or other chemicals that have been contaminated during use.

Although not necessarily indicative of the complete range of wastes that might be generated at NAVORDSTA, annual reports filed by the installation with the State of Maryland include the major types of explosive wastes and explosives/propellant-contaminated wastes that have been generated by the facility and are expected to continue being generated. Appendix C.1 contains annual reports for NAVORDSTA for 1985 and 1986.

The chemical and physical natures of the various categories of wastes typically managed at the thermal treatment areas at NAVORDSTA are presented in Table C-1. Table C-2 provides the required information regarding the following:

- A general description of the explosive wastes and explosives/propellant-contaminated wastes.
- Hazardous characteristics or basis for hazard designation.
- EPA hazardous waste code.

TABLE C-1

Chemical and Physical Nature of Typical
Explosive/Propellant-Contaminated Waste at NAVORDSTA

Category	Typical Constituents	Physical State	Color	Container/Method of Storage
Oxidizers	Ammonium nitrate	Solid-crystals	Colorless	Steel container color coded orange or silver w/conductive plastic bag
	Ammonium perchlorate	Solid-crystals	White	Lever pak
Reactive Metals	Magnesium	Solid-powder	Silvery	Steel container color coded orange or silver w/conductive plastic bag
	Aluminum	Solid-powder	Silver/white	
	Zirconium	Solid-powder		
Solvents (Explosive-Contaminated)	Acetone	Liquid	Colorless	Glass bottles <1 gallon steel can or drum
	Hexane	Liquid	Colorless	" " " " "
	Ethyl ether	Liquid	Colorless	" " " " "
	Heptane	Liquid	Colorless	" " " " "
	Ethyl lactate/butyl acetate	Liquid	Colorless	Steel drum
Nitrated Hydrocarbons	Nitromethane	Liquid	Colorless	Glass bottles <1 gallon steel can or drum
Alcohols (Explosive-Contaminated)	Ethanol	Liquid	Colorless	Glass bottles <1 gallon steel can or drum

TABLE C-1 (Cont.)

Explosive and Explosive-contaminated wastes	Nitroglycerin, desensitized	[1]Liquid (Viscous)	Pale yellow	Steel containers color coded yellow or blue with conductive plastic bag
	Fluorocarbon propellants	Solid	White/silver	
	Black powder	Solid	Black	
	Nitrocellulose	[1]Solid (Amorphous)	White	
	Nitroguanidine	Solid	White	
	HMX, RDX	Solid	White	
	Nitroglycerin slums	Solid		Adsorbed in sawdust

TABLE C-2

Typical Explosive Waste and Explosives/Propellant-Contaminated Waste and Associated Hazards

Category	Typical Constituents	EPA Hazardous Waste Number	Hazard Characteristic	Basis for Designation
Oxidizers	Ammonium nitrate	D003	Reactive	Strong oxidizer, may explode under confinement
	Ammonium perchlorate	D003	Reactive	Shock sensitive, strong oxidizer
Reactive Metals	Magnesium powder	D003	Reactive, flammable	Strong reducing agent
	Aluminum powder	D003	Reactive, flammable	Flammable, explosive mixtures in
	Zirconium	D003	Reactive	Flammable, explosive
Solvents (Explosive-contaminated)	Acetone	D001	Flammable	Flashpoint +1.4°F
	Ethyl ether	F003	Flammable	Flashpoint -49°F
	Heptane	D001	Flammable	Flashpoint +25°F
	Hexane	D001	Flammable	Flashpoing -9°F
	Ethyl lactate/butyl acetate	D003	Flammable reactive	Flashpoint -7°F
Nitrated Hydrocarbons	Nitromethane	D001	Flammable, Reactive	Flashpoint +95°F
Alcohols (Explosive-/contaminated)	Ethanol	D001	Flammable	Flashpoint +55°F
Explosive and Explosive-contaminated Waste	Nitroglycerin,	D003	Reactive	Heat/shock sensitive explosive
	Nitrocellulose	D003	Reactive flammable	Explosive/flashpoint +55°F
	Nitroguanidine, RXD, HMX	D003	Reactive	Explosive
	Fluorocarbon propellants	D003	Reactive	Explosive

C-2 Waste Analysis Plan

C-2a Waste Analysis Parameters and Rationale for Selection

NAVORDSTA may generate virtually any form of explosive wastes and/or explosive/propellant-contaminated waste at any given time. Once generated, most of these wastes are temporarily stored in explosive dumpsters, scrap sheds, etc. and then are taken directly to a thermal treatment area. Long-term storage of such wastes is not practiced due to safety concerns. Thermal treatment is typically conducted either daily or weekly. Some explosive-contaminated scrap materials may be held up to a few weeks before transfer to a thermal treatment area, such as Caffee Road Thermal Treatment Point. It should be noted that explosive wastes and explosive/propellant-contaminated wastes are not generally shipped offsite for disposition due to safety concerns.

Explosive wastes and explosive/propellant-contaminated waste generated or managed by NAVORDSTA are identified by generating personnel on the basis of ingredients used and the processing procedures/conditions. In view of their potential hazard, explosive and explosive/propellant-contaminated wastes are carefully identified and labelled in accordance with Naval Sea Systems Command (NAVSEA) Ammunition and Explosives Ashore (NAVSEA OP 5), which contains detailed safety regulations for handling, storing, production, renovation, and shipping of ammunition and explosives. In the event that unidentifiable materials believed to be explosive/propellant-contaminated waste would be encountered, this WAP would be used to analyze the waste material for the hazardous characteristics of ignitability, reactivity, corrosivity, and EP toxicity, as prescribed in 40 CFR 264.21 through 264.24, and for the characteristics detailed in Subsection C-2b.

To safely handle and treat these explosive and explosive/propellant contaminated wastes, they must be properly characterized. This (WAP) serves the following purposes:

- To determine if explosive wastes and explosive/propellant-contaminated wastes are hazardous as defined by or listed in regulations promulgated by EPA in implementing RCRA.
- To assure proper handling and treatment with regard to chemical compatibility to prevent mixing of incompatible wastes.
- To provide the approximate identification needed by NAVORDSTA transporters and thermal treatment area operators to enable them to operate as prescribed by RCRA.

Wherever possible, the explosive and explosive/propellant-contaminated wastes designated for thermal treatment are collected and packaged in the labeled containers supplied by the manufacturer. Containers and bulk items of explosive and explosive/propellant-contaminated waste are characterized by the generating command on an internal manifest.

Once identified, the waste is assigned one of the compatibility group numbers in the list that follows:

1. Alkalines.
2. Reactive metals and their compounds.
3. Alcohols and aqueous mixtures.
4. Halogenated, nitrated hydrocarbons.
5. Cyanides and sulfides.
6. Peroxides and oxidizers.
7. Inorganic acids and salts.
8. Organic acids.
9. Flammable wastes.

When such a waste contains more than one group of constituents, it is the generating department's responsibility to assign the appropriate compatibility group to the item. It should be noted that no cyanide wastes or fluid halogenated wastes are received or otherwise managed at the thermal treatment areas.

Appendix C.2 summarizes definitions and presents examples of substances in each compatibility group. This appendix also indicates other waste groups that are compatible within a given waste group.

NAVORDSTA is operated by highly trained people, and operations are conducted such that there is little question regarding the major components of any waste generated. In almost all cases these wastes can be easily placed within the proper compatibility category for safety handling and thermal treatment. The primary need for waste analysis is to categorize unlabeled reagents and reaction mixtures of unknown nature, and sometimes unknown origin, which are encountered infrequently.

At present, NAVORDSTA has the in-house analytical capability to conduct the procedures discussed in the paragraphs that follow. However, the laboratory is not fully dedicated to the analysis of explosive and explosive/propellant-contaminated waste. Chesapeake Division, Naval Facilities Engineering Command (CHESNAVFACENGCOM) has retained a commercial laboratory under a Basic Operating Agreement) (BOA) to perform the analyses described in the subsection that follows, if use of such outside resources is necessary.

C-2b Test Methods

If an unknown waste needs to be characterized, the following discussion describes the procedure by which chemical and physical information and data on unknown or unidentified explosive and explosive/propellant-contaminated waste are obtained to ensure proper short-term storage, transport, and thermal treatment at NAVORDSTA. These identification steps will be carried out by a qualified laboratory as required to categorize the waste:

1. The tests for ignitability, corrosivity, reactivity, and EP toxicity as defined and described in 40 CFR 261.21 through 261.24.
2. Qualitative test for water reactivity and solubility of liquid waste.
3. Test for water in liquid waste.
4. Test for pH of liquid waste.
5. Qualitative test for cyanide in liquid waste.
6. Qualitative test for sulfide in liquid waste.
7. Test for organic halogen in liquid waste.
8. Compatibility test for liquid waste (for possible use in bulking multiple liquids).
9. Semi-quantitative determination of peroxides and other oxidizing agents in liquid waste.
10. Free liquid.

Samples of solids and/or soils will be tested in accordance with either Military Standard 286B "Propellants Solid; Sampling, Examination, and Testing," and/or EPA SW-846, Test Method for Evaluating Solid Waste, July 1982, or EPA 600/2-80-018, Samples-Sampling Procedures For Hazardous Waste Streams status depending on the nature of the sample, its expected source, and the parameter of concern.

C-2c Sampling Methods

For containers of liquid wastes, the Environmental Protection Division is responsible for determining whether the drummed material is homogeneous or layered. If homogeneous, a small glass tube or pipette is used to sample the portion of the liquid nearest the surface. For layered wastes, a Coliwasa Sampler (as described by EPA (1980)) is used to collect a sample from the entire liquid

For a container with no free liquids, the Environmental Protection Division assesses the degree of homogeneity of the wastes. Stainless steel spoons, spatulas, or a core sampler are then used to collect at least four grab samples from different portions of the container (if feasible), such that the composite sample represents the container's contents.

When necessary sampling methods for sludges/solids will be conducted according to Military Standard 286B and/or EPA SW-846, as cited above, depending on the nature of the sample.

C-2d Frequency of Analyses

Wastes that cannot be positively identified by their original container markings are sampled once to permit their identification in accordance with the foregoing procedures. Wastes from waste-generating processes will be reanalyzed whenever a change occurs in a process that is expected to alter waste composition.

C-2e Requirements for Wastes Generated Off-site

The only off-site explosive-contaminated waste that would be accepted at NAVORDSTA would originate at other Naval installations. Management of such off-site wastes at NAVORDSTA is rare. Wastes received from off-site sources will be classified in accordance with the Waste Analysis Plan presented in this section:

- Known wastes in original containers will be classified into one of the 9 compatibility groups.
- Unknown wastes will be sampled and analyzed using the procedures described in Appendix C.3 to ensure their handling and thermal treatment with compatible wastes.

C-2f Additional Requirements for Ignitable, Reactive or Incompatible Wastes

The fundamental purpose of this Waste Analysis Plan is to determine whether wastes are ignitable, reactive, or could pose problems of compatibility with other wastes. Through proper characterization, wastes can be treated and stored safely in accordance with Navy safety procedures and applicable regulations.

This plan summarizes the analytical procedures necessary to characterize ignitable, incompatible, and reactive wastes. As indicated earlier, explosive and explosive-contaminated wastes must be further characterized and managed in accordance with NAVSEA OP 5, a copy of which has been submitted to EPA, Region III. NAVSEA OP 5 includes mandatory management practices (for example, limiting the

mass of explosives that can be handled in a given class of facility) for explosive ordnance wastes at all Navy installations.

C-3 Quality Assurance

NAVORDSTA presently uses either a Department of the Navy laboratory or a commercial laboratory under contract to CHESNAVFACENGCOM when necessary to analyze explosive and explosive/propellant-contaminated wastes.

Each laboratory is required to submit a written quality assurance plan for review and approval. A typical quality assurance plan submitted by a qualified contractor is presented in Appendix C.4.

Section: C
Revision: 0
Date: 1 November 1988

APPENDIX C.1

ANNUAL CONTROLLED HAZARDOUS SUBSTANCES REPORTS

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE STATION
INDIAN HEAD, MARYLAND 20640

IN REPLY REFER

5090
Ser 04C/16
28 January 1987

From: Commanding Officer, Naval Ordnance Station, Indian Head, MD 20640-5000
To: Commanding Officer, Naval Energy and Environmental Support Activity (Code 112), Port Hueneme, CA 93043-5014

Subj: ANNUAL HAZARDOUS WASTE REPORT FOR CALENDAR YEAR 1986

Ref: (a) NEESA ltr 6240/10/10 Ser 112H/2343 of 30 Sep 86

Encl: (1) Completed Hazardous Waste Annual Report

1. In response to reference (a), we are submitting the completed Annual Hazardous Waste Report for calendar year 1986 as enclosure (1).

2. If you have any questions, please contact Mr. Thomas H. Woo on Autovon 364-4320.

J. VOLMAN
By direction

Copy to:
CHESDIV 114
NAVSEA 06G1:2E

1358D

1986 HAZARDOUS WASTE ANNUAL REPORT (HWAR)

Instructions for completing and forwarding this report are provided in the HWAR Guide, NEESA 15-023*

PART A. BASIC ACTIVITY INFORMATION

---

1) UIC NUMBER: N0074

2) ACTIVITY NAME: NAVORDSTA, Indian Head, Maryland

3) HW CONTACT: Thomas H. Woo

4) DEPARTMENT TITLE OR CODE: 04C

5) PHONE (AV,FTS,Commercial): A/V 364-4320, Commercial (301)743-4320

6) If Hazardous Wastes from more than one activity are included in this report, list the activities covered by this report:

ACTIVITIES INCLUDED IN REPORT	UIC NUMBER
o	
o	
o	
o	
o	

NOTE: Items in BOLD FACE are defined in the HWAR Guide, NEESA 15-023 Glossary

* NEESA 15-023 available from: Naval Energy and Environmental Support Activity, Code 112H, Port Hueneme, CA 93043, (305) 982-4504, A/V 360-4504, FTS 779-4504

PART B. HAZARDOUS WASTE MANAGEMENT INFORMATION

SECTION 1 ++++++++++ REGULATORY PERMITS AND INSPECTIONS ++++++++++++++++++++

a) RCRA HW GENERATOR IDENTIFICATION NUMBER: MD4 17 002 4109

Name of Activity holding ID number: NAVORDSTA, Indian Head, Maryland

b) RCRA TSD PERMIT NUMBER: A-233 (State of Maryland number)

Name of Activity holding TSD Permit: NAVORDSTA, Indian Head, Maryland

c) RCRA TSD PERMIT STATUS:

	(Circle yes or no)		TYPE OF PERMIT (Circle all that apply)
Part A Permit RECEIVED:	NO (YES)	DATE: 04 / 30 / 82	(T) (S) D
Part B Permit APPLIED FOR:	NO (YES)	DATE: 07 / 26 / 86	T (S) D
Part B Permit RECEIVED:	(NO) YES	DATE: ___/___/___	T S D

OTHER HW TREATMENT, STORAGE OR DISPOSAL PERMITS (Non-RCRA):

Permit Number	Type of Permit	Issuing Agency
o		
o		
o		

e) DOES ACTIVITY HAVE A STATE WASTE HAULER'S PERMIT? (Circle one) YES (NO)

f) NUMBER OF HW EXCEPTION REPORTS FILED AND CURRENT STATUS: None

g) NUMBER OF HW REGULATORY INSPECTIONS RECEIVED CY 86 : 2
Number of Inspections

FOR EACH INSPECTION, LIST (on separate sheet of paper): DATE, INSPECTING ORGANIZATION, SUMMARY OF FINDINGS, RESULTING LAWSUITS, HW NON-COMPLIANCE NOTICES, OR NOTICES OF VIOLATIONS (NOVs) RECEIVED (and RESOLVED) BY THE ACTIVITY. (Copies of inspection report summaries may be attached in lieu of write-up.) See attached copies of inspection reports.

INCLUDE THE CURRENT STATUS OR PLANS TO CORRECT THE IDENTIFIED DEFICIENCIES.

PART B (Continued)

SECTION 2 ++++++++++++++++++++++ GENERATION ++++++++++++++++++++++++++++++++

GENERATOR CLASS:

	CLASS I Generates or accumulates 1000 kg or more HW or 1 kg or more acute HW per month	CLASS II Generates or accumulates 100-1000 kg HW and less than 1 kg acute HW per month	CLASS III Generates or accumulates less than 100 kg HW and less than 1 kg acute HW per month
(Check one)	[X]	[ ]	[ ]

SECTION 3 ++++++++++++++++ TREATMENT ++

List and briefly describe all Navy-owned treatment facilities that have RCRA HW permits.

Three thermal treatment sites for open burning of ordnance waste, pyrotechnics, and explosive contaminated waste.

PART B (Continued)

SECTION C ++++++++++++++++++++ STORAGE ++++++++++++++++++++++++++++++++

a) Indicate activity storage facility type(s) by checking all that apply.

1. Satellite accumulation points (less than 55 gallons/site) |X|

2. Less than 90 day storage |X|

3. Permitted RCRA (Part A or Part B) storage facility |X|
For each permitted area or building, list the building number or a description of the area:

Building 359 - Open-air diked storage area--Hazardous waste

Building 1440 - Polychlorinated biphenyl (PCB) storage facility

4. Storage by another activity |_|

Give the name and UIC number of the activity _____

5. Storage at DRMO |_|

b) If boxes 1, 2 or 3 were checked, do those storage facilities conform to EPA HW storage requirements?

(check one) YES |X| NO |_|

(Refer to Table I-1 of the HWAR Guide, NEESA 15-023 for conforming storage criteria.)

If "no", list all areas of non-conformance.

PART B (Continued)

SECTION 5 ********** DOCUMENT STATUS **********

DOCUMENT	REQUIRED?* (Circle one)	DATE COMPLETED
Hazardous Waste Management Plan (HWMP)	NO YES	4/18/86
HW Spill Contingency Plan	NO YES	7/17/86
HW Spill Prevention Control & Countermeasure Plan (SPCC)	NO YES	8/10/84
Waste Analysis Plan	NO YES	7/26/85
Inspection Schedule	NO YES	7/26/85
Training Program	NO YES	7/26/85
Groundwater Quality Assessment Program Outline .	NO YES	NA
Groundwater Monitoring Program	NO YES	NA
Closure Plan	NO YES	7/26/85
Post-closure Plan	NO YES	7/26/85

* See Table I-2 of the HWAR Guide, NEESA 15-023, for a summary of required documents.

SECTION 6 ********** COSTS **********

a) ANNUAL HW MANAGEMENT COSTS FOR CY (if none, so state):

Treatment	$ 235,000
Storage	$ 91,000
Disposal	$ 10,000
O&M	$ 376,000
Other	$ 23,000
TOTAL COSTS	$ 735,000

b) PERSONNEL: 5½ (Labor years)

PART C. HAZARDOUS WASTE RECYCLING

1) DOES ACTIVITY HAVE A RECYCLING PROGRAM? (Circle one)
(If "no", skip the remainder of Part C.) (YES) NO

2) DOES THE RECYCLING PROGRAM MEET THE REQUIREMENTS OF A QUALIFIED RECYCLING PROGRAM? (YES) NO

3) DOES ACTIVITY HAVE A USED SOLVENT ELIMINATION (USE) PROGRAM? *(YES) NO

If "yes", are solvents recycled/replaced by:

- o On-site Distillation YES NO
- o Organic Solvents Replaced by Water Compounds YES NO
- o Solvent Rental YES NO
- o Off-site Recycling YES NO
- o Other Method (Specify) _____ YES NO

If "yes", list quantities of solvents recycled or replaced in Question 6 of Part C.

4) DOES ACTIVITY HAVE A USED OIL RECYCLING PROGRAM? (YES) NO

If "yes", specify quantity of used oil recycled by each of the following methods:

- o Re-refining On-site: _____ Gallons
- o Re-refining Off-site: _____ Gallons
- o Burning: _____ Gallons
  Specify quantity of virgin fuel mixed with used oil: _____ Gallons
- o Sold: _____ Gallons
- o Reutilized by DOD Facilities: _____ Gallons
- o Transferred to Non-DOD Federal Agencies: _____ Gallons
- o Donated to Non-federal Agencies: _____ Gallons

*We are conducting a study of our plan.

PART C. (Continued)

5) RECYCLING REVENUES RECEIVED BY ACTIVITY:

Recycling Program	ST $)	Gross Revenues ($)	Savings ($)	Net Revenues (Net=Gross - Cost + Savings) ($)
Used Oil				
Used Solvent Elimination (USE)				
Other Programs (Specify)	$18,000 *			$18,000
TOTAL				

*Precious metal recovery from the hypo solution and the silver-contaminated cartridges.

6) HAZARDOUS WASTE RECYCLED: (Use separate sheet of paper if needed)

EPA OR DOT #	MATERIAL* NAME	QUANTITY (Gallons-G or Pounds-P)	USE Program (Y or N)	RECYCLING METHOD
D011	Spent hypo solution	3,200G	N	Electrolysis

* Do not include the recycled used oil summarized in Question 4 of Part C.

READ THE INSTRUCTIONS IN THE HWAR GUIDE BEFORE COMPLETING PART D

NAME AND UIC NUMBER OF GENERATOR NAVORDSTA, Indian Head, MD N00174
(If Lead Activity is submitting Part D for other activities, complete a separate page for each activity listed as generating HW).

WASTE STATUS CODES

N - On-site
F - Off-site (Contractor or another activity)
A - DRMO Accountable
C - DRMO Custody

ABBREVIATIONS FOR UNITS

Pounds - P
Gallons - G
Tons - T
Kilograms - K
Cubic Feet - F
Cubic Yards - Y

WASTE IDENTIFICATION		WASTE ORIGIN		WASTE STATUS as of 31 Dec CY					
WASTE ID NUMBER (EPA or DOT)	WASTE DESCRIPTION	QUANTITY GENERATED In Report CY (Specify Units)	QUANTITY BACKLOGGED From Previous CY (Specify Units)	QUANTITY STORED (Specify Units)	STORAGE STATUS CODE (N,F,A, or C)	QUANTITY TREATED (Specify Units)	TRMT. STATUS CODE (N,F, A or C)	QUANTITY DISPOSED OF (Specify Units)	DISP STATUS CODE (N,F, A or C)
[redacted]	Explosive-contaminated metals, boxes and equipment.	1,760,000P				1,760,[illegible]	[illegible]		
[redacted]	Pyrotechnics and their scrap	23,400P*				23,[illegible]	[illegible]		
[redacted]	Ordnance and its related waste	550,000P				550,000P	N		

NOTE 1: QUANTITIES GENERATED + BACKLOGGED = QUANTITIES STORED + TREATED + DISPOSED

NOTE 2: [illegible] LISTED IN PART C, QUESTION 6. [illegible] DIFFERENCE [illegible] THE HWAR [illegible]

*Included the weight of metal parts also

SEE FOLLOWING PAGE FOR BLANK PART D FORMAT PAGE

UIC Number N00174

WASTE IDENTIFICATION		WASTE ORIGIN		WASTE STATUS as of 31 Dec CY					
WASTE ID NUMBER (EPA or DOE)	WASTE DESCRIPTION	QUANTITY GENERATED In Report CY (Specify Units)	QUANTITY BACKLOGGED From Previous CY (Specify Units)	QUANTITY STORED (Specify Units)	STORAGE STATUS CODE (N,F,A, or C)	QUANTITY TREATED (Specify Units)	TRTMT. STATUS CODE (N,F, A or C)	QUANTITY DISPOSED (Specify Units)	DISP. STATUS CODE (N,F, A or C)
[redacted]	Explosive-contaminated organic solvents	2,890G				2,890G	N		
D001	Organic Solvents	5,520G		890G	A			5,520G	F
F001	Chlorinated Solvents	965G		400G	A			965G	F
M001*	Polychlorinated biphenyl transformers and PCB waste	36,720P**						36,720P**	F
D002	Paint Sludge	1,720G		550G	A			1,720G	F
D009	Dirt contaminated with mercury		112,150P					112,150P	F
D009	Mercury batteries	145P							

*Under Maryland PCB regulations, PCB is considered as a HW, and Maryland designates HW to No. M001 to it.

**This included the metal-part weight also

D008	Used sandblasting residue	3,200P						3,200P	F
D002	Hydrochloric Acid	35G						35G	F
D002	Sodium Hydroxide	73G						73G	F
D002	Tris 1-(2-methyl)-aziridinyl phosphine oxide	80G						80G	F
P-102	Sodium Azide	8P						8P	F
U-223	Formaldehyde Solution	70G						70G	F
D001	Cobalt Chloride	16P						16P	F
D001	Chromium Trioxide	64P						64P	F
NOS	Barium Acetate	57P						57P	F
D002	Trifluoroacetic Anhydride	150P						150P	F

N05	Cupric Solicylate	70G			70G	F
D008	Lead Iodide, Lead Solicylate	831P			831P	F
D001	Ethylene Glycol Monoethyl ether Acetate	50G			50G	F
D003	Potassium	300P			300P	F
D001	Polychloride Vinyl	50G			50G	F
D002	Acetic Acid contaminated with mercury	30G			30G	F
D001	Isobutyl Acetate	300P			300P	F
U223	Isocyanates	196G			196G	F
P098	Potassium Cyanide	1EI			1 P	F

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE STATION
INDIAN HEAD, MARYLAND 20640

IN REPLY REFER TO

5090
Ser 34
14 April 1986

Mr. Thomas C. Battle, Head
Technical Support Section, Hazardous Waste Division
OEP, Department of Health and Mental Hygiene
201 West Preston Street
Baltimore, MD 21201

Dear Mr. Battle:

The following information is forwarded in response to your letter requesting an annual report on material shipped under EPA Identification Number MD7 17 002 4684. This letter confirms the information provided by Ms. Leslie Potter of my staff during a telephone conversation with Mr. John Haus on 2 April 1986.

Our 1985 Annual Hazardous Waste Report, enclosure (1), reflects all hazardous wastes generated and shipped off-site from the Naval Ordnance Station (NAVORDSTA) for the calendar year 1985.

Please note that our Environmental Protection Agency (EPA) Identification Number (ID) has been changed from MD7 17 002 4684 to MD4 17 002 4109 by EPA Region III. Enclosure (2) is a copy of the letter from EPA Region III concerning the change.

Manifests MDC 0037273 and MDC 0044585 were issued prior to the change of our ID number and were identified by the old EPA ID Number. The items accounted for in these two manifests were PCB transformers and PCB-contaminated waste generated from NAVORDSTA and shipped to PCB Incorporated of Missouri on January 16 and 17, 1985. This information is included on page 2 of 7 of enclosure (1) for the generator under our new EPA ID Number.

If you have any questions, please contact Mr. Thomas H. Woo or Ms. Lydia Chang of this command at (301)743-4320.

Sincerely,

J. VOLMAN
Head, Safety Department
By direction of the
Commanding Officer

Encl:
(1) 1985 Annual Hazardous Waste Report
(2) EPA Region III letter of 13 Dec 84

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE STATION
INDIAN HEAD, MARYLAND 20640

IN REPLY REFER TO

5090
Ser 04C/24
26 February 1986

Mr. Ronald Nelson, Director
Waste Management Administration
Department of Health and Mental Hygiene
201 West Preston Street
Baltimore, MD 21201

Dear Mr. Nelson:

Enclosed are the completed Generator and Facility Annual Hazardous Waste Report, and the State's Hazardous Waste Generator Waste Reduction Program questionnaire for calendar year 1985.

If there are any questions, please contact Mr. Thomas H. Woo of this command at (301)743-4320.

Sincerely,

J. VOLMAN
Head, Safety Department
By direction of the
Commanding Officer

Encl:
(1) Generator and Facility Annual Hazardous Waste Report
(2) State's Hazardous Waste Generator Waste Reduction Program questionnaire

Enclosure (1)

Do not make entries in shaded areas — OMB No. 2050-0028 Expires 1-31-87

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

GENERATOR ANNUAL HAZARDOUS WASTE REPORT

This report is for the calendar year ending December 31, 1985

AFFIX LABEL HERE

Please print/type with elite type (12 characters per inch)

GENERAL INSTRUCTIONS: If you received a preprinted label attached to the mailing envelope in which this form was enclosed, affix it in the space provided. If any of the information on the label is incorrect, draw a line through it and provide the correct information in the appropriate section below. If the information is correct and complete, leave Sections I, II, and III below blank. If you did not receive a preprinted label, complete all sections. REFER TO THE SPECIFIC INSTRUCTIONS CONTAINED IN THIS BOOKLET BEFORE COMPLETING THIS FORM. The information requested in this report is required by law (Section 3002 of the Resource Conservation Recovery Act).

I. GENERATOR'S EPA I.D. NUMBER

T/A/C

[F] MD | 4 | 7 | 00 | 24 | 10 | 9 | [T] (1 2 — 13 14 15)

II. NAME OF INSTALLATION

N | AV | A | L | OR | DN | AN | CE | S | T | A | T | ON (15 — 69)

III. INSTALLATION MAILING ADDRESS

[3] RIO | U | T | E | 2 | 1 | 0 (15 16 — 45)

Street or P.O. Box

[4] I | ND | IA | N | H | E | A | D | MD | 2 | 0 | 6 | 40 | -5000 (15 16 — 41 42 | 47 — 51)

City or Town — State — Zip Code

IV. LOCATION OF INSTALLATION (if different than section III above)

[5] (15 16 — 45)

Street or Route number

[6] (15 16 — 41 42 | 47 — 51)

City or Town — State — Zip Code

V. INSTALLATION CONTACT

[2] W | OO | T | H | O | M | A | S | (15 16 — 45)

Name (last and first)

[3] 0 | 1 | — | 7 | 4 | 3 | — | 4 | 3 | 2 | 0 (46 — 55)

Phone No. (area code & no.)

VI. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

J. VOLMAN — Head, Safety Department — 2/27/86

Print/Type Name — Title — Signature of Authorized Representative — Date Signed

EPA Form 8700-13A/S-80 (Revised 10-82)

not make entries in shaded areas

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

C M D 4 1 7 0 0 2 4 1 0 9 (M A C)

VIII. FACILITY NAME (Identify facility to which all wastes on this page were shipped)

PCB Incorporated of Missouri

IX. FACILITY'S EPA I.D. NO.

F M O D 9 8 0 6 3 0 4 4

X. FACILITY ADDRESS

2100 Wyandotte, Kansas City
MO 64108

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification number of all transporters whose services were used during 1985. This section to be completed only once. Do not repeat on supplemental sheets.)

HAZMAT Environmental, EPA ID No. NYD 980769947

XII. WASTE IDENTIFICATION

Sequence #	A. Description of Waste	B. DOT Hazard Class	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	PCB transformers and PCB contaminated waste	1.5	M O 1 0 2 4 8	8 0 2 8 7	P
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

XIII. COMMENTS (Enter information by section number—see instructions)

not make entries in shaded areas

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

MAC
C M D 0 4 1 7 0 0 2 4 1 0 9 1
1 2 11 14 15

VIII. FACILITY NAME (specify facility to which all wastes on this page were shipped)

Fondessy Enterprises, Inc.

IX. FACILITY'S EPA I.D. NO.

F O H D 0 4 5 2 4 3 7 0 6
16 28

X. FACILITY ADDRESS

876 Otter Creek Road
Oregon, Ohio 43616

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification number of all transporters whose services were used during 1985. This section is to be completed only once. Do not repeat on supplemental sheets.)

Delaware Container Co., EPA ID No. PAD 064375470

XII. WASTE IDENTIFICATION

Sequence #	No.	A. Description of Waste	B. DOT Hazard Class	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
	1	Soil contaminated with mercury	15	D009	86880	P
	2					
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					

XIII. COMMENTS (enter information by section number—see instructions)

not make entries in shaded areas

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

C M D 0 4 1 7 0 0 2 4 1 0 9 1 1

VIII. FACILITY NAME

S&W Waste Inc.

IX. FACILITY'S EPA I.D. NO.

F N J D 9 9 1 2 9 1 1 1 0 5

X. FACILITY ADDRESS

115 Jaoobus Ave.
South Kearny, NJ 07032

XI. TRANSPORTATION SERVICES USED

Delaware Container Co., EPA ID No. PAD 064375470
S&W Waste Inc., EPA ID No. NJD 991291105

XII. WASTE IDENTIFICATION

Sequence #	A. Description of Waste	B. DOT Hazard Class	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Waste Lithium Batteries	*	D003	1 5.8	P
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

XIII. COMMENTS

* DOT Hazard class for Lithium Battery is ORM-C, which doesn't have a corresponding DOT Hazard code.

not make entries in shaded areas

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

C M D 4 1 7 0 2 4 1 0 9 1 (PAC)

VIII. FACILITY NAME (Specify facility to which all wastes on this page were shipped)

GSX Services

IX. FACILITY'S EPA I.D. NO.

F M D 0 9 8 0 5 5 4 5 5 3

X. FACILITY ADDRESS

3527 Whiskey Bottom Road
Laurel, MD 20707

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification number of all transporters whose services were used during 1985. This section is considered optional. Do not repeat on supplemental sheets.)

Delaware Container Co., EPA ID No. PAD 064375470

XII. WASTE IDENTIFICATION

Sequence #	A. Description of Waste	B. DOT Hazard Class	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Soil contaminated with mercury	1.5	D009	30.00	P
2	Waste Perchloric Phthalate	1.5	U102	545	P
3	Waste Perchloric Acid, 10%	1.6	D002	292	P
4					
5					
6					
7					
8					
9					
10					
11					
12					

XIII. COMMENTS (Enter information by sequence number. See instructions)

not make entries in shaded areas

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

C M D 4 1 7 0 0 2 4 1 0 9 (N A C)

VIII. FACILITY NAME (Identify facility to which all wastes on this page were shipped)

Waste Conversion Inc.

IX. FACILITY'S EPA I.D. NO.

P A D 0 8 5 6 9 0 5 9 2

X. FACILITY ADDRESS

2869 Sandstone Dr.
Hatfield, PA 19440

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification number of all transporters whose services were used during 1985. This section is to be completed only once. Do not repeat on supplemental sheets.)

Delaware Container Co., EPA ID No. PAD 064375470

XII. WASTE IDENTIFICATION

Sequence #	A. Description of Waste	B. DOT Hazard Class	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Waste Ammonium Hydroxide Solution, 37%	0 2	D 0 0 2	1 5 0 0	P
2	Waste Morpholine	0 8	D 0 0 1	3 8 4	P
3	Waste Phosphoric Acid, 85%	0 2	D 0 0 2	3	P
4	Waste Phosphoric Anhydride	0 2	D 0 0 2	.4	P
5	Waste Phosphorous Acid	0 2	D 0 0 2	3	P
6					
7					
8					
9					
10					
11					
12					

XIII. COMMENTS (enter information by section number—see instructions)

not make entries in shaded areas

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

Generator Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1985

Date rec'd: _____ Rec'd by: _____

VII. GENERATOR'S EPA I.D. NO.

C MD 4 17 0 0 24 1 0 9 DAC 1

VIII. FACILITY NAME (Identify facility to which all wastes on this page were shipped)

Delaware Container Co.

IX. FACILITY'S EPA I.D. NO.

F PA D 0 6 4 3 7 5 4 7 0

X. FACILITY ADDRESS

W. 11th Ave. & Valley Rd.
Coatesville, PA 19320

XI. TRANSPORTATION SERVICES USED (List the name and EPA identification number of all transporters whose services were used during 1985. This section is to be completed only once. Do not repeat on supplemental sheets.)

Delaware Container Co., EPA ID No. PAD 064375470

XII. WASTE IDENTIFICATION

Sequence #	A. Description of Waste	B. DOT Hazard Class	C. EPA Hazardous Waste No. (see instructions)	D. Amount of Waste	E. Unit of Measure
1	Acetone Waste	08	D001 F002 P003	16000	P
2	Cleaning Compound (Agitene)	08	D001	1040	P
3	Dioctyl Adipate Waste	15	NONE	460	P
4	Ethyl Alcohol Waste	08	D001	180	P
5	Isopropanol Waste	08	D001	730	P
6	Methylene Chloride Waste	13	F002	1840	P
7	Paint Sludge	02	D002 D007	5960	P
8	Perchloroethylene Waste	08	D001	4590	P
9	Petroleum Distillate	08	D001 D002	2750	P
10	Toluene Diisocyanate	15	D003	460	P
11	Trichloroethylene Waste	08	D001 F001	4705	P
12	Trichloroethylene Waste	15	F001	22800	P

XIII. COMMENTS (enter information by section number—see instructions)

Do not make entries in shaded are

OMB #: 2050-0035 Expires: 1-31-83

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

FACILITY ANNUAL HAZARDOUS WASTE REPORT

This report is for the calendar year ending December 31, 1985

AFFIX LABEL HERE

Please print/type with elite type (12 characters per inch)

GENERAL INSTRUCTIONS: If you received a preprinted label attached to the mailing envelope in which this form was enclosed, affix it in the space provided. If any of the information on the label is incorrect, draw a line through it and provide the correct information in the appropriate section below. If the information is correct and complete, leave Sections I, II, and III below blank. If you did not receive a preprinted label, complete all sections. REFER TO THE SPECIFIC INSTRUCTIONS CONTAINED IN THIS BOOKLET BEFORE COMPLETING THIS FORM. The information requested in this report is required by law (Section 3004 of the Resource Conservation Recovery Act).

Tear out here

I. FACILITY EPA I.D. NUMBER

T/A C

F M D 0 4 1 7 0 0 2 4 1 0 9 1

(1 2 ... 13 14 15)

II. NAME OF FACILITY

N A V A L O R D N A N C E S T A T I O N

(30 ... 69)

III. FACILITY MAILING ADDRESS

3 R O U T E 2 1 0

(15 16 ... 45)

Street or P.O. Box

4 I N D I A N H E A D | M D | 2 0 6 4 0 - 5000

(15 16 ... 41 42 | 47 ... 51)

City or Town | State | Zip Code

IV. LOCATION OF FACILITY (if different than section III above)

5

(15 16 ... 45)

Street or Route number

6

(15 16 ... 41 42 | 47 ... 51)

City or Town | State | Zip Code

V. FACILITY CONTACT

2 W O O T H O M A S

(15 16 ... 45)

Name (last and first)

VI. COST ESTIMATES FOR FACILITIES

3 0 1 - 7 4 3 - 4 3 2 0

(40 ... 55)

Phone No. (area code & no.)

$ 7 0 0 0 0

(16 ... 19 ... 22)

Cost Estimate for Facility Closure

$ N A

(25 ... 28 ... 31)

Cost Estimate for Post Closure Monitoring and Maintenance (original facilities only)

VII. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

J. VOLMAN	Head, Safety Department		2/27/86
Print/Type Name	Title	Signature of Authorized Representative	Date Signed

EPA Form 8700-13B(5-80) (Revised 10-82)

Do not make entries in shaded are

MARYLAND OFFICE OF ENVIRONMENTAL PROGRAMS

Facility Annual Hazardous Waste Report (cont.)

This report is for the calendar year ending December 31, 1985

VIII. FACILITY'S EPA I.D. NO.

F A C

F M D 4 1 7 0 0 2 4 1 0 9 1 1

1 2 13 14 15

Date received: _____

Received by: _____

IX. GENERATOR'S EPA I.D. NO.

G

10 28

X. GENERATOR NAME (Specify generator from whom all wastes on this page were received)

XI. GENERATOR ADDRESS

XII. WASTE IDENTIFICATION

Sequence #	Line #	A. Description of Waste	B. EPA Hazardous Waste No. (see instructions)	C. Handling Method	D. Amount of Waste	E. Unit of Measure
	1	Methyl Ethyl Ketone Peroxide	U 2 1 8 0	S 0 1	1 2 5	P
	2	Ordnance Waste & Ordnance Contaminated Waste	D 0 0 3	T 1 8	8 6 9 7 0 0	P
	3	Paint Sludge	D 0 0 2 D 0 0 7	S 0 1	1 2 0 0 0	P
	4	Petroleum Distillate	D 0 0 1	S 0 1	1 9 6 0	P
	5	PCB-contaminated Waste	U 2 4 8	S 0 1	1 4 0 5	P
	6	PCB Transformers & PCB-Contaminated Transformers	M 0 0 1 U 2 4 8	S 0 1	2 4 9 8 8	P
	7	Spent Halogenated Solvent	F 0 0 1 F 0 0 2 0 0 8 0	S 0 1	7 0 0 0	P
	8	Spent Non-halogenated Solvent	D 0 0 1	S 0 1	3 6 0 0 0	P
	9	Soil Contaminated with Mercury	D 0 0 9	S 0 1	8 5 0 0 0	P
	10	Sulfuric Acid Contaminated with Mercury	D 0 0 2 D 0 0 9	S 0 1	2 9 0	P
	11					
	12					

XIII. COMMENTS (enter information by section number—see instructions)

*Thermally treated by Open burning.

OFFICE OF ENVIRONMENTAL PROGRAMS
WASTE MANAGEMENT ADMINISTRATION

Hazardous Waste Generator Waste Reduction Program

-Please complete both sides-

Company: Naval Ordnance Station (Name) MD4170024109 (EPA ID number)

Mailing Address: Route 210 (Street) Indian Head, MD 20640-5000 (City, Zip code)

Location of Generator Site: _____ (if different from mailing address)

Contact Person: Thomas H. Woo (Name) (301) 743-4320 (Telephone number)

Thomas H Woo (Signature) Pollution Abatement Coordinator (Title)

Please provide information about your company's hazardous waste minimization program. (If more space is needed, please answer on a separate sheet of paper and attach it to the questionnaire)

1. Separation

Is your company's waste collection system designed to decrease the volume of hazardous waste by keeping hazardous waste separate from non-hazardous waste?

Yes ☒ No ☐

If yes, has the system been improved in the past year to further reduce the amount of hazardous waste?

Yes ☒ No ☐

What reduction in volume was achieved in the last year?

We have reduced ordnance waste and ordnance-contaminated waste by 150,000 lbs. as compared with 1984.

2. Substitution

Has your company substituted a hazardous material with a non-hazardous or less hazardous material to reduce either the amount or toxicity of hazardous waste generated by your operation?

Yes ☐ No ☒

If yes, when was the substitute introduced, and to what extent has it reduced the toxicity or amount of hazardous waste generated in the last year?

3. Efficiency

Has your company improved the efficiency of operations so as to reduce the amount of hazardous waste generated?

Yes ☒ No ☐

If yes, please describe it briefly and state when it was instituted.

In August 1985, we installed a two-chamber ultrasonic liquid-spray-vapor degreaser to maximize the usage life of perchloroethylene as a degreasing agent.

What amount of waste reduction was achieved in the last year?

We reduced approximately 1,300 gal of perchloroethylene.

4. Recycling on-site

Does your company's waste reduction program include a hazardous waste recycling operation on-site?

Yes ☐ No ☒

If yes, please briefly describe the recycling operation and state when it was instituted.

What amount of waste reduction was achieved in the last year?

5. Treatment on-site

Does your company's hazardous waste reduction program include on site waste treatment which minimizes the toxicity or amount of hazardous waste generated?

Yes ☒ No ☐

If yes, please briefly describe the treatment operation and state when it was instituted.

Since 1971, we began to neutralize spent mixed acid (sulfuric & nitric acids) before discharging.

To what extent has the treatment operation reduced toxicity or reduced the amount of hazardous waste generated in the past year?

In 1985, we neutralized 583,700 lbs. of spent mixed acid in wastewater before discharging.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

DEC 13 1984

Mr. Thomas Woo
Naval Ordinance Station
Code E2
Indian Head, MD 20640

Re: EPA Identification Number
Facility Location: Route 210 Indian Head Hwy.
Indian Head, MD 20640

Dear Mr. Woo:

This letter is to inform you that an inadvertent error was made in the assignment of your permanent EPA I.D. number MD7 17 002 4684 issued on 12/22/81.

Since that same I.D. number was correctly assigned to a Federal facility in another State, it is necessary for EPA to change your facility's number. Effective immediately the new EPA I.D. number assigned to your facility is MD4 17 002 4109.

We are sorry for any inconvenience this change may cause. If you have any questions, please contact Joanne Cassidy, a member of my staff, at 215-597-7214.

Sincerely,

Henry J. Sokolowski, Chief
Facilities Management Section

cc: MD Dept. of Health & Mental Hygiene

EXHIBIT (2)

APPENDIX C.2

COMPATIBILITY GROUP DETAILS

APPENDIX C.2

COMPATIBILITY GROUP DETAILS

GROUP 1 -- ALKALINES

1A - Acetylene sludge
1A - Alkaline wastes
1A - Lime wastes

Definitions:

Triple-bonded hydrocarbon (C_2H_2)

Bases, metal hydroxides, or carbonates that neutralize acids; e.g., sodium hydroxide (NaOH), ammonium hydroxide (NH_4OH).

Compatible with:

1, 9

Example wastes:

1. All metal hydroxides
2. Ammonium hydroxide
3. Ammonia solutions
4. Developer-alkaline
5. Sodium hydroxide

GROUP 2 -- REACTIVE METALS

2A - Aluminum metal
2A - Beryllium metal
2A - Calcium metal
2A - Lithium metal
2A - Metal hydrides
2A - Magnesium metal
2A - Potassium metal
2A - Sodium metal
2A - Zinc metal

Definitions:

Metal hydrides -- Binary hydrogen compounds where hydrogen is negative; e.g., lithium hydride (LiH).

Calcium hydride (CaH_2)

Compatible with:

2

Example wastes:

1. Metal hydrides
2. Alum
3. Lithium
4. Aluminum powder
5. Aluminum roof coating
6. Dysprosium
7. Lithium batteries
8. Magnesium
9. Mercury
10. Nickel-cadmium
11. Potassium
12. Selenium
13. Sodium
14. Tellurium

GROUP 3 -- ALCOHOLS

3A - Alcohols
3A - Aqueous mixtures

Definitions:

Alcohols -- Hydrocarbon framework with hydroxyl (-OH) bonded to it; e.g., methyl (CH_3OH) ethyl (C_2H_5OH) isopropyl (C_3H_7OH)

Compatible with:

3, 4

Example wastes:

1. All compounds ending in OL
2. Benzyl alcohol
3. Butanol
4. Ethyl alcohol
5. Karl Fisher reagent
6. Isopropanol
7. Methanol
8. 2-propanol

GROUP 4 -- HALOGENATED/NITRATED HYDROCARBONS

4A - Aldehydes
4A - Halogenated hydrocarbons
4A - Nitrated hydrocarbons
4A - Unsaturated hydrocarbons
4A - Most solvents

Definitions:

Aldehydes -- Hydrocarbon framework with carbonyl group attached; e.g., formaldehyde (CH_2O).

Halogenated hydrocarbons -- Hydrocarbons that contain chlorine; e.g., methylene chloride.

Nitrated hydrocarbons -- Hydrocarbons that contain one or more of the many nitrogen ions; e.g., nitromethane.

Most solvents -- Break down oils, grease; often have a hydrocarbon base; e.g., trichloroethylene, xylene.

Compatible with:

4, 3

Example wastes:

1. Aldehydes
2. Halogenated hydrocarbons(1)
3. Nitrated hydrocarbons
4. Unsaturated hydrocarbons
5. Most solvents
6. Chloroform(1)
7. 1,2-dichloroethane(1)
8. N-dinitrobenzene
9. Hexafluoroacetone(1)
10. Methylene chloride(1)
11. Methyl chloride(1)
12. 2-nitrodiphenylamine
13. O-nitrotoluene
14. 1,1,1-trichloroethane(1)
15. Trichloroethylene(1)
16. Varsol

(1) Fluid halogenated hydrocarbon wastes excluded from thermal treatment operations.

GROUP 5 -- CYANIDES/SULFIDES

5A - Cyanides
5A - Sulfides

Definitions:

Cyanides -- Substances that contain the cyanide ion (-CN); e.g., potassium cyanide (KCN).

Sulfides -- A binary substance that contains the divalent sulfur ion (S=); e.g., hydrogen sulfide (H_2S).

Compatible with:

5

Example wastes:

1. All cyanide compounds
2. All sulfide compounds
3. N-chlorocarbonyl isocyanate
4. Cyanide silver strike
5. Iso-foam isocyanate
6. Potassium cyanide
7. Potassium ferricyanide

GROUP 6 -- PEROXIDES AND OXIDIZERS

6A - Chlorine gas
6A - Chlorites
6A - Hypochlorites
6A - Perchlorates
6A - Chromic acid
6A - Nitrates
6A - Fuming nitric acid
6A - Permanganate
6A - Peroxides
6A - Strong oxidizers

Definitions:

Chlorites -- Substances that contain the perchlorate ion ($-ClO_2$); e.g., sodium chlorite ($NaClO_2$). Hypochlorites -- Substances that contain the chlorite ion (-ClO); e.g., calcium hypochlorite $Ca(ClO)_2$.

Perchlorates -- Substances that contain the perchlorate ion ($-ClO_4$); e.g., potassium perchlorates ($KClO_4$).

Nitrates -- Substances that contain the nitrate ion ($-NO_3$); e.g., sodium nitrate ($NaNO_3$).

Permanganates -- Substances that contain the perchlorate ion; e.g., potassium permanganate ($KMnO_4$).

Peroxides -- Oxygen in the valence state of O^-; e.g., hydrogen peroxide (H_2O_2).

Oxidizers -- Substances with an unusually strong affinity for electrons; e.g., potassium permanganate, calcium hypochlorite.

Compatible with:

6

Example wastes:

1. Oxidizers
2. Chromic acid
3. All chlorate compounds
4. All chlorite compounds
5. All dichromate compounds
6. All nitrate compounds
7. All perchlorate compounds
8. Ammonium perchlorate
9. Sulfuric acid
10. Chromium trioxide
11. Lithium nitrate
12. Magnesium perchlorate
13. Nitric acid
14. Potassium dichromate
15. Potassium nitrate
16. Sodium dichromate

GROUP 7 -- INORGANIC ACIDS AND SALTS

Compatible with:

7

Example wastes:

1. All chlorides
2. All bromides
3. All fluorides
4. All iodides
5. All sulfates
6. Aluminum chloride
7. Boron trifluoride
8. Cesium chloride
9. Cold stripper
10. Etching solution
11. Ferric chloride
12. Hydrochloric acid
13. Hydrochloric/fluoroborate acid
14. Nitric acid
15. Nitrogen trifluoride
16. Phosphoric acid
17. Potassium chloride
18. Scale-removing compound
19. Stannic chloride
20. Sulfuric acid

GROUP 8 -- ORGANIC ACIDS

Definition:

Organic acids -- Organic molecules that contain carbon and that can donate a hydrogen ion (H^+); e.g., acetic acid (CH_3COOH).

Compatible with:

8, 9

Example wastes:

Organic acids

1. Acetic acid
2. Citric acid
3. Oxalic acid
4. Sobrite fluorobate acid
5. Tartauric acid
6. Terephthalic acid

GROUP 9 -- FLAMMABLE SUBSTANCES

Compatible with:

1, 8

Definition:

Substances that exhibit a closed cup flash point less than 60°C (140°F).

Example wastes:

1. Acetone
2. Cellulose nitrate
3. Correction fluid
4. Dichlorodifluoromethanol(1)
5. Dimethyl fluoramide(1)
6. Epoxy resins, hardeners
7. Ethyl hexyl adipate
8. Ethyl silicate
9. Ethylene chloride(1)
10. Ethyl ether
11. Hexane
12. Hydrazine
13. Hydrogen
14. Iso-amyl acetate
15. Methyl trimethoxilane
16. Methylamine
17. N,N-diethyl-1,1,1-trimethylsilyamine
18. Paint
19. Paint thinner
20. Polyurethane cement
21. Polyurethane coating
22. Roof cement
23. Silicone resins and hardeners
24. Thinner dope
25. Trichlorotrifluorothane(1)
26. Toluene
27. Ethanol
28. Urethane sealer
29. Vinyl acetate
30. Xylene

(1) Fluid halogenated hydrocarbon wastes excluded from thermal treatment operations.

APPENDIX C.3

ANALYTICAL METHODS

APPENDIX C.3

ANALYTICAL METHODS

1. The tests for ignitability, corrosivity, reactivity, and EP toxicity as defined and described in 40 CFR 261.21 through 261.24.

2. Qualitative test for water reactivity and solubility of liquid wastes:

   a. Scope and application

      This method is designed as a qualitative test for the reactivity and solubility of an unknown liquid waste in water. It is designed to be a screening procedure to determine, on a qualitative basis, the reactivity of an unknown waste with water.

   b. Summary of method

      A small volume of liquid waste is added to water and the mixture observed for water miscibility, temperature exotherm, precipitation, and gas formation.

   c. Sample handling and preservation

      The sample collected for this test should be tested as soon as possible after being collected. The sample should be kept in a closed container to prevent reaction with atmospheric moisture.

   d. Interferences

      Certain water-reactive materials may require an induction time, catalyst, or heat before reactions occur.

   e. Apparatus

      - Heavy-walled glass test tubes, calibrated at 10 and 20 ml.

      - Liquid thermometer or digital thermometers and thermocouple.

      - Disposable pipettes, 10-ml volume.

f. Reagents

Distilled water or low turbidity tap water.

g. Procedure

- Pipette 10 ml of water into a test tube. The test tube should be clamped to a support and tilted at a 45° angle.
- The temperature of the water and test solution should be approximately the same. If not, allow both to equilibrate to ambient temperature.
- Slowly add 10 ml of the test sample to the test tube. The liquid should drain down the inside of the test tube and the addition stopped if an immediate reaction occurs.
- Mix the sample with a glass stirring rod and measure the temperature of the mixture.
- Turn the test tube to a vertical position.
- Observe the mixture for liquid/liquid phase separation, gas or solids formation, color, and temperature changes.

h. Report

The report should contain, at a minimum, the following information. Additional comments or other unusual observations should be included.

- Temperature change ___°C.
- Gas formation ___ (yes or no).
- Solubility with water ___ (complete, partial, insoluble).
- Precipitation ___ (yes or no).
- Waste density ___ (> water, < water).
- Other observations _____.

3. Test for water in liquid waste by Karl Fischer analysis:

a. Scope and application

This method is for the determination of water in liquid waste. The purpose of the method is to screen liquid samples that may contain high concentrations of water-soluble organic compounds, such as low molecular weight alcohols, ketones, and organic acids. An alternative to the Karl Fischer analysis would be to check the head space of the drum with a portable organic vapor detector for significant quantities of organic vapors.

b. Summary of method

A small aliquot of waste liquid is titrated with Karl Fischer reagent. The concentration of water is calculated and reported as percent water.

c. Sample handling and preservation

The samples should be stored in closed containers prior to testing.

d. Interferences

There are several known compounds and classes of compounds that will interfere with the test by reacting with one or more of the components in the Karl Fischer reagent. High concentrations of certain reducing and oxidizing agents will bias the test results.

e. Apparatus

- Karl Fischer test apparatus are available from several manufacturers. Most laboratory supply houses stock automated, semiautomated, and manual instruments. The instrument selected should have an electrometric end point detector, since highly colored samples would interfere with a colorimetric end point detection.

- Syringes -- 50 ml.

f. Reagents

- Karl Fischer reagent (methanol solution 1 ml to 5 ml H_2O).
- Methanol -- water-free.

g. Procedure

The procedure used will be determined by the apparatus selected. The manufacturer's instructions should be used where applicable. Generally, the sample size used should be 50 ml.

h. Calibration

The Karl Fischer reagent is standardized by titrating 50 ml of water with the reagent. The standardization factor is calculated using the following equation:

$$\text{Standard factor } K = \frac{B}{A} \times 100$$

Where: B = ml of water (normally 50 ml).
A = Volume of Karl Fischer reagent, ml.

i. Calculations

Calculate the percentage of water in the sample using the following equation:

$$\% \text{ water} = \frac{A \times K}{B}$$

Where: A = ml of Karl Fischer reagent.
B = ml of sample.
K = Standard factor.

j. Report

Report as apparent percent water.

4. Test for pH in liquid wastes:

a. Scope and application

This test method is applicable to wastes that are primarily aqueous.

b. Summary of method

- The pH of a sample that is known to be primarily aqueous is measured with an electronic pH meter.

- The pH of a sample is determined by using pH test strips.

c. Interferences

- The pH of a solution normally refers to the hydrogen ion activity in aqueous samples. High concentrations of organic matter may yield results that will lead to erroneous interpretation of the true sample acidity.

- Indicator papers are available that may be used as spot tests. Highly colored matter in the sample can interfere with this test. The presence of strong oxidizing or reducing agents may also cause interferences.

d. Sample handling and preservation

The pH is normally determined directly on aqueous samples in the field.

e. Apparatus

- An electronic pH meter with temperature compensation adjustment and appropriate electrodes.

- Indicator strips are available from several commercial sources which cover the pH range of interest.

f. Procedure

- Electronic pH measurements -- The unit is calibrated using the manufacturer's instructions. The electrode is immersed in the sample and the pH reading read directly from a meter or digital display.

- Indicator papers -- The indicator strip is either immersed in the sampled or a drop of the sample is placed on the test strip. The color developed is compared to a standard color chart supplied with the test package.

g. Report

Report as pH and specify the method used.

5. Qualitative test for cyanide in liquid wastes:

a. Scope and application

This test method is a qualitative test for the determination of cyanide in liquid waste.

b. Summary of method

Samples are neutralized and treated with Chloramine-T to convert cyanide to cyanogen chloride. A pyridine-barbituric acid reagent reacts with the cyanogen chloride to produce a pink to red color.

c. Interferences

Oxidizing agents destroy most of the cyanide during storage. Iron-based cyanide complexes will not be detected by this test. Thiocyanate will give a positive interference.

d. Sample handling and preservation

The sample pH should be adjusted to greater than 12 with NaOH to prevent loss of HCN gas.

e. Apparatus

- Porcelain spot plate with 6 to 12 cavities.
- Dropping pipettes.
- Glass stirring rods.

f. Reagents

- Chloramine-T solution -- Dissolve 1.0 g white, water-soluble pyridine-barbituric in 100 ml distilled water. Prepare weekly and store in a refrigerator.

- Pyridine-barbituric acid reagent -- Place 15 g white, water-soluble pyridine-barbituric powder in 100 ml distilled water. Prepare weekly and store in a refrigerator.

- Hydrochloric acid, HCl, 1 + 9 -- Add 10 ml of concentrated HCl to 50 ml distilled water and mix. Add an additional 40 ml water to make a total of 100 ml.

- Sodium carbonate, Na_2CO_3, anhydrous.

- Phenolphthalein indicator solution.

g. Procedure

- Dilute 1 ml of the solution to 10 ml with distilled water. Add approximately 100 mg Na_2CO_3 to the solution and swirl to dissolve.

- Add one drop of phenolphthalein indicator, then add HCl 1 + 9 dropwise with contant swirling until the solution becomes colorless.

- Place three drops of the sample and three drops of distilled water in separate cavities of a white spot plate.

- To each cavity, add one drop of Chloramine-T solution and mix with a clean stirring rod.

- Add one drop of pyridine-barbituric acid solution to each cavity and again mix.

- After 1 minute, the sample spot will turn pink to red if 0.5 mg/L or more of CN is present. The blank spot should be faint yellow.

h. Calculations

No calculations are required.

i. Report

Report the results as positive or negative CN.

6. Qualitative test for sulfide in liquid wastes:

a. Scope and application

This method is for the qualitative determination of sulfide in liquid wastes.

b. Summary of method

- Potassium antimony tartrate is added to an acidified waste sample. Yellow Sb_2S_3 is formed if sulfide is present.

- Lead acetate paper is suspended above an acidified sample of waste. The paper becomes blackened by the formation of PbS if sulfide is present.

c. Sample handling and preservation

The sample should be kept in a closed container prior to testing.

d. Interferences

Lead sulfide and other metallic sulfides may not dissolve sufficiently in the acid solution to release H_2S.

e. Apparatus

- Glassware, such as test tubes or small glass beakers, should be used as a reaction vessel.

- pH meter or pH test strips.

f. Reagents

- Potassium antimony tartrate -- Prepare a saturated solution of potassium tartrate by mixing 10 g of the salt with 100 ml of distilled water.
- Hydrochloric acid -- Concentrated.
- Lead acetate paper test strips.

g. Procedure

- Antimony test.
  - . Add 20 ml of distilled water to test tube (or beaker), then add 1 ml of the test sample and mix.
  - . Adjust the pH of the mixture to 7 using NaOH, then add 0.5 ml of concentrated HCl.
  - . Add potassium antimony tartrate dropwise (5 to 10 drops). A yellow precipitate of Sb_2S_3 indicates the presence of sulfide.
- Lead acetate test.
  - . Add 20 ml of distilled water to a test tube (or beaker), then add 1 ml of the test sample and mix.
  - . Adjust the pH of the mixture to 7 using NaOH, then add 0.5 ml of concentrated HCl.
  - . Suspend a lead acetate test strip above the liquid and cover the reaction vessel. A slotted stopper may be used if the reaction vessel is a test tube or a watch glass if a beaker is used; allow 30 minutes for the color to develop.
  - . The test strip will turn brown or black as the lead reacts with H_2S to form PbS.

h. Calculations

This test is a qualitative test for sulfide. No calculations are required.

i. Report

Report positive or negative sulfide.

7. Test for organic halogen in liquid wastes:

a. Scope and application

This method is for the determination of organic halogen in liquid waste samples after reduction to the halide ion by sodium biphenyl reagent. The halide ion is determined by potentiometric titration.

b. Summary of method

A sample of waste is added to a known volume of toluene. The toluene solution is extracted with 3N nitric acid to remove ionic halides. An aliquot of the solution is transferred to a separatory funnel and reacted with sodium biphenyl reagent to reduce the organic halogen to the halide ion. The halide ion is titrated with standard silver nitrate.

c. Sample handling and preservation

The samples should be stored in a closed container prior to testing.

d. Interferences

- Organic halogens subject to hydrolysis may react with the 3N nitric extraction.
- Halogenated organic compounds that are insoluble in toluene cannot be quantitatively determined.

e. Apparatus

- 125 ml separatory funnels, pipettes, and other glassware normally used in an analytical laboratory.

- Electronic voltmeter, to measure the potential difference between the electrodes. A pH meter may be converted to this use by substitution of the appropriate electrodes.

f. Reagents

- Sodium biphenyl reagent -- Sodium biphenyl reagent may be purchased from a specialty chemical supplier.

- Toluene -- Reagent grade, halogen free.

- Silver nitrate, 0.01N -- Dissolve 1.7 g $AgNO_3$ in 1,000 ml of distilled water. Standardize this solution against a standard NaCl solution.

- Stock sodium chloride solution, 0.1N -- Dissolve 5.845 g NaCl in 1,000 ml of distilled water.

- Standard sodium chloride solution, 0.01N -- Dilute 10 ml of the 0.1N NaCl standard to 100 ml in a 100-ml volumetric flask.

g. Procedure

- Sodium biphenyl reaction.

  . Add 50 ml of toluene to a 125-ml separatory funnel.

  . Add a small volume of the waste sample to the toluene. A 5 ml aliquot of sample usually will be sufficient. If the sample is suspected of containing a high concentration of organic halogen, 1 ml of sample should be used.

- Add 20 ml of 3N HNO_3 to the sample and shake. Allow the water layer to separate, then drain off and discard the aqueous liquid. Repeat this extraction a second time and discard the aqueous liquid.

- Transfer an aliquot of the toluene to another 125 ml separatory funnel. A 25-ml aliquot should be transferred if the sample is expected to contain less than 1 percent halogen. Smaller volumes should be selected for samples containing greater than 1 percent halogen. Add sufficient reagent grade toluene to the separatory funnel to allow mixing of the biphenyl reagent.

- Add sodium biphenyl reagent in 10-ml increments and mix until a dark blue/green color remains in the solution.

- Add 20 ml of distilled water to the separatory funnel. An exothermic reaction may occur at this point as the excess sodium biphenyl reacts with water. Mix the contents of the separatory funnel without capping, until the green color disappears.

- Drain the aqueous layer into a glass beaker.

- Add 20 ml of 3N nitric acid to the separatory funnel and shake for approximately 30 seconds. Combine the aqueous layer with the sample drawn in the third step in item "g." Repeat the nitric acid extraction.

- Titrate the three combined extracts using 0.01N silver nitrate.

- Titration

  - The various instruments that can be used in this determination differ in operating details. The manufacturer's instructions should be used if an automatic recording titrator is available. A pH meter may be used to follow a manual titration.

- Add 2 ml of concentrated HNO_3 to the test solution. Place a magnetic stirring rod and electrodes in the solution and start the stirrer.

- Set the instrument to the desired range of mV or pH units.

- Add standard $AgNO_3$ titrant, recording the instrument scale reading after each addition. Smaller increments of titrant should be added when large changes in scale readings are noted.

- Plot the differential titration curve if the exact end point cannot be determined by inspection of the data. Plot the change in instrument reading against the volume of $AgNO_3$ added. The end point of the titration is the point of greatest change in instrument reading per unit volume of $AgNO_3$ added.

- Standardization of Titrant

  - Pipette 25 ml of 0.01N NaCl into a beaker. Add distilled water to bring the volume to approximately 75 ml.

  - Titrate the sample with 0.01N $AgNO_3$ using the same procedures outlined in item 7g, under "Titration," of this method.

  - Calculate the normality of the $AgNO_3$ titrant as follows:

$$N(AgNO_3) = \frac{0.25}{V(AgNO_3)}$$

h. Calculations

Calculate the organic halogen content as follows:

$$\frac{V_T \times N_T \times \text{eq. wgt} \times 0.1}{V_S} \left(\frac{V_T + V_S}{V_A} \right) = \text{percent halide as Cl}$$

V_T = Volume of 0.01N $AgNO_3$ titrant.

N_T = Normality of NO_3 titrant.

Eq. wgt. = 35.45 for Cl.

V_T = Volume of toluene (item 7g, under "Sodium biphenyl reaction."

V_S = Volume of waste sample (item 7g, under "Sodium biphenyl reaction."

V_A = Volume of toluene aliquot reduced (item 7g, under "Sodium biphenyl reaction."

i. Report

Report as weight/volume percent halide as chloride.

8. Compatibility test for liquid wastes:

a. Scope and application

- This method is a qualitative test designed to determine the compatibility of liquids of unknown composition at ambient and elevated temperatures. The test method is designed for use in a field laboratory using relatively inexpensive testing devices.

- This method is applicable to both organic and aqueous wastes. The standard test temperature at 75°C must be modified for liquids with boiling points of 75°C.

- All wastes tested by this method should have been tested for water reactivity prior to testing by this method.

b. Summary of method

- Samples of liquid waste are tested in batches of 10 at ambient temperature. If waste incompatibility is detected at ambient temperature, the reactive waste is marked as reactive and incompatible with the batch.

- Samples that are not reactive are individually preheated to 75°C. The heated samples are then blended in an adiabatic test device.

c. Sample handling and preservation

The samples should be stored in closed containers prior to testing.

d. Interferences

Certain reactions may require a catalyst or higher temperature before exothermic reactions occur. The test conditions outlined in this method may not adequately evaluate interactions that could occur when larger quantities of waste are mixed.

e. Apparatus

- A heavy-wall beaker or Dewar flask sized to contain approximately 1.5 to 2.0 times the final test volume is used for the ambient temperature testing.

- A heater block (Figure C.3-1) consisting of a rectangular metal block with cylindrical holes in the top surface large enough to hold test tubes containing 10 ml of sample is used to preheat samples. The block is made from copper or aluminum for good heat conduction. A series of cartridge heaters are placed in horizontal holes drilled into the block. Insulation is placed on the bottom and sides of the block to maintain a uniform temperature throughout the block. A thermocouple and controller are used to regulate the heat supply to the block.

- The adiabatic test device (Figure C.3-2) consists of a glass reaction vessel surrounded by insulation and a heating jacket. A stirrer is mounted on the top cover. A thermocouple, preferable in glass, is immersed in the liquid sample in the reaction vessel. The output of this measuring thermocouple is connected to a recorder. A second thermocouple is attached to the inner wall of the heater surface and is used to maintain the reactor at a constant temperature of 75°C.

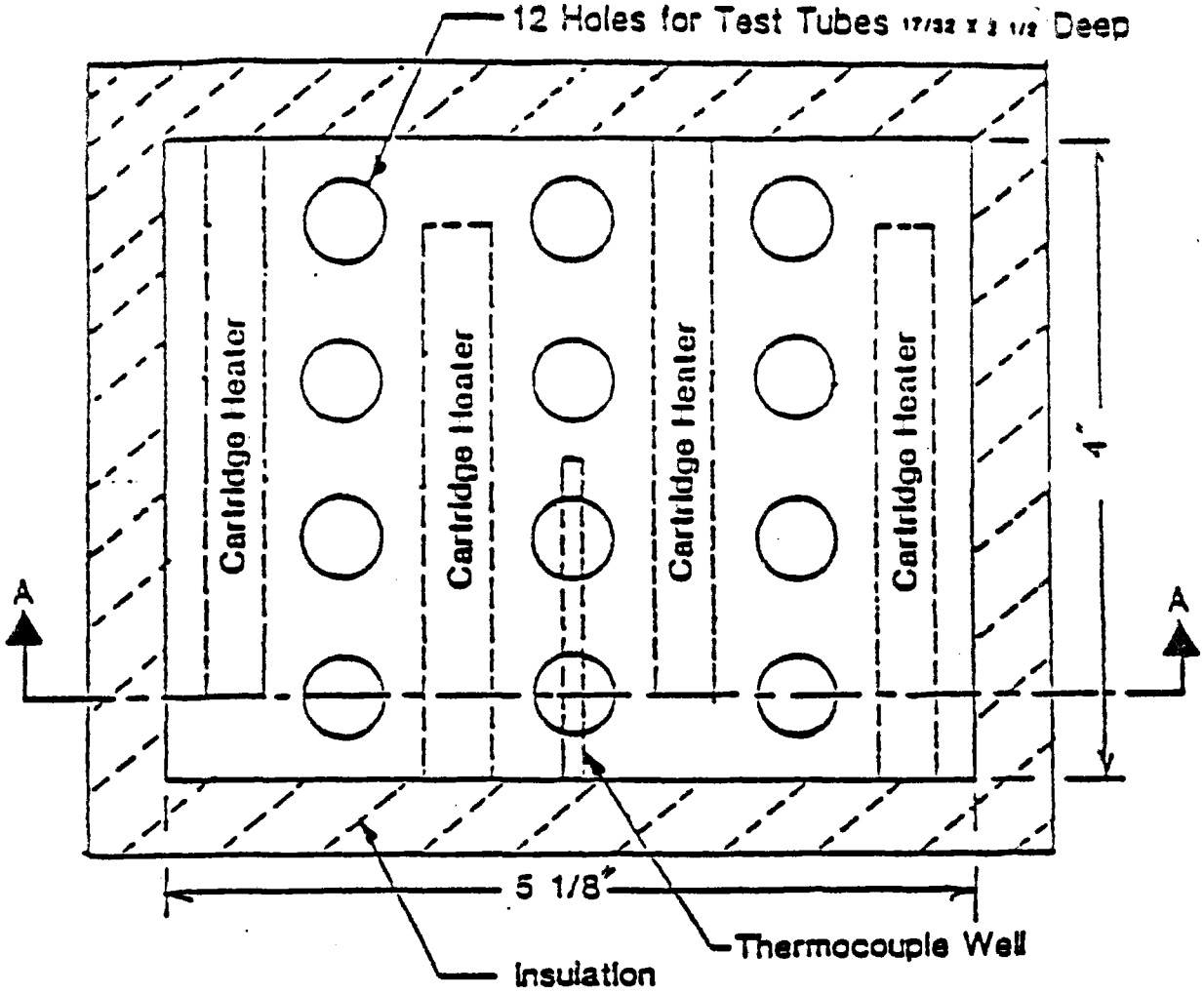
f. Reagents

No special reagents are required for this test.

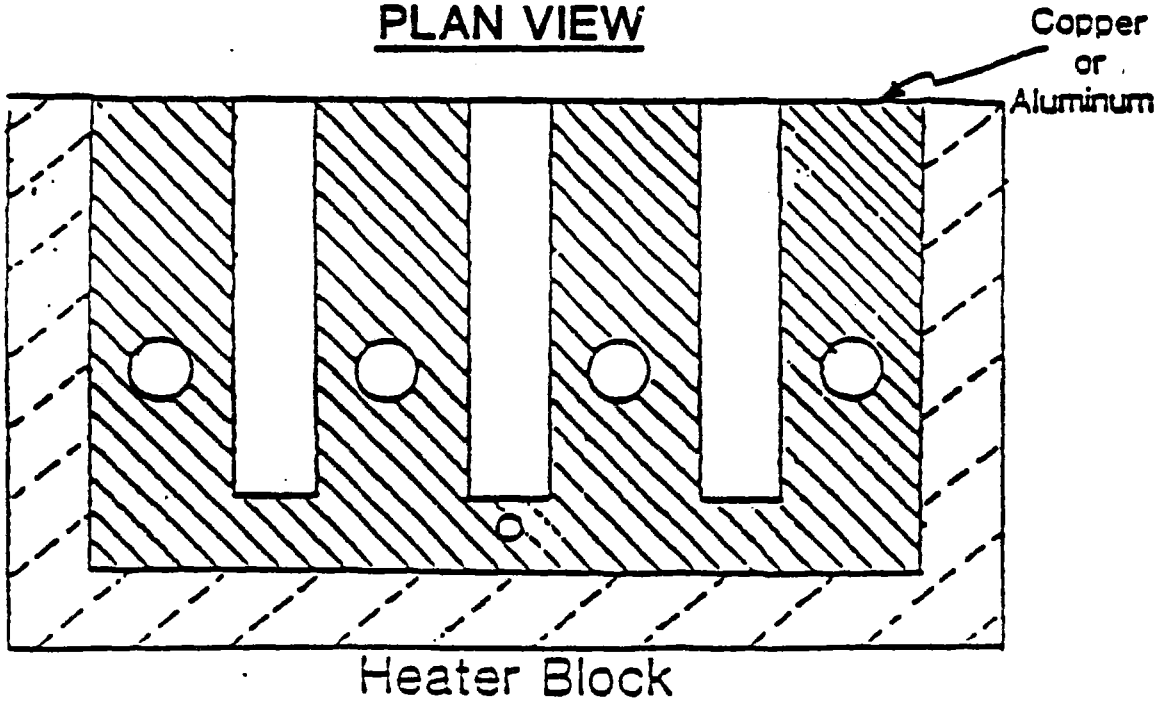
g. Procedure

- Pipette 1 ml of the first sample into a reaction vessel. Place a thermometer of thermocouple in the liquid.

- Add the remaining waste in 1-ml aliquots, stirring after each addition. Record the temperature and other observations (such as gas formation, immiscibility, etc.). If a reaction occurs after the addition of a waste sample, repeat the test for binary combinations of the last sample tested and each of the previous samples tested.

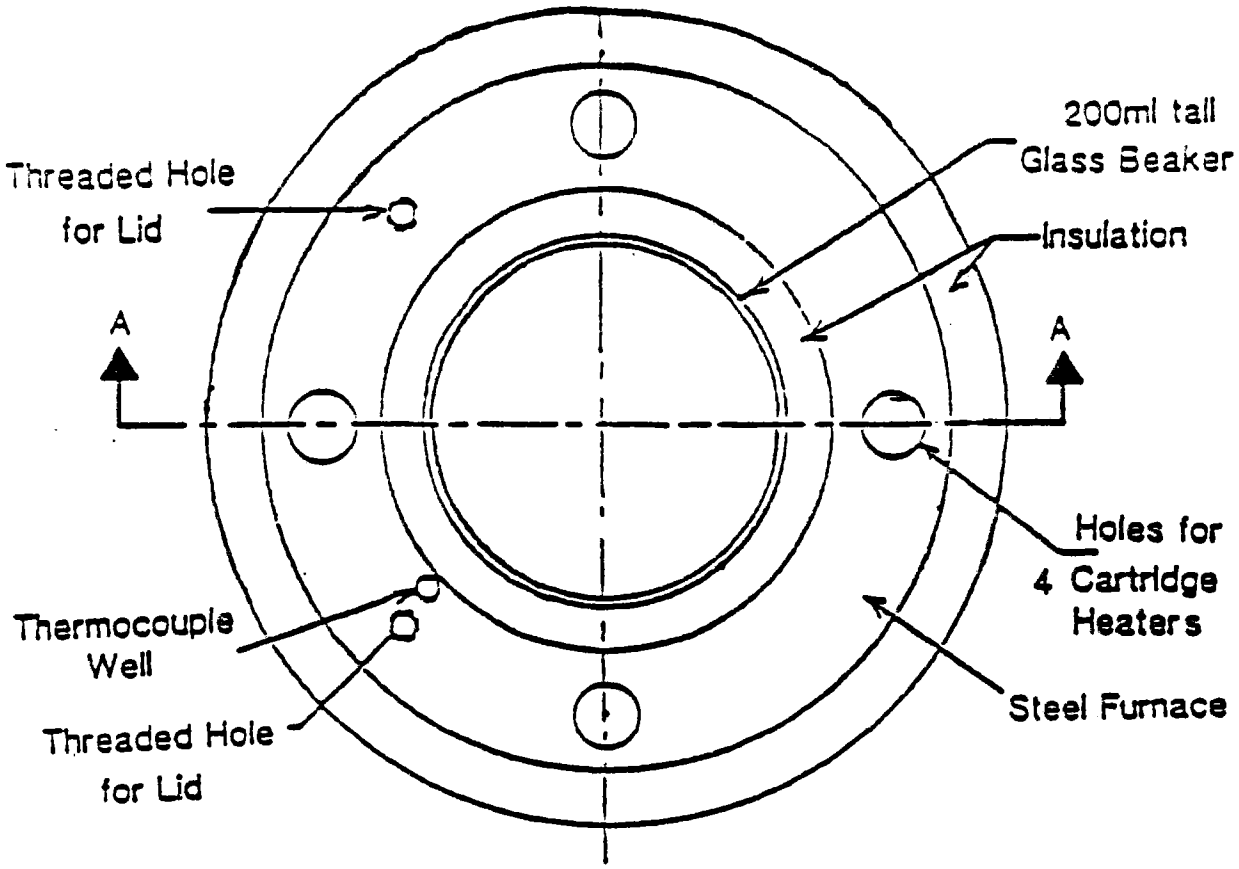


PLAN VIEW

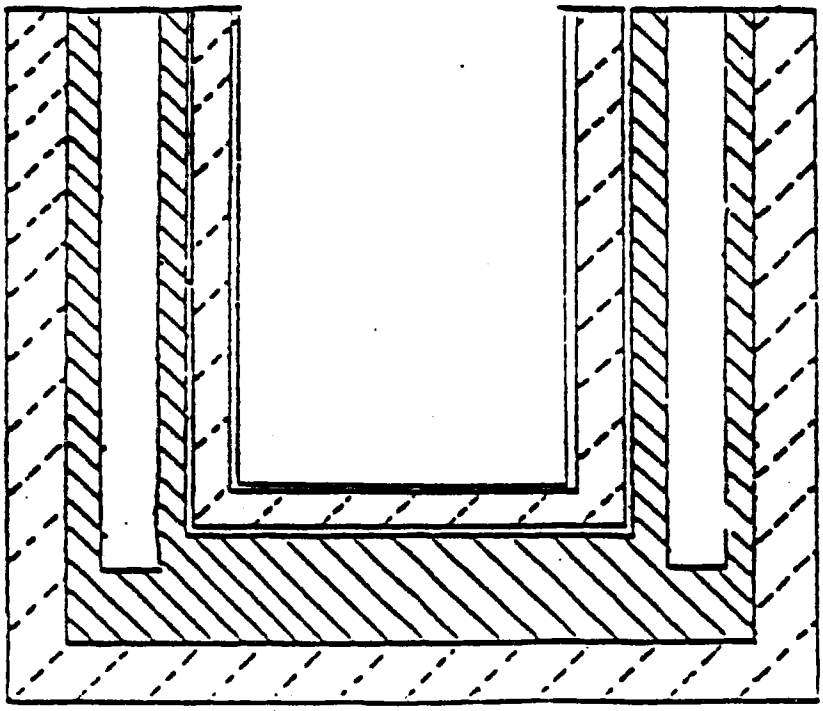


CROSS SECTION A-A

FIGURE C.3-1 HEATER BLOCK



PLAN VIEW



Adiabatic Test Device

CROSS SECTION A-A

FIGURE C.3-2 ADIABATIC TEST DEVICE

- Place approximately 0.5 ml of sample in a test tube. Place the test tube in the heater block, which has been preheated to 75°C. Observe the sample for approximately 30 seconds. If no reaction or boiling occurs, remove the test tube from the heater block. Repeat this procedure for all samples that are to be blended in the adiabatic test device.

- Check the temperature of the samples using a thermocouple or glass thermometer to confirm they are at 75°C. Observe all samples for reactions such as gas formation or exothermic reactions. Any sample that is reactive under these cond- itions should not be blended with other wastes.

- Preheat the adiabatic test device to 75°C. Transfer 5 ml of the first sample to the device. Add 5 ml of the second sample to the device and mix. Observe the temperature recording device for 5 minutes. If no exothermic reaction occurs, continue to add the remaining samples at 5-minute intervals.

- If any reaction occurs, a binary composite of the last sample tested and each of the previous samples tested are mixed in the reaction vessel to determine which materials in the blend are reactive. Both samples are marked reactive.

- If no reactions occur, 5 to 10 ml of the final mixture is taken and placed in the heater block. This composite sample will serve as the first sample for the next series of samples being tested for compatibility. Reserve the remaining final mixture for binary testing.

h. Report

The report should contain, at a minimum, the following information. Additional comments should be made if unusual or unexpected reactions occur.

- Identification number of each waste added.

- Temperature after each addition.

- Miscibility of the material after each addition.
- Formation of precipitates after each addition.
- Gas formation after each addition.
- The exact order of addition of each waste.
- Other comments, such as color and viscosity, of the final mixture.

9. Semi-quantitative determination of peroxides and other oxidizing agents in liquid wastes:

   a. Scope and application

      This method is for the semi-quantitation of active oxygen in liquid waste. Active oxygen is defined as the oxidizing potential present in a waste that will oxidize iodide to iodine under acidic conditions.

   b. Summary of method

      - An organic waste is dissolved in a mixture of methylene chloride and acetic acid. A saturated solution of sodium iodide is added and the mixing is allowed to react in the dark at room temperature for 15 minutes. The liberated iodine is then titrated with standard sodium thiosulfate solution.
      - An aqueous waste is diluted with distilled water and treated with concentrated sulfuric acid to reduce the pH to <2. A saturated solution of sodium iodide is added, and the mixture is allowed to react in the dark at room temperature for 15 minutes. The liberated iodine is titrated with standard sodium thiosulfate solution.

   c. Interferences

      - Conjugated diolefins interfere by absorbing iodine.
      - Highly-colored samples may interfere with the colorimetric end point detection.

d. Apparatus

Laboratory glassware, including burettes, pipettes, Erlenmeyer flasks, volumetric flasks, and beakers.

e. Reagents

- Acetic acid, glacial.
- Methylene chloride.
- Sodium iodide -- Prepare a saturated solution of sodium iodide (NaI) in deaerated water.
- Sodium thiosulfate, standard solution (0.1N) -- Prepare and standardize a 0.1N solution of sodium thiosulfate ($Na_2S_2O_3$) in accordance with the appropriate sections of ASTM Method E-200.
- Starch indicator solution -- Titrate 1 g of soluble starch with a few ml of cold water, and slowly pour into 100 ml of boiling water while stirring.
- Water, deaerated -- Deaerate distilled water by boiling for 5 to 10 minutes prior to use.
- Sulfuric acid -- Concentrated H_2SO_4.

f. Procedure

- Organic waste
  - Add 20 ml of acetic acid to a 250-ml flask.
  - Pipette 1 ml of sample into the acetic acid.
  - Add 10 ml of methylene chloride and mix.
  - Add 5 ml of freshly prepared saturated NaI solution. Stopper the flask and swirl. Allow the sample to stand in the dark for 15 minutes.

. Add 50 ml of deaerated water and titrate with 0.1N $Na_2S_2O_3$ solution until the solution is a pale straw color. Add 1 to 2 ml of starch solution and continue the titration to the sharp disappearance of the blue color. Record the number of milliliters required for the titration.

- Aqueous waste

. Add 50 ml of deareated water to a 250-ml flask.

. Pipette 1 ml of sample into the water.

. Add concentrated H_2SO_4 to adjust the pH of the solution to <2.

. Pipette 10 ml of freshly prepared saturated NaI solution. Stopper the flask and swirl. Allow the sample to stand in the dark for 15 minutes.

. Titrate with a 0.1N $Na_2S_2O_3$ solution until the solution is a pale straw color. Add 1 to 2 ml of starch indicator and continue titration to the sharp disappearance of the blue color. Record the number of milliliters required for the titration.

- General

. Prepare a reagent blank in the same manner as the samples. Titrate and record the milliliters of titrant required for the blank.

. The volume of sample used can be adjusted as required. Larger samples can be used if milligrams per liter (parts per million) accuracy is required. Smaller volumes can be used if the waste contains high (percent level) concentrations of reactive oxygen.

g. Calculations

Calculate the concentration (mg/L) of active oxygen as follows:

$$\text{Active oxygen (mg/L)} = \frac{(A - B) \times N \times 8,000}{V}$$

Where: A = ml sodium thiosulfate solution required for titration of the sample.

B = ml sodium thiosulfate solution required for the blank.

N = Normality of the thiosulfate solution.

V = ml of waste sample.

h. Report

Report as active oxygen, mg/L.

10. Free liquid determination using the paint filter test:

The paint filter test described by the U.S. EPA (50 FR 18370) as specified in Method 9095 in EPA publication SW-846 is used to determine the presence of free liquids in sludges, semisolids, slurries, and other containerized wastes destined for landfill disposal.

Table C.3-1

Analytical Methods Used for Metals Determination
(in ug/L, except where noted)

Parameter	Method	Detection Limit	Reference No.
Aluminum, total	200.7	200	1
Antimony, total	200.7	60	1
Arsenic, total	206.2	10	1
Barium, total	200.7	200	1
Beryllium, total	200.7	5	1
Boron, total	200.7	5	1
Cadmium, total	200.7	5	1
Calcium, total	200.7	5,000	1
Chromium, hexavalent	307B	25 mg/L	1
Chromium, total	200.7	10	1
Cobalt, total	200.7	50	1
Copper, total	200.7	25	1
Iron, total	200.7	100	1
Lead, total	239.2	5	1
Magnesium, total	200.7	5,000	1
Manganese, total	200.7	15	1
Mercury, total	245.1	0.2	1
Molybdenum, total	200.7	1.0	1
Nickel, total	200.7	40	1
Potassium, total	200.7	5,000	1
Selenium, total	270.2	5	1
Silver, total	200.7	10	1
Sodium, total	200.7	5,000	1
Thallium, total	279.2	10	1
Tin, total	200.7	40	1
Titanium, total	200.7	10	1
Vanadium, total	200.7	50	1
Zinc, total	200.7	20	1

Table C.3-1
(continued)

Parameter	Method	Maximum Concentration of Contaminant	Reference No.
EP Toxicity Metals:			
Arsenic	200.7	5,000	3
Barium	200.7	100,000	3
Cadmium	200.7	1,000	3
Chromium	200.7	5,000	3
Lead	200.7	5,000	3
Mercury	200.7	0.2	3
Selenium	200.7	1,000	3
Silver	200.7	5,000	3

Table C.3-2

Organics Methods

Parameter	Method	Detection Limit	Reference No.
Total organic carbon (TOC)	415.1	1 mg/L	1
Total organic halogens (TOX)	450.1	5	1
Trihalomethanes, total	624	10	4
Priority pollutants	624/ 625	10	4
Volatile purgeable organics	624	10	4
Volatile direct injection organics	603	1	4

Table C.3-2
(continued)

Parameter	Method	Detection Limit	Reference No.
Base/neutral extractable organics	625	10	4
Acid extractable organics	625	10	4

Table C.3-3

Inorganic Methods

Parameter	Method	Detection Limit	Reference No.
Acidity	305.1	0.5 mg/L	1
Alkalinity, M	310.1	0.5 mg/L	1
Alkalinity, P	310.1	0.5 mg/L	1
Bromide	406	0.1 mg/L	2
Chloride	325.2	1.0 mg/L	1
Chlorine	409F	0.1 mg/L	2
Cyanide, total	335.3M	0.010 mg/L	1
Cyanide, amenable	360.1	0.010 mg/L	1
Dissolved oxygen	360.1	1.0 mg/L	1
Fluoride	340.2	0.5 mg/L	1
Hardness, total	130.2	0.5 mg/L	1
Hydrogen sulfide	428E	10,000 mg/L	2
Ammonia	350.3	0.020 mg/L	1
Nitrate	353.1	0.050 mg/L	1
Nitrite	353.1	0.010 mg/L	1
TKN	351.2	0.020 mg/L	1
Phosphorus, total	365.1	0.010 mg/L	1
Orthophosphate	365.1	0.010 mg/L	1
Sulfate	375.4	1 mg/L	1
Sulfides	376.2	1 mg/L	1
Sulfite	377.1	2 mg/L	1
BOD_5	405.1	2 mg/L	1
COD	410.1	5 mg/L	1
MBAS	425.1	0.1 mg/L	1
Oil and grease	413.1	5 mg/L	1
Phenols	420.3	0.006 mg/L	1
Dissolved solids, total	160.1	10 mg/L	1
Solids, total	160.3	10 mg/L	1
Suspended solids, total	160.2	4 mg/L	1

Table C.3-3
(continued)

Parameter	Method	Detection Limit	Reference No.
Volatile suspended solids, total	160.4	10 mg/L	1
Color	110.2	1 CU[1]	1
pH	150.1	0.1 su[1]	1
Specific conductance	120.1	1 umhos/cm	1
Specific gravity	210		2
Turbidity	180.1	1 NTU[1]	1
Volatile solids	208E	10 mg/L	2

[1]These values represent the precision of the method.

su = Standard units
CU = Color units (Pt - Co Method)
NTU = Nephelometric turbidity units

Table C.3-4

Miscellaneous Methods

Parameter	Method	Detection Limit	Reference No.
Fecal coliform, MPN	908C	2 cfu/100 ml	2
Total coliform, MPN	908A	2 cfu/100 ml	2
Cesium 134	---	10 pCi/L	---
Gross alpha	---	1 pCi/L	---
Gross beta	---	1 pCi/L	---
Radium, total	---	1 pCi/L	---
Radium 226	---	1 pCi/L	---
Strontium 89, 90	---	5/1 pCi/L	---
Tritium	---	150 pCi/L	---
Uranium	---	0.1 pCi/L	---
Asbestos	Phase contrast	---	---
Chlorophyll a	1002G	---	2
Volatile acids	504C	---	2
Odor	140.1	---	1
Btu	D240	---	ASTM
Ash content	D482	---	ASTM
Sulfur content	D129	0.01 percent	ASTM
Ignitability test	1010	1°F	3
Corrosivity	1110	----	3

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2. 15th Edition, Standard Methods for the Examination of Water and Wastewater.

3. EPA SW-846, Test Methods for Evaluating Solid Waste, July 1982.

4. 40 CFR 136 (26 October 1984).

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   Hatayama, K.K., et al., "A Method for Determining the Compatibility of Hazardous Waste," United States Environmental Protection Agency, EPA-600/2-80-076, April 1980.

2. Qualitative Test for Cyanide in Liquid Waste.

   Standard Methods for the Examination of Water and Waste, 14th Edition, 1975, pp. 361-380.

3. Qualitative Test for Sulfide in Liquid Waste.

   Standard Methods for the Examination of Water and Waste, 14th Edition, pp. 499-509.

4. Test for Organic Halogen in Liquid Waste.

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   Standard Methods for the Examination of Water and Waste, 14th Edition, pp. 306-309.

5. Semi-Quantitative Determination of Polychlorinated Biphenyls in Liquid Waste.

   Federal Register, Volume 44, No. 233, Monday, 3 December 1979, pp. 69501-69509, "Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations."

6. Compatibility Test for Liquid Waste.

   Hatayama, K.K., et al., "A Method for Determining the Compatibility of Hazardous Waste," United States Environmental Protection Agency, EPA-600/2-80-076, April 1980.

7. Semi-Quantitative Determination of Peroxides and Other Oxidizing Agents in Liquid Waste.

   ANSI/ASTM E298-68, "Standard Methods for Assay of Organic Peroxides."

8. MIL STD 286B, Military Standard, "Propellants Solid; Sampling, Examination, and Testing."

APPENDIX C.4

QUALITY ASSURANCE PROGRAM

JTC ENVIRONMENTAL CONSULTANTS, INC.

QUALITY ASSURANCE PROGRAM

SUBMITTED TO:

NAVAL FACILITIES ENGINEERING COMMAND
CHESAPEAKE DIVISION
WASHINGTON NAVY YARD, BUILDING 212
WASHINGTON, D.C. 20374

PREPARED BY:

JTC ENVIRONMENTAL CONSULTANTS, INC.
4 RESEARCH PLACE
ROCKVILLE, MARYLAND 20850

NOVEMBER 27, 1984

Baseline Laboratory Assurance

The baseline laboratory assurance program outlines and sets up the procedures that assure equipment and other apparatus; standards, solvents, reagents and gases; and glassware and other containers to be handled, organized, operated and maintained properly and that they meet stringent requirements. In addition, it details the steps to assure that personnel are specifically trained on particular analytical methods prior to their being given responsibility. Equipment and major items or apparatus in the JTC laboratory are grouped according to analytical use. Each group has a major responsibile person and one or more "use logs" that are currently maintained and contain such information as: operator, analysis/mode, project, date, duration, and comments. This latter category includes descriptions of problems, solutions and/or maintenance of the equipment. In addition, a file is kept of all manufacturers information for quick access when needed. For example, any person using or in any way handling the atomic absorption spectrophotometer must record in a separate bound notebook, the date, name, time in, time out, lamp (element), mode (flame, carbon rod, or cold vapor), and a description of any problems, if encountered, that is whether operation was satisfactory or for what purpose the instrument was handled (i.e., manufacturer's rep. check out, changing instrument gases, etc.). All other instruments have similar logs maintained. In addition, each equipment grouping has a Q/A check sheet outlining required maintenance and Q/A check schedules that are planned in accordance with manufacturers recommended procedures or established laboratory practice. Completion of the required action is signed off and reviewed. For example, among the things routinely monitored are: distilled water conductivity (daily); refrigerator, incubator, freezer, and oven temperatures (daily); distilled water apparatus clean-out (monthly); etc.

Standard, solvent, reagent and gas quality are critical to the performance of exacting analytical methods. In that regard, only ACS standard reagent grade or better materials are utilized for any analysis. These materials are inventoried, clearly labeled (reference to notebook descriptions) and samples retained (in appropriate containers) until Q/A checks on pertinent analyses pass on the material. Only the lab manager or assistant has authority to discard such materials. For most analyses the distilled water utilized is tap water that has been filtered, passed through carbon and ion exchange resins and then distilled. For certain trace organic analyses water and organic solvents require further assurance of hydrocarbon-free conditions. These such solvents are specially distilled and stored (complete descriptions of the methodology and materials used are recorded and ably referenced). A

complete record of standards, reagents, solvents and gases (Standards and Reagents Notebooks) is maintained and contains:

1. Description of standard material; chemical name and formula composition, analytical grade, manufacturer and/or supplier, lot number, expiration data.

2. Specifics of standard preparation; mass of standard material, preparation of standard material, dilution of standard material, solvent preparation or purity.

3. Demonstration of calculation of standard concentration.

4. Steps taken to preserve standard.

5. Date of preparation.

6. Signature of analytical chemist.

Glassware and other basic laboratory apparatus must be scrupulously clean. However, cleaning and rinsing procedures vary with analysis, i.e., nitric acid washed glass and plastic ware is utilized for metals analyses, sulfuric acid wash and extensive rinsing is utilized for trace organic analyses, while chromic acid washed ware is utilized for most nutrient, demand and other general analyses. Of importance here, is the implementation of the proper procedures and the physical separation of glassware (or other apparatus) cleaned by different procedures. This is attained by providing separate storage areas (for both clean and dirty) that are unmistakably labeled as to contents.

All analytical personnel are trained and tested in each particular analytical method they are to handle before they are allowed to analyze contract materials. Acceptable levels of precision and accuracy must be attained (See discussions on analytical assurance below).

Sample Handling Assurance

Proper sample handling and accounting, both in the field and in the lab, is extremely important to the attainment and assurance of reliable analytical information (JTC's sampling methodology, tagging and sealing procedures are not discussed here). The sample chain of custody must be clearly documented. In that regard, JTC maintains a separate sample receiving and storage area. Upon receipt of a sample or samples it is acknowledged by providing a completed receipt form to transmitter of the sample(s). It itemizes and notes origination site, transmittal authority, how stored or handled, and describes the material received. It is signed by the lab manager. A copy is retained for JTC lab records. After formal receipt of the material, it is tagged and numbered and properly stored (according to prior or transmittal instructions). The material description and project requirements are then entered into the sample log according to the tagged number. Also included are project number, date and the lab manager's initials. Any further movement of the material or change in its condition is also entered in the log book. For example, labe use date, purpose, condition change and analyst's name are logged. When the sample is finally either transmitted or discarded (or consumed) this is so logged and initialed by the lab manager. Only the lab manager or assistant is authorized to receive, transmit or discard samples, and then, only at the acceptance of the project manager. Note that all transmittals are accompanied by a transmittal form describing sample name, condition (quantity and state), destination, authorized receiver, purpose and any other pertinent information. Included is a request for the transmittal form to be returned, and initialed by the receiver with receipt conditions stated. This is then compared with JTC's file copy.

Analytical Method Assurance

Perhaps the greatest potential source of data error exists at the assemblage of instruments, apparatus, chemicals, and personnel that constitute the analytical method application. It is for that reason that JTC employs special Q/A monitoring and checking techniques to this situation. There are three aspects to this; method preparation check, initial method test, and continued method challenging.

Prior to analytical determination, standards must be made or obtained, equipment and apparatus assembled and checked, and preliminary methodology applied (i.e., extraction, clean-up, digestion, etc.) All aspects of this must be

carefully recorded and referenced in standards notebooks, equipment use logs, as well as the analytical notebook. All methods to be utilized are fully described or referenced. A listing is provided of all reagents (lot nos.), apparatus and equipment, with a full set-up description, operator signature and data included. Results of equipment checks and preliminary method application is also well documented. Of special note here is the performance evaluation of the GC/MS. Prior to its being used for any analytical work it is first carefully "tuned" and calibrated utilizing perfluorotributylamine (FC43). The calibration data are permanently documented on magnetic tape and on hard copy. Performance of the instrument (GC/MS) would be checked and verified for meeting the specified criteria by analyzing known amounts of standards required by the contractor, i.e., the ability to chromatograph and analyze 20 ng of decafluorotriphenylphosphine and the recorded mass spectrum meeting the criteria as required by EPA. All data assist equipment (i.e., GC/MS computer, disc drives, tape device and printronix hard copies) is checked and proper function documented. Strip charts, acquired during GC, AA or other methods of analysis, will contain operator signature(s), date, equipment and recorder operating parameters, recorder manufacturer's model and serial numbers, and reference to the analytical method.

After method preparation and before contract samples are analyzed the method is tested to insure proper preparation and the applicability of the method to the particular sample matrix. This is performed in three stages. Initially, the detection limit and linear range of compounds are determined with simultaneous analysis of blanks (both field and laboratory when applicable). Blank corrections are determined. The application of the method to the sample matrix is then checked by spiking the sample with standards and analyzing the mixture by the appropriate procedure. This also provides for the determination of the percent recovery of the compound from the sample matrix. The sensitivity and linear range are then determined and compared to results described in the method reference literature. If discrepancies exist, the entire preparation methodology is reviewed for sources of interference, i.e., impurities in reagents, equipment, etc. The second and third aspects of initial method testing involve precision and accuracy determination.

The precision of the method is determined in one of two ways. At four points of the method linear response range representing low, low mid, high mid, and high concentrations, 7 to 9 replicates are run. They are analyzed in the order high, low, intermediate, intermediate, then repeated. The results are reduced using linear regression analysis and the response standard deviation obtained. This value, expressed in measured units, represents the initial

method precision and is incorporated into the method precision statement. Precision may also be determined by analyzing 15 replicates covering the method linear response range of concentrations. The results are tabulated and the initial method "critical difference" is determined (Both precision determination methods are fully described in Quality Assurance Program for the Analysis of Chemical Constituents in Environmental Samples, U.S. EPA, Cincinnati, 1978 and Handbook for Analytical Quality Control in Water and Wastewater Laboratories, U.S. EPA Technology Transfer, 1972).

Initial method accuracy is also determined. Samples both before and after spiking with standards are analyzed as pairs. The concentrations for both plain samples and those spiked cover the method linear response range. Generally, 15 such sample pairs are analyzed. For each pair the percent recovery is determined, then the means and standard deviations of these sample populations are calculated. The standard deviations, in units of percent recovery, are then incorporated into the initial method accuracy statement. Percent recovery standard deviations are listed for both standard and spiked populations.

After the initial method testing has shown the analytical procedures to be in statistical control, contract analyses are begun. It should be noted that all initial testing is thoroughly described and recorded in the analytical notebook for the particular method as in the Q/A master log.

The third aspect of analytical method quality control is that of continuing method challenging. This entails the periodic checking of standard curves and method blanks, the continuous utilization of internal standards (GC or GC/MS), as well as the analysis of both in-house and contractor generated quality assurance (Q/A) samples. It is especially important that method blanks be checked whenever a potential new source of error is introduced into the analytical scheme. Q/A (blind) samples will be of two types; series replicates for precision checks, and series standards and spikes for accuracy checks. Such samples generally represent 15 percent of the analytical load. Replicate differences and standard and spiked percent recoveries will be continuously charted (Q/A charts). Rejection criteria will be whether the calculated control parameter falls outside of the respective control window. For precision, standard accuracy and spiked accuracy, the control windows are represented by the initial method "critical difference", that is, two times the percent recovery standard deviation and three times the percent recovery standard deviation, respectively. Where statistically applicable the control windows will be updated.

If any of the windows are exceeded the source of determinate or indeterminate error will be found and corrected before further contract analyses are performed. Then, all samples analyzed since the last "in control point" will be reanalyzed. The particulars of blind sample frequency and rejection criteria are approved by the contractor project manager for each analysis parameter.

Data Handling Assurance

The last link in the information chain is the reported data. It must be reliable and represent the original sample and the analytical method. Therefore, its handling must be monitored and reviewed. This is generally considered in terms of three aspects. The first is laboratory record keeping. Laboratory notebooks are continuously maintained with complete information as previously outlined. In addition, a sequential list of all measurements actually observed or made is recorded. This would include peak heights, meter deflections, digital display values, etc. For the GC/MS system, data regarding all instrument function and acquired during sample analysis are copied in 9-track magnetic tape, stored and referenced in the appropriate log book. The identity of each measurement is listed, accprding to sample number, and indicated whether sample, calibration standard or reference, method or field blank. Sample size and any other information which may be required for calculation is also recorded. Strip chart, computer printer hard copy and magnetic tape information is carefully labeled and filed. This is referenced in the laboratory notebooks.

Calculations, formulas, and parameter values are contained in separate calculation notebooks. These notebooks also have references to the particular analysis and record the dates of calculation and the calculator's signature. Any printouts, or calculator aids are also attached. Laboratory and calculation notebook pages are continuously prepared in "carbon-copy" duplicate.

After analytical and calculation data is obtained by the laboratory analyst, the duplicate notebook pages are received and reviewed by the laboratory manager. It is reviewed for completeness of information, spot checked for calculation error and the actual measurement data checked for discrepancies. Q/A sample measured values are decoded and the Q/A control charts adjusted accordingly. All strip chart or other instrument information is also reviewed in this procedure. If no problems are found, the lab analyst is given a preliminary Q/A approval for that particular data. If discrepancies are found, the analyst is immeditely contacted, the analyses halted and the situation reviewed by the lab manager, the analyst, the project manager and the

research or project director. Final Q/A approval is always subject to agreement by the JTC staff and the contractor. It should be noted that record integrity is maintained. All lab and calculation notebooks, all instrument charts, magnetic tape or print outs, and all lab management review and Q/A logs are maintained in locked files.

The final aspect of data handling assurance is that associated with reporting formats. All data transmittals are in report form with accompanying appendices where needed or desired, i.e., hardcopies, and magnetic tape, etc. The reports contain references to methods utilized, problems encountered, solutions developed, complete updated Q/A control charts and parameter values in appropriate units and significant figures. The GC/MS magnetic tape data is also accessible according to EPA accepted formats.

Sub-Contractor Assurance

Sub-contractor quality assurance is also of importance. Any sub-contractor to JTC is required to submit to a Q/A review and audit and is expected to maintain comparable data assurance procedures. All related sample and data transmittal information is maintained in separate files and periodically reviewed as to audit or analytical challenge needs.

D — Process Information

SECTION D

PROCESS INFORMATION

D-1 Thermal Treatment of Explosive/Propellant-Contaminated Wastes

The information provided in this section is submitted in accordance with the requirements of 40 CFR 270.13(i) and 270.23 (a). This section provides specific process information for the open burning (OB) thermal treatment areas at NAVORDSTA.

Various types of explosive wastes and explosive/propellant-contaminated wastes are generated at NAVORDSTA as a result of the various research, testing, and production facilities on Station (see Section C). These wastes are considered and handled as if they were reactive due to their ignition/explosion potential. They are thermally treated at three separate locations (shown in Figure A-2) within the Station according to the nature of the waste generated. The three thermal treatment locations and their designated uses are as follows:

- Caffee Road Thermal Treatment Point - thermal treatment of explosive/propellant-contaminated scrap metal and related material.
- Production Thermal Treatment Point - thermal treatment of off-specification explosives, overage fleet return and propellants, and explosive and production scrap wastes.
- Safety Thermal Treatment Point - thermal treatment of explosives and propellants resulting from research and/or testing operations and OB of essentially all high level explosive and propellant scrap waste at NAVORDSTA.

Each OB event at these areas is conducted with the assumption that detonation of explosive/propellant-contaminants could occur during thermal treatment. Accordingly, these treatment areas are located a safe distance away from any magazine, storehouse, inhabited building, public highway or passenger railway in accordance with the quantity-distance arc of the constituents in the wastes treated. Furthermore, routine procedures include verification by operating personnel that no personnel, equipment, or boats are in the water adjacent to a thermal treatment area and that there are no low flying planes nearby immediately before ignition of a burn.

The thermal treatment areas are kept reasonably free of undergrowth and shrubbery and an area of at least 300 feet square is maintained free of all long grass and undergrowth in the location where a planned containment system burn pan or other device is utilized. All vegetation, such as grass, leaves, as well as other combustible material and glass (and glass particles) are prohibited within a radius of 200 feet from the OB thermal treatment areas.

The primary precautionary measure employed at each thermal treatment area to minimize potential adverse effects on humans is to clear the area of persons and conduct the OB operation by remote thermal treatment activation and observation from the control room. Additionally, no individual is allowed to perform the handling and treatment aspects of the OB operation alone, and conversely, the minimum necessary personnel are involved in each event.

OB operations are conducted in accordance with safety regulations for handling, storing, production, renovation, and shipping of ammunition and explosives as contained in Naval Sea Systems Command (NAVSEA) Ammunition and Explosives Ashore (NAVSEA OP 5). Only personnel extensively trained in the handling of explosive and propellant materials are engaged as operators at the thermal treatment areas. In accordance with Navy regulations for ordnance operations, these operators must review the safety precautions for carrying out their function on a routine basis. Section H provides additional detail on personnel training. As a further measure of commitment to safety, the special job procedures for the thermal treatment (and other) operations are reviewed/updated annually.

Only those wastes clearly identified in written documentation and properly labelled/marked are accepted for thermal treatment. Because of the high level of safety required to protect the thermal treatment area operating personnel from injury, no waste material is accepted for thermal treatment which cannot be identified with regard to quality and quantity from the accompanying documentation. If proper information is not confirmed by the thermal treatment area operating personnel, the waste is returned to the generator.

The thermal treatment operations are not initiated during adverse climatic conditions, e.g. high winds or electrical storm, except under unusual conditions, such as an emergency when an unacceptable hazard necessitates such action.

Each of the treatment areas is required to be inspected before each thermal treatment event, and this is documented in the operating log. Operational information is documented during/after each thermal treatment event, including the material, its source, the quantity, unusual circumstances observed during the burn, the effectiveness of treatment based on observations of the residuals (if any), and the weather conditions during the event. The operating records are maintained by the responsible operating group for a period of three years.

D-2 Container Utilization for Thermal Treatment

Included in OP 5 are detailed standard operating/safety/procedures for the handling and routing of various explosive wastes and explosive/propellant-contaminated wastes to a staging area within each research, testing, or production facility. These wastes are packaged into color-coded containers with compatible liners in preparation for transport to the thermal treatment areas.

Some examples of this system are as follows:

Material	Handling Condition	Color of Container
Explosive-contaminated items, such as cotton, inhibitors, paper, rags, wood, etc.	Dry, in conductive plastic-lined can	Yellow
Explosive scrap (fluorocarbon propellant, PBX 1Ø8, arcite, etc.)	Dry, in conductive plastic bags	Blue
Explosive scrap (nitrocellulose, ballistite, cannon powder, etc.)	Covered with water	Blue
Powdered metal (magnesium and others)	Dry, in conductive plastic bags	Silver or aluminum

Containers utilized for explosive wastes and explosive/propellant-contaminated packaging at NAVORDSTA cover a wide range of types, including:

- Plastic bags/sacks for explosive wastes and explosive/propellant-contaminated scrap wastes.
- GI cans and other containers designed or adapted to safely stage/transport explosive and propellant wastes.
- Steel dumpster-type containers for explosive and propellant scrap and contaminated scrap metal, wood debris, etc.

After classification, packaging, and staging at each generating facility, the explosive wastes and explosive/propellant-contaminated wastes are transported to one of the three thermal treatment areas. This is handled either by the Public Works Department, with coordination from the Supply Department and/or the Safety Department, depending on the nature of the wastes involved. Container handling/transportation is conducted according to Navy standard operation procedures and the Station safety manual.

D-3 Description of Thermal Treatment Locations/Operations

The three thermal treatment areas have been in use since well before the promulgation of regulations under the Resource Conservation and Recovery Act (RCRA). The sites were selected based on human safety considerations and remoteness from other Station operations. Their remoteness provides a safety buffer zone from surrounding properties and human activity and allows for containment of any accidental fire resulting from the thermal treatment operations.

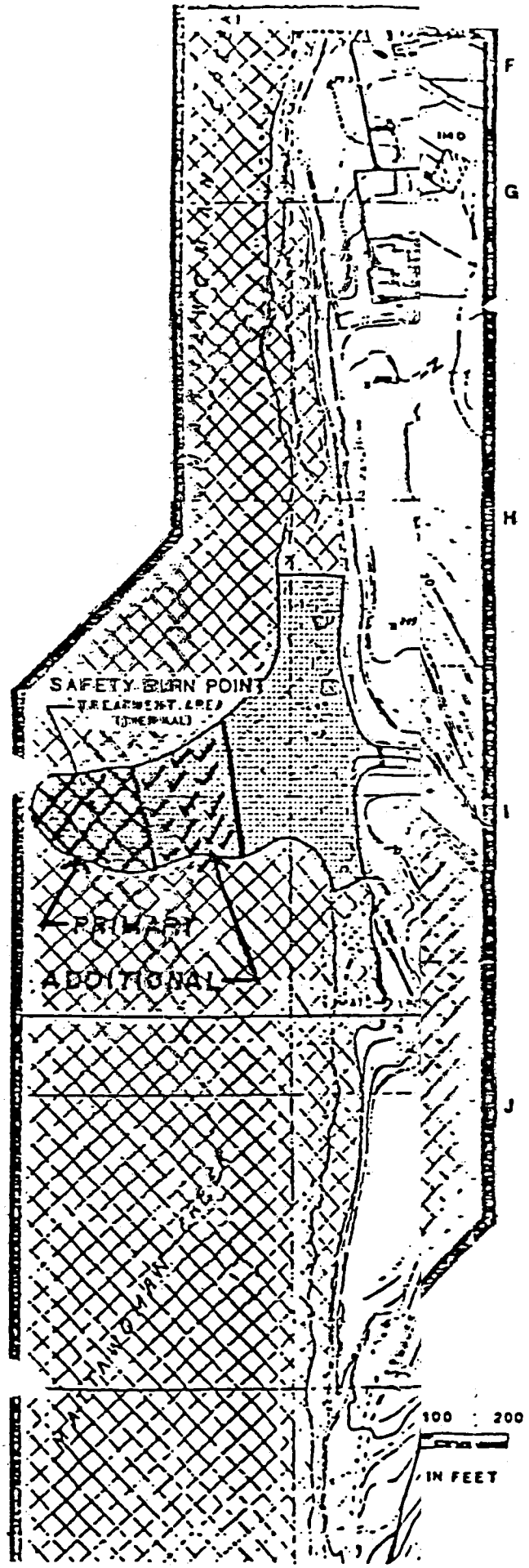
Since a detonation is always possible during the burning of explosive and explosive/propellant-contaminated wastes, this buffer zone also minimizes any damage due to possible explosive shock waves. Station safety regulations require operating personnel to verify that there are no boats present in the adjacent waterways (within 1/2 mile) or low flying planes in the area immediately prior to ignition of the materials.

On occasion the Safety Thermal Treatment Point and the protection Thermal Treatment Point are the site for testing activities unrelated to thermal treament operations.

D-3a Safety Thermal Treatment Point

The Safety Thermal Treatment Point (STTP) is located on a small peninsula at the confluence of Mattawoman Creek and the Potomac River. Figure D-1 shows significant planimetric and topographic features within 1000 feet of this location/operation. Figure D-2 is a photograph of the STTP.

Operation of this facility is the responsibility of the Safety Department. In general, explosive and explosive/propellant-contaminated wastes requiring a greater level of care or safety compared to the operation at the Production Thermal Treatment Point (PTTP) are treated at the STTP. A list of the typical waste types and amounts thermally treated at the STTP is included in Table C-1. The STTP is typically used for thermal treatment of these wastes on a weekly basis during the day shift.



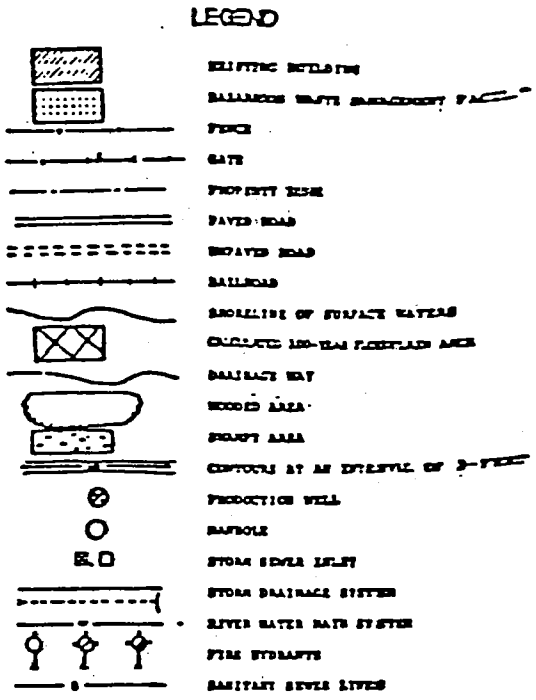


FIGURE D-1
PRODUCTION & SAFETY BURN POINTS
(THERMAL TREATMENT)

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE STATION
INDIAN HEAD, MD.

L. MELENDEZ	4/25/95			

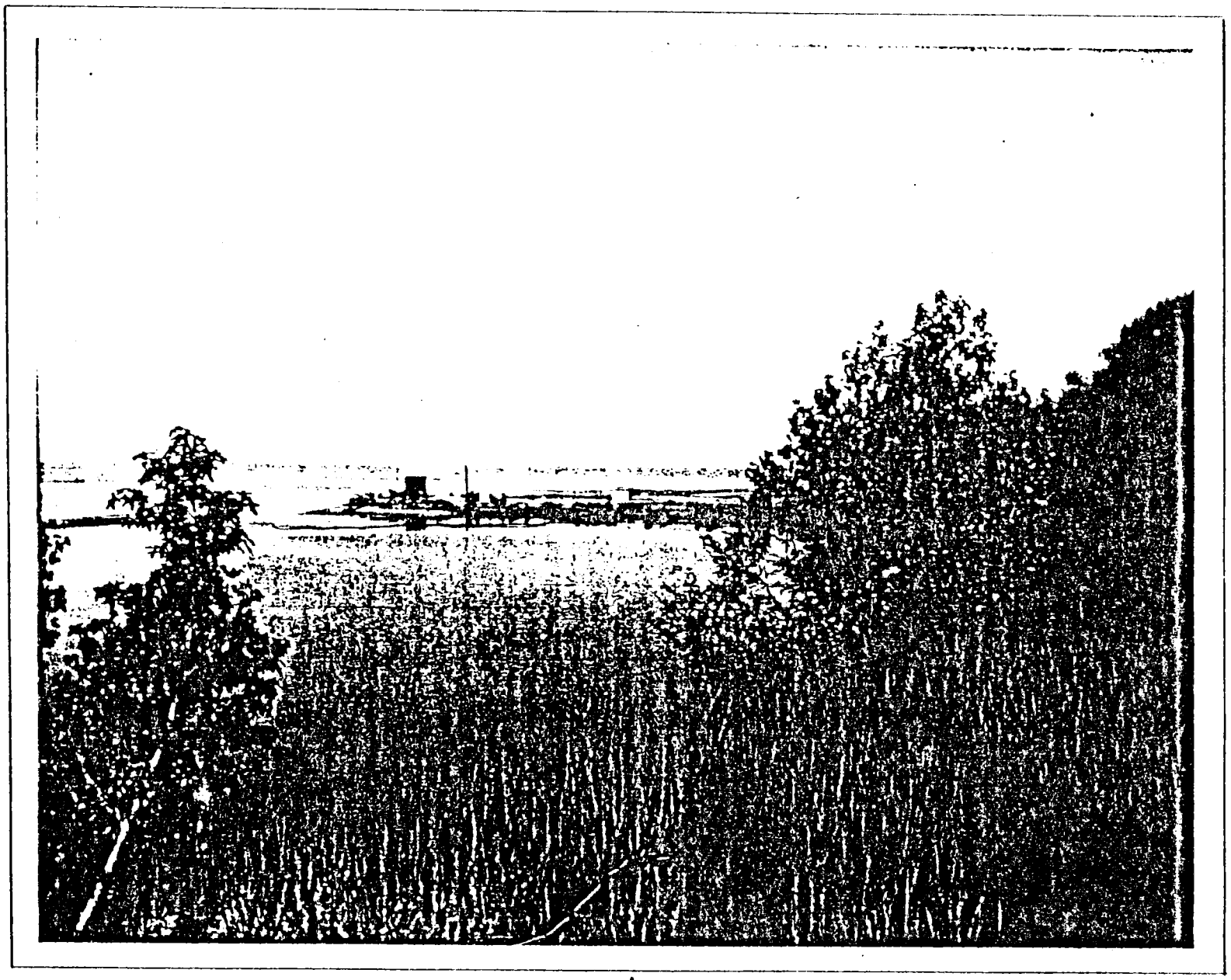


FIGURE D 2a SAFETY THERMAL TREATMENT POINT

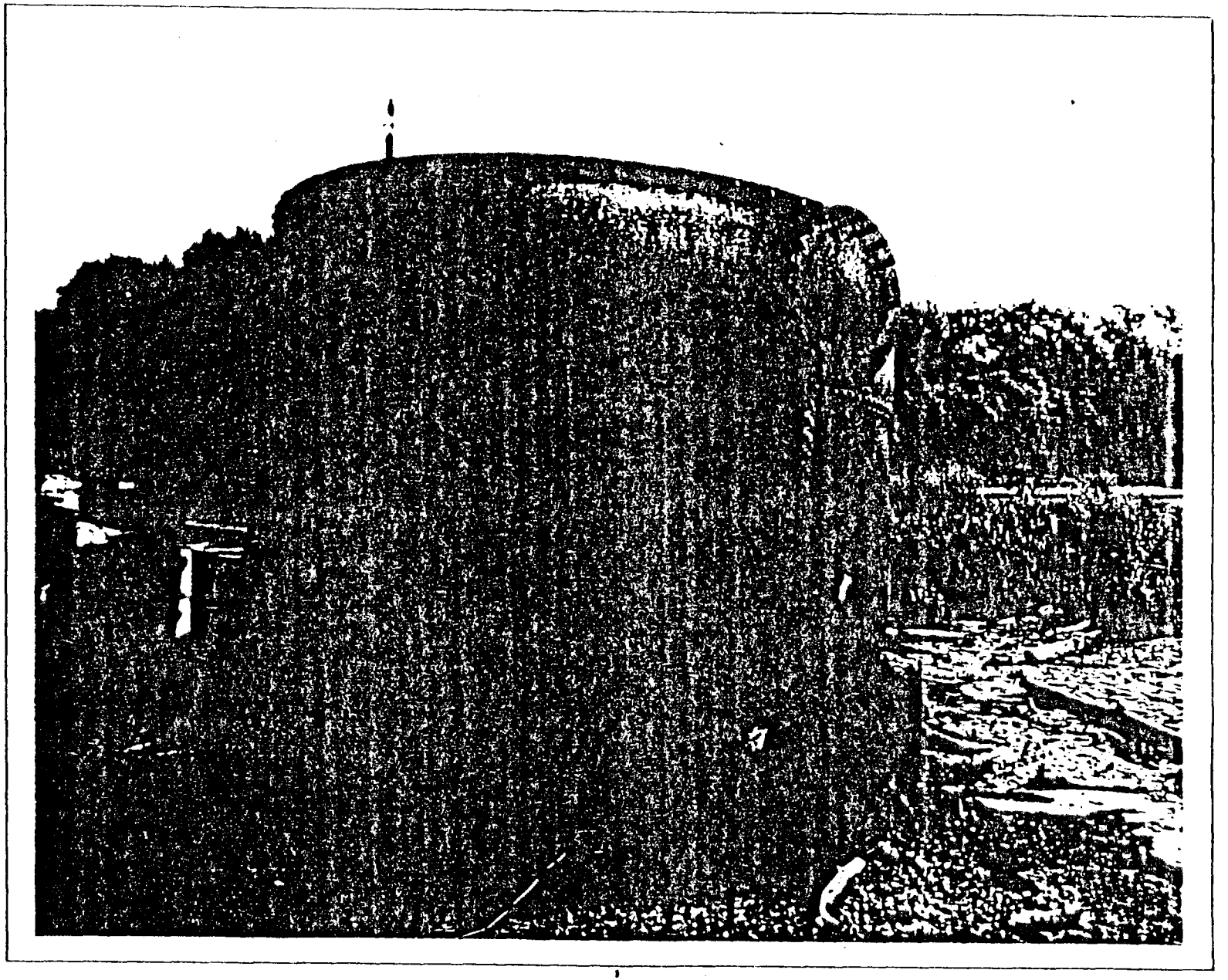


FIGURE D-2b SAFETY THERMAL TREATMENT POINT CONTAMINENT CONTAINMENT VESSEL

The maximum quantity of wastes which can be thermal treated at the STTP is limited to 1000 lbs. per event.

As with all the thermal treatment operations at NAVORDSTA, only properly identified and marked wastes are received for thermal treatment at the STTP. If the material delivered does not meet this criteria, it is returned to the generator for appropriate identification and subsequent disposition.

The thermal treatment operation at STTP consists of placing explosive-wastes and/or explosive/propellant-contaminated wastes into a containment system ~~called a burn pan~~ located on the peninsula. The planned use of one or more burn pans is primarily intended to protect soil, ground water, and surface water from potential contamination of constituents in the explosive and explosive/propellant-contaminated wastes, which are thermally treated at the STTP, and the combustion residuals therefrom.

The application of burn pans for thermal treatment at NAVORDSTA is in a development stage. Testing of different configurations, procedures, etc. for different types of explosive and explosive/propellant-contaminated waste may reveal the need to modify these operations. Such modifications would then need to be incorporated into this document as an amendment.

Figure D-3 shows the preliminary conceptual design of a typical steel burn pan which is to be mounted on concrete piers. It is to be approximately 10 feet by 18 feet x 14 inches in height (exclusive of the cover). The base will be supported on the concrete piers about 8 inches above the ground. The pan is to be constructed of 1/4-inch steel plate with 3-1/2" x 3" x 1/4" common steel angle subframe. The area immediately beneath the pan, consisting of clay-like soils, will serve as a secondary containment system.

A minimum of 6 inches of clay-like soils is placed as bedding material in the bottom of the pan. This material serves as (1) a liner to protect the pan from potentially excessive heat during thermal treatment and (2) a support medium for wastes treated. A 45 degree berm is constructed around the perimeter of the pan to provide additional containment of the minute amount of residuals and potential ejecta.

A movable weather-protection cover (for minimizing precipitation accumulation and wind dispersal) constructed of aluminum roofing material (with aluminum subframe) is to be mounted on casters placed on a steel track. The steel track is mounted on the aforementioned concrete piers. The design allows for inclusion of an optional motorized winch, which would allow for remote control over removal/replacement of the cover.

The burn pan(s) is designed with a sloped cover, which conveys incident precipitation to the ground adjacent to the pan. The cover is removed only for thermal treatment events. The pans are kept covered at other times to avoid precipitation collection within the bedding material used to support the waste materials. As a result of these procedures, no quantities of explosive waste or explosives/propellant-contaminated waste or waste residuals are present at the STTP for extended periods of time.

Only limited quantities of explosive and explosive/propellant-contaminated wastes are subjected to thermal treatment at each event in accordance with the safety regulation contained in Special Job Procedures (SJPs) for the STTP under the direction of the NAVORDSTA Safety Department. A typical operating sequence is as follows:

- o Receive explosive and/or explosive/propellant-contaminated waste via vehicle (e.g. truck) transport at the STTP in accordance with appropriate SJPs for explosives transport.
- o Load packaged slums and scrap propellant up to the applicable quantity limit (based on substances in the waste and stipulated limits in the SJPs or OP 5) in the burn pan(s).
- o Set up igniter system per appropriate SJP.
- o Clear and check area and notify appropriate supervisory staff prior to ignition.
- o Initiate thermal treatment event by remote control.
- o Inspect thermal treatment area after checking (visually) for evidence that reaction has ceased.
- o Clean ground area around burn pan(s) and place residues into burn pan. At appropriate intervals, collect samples of ash for testing.
- o Replace cover over burn pan(s).

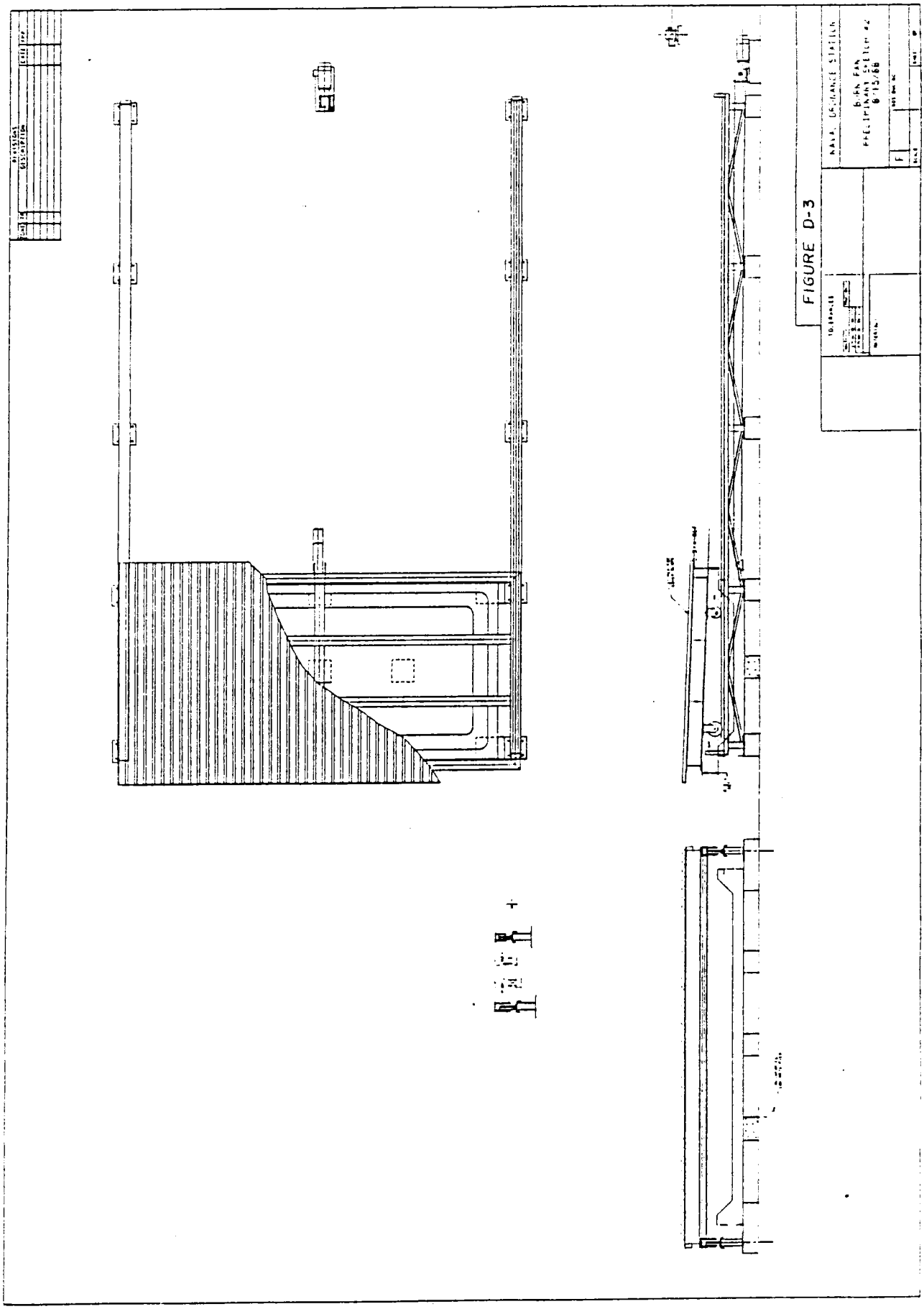


FIGURE D-3

There is also a thermal treatment vessel measuring about 9-feet in diameter and 8'3" in height at the STTP used for treatment of cartridge activated devices and actuator-type constituents, e.g. detonators, boosters, initiators. The vessel is constructed of 1/4-inch steel, has a flat bottom, open top, and legs, and is situated on a secondary containment pad of clay-like soil or concrete.

Any wastes with fragmentation possibilities are thermally treated in a steel vessel within a burn pan on the peninsula. The waste to be thermally treated is ignited using an electric match (squib), which is attached to long lead wires and "fired" remotely from a concrete bunker located a safe distance away.

The day after the treatment, the area is inspected and cleaned. Any explosive material remaining is collected and thermally treated at the next scheduled burn. Scrap metal that remains is visually examined to determine if it is decontaminated. If it is, it is taken to the Caffee Road Thermal Treatment Point (CRTTP) for additional thermal treatment. If it is not, it is placed in the burn pan and thermally treated again at the STTP at the next scheduled burn.

Ashes remaining in the pans are periodically collected, sampled, and analyzed to determine selected constituent levels. The disposal method used for these ashes depends on the results of the analysis. If the analysis shows explosive-contamination, the ashes are again thermally treated at the STTP. If the analysis shows the ashes to be hazardous waste, disposal is conducted as per NAVORDSTAINST 5090.2-Hazardous Waste Management. If the analysis shows the material to be inert and non-hazardous, it is disposed as a solid waste.

Information on access control and warning signs for the treatment areas, including the STTP, is provided in Section B. Safety Department personnel, who are trained in accordance with Navy requirements and Section H, oversee and direct all thermal treatment operations at this location. The Fire Department, which is part of the Security Department, is notified prior to treatment operations at the STTP.

D-3b Production Thermal Treatment Point

The Production Thermal Treatment Point is located at the end of Strauss Avenue on a 1,1ØØ-foot long peninsula extending into Mattawoman Creek. Figure D-1 depicts planimetric and topographic details within 1,ØØØ feet of this location/operation. Photographs of the PTTP are provided in Figure D-4.

OB operations are conducted on a daily basis during the day shift on normal workdays (excluding weekends or holidays), unless necessitated by an emergency action associated with a high hazard potential, at two locations on the peninsula. One OB area is near the end of the long peninsula. This is the main thermal treatment area where the bulk of the explosives-contaminated solid-like (nonflowable) wastes are thermally treated, within the area shown on Figure D-1. The smaller peninsula, which juts out into Mattawoman Creek from the east side of the large peninsula, is referred to as the Auxiliary Thermal Treatment Point (ATTP). Solid-like (non-explosive/propellant-contaminated wastes are also thermally treated at the ATTP. The explosive/propellant-contaminated liquid wastes are treated in the solvent thermal treatment vessel at ATTP. The maximum volume of liquid waste which is allowed to be placed in this vessel for a single thermal treatment event is 5ØØ gallons. There is also an igniter thermal treatment vessel located at the ATTP. Both vessels have legs which provide separation of the bottoms from direct contact with the ground. This allows for routine inspection of the vessels for structural integrity. Beneath each vessel is a secondary containment pad with a concave inward configuration. The pad consists of either concrete or clay-like soil (typically 6 inches or more in thickness).

The solvent thermal treatment vessel is approximately 8 feet in diameter and 7'6" in height. It is constructed of 5/8-inch steel and has a flat bottom and an open top. It is supported on legs and is located atop a secondary containment area consisting of clay-like soils or concrete. The maximum quantity of explosive/propellant-contaminated solvent treated in this vessel per event is 5ØØ gallons.

The igniter containment vessel is constructed of common steel, predominantly 3/8" thickness, and is approximately 16'3" x 5'9" x 4' (LxWxD). It is shaped like a semi-cylinder with a 2 1/2-foot radius. There is a steel grading across the top of the semi-cylinder.

There are also four hog-out pans located at the ATTP. The pans are constructed of 1/4" steel and each measure approximately 1Ø' x 4' x 8" (depth). These containment devices are used to thermally treat the moist solid constituents from motor propellant. These pans also have legs and are situated on a clay-like soil or concrete secondary containment pad.

Explosive-contaminated dumpsters and other containers are also thermally treated at the ATTP on a secondary containment system with clay-like soils. The containers are considered to be the primary containment devices. These containers are reused after decontamination.

Some explosive/propellant-contaminated items, such as rocket motors, are too large to place in a burn pan for thermal treatment.

These items are placed on a concrete or clay-like soil pad which serves as the secondary containment system. As the contaminants are trapped in the item, and are not subject to disengagement from the item by gravity, the item itself is considered to be the primary containment system. Additionally, as in the case of rocket motors, it may be necessary to attach the item to a concrete block typically a 3Ø-inch cube with eyelets on top and a restraining brackets on the side to prevent the item from unrestrained movement from the pad.

The PTTP and its operation are the responsibility of the Cast Division of the Ordnance Department. The explosive wastes and explosive/propellant-contaminated wastes which are thermally treated at this location consist mainly of off-specification production materials, residues, droppings, scrapings, and other by-products. In addition, occasional outdated ordnance and fleet returned overages may also be thermally treated. A list of typical wastes treated at the PTTP is included in Table C-1. The maximum quantity of wastes that are thermally treated at the PTTP is 9ØØØ lbs. per event at each location on the PTTP. In many instances, it is necessary to add supplemental fuel, such as NO.2 fuel oil or wooden, items, to the waste in order to assist in initiating and sustaining effective thermal treatment of the waste.

The operation is very similar to that previously described for the STTP; however, there is less risk of fragments. The propellant- and explosive-laden solid-like (nonflowable) wastes are placed in a burn pan and thermally treated. If there are liquid ingredients in the generally solid-like material, a plastic sheeting is placed over the clay-like soil bedding material in the burn pan before placing the wastes in the pan. The design and planned use of the burn pan(s) at the PTTP is virtually identical to its application at the STTP, as described in the previous subsection. Immediately (two minutes) before ignition of each thermal treatment event, PTTP operators are required to notify the security office dispatcher and the Cast Division office.

The day after treatment, the area of the containment system is inspected and untreated residuals if any, are collected, placed in the pan, and retreated at the next scheduled thermal treatment operation. Remaining metal scrap, which has been appropriately decontaminated, is cleaned up, placed in containers, and transported on Station roadways to the CRTTP for further thermal treatment. The clay-like soil surface is moistured for safety concerns prior to the next thermal treatment event. Ashes remaining in the burn pan are periodically collected, sampled, and analyzed to determine selected constituents. The disposal method used for these ashes depends on the results of the analysis. If explosive-contaminants remain, the ashes are thermally treated again at the PTTP. If the ashes are no longer explosive-contaminated, but contain other hazardous constituents, e.g. EP toxic metals, they will be managed as hazardous waste, and disposal will be conducted as per NAVORDSTAINST 5090.2 - Hazardous Waste Management. If the results show the material to be inert and non-hazardous, it will be disposed as a solid waste.

As indicated at the STTP, the burn pan is kept covered at all times, except during use for thermal treatment. Additionally, thermal treatment operations are not to be conducted if there is a projection of inclement weather conditions for the day, unless necessitated by an emergency. Should such inclement conditions, e.g. lightning and thunder, arise after the initiation of preparation steps for thermal treatment, the operations are halted (any time prior to ignition) and operating personnel are to seek shelter in nearby Building 880. Operations are resumed only after the return of suitable weather conditions. Based on the use of these procedures, no quantities of explosive wastes or explosive/propellant-contaminated wastes are present at the PTTP for extended periods of time.

OB operations are not to be initiated if the wind speed is greater than 30 mph, based on surface anemometer measurements at the PTTP. Wind speeds in excess of 20 mph require special permission from the Cast Division Director prior to commencing thermal treatment operations. Additional precautionary measures taken to protect operating personnel and to prevent accidents, injuries, etc. at the PTTP are extensively described in the SJP and are reflected in Section F of this permit application.

D-3c Caffee Road Thermal Treatment Point

The Caffee Road Thermal Treatment Point occupies approximately 1.25 acres and is located at the terminus of Caffee Road along the shoreline of Mattawoman Creek. Figure D-5 shows the significant planimetric and topographic details within 1,000 feet of the area. Figure D-6 is a photograph of the facility for orientation purposes.

Operation of the CRTTP is the responsibility of the Supply Department (Code 11), which maintains the operating records of the quantity of material treated and salvaged as scrap at this location. The operation at CRTTP is conducted in accordance with SJPs and consists of OB thermal treatment of explosive/propellant-contaminated scraps from Station operations (mostly bulk scrap metal parts). **No explosive waste is received at CRTTP.** The typical contaminated bulk metal materials which are taken to the CRTTP include:

- o Decommissioned/scrapped components from production facilities (piping, vessels, structural supports, machinery, etc.).
- o Spent rocket motors.
- o Empty metal containers.
- o Empty ammunition containers.
- o Scrap metal from the Safety and Production Thermal Treatment Points.

In addition, certain other explosive/propellant-contaminated scraps of a nonmetallic nature are also thermally treated at this location (i.e. packing materials, wooden/cardboard-type containers and scrap materials, etc.). A list of typical scraps that are thermally treated at the CRTTP is included in Table C-1. **The decontaminated scrap (metals) is sold or salvaged through a Defense Reutilization and Marketing Office (DRMO) contractor.**

Liquid organic solvents are not permitted to be received at the CRTTP. All explosive/propellant-contaminated solvents are thermally treated at the PTTP or STTP. Empty solvent containers that are contaminated with explosives may be placed on the CRTTP and decontaminated so they reach a temperature that destroys any explosive or propellant present.

The CRTTP is subdivided into three (3) operational sections to segregate the materials in process:

- Section 1 - Explosive/propellant-contaminated scrap which requires thermal treatment and demilitarization (disassembly).
- Section 2 - Scrap which has been thermally treated, but still requires demilitarization.
- Section 3 - Thermally treated and demilitarized material ready for removal from Station as scrap.

The use of the sections is rotated so that one section is employed for current receipt, one is prepared for or undergoing thermal treatment, and the third section is undergoing inspection to verify decontamination of the scrap or awaiting scrap removal from the CRTTP.

The purpose of rotating the use of these sections is to allow each portion of the surface to be decontaminated at least every 6 months. If a portion of the soil surface is removed during decontamination, a structurally-sound mixture of clay-like soils and sand is used to restore the surface to the original elevation.

It is planned to evaluate the surface of the CRTTP site to determine the effectiveness of the surficial soils as a containment system for the thermal treatment operations. The existing soils will be tested for permeability and potential residual contamination. Based on the results, it may be necessary to develop/design an engineered liner utilizing clay-like (low permeability) materials to provide a continuous system in the area where thermal treatment operations are conducted at CRTTP. It may also be necessary to remove some of the residual-bearing soils, which may be unsuitable as liner material, for disposition elsewhere.

The sequence of operations at the CRTTP is generally performed as follows:

- Contaminated scrap materials are delivered to the site via dump trucks and/or mobile equipment on an as-generated basis by the Supply Department and/or the generator. Access to the site is controlled by 8-foot high, cyclone-type fence/gate that is kept locked to prevent the unauthorized delivery of waste materials to the area.

- Scrap materials are staged at the site following delivery and are consolidated into a mass by pushing or staging with a bulldozer. As part of the materials movement operation, previously treated materials are moved into the mass to allow for multiple treatment of materials.

- Every 1 to 2 weeks the mass is thermally treated through flashing. The ignition of the mass is performed by the Safety Department. The Fire Department is on-call or present during treatment operations. Ignition, is conducted remotely by a "squib", or electric match, that is activated via "wire-line" type leads so that personnel are not present in the treatment area. Navy safety procedures are explicit in this regard and are monitored closely by supervisory personnel to avoid accidents or casualties. At times ignition may be difficult to achieve because the mass (by volume/weight) is almost entirely scrap non-ignitable metals. The amount of combustible materials and explosive/propellant-contaminated wastes is minimal in comparison. On those occasions when difficulty is expected or experienced in igniting the mass, certain ignition aids are utilized, such as No. 2 fuel oil and/or scrap wood. Other materials are not permitted by Station regulations to be used as ignition aids.

- After ignition, the mass generally burns for approximately 1 day. During this period, the site is monitored at regular intervals by Station security patrols, the Safety Department, the Fire Department, and/or the Supply Department. If it is suspected that decontamination via thermal treatment has been only partially completed (as evidenced by paint or other visually observable residuals remaining on scraps in certain areas of the mass), the mass is then "remixed" using the bulldozer and ignited again until it has been visually determined that destruction of the explosive/propellant-decontaminants has been achieved.

- Once the mass of scrap has been satisfactorily decontaminated, it is stored in-place until sufficient quantities are accumulated to warrant salvage/purchase by DRMO contractors.

NAVORDSTA has considered other locations for this operation in the past, including sites away from the shoreline. However, the principal criteria for selection of this site are its remoteness and the safety aspects of this type of operation.

As with the STTP and PTTP, OB operations are not initiated if there is a projection of inclement weather condition, unless necessitated by an emergency. Additionally, thermal treatment is not initiated if the wind speed is greater than 15 mph, based on surface anemometer measurements near the CRTTP. Precautionary measures contained in applicable SJPs are followed by operating personnel to prevent accidents, injuries, etc. at this operating location.

Accordingly, there are no adverse effects for this location on people or structures, which could be adversely impacted by flying sparks that may be produced during treatment operations. A substantial wooded area buffers the treatment site from the interior Station facilities.

D-3d Effectiveness of Treatment

The wastes managed at the three (3) thermal treatment areas are subjected to open burning due their explosive/propellant-contamination and potential reactivity when exposed to shock, flame, static electricity, etc. The use of open burning to render these wastes safe has long been considered the most prudent manner of treating these materials to prevent potential harm to people, structures, and the environment.

The effectiveness of open burning explosive-contaminated wastes has been evaluated by the Department of Defense for the typical materials which are produced at NAVORDSTA.

- Trinitrotoluene (TNT)
- Dinitrotoluene (DNT)
- Hexahydro-1,2,5 trinitro-sym-triazine (RDX)
- Cyclotetramethylenetetranitramine (HMX)
- 2,4,6-trinitrophenyl methyl nitramine (Tetryl).

This has been done by collecting and analyzing 65 soils samples from multiple locations on the open burning grounds of 1Ø DOD facilities (sites other than NAVORDSTA) to determine the reactivity of the samples. The results of the study entitled "Summary of AMC Open Burning/Open-Detonation Grounds Evaluation, March 1981-March 1985," demonstrated that a sample is not reactive if the concentration of total explosives in the sample is less than one percent (1Ø,ØØØ ppm). These results were obtained using two U.S. Department of the Interior Bureau of Mines procedures called the Gap Test and the Interval Ignition Test. These testing procedures have recently gained regulatory acceptance at various EPA regional offices and State agencies in the absence of other standardized test procedures for determining the reactivity of such samples.

Accordingly, explosive and explosive/propellant - contaminated wastes at NAVORDSTA's STTP and PTTP will be considered to have been effectively treated to render the waste nonreactive, particularly since the standard operating procedure for these thermal treatment areas is to inspect the thermal treatment areas after each event and retain any untreated material for the next thermal treatment event. Similarly, explosive/propellant-contaminated waste at CRTTP are subjected to multiple thermal treatment events via mixing of the wastes to assure that the resulting mass of material is rendered safe for off-site salvage/reclamation by a contractor.

D-3e Air Quality Assessment

This subsection addresses the prevention of potential air quality impacts on human health or the environment from the thermal treatment operations at NAVORDSTA, in accordance with the requirements of 4Ø CFR 264.6Ø1(c). All three (3) thermal treatment areas operate in accordance with an air pollution control permit (see Section A, Form 3, Item X) issued by the Charles County Health Department.

Thermal treatment via open burning in containment systems (with removable covers to prevent precipitation accumulation), as conducted at NAVORDSTA, is a relatively short-term operation at the STTP and PTTP, ranging from a few minutes for explosive and propellant waste up to a few hours for high flash point explosive-contaminated solvents. Thermal treatment at the STTP is typically conducted only about once per week during daylight hours. Operations are generally conducted every day (also during daylight), not typically on weekends and holidays, at the PTTP. As indicated in Section D, thermal treatment is not initiated during or when inclement weather is forecasted, or when winds are excessive (greater than 3Ø mph).

Thermal treatment at CRTTP is a less frequent occurrence, which depends on the accumulation rate of scrap materials contaminated with explosives or propellants. Open burning is conducted usually every one to two weeks. Due to the fact that the vast majority of materials received at CRTTP are metallic in nature, it is often necessary to add supplemental fuel, in the form of No. 2 fuel or wood to help sustain a burn in order to achieve decontamination of the metal scrap. Other types of fuels, including solvents, are not allowable at CRTTP.

Although a comprehensive air quality assessment of the thermal treatment operations has not been performed at NAVORDSTA, a Study to Determine Residue from Open Burning of Ordnance-Related Materials dated September 1984 gathered and evaluated available information from multiple facilities engaged in ordnance production. The study included an extensive literature search and computer modeling to simulate the open burning process with regard to the types of combustion products formed from open burning of different ordnance materials at different excess air levels. The focus of the study, however, was on determining the types and levels of residuals remaining at the burning grounds.

The chemical and physical characteristics of the explosive and explosive/propellant-contaminated wastes subjected to open burning are variable among the different types of wastes treated (see Section C). The wastes are handled in limited quantities, temporarily stored as necessary, and thermally treated in accordance with definitive Navy operating procedures by trained personnel (see Sections D, F, and H). Although the primary emphasis is on safety, particularly those individuals handling the wastes, the wastes are maintained in closed containers, where possible, to minimize premature emission of gases and aerosols to the atmosphere.

The planned elevated containment systems (including burn pans with movable covers) are designed to (1) keep the wastes off the ground prior to treatment and (2) allow for sufficient spreading to achieve complete combustion after ignition. They also provide a means to inspect and collect the residuals from thermal treatment for subsequent disposition, so that the residuals are isolated from exposure to precipitation, which could mobilize soluble constituents, such as heavy metals through dissolution.

The operating procedures used at the different thermal treatment areas with regard to achieving effective decontamination/destruction of the organic constituents in the waste are described in Section D. The addition of selected supplemental fuel, as described above, serves both to initiate the thermal treatment of the contaminated scrap materials and to minimize the release of particulate products of combustion.

As indicated above, thermal treatment operations are not scheduled or conducted during inclement weather, which includes excessive wind conditions. The Navy operating procedures are definitive in this regard and supervisory personnel are responsible for monitoring compliance. An anemometer is located near each treatment area and the wind speeds (and general weather conditions) are checked and recorded at the time of each open burning event. Additionally, it is Navy practice to postpone a burn event if adverse atmospheric conditions, such as a local inversion (rare occurrence at NAVORDSTA) prevails.

The existing air quality in the Air Quality Control Region in which NAVORDSTA is located is considered to be acceptable with regard to the parameters monitored under current regulations. The potential for health risks to individuals from the thermal treatment operations at NAVORDSTA is limited to Station personnel during (1) the preparatory phase of thermal treatment operations and (2) the removal of residuals. In view of the remote locations of the treatment areas, more than 2000 feet from the nearest residence across Mattawoman Creek, the potential risks from the emission products to humans are negligible, although quantitative data is not currently available to define the actual risk levels. Also, the short duration of the burn events tends to minimize the potential exposure of individuals offsite.

The aforementioned study indicated that plume emissions from open burning of ordnance (containing explosives) materials are rapidly dispersed to low levels in the atmosphere. Particles in the plume are either solids or liquids in the form of aerosols. Due to the turbulence caused by the rapid burning of these materials, the particulates are entrained in the plume. Residues of the surface of the thermal treatment areas studied were deposited primarily through the mechanics of sedimentation and impaction.

The metallic constituents, including aluminum, lead and magnesium, were found in the form of condensable oxides, which can deposit on the burning grounds and fall throughout a wide area. However, the results appear to indicate that lead in the soil at a propellant burning ground is not readily mobile or taken into the food chain.

The study concluded that combustion of ordnance material leaves behind insignificant quantities of residues, particularly if care is taken to collect unburned and residual materials. It also is concluded that certain materials, which require large amounts of excess air for combustion, such as dimethylhydrazine, should be treated in other devices that can supply the required air and capture the acidic products of combustion in a scrubber unit.

Recognizing that the information contained in the study was not site-specific for NAVORDSTA, the results provide only a general reference point for assessing the potential effects of thermal treatment operations at the Station on local air quality. Only a carefully planned and conducted study of the wastes managed at the NAVORDSTA thermal treatment areas can provide definitive data to demonstrate the actual air quality impacts of these operations.

D-4 Flood Plain Impact

D-4a Safety Thermal Treatment Plant

The STTP is located on a peninsula which is expected to be inundated with floodwaters from a 1ØØ-year storm event (see Figure D-1). The nature of operations at this location is such that planned use of the containment system using the burn pan will virtually eliminate any adverse effects on the environment resulting from a flooded condition at this location. Additionally, the operating schedule is flexible enough to avoid the placement of wastes during a period in which flooding could occur. This flexibility, coupled with the procedures used to (1) inspect and cleanup metal residues, if any, after each event, (2) sample, test, and periodically remove the resulting ash from the burn pan, and (3) monitor weather reports (see Section B) to anticipate and respond to a potential flood warning, virtually assure that no
adverse environmental effects will occur as result of flood conditions at the STTP.

Additionally, the Public Works Department will be notified by the EC that a flood warning has been issued and that delivery of explosive and explosive/propellant-contaminated wastes to all of the thermal treatment areas is to cease until the flood warning has been lifted.

D-4b Production Thermal Treatment Point

Although the PTTP is also located in the flood plain, the planned use of the burn pan containment system and the various thermal treatment devices/vessels will minimize the potential for adverse environmental effects associated with thermal treatment at this location. As with the STTP, the operating schedule flexibility and procedures for residual material and ash removal, and the monitoring of weather conditions essentially assure that flooding at the PTTP will have no adverse effects on the environment.

D-4c Caffee Road Thermal Treatment Point

The location of CRTTP, the surface of which is estimated to be about 2 to 4 feet above MSL, is also expected to be inundated with water during a 1ØØ-year flood condition. Upon receipt of a flood warning, as discussed in Section B, the Emergency Coordinator (EC) or the Alternate EC will review the forecasted flood/high tide predictions to determine if flood control actions are required to protect the CRTTP from flood impact. If action is required, the EC, after consultation with the Executive Officer (XO), will inform the Public Works Officer or Assistant Public Works Officer to proceed with the selected action, derived from the paragraphs that follow.

D-4c(1) Procedures to Mitigate Environmental Effects

Decontaminated scrap metal generated at the CRTTP area is currently sold on an approximately 6-month cycle. It is planned that the type of contract will be modified so that scrap metal will be picked up whenever there is sufficient quantity to fill two trucks, or about 4Ø tons. This will reduce the inventory of decontaminated and demilitarized scrap metal present in the area and permit a larger portion of the area to be used for day-to-day operations.

Collectively, these measures are expected to further minimize the potential for adverse environmental effects associated with possible flooding of the CRTTP by reducing the amount of explosive/propellant-contaminated wastes and scrap awaiting thermal treatment. The specific actions taken in response to a flood warning for the CRTTP are described below.

D-4c(2) Flood Response Operations

There are two responses evoked by flood warning for the CRTTP. One is to cease the delivery of contaminated scrap to CRTTP until the flood warning has been lifted and to delay a pending ignition of the next burn event. The second response is to remove the inventory of explosive/propellant-contaminated waste (awaiting thermal treatment) from the area to prevent washout. Upon receiving a warning of flood conditions or high tide, the EC will review the forecast conditions to determine the extent of the threat. In addition the EC will direct the Public Works Officer (or his alternate) to visit the CRTTP to assess the situation and the effort/amount of resources required to remove the waste from the site in a timely manner related to the flood warning.

Removal operations will be conducted as follows:

- o A working party, consisting of the necessary operating and supervisory personnel, will be assembled at the CRTTP area. The working party will typically use up to six dump trucks, a front end loader, and a crane equipped with a clamshell. The trucks will be loaded and will move the unflashed explosive/propellant-contaminated waste (typically covering an area less that 20 feet x 100 feet) to the asphalt paved area adjacent to Building 1650. (Note: In the unlikely event that the flood warning is received less than 12 hours before the predicted flood crest or the estimated time for removal exceeds the time available before the expected flood crest, then two bulldozers and/or other heavy equipment will be used to move the waste from the flood plain at the CRTTP).

- o The active portion of the decontamination area will be covered with 4 mil sheet plastic to prevent erosion and migration of possible soil contamination from the site. The plastic will be secured with weights (bricks or concrete blocks) placed every 6 feet across the surface. Alternately, Envirofence will be placed around the perimeter of the area to control erosion.

- o Filter cloth barriers (Envirofence) will be placed around the waste in the temporary staging area (near Building 1650).

- o After the flood emergency has passed, the waste in the staging area will be returned to the CRTTP. Once it has been returned to the area, the asphalt at the temporary staging area will be cleaned of visually detectable contamination. Liquids, if present, will be recovered using granular absorbent. Absorbents are stored throughout the facility (see Section G).

D-5 Explosive/Propellant-Contaminated Waste Generated Off-Site

Occasionally NAVORDSTA may receive explosive/propellant-contaminated waste in drums, such as used filter fabric or spent carbon from the treatment of pink water, from the Stump Neck Annex located across Mattawoman Creek from NAVORDSTA. The Station Property Disposal Officer (PDO) will inspect each shipment for consistency with required documentation prior to acceptance for on-site storage or treatment at NAVORDSTA. An internal manifest is used for these wastes.

D-6 Ignitable, Reactive or Incompatible Wastes

NAVORDSTA has a Hazardous Materials Safety Program, as described in NAVSEA OP 5, applicable Special Job Procedures, and Safety Department directives, that stipulates procedures for properly labeling and packaging explosive and explosive/propellant-contaminated wastes. These documents definitely address the methods for handling the wastes in a safe manner to protect Station personnel and the environment in the immediate vicinity of the three thermal treatment areas. NAVORDSTA maintains and enforces the program for all operating departments that use or handle such hazardous substances and manage explosive and explosive/propellant contaminated wastes. The policy for safe handling of this type of waste is set by the Safety Department. The safety program is monitored by Safety Department, Environmental Protection Division, the Supply Department Material Division, and all operating department supervisors.

D-7 Noise Considerations

Environmental noise considerations are not a concern of the thermal treatment areas due to the nature of the noise created by OB operations and the remote location of the areas from human activity. This has been demonstrated by conducting a test under typical operating conditions to measure the level of noise from a safe distance away. The test was performed at a point about 700 feet away from a typical thermal treatment event at the NAVORDSTA Production Thermal Treatment Point in which approximately 5000 lbs. of explosive waste was burned on September 22, 1988. The peak meter reading for this event was 75 decibels, which is well below the trigger level for required use of ear protection.

E - Hydrogeology

SECTION E
HYDROGEOLOGY

E-1 Regional Hydrogeologic Setting

This section provides information on the hydrogeology in the immediate area of the Naval Ordnance Station (NAVORDSTA) in accordance with 40 CFR 270.23 as applicable to miscellaneous thermal treatment units regulated under 40 CFR 264.601.

E-1a Regional Topography and Climate

The NAVORDSTA-Indian Head, Maryland area lies within Charles County, Maryland, and is characterized by gently rolling terrain, marshlands, swamps, and Potomac River Basin shoreline. The maximum topographic elevation within the NAVORDSTA is about 100 feet above sea level.

The climate of the region displays well defined seasonal variations and an average temperature of 56°F. The climate is strongly influenced and moderated by the Potomac River estuary and its major tributaries (Maryland Dept. of Nat. Resources, 1984). The coldest period of the year is usually late January-early February with average daily minimum temperature about 21°F. The end of July is usually the warmest time of year with average daily maximum of 89°F.

Average annual precipitation in Charles County is approximately 46 inches (Maryland Dept. of Nat. Resources, 1984). July and August are the wettest months while February and November are generally the driest. Prevailing winds in this area are west-northwesterly but more southerly winds are common in the warmest periods. Severe damaging storms or weather phenomena are rare.

E-1b Hydrogeologic Overview

The NAVORDSTA area is situated within the Atlantic Coastal Plain physiographic and geologic province. This province is underlain by a sequence of gently dipping unconsolidated layers of marine and coastal clay, silt, sand, and gravel deposits. The composition, lateral extent and thickness of the individual lenses and layers comprising this sequence are variable. Beneath the central portion of the NAVORDSTA, these units were deposited in the Cretaceous geologic period from about 135 million to 65 million years ago, although some of the uppermost sediments such as the Columbia Formation were deposited more recently, within the past few million years of Quaternary geologic time (Johnson, 1964).

The coastal plain sedimentary sequence is underlain by much older (Precambrian) bedrock consisting of consolidated igneous and metamorphic crystalline rocks. Figure E-1 describes the general lithologic column for the region. The Cretaceous Coastal Plain sequence are generally classified in two groups of formations: the deeper group consists of the Patuxent Formation and Arundel Clay and the upper group includes the Patapsco and Raritan Formations. These units are overlain by younger sedimentary layers which may include the Aquia Greensand, the Columbia Formation, and other deposits.

In general the Coastal Plain sediments dip to the southeast at a slope of about 50 feet per mile, as indicated on Figure E-2. The total thickness of the Cretaceous units (Patuxent through the Patapsco-Raritan) ranges from about 500 feet to 600 feet. The surficial sediments in the area are generally a few feet to 40 feet thick.

The principal water-bearing aquifer units in the region consist of several permeable sand layers within the lower and middle Patapsco-Raritan group. These strata are inter-layered between fine grained silty and sandy clay aquitards which act to confine and isolate the water-producing sand layers. The lower Patapsco sand units generally yield the most water to wells in the Indian Head-NAVORDSTA region.

The outcrops and recharge zones for the aquifer units lie eastnortheast of the area, primarily in Virginia and beneath the Potomac Estuary.

E-1c Patuxent and Arundel Clay Formation

These formations are considered as one combined undifferentiated unit in this part of Maryland, although they are identified and described as two separate distinctive geologic units in areas to the north, such as the Baltimore area. The top of the Patuxent-Arundel in the Indian Head area is generally considered to be the bottom of the lowermost sand layer in the Patapsco-Raritan Formation. The average thickness of the Patuxent-Arundel in the vicinity of the NAVORDSTA is about 300 feet and its upper surface ranges from about 250 feet to 300 feet below sea level.

The composition of the Patuxent-Arundel consists primarily of clays and sandy to silty clays. A few water producing permeable sand layers are interbedded within the clay-rich aquitard units. The permeable sand units generally pinch out laterally within two miles or less. Some production wells in the area tap the sand layers within Patuxent-Arundel, but most wells find sufficient water yields within the overlying

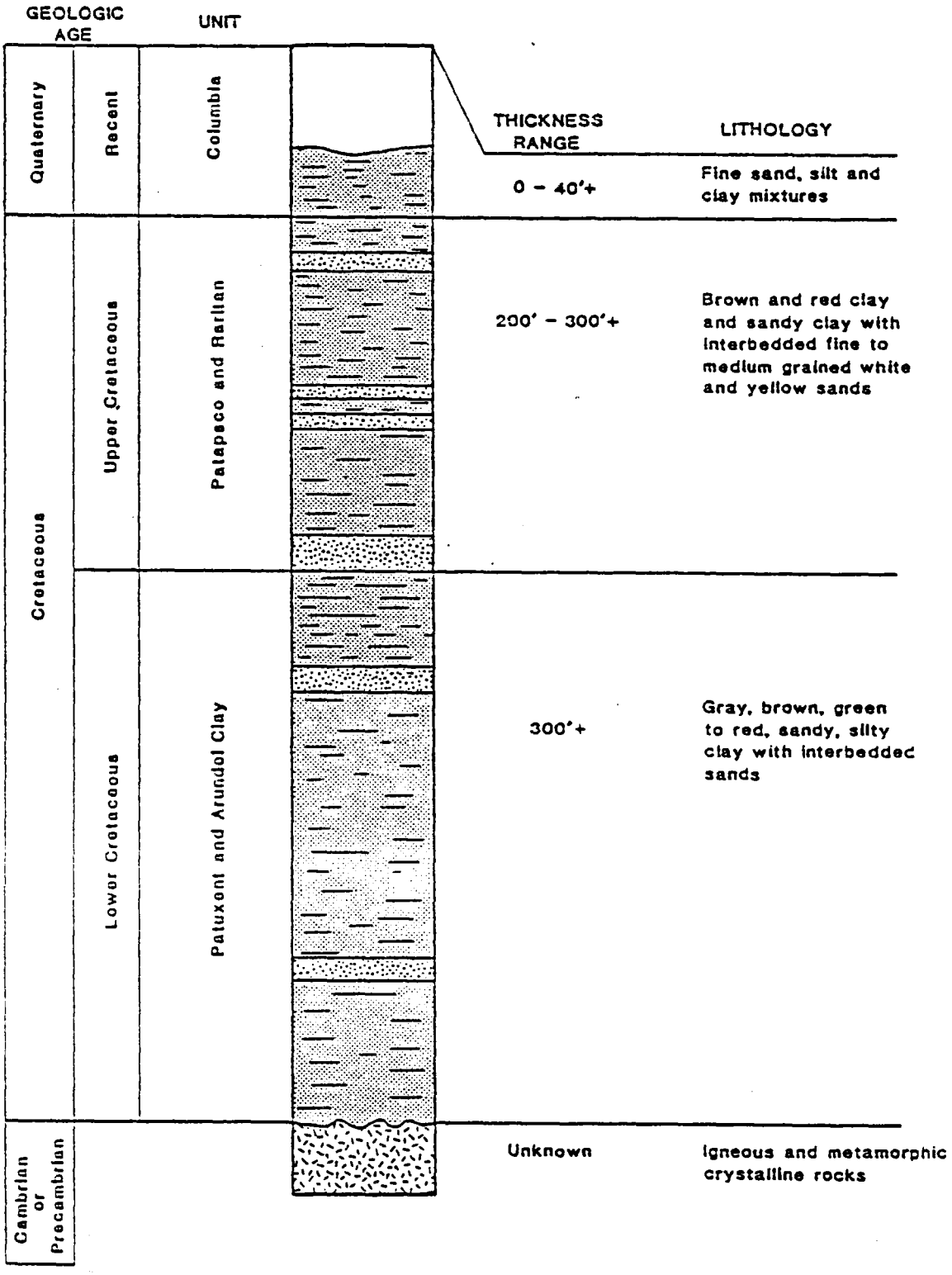


Figure E-1 Generalized lithologic column for the NAVORDSTA-Indian Head area, Maryland (from AWARE, 1982).

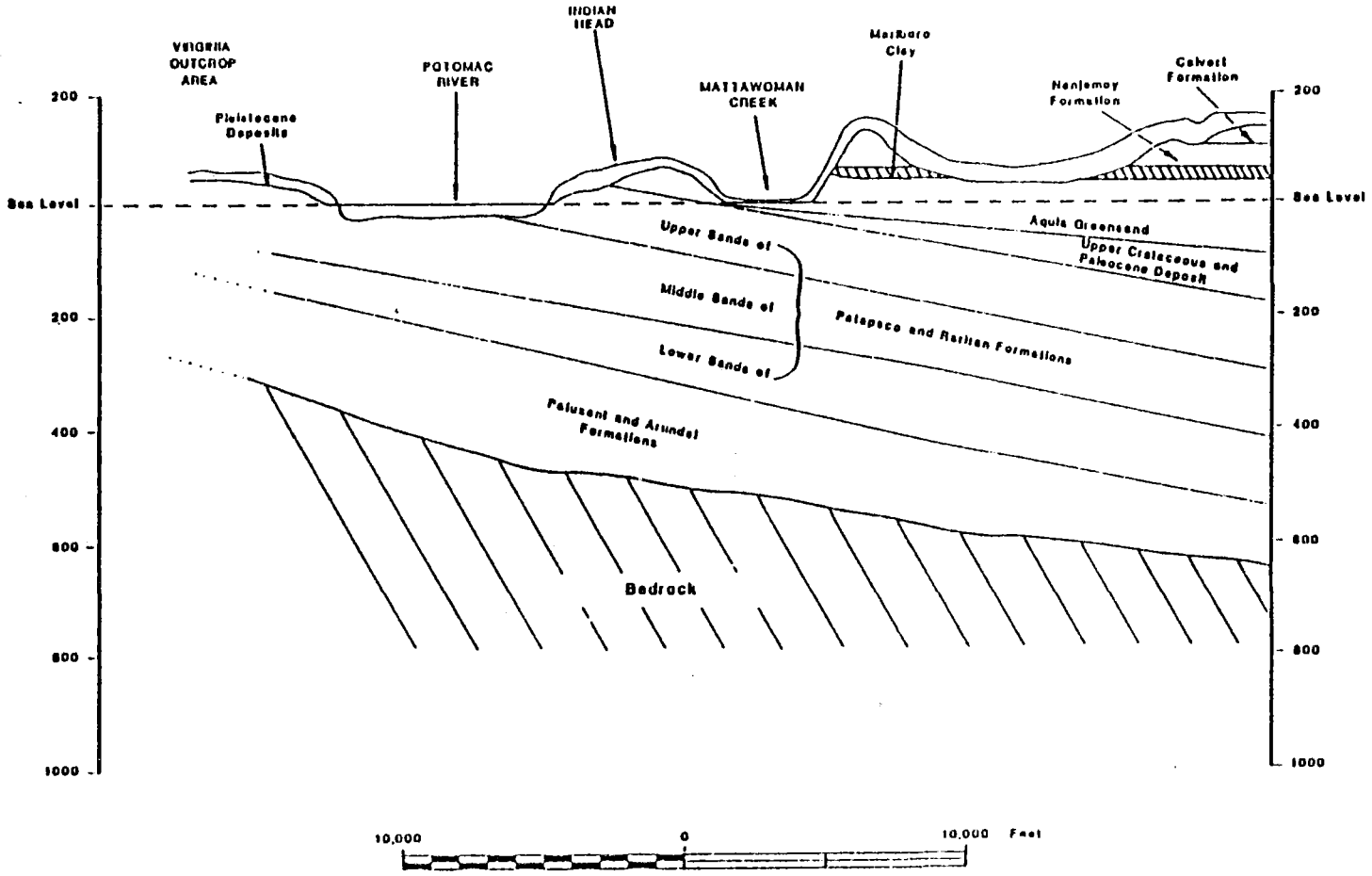


Figure E-2 Generalized geologic cross-section through the NAVORDSTA-Indian Head area, Maryland oriented northwest-southeast (from AWARE, 1982).

Patapsco-Raritan Formation. Figure E-3 depicts hydrogeologic strata of the Patuxent-Arundel and Patapsco-Raritan Formation, as indicated from NAVORDSTA production wells in the area.

E-1d Patapsco-Raritan Formations

The Patapsco-Raritan Formations are considered as one undifferentiated formation group (commonly called Patapsco) for this analysis because the boundary separating them is uncertain. This formation group is composed of interbedded and intermixing silts, sand, and clays with a total thickness of 200 to 300 feet. There are commonly several good water-yielding laterally-discontinuous sand layers within the unit which have been tapped by many production wells in the area. Generally three vertical zones have been encountered which tend to contain the more permeable sand units: the Upper Sand zone, the Middle Sand zone, and the Lower Sand zone. In the NAVORDSTA area, the Upper Sand is usually thin or absent and is not considered to be an aquifer in the area. The Middle Sand usually occurs at elevations between 50 and 200 feet below sea level and is not as productive as the Lower Sand zone. The Lower Sand is generally encountered between 200 and 300 feet below sea level and serves as the most productive aquifer unit in the area.

E-1e Hydraulic Properties of Aquifers and Well Yields

Most of the Patuxent-Arundel and Patapsco-Raritan formations are comprised of clay-rich sediments with very low hydraulic conductivity. These clayey units do not yield sufficient quantities of water to wells to be considered aquifers. However, the less prevalent permeable sand units can be very productive aquifers and have been tapped extensively for water supplies in the area. According to USGS tests, the principal sand units within the Patuxent-Arundel group have moderately low transmissivities in the range of 500 to 800 ft^2/day (Johnson, 1964). The storage coefficient of this combined aquifer ranges from 0.0002 to 0.0004. There are no wells within the NAVORDSTA that have been screened in only the Patuxent-Arundel group and so no water level data are available in the area for that formation. Reported well yields from the Patuxent-Arundel in the region are relatively low, ranging from 100 to 385 gpm; specific capacities range from 1 to 6 gpm/ft of drawdown.

As mentioned previously, the Lower Sand zone of the Patapsco-Raritan group is the most productive aquifer in the NAVORDSTA vicinity. The NAVORDSTA has fourteen production wells screened in the Lower Sand zone. Aquifer tests conducted by the USGS indicate that the transmissivity of the Lower Sand

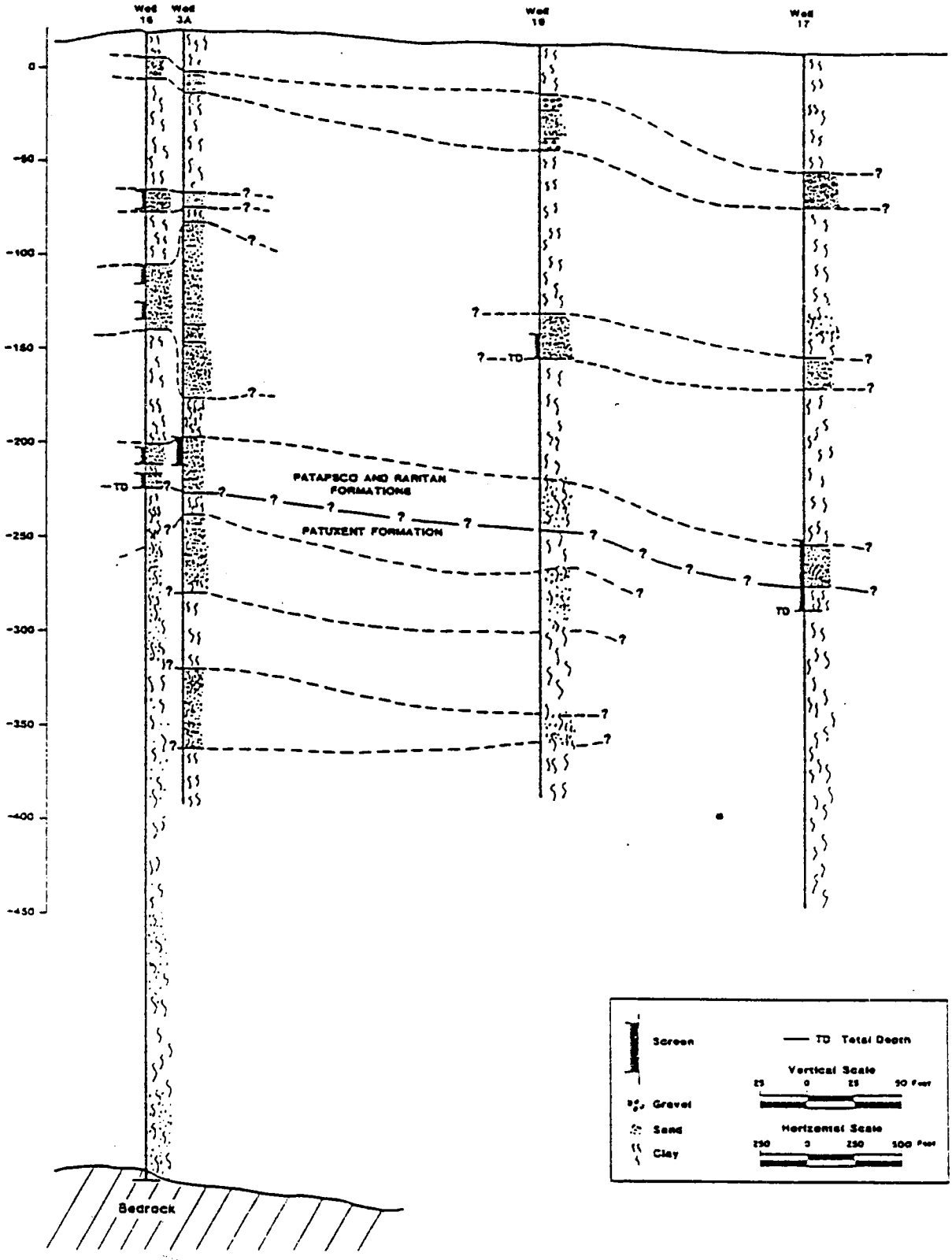


Figure E-3 Geologic cross-section through NAVORDSTA production wells showing typical positions of Patapsco sand-layer aquifer zones (from AWARE, 1982).

zone in the Indian Head area ranges from 270 ft^2/day to 535 ft^2/day. The combined transmissivity of the entire Patapsco-Raritan sequence was estimated to be about 1070 ft^2/day by the USGS. Therefore, the Lower Sand zone, which comprises less than 10 percent of the total formation thickness, provides as much as one half the total formation transmissivity. Vertical hydraulic conductivities of the clay-rich aquitards have been estimated to range from $2x10^{-8}$ to $2x10^{-10}$ ft/s (Mack and Mandle, 1977).

Water level measurements are available from numerous wells which tap only the Lower Sand unit in the area. A typical potentiometric map is presented in Figure E-4. The water level contours clearly reflect the regional drawdown cone of depression caused by the numerous supply wells which have been pumping water for many years. This cone of depression (sometimes called the area of influence or zone of capture) is estimated to be at least 7 miles in diameter along the long NE-SW axis and at least 3 miles wide in the NW-SE direction.

Potentiometric water levels beneath the NAVORDSTA are estimated to have declined more than 85 feet over the past 80 to 90 years, due to pumping. This has created a condition which may be inducing recharge of poor-quality water from the Potomac River. This has also increased vertical gradient downward from the water table through the confining clay layers. However, the vertical permeability of these thick clay aquitards is too low to allow significant migration of potential surface contaminants downward to the lower productive aquifers.

E-1f Water Use

Groundwater is the principal source of public and private water supply in the Indian Head-NAVORDSTA vicinity. Charles County has reported a total of 35,217 individual wells being used for public and private supplies (Maryland Dept. of Nat. Resources, 1984). Approximately 95 percent of all water appropriated in the Indian Head-NAVORDSTA area is from the Patapsco Formation. The Naval Ordnance Station is the largest water user in the Indian Head area. In the first six months of 1988, average daily use at NAVORDSTA was 1.42 mgd, all from wells tapping the Patapsco and Patuxent aquifers. The Station has 15 operable wells, eight of which tap only the lower Patapsco sands, with the other seven tapping the upper/middle sands as well as the lower sands. Characteristics of NAVORDSTA wells are listed in Table E-1 and locations are shown on Figure E-5.

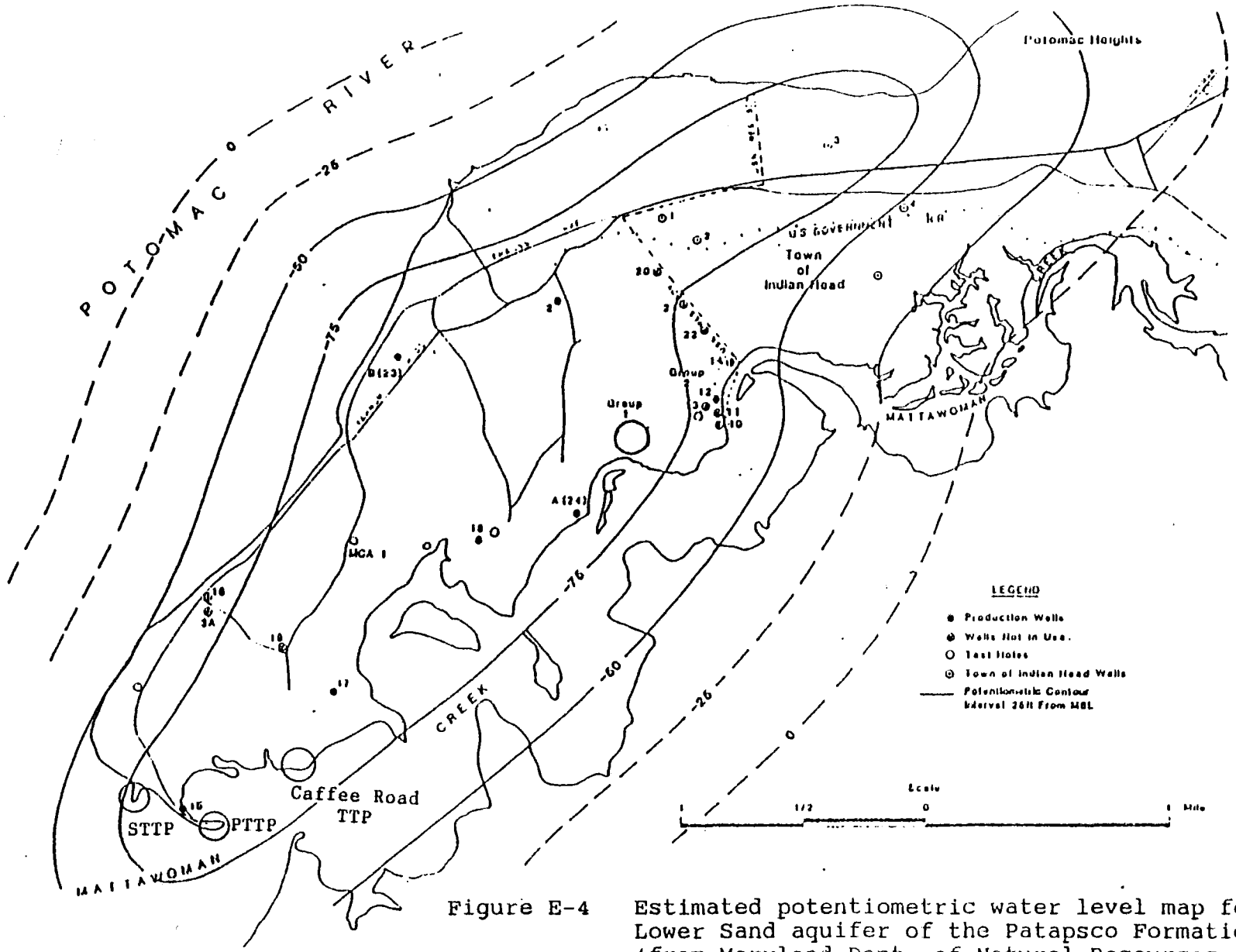


Figure E-4 Estimated potentiometric water level map for the Lower Sand aquifer of the Patapsco Formation, 1981 (from Maryland Dept. of Natural Resources, WRA, 1984).

Table E-1. Production wells on the NAVORDSTA and Stump Neck Annex facilities.

Owner	Owner's well number	Depth (in feet below ground surface)	Date drilled	Aquifer	Map location (Fig. E-5)	Comments ("BSL" - Below Sea Level)
Naval Ordnance Station	2A	380	1972	Lower Patapsco	1.	Screened 205-315 BSL
	3A	233	1972	Lower Patapsco	2.	Screened 182-197 BSL
	6	398	1915	Upper/Middle Patapsco & Lower Patapsco	3.	Screened 213-223, 263-273 and 338-359 BSL
	7	419	1915	Upper/Middle Patapsco & Lower Patapsco	4.	Screened 216-226, 269-278 and 338-360 BSL
	9	390	1915	Upper/Middle Patapsco & Lower Patapsco	5.	Screened 153-163, 203-213 and 323-344 BSL
	11	409	1918	Lower Patapsco	6.	MGS Observation Well
	12	390	1918	Lower Patapsco	7.	
	14	430	1918	Lower Patapsco	8.	
	15	623	1953	Upper/Middle Patapsco & Lower Patapsco	9.	Screened 167-182, 206-210 and 216-220, 244-256 BSL
	16	242	1953	Upper/Middle Patapsco & Lower Patapsco	10.	Screened 47-55, 85-95, 183-191 and 196-204 BSL

Table E-1. Continued.

Owner	Owner's well number	Depth (in feet below ground surface)	Date drilled	Aquifer	Map location (Fig. E-5)	Comments ("BSL" - Below Sea Level)
	17	454	1954	Lower Patapsco	11.	Screened 231-265 BSL
	18	302	1954	Upper/Middle Patapsco & Lower Patapsco	12.	Screened 175-188 and 242-270 BSL
	19	167	1952	Lower Patapsco	13.	MGS Observation Well
	43	580	1958	Lower Patapsco and/or Patuxent	14.	Stand-By Well
	2012(SN)	290	1961	Lower Patapsco	15.	Screened 185-195, 224-235 and 275-285 BSL
	A	286	1957	Upper/Middle Patapsco & Lower Patapsco	16.	Screened 216-227 and 257-274 BSL
	B	294	1957	Lower Patapsco	17.	Screened 188-242 BSL
	21	450	1954	Lower Patapsco	18.	MGS Observation Well

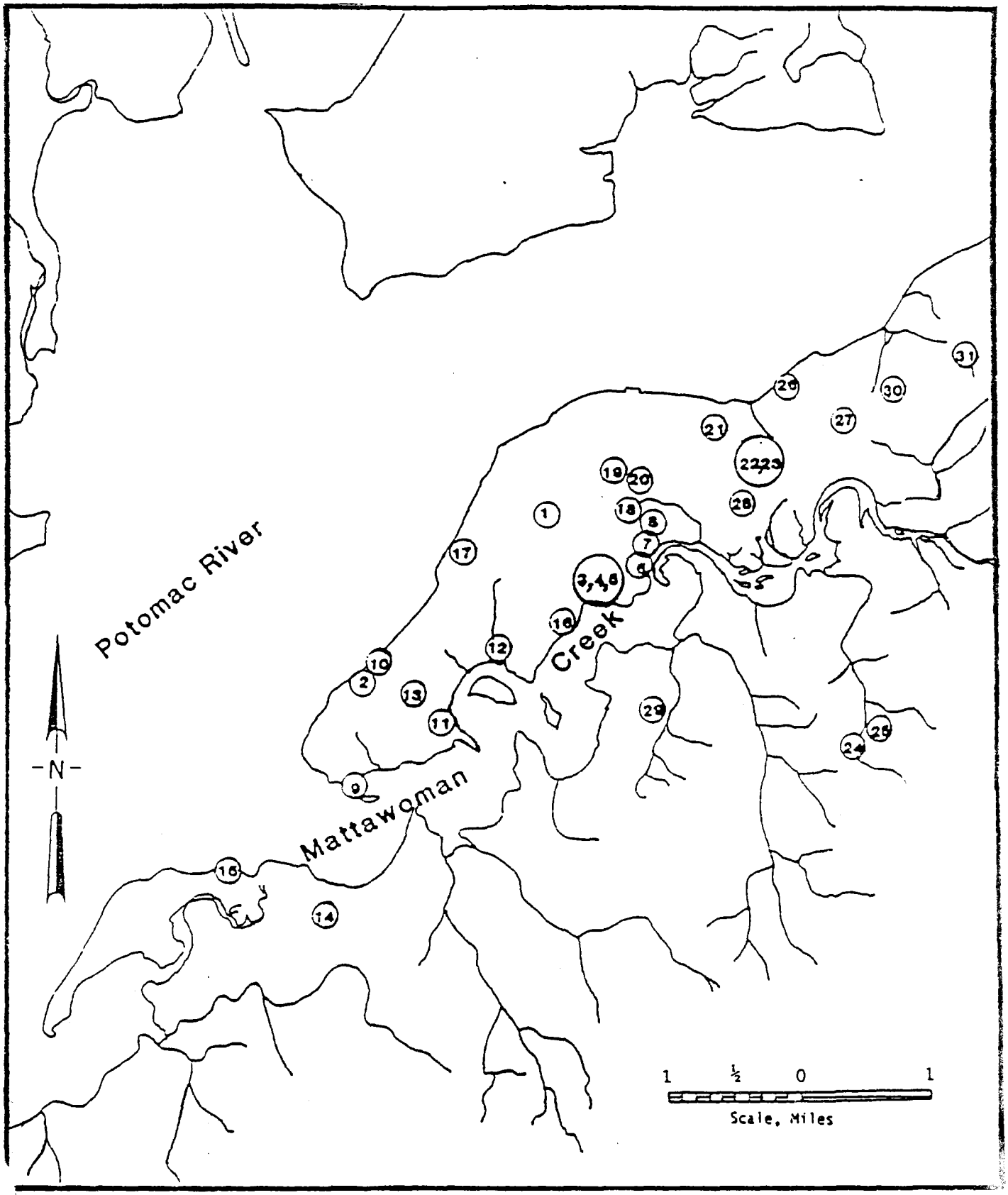


Figure E-5 Map of NAVORDSTA area showing map locations of NAVORDSTA production wells listed in Table E-1 (well numbers assigned by Charles County) (from Maryland Dept. of Natural Resources, 1984).

E-1g Recharge and Discharge

Recharge to the major regional aquifers in the Patapsco and Patuxent Formation occurs primarily from two mechanisms: (1) infiltration and percolation from outcrop areas to the northwest in Virginia and subcrop areas under the Potomac River; (2) water released from storage and vertical percolation through the confining aquitard units. Quantitative estimates of recharge rates are unavailable at this time, but are clearly significantly lower than recent discharge rates. Discharge from the regional aquifer system in the NAVORDSTA-Indian Head vicinity is almost entirely by production well pumpage. Total pumpage rates over the past 40 to 50 years have continued to create a spreading and deepening decline in potentiometric water levels, indicating that withdrawals are exceeding recharge rates and that water is being "mined" from the system.

E-1h Flow Direction and Rates

On a regional basis, groundwater flow is predominantly lateral and downgradient in the thinner and more transmissive and laterally extensive aquifer zones, such as the Lower Sand zone of the Patapsco formation. However, groundwater flow through the thicker low-permeability confining units is more likely to be vertically downward, from one permeable sand unit to the next lower sand unit.

Thus, regional flow directions in the Lower Sand unit are radially inward, perpendicular to the potentiometric contours on Figure E-5, toward the pumping center at NAVORDSTA and Indian Head. The flow rates in the Lower Sand can be estimated from Darcy's law and an effective porosity $V = (K/n_e) \times$ gradient, where V is seepage velocity, K is hydraulic conductivity and gradient is the hydraulic potential gradient. For the Lower Sands, K is approximately 20 feet per day, based on transmissivity and thickness data (AWARE, 1982). n_e is assumed to be about 25 percent and the average gradient is about 0.0125, based on Figure E-4. Therefore the estimated velocity is $(20/0.25) \times (0.0125) = 1$ foot per day.

Vertical velocities through the aquitard units can be estimated in a similar manner. For an assumed hydraulic conductivity of 1×10^{-9} ft/sec (Sloughter and Otten, 1968), a porosity of 0.25, and a downward gradient of 0.4, the calculated velocity is 1.4×10^{-4} ft/day or 0.05 ft/year (about one-half-inch per year). Because of uncertainty and areal variations, the actual vertical flow rates are estimated to range from 1×10^{-5} to 1×10^{-3} ft/day.

E-1i Water Quality

Groundwater quality in the most-used aquifer units of the Patapsco-Raritan and Patuxent Formation has generally been reasonably good, although considerably variable. Some of the water in the middle/upper sands of the Patapsco have high iron concentrations and sulfur odors (AWARE, 1982). That is one reason the Lower Sands are generally preferred over the higher units for water supplies. Typical chemical compositions for water from two NAVORDSTA production wells (Nos. 3A and 16) are shown in Table E-2. Total dissolved solids typically range from 200 to 600 mg/l. Iron and manganese commonly exceed EPA drinking water standards, but are not considered health threats.

The water producing zones tapped by the NAVORDSTA wells are virtually invulnerable to potential contamination from land-surface or shallow sources or releases, because of the extremely low permeability of the thick clay aquitards between the aquifer zones and the land surface. However, it is possible that contaminants or poor quality water can enter these aquifer zones from the Potomac River estuary.

Long-term pumping of the aquifers has lowered the potentiometric water levels below sea level, thus providing a strong downward gradient beneath the saline Potomac River. These greatly lowered potentials may also be inducing lower quality water to flow into the aquifer from deeper, more saline, strata and from the overlying confining layers which may contain lower quality water. It is clear from long-term monitoring data that chloride and other constituents are increasing with time in some of the NAVORDSTA and Indian Head wells, indicating intrusion of more saline water into the aquifer units. Continued pumping at current and previous rates will undoubtedly cause a continuing decline in groundwater quality.

E-1j Factors Affecting Contaminant Migration to the Aquifers

As pointed out in the previous sections, the only aquifers present in the vicinity of the NAVORDSTA are the Upper, Middle, and Lower sands of the Patapsco-Raritan group and similar sand layers in the underlying Patuxent-Arundel group. All these aquifer zones which are tapped by NAVORDSTA wells are isolated from land surface sources of waste and potential contaminants by at least 75 feet of low-permeability clay-rich layers. The Lower Sand zone, which is the chief aquifer of the area, is overlain by at least 200 feet of low-permeability clay-rich confining layers.

Table E-2. Results of chemical analyses of groundwater from NAVORDSTA wells 3A and 16 (from AWARE, 1982).

Parameter	Well Number and Sample Date						U.S. EPA Drinking Water Standards
	3A 11/81	3A 1973	3A 1/71	16 5/71	16 1971	16 8/53	
	(Results in mg/l, unless otherwise indicated)						
Fe	4.7	12.9	2.0	23.0	16.0	2.1	0.3
Mn	0.57	-	0.11	0.46	0.36	0.54	0.05
Mg	12	44	8	56	7.8	19	d
Ca	5.8	16	-	62	30	23	d
Na	53	-	-	-	29	47	d
SiO_2	33	30.4	39.9	35	34	32	d
SO_4	10	-	0.5	-	1.8	0.8	250
Bicarbonate	110	-	-	-	-	137	d
Cl	20	146	95	137	61.0	101	250
TDS	430	-	399	410	244	399	500
TSS	3.4	-	18	-	-	-	d
pH[a]	6.7	7.1	7.3	6.9	6.9	6.9	-
Specific Conductance[b]	-	950	-	-	385	536	d
Total Hardness (as $CaCO_3$)	-	60	17	118	120	114	d
Alkalinity	-	218	5	93	200	-	d
Al	-	-	-	-	1.0	0.3	d
K	-	-	-	-	2.4	2.7	d
NO_3	-	-	0.5	-	1.1	0.8	10
PO_4	-	-	-	-	0	0.2	d
F	-	-	0.00	-	0	-	1.4-2.4
Source of Analyses	AWARE	MCA[c]	MCA	MCA	MCA	USGS	

[a]Standard pH units
[b]Micromhos/cm at 25°C
[c]Matz, Childs and Associates
[d]No standard

Any contaminants which might be spilled or released on the land surface would have to migrate through the clay confining layers to reach a producing aquifer. The migration rates are on the order of one-half-inch per year. Therefore, there is virtually no likelihood of potential contaminants from possible surface or near-surface releases in the NAVORDSTA area reaching these aquifer zones within the next several hundred years. Consequently, there is no significant risk of exposure to people drinking water from the NAVORDSTA wells. However, there is some likelihood that contaminants released to the Potomac River by upstream activities could infiltrate directly into the aquifer units from the River and eventually migrate to the pumping wells. The thermal treatment unit is designed and operated in such a way that it is not expected to cause any significant release of contaminants to the subsurface or to surface water bodies.

E-2 Site-Specific Hydrogeologic Conditions

E-2a Exemption from Groundwater Protection and Hydrogeologic Assessment Provisions

The open burning thermal treatment points (TTP) included in this permit (Production Thermal Treatment Point, Safety Thermal Treatment Point and Caffee Road Thermal Treatment Point) are considered to be exempt from the groundwater protection and hydrogeologic assessment requirements of Parts 270.14(c), 270.23(b) and 264.601 because virtually no potential for groundwater contamination exists. This is based on the following justifications:

1. Thermal treatment at all areas is to be carried out in above-ground containment devices, as described in Section D.

2. Leakage from such containment devices is effectively detected by frequent periodic visual inspection, after each burn event. Leakage detection for free-liquid burn containment devices will consist of a secondary containment system which will be visually inspected after each burn event. If it is decided to place the Caffee Road TTP containment device on or beneath the ground surface depending on the results of soils testing as discussed in Section D, then appropriate additional leak detection systems may have to be employed, such as monitoring wells or other effective detection system(s).

3. Well-established, detailed, and consistent protection procedures are followed at each facility to maximize human and environmental protection and minimize releases of any residue to the environment as discussed in Sections D and F.

4. If ejecta or leakage would escape the primary containment device, it is visually located, removed, and properly treated or disposed, as described in Section D of this application.

5. The upper-most aquifer units in the area in the Patapsco-Raritan Formations are overlain by clay-rich confining layers, generally more than 75 feet in thickness, and with low vertical hydraulic conductivities, on the order to $1x10^{-9}$ ft/sec. Vertical groundwater velocities through these units are on the order of $1x10^{-4}$ ft/day.

6. Except for trace metals, the organic constituents of the thermally treated waste are virtually entirely consumed in combustion. Any trace metals remaining in residues are contained in the containment devices. Even if some traces of metals were ejected to the surrounding soil surface, the metals of concern, such as mercury and lead, are essentially immobile in these clay-rich soils.

Although an exemption is claimed for this thermal treatment area, it is nonetheless useful to present some of the current information and understanding of hydrogeologic conditions at NAVORDSTA. An overview of the regional hydrogeology is presented in Section E-1, Regional Hydrogeologic Conditions. More site-specific conditions are discussed in the remainder of this section.

E-2b Soils and Surficial Geology

Soil types and classification at the NAVORDSTA have been described by the Soil Conservation Service (SCS), U.S. Department of Agriculture (1971). This survey includes areas occupied by the PTTP, STTP, and Caffee Road Thermal Treatment Point.

Figure E-6 indicates that Deep Point (site of STTP) and the southern tip of Cornwallis Neck (site of the PTTP) are classified as McB which means man-made landfills on old tidal marshes or flood plains. Thus, both STTP and PTTP are located on fills, a few feet above the marsh area. Materials in the

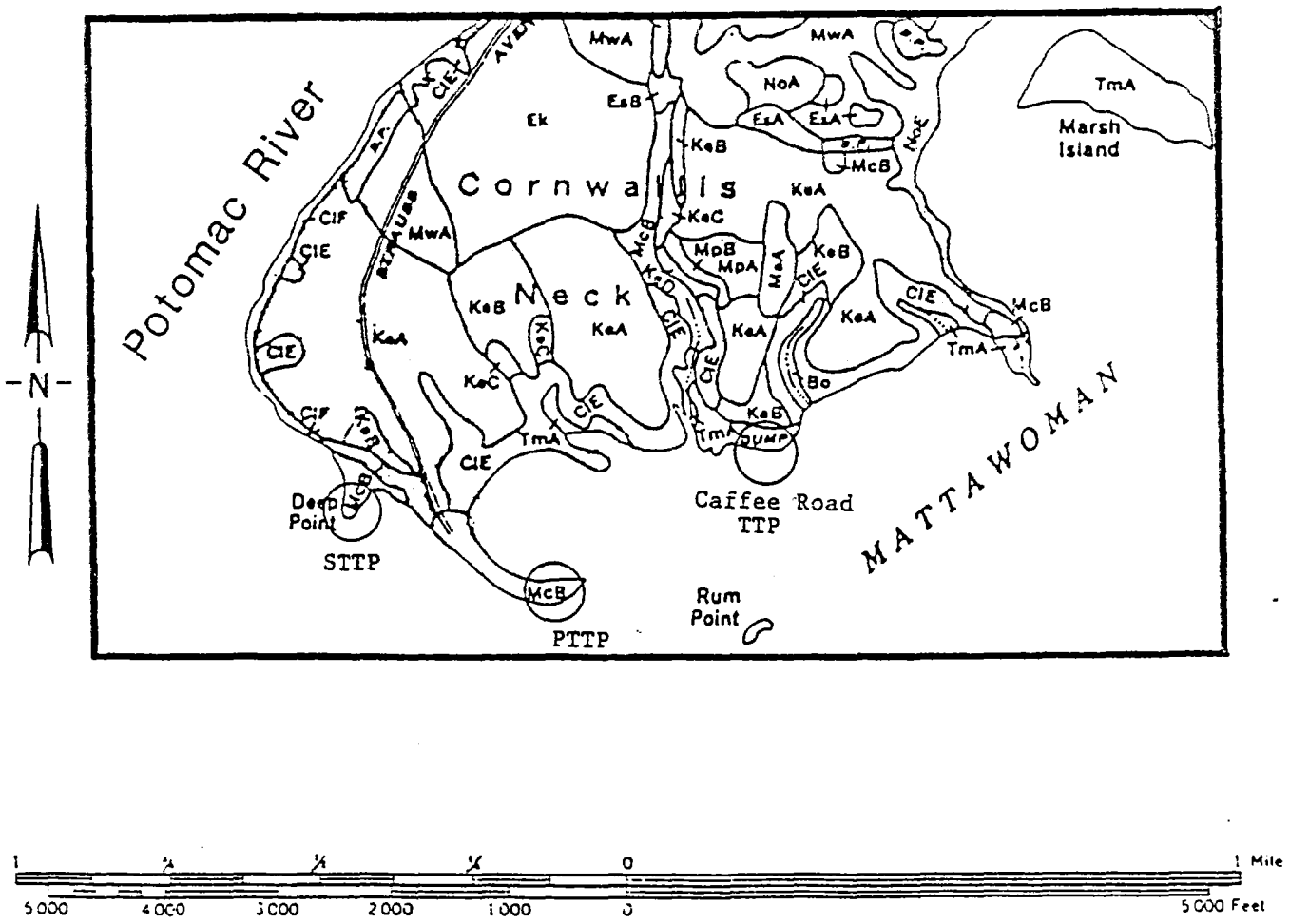


Figure E-6 Soil classification map for NAVORDSTA area showing locations of PTTP and STTP (after US Dept. of Agriculture, 1971).

fill consist of local sands, silts, and clays in various proportions. Little is known of their hydraulic properties but permeability is probably fairly low because of their clay content. These fill soils at the STTP and PTTP are bare of any vegetation and have relatively smooth and flat topography with no apparent naturally developed drainage features.

Caffee Road TTP appears (on the 1971 SCS map) to be located on material classified as "dump", which, in SCS terminology, means active trash dump. This classification may have been made because considerable scrap material equipment and related items are accumulated and thermally treated prior to removal for scrap at the Caffee Road site. The soil at the Caffee Road TTP is artificial fill.

The thermal treatment sites surface soils are underlain by recent marsh deposits and typical coastal plain sandy-silty clays.

E-2c Subsurface Geology and Water Bearing Zones

The surficial soils and near-surface sediments at the four TTP site are underlain by the regional sequence of multi-layered coastal-plain sedimentary deposits. These strata are composed dominantly of clays with intermixed silts and sands. The coastal plain sequence is about 600 feet thick beneath the TTP site.

Two major formation groups of Cretaceous geologic-age, make up most of the stratigraphic thickness: the Patuxent-Arundel Formations constitute the lower group, about 300 feet in thickness; the overlying Patapsco-Raritan Formations, which are also about 300 feet thick constitute the upper group. More recent Quaternary Age sediments, ranging in thickness from a few to perhaps 20 feet, may overlie the Patapsco-Raritan group beneath the TTP site. The coastal plain sedimentary sequence is underlain by Precambrian age igneous and metamorphic bedrock.

More specific information on these formations is presented in the previous section, E-2, Regional Hydrogeologic Conditions. Typical stratigraphic descriptions and cross sections for the NAVORDSTA area are shown on Figures E-1 and E-2 of Section E-1.

Only one of the 14 active NAVORDSTA Production Wells (No. 15) is near any of the TTP sites. Production Well 15 is less than 1000 feet north of the PTTP and east of the STTP. That well is 623 feet deep and penetrates the entire sequence of coastal plain sediments to the top of bedrock at a depth of about 620 feet below land surface. The well is screened in four zones of the middle and lower sands of Patapsco-Raritan Formations. The lowest sand layer screened by the well is a zone extending from 244 ft to 256 ft below sea level (Table E-1). Other screened sand zones are at elevations of 216-220 ft, 206-210 ft, and 167-182 ft below sea level.

The relatively thin permeable sand layers which constitute the aquifer zones in the Patapsco-Raritan and Patuxent Formation are commonly discontinuous laterally over distances of more than 1 or 2 miles. However, the general stratigraphic position of their occurrence is consistent over distances of many miles. For example, the Lower Sand zone of the Patapsco is consistently found at a position approximately 300 feet below the top of the formation, although its thickness and composition and interbedding are laterally variable.

E-2d Production Wells

The NAVORDSTA is entirely dependent on groundwater for all on-site uses. Fourteen production wells which top the Upper/Middle and Lower Patapsco sands were used to supply the average daily demand of about 1.42 mgd (Figure E-5 and Table E-1) during the first six months of 1988. As pointed out above, the only production well within ¼ mile of any TTP unit is Well No. 15 (near PTTP and STTP).

E-2e Rainfall, Recharge and Evapotranspiration

There are no site-specific data available for precipitation, recharge, and evapotranspiration rates at the TTP site. Precipitation rates are undoubtedly close to the long term measured annual average of 46 inches for Charles County (Maryland Dept. of Nat. Resources, 1984). Some studies on small watersheds in the area suggest annual shallow recharge rates of about 7 inches per year. Recharge to the deeper Patapsco and Patuxent aquifer is probably much lower than that, due to low permeability and thickness of the clay-rich confining layers.

Potential evaporation rates from free-water surfaces in this area are estimated to be between 35 inches and 40 inches per year (Linsley and Franzini, 1964). Actual evapotranspiration rates from the ground surface would be lower than potential free surface evaporation rates, but have not been determined.

E-2f Monitoring Wells

None of the thermal treatment facilities currently have or previously have had any monitoring wells. Consequently, there is no site-specific groundwater quality monitoring data or water level data available. The PTTP is located within 1000 feet of NAVORDSTA Production Well 15 which is used for potable water in the Station water supply network. This well has been periodically monitored for drinking water quality parameters and has shown no signs of contamination from unnatural dissolved constituents. Well 15 is approximately 623 feet deep and is screened in the middle and lower Patapsco-Raritan sand zones.

E-2g Flow Rates and Directions

All three thermal treatment areas are located within a few yards of the shoreline (Potomac River, Mattawoman River, or Chicamuxen Creek) and at an elevation of only a few feet above sea level. Therefore, the water table at the facility is probably less than 5 feet below land surface. The gradient and flow direction of the shallowest water directly beneath the water table is most likely toward the nearest surface water shoreline.

The uppermost aquifers at each of the facility are the middle and lower sands of the Patapsco and Raritan Formations at depths ranging from about 120 feet to about 300 feet. All known supply wells in the area are constructed to draw water from those units. No wells in the area are known to tap the less permeable sedimentary layers overlying those middle and lower sands.

The Patapsco-Raritan sands behave as well-confined aquifers and, therefore, are not effectively hydraulically connected to the shallow water table zone which is not an aquifer. Stated in another way, clay-rich aquitards hydraulically separate the deeper aquifers from the ground

surface, unsaturated zone, and water table zone. Although the major component of groundwater flow through the confining layers is vertically downward, the rate of flow is probably extremely low, on the order to $1x10^{-4}$ ft/day. Additional descriptions of regional groundwater flow rates and directions are presented in Section E-1, Regional Hydrogeologic Conditions.

Groundwater flow directions in the confined (isolated) Patapsco-Raritan sands are generally toward the regional pumping centers within the large regional drawdown cone shown in Figure E-4. The flow directions in those aquifers beneath the PTTP and STTP are probably toward NAVORDSTA Production Well 15 which pumps regularly to supply part of the Station water supply demands.

E-2h Groundwater Quality

Regional quality of the water produced from the principal aquifer zones in the Middle/Upper and Lower sands of the Patapsco Formation is described in Section E-1 (Regional Hydrogeologic Conditions). No information is available on a more site-specific basis for the TTP sites. Water from NAVORDSTA Production Well 15, which is near PTTP and STTP, reflects typical chemical composition and quality parameters for the Patapsco sands in this area. There have been no indications of contaminants from surface sources or other unnatural sources.

Groundwater from the Patapsco-Raritan formations is generally high in iron and manganese (Table E-2) and has displayed increasing trends in salinity, apparently caused by the long-term heavy pumping at the NAVORDSTA-Indian Head area and resultant large potentiometric water level declines in the region.

No instances of any groundwater contamination, shallow or deep, have been observed or reported for the TTP sites.

E-2i Potential Contaminant Migration Pathways and Receptors

Because all of the TTPs will employ containment devices and leak detection procedures, there is virtually no opportunity for constituents of the thermally treated wastes to be released to groundwater. The organic constituents in the explosive/propellent-contaminated waste are essentially totally

consumed in the combustion. Solid residues remaining in the containment system burn pan are removed. Spills or leakage from the containment devices can be visually observed and cleaned up.

Free liquids containing explosives which are burned at the PTTP are also totally contained in containment devices. Secondary containment systems will be employed to assure detection and containment of any inadvertent leaks or releases.

Residues from the combustion operation may contain traces of metals such as mercury and lead. These compounds are essentially immobile in clay-rich sediments such as those that occur beneath the TTP sites.

In the unlikely event that EP-toxic residual materials would be released onto the soil outside the containment systems and not be detected by operations personnel, there is no credible migration pathway for those substances to reach the uppermost aquifer zone in the Patapsco-Raritan formation group. This is because the vertical hydraulic conductivity (10^{-8} to 10^{-10} ft/sec) and the vertical gradients within the thick clay aquitards restrict vertical flow velocities to an estimated $1x10^{-4}$ ft/day (about one-half-inch per year). These conditions make it virtually impossible for any contamination released to the ground surface at any of the TTPs to migrate to the uppermost aquifer of the area, within time periods of less than a few 100 years. The uppermost aquifer units generally occur at depths of 100 feet or more in the NAVORDSTA vicinity.

References (Section E)

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F — Procedures to Prevent Hazards

SECTION F

PROCEDURES TO PREVENT HAZARDS

The following subsections are addressed:

- o F-1 Security
- o F-2 Inspection Requirements
- o F-3 Preparedness and Prevention Requirements
- o F-4 Preventive Procedures & Equipment
- o F-5 Prevention of Reaction of Ignitable, Reactive and Incompatible Wastes

These procedures are for the following miscellaneous treatment (open burn) areas at NAVORDSTA.

- o Production Thermal Treatment Point
- o Safety Thermal Treatment Point
- o Caffee Road Thermal Treatment Point

F-1 Security

F-1a Security Procedures and Equipment

NAVORDSTA meets the requirements for security procedures and equipment through a combination of 24-hour surveillance of entry into the base and various barriers and warning signs at each of the three thermal treatment areas.

F-1a(1) Twenty-Four Hour Surveillance System

Civilian security is maintained at NAVORDSTA, including 24-hour surveillance at the highway entrance to the fenced facility. A full-time security staff guards the gates both to the administrative area and also to the restricted area (all three thermal treatment located in this area). The security guards continually patrol the grounds and buildings and monitor the integrity of fences and other barriers.

NAVORDSTA is located on a peninsula and is surrounded by a combination of water i.e., the Potomac River and Mattawoman Creek, and fences that are barriers to unauthorized entry to the installation. The fences are approximately 7 feet high and made of galvanized metal. There is at least one, and normally two, armed guards at the main entrance, Gate 1, 24 hours/day, 7 days/week. Proper credentials must be presented at the gate to enter and exit NAVORDSTA. All visitors or contractors must receive a visitor's pass from the Pass Office adjacent to Gate 1. This pass is to be returned to security personnel before departure. Visitors to the thermal treatment open burning areas must be escorted by a Station employee knowledgeable of the hazards pertaining to the area and the required safety precautions.

Gate 2 is used to control access to the restricted areas. No smoking, matches, or lighters are permitted beyond this gate, which is monitored by a guard. Smoking is strictly prohibited beyond Gate 2, except at specifically marked areas. Red lines painted on the road designate areas within the second gate security area where radio transmission is forbidden. The locations of Gate 1 and Gate 2 are shown in Figure A of this application.

F-1a(2) Barrier and Means to Control Entry

F-1a(2)(a) Barrier

There is a 7-foot fence around the restricted area, except along the shoreline.

Access to the Safety Thermal Treatment Point (STTP) and the Production Thermal Treatment Point (PTTP) is further restricted by wire cables across their entrance. These wire cables are kept locked and keys are provided only to authorized personnel for access, when necessary. Wastes are stored for only a short period of time (less than a day) at the STTP and PTTP. Therefore no further barriers are provided.

The Caffee Road Thermal Treatment Plant (CRTTP) has an 8-foot high cyclone fence. There is no admittance to CRTTP without permission from the Property Disposal Officer.

F-1a(2)(b) Means to Control Entry

As discussed in Subsection F-1a(1), entry to NAVORDSTA is controlled by two armed guards stationed at the main entrance gate. Employees are required to show identification cards when reporting for work, and visitors and contractors entering the Station must sign a log sheet (see Figure F-1) and obtain a visitor's pass. The person to be visited is telephoned to verify that the visitor is expected.

VISITOR PASS MUST BE TURNED IN TO GATE SENTRY WHEN LEAVING

VISITOR PASS

NAVAL ORDNANCE STATION

INDIAN HEAD, MD. 20640-5000

NDW-NOS 5512/28

No. 180272

Date SAMPLE

Name: License No. SAMPLE

Car: SAMPLE

WRITE NAMES OF PERSONS IN YOUR PARTY BELOW:

SAMPLE

WRITE FIRM NAME AND ADDRESS BELOW:

SAMPLE

To See: SAMPLE Purpose:

☐ Classified Visit ☐ Unclassified Visit

VISITOR CARRYING

☐ Package ☐ Briefcase ☐ Satchel ☐ Other _____

Left Pass Office _____ Time _____ Vehicle Pass _____

GPO : 1984 - 449-448

SIGNATURE OF VISITOR HOME ADDRESS OF VISITOR

SMOKING OR CARRYING OF FLAME PRODUCING DEVICES IS STRICTLY PROHIBITED.

I ASSUME ALL RISK FOR PERSONAL INJURY OR LOSS OF ANY NATURE NOT ATTRIBUTABLE TO NEGLIGENCE OF GOVERNMENT PERSONNEL ACTING WITHIN THE SCOPE OF THEIR EMPLOYMENT.

I AGREE TO ABIDE BY ALL RULES AND REGULATIONS OF THE NAVAL ORDNANCE STATION AND SUBJECT MYSELF TO ANY SEARCH OR DETENTION NECESSARY FOR THE PROTECTION OF INFORMATION AND PROPERTY OF U.S.

NOS EMPLOYEES ONLY WILL MAKE ENTRIES BELOW THIS LINE

1.	SIGNATURE OF PERSON VISITED	TIME IN	TIME OUT	SENT TO
2.	SIGNATURE OF PERSON VISITED	TIME IN	TIME OUT	SENT TO
3.	SIGNATURE OF PERSON VISITED	TIME IN	TIME OUT	SENT TO
4.	SIGNATURE OF PERSON VISITED	TIME IN	TIME OUT	SENT TO

FIGURE F-1 VISITOR/CONTRACTOR ENTRY LOG SHEET

F-1a(3) Warning Signs

Warning signs (in English) are posted at approaches to the three thermal treatment areas. These signs are legible from a distance of at least 25 feet and are visible from road and water approaches. They bear the warning **"Danger - Unauthorized Personnel Keep Out"**. Burning operations are not initiated unless a red flag is prominently displayed and/or a whistle or siren is sounded.

F-1b Communication/Alarm Systems

F-1b(1) Internal Communication/Alarm Systems

Each of the three thermal treatment areas is linked with the station telephone network.

F-1b(2) External Communication/Alarm Systems

NAVORDSTA is externally linked by telephone to county and state police departments as well as to fire departments in the area.

F-1b(3) Personnel Access to Communication/Alarm Systems

Personnel have access to telephone and alarm systems to enable communication on/off-site. Logs are kept for security.

F-1c Waiver

NAVORDSTA does not request a waiver of the requirements stated in 40 CFR 264.14(a) regarding injuries to intruders and violations by intruders.

F-2 Inspection Schedule and Requirements

F-2a General Inspection Requirements

Trained NAVORDSTA personnel conduct regular inspections of the thermal treatment areas for possible structural deterioration, operational problems, and the potential for discharges that could adversely affect the environment or human health. These inspections include review of operating procedures to identify and correct problems before harm occurs.

F-2a(1) Types of Problems

Table F-1 presents a schedule for inspecting the grounds, waste materials, operating practices, safety and emergency equipment, and security devices at the treatment areas. This schedule and listing of inspection locations may be periodically revised during the life of the permit to reflect additional operational regulatory, or administrative requirements. The items listed in Table F-1 are considered important because of their role in preventing, detecting, or responding to environmental or human health hazards. Potential problems and concerns that should be checked as part of the inspections are provided for each item.

F-2a(2) Frequency of Inspection

The frequency of inspection is based on the need to prevent the occurence of an uncontrolled event and the deterioration of equipment and security devices. Inspections are typically performed at the intervals presented in Table F-1. Regular inspections are performed by trained NAVORDSTA personnel from the Safety Department. The Pollution Abatement Coordinator and staff make unannounced inspections for compliance with the regulatory requirements. The inspection logs illustrated in this section are retained by the Property Disposal Officer for a period of 3 years.

If any malfunctions, deteriorations, or operating discrepancies are noted during the inspection, the inspector will submit to supervisory personnel a problem description and suggested procedure to eliminate the problem or discrepancy. The Emergency Coordinator will be notified in the event urgent resource response is required (see Section G).

Table F-1

Inspection Schedule

Location	Concerns/Potential Problems	Frequency
Production Thermal Treatment Point and Safety Thermal Treatment Point	Structural integrity, spills, residuals removed, appearance flooding, warning signs damaged	after each use
Caffee Road Thermal Treatment Point	Inventory, integrity spills, residuals, appearance, flooding, security, warning signs damaged	after each use
All locations Safety procedures	Noncompliance with NAVORDSTA's standard operating and special job procedures	Daily when operations are scheduled
All locations	Verification of material (source, type and quantity)	Daily when operations are scheduled

F-2b Specific Process Inspection Requirements

F-2b(1) General

Table F-2 shows a typical inspection form utilized to assess the three thermal treatment areas.

The treatment areas are inspected for:

- Security and general facility appearance.
- Operational practices and procedures.
- Surface integrity and warning sign condition acceptability.
- Presence of free liquids or residual wastes, additional ash and items of unburned materials.
- Potential for flooding from the adjacent waterways.

The potential problems on the inspection form represent only a guide for the inspector to perform a thorough inspection. The inspector is required to check the status of each item and indicate whether its condition is acceptable or unacceptable. If the status is unacceptable, specific observations will be recorded along with specific corrective actions required and schedule of implementation.

Thermal Treatment Area
Inspection Sheet

Date _____ Ignition Times - Main _____

Aux _____

Wind Direction and Velocity at Ignition - Main _____

Aux _____

Amount of Material Treated - Main _____

Aux _____

Item	Status		Date and Nature of Action
	Accept	Reject	
Appearance of Area	☐	☐	
Evidence of damage or deterioration of thermal treatment area	☐	☐	
Inventory of material being treated	☐	☐	
Safety and spill equipment is available and in good condition	☐	☐	
Access read, security system, and communication system are working	☐	☐	
No evidence of flooding	☐	☐	
No evidence of previous spillage	☐	☐	
No evidence of residual waste	☐	☐	

Inspector_____

Table F-2
Typical Inspection Form for Thermal Treatment Area

F-3 Preparedness and Prevention Requirements

NAVORDSTA does not wish to request a waiver of the preparedness and prevention requirements (40 CFR 264 Subpart C.)

NAVORDSTA maintains the following equipment at the Station:

- o A fire call box communication system capable of providing immediate emergency response to facility personnel.
- o Radio communications (under acceptable conditions) for use in the event of power failure.
- o Portable fire extinguishers and equipment.
- o Fire-fighting water at a flow rate of approximately 1,000 gpm and a minimum pressure of 100 psi from adjacent hydrants.

A list of specific equipment and the respective locations is provided in Section G.

F-4 Preventive Procedures, Structures, and Equipment

F-4a General

NAVORDSTA recognizes the need for preventive procedures for the safe handling of explosive and propellent contaminated wastes. The preventive procedures in effect at NAVORDSTA are written into Special Job Procedures (SJPs) that detail the following information for each job involving thermal treatment of explosive or propellant contaminated waste.

- o Explosive quantity and numbers of personnel limits for the procedure.
- o A detailed step-by-step sequential description of the procedure, including applicability, approval procedures, packing, transporting, preparation, and execution of the job.
- o Tools, equipment, or supplies required by the procedure, including a checklist of safety equipment and stock numbers.
- o Misfire procedures
- o Clean-up procedures

- Safety sheets for each chemical substance used or handled in the procedure, including the chemical/physical characteristics of the substance, effects of exposure, symptoms, first aid/medical attention, and applicable safety equipment.

The SJP's for thermal treatment of explosive and explosive/propellant-containmenated wastes are periodically revised, as illustrated by the changes recorded at the front of the SJP, to reflect new operational or administrative requirements. An SJP is in effect for each job involving explosive /propellent wastes. Supervision during each job ensures that the SJPs are read and reviewed, generally on a monthly basis. The job is periodically audited for compliance with operating instructions and safety requirements.

The Production Thermal Treatment Point and Safety Thermal Treatment Point are not used during rainfall or flooding events. Explosive waste are completely treated and residuals are removed expediently from the treatment area to minimize contact with rainfall/runoff.

Caffee Road Thermal Treatment Point (CRTTP) receives only explosive contaminated scrap like waste in which the contaminant is generally trapped/impregnated within the item which must be decontaminated or demilitarized. Therefore runoff from CRTTP is expected to have minimal amounts of explosive contaminants.

The thermal treatment areas are designed to treat explosive contaminated wastes in a safe manner. Ignitable wastes are not treated on-site, but ignitable materials (e.g., kerosene, fuel oil, wood scrap) are used in the decontamination process. The treatment areas are designed and operated to minimize uncontrolled reaction.

The containers for ignitable or reactive wastes are selected to be compatible with the wastes. The only potential source of ignition would be external to the container. Accidential reaction of explosives-contaminated wastes is minimized through proper packaging, handling, and storage of the containers (i.e., stacking, aisle space, labeling, and sealing of the containers). Only spark resistant tools (e.e., beryllium alloy hammers and wrenches) are used on containers storing ignitable or explosive materials. Containers that are to hold explosive wastes or explosive contaminated wastes are checked for compatibility prior to placing wastes in them.

Personnel wear appropriate safety and protective equipment, as needed. Fire protection, first aid, and emergency response equipment are available within the immediate vicinity of the treatment areas, and are readily available at NAVORDSTA.

F-4b Runoff

Treatment at each of the three burn areas are routinely planned a minimum 24 hours in advance and controlled execution. Explosive wastes are not stored at the thermal treatment areas and no burning is conducted if rain is threatening. Therefore during rainfall, runoff from the treatment grounds should be relatively free of contaminant from the treated waste products.

F4c Water Supplies

The open burn operation will be conducted in specially designed containment pan (see Section D). No adverse impact on the underlying ground water is anticipated. Spilled and ejected materials are expediently cleaned up after a spill.

F-4d Equipment and Power Failures

All equipment and power sources required for thermal treatment operations must be functional before treatment is initiated. Per NAVSEA OP-5 Section 11-3.2.10, no treatment shall be undertaken during electrical storms.

F-4e Personnel Protection Equipment

Personnel protective equipment is routinely stocked and used as required.

A checklist of appropriate personnel protection equipment used for specific hazardous situations is presented in Appendix F-1. The procedures and need to use protective equipment is covered in the initial and annual personnel training program (see Section H) for persons involved with thermal treatment operations.

F-5 Prevention of Reaction of Ignitable, Reactive and Incompatible Wastes

F-5a Precaution to Prevent Ignition or Reaction of Ignitable or Reactive Wastes

Containers selected for the storage of ignitable or reactive wastes will be compatible with the specific explosive waste. Smaller containers of compatible wastes are packaged into 55-gallon drums. Containers will be kept closed (except to allow for sampling). The only potential source of ignition would be external to the container. Smoking is not permitted. Flammable gases or vapors that could accumulate will be removed via active and passive ventilation systems.

Ignition of flammable or combustible liquids will be prevented by strict adherence to NFPA Code 30 (1985). Details of the equipment and procedures that will be used to meet the code are described in the ensuing paragraphs.

Closed cabinets constructed in accordance with NFPA requirements will be used, where appropriate, for storing flammable liquids, and corrosive or reactive wastes. Shelves of appropriate construction may be used to store containerized liquid wastes. The storage volumes will not exceed that allowed for the individual containment areas.

F-5b General Precautions for Handling Ignitable or Reactive Waste and mixing of incompatible wastes

Prior to handling containerized ignitable or reactive wastes, personnel will be trained (see Section H) in the proper procedures, including segregation practices, sampling techniques, and the use of protective equipment. It is the practice to reject and return to the originator any waste that is not identified or properly prepared.

The mixing of incompatible wastes will be prevented through the use of a specific segregation program. The segregation program is dependent on information supplied by the generator or on data obtained from the Waste Analysis Plan (see Setion C) for ensuring segregation or separation of incompatible explosive/propellant-contaminated wastes. Mixing incompatible explosive contaminated wastes is unlikely at NAVORDSTA since the wastes are rarely mixed or bulked into larger containers. Small containers of compatible wastes are normally packaged (without opening) into 55-gallon drums (i.e., lab packs) for disposal (without opening). The segregation of compatibility groups is illustrated in Figure D-8.

APPENDIX F.1

PERSONNEL PROTECTIVE EQUIPMENT

CHAPTER 6

PROTECTIVE CLOTHING AND EQUIPMENT

0601. GENERAL PROVISIONS

1. Personal protective equipment consists of garments or devices to protect individuals from specific hazards encountered in the performance of their jobs. These hazards must be kept to a minimum through engineering design or by changes in methods or processes. If it is impractical to eliminate a hazard, its source should be guarded, isolated or confined so that personnel will not be exposed. Protection by mechanical means is generally more reliable than protection which is dependent upon human behavior. However, there are some hazards which cannot be totally eliminated by mechanical means. For these situations, SJPs and work permits contain specific requirements for personal protective equipment and clothing.

2. Preemployment and preplacement physical examinations shall include a determination of the individual's ability to wear the protective equipment which is required.

0602. SCOPE

All NAVORDSTA personnel and plant visitors shall comply with the local requirements for the use of personal protective equipment, as specified in the SJPs for the operation and area. Public Works Department trades personnel shall wear protective equipment appropriate for the hazards of the job being performed.

0603. SELECTING EQUIPMENT

Purchases of protective equipment that is not a standard use item at NAVORDSTA must be approved by the Safety Department. Federal and Military Specifications, Department of Navy Instructions, National Institute for Occupation Safety and Health, American National Standards Institute and other nationally recognized publications are sources which provide guidance in establishing criteria for personal protective equipment.

1. Table 6-1 provides a checklist for the selection of personal protective clothing and equipment for various hazardous situations. This table can be used for guidance by supervisors and SJP writers. Final determination of the type of equipment needed will be made by the Safety Department, in conjunction with the Industral Hygienist, and will be prescribed in the appropriate SJP or work permit.

TABLE 6-1

HAZARDOUS SITUATION	PROTECTIVE EQUIPMENT REQUIRED
Heavy Impact of Falling Object	Head: plastic hard hats Knees, Legs, and Ankles: fiber or metal leggings Feet and Toes: steel box toe shoes.
Moderate Impact	Head: plastic bump cap or plastic hard hat Feet and Toes: steel box toe shoes
Large Flying Particles or Objects	Head: plastic hard hat Eyes: goggles, spectacles with side shields Face: plastic face shields Fingers, Hands and Arms: leather gloves or mittens, sleeves Trunk: leather or canvas fiber aprons, coats or jackets Knees, Legs, and Ankles: leather, fiber metal or flame-resistant duck pants, knee guards, leggings, or spats
Small Flying Particles	Head: plastic hard hat Eyes: goggles, spectacles with side shields, plastic face shields Fingers, Hands, and Arms: leather or duck fabric gloves or mittens, sleeves Trunk: leather or canvas fiber aprons, coats or jackets Knees, Legs and Ankles: leather, fiber metal or flame-resistant duck pants, knee guards, leggings or spats
Dusts	Eyes: goggles, spectacles with side shields, plastic face shields Face: plastic face shields Respiratory: approved dust, airline, or abrasive blasting respirator
Sparks and Metal Spatter	Head: approved hard hat, cotton or wool cap Eyes: goggles, spectacles with side shields, plastic face shields Face: plastic face shields

TABLE 6-1 (cont'd)

HAZARDOUS SITUATION	PROTECTIVE EQUIPMENT REQUIRED
Sparks and Metal Spatter (Cont'd)	Fingers, Hands, and Arms: leather, flame-resistant duck or aluminized fabric gloves or mittens, sleeves Trunk: leather aprons, coats or jackets Knees, Legs, and Ankles: leather, fiber metal or flame-resistant duck pants, knee guards, shin guards, leggings or spats Feet and Toes: leather shoes, foundry shoes
Splashing Metal	Head: approved hard hat Eyes: goggles, spectacles with side shields, plastic face shields Face: wire screen shield Fingers, Hands, and Arms: leather, flame-resistant duck or aluminized fabric gloves, mittens or sleeves Trunk: leather aprons, coats, or jackets Knees, Legs, and Ankles: leather, fiber metal or flame-resistant duck pants, knee guards, leggings or spats Feet and Toes: leather shoes, foundry shoes
Splashing Liquids and Chemicals	Head: approved hard hat Eyes: goggles, hood Face: plastic face shields, hoods Respiratory: chemical-resistant suits with air supply Fingers, Hands, and Arms: rubber, natural rubber, plastics, synthetic fabrics, coated glass fiber, or other chemical-resistant gloves or mittens, sleeves Trunk: rubber, plastic, or other chemical-resistant material Knees, Legs, and Ankles: rubber, plastic, or other chemical-resistant material Feet and Toes: nonskid shoes with rubber or neoprene soles, rubber or neoprene overshoes

TABLE 6-1 (cont'd)

HAZARDOUS SITUATION	PROTECTIVE EQUIPMENT REQUIRED
Splashing Liquids and Chemicals (cont'd)	Whole body: coveralls, overalls, or liquid hazard suit of impervious materials
Mists, Vapors, Gases, Fumes and Smoke	Eyes: goggles Face: plastic face shields for mists Respiratory: Immediately dangerous to Life: self-contained apparatus, hose mask with blower, gas mask with special filter (restricted) Not immediately Dangerous to Life: air-line respirator, hose mask without blower (75 foot maximum length of hose), chemical cartridge respirator with special filter Fingers, Hands, and Arms: rubber, natural rubber, plastic, synthetic fiber, coated glass fiber, or other chemical-resistant gloves or mittens, sleeves, protective creams Trunk: rubber, plastic, or other chemical-resistant material Knees, Legs and Ankles: rubber, plastic or other chemical-resistant material Feet and Toes: conductive shoes (for explosive gases, vapors, or other material)
Hot Materials	Head: approved hard hat Fingers, Hands, and Arms: leather gloves, mittens, hand pads, or finger cots, leather, or flame-resistance duck sleeves Trunk: leather aprons, coats, or jackets Knees, Legs, and Ankles: leather or flame-resistant duck pants, knee guards, leggings, or spats Feet and Toes: wood soles

TABLE 6-1 (cont'd)

HAZARDOUS SITUATION	PROTECTIVE EQUIPMENT REQUIRED
Heat	Head: approved hard hat, cotton or wool cap Fingers, Hands, and Arms: leather, aluminized fabrics, glass fiber insulated gloves, mittens, or hand pads, flame-resistant fabric (for radiant heat) sleeves Trunk: flame-resistant fabrics, aluminized fabrics for radiant heat Knees, Legs and Ankles: flame-resistant duck, aluminized fabrics for radiant heat Feet and Toes: leather or wood soles, thermal insulated shoes Whole Body: aluminized garments for radiant heat, vortex tube with air cooled suits
Moisture and Water	Head: approved hard hat Fingers, Hands, and Arms: rubber, oiled fabrics, plastic, coated glass fiber gloves, mittens or finger cots, rubber oiled fabrics, or plastic sleeves Trunk: rubber or plastic material Knees, Legs and Ankles: rubber or plastic material Feet and Toes: nonskid shoes, leather or wood soles, rubber or neoprene overhsoes Whole Body: garments of rubber, plastic or other impervious material
Slips and Falls	Feet and Toes: nonskid shoes
Cuts and Abrasions	Head: approved hard hat Fingers, Hands, and Arms: leather metal mesh, or finger cots, leather sleeves Trunk: leather or canvas fiber aprons, cots or jackets Knees, Legs and Ankles: leather or fiber metal pants, knee guards, shin guards, leggings or spats Feet and Toes: steel box toe or steel toe caps

TABLE 6-1 (cont'd)

HAZARDOUS SITUATION	PROTECTIVE EQUIPMENT REQUIRED
Dermatitis	Head: approved hard hat, cotton or wool cap Face: plastic face shield, protective barrier creams Fingers, Hands, and Arms: rubber, synthetic rubber, plastic or cotton gloves, protective barrier creams Trunk: rubber or plastic material Knees, Legs, and Ankles: rubber or plastic material Feet and Toes: rubber boots, wood soles shower sandals (paper or wood)
Electricity and Electric Shock	Head: plastic-rubber or plastic hard hat Fingers, Hands, and Arms: rubber gloves and sleeves resistant to 10,000 volts for three minutes Trunk: rubber material Knees, Legs and Ankles: rubber material Feet and Toes: non-conductive safety toe shoes
Explosives	Head: cap Fingers, Hands and Arms: gloves Trunk: powder uniform Feet and Toes: conductive safety shoes
Machinery	Head: cap (women), cotton or wool caps Fingers, Hands, and Arms: flame-resistant duck sleeves Trunk: rubber, plastic, or canvas fiber aprons, coats, or jackets Knees, Legs, and Ankles: fiber material or flame-resistant duck pants, knee guards, shin guards, leggings or spats Feet and Toes: steel box shoes
Reflected Light and Glare	Eyes: goggles, spectacles with side shields with filter lenses
Welding	Eyes: goggles-welders' eyecup, helmets, or hand shields with filter lenses

TABLE 6-1 (cont'd)

HAZARDOUS SITUATION	PROTECTIVE EQUIPMENT REQUIRED
Welding (cont'd)	Face: helmets or hand shields with filter lenses, face shields
Radiant Energy (Intense)	Eyes: helmets (filter lenses) with metal or plastic spectacles, hand shields (filter lenses) with metal of plastic spectacles Face: helmets or hand shields with filter lenses
X and Gamma Radiation	Fingers, Hands, and Arms: leaded rubber or leather gloves Trunk: leaded rubber or leather apron
Laser Radiation	Eyes: protective eyewear in accordance with BUMED Instruction 6470.14
Radioactive Aerosols and Gases	Respiratory: special respiratory devices Whole Body: radiation exposure suits of plastic or paper with special respirators
Noise	Ears: plug or insert, cup or muff, ear protectors, helmets

G — Contingency Plan

SECTION G

CONTINGENCY PLAN

G-1 General Information

Copies of this Contingency Plan and all revisions will be retained by the Emergency Coordinator (EC), the alternate EC, the Station fire department, the medical clinic, and the Police Protection Branch. The EC has the authority to commit the resources needed to carry out the contingency plan. This plan will be reviewed by the EC on an annual basis so that the designated response actions and emergency phone numbers and contacts are kept up to date. This plan will also be reviewed after each activation to determine wether any improvements in the plan can be made. The review will include an analysis of the incident by the Emergency Coordinators and supervisory personel so that recommendations to prevent a recurrence of the incident can be formulated.

G-1a Location

The Naval Ordnance Station is located on a approximately 3,500 acres of land 25 miles south of Washington, DC on the easternshore of the Potomac River. The Station is adjacent to the Town of Indian Head in the west central portion of Charles County. The Station is bounded on three sides by the Potomac River and Mattawoman Creek.

G-1b Mission

The mission of the Naval Ordnance Station is to provide material and technical support for assigned weapons systems, weapons, or components and to perform additional tasks as directed by the Naval Sea System Command. These tasks include research, development, engineering, production, and quality assurance in the fields of weapons systems, propulsion, unconventional explosives, cartridge- and propellant-actuated devices and chemicals.

G-2 Emergency Coordinators

Primary Emergency Coordinator:

Thomas H. Woo, Environmental Coordinator (Code 0431)
Work phone number: 301-743-4320
Beeper Phone number: 11-730

Home Address - 801 Pocahontas Drive
Fort Washington, Maryland 20744

Alternate Emergency Coordinator
Environmental Protection Engineer, Code 0431

The EC will provide the primary (first line) response to coordinate necessary corrective actions including designation of primary emergency authorities. After duty hours, the Fire Department will provide initial response to contain or mitigate a controlled hazardous substance emergency, pending arrival of the EC. Table G-1 lists the on-Station resources available to the EC for spill response. Additional on-Station resources can be accessed from department heads. Additional resources are also available from other Federal installations and outside contractors.

G-3 Implementation of the Plan

Personnel who observe or otherwise detect an imminent or actual emergency situation will immediately warn others working nearby and notify the EC. To alert all potentially affected personnel the EC will instruct the Station Police Protection branch to notify all department heads of the emergency situation, including possible need for evacuation plan implementation. Signals to begin evacuating include sirens, alarms, telephones, and radio communications.

G-3a Notification

Detecting personnel will report to their supervisor or the EC the apparent identity, location, magnitude, and source of the spill as soon as possible, but no later than 15 minutes after detection. The supervisor will notify the EC (Code 0431) during working hours. After working hours the supervisor will notify Security, who will subsequently inform the Command Duty Officer (CDO). The supervisor will then proceed to take any measures necessary to confine the spill and to stop it at the source, pending arrival of the EC.

Table G-1

Emergency Equipment and Location

Material	Location	Telephone Number 301-743-4210
Maps and charts	Building 351 Public Works Office	Ext. 4288/4286
Boat, motor, gasoline, and life preservers	Building 510	Ext. 4269
Floating boom (Class II), boom warning lights, and workboats	Building 406	Ext. 4269
Nets and absorbent mats	Building 406	Ext. 4269
Pumps	Building 406	Ext. 4269
Drums	Outside Building 406	Ext. 4269
Sandbags	Building 24	Ext. 1289
Soda ash (sodium carbonate)	Building 304 or 263	Ext. 4722/4677
Acetic acid	Building 304	Ext. 4677
Hydrochloric acid	Building 304	Ext. 4677
Rail car (absorbents) (USN 64-04245)	Near Building 456	Ext. 4269
Rail car (floating booms) (USN 61-03600)	Between Buildings 127 and 412	Ext. 4269

After duty hours the CDO will:

- Notify the EC or Alternate EC as listed in Subsection G-2 of this plan.
- Notify the Executive Officer (XO), the appropriate facility supervisor, Fire Protection (Code SCSF), Police Protection (Code SCSP), and Branch Medical Clinic (Code ME), if required using the numbers listed in Table G-1 and/or the latest NAVORDSTA telephone directory.

The Station personnel listings will be kept and maintained up-to-date at the Station's CDO office (ext. 4438), and Code 0431 (ext. 1249/4320).

Additional listings will be kept by the Commanding Officer (CO) (ext. 4401), Executive Officer (ext. 4301), and by the Security (police) Dispatcher (ext. 4381/4482).

G-3b Identification of Explosive Contaminated Waste

The identity of spilled or released explosive contaminated waste can be determined at one of two points during response to a spill. The first opportunity for identification of a spilled material occurs in the reporting phase. If the observer or reporter of a spill is the individual responsible for handling the material, then the responsible individual will be aware of the material's identity. When a explosive contaminated waste material or substance is spilled, the reporter will disseminate all first-hand information available regarding the identity of the spiled material. If the observer or reporter is not directly involved with the spilled material, the identity of the spilled substance may not be known. The observer or reporter will leave the immediate area to report the spill. Due to the unknown nature of the situation, the reporter will not re-enter the spill site.

A second opportunity for identification of the spilled or released material exists when the EC responds to the incident. Upon being notified, the EC will immediately proceed to the site of the spill/release. The EC will determine or estimate the following characteristics of the spill/release:

- Exact source of the spill/release.
- Amount and/or geographical extent of the spill/release.
- Type or characteristics of the spilled/released waste.

In identifying the type or characteristics of the spilled/released material, the EC will utilize the following information sources:

- o Interviews with observers or handlers
- o Labels or container identification.
- o Internal manifests.
- o Uniform manifests.
- o Analysis of samples of the spilled/released material in accordance with the Waste Analysis plan.

G-3c Assessment

Upon being notified, the EC will proceed immediately to the site of the spill and will determine or estimate the following:

- o The source of the spill and the proper actions to stop it and to prevent its further spread.
- o The identity of the explosive contaminated waste and its potential impact(s) on human health or the environment.
- o The amount and geographic extent of the spilled/released material.
- o The resources (personnel and materials) necessary to contain and clean up the spill/release. The EC will advise the Commanding Officer if off-Station assistance is required or is likely to be required.
- o The EC will determine off-Station notification requirements (Table G-2) and prepare the appropriate messages for release by the XO/CO.

Once the source and quantity of the spill/release are known, the characteristics of the material and possible hazards to human health and the environment can be assessed by obtaining data from the Material Safety Data Sheet (MSDS) from the Safety Department for the source operating area. The characteristics of the spilled/released material can also be obtained from the Oil and Hazardous Materials Technical Assistance Data System (OHMTADS) data base. The data base can be accessed by the EC.

Table G-2

Personnel and Organization Notification List

Organization	Contact	Telephone (work)	Telephone (after hours)	Pager
Emergency Coordinator	Thomas Woo	301-743-4320	301-567-3415	11-730
Alternate Emergency Coordinator		301-743-4805		
Fire Protection		301-743-4333		
Security Police		301-743-4280		
Branch Medical Clinic		301-743-4449		
CHESNAVFACENGCOM	Navy On-Scene Coordinator (CO)	202-288-3300	202-433-2607	
	Environmental Engineering Branch (Code 114)	202-288-3760	202-433-2607	
Navy Department Duty Captain (NDDC)		AV-225-0231		
Navy Comand Center (NCC)		202-695-0231		
U.S. Coast Guard	Duty Officer	202-426-2675	202-426-2675	
EPA National Response Center		800-424-8802	800-424-8802	
Maryland Department of Health and Mental Hygiene		1-383-6650	1-243-8700	
NAVSEA OOD	Watch Officer	AV-222-7527 202-692-7527		

G-3d Control Procedures

Cleanup, decontamination, and disposal procedures will vary, depending on the site-specific characteristics and the nature of the material(s). Although no contingency plan can forecast all potential incidents at a particular facility, potential incident areas can be identified and appropriate responses developed for them. Several potential emergency situations that could be encountered at the open burn areas at NAVORDSTA are identified:

- o Natural Disasters
  - 100-year rainstorm or hurricane.
  - Electrical storm.
- o Accidents
  - Fire or explosion.
  - Explosive contaminated waste spill/release.
  - Personnel physical injury.

This Contingency Plan has not been implemented at this Activity because the incidents listed either have not occurred or have not involved explosive contaminated waste. In the unlikely event one of these incidents does occur, the appropriate emergency responses are discussed in the subsections that follow.

G-3d(1) 100-Year Rainstorm or Hurricane

A 100-year rainstorm could lead to flooding of sections of the Naval Ordnance Station including the three open burn areas. However, resulting harm to the environment should be negligible because:

(i) Explosive contaminated wastes are not stored at the thermal treatment points.

(ii) Batch operation is used at the thermal treatment points and controlled quantities are treated.

(iii) Reception and treatment of wastes are carefully planned in advance to avoid adverse weather conditions.

G-3d(2) Electrical Storm

Buildings are protected by lightning masts and operating procedures call for proper grounding of equipment and containers to avoid electrical sparks or fires. However if drums containing flammable liquids is struck by lightning, fire could ensue. Response measures would involve activating the NAVORDSTA Fire and Police Departments.

G-3d(3) Personnel Physical Injury

Personnel engaged in thermal treatment of explosive contaminated waste operations at NAVORDSTA are susceptible to physical injuries including burns, back injuries, falls, cuts, and chemical contact. Traumatic injuries involving the use of heavy equipment could occur.

Responses to personnel physical injuries will include the following steps:

- Evacuate the victim if there is a possibility of explosion, fire, or direct contact with explosive-contaminated waste; administer first aid at a remote location; or,
- Administer first aid to the victim in-place.
- Transport the stabilized victim(s) to the medical clinic for additional care.
- In cases of severe trauma, the victim may be transported to:

Washington Hospital Center
Trauma Center
202-541-6701 (emergency)
202-541-0500

or

University of Maryland Hospital
Maryland Institute for Emergency Medicine
Baltimore, Maryland
301-528-7813

G-3e Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The potential for fires and releases to spread or migrate to other areas at NAVORDSTA is limited. This is because the burn points are isolated from the other activity areas. However, the EC will take the appropriate steps necessary to ensure that fires, explosions, or releases do not occur, recur, or spread to other areas of the Station. To accomplish this goal, the EC may initiate any of the following preventative measures:

- Repair, replace, or remove from service the equipment or facility responsible for the incident.
- Utilize the Station Fire Protection Branch to fight any fires that could involve additional nearby property.

G-3f Treatment of Released Material

Once an incident is under control, the EC will make arrangements for the on-site collection and treatment, or off-site treatment and/or disposal of recovered wastes, contaminated soil, surface run-off or other contaminated material contained on-site, as a result of implementation of the plan. Care will be taken to ensure that incompatible wastes are segregated during clean up.

G-3g Post-Emergency Equipment Maintenance

Emergency equipment used during an emergency event will be decontaminated. Equipment not suitable for use will be replaced. Cleanup may also require removal of contaminated soil. Personnel decontamination will include showers and cleaning of clothing and equipment. All contaminated materials, including sorbents, cloth, soil, wood, etc. that cannot be decontaminated will be disposed of at a permitted off-site facility or at the Caffee Road decontamination burn point.

G-4 Emergency Equipment

A listing of pollution control equipment available at NAVORDSTA is presented in Table G-1. The list specifies the locations where the equipment can be found, and the work telephone numbers for the personnel responsible for the equipment. The EC and CDO maintain a list of the individuals responsible for the equipment and their off-duty telephone numbers.

G-5 Coordination Agreements

G-5a Police Protection

The NAVORDSTA Security Department is responsible for security at NAVORDSTA. Police Protection Group Regulations describe the procedures used by this organization. In addition to routine security, Police Protection personnel respond to all fire alarms and ambulance calls in order to control traffic and secure the area so that emergency personnel are not hampered in their response efforts. Security personnel provide required assistance to the EC during emergency events. NAVORDSTA also has a Mutual Police Assistance Agreement with the Charles County (Maryland) Sheriff's Department. A copy of this agreement is included in Appendix G.1. The Station also has verbal (unwritten) agreements with the Maryland State Police and the Maryland Department of Natural Resources, Marine and Inland Police to provide similar emergency assistance as required.

G-5b Fire Protection

The Fire Protection Branch (presently staffed by 63 employees) is responsible for fire safety at NAVORDSTA. The Fire Bill and Fire Regulations describing the procedures used by this organization are available at the Activity. The Fire Protection Branch maintains the following major equipment for response on a 24-hour basis:

- Seagraves pumper (1,ØØØ gpm) (1978) with "telesquirt," a remotely operated nozzle on a 35-foot boom.
- Ward-79 pumper (1,ØØØ gpm).
- GMC pumper (75Ø gpm).

Two of these units are routinely stationed near Gate 2 in Building 878 (see Drawing 15551A) at NAVORDSTA, and one is stationed in Building 2 at NAVEODTECHCEN. A fourth pumper (75Ø gpm) is maintained at Building 878 as a reserve at NAVORDSTA in case of mechanical failure of one of the primary units.

The Naval Ordnance Station has a Mutual Firefighting Assistance Agreement with Charles County, Maryland for fire and first aid response. A copy of this agreement is included in Appendix G.1.

G-5c Hospitals and Medical Support

The Branch Medical Clinic at NAVORDSTA is staffed by personnel of the Naval Medical Command National Capital Region. The normal staff consists of two medical officers, one physician's assistant, 18 hospital corpsmen, one dentist, two dental assistants, one industrial hygienist, and one occupational health nurse.

First aid treatment is provided to all personnel injured at NAVORDSTA. Injured personnel who require additional treatment are referred to the nearest appropriate facility such as Physicians' Memorial Hospital in La Plata, Maryland; Southern Maryland Regional Hospital in Clinton, Maryland; or Malcolm Grow Hospital at Andrews Air Force Base. Victims requiring specialized burn or trauma care can be transported to the civilian hospitals listed in Subsection G-3d(5).

The clinic has three ambulances available to respond to emergency calls. Helicopter evacuation of injured personnel is available; however, the clinic ambulance service is normally used for routine evacuation of stabilized patients to nearby hospitals. At least three hospital corpsmen are always present at the clinic and at least one physician or physician's assistant is always on call at the Station.

The clinic has a Mass Casualty Plan in effect, which is available at the Activity. This plan provides for the use of clinic ambulances to evacuate injured personnel to the clinic where they will receive initial treatment on a priority basis. Injured personnel who require further treatment can be evacuated to local hospitals in Charles County Rescue Squad ambulances if the clinic ambulances are not available. Appendix G.1 includes a copy of the mutual aid agreement.

G-5d Contractors

NAVORDSTA does not have formal contracts with outside emergency response or cleanup contractors because Station forces are capable of containing and responding to most spills/releases. If required at the direction of the EC, the head of the Public Works Department has legal authority to contract for outside assistance. Additional contractor support is available through the Commanding Officer, CHESNAVFACENGCOM. A list of contractors for the region who are registered with the U.S. Coast Guard, is contained in Appendix G.2.

G-6 Evacuation Plan

G-6a Evacuation Procedures

The number of occupants and the quantities of explosive contaminated waste permitted in each building are governed by strict safety rules and by the Quantity-Distance Requirements and Standards specified in NAVSEA OP 5 (fourth revision) Ammunition and Explosives Ashore. NAVORDSTA Fire Bill and Fire Regulations (copy on file with the State), require that a fire monitor and an alternate be appointed for each building or group of buildings, as appropriate. A detailed Local Fire Bill is posted in the control buildings. Each Local Fire Bill includes designated evacuation procedures for the area in the event of an emergency and also a method of sounding the alarm to request emergency assistance. Specific procedures for the areas are presented in the ensuing discussions. Evacuation routes for the Station are shown in Figure A-2. Details of the evacuation routes for each of the burn points are presented in the subsections that follow. Additionally the NAVORDSTA Commanding Officer (CO) has the authority under 33CFR 204.41 (navigation and navigable waters) to require evacuation of navigable waters adjacent to the reservation under emergency conditions.

G-6b Evacuation of Production Thermal Treatment Point

The number of personnel present during activities at the Production Burn Point is kept to a minimum. In the event that evacuation of these personnel is required, the following routes will be utilized:

Primary Route	Strauss Avenue; right onto Greenslade Road; left onto Caffee Road; right onto Hanlon, left onto Patterson, right onto Farnum to the main gate.
Alternate Route	Strauss Avenue to Farnum to Main Gate.
Regrouping Point	Strauss Road, immediate area of Bldg. 890.

G-6c Evacuation of Safety Thermal Treatment Point

The following routes will be utilized for evacuation of personnel from the Safety Burn Point.

Primary Route	Exit the immediate area; left onto Strauss Avenue; right onto Greenslade Road; left onto Caffee Road; right onto Hanlon Road; left onto Patterson, right onto Farnum, follow Farnum to main gate.
Alternate Route	Strauss Road to Farnum to main gate.
Regrouping Point	Immediate area of Bldg. 076.

G-6d Evacuation of Caffee Road Thermal Treatment Point

Primary Route	Caffee Road; right onto Hanlon Road; left onto Patterson, right onto Farnum, Farnum Road to main gate.
Primary Regrouping Point	On Caffee Road adjacent to Bldg. 24 (approximately 300 feet)
Alternate Route	Caffee Road; left onto Olson Road; left onto Voegel Road; right onto Gallery; left onto Greenslade; right onto Strauss; Strauss to Hanlon; left onto Patterson, right onto Farnum, Farnum to main gate.
Alternate Regrouping Point	Immediate area of Bldg. 1650.

G-7 Potential Pathways of Exposure and Potential Exposure Magnitude

This subsection addresses the potential pathways, the nature of human or environment exposure, and the relative magnitude of potential exposure from planned or unplanned releases at the NAVORDSTA thermal treatment areas in accordance with 40 CFR 270.23(c) and 264.601.

There are three (3) potential pathways by which humans or the environment could be exposed to contaminants contained in the wastes managed at the thermal treatment areas:

- Through the air in the form of particulate matter or volatile compounds contained in the wastes or the combustion products of thermal treatment.

- Through surface water due to runoff associated with possible spilled materials or ejecta deposited outside the containment system (burn pan).

- Through soils to groundwater beneath the thermal treatment areas.

As discussed in Sections D and F, the individuals with the greatest potential for exposure to the contaminants in the thermally treated wastes are the treatment area operators. They are required to follow the Navy operating procedures (see Sections D and F), which include the utilization of personnel protection apparel, and to limit the number or persons engaged in the operations. During the open burning operations, they are required to remain a safe distance away from the site and to not return until there is visual evidence that all reaction of explosive materials has been completed.

With regard to offsite human exposure, the operations personnel are required to survey the area of the nearby waterways immediately before a burning event to assure that no boats are within a safe distance of the site. The next nearest receptors to the thermal treatment areas would be persons engaged in outdoor activities across Mattawoman Creek at Smallwood State Park, more than 3ØØØ feet from all three thermal treatment areas.

Although no quantitative information is available for the levels of combustion products from the various explosive and explosive/propellant-contaminated wastes at this distance and the potential risks of same, computer modeling could be conducted to make such a determination, employing local weather information, the frequency and duration of a typical burn event, and other variables which would need to be defined for the model. A separate model was recently (1987) developed by Baroody and Tominack at NAVORDSTA to predict the pollution products of open burning of Navy explosives and propellants, which could be used as a starting point for such an air dispersion study, as discussed in Section B-5.

The potential for migration of explosive-contaminants into surface waters is limited to spills and ejecta from burn events, if they are not cleaned up and are allowed to be exposed to rainfall. The planned use of containment systems with removable covers will effectively eliminate the collection and contact of precipitation with residuals in the burn pan, which are to be periodically removed, tested and disposed of appropriately, based on the test results. Based on careful adherence to the operating

procedures, which require post-burn inspection and cleanup of any materials which have spilled or otherwise reached the ground outside the burn pan, there is negligible potential exposure of nearby surface waters to the explosive constiutents of the waste subjected to thermal treatment operations.

As discussed in Section E, there is virtually no potential for contaminants from spills or ejecta to reach the groundwater beneath the thermal treatment areas, due to the low permeability of the subsurface soils and the low rate of groundwater movement downward to the water-bearing aquifers in the region, which are several hundred feet below ground elevation.

Additionally, a study by the U.S. Army Environmental Hygiene Agency of a dozen installations with thermal treatment areas at ordnance-producing facilities around the country in has shown that soils contamination from open burning directly on the ground surface is generally limited to the top 18 inches of soils. Based on the relatively low permability of the soils at NAVORDSTA, as discussed in Section E, there is negligible potential for exposure to contaminants from the thermal treatment areas at NAVORDSTA via subsurface migration through water.

G-8 Reports

Telephone reporting will be to:

- The National Response Center, toll free number 9-1-800-424-8802 or Washington metropolitan number 7-426-2675.

- The Naval On-Scene Coordinator (NOSC), Commanding Officer, Chesapeake Division, Naval Facilities Engineering Command (CHESNAVFACENGCOM), Washington, DC at telephone number 7-433-3760 (Code 114), working hours; or 7-433-3300 (CO), working hours; or 7-433-2607 (Command Duty Officer, NDW), after working hours.

Telephone reports will be as complete as possible. Preferably, the telephone report will contain at least the following.

- The name and phone number of the caller.

- The location of the spill/release (i.e., Naval Ordnance Station, Indian Head, Maryland). (Give building number or other specific location if known.

- The type of material spilled to include chemical name and chemical abstract number (if known) or other wise, the type of material such as explosive or propellant, etc.

- The amount of material spilled in gallons, pounds, and so forth.

- The possible hazards to human health or the facility.

- A brief summary of planned Station response such as:

  "The spill will be contained and cleaned up by Station forces."

  "The spill will be contained by Station Forces; however, an outside contractor will be used to assist in cleanup."

  "Outside contractors will be required to contain and clean up the spill."

Table G-2
Personnel and Organization Notification List

Organization	Contact	Telephone (work)	Telephone (after hours)	Pager
Emergency Coordinator	Thomas Woo	301-743-4320	301-567-3415	11-730
Alternate Emergency Coordinator		301-743-4805		
Fire Protection		301-743-4333		
Security Police		301-743-4280		
Branch Medical Clinic		301-743-4449		
CHESNAVFACENGCOM	Navy On-Scene Coordinator (CO)	202-288-3300	202-433-2607	
	Environmental Engineering Branch (Code 114)	202-288-3760	202-433-2607	
Navy Department Duty Captain (NDDC)		AV-225-0231		
Navy Comand Center (NCC)		202-695-0231		
U.S. Coast Guard	Duty Officer	202-426-2675	202-426-2675	
EPA National Response Center		800-424-8802	800-424-8802	
Maryland Department of Health and Mental Hygiene		1-383-6650	1-243-8700	
NAVSEA OOD	Watch Officer	AV-222-7527 202-692-7527 AV-288-3636		

APPENDIX G.1

NAVORDSTA MUTUAL ASSISTANCE AGREEMENTS

Mutual Police Assistance Agreement

This agreement, made and entered into this 21 st day of December 19 82 by and between the Charles County, Maryland Sheriff's Department and the Commanding Officer, Naval Ordnance Station, Indian Head, Charles County, Maryland.

WITNESSETH:

Whereas, each of the parties hereto maintains equipment and personnel for the protection of life, limb and property, and

Whereas, the parties hereto desire to augment the police protection available in their various agencies in the event of riot, insurrection or major disaster, and

Whereas, the lands of the parties hereto are adjacent or contiguous so that mutual assistance in an emergency is deemed feasible, and

Whereas, it is mutually deemed sound, desirable, practicable and beneficial for the parties to this agreement to render assistance to one another in accordance with these terms;

THEREFORE, BE IT AGREED THAT:

1. Whenever it is deemed advisable by the senior officer of the parties of this agreement, or by the senior officer of either party, on the scene of an emergency, to request police assistance under the terms of this agreement, he is authorized to do so, and upon receipt of such request the following action should be taken:

a. Immediately determine if equipment and personnel can be spared in response to the request.

b. What equipment and personnel most effectively should be dispatched.

c. Forthwith dispatch such equipment and personnel as, in the judgment of the senior officer receiving the call, should be sent, with complete instructions as to the mission to be accomplished.

2. The request for assistance should include:

a. Nature of the emergency

b. Number of personnel requested

c. Type of equipment, if needed

d. The name and location of the ranking officer to whom the requested personnel should report.

3. The assisting personnel shall have the use of deadly force only in defense against an attack that may result in death or serious bodily injury to the officer or to an innocent bystander.

4. The assisting personnel shall not become involved in matters other than those pertaining to the emergency.

5. The Sheriff and his personnel are invited and encouraged to visit the Naval Ordnance Station for guided familiarization tours consistent with security requirements and, as feasible, to conduct pre-emergency planning inspections.

6. The technical heads of these parties are authorized to meet and draft any detailed plans and procedures of emergency operations to effectively be of assistance.

7. The rendering of assistance shall not be mandatory: but the party receiving the request for assistance should immediately inform the requester, if for any reasons, assistance cannot be rendered.

In Witness Whereof, the parties hereto have executed this agreement on the day and year first written above.

21 December 1982

Fred S. Underwood
Commanding Officer, Naval Ordnance Station

D. D. Fella
Sheriff, Charles County, Maryland

MUTUAL FIREFIGHTING ASSISTANCE AGREEMENT

THIS AGREEMENT, made and entered into this 10 th day of November, 1977 by and between Charles County, Maryland and the Commanding Officer, U.S. Naval Ordnance Station.

WITNESSETH:

WHEREAS, each of the parties hereto maintains equipment and personnel for the suppression of fires within its own jurisdiction and areas, and

WHEREAS, the parties hereto desire to augment the fire protection available in their various establishments, districts, agencies and municipalities in the event of large fires or conflagrations, and

WHEREAS, the lands or districts of the parties hereto are adjacent or contiguous so that mutual assistance in a fire emergency is deemed feasible, and

WHEREAS, it is the policy of the Navy Department and of the municipalities or other districts and of their governing bodies to conclude such agreements wherever practicable, and

WHEREAS, it is mutually deemed sound, desirable, practicable, and beneficial for the parties to this agreement to render assistance to one another in accordance with these terms;

THEREFORE BE IT AGREED THAT:

1. Whenever it is deemed advisable by the senior officer of a fire department belonging to a party to this agreement, or by the senior officer of any such fire department actually present at any fire, to request firefighting assistance under the terms of this agreement, he is authorized to do so, and the senior officer on duty of the fire department receiving the request shall forthwith take the following action:

a. Immediately determine if apparatus and personnel can be spared in response to the call.

b. What apparatus and personnel might most effectively be dispatched.

c. The exact mission to be assigned in accordance with the detailed plans and procedures of operation drawn in accordance with this agreement by the technical heads of the fire departments involved.

d. Forthwith dispatch such apparatus and personnel as, in the judgment of the senior officer receiving the call, should be sent, with complete instructions as to the mission, in accordance with the terms of this agreement. Provided, however, that when a call for assistance is received by a Navy fire department, it shall be referred at once to the Commanding Officer of the activity concerned, or his duly authorized Duty Officer, before any equipment or personnel is dispatched.

2. The rendering of assistance under the terms of this agreement shall not be mandatory, but the party receiving the request for assistance should immediately inform the requesting service if, for any reason, assistance cannot be rendered.

3. a. Claims for costs incurred by fire services in firefighting on Federal property can be filed with the National Fire Administration, in accordance with enclosure (1) of this agreement.

b. No firefighting personnel below the age of eighteen (18) shall be permitted within the restricted areas of NAVORDSTA. It shall be the responsibility of the Officer-in-Charge of each responding apparatus to see that this requirement is adhered to.

c. Each mutual aid apparatus responding into the restricted areas of NAVORDSTA must be accompanied by an officer of the NAVORDSTA Fire Department.

d. Because of hazardous operations within the restricted areas of NAVORDSTA, radio transmissions must be kept to a minimum. Responding Mutual Aid apparatus will report "10-23" or "On the Scene" to Charles County Fire Headquarters before entering the restricted area.

e. All Mutual Aid apparatus responding to the restricted areas of NAVORDSTA will report to NAVORDSTA Fire Headquarters before entering any restricted areas.

4. The technical head of the fire department of the requesting service shall assume full charge of the operations, but if he specifically requests a senior officer of a fire department furnishing assistance to assume command, he shall not, by relinquishing command, be relieved of his responsibility for the operation; provided, that

the apparatus, personnel, and equipment of the agency rendering assistance shall be under the immediate supervision of and shall be the immediate responsibility of the senior officer of the fire department rendering assistance.

5. The chief fire officers and personnel of the fire departments of both parties to this agreement are invited and encouraged, on a reciprocal basis, to frequently visit each other's activities for guided familiarization tours consistent with local security requirements and, as feasible, to jointly conduct pre-fire planning inspections and drills.

6. The technical heads of the fire departments of the parties to this agreement are authorized and directed to meet and draft any detailed plans and procedures of operation necessary to effectively implement this agreement. Such plans and procedures of operations shall become effective upon ratification by the signatory parties.

7. This agreement shall become effective upon the date hereof and shall remain in full force and effect until canceled by mutual agreement of the parties hereto or by written notice by one party to the other party, giving ten (10) days notice of said cancellation.

IN WITNESS WHEREOF, the parties hereto have executed this agreement at Indian Head, Maryland on the day and year first above written.

T. A. Hauser
Commanding Officer, Naval Ordnance Station

H. D. White
Chas. Co. Vol. Firemen's Association .

James E. Headley
Chas. Co. Asso. of Emer. Med. Services

DEPARTMENT OF THE NAVY
NAVAL LEGAL SERVICE OFFICE
WASHINGTON NAVY YARD
WASHINGTON, D.C. 20374

SRC:tec
5801
8 December 1982

From: Lieutenant Steve R. CONWAY, JAGC, USNR
To: Commanding Officer, Naval Ordnance Station, Indian Head, Maryland

Subj: Mutual Police Assistance Agreement between Charles County Police and Naval Ordnance Station, Indian Head, MD

Encl: (1) Subject named agreement; copy of

Ref: (a) Conversation between LT CONWAY (NLSO) and Mr. Andrew Peterson (NOS) of 8 December 1982

1. As requested during reference (a), a review was made of enclosure (1) to insure it conformed with applicable law and regulations. Specifically, Mr. Peterson wished to address the planned meeting between naval personnel and civilians on board Naval Ordnance Station, Indian Head.

2. The proposed agreement is not only in compliance with Navy Regulations but is exemplary of good relations between the civilian community and the Naval Ordnance Station. The agreement reflects well on the command.

S. R. CONWAY

APPENDIX G.2

CONTRACTORS REGISTERED WITH THE U.S. COAST GUARD

Contractors registered with the USCG to provide for containment and cleanup of spills (Fifth Coast Guard District) are the following:

Firm	Phone
A & A Waste Oil Co. Inc. 3635 Woodland Avenue Baltimore, MD 21215	(301) 578-0956
Clean America, Inc. 3300 Childs Street Baltimore, MD 21226	(301) 354-0751
George S. Goodhues & Son, Inc. 522 South Ann Street Baltimore, MD 21231	
Industrial Marine Service, Inc. 1301 Marsh Street P.O. Box 1779 Norfolk, VA 23501-1779	(804) 543-5118
J & L Industries, Inc. 6923 Ebenezer Road Baltimore, MD 21220	(301) 488-0800
Maryland Liquid Waste, Inc. 3598 Picnic Grove Rd. Millers, MD 21107	(301) 239-8962
Mid-Atlantic Refinery Services, Inc. 2301 Pennsylvania Ave. Deptford, NJ 08096	(609) 589-5000
PetroChem Recovery Services, Inc. P.O. Box 1458 Norfolk, VA 23501	(804) 627-8791
Specialized Marine, Inc. P.O. Box 813 Wrightsville, NC 28480	(919) 256-5780

H — Personnel Training

SECTION H

PERSONNEL TRAINING

The information in this section outlines the training program and its implementation for NAVORDSTA's open burn facilities in accordance with the requirements of 40 CFR 264.16 and 40 CFR 270.14(b)(12).

H-1 Outline of the Training Program

H-1a Job Title and Duties

Key individuals are trained for implementing explosive-contaminated waste thermal treament at NAVORDSTA. Their specific responsibilities and duties are listed in Appendix H.1 for each position title.

Individuals assigned to the outlined positions are required to be trained in RCRA as well as explosive waste and explosive/propellant contaminated waste management as a prerequisite for working in these positions.

H-1b Training Content, Frequency, and Technique

Personnel training for explosive contaminated waste by open burn has been divided into four training programs for the various personnel categories. Table H-1 presents the personnel training requirements and frequency of attendance.

The Overview Seminar is intended for personnel responsible for directing and overseeing the explosives-contaminated waste treatment activities at NAVORDSTA. The course focuses on the regulatory and technical aspects of the activity's management program and its implementation. Table H-2 lists typical course topics that are covered.

Table H-1

Personnel Training Requirements[1]

Personnel Category	Over-view (a)	Open Burn Operators Seminars (b)	Health and Safety (c)	Emergency Response (d)
Station Control and Security Officer	I	I	I	A
Pollution Abatement Control Officer/EC	I	I	I	A
Pollution Abatement Control Engineers	I	I	I	I
Pollution Abatement Control Technician		A	A	A
Property Disposal Officer	I	I	I	I
Property Disposal Office Staff		A	A	A
Fire Chief and Staff	I		I	I
Public Works Officer	I			

[1]Frequency:

I - Initial, updated as needed
A - Annual

Training Programs

(a) Overview: (Table H-2).
(b) Facility Operators: Open Burn Facility Operators' Course (Table H-3).
(c) Health and Safety: Safety Awareness, Protection, and First Aid Training (Table H-4).
(d) Emergency Response: Contingency Planning and Emergency Response Procedures (Table H-5).

Table H-2

Topics of Discussion -- Overview

- Department of Defense policy on environmental protection.
- U.S EPA hazardous waste management regulations. (RCRA)
- Description of facility and explosive-contaminated waste thermal treatment activities and units.
- Waste characteristics and management utilization.
- Procedures to prevent hazards.
- Preparedness and contingency planning.
- Other training programs.

The Explosive Operations Course is intended for Navy personnel who actually handle, or otherwise manage explosive waste and explosive-contaminated wastes at the Safety Thermal Treatment Point, Production Thermal Treatment Point and or the Caffee Road Thermal Treatment Point. This course provides information and procedures on the operation of the facilities in a manner that is safe and protective of the environment, in accordance with regulatory requirements and Navy operating standards. Table H-3 presents topics of discussion for this course.

NAVORDSTA also provides additional health and safety training through a separate course or as part of the Operators' Course. Table H-4 lists topics discussed.

An emergency response training seminar is conducted, which includes an overview of emergency response procedures and communications, notification lists, emergency equipment and utilization, evacuation plan, and reporting of emergency incidents. (See Table H-5)

H-2 Implementation of Training Program

The director of the training program and all personnel currently involved with explosive-contaminated waste handling, and management have been trained in the practices and procedures outlined in this section. All new personnel will complete the outlined training programs within 6 months of assignment to thermal treatment duties or within 6 months of employment, whichever is later. Personnel assigned to NAVORDSTA's explosive-contaminated waste management program will not work unsupervised prior to completion of the required training.

The Pollution Abatement Coordinator, in addition to the personnel office, will keep copies of training records (see Figure H-1 example) for each position title and assigned individual(s). Training records pertaining to current employees will be retained until completion of final closure. Training records for past employees will be retained for 3 years from the last year in which the employee worked.

Table H-3

Topics of Discussion -- Facility Operator's Course
Facility Operators' Course

- Explosive handling and management
- Hazardous wastes and hazardous waste laws, regulations, and policies (RCRA)
- Local regulations
- Hazardous waste classifications
- Health and environmental effects
- Personal safety
- Health and safety
- Waste identification and labeling
- Waste packaging and handling
- Waste storage
- Waste processing in the Navy
- Waste transportation
- Waste considerations in the Navy
- Contingency planning
- Spill response, cleanup, and decontamination

Table H-4

Topics for Health and Safety Course

- NIOSH incidents.
- Respiratory protection.
- Hearing protection.
- Static electricity.
- Personal safety gear.
- Safety policy training education.
- Special job procedures.
- Prevention of explosive accidents case histories.

Table H-5

Topics for Contingency Planning and Emergency Response Course

- Emergency communication procedures and alarm systems.
- Procedures for locating, using, inspecting, repairing, and replacing facility emergency and monitoring equipment.
- Response to explosions and fires.
- Evacuation routes and procedures
- Decontamination procedures.

TRAINING RECORDS

Employee _____

Title _____

Employee Number _____

Course Title	Date(s)	Hours of Instruction	Instructor	Location
Overview Seminar				
Facility Operator's Overview Seminar				
Health and Safety				
Emergency Response				

FIGURE H-1 TYPICAL PERSONNEL TRAINING RECORD

APPENDIX H.1

RESPONSIBILITIES AND DUTIES OF KEY PERSONNEL INVOLVED WITH EXPLOSIVE CONTAMINATED WASTE THERMAL TREATMENT ACTIVITIES (ECWTT)

APPENDIX H.1

RESPONSIBILITIES AND DUTIES OF KEY PERSONNEL INVOLVED WITH EXPLOSIVE CONTAMINATED WASTE THERMAL TREATMENT

Position Title: Pollution Abatement Coordinator

Responsibilities and Duties:

- Emergency Coordinator for explosive-contaminated waste thermal treatment (ECWTT) response activities.
- Coordinator for environmental permitting and compliance with regulations.
- Coordinates training for NAVORDSTA ECWTT management personnel.
- Manages overall inspection program for hazardous substances management units.
- Retains copies of ECWTT management training records.
- Retains records of ECWTT management unit inspections.
- Prepares environmental incident response summaries.
- Prepares annual reports and other correspondence with regulatory agencies.
- Reviews and approves drawings for ECWTT facilities
- Provides technical assistance to NAVORDSTA's tenant activities.

APPENDIX H.1
(continued)

Position Title: Station Control and Security Officer

Responsibilities and Duties:

- o Alternate Emergency Coordinator.
- o Management of site security forces and systems, including traffic control.
- o Management of the Fire Department.
- o Prepares emergency notifications for release by CO/XO.

Position Title: Pollution Abatement Engineers

Responsibilities and Duties:

- o Assist the Pollution Abatement Coordinator.
- o Environmental representatives and contacts for explosive-contaminated waste thermal treatment activities at NAVORDSTA.
  NAVORDSTA.
- o Identification of potential problems and reports detected leaks or spills.
- o Preparation of environmental permit applications.

APPENDIX H.1
(continued)

Position Title: Property Disposal Officer

Responsibilities and Duties:

- o Supervisor for overall operation and maintenance of the controlled open burn areas and buildings.
- o Coordinator for the transfer of transport of waste materials from the point of generation to treatment, or disposal.
- o Interfaces with contract officer and comptroller to ensure that contractors are prequalified for explosive-contaminated waste thermal treatment support activities.
- o Maintenance of operating logs and inspection reports.
- o Control of the labeling and accumulation of waste in storage.

Position Title: Safety Director

Responsibilities and Duties:

- o Overall safety management
- * Provides support services to the EC during emergency situations.

APPENDIX H.1
(continued)

Position Title: Fire Department Chief and Staff

Responsibilities and Duties:

- o Provides emergency response assistance when requested.
- o Maintains fire-related emergency response equipment.
- o Assists in contingency planning.

Position Title: Pollution Abatement Control Officer

Responsibilities and Duties:

- o Surveys ECWTT areas
- o Secures samples as required

APPENDIX H.1
(continued)

Position Title: Operator(s)

Responsibilities and Duties:

* Inspects materials shipped to the treatment plant.
* Prepares accepted material for burning per SJPs
* Returns rejected waste materials to the generator
* Housekeeping

I — Closure/Post Closure/Financial

SECTION I

CLOSURE PLAN, POST-CLOSURE PLAN, AND FINANCIAL REQUIREMENTS

I-1 General

This section is submitted in accordance with the requirements of the 40 CFR 264.603 regarding closure of permitted facilities. It identifies the steps that will be implemented to close the various open burn facilities at NAVORDSTA. A copy of this section, herein referred to as the Plan, will be maintained by the facility's Pollution Abatement Coordinator until the certification of closure completeness has been submitted and accepted by the U.S. Environmental Protection Agency (EPA).

The Station's Commanding Officer, or his designee, will notify the EPA 180 days prior to the date that final closure begins. Partial closure of certain individual facilities is possible in the future and outlined herein. It is not known when or if final closure of all of the thermal treatment points will occur in that NAVORDSTA is a key military activity.

The facilities covered in this section are:

Safety Thermal Treatment Point
Production Thermal Treatment Point
Caffee Road Thermal Treatment Point

A copy of this plan and all revisions will be retained at the facility by the Pollution Abatement Coordinator. This closure plan may be amended to reflect changes in the operation or design of the facility or the closure procedures. Amendments to this plan will be made within 60 days of the changes.

I-2 Maximum Inventory

An inventory of explosive or propellant wastes is not maintained at the Safety or Production Thermal Treatment Points. The maximum inventory of explosive-contaminated scrap to be stored in the operational section of the Caffee Road Thermal Treatment Point will be 25 tons.

I-3 Schedule of Closure

Each of the thermal treatment areas may be closed independently of the other two. Final closure of the three units is estimated to require up to 6 months if all three areas are closed simultaneously. The date of final closure for the thermal treatment areas cannot be projected at this time, but will probably occur after the year 2ØØØ (see Table I-1). The schedule of closure activities is shown in Table I-2.

I-4 Decontamination Procedures

Specific procedures for the three thermal treatment areas are described in the paragraphs that follow:

The closure of the Production and Safety Thermal Treatment Points will be nearly identical in scope and procedure due to their common settings and nature of treatment operations. Both locations involve thermal treatment of explosive-contaminated and propellant-based wastes by igniting the explosive wastes and thereby converting them to nonhazardous residuals. The residuals (decontaminated metals) are cleaned up after each burn and transported to the Caffee Road Thermal Treatment Point. The procedures to be followed during closure are summarized as follows:

Residual explosives treated first as a waste.

Scrap metal will be transported to the Caffee Road Thermal Treatment Point for further thermal treatment.

A visual inspection will be made of each facilities within the treatment boundaries.

If untreated residuals are visually evident on the soils, these areas will be retreated, if deemed necessary by the Safety Director. Soils at the Production Thermal Treatment Point will be sampled on 25-foot centers over a 1ØØ foot by 1ØØ foot area (16 samples total). The Safety Burn Point soils will also be sampled on 25 foot centers covering a 5Ø foot by 5Ø foot area (four samples). Table I-3 outlines the sampling procedure and laboratory testing to be performed on soil samples. Table I-4 lists the potential contaminants of concern for soils testing at these treatment areas.

The existing burn pans/vessels may be left in place during closure, following visual inspection for any remaining explosive- or propellant-contaminated wastes or be taken to the Caffee Road site for further treatment.

Warning signs pertaining to areas of the thermal treatment operations will be removed.

Equipment used to close the Safety and Production Thermal Treatment Points will be decontaminated and/or treated at the Caffee Road Thermal Treatment Point.

A registered professional engineer will inspect the facility during and after closure to certify that closure has been carried out in accordance with this plan.

Contingent upon promulgation and implementation of criteria applicable to thermal treatment of explosives, propellants, or explosive-contaminated substances, those criteria will be applied to the three thermal treatment areas at NAVORDSTA.

I-5 Closure Cost Estimate

Closure cost(1) estimate based on maximum expected volume of soil to be solidified on site is as follows:

	PTTP (2 Acres)	STTP (1 Acre)	CRTTP (4 acres)
Sampling, Analysis Monitoring & Documentation Requirements(2)	$500,000	$500,000	$500,000
Solidification (Solidify Appropriate Areas with Concrete Mix and Cap) Est. at $1.00/S.F.	$ 87,120	$ 43,560	$174,240
Total Costs	$587,120	$543,560	$674,240

Notes

1 Costs to be reviewed and updated as necessary on an annual basis.

2 Based on recent requirements for local landfill operation (St. Mary's County).

I-6 Post-Closure Plan

A post-closure plan is not included in this application because explosive/propellant-contaminated wastes will not remain at the sites. There is no storage at the Safety Thermal Treatment Point or at the Production Thermal Treatment Point.

I-7 Notice of Deed

A notice in the NAVORDSTA deed is not required because the three (3) thermal treatment areas described herein have been decontaminated and tested to verify "clean closure." No Wastes will remain at the sites.

I-8 Liability Requirements

The U.S. Navy, as an agency of the United States government, accepts legal and financial responsibility for sudden and non-sudden accidental occurrences that are directly or indirectly caused by thermal treatment operations at NAVORDSTA.

TABLE I-1
SCHEDULE OF CLOSURE

Facility	Partial Closure (year expected)	Final Closure (year expected)
Caffee Road Thermal Treatment Burn Point		Unknown > 2000
Production Thermal Treatment Point		Unknown > 2000
Safety Thermal Treatment Point		Unknown > 2000
Final Closure		Unknown > 2000

TABLE I-2
SCHEDULE OF CLOSURE ACTIVITIES

STEP	TIME REQUIRED
Notify the U.S. Environmental Protection Agency	180 days
Remove/Treat Inventory (Not Applicable)[1]	0
Flush pans and decontaminate equipment	45 days
Inspect for and clean-up residuals and testing as required	45 days
Certification by Professional Engineer	45 days

[1]There is no storage at Safety Thermal Treatment and Production Thermal Treatment Points. The inventory at Caffee Road Thermal Treatment Point (25 tons max.) will be worked off to "zero" before closure.

TABLE I-3
SOIL SAMPLING AND TESTING PROCEDURES

Soil samples are to be collected using EPA 600/2-80-018. Samples and Sampling Procedures for Hazardous Waste Streams. Samples at the soil surface will be collected using a trowel or scoop. The procedure to be used in collecting surface soil samples is as follows:

1. Near the center of the grid squares, collect a small portion of soil from the surface of the ground using a trowel or scoop (to a depth of up to 6 inches). The sampling device will be decontaminated between different sample points.

2. The sample will be placed in a 1 liter wide-mouth glass bottle and two 40 milliliter septa vials. (The two 40 milliliter vials will be completely filled and analyzed for volatile purgable organics.) The containers will be capped. A label will be attached to each container. The sample will be recorded in the field log book and a chain-of-custody record initiated.

3. The samples will be shipped to a CHESNAVFACENGCOM contract laboratory for analysis.

TABLE I-4
TESTING PARAMETERS FOR CLOSURE
OF THERMAL TREATMENT AREAS AT NAVORDSTA

Nitrate esters
- Nitroglycerin
- Propyleneglycol dinitrate
- Metriol trinitrate
- Triethylene glycol dinitrate
- Butanetriol trinitrate
RDX
HMX
TNT
Ammonium perchlorate
Nitroguanidine
Triacetin
Dinormal propyl adipate
2-Nitrodiphenylamine
Resorcinol
Phenyl beta naphthylamine
Toluene Diisiocyanate
Heavy metals -- all EP toxicity metals

J — Other Environmental Laws

SECTION J

OTHER ENVIRONMENTAL LAWS

J-1 NPDES Status

NAVORDSTA has 43 industrial wastewater outfalls that are permitted by the Maryland Department of the Environment (MDE) under NPDES permit No. MD0003158. This permit includes the outfalls at NAVORDSTA Stump Neck Annex.

Sanitary outfalls are permitted under permit No. MD0020885. Additional information on these and other permits is provided in Section A, Form 3, Item X.

J-2 Oil Operations

NAVORDSTA utilizes oil, primarily for heating and vehicle maintenance. The oil operations at the facility have been permitted by MDE. Permit No. 89-OP-0666 is valid until Arpil 19, 1993.

J-3 Air Pollution Control

NAVORDSTA is permitted to operate the three open burning thermal treatment points under permit No. AP-88-317, which was issued by the Charles County Health Department.

NAVORDSTA operates three 180-million Btu/hour oil/coal-fired boilers at the Station's powerhouse. The operation of these boilers is permitted by the MDE under permit nos. 08-0040-4-0063, -0064, and -0065.

J-4 Cultural Resources

NAVORDSTA is included in the Navy's Cultural Resource Management Program, which was instituted to meet the requirements of the following:

-- National Historic Preservation Act.

-- Archaeological Resources Protection Act of 1979.

-- National Environmental Policy of 1969.

-- Executive Order 11593 -- Protection and Enhancement of the Cultural Environment.

A cultural resources survey was initiated at NAVORDSTA in 1984 to fulfill the requirements of the regulations listed. The survey was completed in fiscal year 1985.

K — Certification

SECTION K

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Date

George F. Wendt
Captain, USN
Commanding Officer
Naval Ordnance Station
Indian Head, Maryland 20640

NAVAL ORDNANCE STATION

COMPLETENESS CHECKLIST.

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
	270.14		Part B General Information Requirements	X		Sections B-K	
4.1.	270.14(b)(1)		- General description of the facility	X		B-1	
4.2.	270.14(b)(2)	264.13(a)	- Chemical and physical analysis of hazardous wastes to be handled	X		C-1	
4.3.	270.14(b)(3)		- Waste analysis plan	X		C-2	
		264.13(b) (1)-(5)	- Analysis parameters with rationale	X		C-2a	
			- Test methods for analyzing parameters	X		C-2b	
			- Procedure for collecting presentative samples	X		C-2c	
			- Frequency of analyses	X		C-2d	
			- Compatibility with containment device	X		C-2c	
			- Free liquid documentation	X		C-2b	
		264.13(c)	- Procedures to determine identity of each waste movement from offsite		X	C-2e	
			- Procedures for collecting representative samples of offsite waste		X	C-2e	
4.4.	270.14(b)(4)		- Security description for active portion of facility	X		B-2,F-1	
		264.14(a)	- Unit within secure installation	X		B-2,F-1a	
			- Unknowing/unauthorized contact with waste not harmful	X		B-2,F-1a,D-1	
			- Unknowing/unauthorized disturbance of waste or equipment cannot cause violation of Part 264	X		B-2,F-1a,D-1	
		264.14(b)	- Description of 24-hour surveillance system	X		F-1a	
			- Description of artificial or natural barriers	X		F-1a	
			- Description of controlled entry/egress procedures	X		B-2,F-1a	
		264.14(c)	- Description of warning signs	X		B-2,F-1a	
			- List of languages on signs	X		F-1a	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.4.		264.14(c)	- Statement of 25-foot legibility	X		F-1a	
			- Description of sign locations and number of signs	X		F-1a	
4.5.	270.14(b)(5)		- General Inspection Schedule and Procedures Description	X		F-2	
		264.15(b)(1)	- Written schedule	X		F-2a	
		264.15(b)(2) and 265.15(d)	- Statement as to where, at facility, inspection schedule and inspection records will be kept	X		F-2a	
		264.15(b)(1)	- Identification of equipment/processes to be inspected	X		F-2a	
		264.15(b)(3)	- Identification of types of problems each equipment/process to be checked for	X		F-2a	
		264.15(b)(4)	- Frequency of inspections by equipment/process	X		F-2a	
		264.15(c)	- Schedule of remedial action	X		F-2a	
4.6.	270.14(b)(6)	Part 264 Subpart C	- Preparedness and Prevention Documentation	X		F-3	
			- Waiver(s) request and justification		X	F-3	
		264.32(a)	- Description of internal communications/alarm system(s)	X		F-1b,F-3a	
		264.34(a)	- Documentation of personnal access to internal communications/alarm system(s)	X		F-1b	
		264.32(b)	- Description of external communications/alarm system(s)	X		F-1b	
		264.34(b)	- Documentation of personnel access to external communications/alarm system(s)	X		F-1b	
		264.32(c)	- Description of fire control/extinguishing, spill control, and decontamination equipment	X		F-3a,G-4,5b,5d	
		264.32(d)	- Documentation of adequate water volume and pressure for above equipment	X		F-3a,G-5b	
		264.33	- Documentation of equipment testing/maintenance schedule and procedures	X		F-2a,G-5b	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.6.	270.14(b)(6)	264.35	- Documentation of adequate aisle space		X		
		264.37 (also 264.52(c)	- Documentation and descriptions of arrangements or attempts at arrangements with:	X		G-5	
			- Onsite:	X		G-5	
			- Police department(s)	X		G-5a	
			- Fire department(s)	X		G-5b	
			- Hospitals	X		G-5c	
			- Local emergency response teams	X		G-5c	
			- State emergency response teams	X		G-5a	
			- Emergency response contractors	X		G-5b	
			- Equipment suppliers	X		G-4	
			- Offsite:	X		G-5	
			- Police department(s)	X		G-5a	
			- Fire department(s)	X		G-5b	
			- Hospitals	X		G-5c	
			- Local emergency response teams	X		G-5c	
			- State emergency response teams	X		G-5a	
			- Emergency response contractors	X		G-5d	
			- Equipment suppliers	X		G-5d	
		264.37(a)(2)	- Documentation of agreements designating primary emergency authority	X		G-2	
4.7.	270.14(b)(7)	Part 264 Subpart D	- Contingency Plan Documentation	X		Section G	
		264.51 and 264.52(a)	- Criteria for implementation of contingency plan	X		G-3	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.2.	270.14(b)(7)	264.52(d)	- Emergency Coordinators Identification	X		G-2	
			- Name	X		G-2	
			- Addresses	X		G-2	
			- Home/Work Phones	X		G-2	
		264.55	- Documentation of Qualifications	X		H-1	
			- Documentation of Authority	X		G-1	
			- Descriptions of Notification procedure	X		G-3a	
		264.52(e)	- Emergency equipment list	X		G-2,Table G-1	
			- Documentation of equipment location	X		G-2,Table G-1	
			- Physical description of equipment	X		G-2,Table G-1	
			- Statement of equipment capabilities	X		G-5b	
		264.52(f)	- Evacuation Plan	X		G-6	
			- Criteria for implementation	X		G-3	
			- Description of signal(s) to implement	X		G-3	
			- Description of primary and alternate routes	X		G-6	
		264.53	- Contingency Plan Copy Location	X		G-1	
			- Description of location of facility's copy of plan	X		G-1	
			- Number of duplicate copies distributed and their location	X		G-1	
		264.54	- Contingency Plan Amendment	X		G-1	
			- Identification of person responsible and authorized to change/amend plan	X		G-1	
			- Description of procedure to change/amend facility copy of plan	X		G-1	
			- Description of procedure to ensure update of all copies of plan	X		G-1	

Manual Paragraph	Part 270	Part 265	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.7.	270.14(b)(7)	264.56	- Detailed Emergency Procedures	X		G-3	
			- Procedure for facility personnel notification	X		G-3	
			- Procedure for State/local agency notification	X		G-3a	
			- Procedure for identification of character, source, amount, and areal extent of released materials	X		G-3b	
			- Procedure for assessment of environmental/ human health hazards	X		G-3b	
			- Identification of On-Scene Coordinator for geographic area	X		Table G-2	
			- Description of specific responses and control procedures for:	X		G-3d	
			- Fire	X		G-3d,5b	
			- Explosion	X		G-3d,5b	
			- Spill	X		G-3,3c	
			- Description of process shutdown and monitoring procedures	X		D-3a,3b,3c	
			- Description of cleanup procedures and associated material treating, storing, disposal procedures	X		G-3f,3g	
			- Description of emergency equipment cleaning and refilling procedures	X		G-3g	
			- Description of procedures to ensure incompatible waste segregation during cleanup	X		G-3f	
4.8.	270.14(b)(8)		- Preventive Procedures, Structures, and Equipment Documentation, including descriptions of equipment/procedures to:	X		Section F	
			- Prevent hazards during unloading operations	X		F-4	
			- Prevent runoff and flooding	X		F-4b,D-4	
			- Prevent water supply contamination	X		F-4c,D-3	
			- Mitigate equipment failure and power outages		X	F-4d	

(Manual) Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.8.	270.14(b)(8)		- Prevent undue personnel exposure to wastes	X		D-3	
4.9.	270.14(b)(9)	264.17	- Prevention of Accidental Ignition or Reaction Documentation	X		F-5,D-1	
			- Description of separation and protection of ignitable, reactive, incompatible wastes	X		F-5b	
			- Description of ignitable, reactive, incompatible wastes handling procedures	X		F-5b,C	
			- Description of number, location, and type of warning/prohibition signs	X		F-1a	
			- Documentation that procedures are adequate to prevent accidental ignitions or reactions	X		F-5	
			- Description of number, location, and type of warning/prohibition signs	X		F-1a	
			- Documentation that procedures are adequate to prevent accidental ignitions or reactions	X		F-5	
4.10.	270.14(b)(10)		- Traffic Documentation*	X		B-4	
			- Identification of:	X		B-4	
			- Waste movement routes	X		B-4	
			- Number of movements by type vehicle	X		B-4	
			- Quantity of waste moved per movement per vehicle	X		B-4	
			- Traffic control sign personnel	X		B-4	
			- Route surface composition and load bearing capacity	X		B-4	
4.11.	270.14(b)(11)		- Facility Location Documentation	X		B-1,Fig. B-1	
	270.14(b)(11)(i) and (ii)		- Political jurisdiction identified (new facilities only)		X		
			- Comparison to Appendix VI of Part 264		X		

*There are no standards in Part 264 for traffic movement. The information that must be submitted with the Part B permit application, as required by 270.14(b)(10), will be used by the Agency to evaluate safety at the facility.

NAVORDSTA

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.11.	270.14(b)(11)(i) and (ii)		- Demonstration that faults with displacement in Holocene time are more than 3,000 feet from facility		X		
		264.18(a)	- Demonstration that no faults pass within 200 feet of sites where I/S/D to be conducted		X		
	270.14(b)(11)(iii)(iv)	264.18(b)	- Documentation of facility location relative to 100 year flood plain level or wave action flooding	X		B-3b,D-3	
			- Documentation that facility can withstand the 100 year flood without washout of hazardous waste by:	X		B-3b,D-3	
			- Analysis of hydrodynamic/hydrostatic forces resulting at site from 100 year flood, and		X	B-3b	
			- Presentation of operating units and flood protection devices design and how they will will prevent washout, or	X		B-3b,D-3	
			- Plan for removal of waste before washout including,	X		D-3	
			- Timing of removal relative to flood levels	X		D-3	
			- Estimated time to remove all waste	X		D-3	
			- Location to which waste will be moved and proof of compliance with Parts 122 through 124 and 264 through 267 of this Chapter	X		D-3	
			- Detailed description of personnel, equipment, and procedures for waste removal sufficient to ensure availability in time for use	X		D-3	
			- Analysis of potential for discharge during waste movement	X		D-3	
			- Justification for leaving unit at site during flood	X		D-3	
	270.14(b)(11)(v)		- A plan documenting how and on what time schedule the facility will comply with 264.18(b) if not in compliance (existing facilities only)		X	B-3b,D-3	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.12.	270.14(b)(12)	264.16	- Personnel Training Program Documentation	X		Section H	
			- Outline of introductory and continuing personnel training programs*	X		H-1	
			- Identification and qualifications of program instructor	X		H-2	
			- Brief description of how training program meets actual job tasks*	X		H-2,Tables H-1,2,3,4	
			- Description of procedures to ensure all appropriate personnel receive appropriate training and receive annual training review	X		H-2,Table H-1	
			- Description of records to be kept, their location, and procedures to ensure they are retained for proper length of time	X		H-2	
4.13.	270.14(b)(13)	264.112	- Closure Plan Documentation	X		Section I	
			- Description of partial and final closure procedures	X		I-4	
			- Description of maximum unclosed portion during facility life	X		I-2	
			- Estimate of maximum waste inventory in storage/ treatment during facility life	X		I-2	
		264.114	- Equipment decontamination procedure	X		I-4	
			- Estimated year of closure	X		Table I-1	
		264.113	- Description of closure schedule including;	X		Table I-2	
			- Total time to close	X		Table I-2	
			- Trackable intervening closure activities	X		Table I-2	
			- Location(s) and number of copies of closure plan	X		I-1	
			- Identification of person responsible for storage and updating of facility copy of closure plan	X		I-1	
			- Procedure for updating all other copies of closure plan	X		I-1	

*This documentation on Personnel Training must be included in the application. The remaining three items may be included at the applicant's discretion.

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.13.	270.14(b)(13)	264.117 and 264.118	- Postclosure Plan Documentation		X	I-6	
			- Description of ground-water monitoring activities and frequencies		X		
			- Description of maintenance activities and frequencies for:		X		
			- Final containment structures		X		
			- Facility monitoring equipment		X		
			- Location(s) and number of copies of postclosure plan		X		
			- Identification and location (address and phone number) of person responsible for storage and updating facility copy of postclosure plan prior to closure		X		
			- Identification and location (address and phone number) of person responsible for storage and updating facility copy of postclosure plan during postclosure period		X		
			- Procedure for updating all other copies of postclosure plan		X		
4.14.	270.14(b)(14)	264.120	- Documentation of Notice on Deed (existing facilities only)		X	I-7	
			- Statement that land used to manage wastes		X		
			- Statement of restricted use per 264.117(c)		X		
		264.119	- Documentation of type, location, and quantity of wastes filed with local authority and EPA Regional Administrator		X		
4.15.	270.14(b)(15)	264.142	- Closure Cost Estimate			I-5	
4.16.	270.14(b)(16)	264.144	- Postclosure Cost Estimate		X	I-6	
4.17.	270.14(b)(17)	264.147	- Documentation of Insurance			I-8	
4.18.	270.14(b)(18)	264.149	- Documentation of a State Required Financial Mechanism for Closure, Postclosure, or Liability		X	Fed. Facility	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.19.	270.14(b)(19)		- Topographic map showing a distance of 1,000 feet around facility at a scale of not more than 1 inch equals 200 feet that clearly shows:	X		B-2,D-3	
			- Contours	X		D-3	
			- Proper contour intervals	X		D-3	
			- Map scale and date	X		D-3	
			- 100-year flood plain area	X		D-3	
			- Surface waters and intermittent streams	X		Fig. B-3,D-3	
			- Surrounding land uses	X		Fig. B-5	
			- Wind rose	X		Fig. B-6	
			- North orientation	X		Figs. B-1,B-2	
			- Legal boundaries of facility site	X		Fig. A-1	
			- Access control	X		B-2, F-1	
			- Injection and withdrawal wells onsite and offsite	X		Table B-1,E-1f	
			- Buildings and recreation areas	X		Fig. A-1	
			- Runoff control systems	X		Fig. A-1	
			- Access and internal roads	X		B-4,Fig. A-1	
			- Storm, sanitary, and process storage systems	X		Fig. A-1	
			- Loading and unloading areas	X		D-3	
			- Fire control facilities	X		G-5b	
			- Barriers for drainage or flood control	X		B-3b,D-3	
			- Location of past or present operational units and equipment cleanup areas	X		D-3	
			- Justification for larger scale	X		Sec. A,Form 3,#V	
4.20.	270.14(c)	Part 264 Subpart F	Part B Protection of Ground Water Information Requirements for Surface Impoundments, Waste Piles, Land Treatment Units, and Landfills		X		

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.20.	270.14(c)(1)		- Summary of existing ground water monitoring data		X		
			- Summary of existing water level elevation data		X		
	270.14(c)(2)		- Identification of uppermost and hydraulically interconnected aquifers under facility including:		X		
			- Water flow rate and direction		X		
			- Bases for identification		X		
	270.14(c)(3) and 270.14(b)(19)		- Topographic Map		X		
			- Delineation of property boundary		X		
		264.95(b)	- Delineation of waste management area		X		
		264.95(a)	- Ground-water monitoring well locations		X		
	270.14(c)(4)		- Description of existing contamination		X		
			- Description of remedial actions		X		
	270.14(c)(5)	264.97	- Detailed plans and an engineering report of Ground-Water Monitoring Program		X		
		265.97(a)	- Description of wells		X		
			- Number of wells		X		
			- Locations		X		
			- Assurance of unaffected background water measurement		X		
			- Assurance of compliance point ground water measurement		X		
		264.97(c)	- Monitoring well construction details		X		
		264.97(d)	- Description of sampling/analysis procedures		X		
			- Field measurements		X		
			- Well evacuation		X		
			- Sample collection methods		X		

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
4.20.		264.97(d)	- Sample preservation/shipment		X	*	
			- Analytical procedures		X		
			- Chain of custody control		X		
		264.97(c)	- Documentation of proper/adequate analytical procedures to include a description of the QA/QC program		X		
	270.14(c)(6)	264.91(a)(4) and 264.98	- Description of Monitoring Program including		X		
	270.14(c)(6)(i)	264.93 and 264.98(a)	- List of indicator parameters, waste constituents, reaction products to be monitored for;		X		
			- Sampling frequency		X		
			- Description of chemical data evaluation procedures		X		
			- Description of water level elevation data evaluation procedures		X		
			- Description of data reporting procedures		X		
5.	270.23		SPECIFIC PART B REQUIREMENTS FOR OB/OD MISCELLANEOUS UNITS	X		Section D	
5.1			OB IN CONTAINMENT DEVICES	X		Section D	
5.1.1.2.1.	270.23(a)(1)		- Physical Characteristics, Materials of Construction and Dimensions	X		D-3	
			- General description	X		D-3	
			- Engineering drawings	X		D-3, Fig. D-3	
			- Containment device description	X		D-3	
			- Lining material within device	X		D-3	
			- Containment device support system	X		D-3	
			- Lining material below device	X		D-3	
			- Leak detection provisions	X		D-3	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
5.1.1.2.1.	270.23(a)(1)		- Precipitation cover	X		D-3	
			- Runon/runoff management devices	X		D-3	
5.1.1.2.2.	270.23(a)(2)	264.601 264.602	- Documentation of Protection of Human Health and Environment	X		D-1,D-3,Apx.	
			- Ground-water monitoring		X	E-2i,2a	
			- Control of PCP ejection	X		D-3	
			- Integrity of containment device considerations	X		D-3	
			- Deterioration or malfunction procedures	X		F-2a,F-4a	
			- Prevention of accumulated precipitation or leaked/spilled materials	X		D-3	
			- Management of wind dispersal of ash	X		D-3	
			- Runon/runoff control measures	X		F-4b,D-3	
			- Ash/residue management	X		D-3	
			- Risk assessment	X		G-3c,G-7	
			- Fire hazard minimization	X		F-1a	
5.1.1.2.3.	270.23(a)(3)	264.601	- Postclosure Requirements		X	I-6	
5.1.2.	270.23(b)	264.601	- Hydrogeologic Assessments	X		Section E	
			- Description of the quantitative, physical, and chemical characteristics of the waste	X		Section C	
			- Hydrogeologic characterization of the site	X		E-1	
			- Average depth to ground water beneath the facility	X		E-1c	
			- Estimated net recharge rate	X		E-1e,1g	
			- Aquifer media	X		E-1b,1e,1d,1	
			- Soil media	X		E-1b,1c,2b	
			- Topography	X		E-1e,Fig. E-4	
			- Aquifer conductivity	X		E-1e	
			- Regional land uses	X		E-1f,Fig. B-5	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
5.1.2.	270.23(b)	264.601	- Brief description of ground-water flow direction and rate	X		E-1h,2g	
			- Proximity to ground-water withdrawal points	X		E-1f	
			- Qualitative description of ground-water quality (if available)	X		E-1i,2h	
			- Discussion of potential impacts on human health (if potential exists)	X		E-1j,2i	
			- Discussion of potential impacts on plants and animals	X		E-1j,2i	
			- General assessment of subsurface migration potential	X		E-2i	
5.1.3.	270.23(b)		- Meteorological Assessments	X		D-3e	
		264.601(c)(1)	- Quantitative, physical, and chemical characteristics of the waste and potential for air emissions	X		C-1	
		264.601(c)(2)	- Description of systems and structures, their reliability and effectiveness to reduce or prevent emissions to the air	X		D-3	
		264.601(c)(3)	- Description of the operating characteristics of the unit	X		D-3e	
		264.601(c)(4)	- Description of the climatology in the local area	X		E-1a	
		264.601(c)(5)	- Description of the existing air quality in the area	X		D-3e	
		264.601(c)(6)	- Analysis of the potential for health risk	X		D-3e	
		264.601(c)(7)	- Analysis of the potential for damage to flora and fauna	X		D-3e	
	270.3(f)		- Documentation to show compliance - Air Permit	X		Sec. A, Form 3, #X	
5.1.4.	270.23(b)		- Land Use Maps	X		Fig. B-5	
5.1.5.	270.23(c)		- Pathways of Exposure and Exposure Magnitude	X		G-7, E-2i	
			- Exposure checklist completed		X		

Manual Paragraph	Part 270	Part 265	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
5.1.6.	270.23(d)		- Effectiveness of Treatment	X		D-3d	
			- Analysis of samples for reactivity	X		D-3d	
			- Explosives analyses	X		D-3d	
5.1.7.			Minimum Protective Distances	X		D-3,D-1	
		265.382	- Evidence to show minimum protective distances are being complied with	X		D-3	
5.1.8.			Standing Operating Procedures	X		D-3	
		264.31	- Evidence that SOP's are written and that they are updated on a satisfactory frequency	X		D-3	
5.1.9.			- Open Burning of PEP-contaminated Solvents	X		D-3	
		265.382	- Requirement for Safety Official's certification of Explosive Instability	X		D-3	
5.1.10.			- Noise Considerations	X		D-7	

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
5.2.	270.23		OB ON THE GROUND SURFACE		X		
5.2.1.2.1.	270.23(a)(1)		- Physical Characteristics, Materials of Construction and Dimensions		X		
			- General description		X		
			- Engineering drawings		X		
			- Pad Material		X		
			- Lining material		X		
			- Leak detection provisions		X		
			- Precipitation cover		X		
			- Runon/runoff devices		X		
5.2.1.2.2.	270.23(a)(2)	264.601 264.602	- Documentation of Protection of Human Health and Environment		X		
			- Ground-water monitoring		X		
			- Minimization of subsurface contamination		X		
			- Management of pad deteriorations		X		
			- Prevention of accumulation of precipitation		X		
			- Runon/runoff control measures		X		
			- Handling of accumulated precipitation or liquids migrating from the unit		X		
			- Management of wind dispersal of ash		X		
			- Minimization of OB surface area		X		
			- Ash/residue and contaminated soil management		X		
			- Risk assessment		X		
			- Fire hazard minimization		X		
5.2.1.2.3.	270.23(a)(3)	264.601	- Postclosure Requirements		X		

Manual Paragraph	Part 270	Part 264	Subject Requirement	Provided	Not Applicable	Location in Application	Comments
5.2.3.		264.601(c)(3)	- Description of the operating characteristics of the unit		X		
		264.601(c)(4)	- Description of the climatology in the local area		X		
		264.601(c)(5)	- Description of the existing air quality in the area		X		
		264.601(c)(6)	- Analysis of the potential for health risk		X		
		264.601(c)(7)	- Analysis of the potential for damage to flora and fauna		X		
	270.3(f)		- Documentation to show compliance - Air Permit		X		
5.2.4.	270.23(b)		- Land Use Maps		X		
5.2.5.	270.23(c)		- Pathways of Exposure and Exposure Magnitude		X		
			- Exposure checklist completed		X		
5.2.6.	270.23(d)		- Effectiveness of Treatment		X		
			- Analysis of samples for reactivity		X		
			- Explosives analyses		X		
5.2.7.			Minimum Protective Distances		X		
		265.382	- Evidence to show minimum protective distances are being complied with		X		
5.2.8.			Standing Operating Procedures		X		
		264.31	- Evidence that SOP's are written and that they are updated on a satisfactory frequency		X		
5.2.9.		265.382	OB of PEP-Contaminated Solvents		X		
			- Requirement for safety official's certification of explosive instability		X		
5.2.10.			Noise Considerations		X		