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"ROGER, GOLDEN AND HALPERN"

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Master Plan Update

Naval Ordnance Station Indian Head, Maryland

Chesapeake Division, Naval Facilities Engineering Command

Prepared for Chesapeake Division, Naval Facilities Engineering Command

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Executive Summary

EXECUTIVE SUMMARY

The Naval Ordnance Station, Indian Head, located at the southern terminus of Indian Head Highway, 22 miles from Washington, DC, is involved in pilot operations for the development of ordnance and the production of specialized ordnance products. The Station is divided into two main operational areas; the Indian Head area, consisting of 2,009 acres and the Stump Neck area consisting of 1,171 acres.

This plan includes an analysis of existing conditions and recommendations for the future development of the Station and its major tenants, the Naval Explosive Ordnance Disposal Technology Center (NAVEODTECHCEN) and the Naval School, Explosive Ordnance Disposal (NAVSCOLEOD).

The key issues addressed in this plan are:

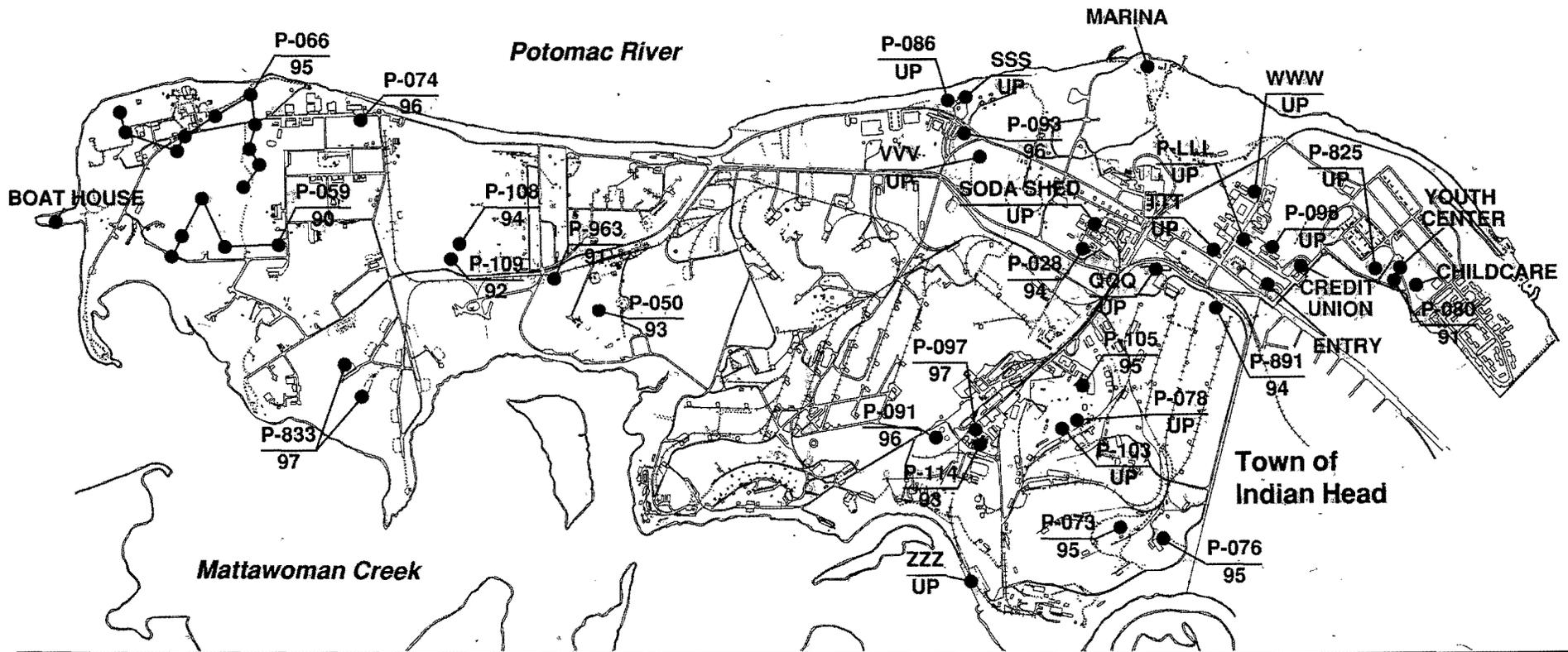
- The need for improved circulation patterns, especially as related to Station safety and security needs.
- The potential for conflict with off-site uses due to the steady increase in development in the vicinity of the Station.
- The need to consolidate uses to facilitate management and services.
- Construction of facilities to alleviate space problems and to efficiently organize the Station through careful project siting in the appropriate land use area.
- Development of administrative, community support and supply areas.

- The importance of protecting natural resources, recognizing limitations imposed by environmental features such as water supply availability, and ensuring compliance with all applicable environmental laws and regulations.

The major recommendations of this plan that address these issues are:

- Realignment of the restricted area perimeter fence to exclude work areas that do not need to be within the restricted area. Related recommendations are the creation of two new gates to the restricted area, improvements to circulation and functions at the main gate and pass office, and a perimeter fence around the entire Station.
- Designation of development-limited zones along portions of the Station to provide a buffer between the Station and off-site use areas, and to conserve sensitive environmental resources.
- Designation of land use areas based on use consolidation. A related recommendation is consideration of on-station land use compatibilities in siting decisions (see Proposed Land Use maps, pages 9-2 and 9-3).
- Consideration of natural resources in the siting of new projects, and in project design and construction. Specific recommendations in the form of a constraints map, siting guidelines, and sites for MILCONs (in the Capital Improvements Plan) are provided.

Specific project recommendations in the Master Plan that relate to the above issues and recommendations are provided in the Capital Improvements Plan, and are shown on the next pages (Figures 1-1 and 1-2).



INDIAN HEAD

Project Locations

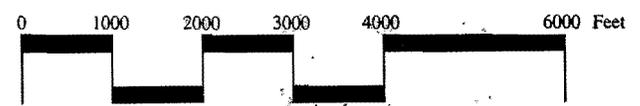
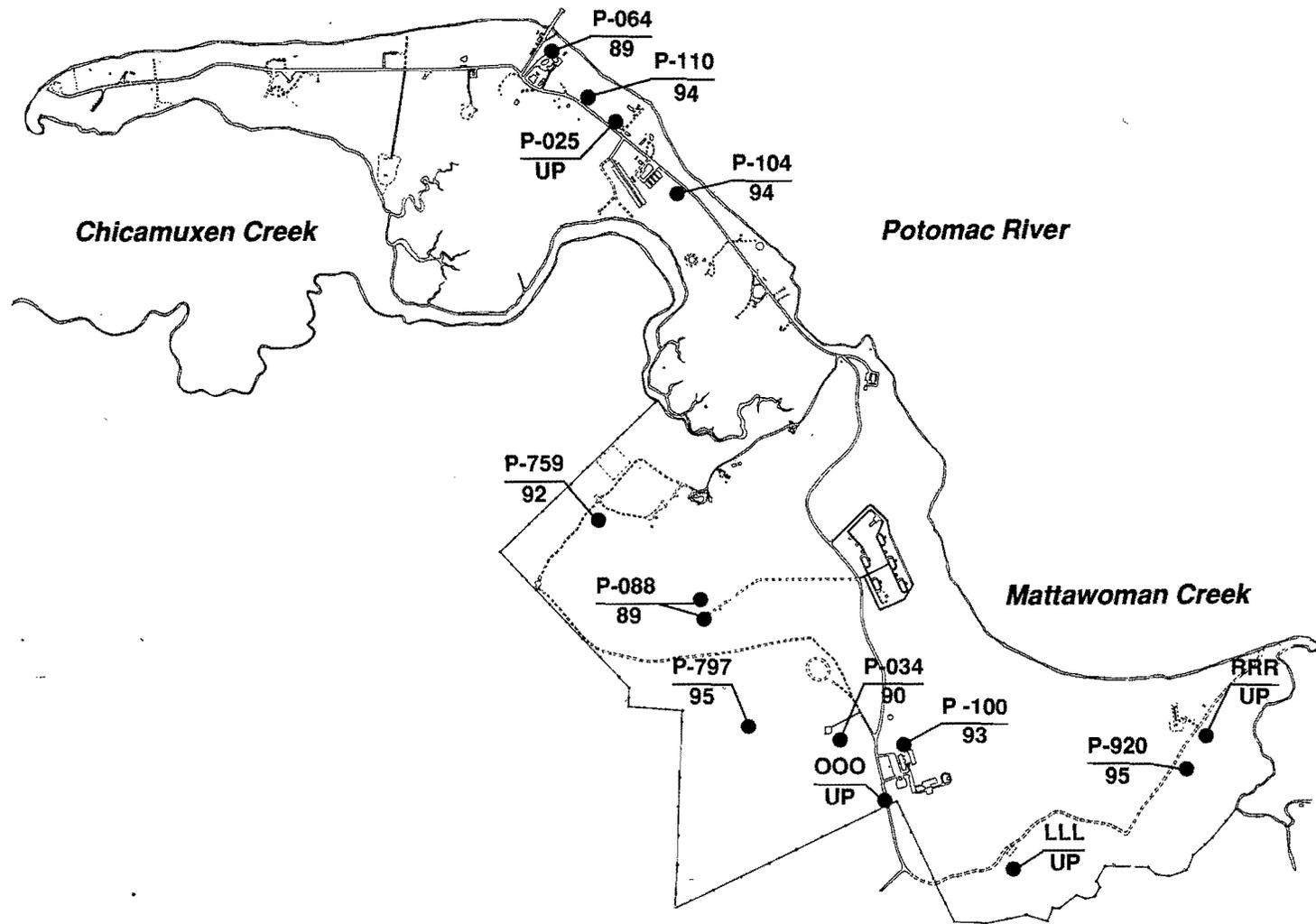


Figure 1-1

Naval Ordnance Station, Indian Head



STUMP NECK Project Locations

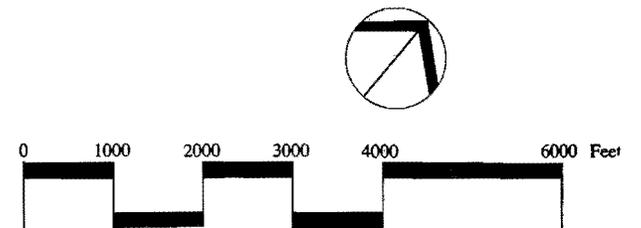


Figure 1-2

Naval Ordnance Station, Indian Head

2

Introduction

INTRODUCTION

The Master Plan Update for Naval Ordnance Station, Indian Head is the result of a comprehensive planning process designed to insure logical and efficient use of facilities and real property assets, and to guide growth and change. Projects are sited to meet operational, safety, and environmental requirements, with consideration of infrastructure support and site improvement needs. The Master Plan Update provides a vehicle for implementing planning recommendations and proposals, and serves as a compendium of factual material describing NOS, its mission, and the natural and built environments in which it operates. More detailed information on specific activities and requirements is contained in the Department and Station Strategic Plans. The strategic plans address mission-related strategies, resources, and management; the Master Plan Update addresses the physical conditions (i.e., the natural and built environments) within which the strategic plans are carried out.

This Update has been prepared in accordance with OPNAV Instruction 1100.16A (Command Responsibility for Shore Activity Land Facilities), NAVFAC Instruction 11010.63B (Planning Services for Navy and Marine Shore Activities) and 11010.44E (Shore Facilities Planning Manual).

Purpose and Use of the Plan

The Master Plan Update provides a guide to development over a 20 to 25 year planning horizon. This guidance is in the form of a recommended long term land use plan. The Master Plan Update also includes specific guidance for a 5 to 7 year planning horizon, in the form of siting recommendations for specific projects identified in the

Capital Improvements Plan, a part of the Master Plan. Project siting recommendations are consistent with the long term land use plan.

The Master Plan Update should be used by all project planners when making siting decisions for projects. This document provides information on both appropriate and inappropriate siting locations based on project function and existing natural and man-made constraints. The Master Plan Update can also be used as a convenient reference tool when information is needed about the natural and built environment. This document will either provide the information needed, or identify the references that contain more specific information.

Processes Used to Develop the Plan

The Master Plan Update is the result of extensive data collection at NOS and off-station. Two general types of data collection activities were conducted: interviews with knowledgeable personnel, and collection of existing documentation.

Formal interviews were conducted with command staff, all department heads and all tenant organizations. Follow-up interviews were held with key personnel when more specific information was required. The results of these interviews were incorporated into the planning process in several ways. Specific information about location and function was incorporated into mapping of current conditions. Information about problems and limitations pertaining to each organization, or to NOS in general was used to develop and evaluate land use alternatives.

Existing documentation related to the natural and built environments at NOS was gathered to determine opportunities and constraints for land use planning. The content of these documents is summarized and referenced in the appropriate sections of the Master Plan Update if the content has general applicability for land-use decision-making (for example, availability and capacity of infrastructure, or construction limitations posed by natural features). This information is also used to guide the development and evaluation of land use alternatives.

Description of Format

Chapter 1, the Executive Summary, presents the Master Plan Update highlights and recommendations. Chapter 2 is this Introduction. Following this Introduction, the Master Plan Update begins with a Background chapter (Chapter 3) that provides a general description of the Station's history, previous real property transactions, and current mission and organization, including on-site tenants.

Chapter 4, Regional and Local Conditions, provides an overview of conditions surrounding the Station. The emphasis of this overview is to identify factors that may be relevant to the Station's operation now or in the future.

Chapter 5, NOS Environmental Features, describes on-site natural conditions. The emphasis of this chapter is to identify areas that may impose natural limitations to future development, and areas that offer opportunities for development or other use.

Chapter 6 describes the Environmental Management Programs at NOS. These are the programs directed toward controlling environmental releases from the Station in compliance with Federal

and state regulations and other directives. All new development at NOS must be evaluated for consistency with existing environmental management programs.

Chapter 7 contains a description and analysis of Man-Made Features at NOS. These include the built environment, infrastructure, and hazard areas.

Development and analysis of alternative planning concepts are contained in Chapter 8. In this chapter, the various development challenges confronting NOS are discussed, and plans for meeting these challenges are described. The combined result of alternatives is presented as the Proposed Land and Facility Use Plan in Chapter 9. This chapter highlights the programmed and unprogrammed projects needed to accomplish the goals of the land and facility use plan. The Preliminary Environmental Assessment (PEA) for programmed MILCONs is presented in Chapter 10. The PEA is prepared as an integral component of the Master Plan, in compliance with the National Environmental Policy Act.

Chapter 11 presents the Energy Conservation Plan for NOS, Indian Head. This plan addresses specific conservation methods and recommendations for implementing a conservation program.

A list of references cited in or used to prepare this Master Plan Update is presented in the Bibliography, Chapter 12, which is followed by the Capital Improvements Plan (CIP) for the Station. The CIP is provided as removable document at the end of the Master Plan.

3

Background

BACKGROUND

Location

The Naval Ordnance Station (NOS), Indian Head, is located in the northwestern portion of Charles County, Maryland, 22 miles south of Washington, DC (see Figure 3-1).

Charles County is geographically located in the Atlantic Coastal Plain physiographic province, and is one of five counties which comprise the geographic region known as Southern Maryland. Southern Maryland is an irregularly shaped peninsula of 1,944 square miles, bounded on the south and west by the Potomac River, on the northwest by the District of Columbia, on the north by the Patapsco River, and on the east by the Chesapeake Bay.

Charles County adjoins Prince George's County to the north, and Saint Mary's County to the east; the county is part of the Southern Maryland Tri-County Council (with Saint Mary's and Calvert Counties). Charles County has also recently joined the Metropolitan Washington Area Council of Governments (COG), an organization of 15 area counties and municipalities in the Washington, DC area.

The principal facilities of NOS are located on the Indian Head peninsula, which is bounded on the west by the Potomac River, on the east by Mattawoman Creek, and on the north by the Town of Indian Head. Other NOS facilities are located on a nearby parcel of land known as Stump Neck. Stump Neck is bounded by Mattawoman and Chicamuxen Creeks.

The total land area of NOS is approximately 3,405 acres, of which 2,009 acres are within the boundaries of the Indian Head area and 1,171 acres are within the boundaries of the Stump Neck area. The remaining Station acreage is split among Bulléts Neck (a 47-acre promontory in the Mattawoman Creek estuary), housing sites in Waldorf and La Plata (about 18 acres total) and a right-of-way for the White Plains Railroad which connects NOS, Indian Head to the CONRAIL junction at White Plains, Maryland (see Figure 3-1).

The primary access to NOS is via Indian Head Highway (Maryland Route 210), which terminates at the Station's main gate. Due to its location, NOS has enjoyed both a degree of isolation from the pressures of the metropolitan area and convenient access to that area.

History

The Naval Ordnance Station, Indian Head, has been prominent in local county history since its establishment as the Naval Proving Ground in 1890. Until 1900, the U.S. Naval Proving Ground was strictly a facility for testing and proving all powder purchased by the Department of the Navy and all naval guns turned out at the Navy Yard in Washington, DC. In addition, the facilities at Indian Head were occasionally used to evaluate the effects of different projectile types on armor plate. During this period, all provisioning and shipments into and out of the Naval Proving Ground were made across the Indian Head wharf on the Potomac River. In 1900, the Naval Proving Ground was the first to produce smokeless powder, on the Mattawoman Creek side of the present Station.

The Stump Neck Annex properties were purchased in 1901 as a matter of precaution because the testing of larger naval guns sometimes

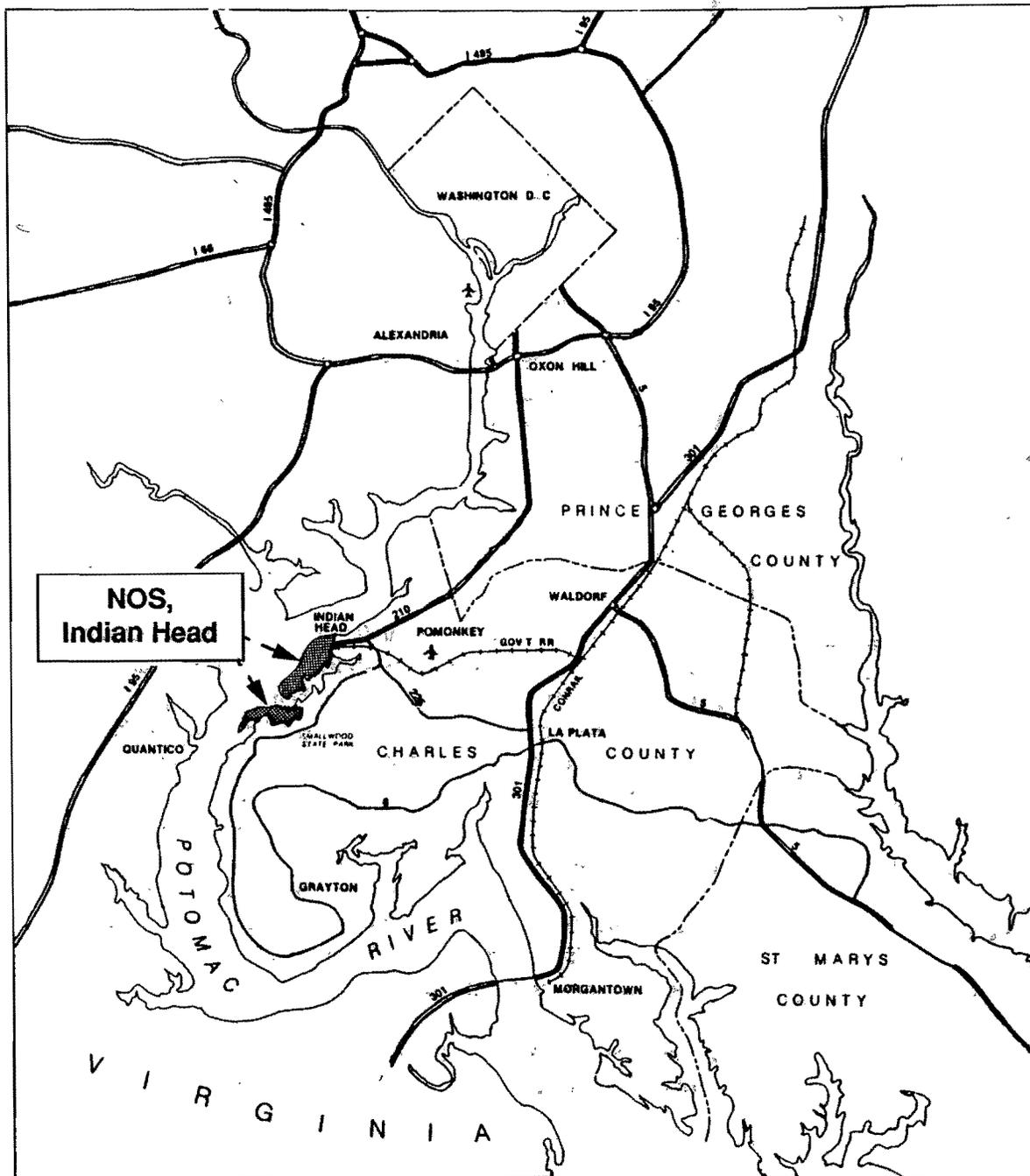
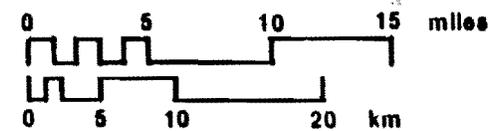


Figure 3-1
Location-
NOS, Indian Head



Source: Land Use Compatibility Study (1987).

resulted in inadvertent shelling of that property. Additional plant facilities on the single base gun propellants line and a new acid plant were built in 1915; the latter to offset the rising production costs resulting from increased sulfuric and nitric acid purchases.

In 1918, during World War I, the Station was enlarged by the purchase of 1,160 acres of adjacent land, and a 14.4 mile railroad spur was laid from the Naval Proving Ground to the Pennsylvania Railroad Junction at White Plains, Maryland. Finally, the hazards of shot and shrapnel exceeded the safety limits of the Station and in 1921 all proving ground activities were moved to Dahlgren, Virginia. In 1932, the Dahlgren Naval Proving Ground was established as a separate command and Indian Head was redesignated the Naval Powder Factory.

As World War II approached, smokeless powder was the mainstay gun propellant but it lacked a flashless quality. The Naval Powder Factory developed a technique for producing flashless powder and pellets. Coincident with the National Defense effort, new production facilities were built and new products were manufactured. Fundamental research in rocketry and rocket propellant grains for bombardment rockets, bazookas and air-to-ground anti-tank weapons began in 1940. A new Explosive "D" Plant was completed in 1942 and the Extrusion Plant with a new double-base product line began operations in 1943. Construction of Route 210 as a Defense Access Road was also completed in 1943 (jurisdiction was transferred to the state in 1954). As the war drew to a close in 1945, propellant research and development was added to the mission of the Station. This was followed in 1949 by the opening of the Patterson Pilot Plant for scaled-up experimental production.

The Korean conflict brought the Naval Powder Factory back to World War II status and four new production plants were built. The Station

was redesignated as the Naval Propellant Plant in 1958. Following earlier development work in the Polaris Program, 23 new buildings for the manufacture of Polaris base grain were completed in 1960.

As the Naval Propellant Plant continued to grow in capability, an "on-line" computer facility for ballistic evaluation was completed in 1961 and nitroplasticizers were first produced for the Polaris Program. Manufacture of the X-248 Scout, a space-oriented program, was added to the plant capabilities in 1962. During the same year the Station developed Otto Fuel II, a liquid monopropellant for use in the Mark 46, Mod 1, and Mark 48 torpedoes. Inert diluent and pneumatic mixing processes were developed and, in 1966, the entire facility was redesignated the Naval Ordnance Station and approached maximum production capability in support of the Vietnam conflict.

Within the last 20 years, the Station has produced NACO, or Navy cool gun propellant, and high energy casting powder for the second stage of the C-3 Poseidon Missile.

After experiencing a surge of activity generated by the Vietnam conflict, the Station's workload was shifted from primarily a production facility to a highly technical engineering support operation. The Station has been designated by the Secretary of Defense to be the Engineering/Production Center for the Tri-Service Cartridge Actuated Devices/Propellant Actuated Devices Program. The Station also modified and reactivated two "mothballed" plants to produce UDMH for the Department of Defense when the only remaining private producer of this important chemical ceased its production. UDMH production has since been discontinued.

In 1976, the Station was assigned the task of producing 1,000 Standard ARM Rocket Motors. The following year the Station was designated the design agent for Standard Missile Motors.

Modernization of the Moser Nitrating Plant was completed in 1978, making the Naval Ordnance Station the most flexible producer of speciality chemicals in the free world.

In 1982, NOS developed the Standard Missile Extended Range and the Terrier Simulator MK 89. In 1983, the mothballed Polaris Plant was reactivated for limited production of Polaris Second Stage casting powder. Modification of the Polaris Plant facilities as a pilot production source for Low Vulnerability Ammunition (LOVA) propellant is now complete.

The Station was awarded the Secretary of the Navy's Energy Conservation Award in 1981. In 1983, the Station received 3 awards: Honorable Mention in the Secretary of the Navy's Energy Conservation Contest, the Secretary of the Navy's Meritorious Unit Commendation Award, and the Outstanding Business and Industry Award from the Maryland Association for Cooperative Education.

NOS was established as a Center of Excellence in 1987 to promote technological excellence in specialized fields. The six Centers of Excellence at NOS are:

- Energetic Chemicals
- Guns, Rockets & Missile Propulsion
- Ordnance Devices
- Explosives
- Safety & Environmental Protection
- Simulators & Training Shapes

Real Property

NOS is composed of ten separately identifiable sites in four discrete areas:

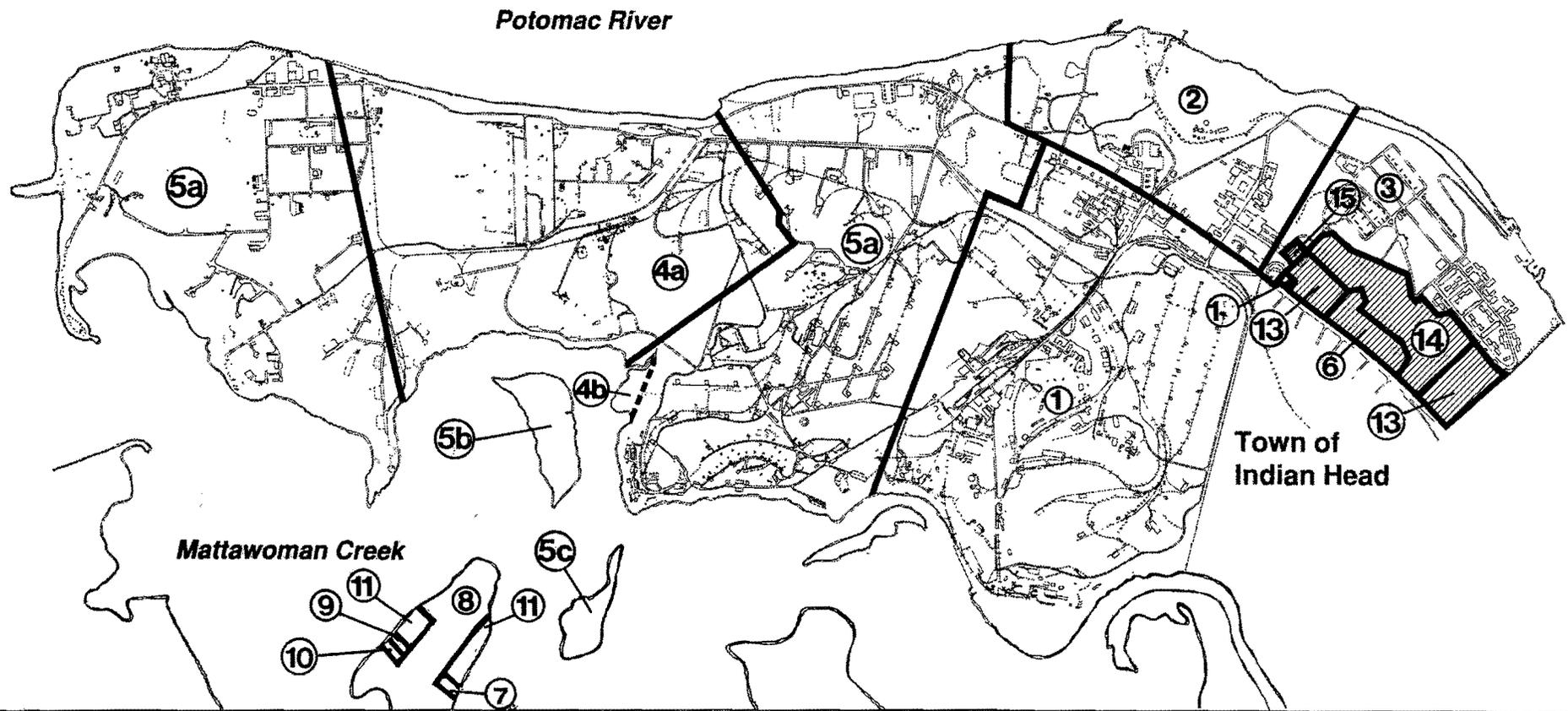
- 1) The Indian Head area, including the main Indian Head site, Hog Island, Thoroughfare Island and Marsh Island,
- 2) The Stump Neck area, which is made up of the Stump Neck site and Rum Point,
- 3) Bullet's Neck, a promontory near Rum Point, and
- 4) The remote sites owned by NOS: the White Plains railroad right-of-way, and two housing sites near La Plata and Waldorf in northern Charles County.

These areas are shown in Figures 3-2, 3-3 and 3-4, and are described in Table 3-1.

Acquisitions

All of the NOS land in the Indian Head area was obtained in five acquisitions that took place between 1890 and 1918. This area currently consists of about 2,009 acres including Hog Island, Marsh Island, and Thoroughfare Island.

The initial purchase was made in 1890 in the area then known as Cornwallis Neck. A total of 659 acres, in two parcels of 473 and 186 acres respectively, were acquired and the Naval Proving Ground was established on these tracts in the same year (see transactions 1 and 2, Indian Head Area, in Table 3-1). Another 222.75 acres, from a tract



INDIAN HEAD

Real Property

Source: NOS Public Works Engineering Division files, CHESDIV Real Estate Division files

LEGEND

- Acquisitions (numbers are keyed to Table 3-1)
- ▨ Disposals (numbers are keyed to Table 3-1)
- Transaction Boundary
- - - Approximate Transaction Boundary

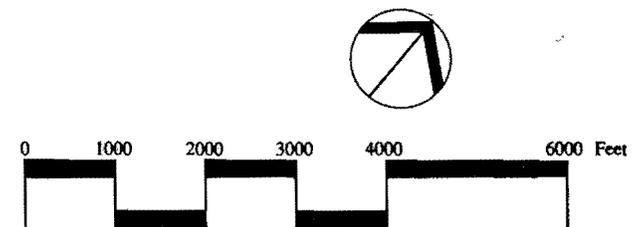
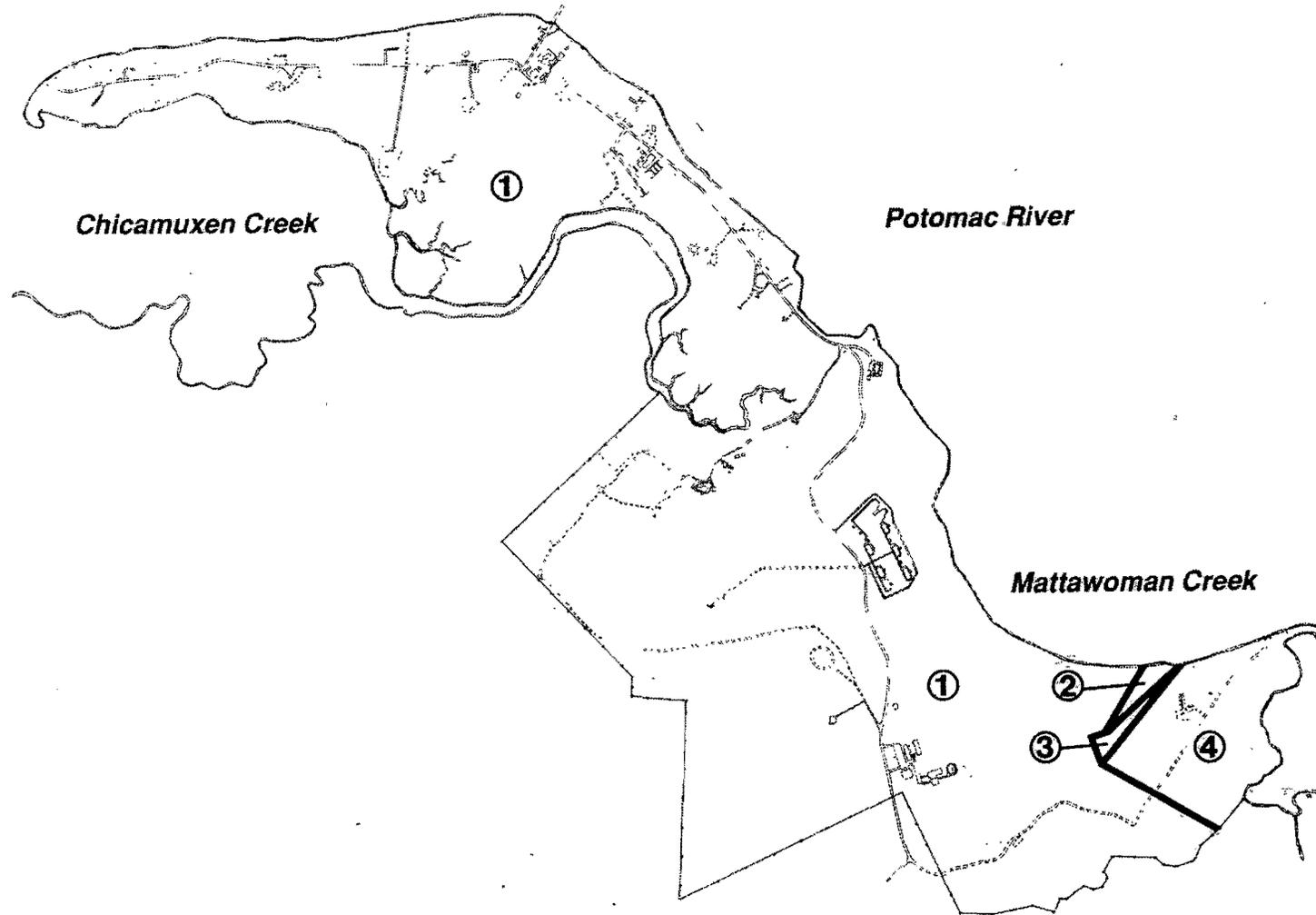


Figure 3-2

Naval Ordnance Station, Indian Head



STUMP NECK Real Property

Source: NOS Public Works Engineering Division files, CHESDIV Real Estate Division files

LEGEND

- Acquisitions (numbers are keyed to Table 3-1)
- Transaction Boundary

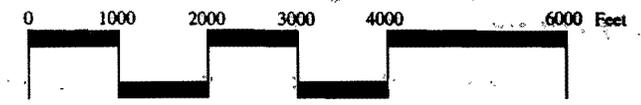


Figure 3-3

Naval Ordnance Station, Indian Head

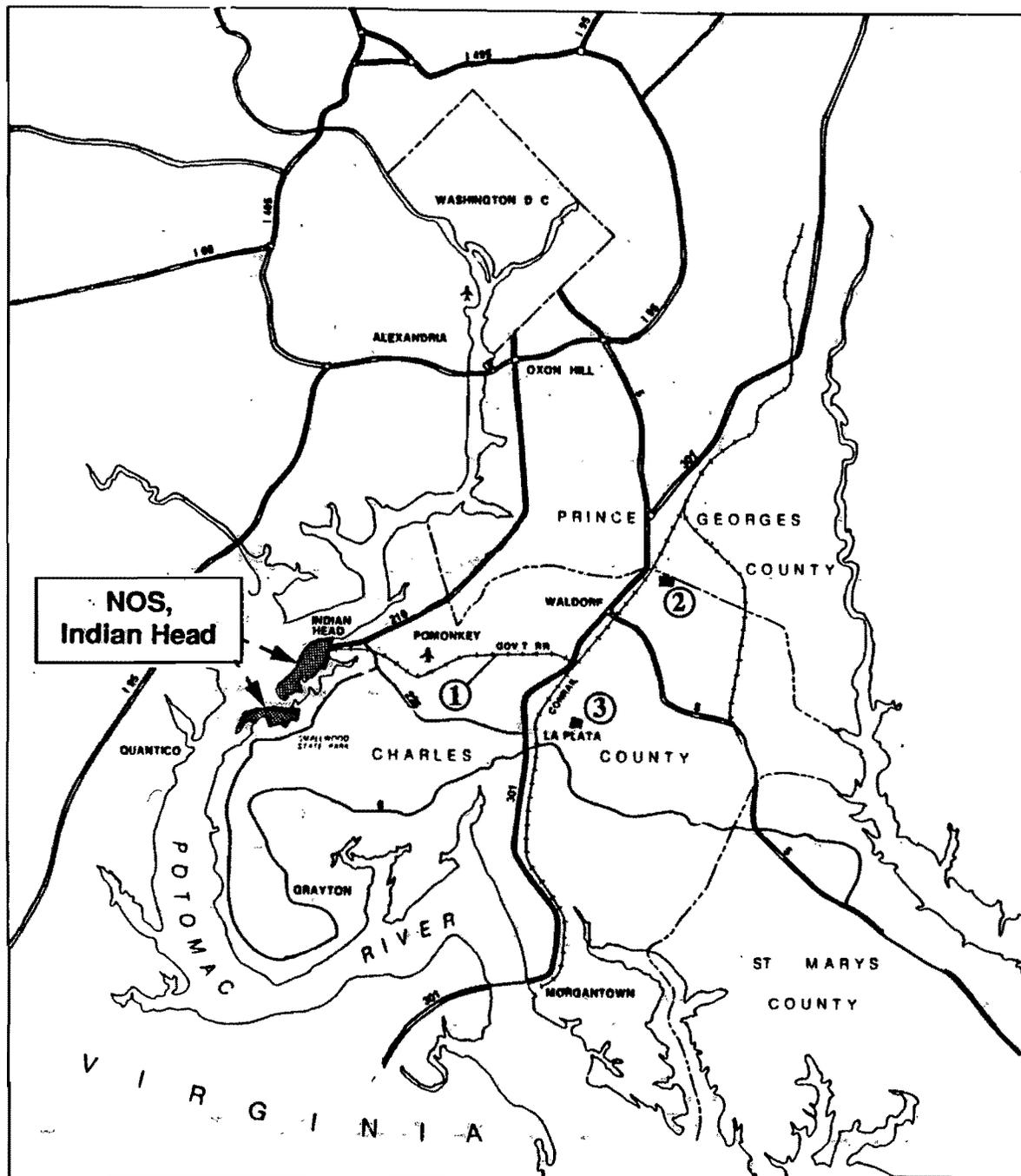


Figure 3-4
Real Property: Remote Sites

- REMOTE SITES:**
- ① White Plains RR
 - ② Waldorf Housing
 - ③ La Plata Housing

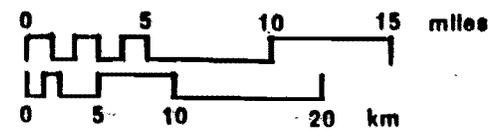


Table 3-1. Summary of Real Estate (Real Property) Acquisitions and Disposals (1)

GENERAL AREA and Specific Site	Transaction Number	Type	To or From	Original or Other Description of Tract	Date	Acres	
INDIAN HEAD AREA (2)							
Main Site	1	Acquisition	B. Cooley	Cornwallis Neck	May 14, 1890	473.00	
	2	Acquisition	K.U. Taylor	Cornwallis Neck	May 14, 1890	186.00	
	3	Acquisition	M.T. Irwin	Mount Pleasant Farm	Sep 15, 1891	222.75	
	4a	Acquisition	A. Reuter	Hopewell Farm	Apr 5, 1918	427.01 (3)	
	5a (4)	Acquisition	Arundel Sand & Gravel		Jun 10, 1918	385.00	
		Acquisition	Mitchell, Mattingly	Fisher Tract	Jun 10, 1918	280.20	
		Acquisition	S.E. Mudd		Jun 10, 1918	66.70	
	6	Disposal	Charles County Schools	Indian Head Elementary School	Mar 15, 1955	-12.74 (5)	
	12	Disposal	Town of Indian Head	New Post Office site	Apr 20, 1976	-1.00	
	13	Disposal	Town of Indian Head	Village Green/Summers Road	Mar 1, 1977	-20.14	
	14	Disposal	Charles County Schools	Fletcher Field, Diffenbach Court	Mar 6, 1978	-39.01 (6)	
	15	Disposal	Town of Indian Head	Old NOS Post Office (Bldg 293)	Sep 11, 1985	-1.22	
	<i>Main Indian Head Site, Subtotal Acres</i>						1,966.55
	Hog Island	4b	Acquisition	A. Reuter	H. Grimes Island	Apr 5, 1918	6.90 (7)
	Thoroughfare Island	5b	Acquisition	S.E. Mudd		Jun 10, 1918	25.00
Marsh Island	5c	Acquisition	S.E. Mudd		Jun 10, 1918	10.30	
INDIAN HEAD AREA, Subtotal Acres						2,008.75	
BULLETS NECK AREA (2)							
	7	Acquisition	W. Grinder		Oct 5, 1965	1.50	
	8	Acquisition	B. Grinder		Jan 26, 1966	35.57	
	9	Acquisition	S. Howard		Apr 14, 1966	0.75	
	10	Acquisition	G. Henderson		Apr 11, 1966	0.85	
	11	Acquisition	E. King, et al.		Jun 15, 1966	8.33 (8)	
BULLETS NECK AREA, Subtotal Acres						47.00	
STUMP NECK AREA (9)							
Main Site	1	Acquisition	Est. of B. Goffield	Mason's Enlargement	Aug 5, 1901	1,084.00	
	2	Acquisition	W. & E. Harlee		Nov 11, 1918	3.30	
	3	Acquisition	Est. of W. Harlee		Apr 25, 1966	3.30	
<i>Main Stump Neck site, Subtotal Acres</i>						1,090.60	
Run Point	4	Acquisition	E. King, et al.		Jun 15, 1966	80.00	
STUMP NECK AREA, Subtotal Acres						1,170.60	
REMOTE SITES (10)							
White Plains RR	--	Acquisition	Various (11)	Government RR Right-of-Way	Aug 7, 1918	160.94	
WHITE PLAINS RR, Subtotal Acres						160.94	
Waldorf Site	--	Acquisition	Dept. of the Army	Waldorf housing site	Mar 4, 1974	3.68	
La Plata site	--	Acquisition	Dept. of the Army	La Plata housing site	May 3, 1974	13.83	
WALDORF & LA PLATA SITES, Subtotal Acres						17.51	
TOTAL ACRES GOVERNMENT OWNED						3,404.80 (12)	

Table 3-1 Notes:

- (1) Transaction numbers in this table are keyed to each Real Property map. Tracts acquired in the same transaction but which are currently inventoried as separate entities, such as Thoroughfare Island and Rum Point, are listed individually with the acreage for each, but are given related transaction numbers (such as 4a and 4b).
- (2) See Figure 3-2 (Real Property map, Indian Head Area).
- (3) Hopewell Farm and Hog Island were acquired in the same transaction. Some documents show the acreage for both areas combined as one tract totalling 433.91 acres.
- (4) Presidential Proclamation number 1458 authorized transactions 5a - 5c, which total 767.20 acres. Among the tracts acquired was a total of 102 acres purchased from the heirs of S.E. Mudd, including the areas now known as Thoroughfare and Marsh Islands. These are listed separately, as transactions 5b and 5c, for consistency with current inventories. Specific parcel boundaries within transaction 5a are not available in Navy files; hence only 5b and 5c are shown separately on the Real Property map (Figure 3-2).
- (5) This parcel included the old Indian Head Elementary School building, as well as the land on which the new elementary school was later built.
- (6) Disposal to Department of Health, Education and Welfare (HEW) in 1978; deeded by HEW to the Charles County Board of Education. All but about 7.5 acres of this parcel later reverted to the GSA and was auctioned in 1987 to the Cook Inlet Region Corporation.
- (7) Originally known as H. Grimes Island, Hog Island was an island but is now appended to the main Indian Head peninsula (through siltation in the channel between the two). It was purchased in the same transaction with the Hopewell Farm as 6.0 acres. Later documents have defined Hog Island as a 6.90 acre area; for consistency with current inventories, the latter figure is used here.
- (8) This 8.33 acre portion of Bullets Neck was purchased in the same transaction as the 80 acres at Rum Point; some documents will show them as one tract consisting of 88.33 acres.
- (9) See Figure 3-3 (Real Property map, Stump Neck Area).
- (10) See Figure 3-4 (Real Property: Remote Sites).
- (11) Presidential Proclamation number 1472 authorized the taking of land for this right-of-way from about 70 individual owners.
- (12) This total differs from that shown in the report, "Detailed Inventory of Naval Shore Facilities" (P-164) by 4.88 acres; apparently due to a discrepancy in the acreage for Bullets Neck and White Plains RR (acreage for some outgrants appears to have been added to the original total acreage in the P-164 totals).

SOURCES: NOS Public Works Engineering Division files; NAVFACENCOM, Chesapeake Division, Real Estate files

known locally as the Mount Pleasant Farm, were added to the Indian Head site the following year (transaction 3).

World War I brought about a demand for increased powder production, which in turn brought about the next major acquisition of land in the Indian Head area. In April, 1918, Congress authorized an expansion of the Naval Proving Ground. The same month, the Hopewell Farm and Hog Island were purchased from one owner (transactions 4a and 4b).

Originally known as H. Grimes Island, Hog Island was at that time an islet in the Mattawoman Creek but has since become a part of the Indian Head peninsula.

In June 1918, President Wilson signed Presidential Proclamation number 1458 which authorized the taking of all remaining land on Cornwallis Neck in order to expand the Naval Proving Ground. As a result, three tracts totalling about 732 acres were acquired from different owners (transaction 5a). Marsh Island and Thoroughfare Island were also purchased at this time from the heirs of S.E. Mudd: (transactions 5b and 5c). Both islands are located in the marshy area of the Mattawoman Creek, between the main site and Stump Neck.

In August 1918, also as a result of World War I production needs, Presidential Proclamation 1472 authorized the acquisition of land for a railroad right-of-way, running from the Naval Proving Ground to the Pennsylvania Railroad junction at White Plains. Land was purchased from approximately 70 separate landowners, for a total of about 161 acres (transaction 1, Remote Sites), and a 13.8-mile railroad spur was laid.

The bulk of real estate in the Stump Neck Area was acquired in a single purchase of 1,084 acres in 1901, a property known locally as

Mason's Enlargement (transaction 1, Stump Neck Area). Two small tracts of 3.30 acres each were acquired in 1918 and 1966, from the same original owner (transactions 2 and 3). Rum Point, an 80-acre promontory in the Mattawoman Creek closely related to the rest of the Stump Neck area, was acquired by condemnation in 1966 (transaction 4).

Bullets Neck, a separate 47-acre promontory in the Mattawoman Creek, was purchased in five small acquisitions (numbers 7 - 11, Indian Head Area) in 1965 and 1966. The primary consideration in acquiring this property, as in acquiring Rum Point, was one of safety and security arising from explosive safety quantity distance arcs for magazines on the Indian Head site across Mattawoman Creek.

In 1974, two residential housing sites in Waldorf and La Plata were acquired from the Department of the Army (transactions 2 and 3, Remote Sites). These sites total about 17 acres, and contain additional housing units for military dependents.

Disposals

All disposals of land by NOS have been from the Indian Head site in the area of the Town of Indian Head. All disposals are initially made to the General Services Administration (GSA) and thence to the ultimate recipients listed below.

In 1955, a 12.74-acre parcel including the old Indian Head Elementary School building, as well as the land on which the new elementary school was later built, was deeded to the Board of Education of Charles County (transaction 6).

A total of 22.35 acres was deeded to the Town of Indian Head in three separate disposal actions (transactions 12, 13, and 15) in 1976, 1977

and 1985. These parcels include the current site of the Town of Indian Head's Post Office, a water tower and the Village Green, as well as the old NOS Post Office (Bldg. 293) which is currently being used as a community center by the town.

The largest disposal was of a 39-acre tract deeded in 1978 to the Charles County Board of Education (via the Department of Health, Education and Welfare), on the condition that it be used for educational purposes (transaction 14). This parcel included a baseball field known as Fletcher Field, and the road called Diffenbach Court. As a result of the restrictions on use, the parcel (all except about 7.5 acres to the west of Stark Road and the old school building) was later returned to the GSA and was sold at auction by the GSA in 1987 to the Cook Inlet Region Corporation. This parcel has been rezoned to Commercial-General and is expected to be developed for future use as commercial/office space along with the old Indian Head Elementary school building, which was recently auctioned off by the Charles County Board of Education.

Outgrants

Included in the total acreage owned by NOS are approximately 70 acres on which about 40 easements or useage licenses have been granted. Several of these easements are on the main site; most are on the White Plains Railroad right-of-way. Easements are granted for varying periods of time and many cover very small areas (less than 1/10th of an acre).

The purposes of such easements have included rights-of-way for telephone cables, electric lines and other equipment, and to allow access across NOS-owned property to land owned by other parties. As part of the purchase agreements, several of the former owners of

property on Bullets Neck were granted limited licenses for seasonal recreational use of those properties.

The most significant easement was to the State of Maryland in 1964 for the widening of Route 210 (Indian Head Highway). Other easements have been granted to Southern Maryland Electric Cooperative, C&P Telephone, the Town of Indian Head, the Veterans of Foreign Wars, the Charles County Sanitary District, and private landowners.

Since they are numerous and cover small areas, individual easements are not listed here. For detailed information on current easements, refer to the "White Plains Railroad Real Estate Summary Map" and other files held by the Facilities Acquisition Division of the Public Works Department at NOS.

The total acreage currently owned by NOS is about 3,405 acres.

Ingrants

The Naval Ordnance Station currently has two ingrants for a total of 23,750 SF. Both ingrants are located in the Town of Indian Head less than two miles from the Station.

Government Lease N6247787RP00018 provides approximately 14,000 SF of space used by the Station's Technical Information Department (Code 36), Instructional Resources Branch. It functions as an Applied Instruction Area for the Missile Propulsion Maintenance (MPM) School.

Government Lease N6247789RP00079 provides approximately 9,750 SF of space used by the Station's Weapons Simulation Department

(Code 64) as a Systems Laboratory for the Air and Sea Weapons Simulation Divisions.

Mission

The mission of the Naval Ordnance Station, Indian Head is to:

"Provide quality and responsive technical, engineering, manufacturing, and material support to the Fleet and other operating forces for combat subsystems, equipment, and components in the areas of gun, rocket, and missile propulsion, energetic chemicals, missile weapon simulators and trainers, ordnance devices, aircrew escape propulsion systems, warheads, special weapons, and explosives and to perform other tasks as assigned by the Commander, Naval Sea Systems Command. Provide Naval station mission-essential services as assigned."

This mission is accomplished through an organization geared toward operations and engineering services, with administrative support provided to facilitate mission-related activities.

Base Loadings

The current (FY89) and projected (FY93) base loadings for the Naval Ordnance Station, including tenant activities, are shown in Table 3-2. The figures for NOS and NAVEODTEHCEN were established for the draft Basic Facilities Requirement report dated March 15, 1989, and are subject to approval by NAVSEA as NOS's major claimant. During that study, it was determined that the standard reported base loadings for NOS, perhaps due to NOS's Navy Industrial Funding (NIF) Status, showed nearly 1,000 fewer civilians than were currently

on-board. As Table 3-2 shows, the number of civilian workers at NOS is expected to increase by about another 800 persons to meet projected workload increases. Military personnel are expected to remain the same. NAVEODTEHCEN expects a slight increase in military and a slightly larger increase in civilians (about 14 and 37 persons, respectively). Staffing levels for the other tenants are expected to remain fairly constant.

Organization

The Naval Ordnance Station is composed of the Commanding Officer and his staff, and 17 departments (see Figure 3-5). The Technical Director (TD) and the Executive Officer (XO) report directly to the Commanding Officer.

The staff departments and staff specialists report to either the Commander (Safety Department, Deputy EEO Officer and Command and Quality Review), the Executive Officer (Military Operations Department, Security Department, Chaplain and Public Affairs Officer) or the Technical Director (Comptroller and Legal Counsel). These departments' primary function is one of accountability for certain aspects of the Station's operations. All other departments report to one of the Technical Director's deputies.

The Director of Industrial Operations (TDO) oversees the departments responsible for carrying out the ordnance manufacturing portion of the Station's mission.

The Director of Product Support (TDE) directs the departments responsible for performing the technical, engineering and material support portions of the Station's mission.

Table 3-2. Current and Projected Base Loadings

	FY 1989			FY 1993		
	Civilian	Military	Total	Civilian	Military	Total
NOS	2,515	44	2,559	3,225	44	3,269 (1)
Tenants: (2)						
NAVEODTEHCEN	234	90	324	271	104	375 (3)
NAVSCOLEOD	35	459	494	37	487	524 (4)
Branch Dental Clinic	0	4	4	0	4	4
Branch Medical Clinic	5	23	28	5	23	28
NPPSBO	6	0	6	6	0	6
NSCT	2	23	25	0	0	0 (5)
NSWC Detachment	50	0	50	50	0	50
NAVSEAADSA	185	0	185	185	0	185
PSD	5	8	13	5	8	13
Branch Navy Exchange	8	1	9	8	1	9
Defense Reutilization Marketing	0	1	1	0	6	6
Personal Property Office	1	0	1	1	0	1
Tenants, subtotal:	530	608	1,138	575	627	1,202
TOTALS	3,054	652	3,697	3,800	671	4,471

(1) Source: FY 1989 -- Telecons, NOS Resources and Planning Department, 2/89; FY 1993 -- Departmental Strategic Plans or Staffing Plans and interviews, 11/88 - 2/89.

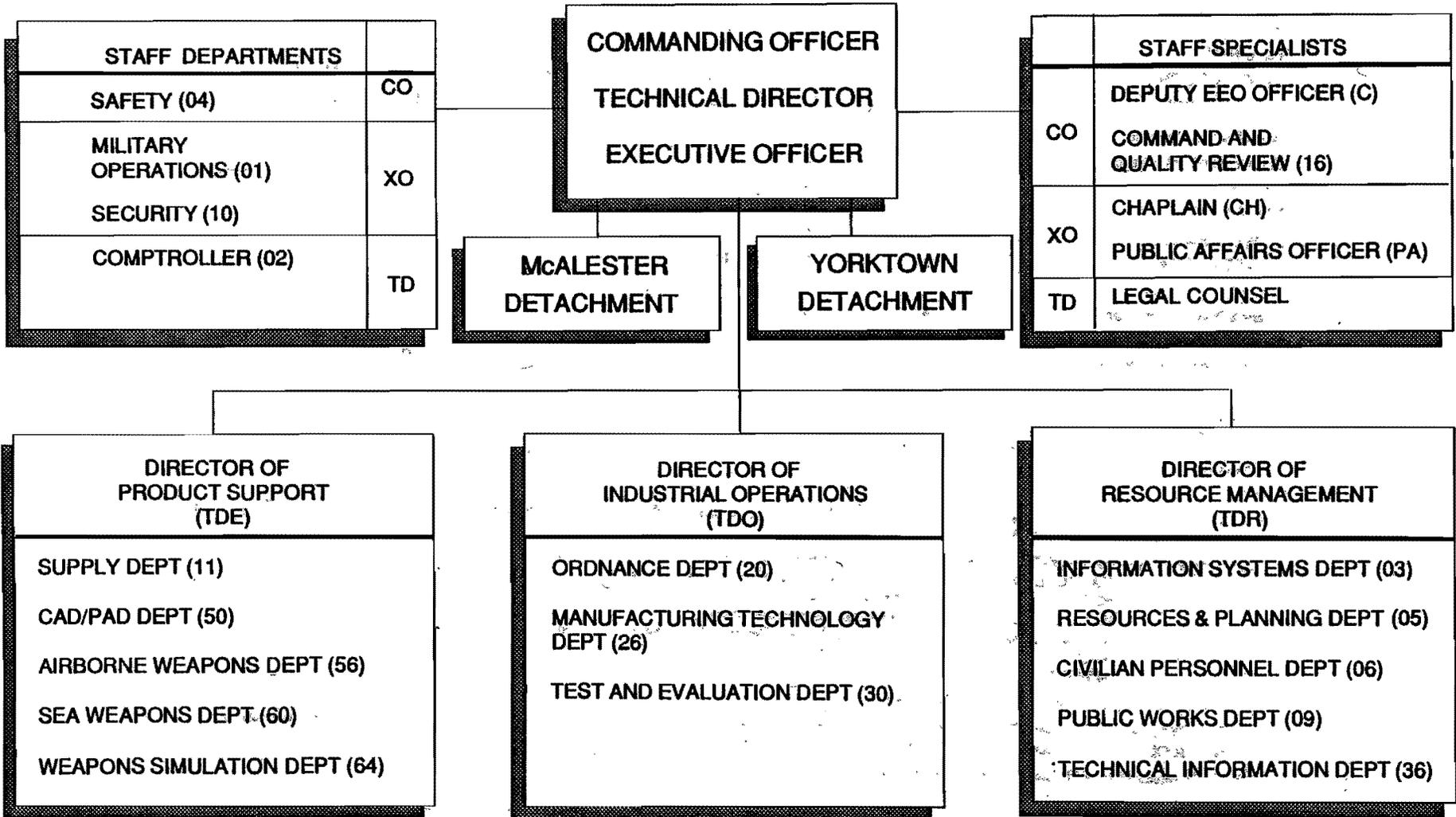
(2) Abbreviations: NAVEODTEHCEN Naval Explosive Ordnance Disposal Technology Center
 NAVSCOLEOD Naval School, Explosive Ordnance Disposal
 NSWC Naval Surface Warfare Center
 PSD Personnel Support Detachment
 NAVSEAADSA Naval Sea Systems Command Automated Data Systems Activity
 NSCT Naval Security Coordination Team
 NPPSBO Naval Publications & Printing Service Branch Office

(3) Source: Staffing Plan and interviews, 11/88 - 2/89.

(4) Both FY89 and FY93 include FY89's average student on-board count of 283 military (30 officers, 253 enlisted) and 20 civilians. Source: telecons, NAVSCOLEOD N2 (R. Gettman), 8/16/89 and 9/5/89.

(5) NSCT relocated to NAB Little Creek, VA in August, 1989.

**Figure 3-5
Organization
NOS, Indian Head**



The Director of Resource Management (TDR) supervises those departments which, along with the staff departments, provide the working environment that allows the industrial operations and product support departments to function properly.

The following is a summary of the functions of the NOS departments.

Staff Departments

Code 01: Military Operations Department

Provides military support services for the Station and tenants. Manages the Consolidated Business Office, Clubs Division, Recreation Division, Bachelor Housing Division, Galley Division, and Family Housing.

Code 02: Comptroller

Responsible for the Station's financial management. Manages the Accounting, Disbursing, Budget and the Progress Analysis Divisions.

Code 04: Safety Department

A Naval Sea Systems Command (NAVSEASYS COM) advisory field agency for propellant safety. Establishes safety guidelines and standards. Administers the Station's Environmental Protection, Explosive Safety and Navy Occupational Safety and Health (NAVOSH) Programs. Provides technical safety guidance and engineering for new buildings and alterations.

Code 10: Security Department

Provides physical security, information security and fire protection to Command and tenants. Manages the Station's security program. Conducts criminal and administrative investigations for Missing/Lost/Stolen/Recovered Government property and accidents. Keeps data on crimes and accidents.

Code 40: Quality Assurance Department

This department is being disestablished during FY89. Its functions are being realigned to Command and Quality Review (Code 16), Supply (Code 11) and Information Systems (Code 03). This department does not appear in Figure 3-5 (Organization).

Industrial Operations Departments

Code 20: Ordnance Department

Manufactures, loads, assembles, disassembles and reworks warheads, rockets, missiles, Cartridge Actuated Devices (CADs), Propellant Actuated Devices (PADs) and related components. Provides mechanical engineering design services to other departments. Administers a receipt, storage and inspection program as the Department of Defense (DOD) East Coast CAD Stock & Issue Point.

Code 26: Manufacturing Technology Department

Designs, develops, manufactures and loads pilot quantities and analyzes rocket motors, propellants, explosives, components, chemicals and igniters. Develops processes for design and pilot production of new explosives, propellants and chemicals.

Code 30: Test and Evaluation Department

Plans and conducts destructive and nondestructive tests and analyses, to evaluate propulsion systems produced at NOS. Evaluates raw materials and metal parts; performs special tests for engineering studies. Operates and maintains all testing facilities.

Product Support Departments

Code 11: Supply Department

Directs all supply functions, including procurement, shipping and receiving, issue, control and storage of material, equipment and services for NOS and its tenants. Conducts stock inventories. Responsible for Small Business/Labor Surplus Program and technical services.

Code 50: CAD/PAD Department

Performs design, development, quality evaluation, documentation, preproduction engineering, manufacture and rework of Cartridge Actuated Devices (CADs), Propellant Actuated Devices (PADs) and Aircrew Escape Propulsion Systems (AEPS) for DOD and the Navy. Cognizant Field Activity for the Naval Air Systems Command (NAVAIRSYSCOM) on CADs/PADs/AEPS. Serves as consultant to NOS, operating forces, Systems Command, DOD and others.

Code 56: Airborne Weapons Department

Plans and executes domestic and Foreign Military Sales, Fleet Support programs, including engineering, maintenance and logistical support, on airborne missiles and cruise missiles, rocket

and JATO propulsion units and surface and underwater weapons. Navy Acquisition Agent and In-Service Engineering Agent for the above.

Code 60: Sea Weapons Department

Plans and administers design, engineering, procurement, fleet support and evaluation for gun propulsion systems, missile, surface and underwater weapons. Acts as Navy Acquisition Agent and In-service Engineering Agent for the above.

Code 64: Weapons Simulation Department

Provides engineering support in simulation development for Naval weapon systems, performs electronic design and technical support for NOS programs, and provides management and maintenance support for electronic equipment and missile training shapes. Designs, develops and fabricates missile training shapes and simulators. Provides design, development, and technical guidance to Station organizations and tenants for electronic systems and equipment. Installs and maintains the Station's security alarms.

Resource Management Departments

Code 03: Information Systems Department

Administers Station Automated Data Processing (ADP) Program for business, logistics, Quality Evaluation (QE) statistical and scientific applications. Provides technical leadership in acquiring and using ADP hardware (mainframe and personal/business computers), and guidance in developing and using the Station's computerized Management Information Systems. Manages the

Station's data communications network and databases. Serves as the development and test activity for NAVSEASYS COM standard functional data systems.

Code 05: Resources and Planning Department

Provides management consultant and industrial engineering services to the Commander and the Station. Responsible for Corporate Planning, Productivity Improvement, Position Management, Modernization and Commercial Activities Programs. Develops Station-wide management systems.

Code 06: Civilian Personnel Department

Administers civilian Staffing and Placement, Training and Development, Employee/Labor Relations, and Services and Wage and Classification programs. Advises on personnel management and policies, as they relate to laws and regulations. Develops automated personnel systems for the Station.

Code 09: Public Works Department

Constructs, operates, and maintains all facilities and utilities, as well as transportation and engineering equipment. Administers all natural resource, land management, energy management, and master planning programs. Provides construction contract management services. Administers the NAVORDSTA Facilities Support and Contracting Program; prepares, inspects and administers all facilities/support service contracts. The Naval Facilities Engineering Command, Chesapeake Division (CHESDIV), Resident Officer in Charge of Construction (ROICC) and his staff work closely with the Public Works

Department, inspecting and approving all facilities construction at NOS.

Code 36: Technical Information Department

Provides Technical Information support to NAVSEASYS COM, NAVAIRSYS COM and DOD, including engineering data, standards, documentation and publications. Operates the Technical Library and Missile Propulsion Maintenance School (Instructional Resources Branch). Administers NOS mail distribution, forms, paperwork and file management, and distributed copy equipment.

NOS Detachments

Code 90: Special Weapons Department -- NOS Detachment, McAlester, Oklahoma

A detachment of NOS located at the Army Ammunition Plant at McAlester, Oklahoma, operating as a tenant organization there and reporting to the Commanding Officer at NOS. Provides in-service engineering support for assigned nuclear weapons and technical liaison and direction for inventory control of all air-launched nuclear weapons, performs maintenance and repair on certain weapons, maintains technical documentation concerning nuclear weapons in the Fleet and performs proficiency and acceptance inspections. Facility planning concerns for the Special Weapons detachment are handled by the host organization at McAlester.

Code 46: Naval Explosive Development Engineering Department (NEDED) -- NOS Detachment, Yorktown, Virginia

A detachment of NOS, acquired in June 1988 and currently located as a tenant at Yorktown Naval Weapons Station, Yorktown, Virginia. NEDED is responsible for research and development studies of new explosive compositions and industrial processes for the Navy. The mission of NEDED is to provide quality and responsive engineering, technical and material support to the Fleet for combat subsystems, equipment and components, warheads, and explosive process development, as assigned by the Commander, Naval Sea Systems Command.

Tenant Activities

In addition to its own mission-related activities, NOS houses and provides support for two major and several smaller tenant organizations. The major tenants are the Naval Explosive Ordnance Disposal Technology Center (NAVEODTECHCEN), and the Naval School, Explosive Ordnance Disposal (NAVSCOLEOD).

The mission of the Naval Explosive Ordnance Disposal Technology Center is to:

"Conduct research, development, test, and evaluation in technical matters concerning explosive ordnance disposal and render safe procedures for conventional and special weapons, guided missiles, biological and chemical munitions, tools, equipment, and techniques as required to discharge the Navy's responsibility to the Department of Defense and to the Departments of the Army

and the Air Force, and other agencies as well as other nations in matters relating to explosive ordnance disposal."

The mission of the Naval School, Explosive Ordnance Disposal is to:

"Train officers and enlisted personnel of the Navy, Army, Air Force, and Marines, both U.S. and foreign; and civilian officials, in the best methods and procedures for the recovery, evaluation, rendering safe and disposal of surface and underwater, conventional and nuclear, explosive ordnance employed by the U.S. and other nations."

Other tenant activities located at NOS are:

Branch Dental Clinic (DE)

An activity of the Naval Dental Center, Bethesda, MD. The clinic provides full dental treatment for active duty and retired military personnel, and oral hygiene and examination services for family members.

Branch Medical Clinic (ME)

A branch clinic of the Naval Medical Command, National Capital Region. In addition to providing medical services for active duty and retired military personnel and families, the clinic treats on-the-job injuries and performs physical and industrial health examinations for the Station's civilian work force, responds to emergencies, and provides disaster control and mass casualty services to Station personnel.

Naval Publications and Printing Service Branch Office (NPPSBO)

A branch of the Navy Publications and Printing Service Office, Naval District of Washington. Provides or procures all printing, large-volume reprographics, micrographics, automated publishing, and electronic page printing services to NOS and its tenant activities. The NPPSBO prints Station notices, technical documents, instructions, procurements, pamphlets, and the Station newsletter.

Naval Surface Warfare Center (NSWC)

A detachment of NSWC, White Oak Laboratory, representing its Research and Technology Department's Energetic Materials Division. Conducts basic and applied research in the fields of high-energy chemistry. Consulting services are also provided to other Navy and DOD activities as requested. Works closely with NOS's Ordnance, Manufacturing Technology, Test & Evaluation, Airborne and Sea Weapons Departments. The NSWC detachment is expected to be relocated away from NOS sometime within the next 10 years, but will still continue to interact with the above-mentioned NOS industrial operations and product support departments after that relocation.

NAVSEASYSKOM Automated Data Systems Activity (SEAADSA)

A field activity of the Naval Sea Systems Command (NAVSEASYSKOM), providing 16 NAVSEA organizations, including NOS, with support in the development and maintenance of automated systems. The activity designs, tests and assists in the implementation of management information and data processing systems to support Navy military industrial activities.

Personnel Support Activity Detachment (PSD)

A branch of the Personnel Support Activity, Naval District of Washington, which administers active duty military pay and personnel functions, issues identification cards for military families, and arranges passenger transportation for Navy-sponsored travel.

Navy Exchange, NAVORDSTA Branch (EXCH)

A branch of the Navy Exchange, Patuxent River Naval Air Station, Patuxent River, MD, which operates a retail store at NOS.

4

Regional and Local Conditions

REGIONAL AND LOCAL CONDITIONS

Climate

NOS, Indian Head is midway between the rigorous climate of the north and the mild climate of the south. Since the Station is located in the middle latitudes where the general atmospheric flow is from west to east across North America, it has a continental-type of climate with four well-defined seasons. However, the proximity of the Potomac River and its tributaries have a considerable modifying effect on the climate, especially in moderating extreme temperatures.

Climate data from the Naval Weather Service Detachment from the period of 1945-1982 were assessed to characterize conditions at Indian Head. The closest weather station to Indian Head is located on the Patuxent River. Summary climate data are presented in Table 4-1.

Generally, the coldest period of the year is late January and early February when the early morning temperature averages 29°F. The warmest period is late July when the afternoon maximum temperature averages 85°F. The highest temperature recorded between 1945-1982 in the Indian Head region was 103°F, recorded in July 1980, while the lowest was -3°F recorded in January 1977. Precipitation is somewhat evenly distributed through the year with either July or August being the wettest month, and February, April or October the driest. The heaviest precipitation during the colder half of the year is generally the result of low pressure systems moving northeastward along the Atlantic coast; in summer it occurs as thunderstorms. The highest official one-day precipitation recorded during 1945-1982 was 5.88 inches, which occurred on August, 1969. The greatest accumulation of snow occurred in February 1979, with 11.7 inches.

Prevailing surface winds are from the north-northwest to northwest except during the warm months of the year when they become more southerly. The most windy period is late winter and early spring when the wind speeds average more than 3 mph.

Table 4-1. Climate Summary

Mean Daily Extremes for Rainfall (inches)

J	F	M	A	M	J	J	A	S	O	N	D
2.14	3.06	2.66	1.93	.68	3.06	4.61	5.88	3.89	3.55	4.22	1.91
(1962)	(1979)	(1980)	(1946)	(1971)	(1963)	(1960)	(1969)	(1960)	(1966)	(1956)	(1975)

Mean Daily Extremes for Snowfall (inches)

J	F	M	A	M	J	J	A	S	O	N	D
11.2	11.7	9.4	0.3	-	-	-	-	-	0.1	7.1	8.0
(1954)	(1979)	(1960)	(1972)						(1979)	(1967)	(1966)

Natural Conditions

Charles County is located within the inner Potomac Coastal Plain geologic province. The soils in this area are derived from unconsolidated marine sediments that vary from sandy to clayey in texture and from excessively well drained to poorly drained. High water tables, severe erosion, earthslides and hardpans are common.

The topography near Indian Head and Stump Neck is gently rolling, for the most part. The area includes many drainage swales and streams, and the shoreline areas are generally steeply sloped. The most important hydrological feature in the area is the Potomac River. It is a continuous, slow-moving, tidal tributary of the Chesapeake Bay. Mattawoman Creek and Chicamuxen Creek are also

important waterways. They both have large floodplains and contain large expanses of tidal wetlands and swamps. The area is crossed by many small streams, most of which drain directly into one of the three major waterways.

NOS is bordered by and contains large tracts of both tidal and non-tidal wetlands. Wetlands and floodplains are valuable habitat for wildlife, important groundwater recharge areas, and filters for surface water runoff, thus minimizing siltation and erosion. They are also important aesthetic buffers, recreational areas (in some cases), and scientific resources.

The land around both Indian Head and Stump Neck is heavily vegetated. Most of the forested land is either second or third growth; little, if any, virgin forest remains. The most abundant trees are Virginia pine, sweet gum, red oak, and yellow poplar.

Local Development History

The Town of Indian Head had its origins as housing built by the Navy for its employees. The road now known as Indian Head Highway was built during the early part of World War II to service the Station, and was later deeded to the state.

The area around NOS, Indian Head, outside of the town, traditionally has been a tobacco producing region and has remained very rural until recently. Development has clustered along the major highways in Charles County, which include Routes 210, 301 and 5. Both residential and commercial strip development along these routes tend to be clustered, with undeveloped land between developed areas.

In the last two decades, the proximity of Charles County to Washington, DC, and the intense development and rising cost of land in the closer-in counties has caused the population to grow and urbanization to increase in the county. However, the majority of land in Charles County, approximately 90% of the county's total 299,488 acres, is still open land, primarily agricultural and forested.

Although the acreage of developed land is still a small percentage of the total land in the county, it has increased substantially in the 12-year period 1973-1985. The increase from 5.5 to 8.1% during that period represents a 47% growth rate.

Future development in the county is expected to center in the northern part of the county, still along the major highways (including the proposed Eastern Bypass) for new residents commuting to employment centers in Washington, DC and its Maryland suburbs, and along the waterfront in the southern part of the county, for vacation and retirement housing markets. The primary constraints will be availability of water and sewer service and adequate local roads.

Land Use

The south side of Route 210 extending from the Station's main gate to the Town boundary consists of a variety of commercial, retail, and institutional land uses. The area adjacent to NOS along its boundary with the town south of Route 210 to the Mattawoman Creek is occupied by single family detached housing and a Town boat ramp located on the Creek at the Station boundary.

The north side of Route 210 encompassing the area between the main gate and Summers Road and extending northward to the Station

boundary was formerly owned by the Navy. This area was annexed by the Town several years ago. Land uses here include a public park and open space, and both the existing and abandoned Indian Head elementary school buildings. Commercial uses are not present along the north side of Route 210 until east of its intersection with Summers Road, although the old Indian Head elementary school and the area near it are expected to be developed as commercial/office space. The strip immediately adjacent to the north side of Route 210 extending from Summers Road east to the Town boundary contains a variety of commercial and retail uses.

The primary activity on the land adjacent to Stump Neck is agriculture, interspersed by scattered, low density residential development. The residential development intensity averages less than one dwelling unit per three acres.

The General Smallwood State Park lies immediately to the east of Stump Neck. This park contains six boat launching ramps, five boating piers, restrooms, and a concession facility. A pedestrian foot bridge provides access to a day-use picnic area. The state is currently planning to improve the Park facilities, including construction of 200 boat slips.

The state has been purchasing properties along the southern edge of Mattawoman Creek east of the park. At the present time, they own much of the waterfront acreage between Stump Neck and Route 225. These purchases ensure that this land will remain as a natural area and open space. Additional information on nearby land use is contained in the Land Use Compatibility Study (1987).

Population

The population of Charles County is increasingly part of an expanding metropolitan Washington area. Both Charles County as a whole and the Town of Indian Head in particular have undergone substantial increases in population over the last three decades.

Charles County's population grew by over 46% between 1960 and 1970, and by about another 53% between 1970 and 1980, to a total of 72,751 residents. This growth has been more evenly distributed over time than that of neighboring Prince George's County, which grew an explosive 85% between 1950 and 1960 and again between 1960 and 1970, then dropped off sharply to less than 1% between 1970 and 1980. By contrast with both counties, the population of Maryland as a whole rose by approximately 27% between 1960 and 1970, and by 7.5% during the period 1970 to 1980.

While the bulk of Charles County's growth occurred in the more urbanized areas of Waldorf, including the "new town" of St. Charles, and La Plata (up by nearly 60% from 1970 - 1980), the Town of Indian Head and the election districts of Pomonkey and Marbury have also grown steadily since 1980.

The population of Indian Head increased by 2.3% from 1970 to 1980 according to 1980 Census figures, and increased by about 16% between 1980 and 1986, rising from 1,381 to 1,603. Other estimates put the 1986 Indian Head population closer to 2,300, counting gains from annexation as well as actual residential development within the Town.

By 1990, Charles County's population is expected to have increased by nearly 30%, to around 94,500 people. The Department of State

Planning projects that Charles County will have a population of about 119,250 by 2005, which the Charles County proposed Comprehensive Plan translates into a need for more than 18,500 additional residences in the entire county by that year.

Economy

According to state employment projections, the largest group of workers in Charles County is employed in wholesale and retail trade: about 7,000 in 1985, projected to rise to over 10,000 by the year 2005. Employment in manufacturing accounts for the lowest number, or about 300 in projections for 1985. Employment in agriculture, including forestry and fishery, is projected to be between 1,100 and 1,200 over the next 20 years. Around 3,700 employees in Charles County are estimated to have worked (as civilians) for the Federal government in 1985. State and local government combined are projected to employ close to 3,500 people consistently over the next two decades. There is net out-commuting from Charles County, as approximately 5,000 more employed persons reside in the county than the number of persons working in the county.

NOS remains the largest single employer within Charles County, with about 2,500 civilian workers in 1988, of which about 65% to 70% were county residents. An additional 500 civilian workers were employed by NOS tenants.

Utilities

Sewers

The Town of Indian Head has its own wastewater treatment system, which does not receive wastewater from NOS. The design capacity of the plant is .5 million gallons per day (mgd), and the average daily flow in 1988 was .3 mgd.

Water System

The Town of Indian Head relies on groundwater for its drinking water. Five wells are used, with a total daily flow of .2 mgd. There are two storage tanks with capacities of 100,000 and 200,000 gallons per day. The Town plans to add more storage capacity in FY91. The distribution system in more than half the town was replaced in 1980.

As evidenced by several recent water supply planning studies for Charles County and the Town of Indian Head, water supply is becoming a significant issue and a possible constraint on development. Both the town and NOS, Indian Head draw their groundwater from the same aquifer, with the Navy using approximately 1 mgd. Salt water intrusion into the aquifer is becoming a problem.

Transportation

Maryland Route 210 is a four lane, divided highway with limited access for most of its length from the District of Columbia line to NOS, Indian Head. Access is controlled through limitations on the

type and number of at-grade intersections permitted along the highway. The access limitations placed on Route 210 do not restrict the construction of either overpasses or underpasses.

Access limitations are strongest in the Prince Georges County segment of the road, and less restrictive along the road segment in Charles County. Development on parcels immediately adjacent to the highway from just north of Route 227 to the entrance of the Station may provide access directly onto the highway, while development further north must use either a nearby public road or a parallel access road.

Community Facilities

Fire Protection

The Indian Head and the Potomac Heights volunteer fire departments provide fire protection services in the vicinity of the Town of Indian Head. The Marbury volunteer department provides fire protection for the Stump Neck area. NOS, Indian Head provides its own fire protection services for the Station; all fire companies assist each other when needed.

Police Protection

The Charles County Sheriff's Office provides the law enforcement services for the Town of Indian Head and the portion of Charles County surrounding the Stump Neck facility. Federal and local police have concurrent jurisdiction over the La Plata and Waldorf housing sites. NOS has exclusive jurisdiction over the off-station railroad right-of-way.

Education

The Indian Head elementary school (K-6) is part of the Charles County School System. The total enrollment in this school was 585 students as of September, 1989. Approximately 100 children of military personnel stationed at NOS, Indian Head attended the Indian Head Elementary school during the 1989/90 school year.

There are no commercial day care facilities in the Town of Indian Head.

Emergency Medical Services

The Indian Head Volunteer Rescue Squad provides emergency medical assistance and ambulance service for the residents of the Town of Indian Head. The closest hospital is Physicians Memorial Hospital located in La Plata. Because on-station emergency medical services are available, NOS, Indian Head does not rely upon these community services.

Solid Waste Disposal

The Town of Indian Head provides solid waste disposal services for residents and businesses located in the municipality. All residents and businesses are required to use the collection service. The town owns 2 packer trucks which collect the waste and transport it to the Charles County landfill in Pisgah. This service is not extended to NOS, Indian Head, which has a service contract for waste removal.

Encroachment

The Land Use Compatibility Study (1987) addresses encroachment issues in detail. The conclusions of that study are summarized here.

- Environmental features near the Station protect NOS from encroachment. For example, surrounding water bodies limit the potential for conflicting adjacent land uses, while the presence of endangered species may limit the likelihood of major roadway construction (and attendant population growth) near the Station.
- Several small developments in the 210 corridor and in the town of Indian Head are not expected to have any discernible impact on NOS. However, larger developments may have an impact to the extent that they result in increased boat traffic in the vicinity and consumption of potable water resources.
- NOS activities can have off-station consequences. Areas of concern that could affect or limit NOS activity are:
 - Noise
 - Transportation of hazardous materials
 - Groundwater withdrawals by NOS in competition with civilian users
 - Surface or groundwater contamination from on-site spills or disposal of toxic or hazardous materials
 - Transient boat use of areas within ESQD arcs or the navigation danger zone.
- The State of Maryland is projecting an increased rate of growth in Charles County over the next decade.

5

NOS Environmental Features

NOS ENVIRONMENTAL FEATURES

As a Federal facility, NOS Indian Head has a responsibility and a commitment to protect the natural resources within its jurisdiction, and to prevent off-site impacts resulting from on-station activities. To help meet this commitment, the NOS Natural Resource Manager (Code 097D) is available to consult with Station personnel who must incorporate resource protection into project design and other activities. Additional support is available through the Natural Resources and Land Management Branch (Code 243) of CHESDIV. Code 243 provides guidance and assistance in the management of forests, fish and wildlife, outdoor recreation opportunities, and soil and water conservation efforts. Emphasis is being directed to the support of the Chesapeake Bay Initiatives and reducing non-point source pollution, especially from shoreline erosion and erosion from new construction. In addition, technical assistance in evaluating project sites for the presence of wetlands is available from Code 243. A summary of the Station's natural resources and their implications for land use planning is presented in the following sections.

Geology

Indian Head and Stump Neck lie within the Potomac River Basin in the Coastal Plain, which was formed over 500 million years ago. The deposits beneath the area are composed of gravel, sand, silt, and clay. These materials were transported by streams from the Appalachian and Piedmont region, west and north of the region, and deposited in the form of alluvial fans, deltas, and as estuarine and marine layers. The deposits are chiefly of Cretaceous, Tertiary, and Quaternary age resting on dense, hard, crystalline metamorphic, and igneous rocks of Precambrian or Cambrian age. Bedrock is usually found at an average

depth of 600 feet below the surface. It is primarily crystalline in nature and composed of quartz, chlorite, mica and kaolinite.

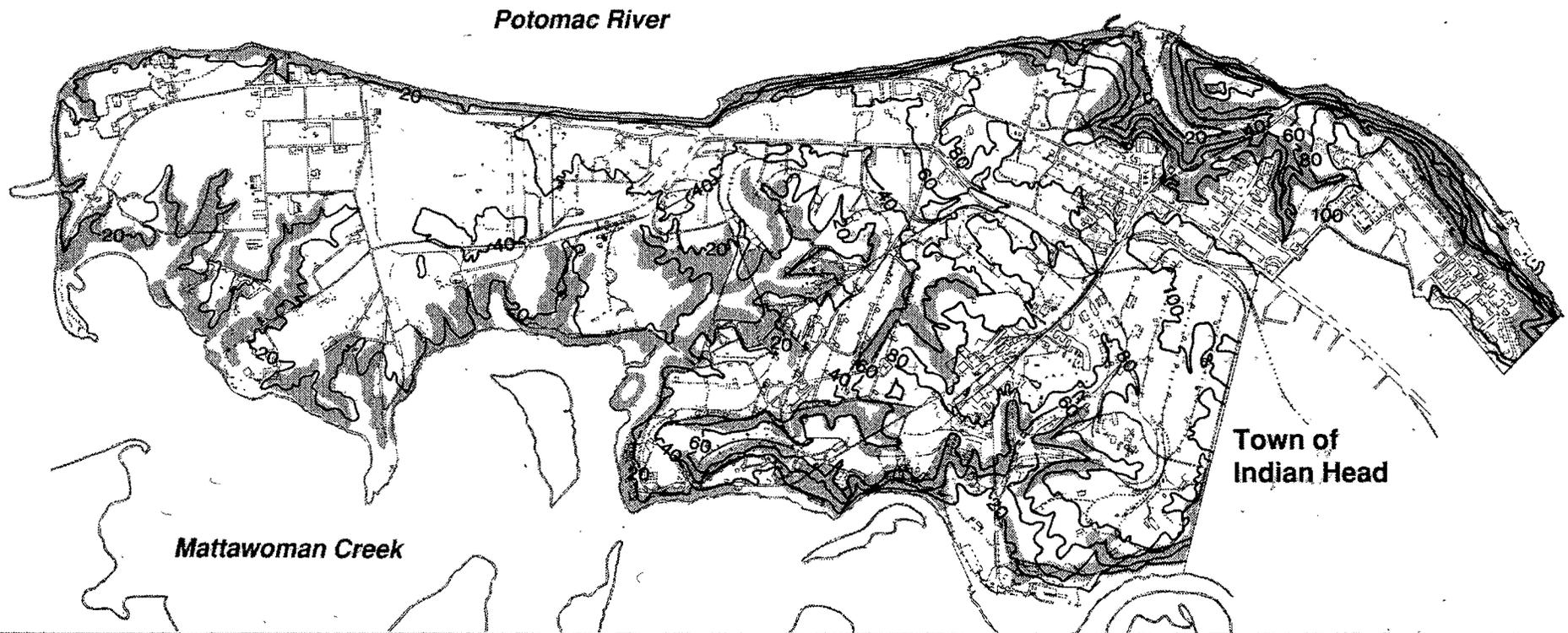
Topography

Both Stump Neck and Indian Head are located on peninsulas adjacent to the Potomac River. Indian Head is bordered by Mattawoman Creek to the southeast, while Stump Neck is bordered to the southeast by Chicamuxen Creek. Both land forms have very low elevation profiles typical of the Coastal Plain region. Indian Head decreases in elevation from north to south, with its highest elevation being 100 feet above sea level (Figure 5-1). Stump Neck decreases in elevation from east to west and has a maximum elevation of 110 feet above sea level (Figure 5-2). The overall terrain on both peninsulas is rolling and is marked by many drainage swales and streams.

The Potomac River shoreline of Indian Head and, to a lesser degree, Stump Neck is marked by steep slopes, most in excess of 15 percent. Facilities in this area are in danger of being undermined due to continuing wave undercutting and groundwater freeze-thaw processes.

While Mattawoman and Chicamuxen Creeks also have some areas of steep slopes, the majority of their shoreline area is composed of wetlands, swamps and floodplains. These act as buffers against continual wave action and groundwater erosion along the shore.

Because they pose structural hazards, and because development will exacerbate soil erosion, causing increased sedimentation of the river, steep slopes (see Figures 5-1 and 5-2) should be avoided for all construction. Specific erosion problems on these slopes, and plans for



INDIAN HEAD

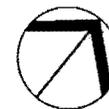
Topography

Source: Master Plan Update (1982)

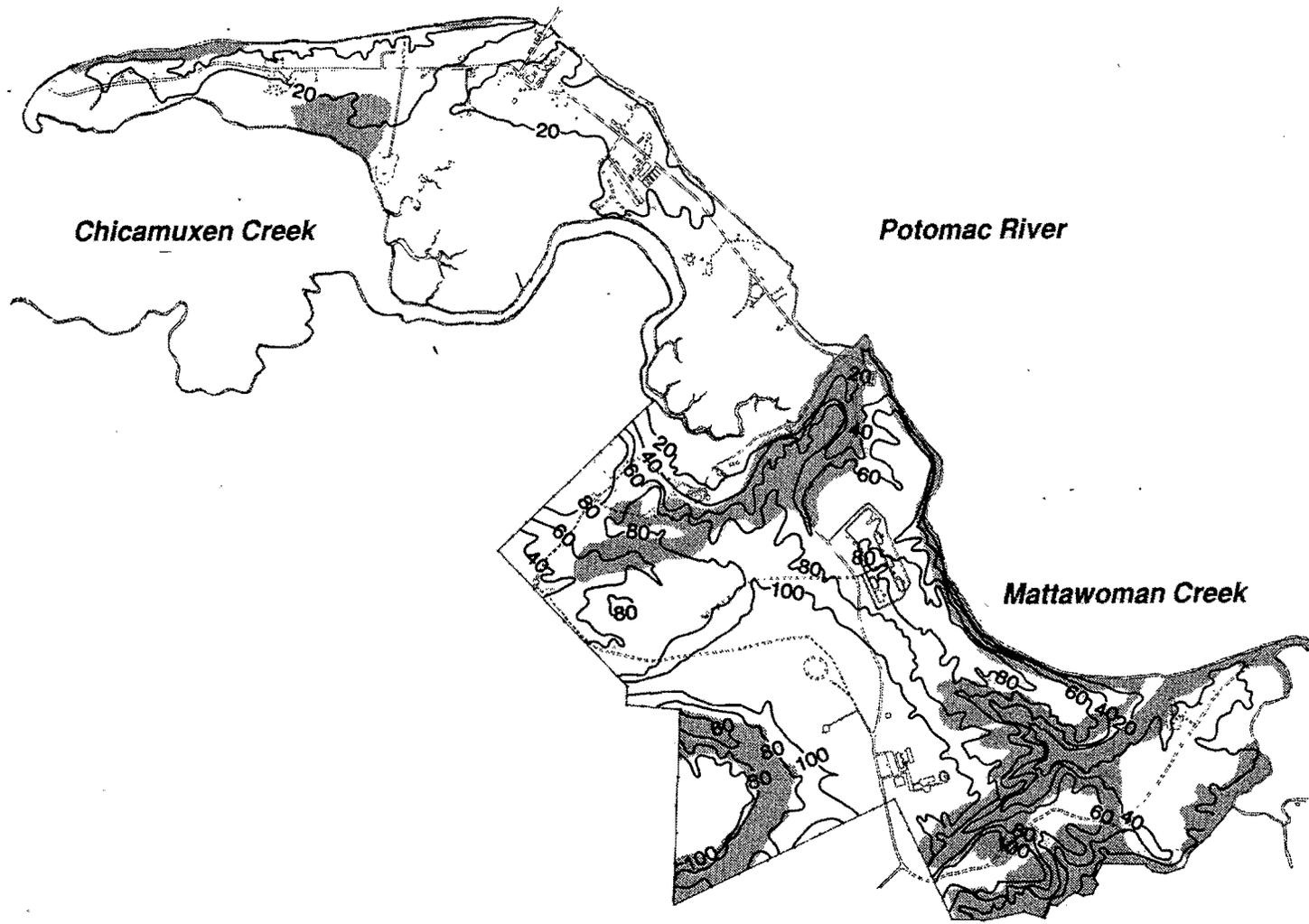
LEGEND

-  Steep Slope
-  20' Contour Line

Figure 5-1



Naval Ordnance Station, Indian Head



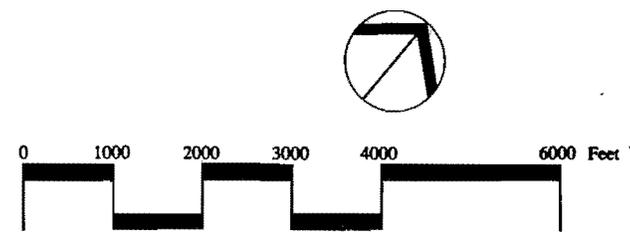
STUMP NECK Topography

Source: Master Plan Update (1982)

LEGEND

-  Steep Slope
-  20' Contour Line

Figure 5-2



Naval Ordnance Station, Indian Head

controlling erosion, are contained in the Naval Installations Erosion Control Study, prepared by the Army Corps of Engineers (1985).

Soils

The soils of Indian Head and Stump Neck were mapped by the U.S. Department of Agriculture, as recorded in the Soil Survey of Charles County (1974). Many of the soil types have severe load bearing capacity limitations caused by severe erodability and high water table conditions. More detailed information about these soils can be found in the Charles County Soil Survey.

Soils with high water tables (including hydric, or wet soils) at Indian Head and Stump Neck have been mapped in Figures 5-3 and 5-4. These areas should be avoided where possible due to construction limitations. Erodible soils have not been mapped, as avoidance of steep slopes (shown in Figures 5-1 and 5-2) will minimize impacts associated with construction on erodible soils.

In addition to construction limitations, soils may also present limitations on the use of septic systems. A review of the soils on Stump Neck, where no central sanitary sewer system is present, shows that the majority of the remaining undisturbed soils may not be considered acceptable for septic system use (see Figure 5-5). The Maryland Department of Environment follows the USDA guidelines in the Soil Survey of Charles County to determine soil suitability and limitations. Soils listed in the survey as hydric or as having a water table within 3 feet of the soil surface at least 9 months per year cannot be used for septic systems. Other soils listed as having perched, seasonally high or high water tables must be checked during the months of February, March or April to determine if waivers can be

granted. Percolation tests done at any other time are not considered valid or acceptable.

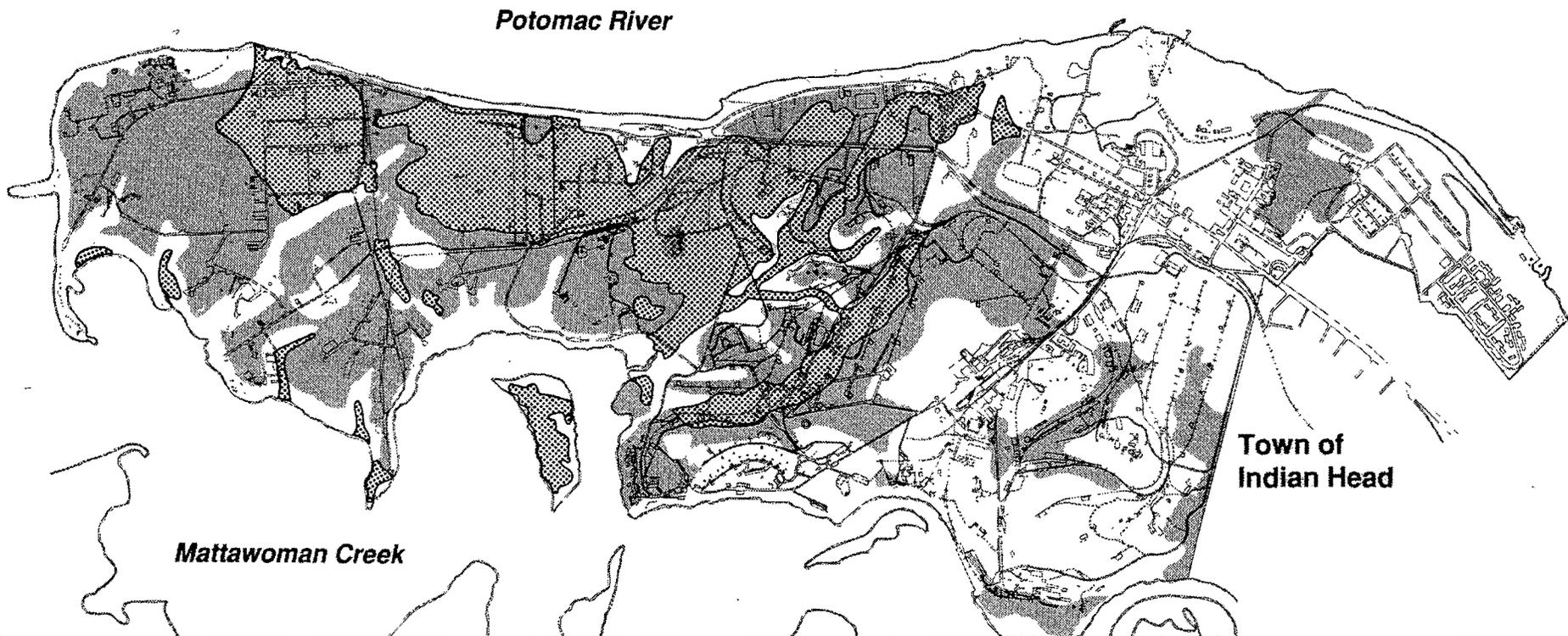
Surface Water

Due to its rolling topography and its proximity to water bodies, NOS, Indian Head is intimately involved in the surface water systems of the region. Wetlands serve to maintain surface water quality. Natural drainage channels on-station quickly transport surface runoff to the Potomac River or its tributaries, but can also carry pollutants such as sediment and toxics. Due to the sensitive location of the Station vis-a-vis surface water, care must be taken to prevent water quality impacts from occurring. There are several Federal and State programs designed to prevent these impacts. These programs, and the resources they are designed to protect, are discussed below.

Wetlands

Wetlands are defined by the Corps of Engineers and the U.S. Environmental Protection Agency (EPA) as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Identification and delineation of wetlands is based on the "Three Parameter Approach" developed by the Corps of Engineers. An area is considered a wetland if (1) the prevalent vegetation consists of species specifically adapted to areas having hydrological and soil conditions described above, (2) the soils are classified as hydric or possess characteristics that are associated with saturated conditions



INDIAN HEAD

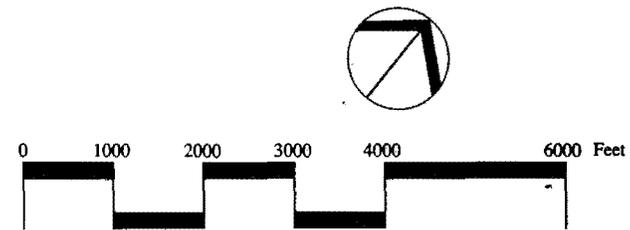
Soil Constraints

Source: Soil Survey of Charles County (1974)

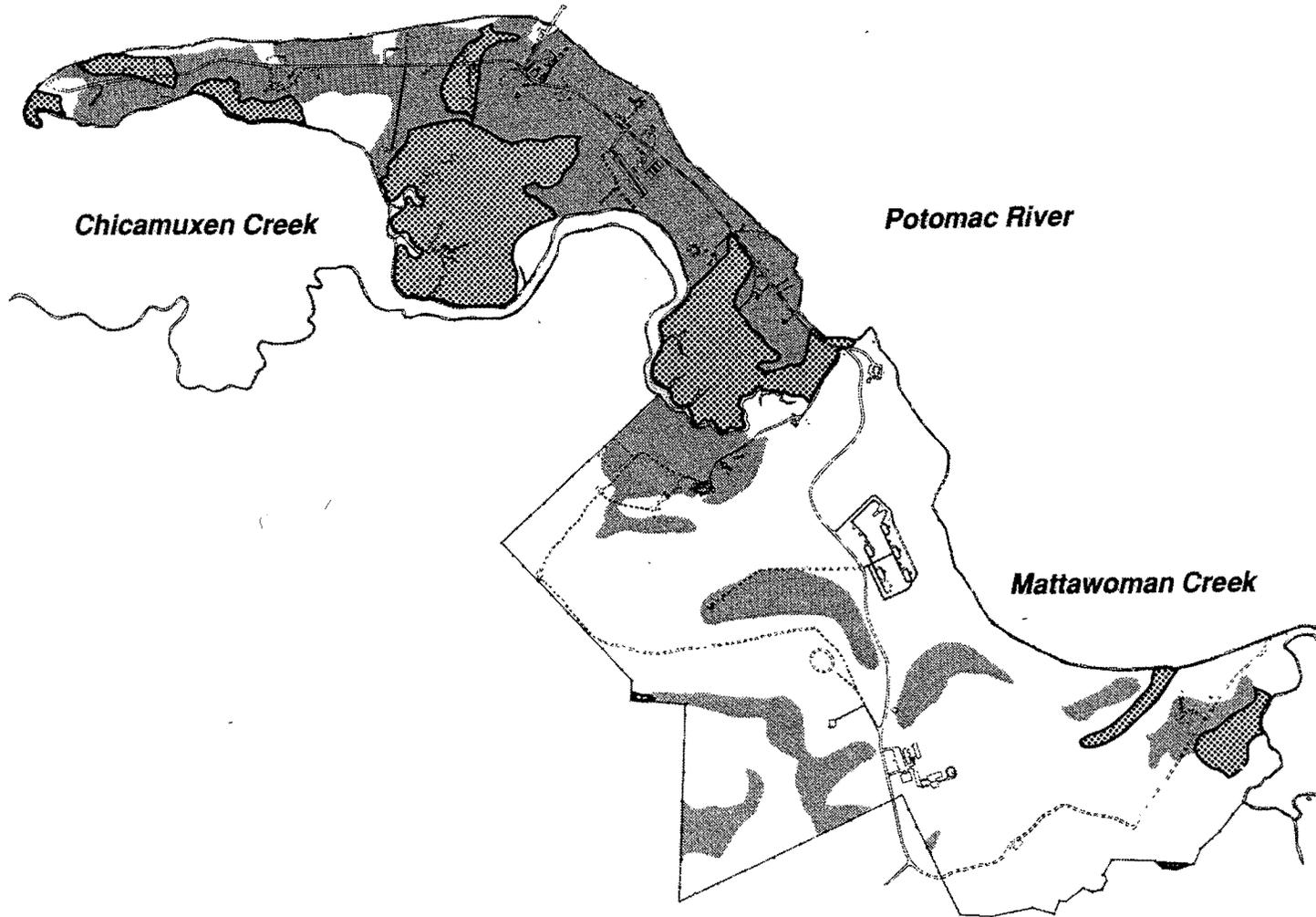
LEGEND

-  Hydric Soils
-  Seasonal High Water Table

Figure 5-3



Naval Ordnance Station, Indian Head



STUMP NECK

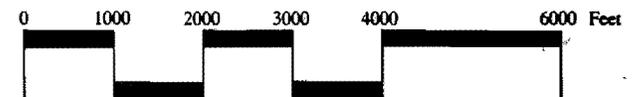
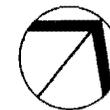
Soil Constraints

Source: Soil Survey of Charles County (1974)

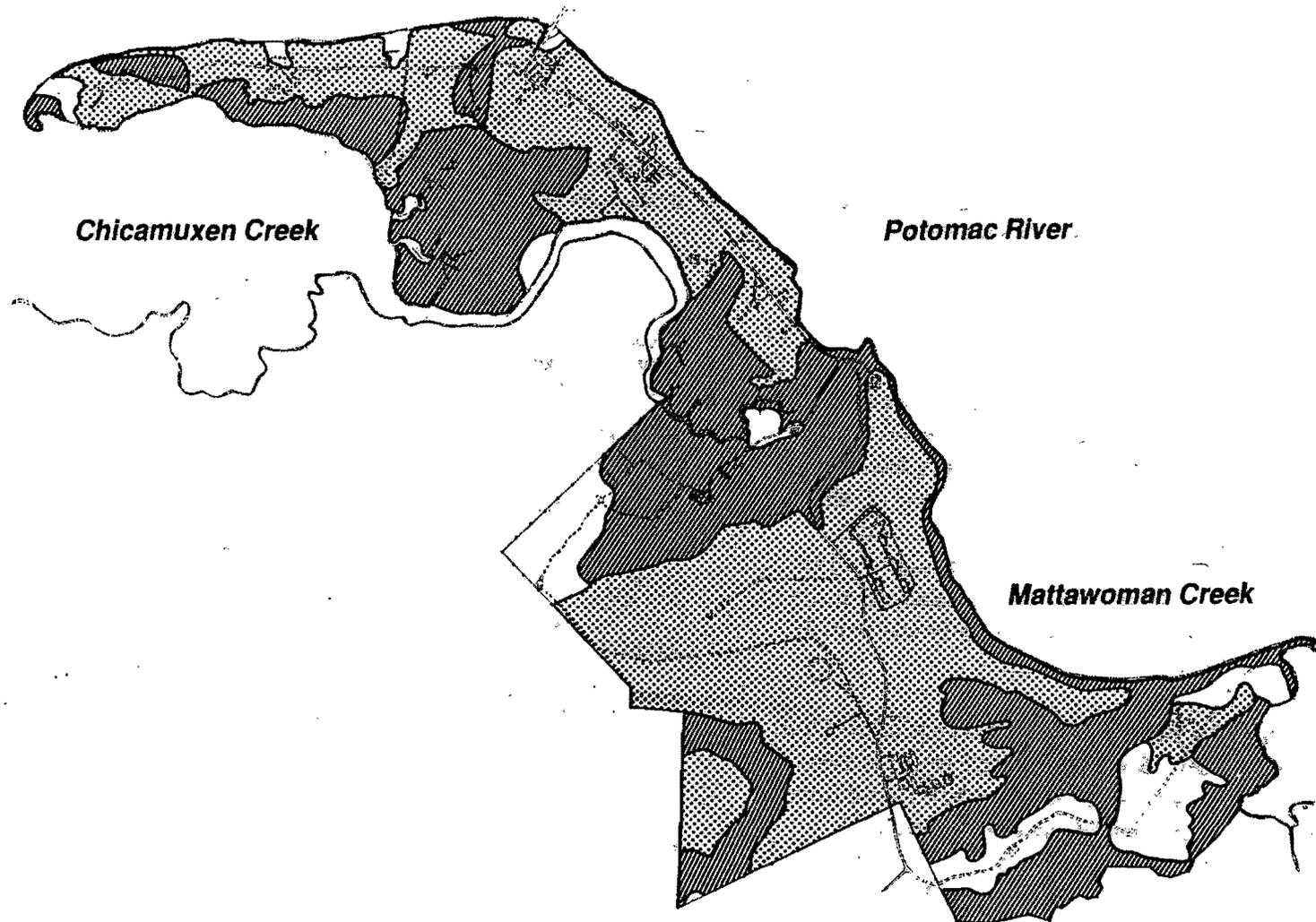
LEGEND

-  Hydric Soils
-  Seasonal High Water Table

Figure 5-4



Naval Ordnance Station, Indian Head



STUMP NECK Septic Limitations

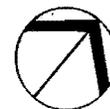
Source: Soil Survey of Charles County (1974)

LEGEND

 Septic Systems Prohibited

 Waiver Required for Septic Systems

Figure 5-5



Naval Ordnance Station, Indian Head

(e.g., gleying, mottling) and (3) the area is inundated permanently or periodically, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (Corps of Engineers Wetlands Delineation Manual, 1987).

Wetlands are important to NOS for several reasons. Aside from their significance as plant and wildlife habitat, and as buffers and filters for maintaining water quality, wetlands are protected by Executive Order (E.O.) 11990. E.O. 11990 requires that all agencies avoid construction in wetlands unless the head of the agency finds that (1) there is no practicable alternative to the construction and (2) all practicable measures will be taken to minimize impacts to the wetlands. Water dependent uses (e.g. docks, intake structures) are examples of facilities for which there are no practicable alternatives. When construction in a wetland is unavoidable, early review of the proposed action must be provided to the public.

Wetlands also fall under the jurisdiction of Section 404 of the Clean Water Act and, to some extent, Section 10 of the Rivers and Harbors Act. As a result, a "Section 404/10" permit must be obtained from the Corps of Engineers prior to the start of any work in a wetland, including all open waters and intermittent streams. The Corps solicits comments from the USFWS, EPA, NMFS, MD-DNR and MD-DOE. In response to recommendations from these agencies, the Corps may require mitigation in the form of wetland creation. The costs involved with creating wetlands can reach \$50,000 or more per acre, not including the cost of the upland property to be altered.

Figures 5-6 and 5-7 indicate the approximate extent of nontidal wetlands on both Indian Head and Stump Neck (wetland map symbols are explained in Table 5-1). The areas shown in the figures should be avoided whenever possible. When projects are sited near mapped

wetlands, CHESDIV (Code 243) should be consulted to verify the wetland boundary.

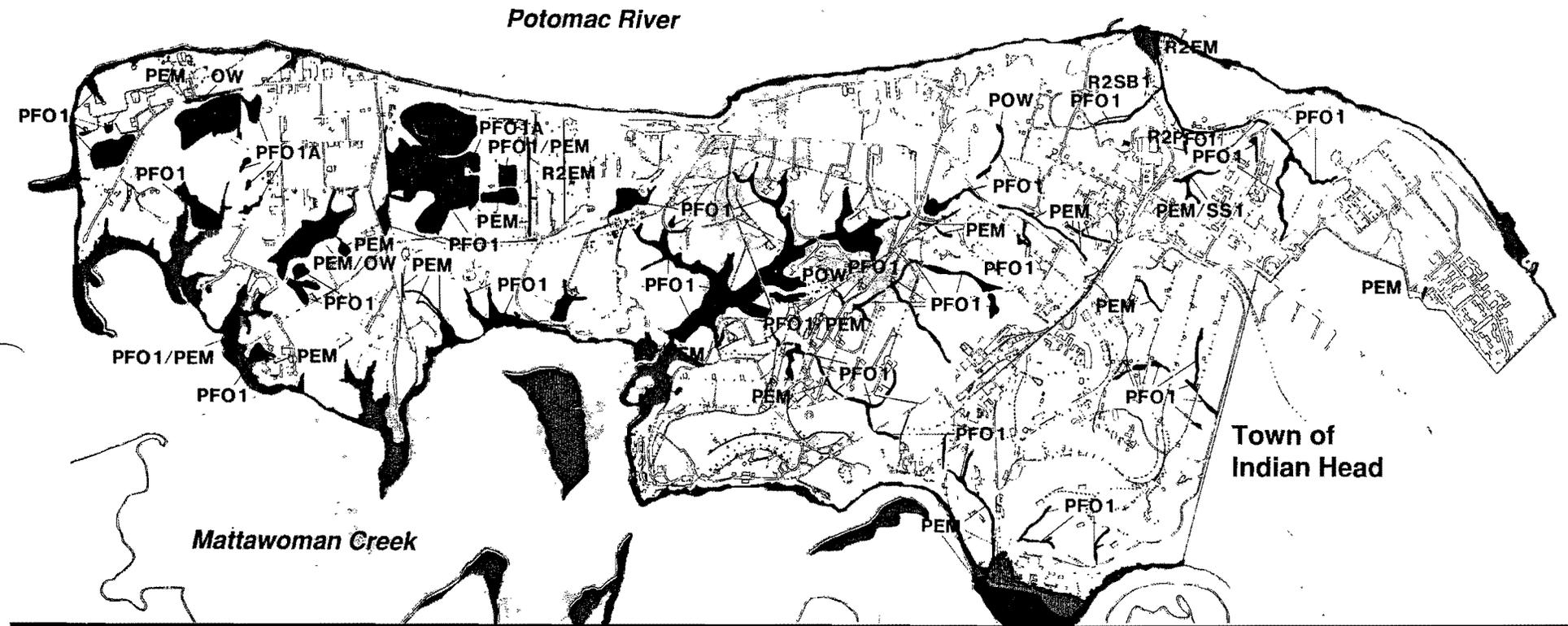
**Table 5-1. Key to Wetland Symbols
(Figures 5-6 and 5-7)**

Wetland Symbol	Wetland Type
OW	Open water
PEM	Palustrine emergent wetland
PEM/OW	Palustrine emergent/open water wetland
PEM/SS1	Palustrine emergent/broad-leaved deciduous scrub-shrub wetland
PFO1	Palustrine forested broad-leaved deciduous wetland
PFO1A	Palustrine forested broad-leaved deciduous temporarily flooded wetland
PFO1/PEM	Palustrine forested broad-leaved deciduous/palustrine emergent wetland
POW	Palustrine open water wetland (unknown bottom)
R2EM	Lower perennial riverine emergent wetland
R2/PFO1	Lower perennial riverine/palustrine forested broad-leaved deciduous wetland
R2SB1	Lower perennial riverine bedrock streambed wetland

Floodplains

A floodplain is defined as land subject to flooding. Floodplains are typically described as an area likely to be inundated by a particular flood. For example, a flood that has a 1% chance of occurring in any one year (i.e., a 1-in-100 chance) is the 100-year floodplain. The 100-year floodplain includes some land areas that are flooded by small, and often dry water courses. The 100-year floodplain at Indian Head and Stump Neck is shown in Figures 5-6 and 5-7.

Executive Order 11988 restricts development within the 100-year floodplain to water dependent activities. Under this Executive Order, each Federal agency must review its action to determine if any part of it will occur within a floodplain. Potential effects of the action within the floodplain, and project alternatives, must be evaluated. Any construction within the floodplain must be in accordance with the



INDIAN HEAD

Hydrology

Source: Draft Wetland Delineation (1989)

- LEGEND**
- Wetland (See Table 5-1; boundaries between classes of wetlands not shown)
 - 100-Year Floodplain

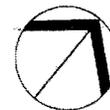
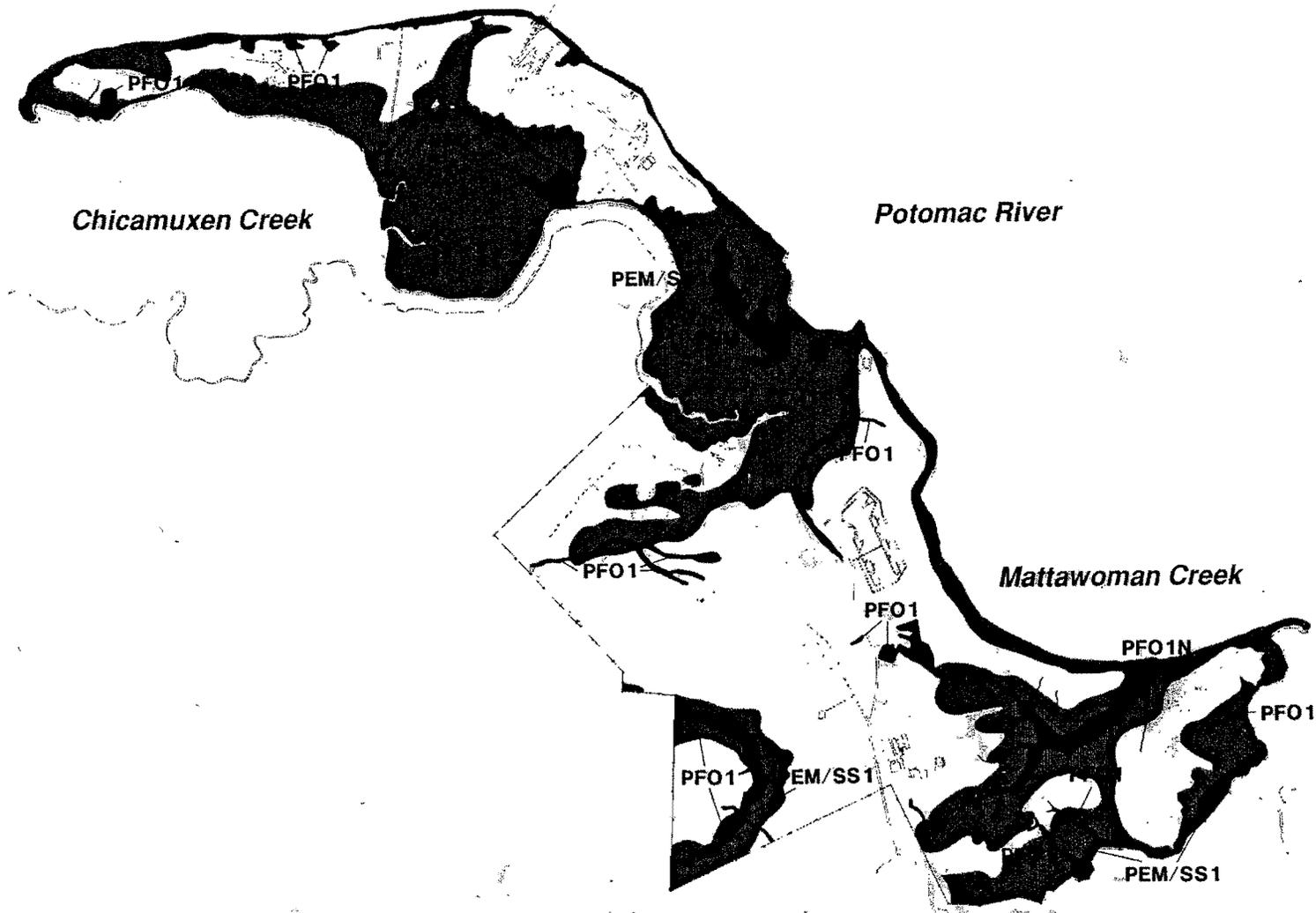


Figure 5-6

Naval Ordnance Station, Indian Head



STUMP NECK

Hydrology

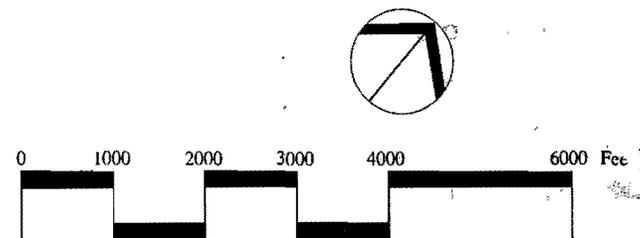
Source: Draft Wetland Delineation (1989)

LEGEND

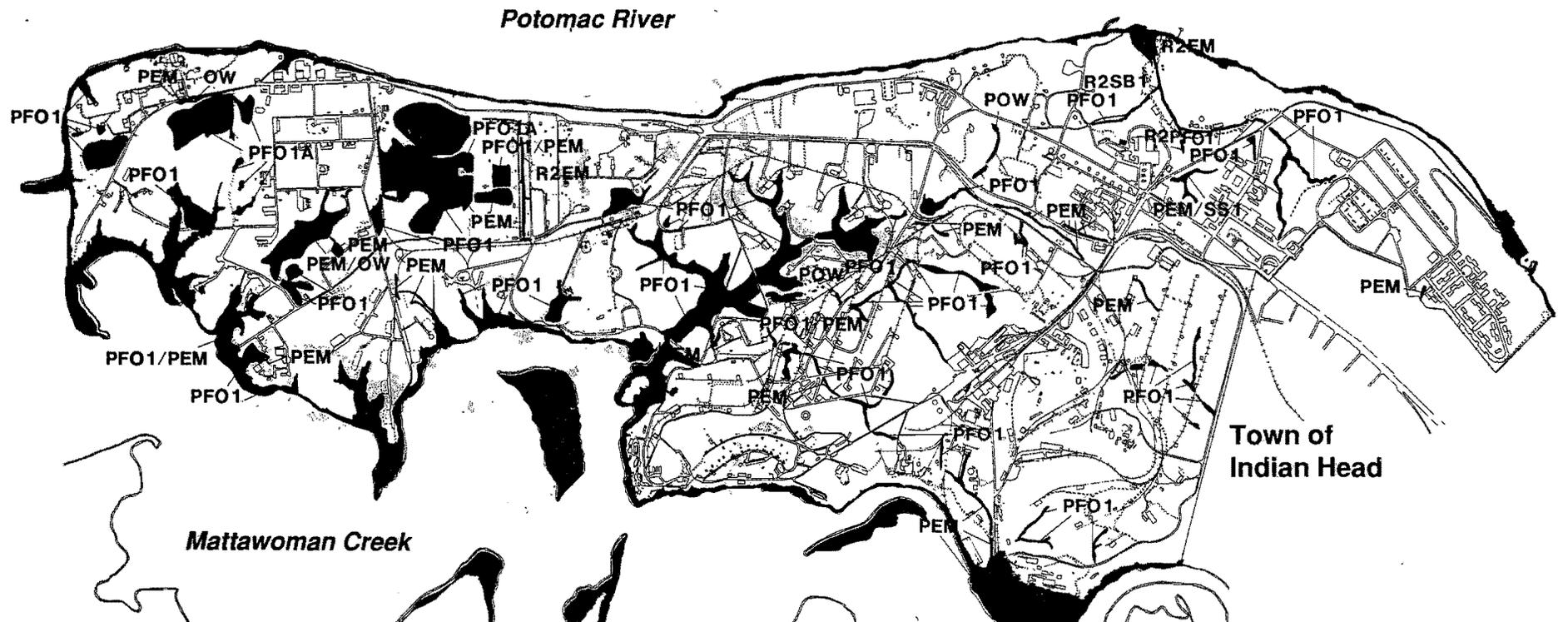
 Wetland (See Table 5-1; boundaries between classes of wetlands not shown)

 100-Year Floodplain

Figure 5-7



Naval Ordnance Station, Indian Head



INDIAN HEAD

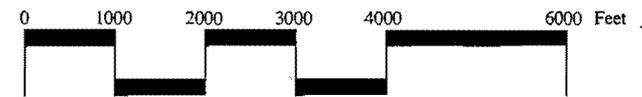
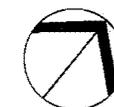
Hydrology

Source: Draft Wetland Delineation (1989)

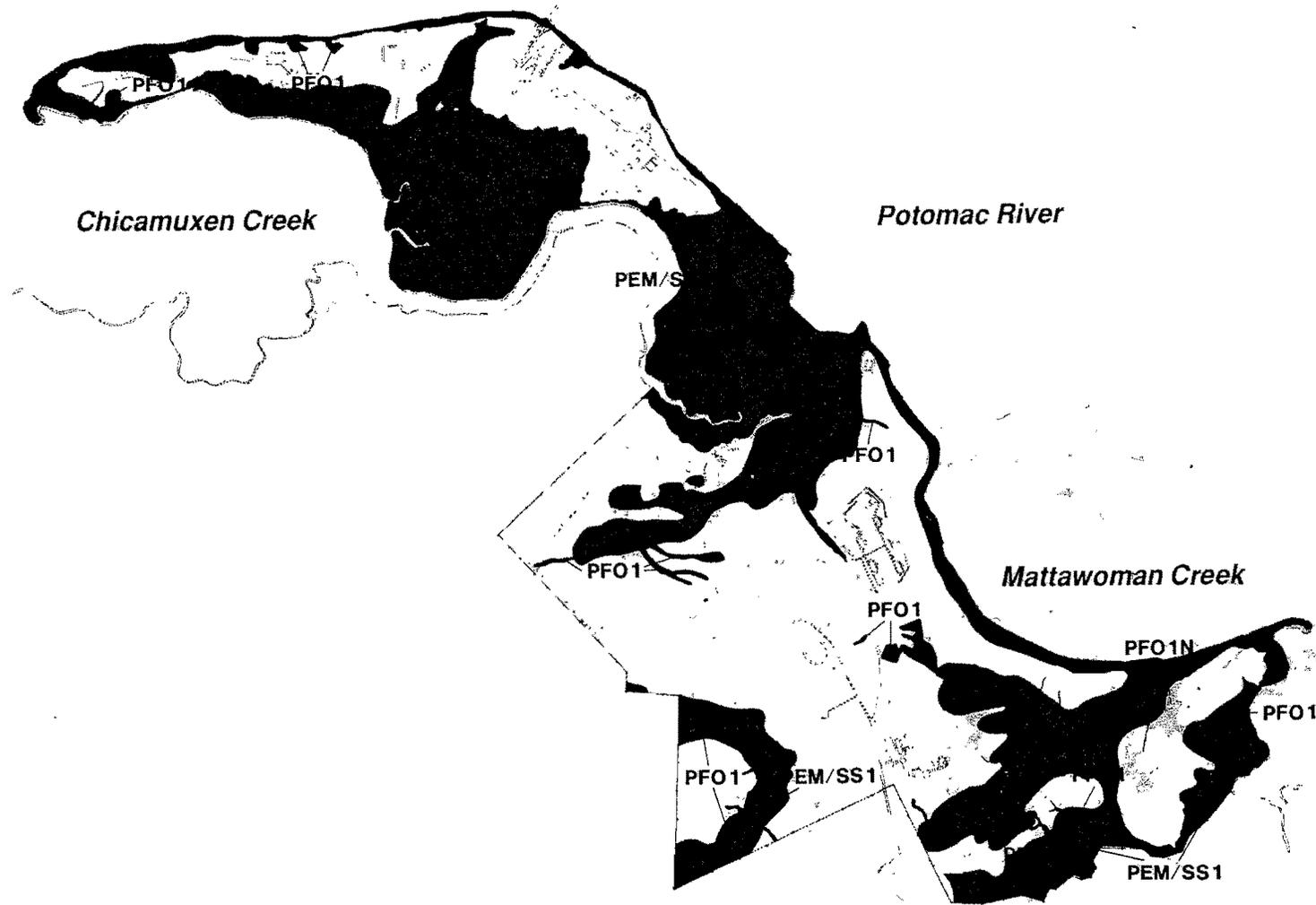
LEGEND

- Wetland (See Table 5-1; boundaries between classes of wetlands not shown)
- 100-Year Floodplain

Figure 5-6



Naval Ordnance Station, Indian Head



STUMP NECK

Hydrology

Source: Draft Wetland Delineation (1989)

LEGEND

-  Wetland (See Table 5-1; boundaries between classes of wetlands not shown)
-  100-Year Floodplain

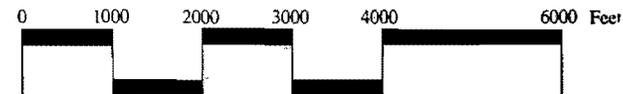
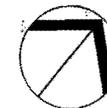


Figure 5-7

Naval Ordnance Station, Indian Head

regulations promulgated by the Federal Insurance Administration pursuant to the National Flood Insurance Act of 1968. Permits for construction within the 100-year floodplain are also required, and are administered by the Waterway Permits Division (MD-DNR) through the joint Federal/State application process for the alteration of any Floodplain, waterway, tidal or non-tidal wetland in Maryland.

The Potomac River floodplain for both Indian Head and Stump Neck is limited by the steep slopes on the northwest shoreline of both peninsulas. The floodplains for both Mattawoman and Chicamuxen Creeks are more extensive because of the flatter topography associated with their shorelines.

The Coastal Zone

Maryland's Coastal Zone program consists of ensuring compliance with all state requirements that can affect actions in the coastal zone. The program is coordinated by the Department of Natural Resources.

The Coastal Zone of Maryland includes all land and water lying within coastal counties, one of which is Charles County. Based on Executive Order 12372 (Intergovernmental Review of Federal Programs), any federal action (and therefore, any action at NOS, Indian Head) is required to undergo a Coastal Zone Consistency Review. If a federal permit is required (e.g., Section 404/10 permit), the federal permit application will automatically be forwarded to the Maryland Tidewater Administration. If a federal permit is not required, CHESDIV will coordinate with the Tidewater Administration to request a Federal Consistency Determination. Either the permit application or direct contact with the state must include a certification that the proposed action is, to the maximum extent practicable, consistent with the state's coastal zone management program.

The Critical Area. Within the Coastal Zone, Maryland has defined an area within which strict land use management is needed to protect the Chesapeake Bay. This is the Critical Area, defined as a 1,000-foot wide strip of land surrounding the Bay and its tidal tributaries. Requirements for development are extensive, and include the following:

- Prohibition of most construction within 100 feet of the Mean High Water Line. This area is called the Buffer, and it may be wider if steep slopes, hydric soils, or erodible soils are adjacent to the Buffer.
- Prohibition of most construction within wetlands, and within a minimum 25-foot buffer around the wetlands.
- Limitations on impervious surface and clearing, and required re-forestation.

The Critical Area Law and Criteria (i.e., the specific requirements) have been adopted by amendment into Maryland's Coastal Zone Management program. All new facility designs submitted to the state for a Federal Consistency Determination will be reviewed for consistency with the Critical Area Criteria as well.

The Chesapeake Bay Program. The Department of the Defense (DOD) first became involved in the Chesapeake Bay Program in September 1984, when the Secretary of DOD signed a Joint Resolution with the Environmental Protection Agency (EPA). This agreement called for DOD to give priority consideration to funding projects, studies, and review programs to support the Bay clean-up effort.

The 1984 agreement prompted a two-year study by DOD to survey installations in the Chesapeake Bay drainage area, identify those with the greatest potential impacts, and make recommendations to improve water quality. Subsequently, NOS, Indian Head was identified as having potential for significant impacts on water quality in the Bay. Even before the recommendations of the DOD study were published, NOS was implementing projects and programs to reduce adverse impacts on the Bay such as sewage system improvements, development of new technology for treatment of ordnance and explosive wastewater, and implementation of "Best Management Practices" to minimize non-point source pollution.

In December of 1987, DOD signed The Chesapeake Bay Agreement which further defined and expanded its role in the clean-up effort with the District of Columbia, the State of Maryland, and the Commonwealths of Virginia and Pennsylvania. In June of 1988 the Commander, Naval Base, Norfolk, Virginia was appointed as Navy Coordinator for the Chesapeake Bay program. The COMNAVBASE Norfolk will ensure that the Navy supports the specific goals of the 1987 Agreement. Accordingly, NOS is developing a progressive program to support various projects being implemented by the Governor of Maryland to clean up the Bay and promote the 1987 Agreement.

Groundwater

The groundwater in Charles County and NOS, Indian Head is recharged chiefly by precipitation. The water filters through soil and is held primarily in sandy/gravelly formations. The Patuxent Formation is the main aquifer supplying Indian Head. Currently NOS is approaching its maximum contractual level of withdrawal from the

aquifer (this issue is discussed further in Chapter 7). The continuous use of the aquifer has made brackish contamination a real possibility.

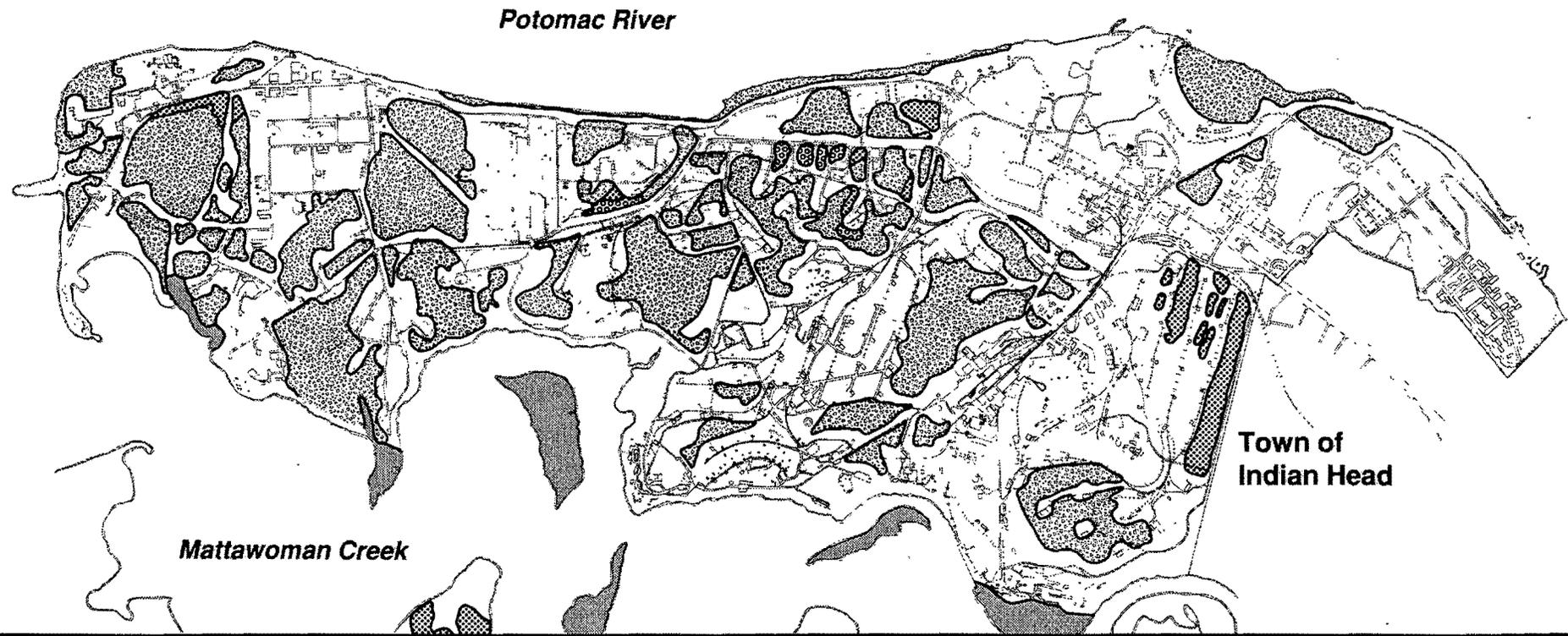
Vegetation

A Forest Management Plan for NOS, Indian Head (1982) has been prepared to provide for the long-term management of forest resources on-station. The plan includes a detailed inventory of existing resources, and recommendations for timber harvest, reforestation, and other management techniques.

There are five basic vegetative cover types on NOS: pine, hardwood, pine-hardwood mix, tidal and non-tidal wetlands, and urban landscape. Both the hardwood category and the pine-hardwood mix category can be further subdivided into upland and wetland divisions. Vegetative cover types are shown in Figures 5-8 and 5-9.

The pine cover areas account for approximately 91 acres on NOS. Of that, pure Virginia pine stands comprise approximately 17 acres. The remaining acreage (approximately 74 acres) is devoted to loblolly pine plantations.

The hardwood forest portion of NOS is approximately 1,078 acres. Approximately 98% of this is mature or overmature hardwood. Recommendations in the Forest Management Plan are designed to eventually balance the age distribution of all forest land to provide for a sustained yield of forest products. Species commonly found in the upland portions of hardwood forests include red oak, white oak, chestnut oak, tulip poplar, and hickories. Red maple, sweet gum, green ash and American sycamore often comprise the wetland acreage.



INDIAN HEAD

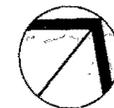
Vegetation

Source: NOS Master Plan Update (1982)

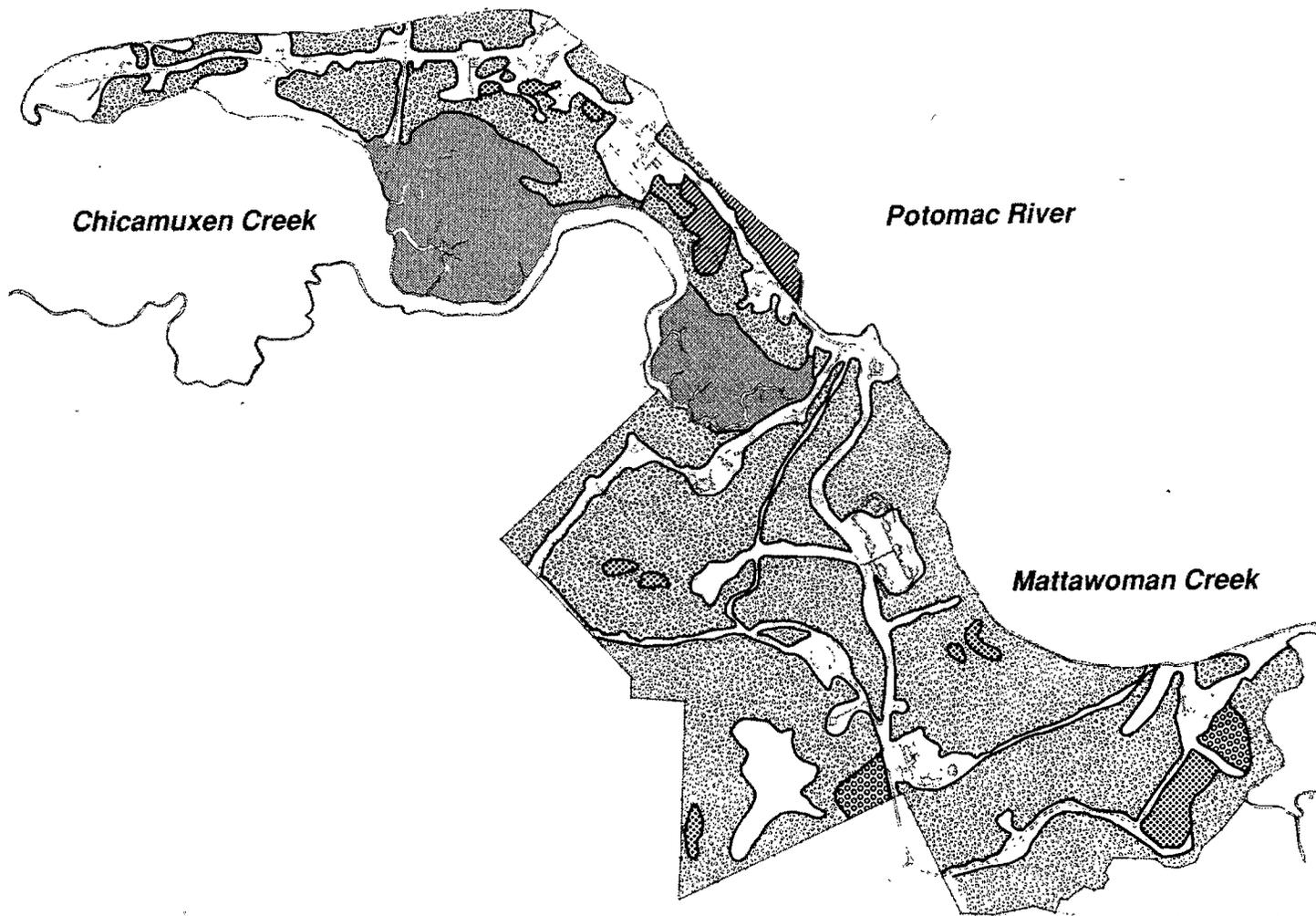
LEGEND

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| | | |

Figure 5-8



Naval Ordnance Station, Indian Head



STUMP NECK

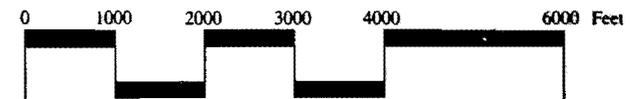
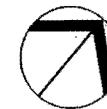
Vegetation

Source: NOS Master Plan Update (1982)

LEGEND

- | | | | |
|--|------------------------|--|-------------------|
| | Pine Forest | | Marsh |
| | Pine / Hardwood Forest | | Open Field |
| | Hardwood Forest | | Developed / Other |

Figure 5-9



Naval Ordnance Station, Indian Head

Virginia pine, red oak, white oak, and chestnut oak comprise the pine-hardwood forest areas. These areas occupy approximately 29 acres at NOS. Most of the trees in these stands are well over 50 years old.

The developed areas include those areas around buildings that have been landscaped after development. They are composed primarily of grasses and ornamental plantings.

Wildlife

The NOS Wildlife Management Plan was updated in 1987. The primary objectives of the wildlife management program are to:

- Provide sufficient suitable habitat to meet or exceed population maintenance requirements for threatened, endangered, or sensitive species inhabiting the installation.
- Improve and maintain habitat to provide a sustained yield of game animals for hunters and fishermen and a variety of non-game animals for the nonconsumptive user.

In an effort to implement these objectives it will first be necessary to control the white tailed deer population. As the deer population increases, strain is placed on the existing habitat which then adversely affects populations of numerous other animals as well as the habitat itself. Due to the absence of natural predators (wolf, bobcat, black bear) and lack of hunting, the deer population will continue to rise until carrying capacity is exceeded. The existing habitat will become so overused that a large deer die-off will occur and the value of remaining habitat will be marginal.

The Southeastern Cooperative Wildlife Disease Study Division of the Department of parasitology, College of Veterinary Medicine, University of Georgia, conducted a herd health check on the NOS deer population in 1982. Based on the findings of this study, the Department concluded that there is a good likelihood that the deer population exceeds the habitat carrying capacity, the herd is experiencing parasitism problems (lungworm pneumonia and heavy tick infestations), and evidence suggests that the majority of the animals are susceptible to infection by hemorrhagic disease-causing virus. To avoid excessive malnutrition and heavy parasitism in the near future, it was recommended that herd growth to be stopped and consideration given to herd reduction.

Another field survey conducted in March 1982 by the Regional Forester (Maryland Forest and Park Services), the Project Forester for Charles county, and the Base Forester revealed significant deer browsing which was severe in some areas. The Regional Forester concluded that any attempts at afforestation or reforestation would be wasted unless intensive management of the deer herd is initiated. Trees would be stunted, deformed, or killed under present circumstances.

Based on these studies and as recommended in the 1987 Wildlife Management Plan, the deer population should be reduced soon. A deer control program in accordance with the Cooperative Agreement for Wildlife Management between NOS, the Maryland Department of Natural Resources, and the U.S. Fish and Wildlife Service should be initiated. Initial control measures should be conducted by the NOS Natural Resources Manager. Maintaining the deer population within carrying capacity can be accomplished through a bow hunting season. Bow hunting is not unusual on ordnance stations. A bow season can be easily tailored to NOS requirements with assistance from the Maryland Department of Natural Resources.

The remote and diverse natural conditions of NOS offer an exceptional opportunity to contribute to the conservation of fish and wildlife resources. The species richness of the area is depicted in the list of species that are considered to be common or abundant in Charles County (Table 5-2). Of particular note is the opportunity to conserve wetlands and waterfowl by supporting the North American Waterfowl Management Plan.

Endangered Species

The Endangered Species Act of 1973 requires a federal agency to ensure that its actions and those of its contractors will not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of its critical habitat.

There are four endangered species located within the boundaries of NOS. All are located on Stump Neck. Three of the species are now federally protected: the American bald eagle, rainbow snake, and sensitive joint-vetch. The fourth species, the scaly blazing-star is a species of special concern in the State of Maryland.

Cultural Resources

A survey of archaeological resources at NOS, Indian Head was conducted in 1985. The results of that survey are recorded in the Preliminary Archaeological Reconnaissance Survey of the Naval Ordnance Station, Indian Head Maryland. The survey resulted in the discovery of 45 sites representing prehistoric time periods from the Early Archaic through the Late Woodland/Contact transition period. Four of these sites were considered to be eligible for nomination to the National Register of Historic Places as containing "categories of

information that will help to further the discipline of archeology." An additional eight sites might be eligible but need further investigation. The entire region of Bullets Neck, with five sites identified and several other potential sites, was considered to be eligible for registration as a prehistoric site district which should be preserved as a unit pending more detailed study. In addition to the prehistoric sites, three 19th century sites and one 19th/20th century site were identified.

Precise location of archaeological and historic sites are not included as part of the Master Plan. This has been done to help prevent vandalism and disruption of the sites. Complete information regarding the archaeological sites is available in the draft of the Archaeological Survey which is available through CHESDIV.

The Contact period site, which contains the remains of a small Potomac Creek Indian village, is located near the north bank of Mattawoman Creek (northwest of Marsh Island), off Noble Road. This site was considered especially important, in that there are very few such sites known in Maryland. This site promises information on the introduction of European trade goods into the aboriginal culture and resultant culture changes. The other three sites eligible for nomination to the National Register of Historic Places are in the general vicinity of the first, north of Marsh Island.

In addition to the sites discovered, the draft archeological report described several related areas likely to be archaeologically significant, which were not completely surveyed; an archeological reconnaissance should be undertaken as part of the planning for any improvements in these areas. Development near or on sites described above will require at a minimum that a Phase II archaeological study be completed to determine the exact nature and extent of the artifacts, and whether the site can be developed after all artifacts are extracted

Table 5-2. Common or Abundant Wildlife in Charles County, Maryland.

AMPHIBIANS

northern two-lined salamander
upland chorus frog
green frog
pickereel frog
northern red salamander
American toad
northern cricket frog

northern spring peeper
bullfrog
southern leopard frog
red-backed salamander
northern dusky salamander
Fowler's toad

REPTILES

northern fence lizard
five-lined skink
eastern hognose snake
rough green snake
northern water snake
eastern garter snake
snapping turtle

six-lined racerunner
eastern worm snake
black rat snake
eastern king snake
northern brown snake
eastern mud turtle
eastern box turtle

BIRDS

horned grebe
great blue heron
green-backed heron
whistling swan
Canada goose
mallard
black duck
American wigeon
wood duck
canvasback
common goldeneye
bufflehead
ruddy duck
common merganser
red-breasted merganser
turkey vulture
red-tailed hawk
red-shouldered hawk

barred owl
whip-poor-will
chimney swift
common flicker
red-bellied woodpecker
downy woodpecker
eastern kingbird
eastern phoebe
acadian flycatcher
eastern wood peewee
tree swallow
barn swallow
purple martin
blue jay
Carolina chickadee
tufted titmouse
white-breasted nuthatch
brown creeper

BIRDS (contd.)

osprey
American kestrel
bobwhite
killdeer
common snipe
herring gull
lauging gull
ring-billed gull
mourning dove
yellow-billed cuckoo
scarlet tanager
indigo bunting
rufous-sided towhee
chipping sparrow
white-throated sparrow
ovenbird
blue-gray gnatcatcher
ruby-crowned kinglet
starling
red-eyed vireo
yellow-rumped warbler
prarie warbler
house sparrow

Carolina wren
mockingbird
catbird
brown thrasher
eastern meadowlark
red-winged blackbird
common grackle
American robin
wood thrush
estern bluebird
cardinal
American goldfinch
dark-eyed junco
field sparrow
song sparrow
American redstart
golden-crowned kinglet
cedar waxwing
white-eyed vireo
northern parula warbler
blackpoll
common yellowthroat

MAMMALS

opossum
eastern mole
little brown myotis
silver-haired bat
red bat
gray squirrel
white-footed mouse
pine vole
Norway rat
meadow jumping mouse
raccoon
fox

least shrew
star-nosed mole
Keen's myotis
eastern pipistrelle
woodchuck
southern flying squirrel
meadow vole
muskrat
house mouse
eastern cottontail
white tailed deer
skunk

by professional archaeologists, or whether it should be made part of the National Register of Historic Places to preserve its value.

An historic survey of NOS buildings was also conducted, and found remnants dating back to the Civil War. In the ravine leading up from the original Potomac River landing area, remnants were found of the original guns tested there, as well as metal plates dating back to the late 19th century. The single base line (single base powder production area), a series of buildings located at the top of the ridge, dates from 1899, as does the water tower, the original power plant, and some administrative and residential buildings (Victorian officers' quarters and the surgeon's house).

The issue of National Register eligibility has not been addressed yet (an upcoming draft historical survey report will include that), but individual buildings and complexes are expected to qualify. These are buildings 101, 103, 111 and 113. Other buildings may also be eligible for the Register. Most significant is the role played by the Station in the industrial history of the development of munitions, and in Naval history. In that sense, the Station as a whole may be considered to be historically significant.

Once buildings are determined to be eligible, impacts of proposed activities must be assessed in accordance with Advisory Council on Historic Preservation regulations (36 CFR 800). One potential conflict posed by the historicity of the production facilities, especially the single base line, is that many of the buildings are stripped to shells, contaminated, and have of necessity been demolished for safety reasons. Also, any renovation of salvageable WWI or WWII facilities, while desirable for reasons of safety and efficiency, would reduce the historical value of those buildings.

Outdoor Recreation

The primary goal of the NOS Outdoor Recreation Program as detailed in the 1988 Outdoor Recreation Plan is to provide a full spectrum of recreation opportunities which complement the existing recreation programs and are consistent with the NOS mission. To meet this goal the following objectives should be promoted:

- Provide for the physical and social well being of military and civilian personnel by providing outdoor recreation opportunities not currently available on the installation or within the surrounding community.
- Provide recreation opportunities in locations convenient to users and compatible with master planning.
- Provide a physical environment in a safe setting that enhances outdoor recreation experiences.
- Provide community outreach programs to foster a "good neighbor" relationship.
- Implement the Outdoor Recreation Plan and Cooperative Agreement to help to ensure that the quality of life for installation employees is improved.

Summary

NOS is taking major steps to manage the natural resources under its stewardship. Notable accomplishments should be documented for participation in the next (1991) DOD Natural Resources Conservation Awards Program. Continued Command support for the Natural Resources Management Program will help to ensure placement in the competition.

6

Environmental Management

ENVIRONMENTAL MANAGEMENT

It is Navy policy, as stated in OPNAVINST 5090.1, to comply with the intent of all federal and state environmental directives. The NAVORDSTA Environmental Handbook serves as a convenient reference to the myriad environmental regulations and requirements that govern waste management, environmental releases, personnel training and related environmental concerns at the Station. The scope and implications of environmental management requirements are described below.

Air Quality

Charles County is currently classified as an air quality attainment area. This status excludes NOS from many air quality regulations. However, Maryland has proposed strict regulations to govern volatile organic compounds (VOC's), which are precursors to ozone. If and when enacted, these regulations will require NOS to reduce VOC emissions and implement a strict monitoring and control program. It also appears likely that Charles County will be reclassified as non-attainment for ozone because of its proximity to the Washington DC metropolitan area. If this happens, air quality standards for new and existing sources will be even more stringent.

Only the power house and thermal treatment area currently require air emission permits. The permit for the power house is issued by the Maryland State Department of the Environment. The thermal treatment area (burn point) is regulated by two permits, one issued by the State of Maryland Department of Health and Mental Hygiene and the second by the Charles County Health Department. The proposed VOC regulations would, however, require permits for many of the

other activities currently at NOS, as well as for many proposed activities. To obtain permits, NOS will have to show that the activity in question will not degrade ambient air quality beyond the limits set by new regulations. Activities that may require permitting in the future include boilers, incinerators, petroleum storage tanks, fueling operations, open burning sites, activities that allow solvents to evaporate into the atmosphere, and industrial processes such as spray painting, curing and drying.

Wastewater

NOS operates under an Industrial Wastewater Discharge permit issued by the State of Maryland and EPA. At present, many wastewater streams undergo primary treatment prior to discharge. However, in order to meet a compliance schedule placed in their discharge permit, NOS is constructing treatment facilities at various sites. Phase I (MILCON P-963), programmed for FY91, will provide a collection system and additional treatment facilities for nitration plant wastewaters. It will also include sewer connections to connect selected industrial wastewaters to the NOS domestic sewage treatment plant. Phase II (MILCON P-106), programmed for FY92, will provide holding tanks and sewer connections for the remaining industrial wastewater sources. The Best Management Practices Plan for NOS presents a plan for managing and treating all industrial wastewater at the NOS.

NOS also operates under a Sanitary Wastewater Discharge permit issued by the State of Maryland and EPA. All sanitary sewage on Indian Head is currently treated at the existing treatment plant. Sanitary sewage on Stump Neck is managed by 17 septic fields. Of these, five are surface outfall systems operated under permits issued

by the State of Maryland. Currently, these septic outfalls do not always meet standards. The five surface systems will be upgraded by NOS in FY90.

Stormwater and Sediment Control

Stormwater is an environmental management issue because it can carry surface pollutants and eroded soil (i.e., sediment) to nearby surface waters. Stormwater at NOS is typically handled by allowing the water to collect in ditches from which it eventually discharges directly to the Potomac River or the Mattawoman or Chicamuxen Creek. In many cases these culverts have developed leaks, cracks and breaks which allow water to seep directly out through the cliff face, contributing to existing erosion problems. This overland system of stormwater management has also resulted in increased erosion (and therefore, increased generation of sediment) in many of the drainage swales and ditches.

Stormwater runoff is governed by regulations enforced by the Maryland Water Resources Administration. The adoption of the Chesapeake Bay Agreement will serve to strengthen these regulations, because sediment control is an important aspect of Bay water quality control. Construction of new projects requires analysis of post-development stormwater runoff and a plan for maintaining predevelopment runoff levels. The Maryland Standards and Specifications for Erosion and Sediment Control outlines specific measures to be taken to control sedimentation and erosion as well as suggestions for managing stormwater. Supplemental guidance for preparing stormwater management reports has been prepared by Code 114 (Environmental Engineering Branch) and Code 405 (Civil Engineering, Design Branch), CHESDIV. These sources should be

consulted during the design phase of any action requiring disturbance of soil. Stormwater Management and Sediment Control Plans are coordinated by the Public Works Facilities Acquisition Division (Code 092).

Hazardous Waste

Hazardous wastes are defined by EPA as substances that exhibit ignitability, corrosivity or toxicity. Hazardous wastes include spent solvents, heavy metals, and explosive scrap.

The Clean Air Act, the Clean Water Act, and the Resource Conservation and Recovery Act (RCRA) all regulate the release of hazardous wastes. The U.S. Department of Transportation (DOT) regulates the transport of hazardous materials. NAVORDSTAINST 5090.2 specifies the procedures for use at NOS, Indian Head during handling, turn-in, storage, and treatment of hazardous waste.

NOS has a permit that allows storage of hazardous wastes beyond the 90-day limit (RCRA Part B Permit), and a permit allowing the storage and delivery of oil (Oil Operations Permit). Non-compliance with these permits can result in the revocation or suspension of these permits as well as fines to the responsible parties or individuals. Wastes other than explosive wastes are delivered to the central storage facility (Building 455) for off-station disposal. Explosive wastes on NOS are disposed of by burning at one of two active burn points. This is conducted under "interim status" (i.e., a final permit has not yet been issued).

All naval installations are required by 1992 to reduce their hazardous waste production to one half the level produced in 1987. For this

reason, it is unlikely that new hazardous waste storage facilities will be funded by DOD, despite the current shortage of space.

An Initial Assessment Study of the Station (NEESA 13-021), completed in 1983, identified 38 potential hazardous and non-hazardous waste sites on NOS. Most of the sites are historic and many were subject to clean-up prior to the study. Of the sites, only one, a mercury deposition site in a wetland near Building 766, is currently undergoing review for cleanup due to potential impacts to human health and the environment. However, the locations of certain other sites that do not currently pose a threat to human health or environment in their current use should be noted (see Figures 6-1 and 6-2). The sites in Figures 6-1 and 6-2 may present constraints for future development, although data to characterize the sites are insufficient. If these sites are considered for future use or disturbance of any type, site surveys should be conducted to evaluate actual risks that may be incurred. The sites are described below. Site numbers correspond to those assigned in the Initial Assessment Study.

Site No. 1 -- Thorium Spill

This spill site is the area near the Special Weapons Disposal Building (Building 900). Although some cleanup took place, there are no records available to indicate the success or extent of cleanup of thorium-contaminated soil. A thorough survey should be made prior to any excavation or change in land use in the vicinity of Building 900.

Site No. 5 -- Grain Manufacture and X-Ray Building, Open Drain

This open ditch was formerly used to discharge wastewater. Silver compounds, which are toxic to marine life, may have deposited along the sidewalls and bottom of the ditch. Further study of the site is recommended to determine whether earthwork associated with future activities may result in migration of contaminants to surface water.

Site No. 7 -- HMX Spill

This spill is the area around the Slurry Mix Building (Building 682). HMX was discharged in the area around Building 682, and HMX and lead were discharged into an open storm ditch (no. IW10). It is probable that HMX and lead remain in the vicinity of Building 682. Therefore, precautions should be taken during future earthwork activities in this area.

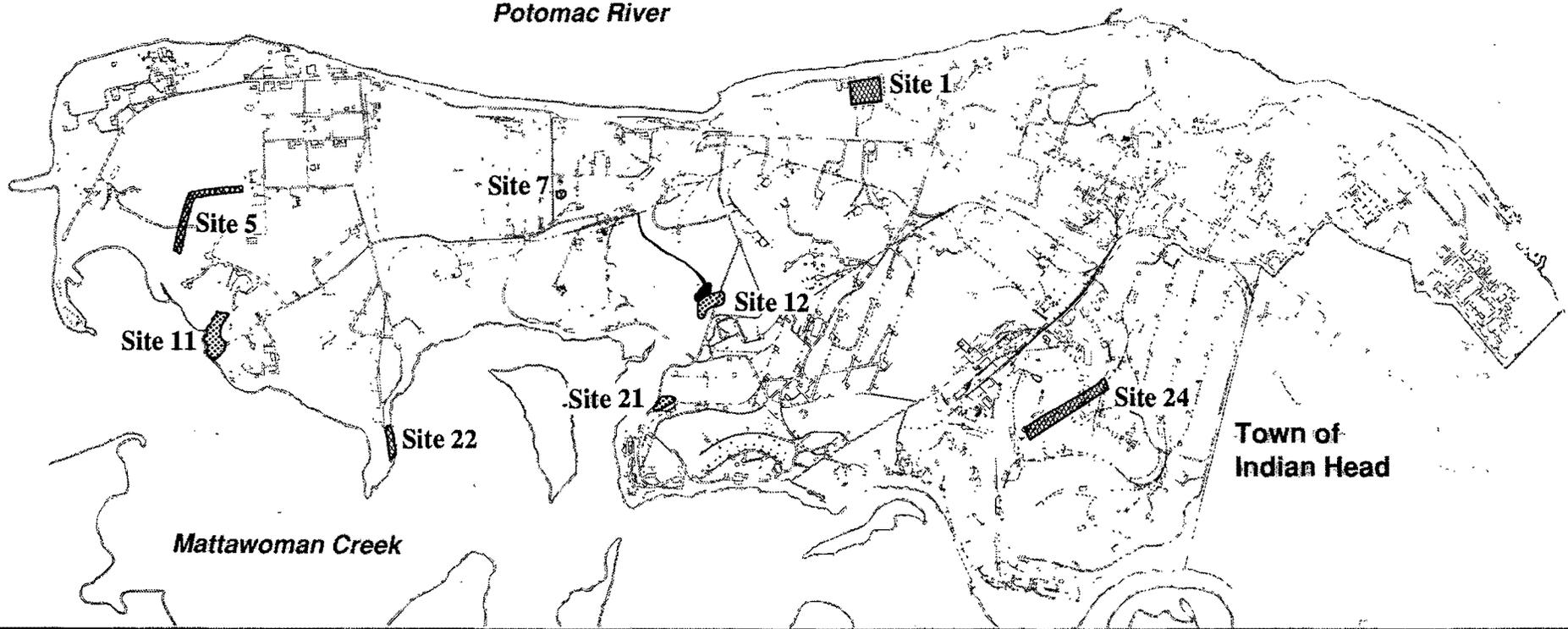
Site No. 11 -- Caffee Road Landfill

This site is a formerly used disposal site for trash, bulk items and other undetermined materials. Physical characteristics of the site have not been evaluated. Due to the uncontrolled nature of disposal operations, this site should be avoided for future development due to potential for stability and contamination problems.

Site No. 12 -- Town Gut

This site was used for disposal of landscaping waste, fill material and rubble, and may have been used for unauthorized trash disposal, including paints and varnish. Further study of the site is recommended to determine nature and extent of contamination.

Potomac River



INDIAN HEAD

Former Waste Disposal Sites

Source: Initial Assessment Study, 1983

LEGEND

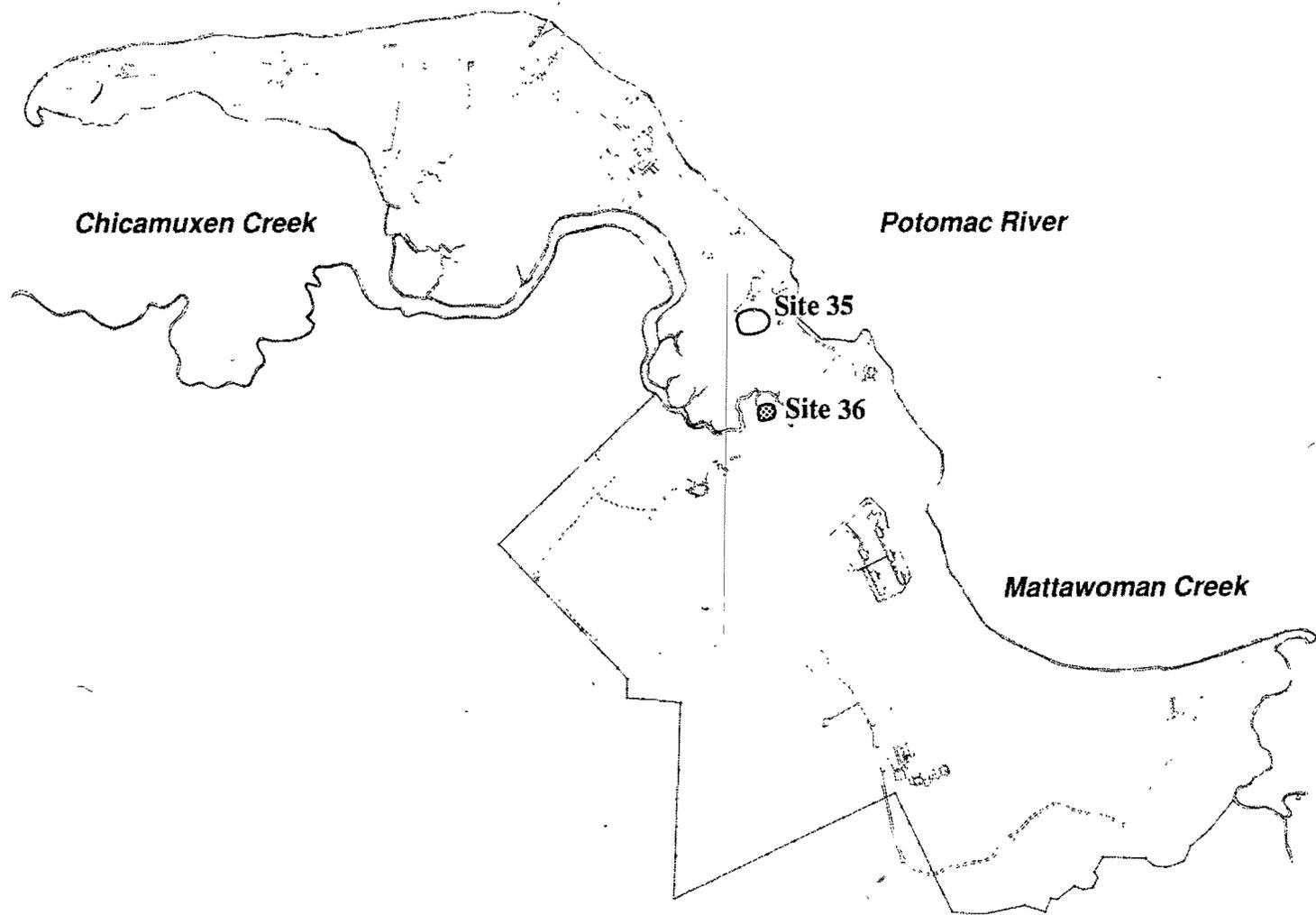
-  Closed Landfills
-  Mercury Deposits
-  Other Waste Sites

All boundaries are approximate

Figure 6-1



Naval Ordnance Station, Indian Head



STUMP NECK

Former Waste Disposal Sites

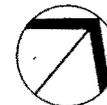
Source: Initial Assessment Study, 1983

LEGEND

-  Closed Landfill
-  Buried Torpedoes

All boundaries are approximate

Figure 6-2



Naval Ordnance Station, Indian Head

Site No. 21 -- Bronson Road Landfill

This site is the location of a two-acre abandoned gravel mining pit. This site was used for disposal of trash, paint sludges, bagged asbestos, and unauthorized materials. Due to the site's use for disposal operations, the site should be avoided for future development due to potential for stability and contamination problems.

Site No. 22 -- NG Slums Burning Site

This site was formerly used as a burning ground for NG slums generated by the nitroglycerin plant. Explosive hazards should be considered prior to the use of this site.

Site No. 24 -- Abandoned Drain Lines

This site is the location of the abandoned nitrocellulose production facilities. There is some concern that nitrocellulose may have deposited in abandoned drain lines located near the old plant site. Due to its explosive characteristics, this potential safety hazard should be factored into any future development plans, especially earthwork activities in the vicinity of the old plant and abandoned drain lines.

Site No. 35 (Stump Neck) -- Buried Torpedoes

This unconfirmed site is believed to contain buried torpedoes, including parts that were not rendered safe. This site should not be disturbed due to the potential safety hazard.

Site No. 36 (Stump Neck) -- Closed Landfill

This site is believed to contain metal casings such as mines, bombs, and torpedoes. The contents are claimed to have been certified inert and did not contain explosives or chemicals when buried. However, the site should be avoided due to potential stability problems.

EPA has conducted a RCRA facility assessment (RFA) of NOS, Indian Head. The RFA is an inventory of all solid waste management units at NOS. Based on review of available documents and a visual inspection of NOS, EPA has identified a total of 78 solid waste management units and 13 areas of concern. The latter are areas where the potential for contamination exists, such as former spill sites. EPA, through its authority under the 1984 amendments to RCRA, can require remedial action for unregulated releases from any of these units or areas.

Non-Hazardous Solid Waste

NOS disposes of non-hazardous solid waste by contract. The waste is taken to the Charles County landfill.

7

Man-Made Features

MAN-MADE FEATURES

The built environment at NOS presents opportunities and constraints for future use in much the same way that natural features do. Existing land use patterns are described, and will serve as the starting point from which development patterns will evolve. An analysis of facilities is included as an input to the facilities planning process. Information on infrastructure is also provided, as these features will determine, to some degree, the ability of existing systems to support additional growth or redevelopment.

Land Use

Current land use patterns, based primarily on assigned category codes, are shown in Figures 7-1 (Indian Head) and 7-2 (Stump Neck). Category codes for specific facilities are as contained in the NOS Engineering Evaluation data base, in which category codes are assigned to facilities according to the system established in Department of the Navy Facility Category Codes, April 1984 (NAVFAC P-72).

The land use classifications shown in Figures 7-1 and 7-2 were derived according to the following rules:

Operations/Training - Facilities coded in the 100 series. These are typically occupied by or under the cognizance of organizations whose mission is related to explosive ordnance disposal technology and training.

Production - Facilities coded in the 200 series, excluding facilities under the cognizance of the Public Works Department. These are facilities used to produce ordnance and other products.

Maintenance/Utilities - Facilities coded in the 800 series, and facilities coded in the 200 series and under the cognizance of the Public Works Department. These facilities are related to the supply of power, water, waste treatment, and facility and equipment construction and maintenance.

RDT&E - Facilities coded in the 300 series. These are facilities associated with product research and development, testing and evaluation.

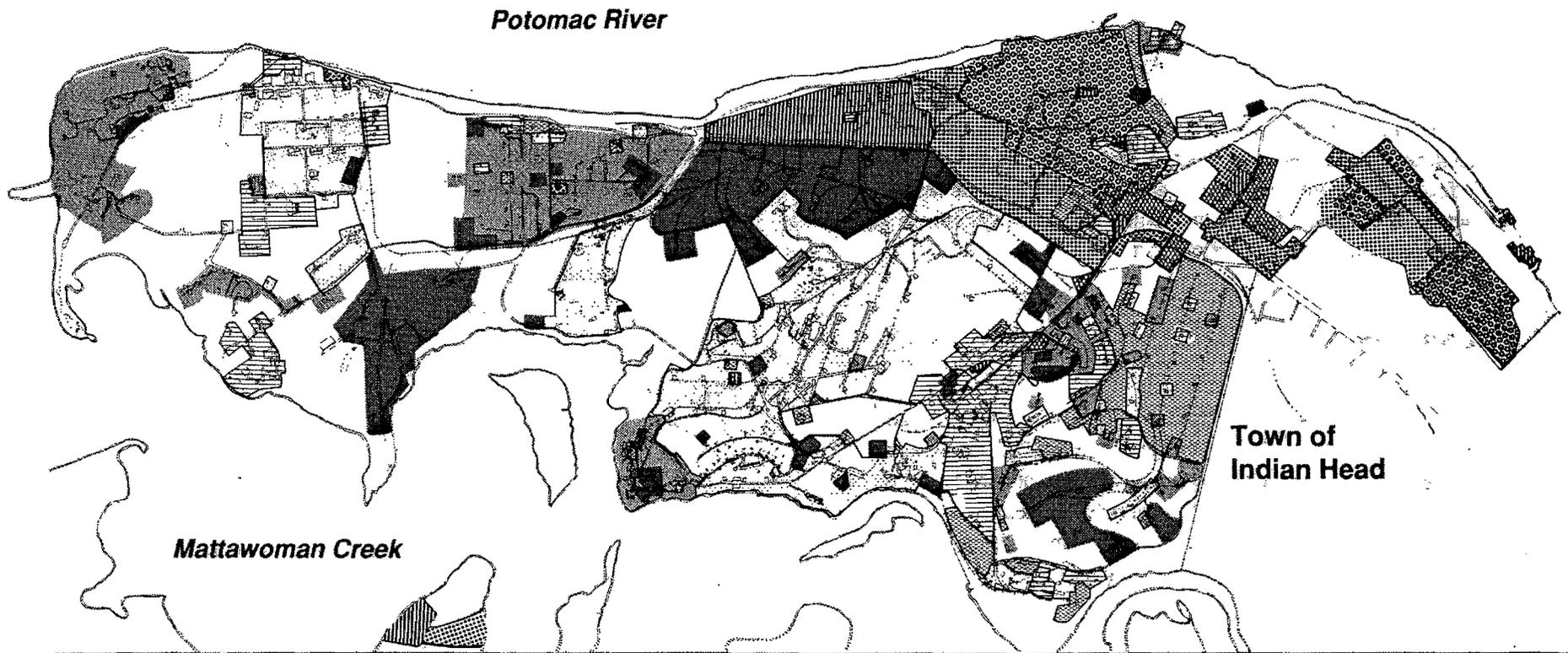
Explosives Storage - Facilities coded in the 420 series. These are storage facilities that generate an explosive safety quantity distance arc.

Supply/Non-explosive Storage - Facilities coded in the 400 (excluding 420) series. These are typically storage and other facilities under the cognizance of the Supply Department.

Administration - Facilities coded in the 600 series. These facilities provide work space for personnel whose job is to support production and RDT&E functions.

Community Facilities and Services - Facilities coded in the 500 and 700 series, excluding 710 and 720. These facilities provide services related to the non-professional needs of the on-station community (e.g., medical, recreational, security).

Housing - Facilities coded as 710 and 720 (residential and related buildings).



INDIAN HEAD

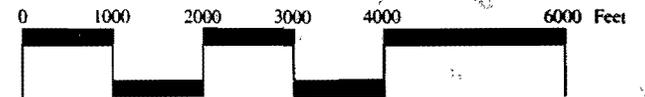
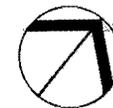
Existing Land Use

Source: Engineering Evaluation (1988)

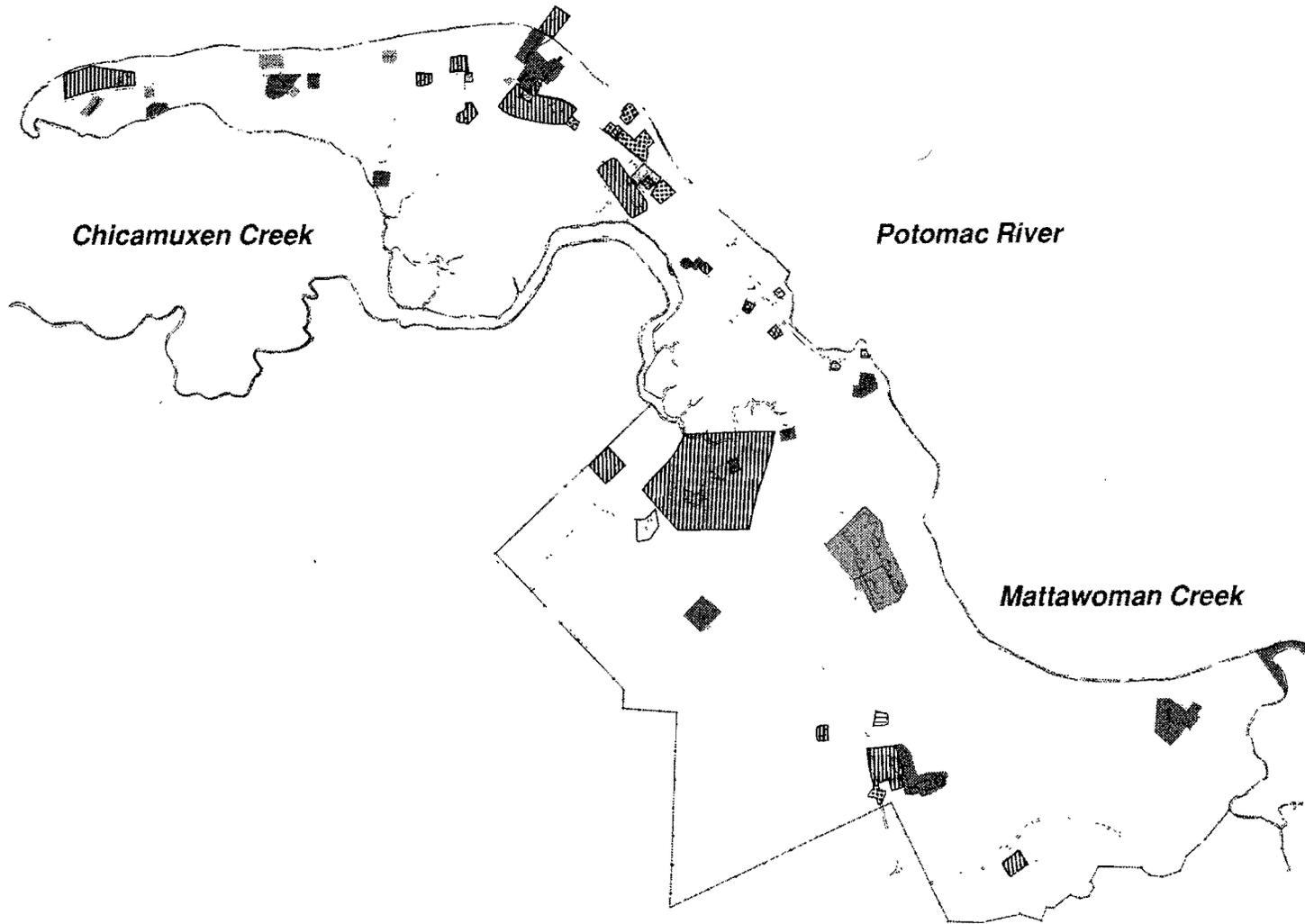
LEGEND

- | | | |
|--|--|---|
|  Operations / Training |  RDT&E |  Open Space |
|  Production |  Explosives Storage |  Administration |
|  Maintenance / Utilities |  Supply / Non-Explosive Storage |  Community Facilities and Services |
| | |  Housing |

Figure 7-1



Naval Ordnance Station, Indian Head



STUMP NECK

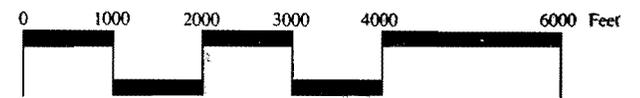
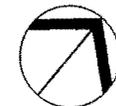
Existing Land Use

Source: Engineering Evaluation (1988), NOS Public Works Engineering Division Files

LEGEND

- | | | |
|-----------------------|--------------------------------|-----------------------------------|
| Operations / Training | Maintenance / Utilities | Administration |
| RDT & E | Explosive Storage | Community Facilities and Services |
| Production | Supply / Non-Explosive Storage | Open Space |

Figure 7-2



Naval Ordnance Station, Indian Head

The development pattern at Indian Head has evolved over the years, resulting from continual changes in workload that have occurred in response to the Navy's requirements. The Station has had to gear up for new tasks, vacating some structures and adding others as required for a particular need. Vacated structures are quickly used for other purposes when possible, resulting in a seemingly scattered and unorganized land use pattern. This pattern and process of land development and use has created functional as well as operational inefficiencies within some organizations.

Production is the largest single land use at Indian Head. The production area has been established over many years of development at NOS and consists of three major areas: The Cast Plant, Nitration Plant, and Intermediates Manufacturing. Two smaller production facilities include Extruded Products and CAD/PAD manufacturing. Safety requirements prohibit dense development of these facilities, and require them to be located within the security fence.

The second major land use at Indian Head is RDT&E, also located within the security fence. Major areas are the test areas near Hog Island and near the Old Burn Point, the manufacturing technology area between Strauss Avenue and Caffee Road, and smaller areas along Mattawoman Creek and just within the secure area gate.

Explosives storage occurs in a few large clusters, providing for better control and safety, while non-explosive storage and supply is widely scattered throughout Indian Head to better serve the needs of Station activities. The major exception to this is use of the old dry houses near Benson Road, by the Supply Department.

Most other uses at Indian Head, with the exception of Maintenance, are located outside of the security fence. Maintenance functions are scattered, with major areas occurring along Patterson Road within the

security fence, and along the Potomac waterfront (in "the Valley") outside of the security fence.

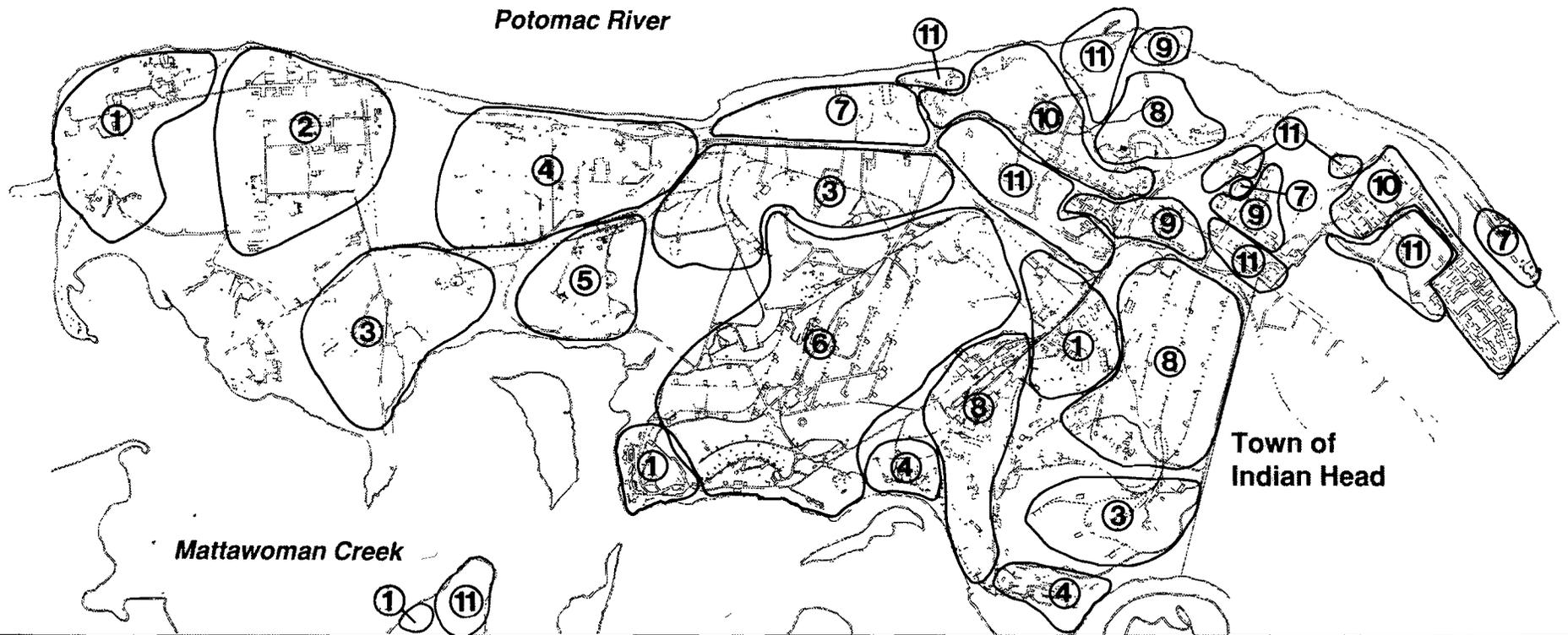
At Stump Neck, a variety of land uses occur, but there are fewer use categories, and use areas are much smaller than on Indian Head. This is primarily due to the development constraints and safety requirements of the site. Stump Neck is the primary location of the Naval Explosive Ordnance Disposal Technical Center, and most uses located at Stump Neck are related to the needs of that organization. In addition, the Naval Ordnance Station conducts some testing and evaluation and operational training at Stump Neck.

At Bullets Neck, plans for a natural Resources/Environmental Education Center and a Weather/Air Quality Monitoring Facility are being implemented.

The land use patterns at Indian Head and, to a lesser degree, Stump Neck, appear quite complicated. However, close examination reveals that land uses fall into several distinct functional areas, based on the use that predominates in each location. These functional areas are shown in Figures 7-3 and 7-4. Consideration of these functional areas will be an important factor in planning for future land uses. To the extent that like functions can be clustered (as permissible within operational needs and constraints), overall Station efficiency will be improved.

Facilities

In support of the Station's mission approximately 1,057 buildings, totalling nearly 2.9 million square feet, have been constructed at NOS. Of these buildings, 80 are located at the Stump Neck and Rum Point



INDIAN HEAD

Functional Areas

Source: 1989 Master Plan Update

LEGEND

- 1 Test and Evaluation
- 2 Cast Production
- 3 Explosives Storage

- 4 Manufacturing Technology
- 5 Nitration
- 6 Ordnance
- 7 Training

- 8 Support (Public Works / Supply)
- 9 Administration
- 10 Housing
- 11 Community Facilities and Services

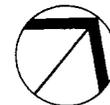
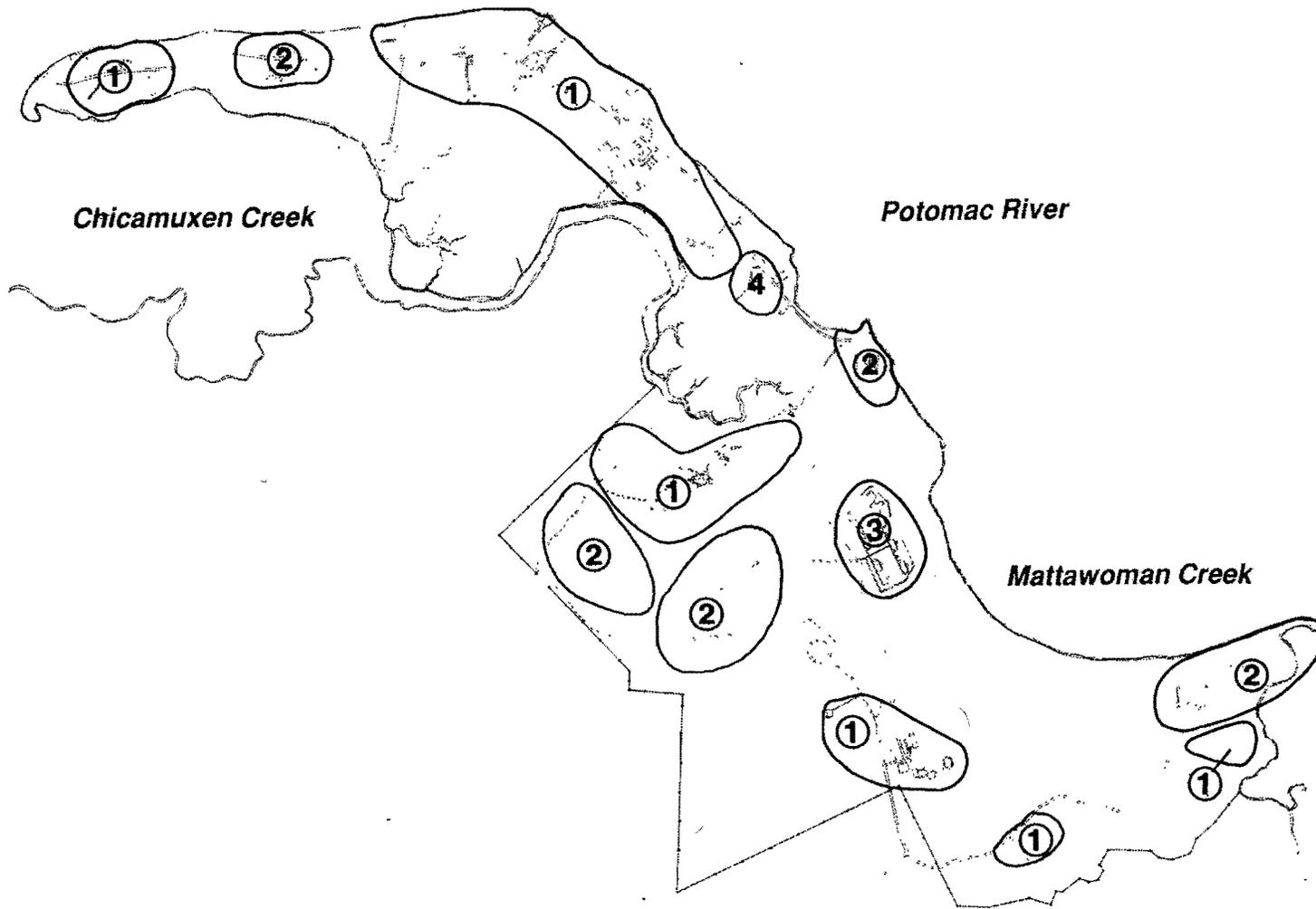


Figure 7-3

Naval Ordnance Station, Indian Head



STUMP NECK

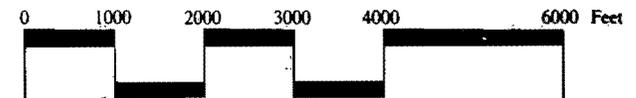
Functional Areas

Source: 1989 Master Plan Update

LEGEND

- 1 Training
- 2 Test and Evaluation
- 3 Explosives Storage
- 4 Facilities Maintenance

Figure 7-4



Naval Ordnance Station, Indian Head

sites, 4 buildings (3 of which contain residential units) are located at Waldorf, 4 buildings are located at LaPlata, and 1 building is located on Bullets Neck (a former residence, pre-dating the land acquisition by NOS). The remaining buildings are located on the main Indian Head site.

Many of the structures at NOS were constructed to support the Station's efforts related to World War I, World War II, and the Korean conflict. Several date back to the Station's turn of the century origins, and approximately 25 buildings are old enough to be of possible historical significance.

Most of the older buildings are production buildings, many with unusual configurations related to their original function. There are also a large number of magazines among the structures at NOS. Construction materials used in the buildings at NOS vary from very large masonry and steel structures to small metal or wooden structures. Magazines are typically of concrete or brick; many have been further hardened (made better able to contain explosive forces) by being partially enclosed by earthen berms.

Facilities Analysis

Table 7-1 summarizes the buildings at NOS by their general type of construction, which is defined in the Shore Facilities Planning Manual (NAVFACINST 11010.44E) as follows:

Permanent: a building constructed with a highly durable exterior, structural framing of substantial building materials such as masonry, concrete, or steel, finished interior (where normally applicable), and expected to be useful for its designed function with minimum maintenance for a period of at least 50 years.

Semi-Permanent: a building constructed with a moderately durable exterior, structural framing of substantial building materials such as masonry, concrete, or steel, interior finished or unfinished, and expected to be useful for its designed function with moderate or high maintenance for a period of at least 25 years, but not less than 10 years.

Temporary: a building constructed with a nondurable exterior, structural framing of lesser grades such as wood or light gauge steel, low grade or nonexistent interior finishes, and expected to provide minimum facilities for five years without regard to the degree of maintenance.

Table 7-1. Facilities Construction

Type of Construction	Number of Buildings	Percent of Buildings	Square Footage	Percent
Permanent	546	52%	1,921,785	67%
Semi-Permanent	301	28%	779,047	27%
Temporary	210	20%	163,482	6%
Totals ⁽¹⁾	1,057	100%	2,864,314	100%

Note:

(1) Structures not normally measured in terms of square feet (such as wharfs, liquid fuel storage facilities, and open storage areas) are not included in these totals.

Source: NAVFAC report P-164 -- Detailed Inventory of Naval Shore Facilities, 30 September 1988.

As Table 7-1 shows, permanent and semi-permanent buildings comprise 80% of the total number of buildings and 94% of the total space (gross square footage) at NOS today. The use of temporary buildings has declined somewhat since 1982, when temporary buildings made up 25% of the total (1982 Master Plan Update). Permanent buildings make up 5% more of the total now than in 1982.

The terms "permanent", "semi-permanent" and "temporary", by definition, apply only to buildings. A number of vital structures (such as magazines, wharfs, liquid fuel, and other storage facilities, and open storage areas) are not normally measured in terms of square feet. Measures such as cubic feet, gallons, berthing feet, outlets, square yards, etc. are used instead. Such facilities are not summarized by type of construction or number of structures on the P-164, and thus can not be included in these totals. Most such structures could be considered as "permanent", albeit in a more general sense than that of the NAVFACINST 11010.44E definitions.

As ordnance technology has evolved, production facilities that could be adapted were renovated to accommodate new technology and production methods; and to meet the Navy's and the Station's changing needs. However, certain buildings, because of their configurations and specialized equipment, were not adaptable to new production technologies. Such buildings were replaced by new facilities, and their only subsequent use, if any, has been for purposes other than production. For example, a number of the older dryhouses, no longer needed in that function, have been renovated for general storage or office space.

Most ordnance production facilities must be decontaminated and extensively renovated before they can be used for other purposes. Since this process can be prohibitively expensive, a number of the outmoded production buildings have been demolished, when decontamination is impractical, or abandoned when are not available for renovation.

Table 7-2 (Facilities Usage Summary), summarizes the facilities at NOS by their general type of function using data from the most recent Engineering Evaluation (Assets Evaluation) of NOS facilities. Functions correspond to the category codes assigned to individual

facilities, as defined in Department of the Navy Facility Category Codes (NAVFAC P-72).

Table 7-2. Facilities Usage Summary

Category	CCN	Number of Facilities	Percent	Gross Feet	Percent
Operations & Training	100	56	4%	276,573	10%
Maintenance & Production	200	398	30%	767,839	27%
RDT&E	300	277	21%	384,975	13%
Supply	400	76	6%	355,613	12%
Magazines	420	174	13%	242,868	8%
Medical/Dental	500	2	<1%	9,525	<1%
Administrative	600	45	3%	252,495	9%
Family Housing	710	92	7%	422,715	9%
"Bachelor" Housing (UPH)	720	16	1%	111,205	3%
Community Facilities	700	58	4%	124,894	4%
Utilities	800	129	10%	120,138	4%
TOTALS:		1,323	100%	3,068,840	100%

Note: (1) Facilities not normally measured in terms of square feet (such as runways, wharfs, liquid fuel storage facilities, and open-storage areas) are not included in these totals. Magazines are included in these totals, although only some magazine types are normally totalled by square footage as "buildings" (vs. "structures"), totalled by cubic feet.

Source: Engineering Evaluation, Naval Ordnance Station, May 1988.

A "facility" as included in this table, and as defined in NAVFAC P-72, may be an entire building or other structure, or may be only part of a building, in cases where a building is used for more than one function (category code). For example, part of a building may be used for administrative office space and part for a locker room (change/relief house). Such buildings are referred to as "multi-user buildings."

The building in the preceding example would be counted *both* under the total Number of Facilities for administration (category 600) and *again* under maintenance and production (category 200, under which the detailed category code for change/relief house falls). However, the square footage used for *each function* is counted *separately* under

each appropriate category code. Because the totals in the Facilities Usage Summary (Table 7-2) are for facilities, not buildings, the overall totals will not match those in Table 7-1 (Facilities Construction), which are for buildings.

As Table 7-2 shows, maintenance and production functions together occupy about 398 facilities (30% of total facilities) and about 768,000 square feet (SF), or about 27% of total SF. Approximately 277 facilities, representing about 21% of all facilities and 13% of total SF, are used for research, development, testing and evaluation (RDT&E) activities. These two operational categories account for about 51% of all facilities and 40% of all space (SF) at NOS.

About 174 facilities (13% of total facilities), representing 8% of total SF, are used for explosives storage. Other types of storage and supply functions occupy about 76 facilities and 12% of SF. (A relatively low number of supply facilities account for a substantial proportion of the total SF because many are warehouses, which tend to be relatively large individual buildings, especially as compared to magazines, which are numerous but tend to be small structures.) Administrative uses account for about 45 facilities, and close to 9% of SF.

Community facilities, including NOS's medical/dental clinic and a variety of recreational and other support facilities, occupy about 60 facilities and 5% of total SF, in addition to the non-structural facilities such as ball fields and picnic areas which are not listed here. About 129 facilities and 4% of total SF are facilities related to Station utilities (power, steam, water, sewer), in addition to the many utility-related facilities which are not normally measured in SF (transformer stations, waste treatment units, steam lines, fuel tanks, sewage treatment tanks and basins, etc).

Housing provided by NOS for military personnel with families accounts for about 92 facilities (housing, garages, and storage buildings) and 9% of SF, including the 7 housing buildings and one related storage building at the Waldorf and LaPlata housing sites. Many of the family housing units are detached houses which are fairly old, but are in relatively good condition; the Station's multifamily units tend to be of more recent construction, and are also in relatively good condition overall. NOS also maintains a number of sites that are used for tenant-owned trailers. Including the trailer sites, NOS can provide housing for about 300 families. About 16 residential facilities are housing and mess facilities for Unaccompanied Enlisted Personnel Housing ("bachelor" quarters, or UEPH).

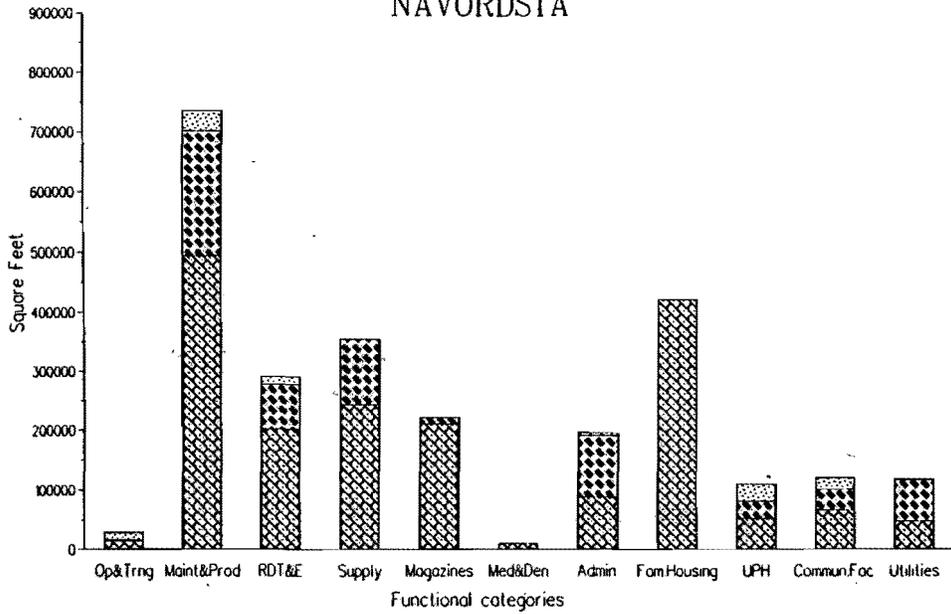
Condition of Facility Assets

Figure 7-5 (Facility Assets) illustrates the condition of the assets at NOS used by NAVORDSTA and its two major tenant activities, the Naval Explosive Ordnance Disposal Technology Center (NAVEODTECHCEN) and the Naval School, Explosive Ordnance Disposal (NAVSCOLEOD).

This summary is provided for general planning purposes only, and is not intended to replace the latest Facility Planning Document (FPD). As an overview, this figure and discussion show adequate, substandard and inadequate assets at the most general level of functional categories, whereas the FPD analyzes them at the level of detailed category codes and individual facilities, including requirements.

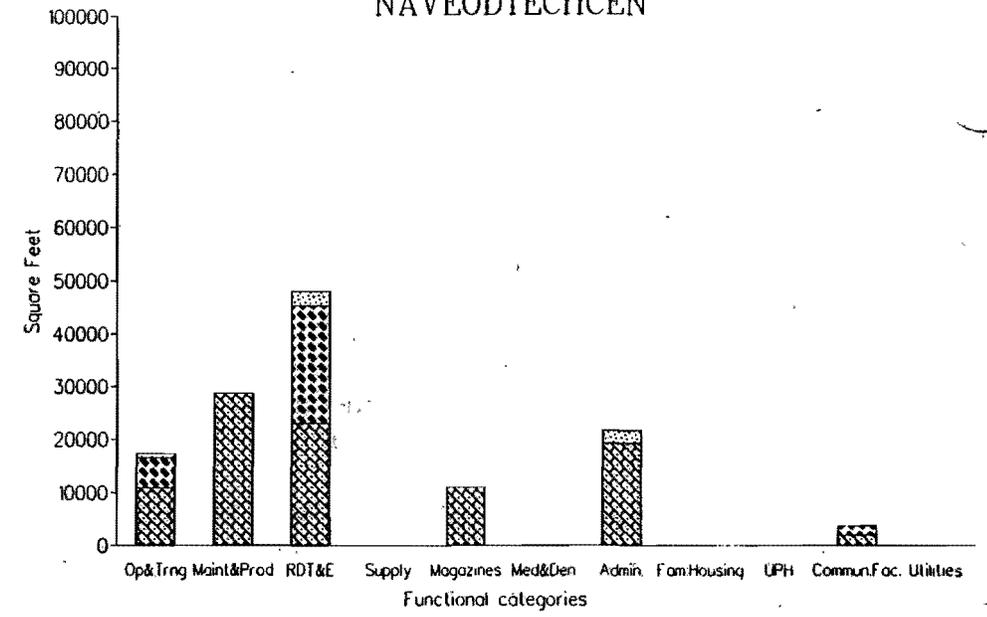
Requirements are based on analysis of the NOS mission, base loading and other relevant information, resulting in a minimum requirement for space (assets) needed in each category code relevant to the Station's mission. In the FPD, this requirement is compared with

Facility Assets
NAVORDSTA

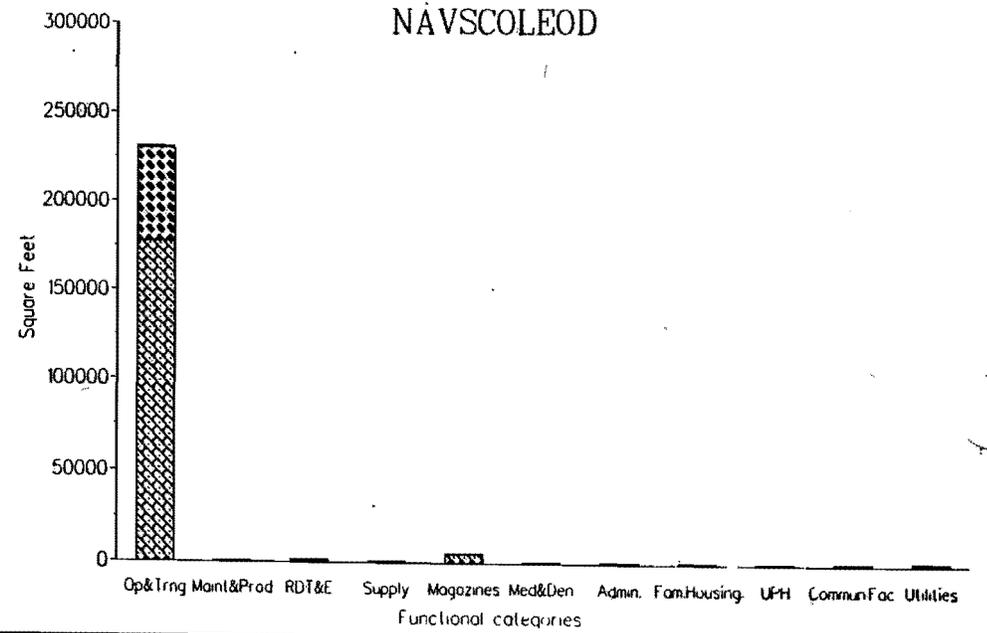


KEY:
 Inadequate Assets
 Substandard Assets
 Adequate Assets

Facility Assets
NAVEODTECHICEN



Facility Assets
NAVSCOLEOD



Facility Assets
Figure 7-5

existing assets, and specific actions are proposed for resolution of deficiencies and/or surpluses in each category code. For detailed information on Basic Facility Requirements, contact the Facilities Acquisition Division (Code 092) of the Public Works Department at NOS.

Facilities (assets) are categorized as either adequate, substandard, or inadequate spaces, as defined in the Shore Facilities Planning Manual (NAVFACINST 11010.44E), December 1987, and summarized below:

Adequate: facilities which are fully capable of supporting their current use without modification or repairs that normally require approval and funding beyond the authority of the activity's Commanding Officer; such facilities should be within the limits and restrictions of planning criteria, satisfy structural and mechanical criteria, and do not conflict with operational or safety requirements; facilities that are acceptable but barely satisfactory are considered adequate.

Substandard: facilities which are capable of supporting their current use, but require modifications or repairs which normally require approval and funding beyond the authority of the activity's Commanding Officer to make them adequate; such facilities can be converted to another functional use for which they would be adequate, if economically justifiable.

Inadequate: facilities that cannot be made adequate for their present use through "economically justifiable means"; inadequate facilities may be made adequate or substandard for a use other than the current one. (The difference between substandard and inadequate is essentially economic; in general, a facility requiring repairs that would cost more than 75 percent of the cost for equivalent new construction should be considered substandard.)

A deficiency is defined as the difference between the approved requirement in a given category code, and existing adequate assets within a category code. Substandard facilities should be upgraded to adequate status wherever possible, or converted to another use for which they would be adequate. Inadequate facilities should be converted to another use or disposed of.

As the Basic Facility Requirements for NOS is under revision, an analysis of assets versus requirements cannot be presented here. Contact the Public Works Facilities Acquisition Division (Code 092) for further information.

There is a prevailing shortage of space at NOS. One result of this situation is that vacant buildings are quickly made use of by a different function, when buildings become no longer useable for their original functions due to changing technology or changes in mission. The changing uses of facilities as they become available often result in substandard or inadequate configurations for the new uses. For example, former production or storage buildings may have inadequate overhead space or cramped floor layouts for administrative or engineering office space; dryhouses formerly loaded from a boxcar loading dock, converted to storage for rocket motors and now loaded by forklift, may not provide good access.

Projects currently planned to correct deficiencies, for NOS as well as its two major tenants, are described in the Capital Improvements Plan.

Transportation

Vehicular access to NOS is from MD 210, a four lane divided highway which extends south from I-95 to the entrance gate to Indian Head. The highway was constructed by the Federal government to assure good access to NOS production and storage facilities. The main gate at the edge of the Town of Indian Head is the only open road access to the Station. At the main gate, MD 210 narrows to two lanes and becomes Strauss Avenue. On an average day, more than 1,250 vehicles pass through the gate. A small guard house provides the only transition between the Town and the Station. Guards depend on signs to slow traffic approaching the gate. Primary and secondary traffic routes and primary traffic destinations are shown in Figure 7-6.

During the morning rush hour, most of the traffic entering the front gate bears left and follows Farnum Road and turns left on Patterson Road to pass through a second security gate to the restricted area. The restricted area gate is a choke point for traffic on the Station. Much of this traffic is headed to the Public Works and Supply area. Other destinations include supply, engineering offices, and other functions that are not required to be in the restricted area. The rest of the organizations within the restricted area are widely dispersed.

The remainder of the traffic follows Strauss Avenue into the non-restricted area. The work centers include Central Administration, the EOD School and Training Facilities, SEAADSA, personnel and administrative facilities. In addition, all traffic to the housing area in the northeast corner of the Station must use Jackson Road to Patterson and Earle Roads.

During the evening rush hours, the traffic pattern reverses with the majority of the traffic exiting the installation from the restricted area.

This traffic uses Patterson Road, then Farnum Road through the main gate.

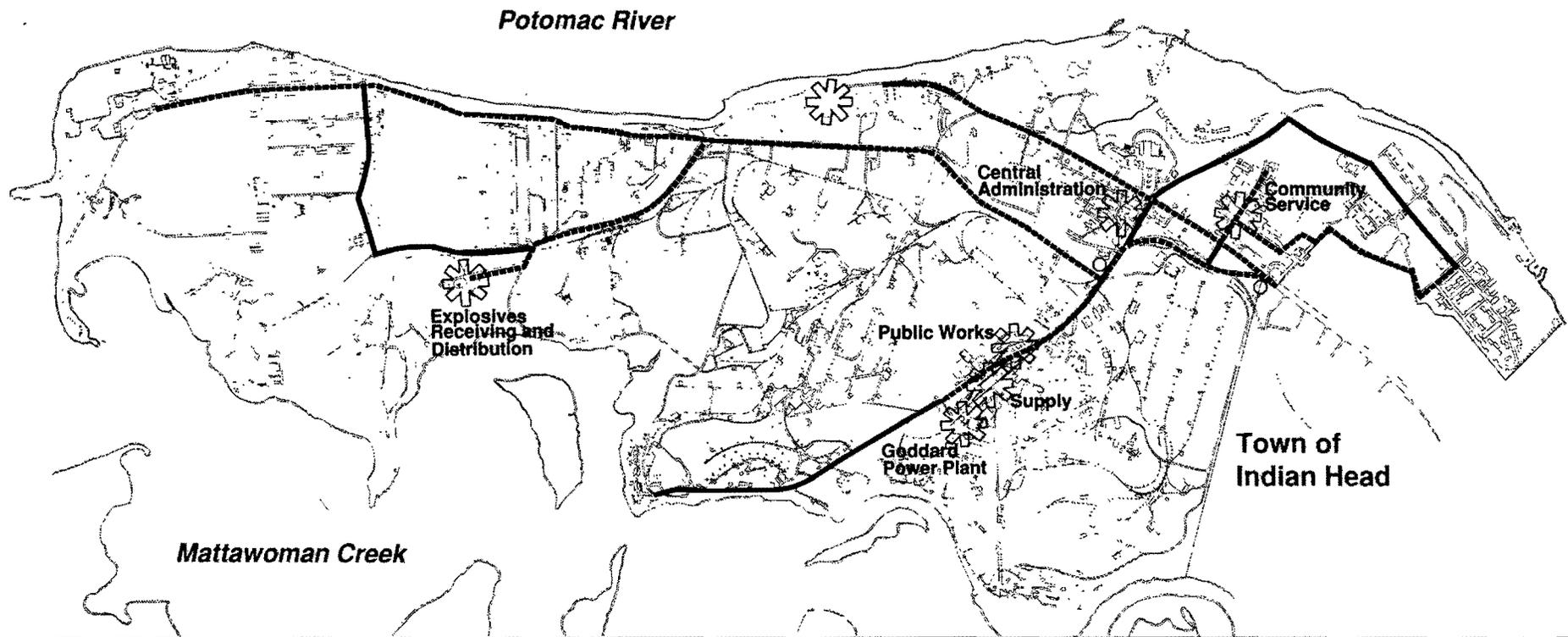
Studies by the Military Traffic Management Command have identified intersections that need to be improved for safety reasons. The intersection of Strauss Avenue and Jackson Road is one of several intersections that will be reconfigured to assure safe traffic flow.

Parking is available in sufficient quantity throughout the Station. In many cases however, this is on-street parking or it conflicts with service access. Both of these situations create serious circulation and safety problems. The worst example of this is the supply building loading dock (Building 116). This one area includes service access for tractor trailers, employee parking, and pedestrian traffic moving between buildings. In general, on-street parking should be eliminated from primary roads and loading area access points, and reduced where possible on other roads.

Patterson Road has parallel parking and 90-degree parking between Farnum Road and Strauss Avenue. This arrangement adds confusion to an area located between two of the three busiest intersections on Station. Adding to the confusion is a service drive extending from Building D-323 to the intersection of Strauss and Patterson.

Parking also creates a hazard on Patterson Road near Buildings 351, 503, and 551. Perpendicular spaces create a situation where cars back out on to a busy road. Heavy traffic at rush hours makes the situation even worse.

Visitors to NOS must register at the Pass Office (Building 872) outside the front gate. Badges are issued here during daytime business hours (7:00 a.m. to 4:00 p.m.). After business hours, visitors are issued a temporary pass at the gate and then must go to Security



INDIAN HEAD

Existing Circulation

Source: Physical Security Division (Dept. 10), Traffic Engineering Study (1984),
Master Plan Update (1982), Facilities Planning Branch (Dept. 09)

LEGEND

- Primary Traffic Routes
- Secondary Traffic Routes
- ⊛ Primary Traffic Destinations
- Security Gate

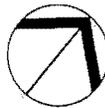


Figure 7-6

Naval Ordnance Station, Indian Head

Police Headquarters (Building D339) to be issued a badge. All visitors entering the Station are subject to inspection by security police. There is no designated area for inspections and most take place at the gate. Vehicle inspections cause traffic to back up, particularly at rush hours. Trucks are not allowed on Station until 8 a.m.

Over 100 delivery trucks a day pass through the main gate at Indian Head. Most of this traffic is headed to the supply warehouse or munitions unloading area. Both of these facilities are located in the restricted area. Each of these vehicles must make three stops: pass office, front gate, and the restricted area gate. The supply warehouse has no requirement to be in the restricted area, but all traffic going there must follow the required security procedures.

The transportation system at Stump Neck (Figure 7-7) is much simpler than at Indian Head. Archer Road is the primary traffic route, and leads from the main gate westward through the middle of the site. Access to Rum Point is currently unrestricted; visitors do not have to pass through the security gate to reach that destination.

A Traffic Management Group has been established to review traffic impacts of all projects and to oversee improvements related to vehicular traffic and safety.

Pedestrian Circulation

Most work centers in the non-restricted area have sidewalks connecting buildings within that area. However, there is very little pedestrian access between work centers. On-station traffic could be reduced by the development of a well-defined pedestrian circulation system. NOS is small, but distances between work centers are perceived as being greater because there is no definite pedestrian link.

Where pedestrian walkways do exist, they are limited in scope. Important pedestrian connections are:

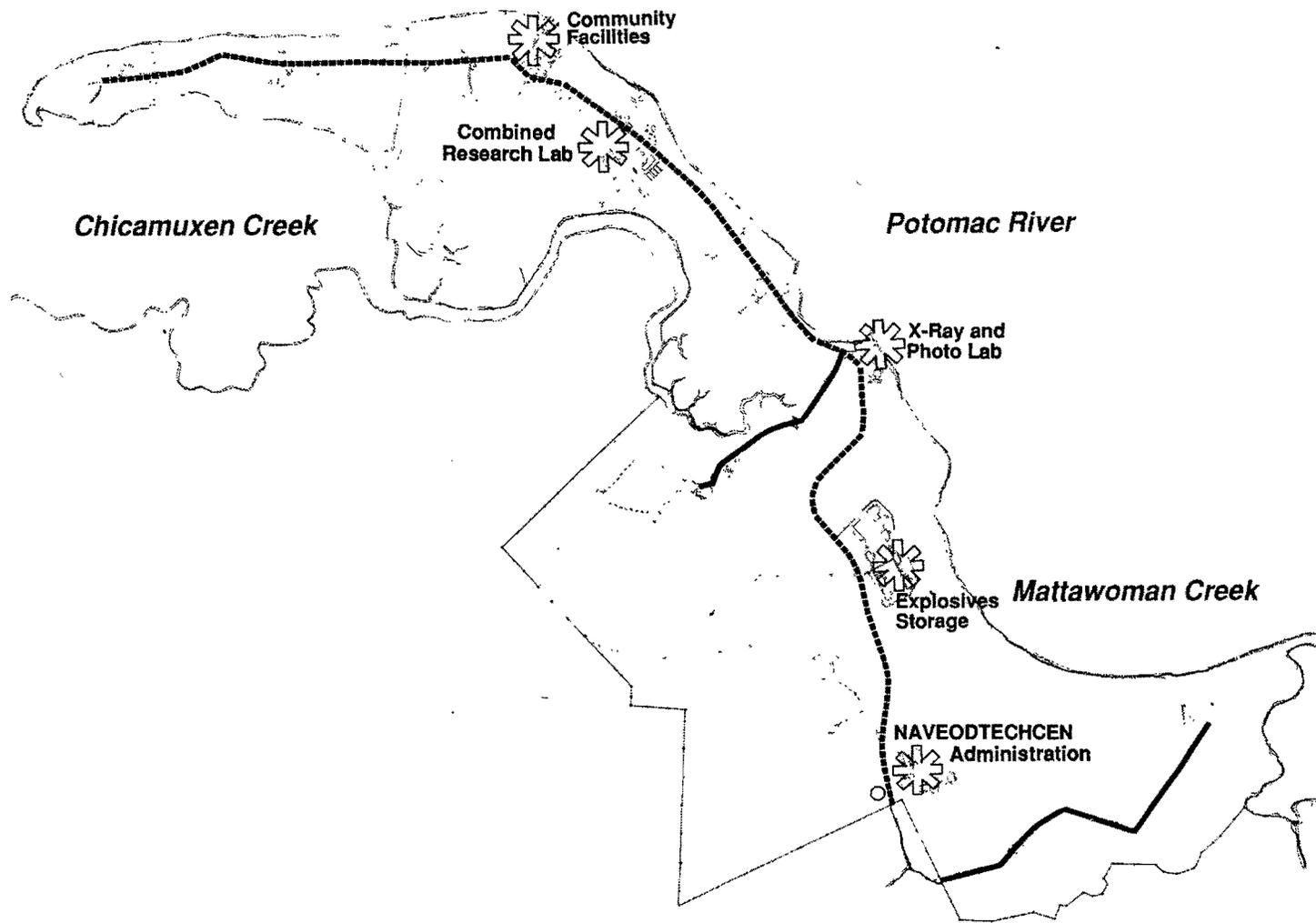
1. Housing--Swimming Pool--Recreation
2. EOD School--Bachelor Housing
3. Administration--Community Facilities and Services--Housing
4. Public Works--Maintenance/Utilities

Production and RDT&E facilities are widely dispersed to meet ESQD requirements. Pedestrian circulation has been developed within general building clusters; this practice should be continued.

Rail System

NOS Indian Head has a rail system (Figures 7-8 and 7-9) that serves the restricted area of the Station with a connecting spur that extends to the CONRAIL junction at White Plains, MD. This unique capability is considered by the Station to be a valuable asset for meeting mobilization requirements. Although the rail system is currently inactive, the Station intends to maintain it for specialized transportation of materials to and from Indian Head. To this end, a railroad operations master plan and instructions are in progress. Use of the rail system will be determined by the comparative cost and convenience of other modes of transportation. Many oversized objects or heavy loads are better delivered by rail.

There are 20.5 miles of track on station; of these, 5.3 miles are active. Facilities served by this portion of the rail system include: coal storage for the Goddard Power Plant, the machine shop (Building 268), supply warehouse (Building 116), packing house #3 (Building 313), the Biazzi plant, and barricaded transfer stations (Buildings 1103 and 1105). While use of this track has been temporarily suspended, the overall condition is good. The suspension is to allow for repair,



STUMP NECK

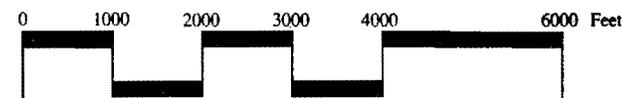
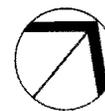
Existing Circulation

Source: Physical Security Division (Dept. 10), Traffic Engineering Study (1984),
 Master Plan Update (1982); Facilities Planning Branch (Dept. 09)

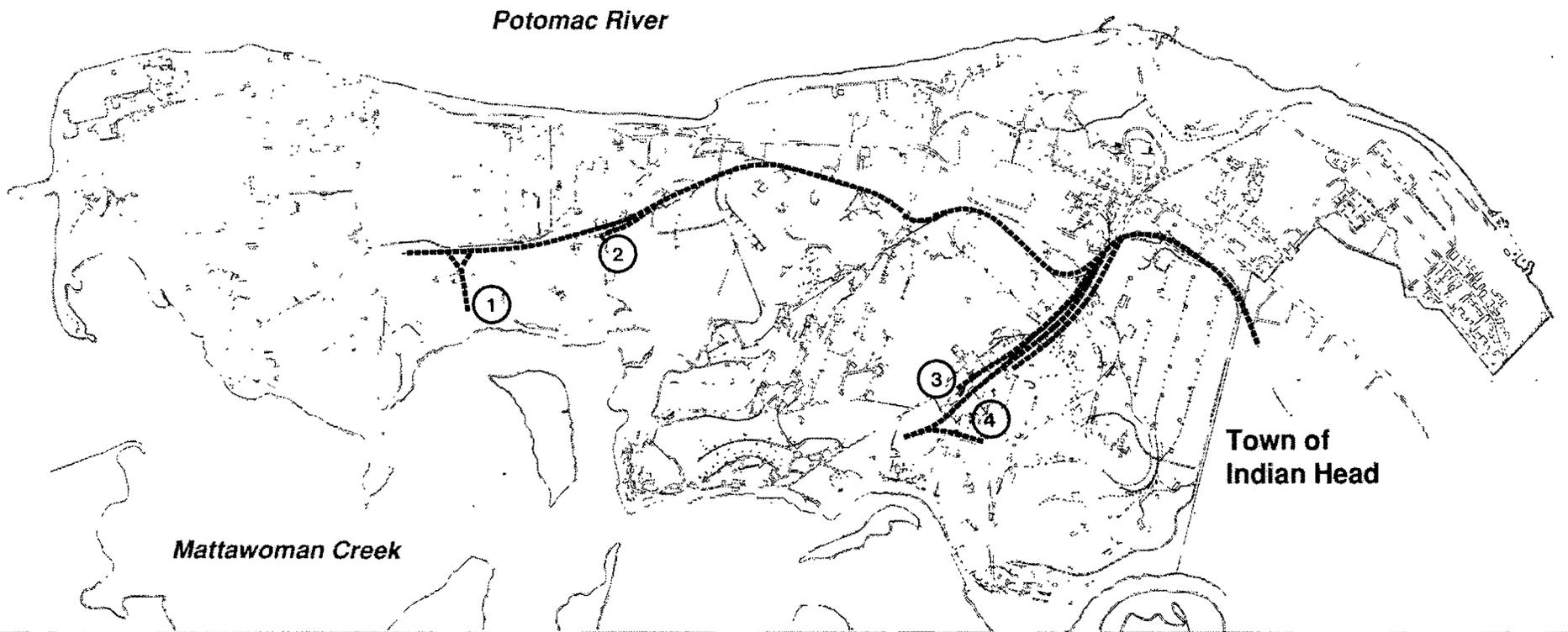
LEGEND

- Primary Traffic Route
- Secondary Traffic Route
- ☼ Primary Traffic Destinations
- Security Gate

Figure 7-7



Naval Ordnance Station, Indian Head



INDIAN HEAD Rail System

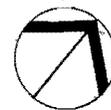
Source: Government Railroad Survey Report (1988), Map - Active Railroad Track Requiring Maintenance (1982)

LEGEND

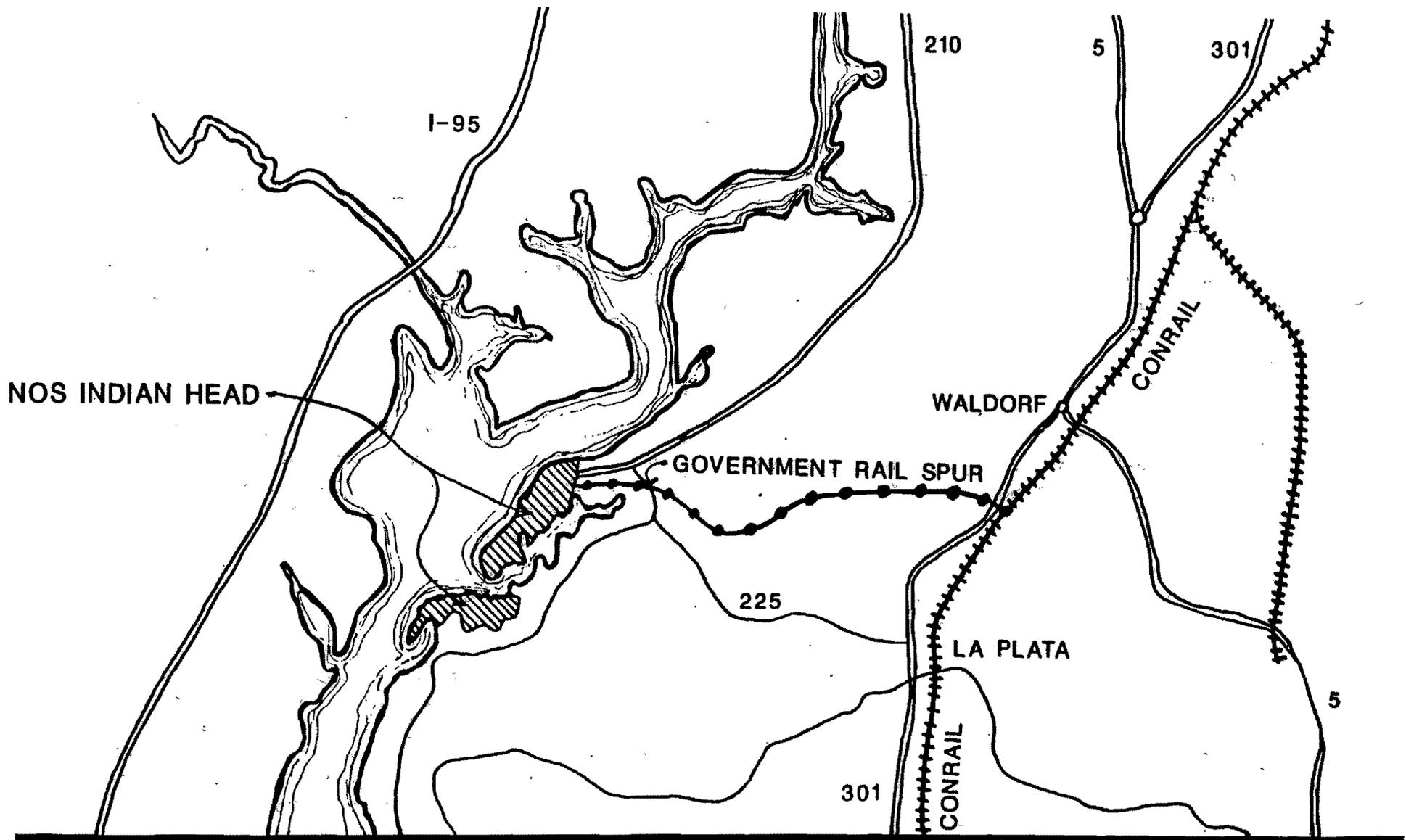
— Active Rail Line

- ① Supply and Explosives Scales
- ② Biazzi Plant
- ③ Rail Yard
- ④ Goddard Power Plant

Figure 7-8



Naval Ordnance Station, Indian Head



INDIAN HEAD

Government Rail Spur

Source: Government Railroad Survey Report (1988) Land use Compatibility Study (1987)

Figure 7-9



NOT TO SCALE

testing, and recertification of portions of the track. Most of the current repairs are on the section of track between the industrial spur and the power plant. Upon completion of this work and recertification of the track, use will be resumed.

The remaining 15.2 miles of on-station track are inactive. This portion of the rail network extends throughout the restricted area. The condition of this track has deteriorated to the point that the Station has abandoned it in place. All switches to the inactive track have been spiked to prevent inadvertent access.

The off-station portion of the rail system is a 14.4 mile connecting spur extending through Charles County. Between the Station fence and the White Plains CONRAIL junction, the 100-foot right-of-way contains approximately 164 acres. Over this distance there are 13 public and 6 private grade crossings. Additionally, there are 48 utility crossings, and two utility lines running parallel to the track. Before reactivation of the rail system, the track and crossings will be evaluated to assure compliance with all applicable regulations.

NOS has established a railway management team to ensure that all aspects of the railway system are properly managed and maintained. The team is responsible for the management of the White Plains right of way, and the maintenance, inspection, and operation of the NOS rail system. They will establish standard operating procedures for the system prior to the activation of the system.

A recent review of right-of-way records conducted for the draft Railroad Operations Master Plan (January 1989) has found that there is encroachment pressure on the railroad right-of-way. An annual update of property records, based on physical inspection of the property, has been initiated to protect the Navy's interest.

Utilities

A Utility System Assessment (USA) was completed by CHESDIV in FY89. This document should be used with the Master Plan when planning for new or remodeled facilities at NOS. The USA provides an in-depth look at the condition and expansion capabilities of existing infrastructure.

Electrical System

Electrical power requirements at Indian Head are met by a co-generation facility working in parallel with a commercial electric utility. The government owned and operated Goddard Power Plant produces 50% of the power used at NOS. The remainder is purchased from Potomac Electric Power Company (PEPCO). All power at the Stump Neck site is purchased from Southern Maryland Electric Cooperative (SMECO).

The Goddard Power Plant uses two 5000kW steam driven electric turbine generators. These generators, numbers 1 and 2, are connected to 13.2kV buses A and B, respectively. They are run on a rotating basis for six month periods. During down-time each generator undergoes maintenance or is kept on stand-by. Both generators run in parallel with PEPCO service through main buses A and B. A normally closed bus-tie breaker connects the two buses.

The PEPCO feeder enters NOS near the front gate, parallels the fence and then runs to the Goddard Substation. The PEPCO line is metered at 69kV before terminating at two government owned 7,500 kVA transformers at the Goddard Substation. The 13.2kV transformer secondaries are tied to both buses A and B in the Goddard Plant. This arrangement allows the use of commercial power to supplement either

of the NOS generators. Because of contract limitations between PEPCO and SMECO, the Station can only purchase 10,000 Kw (10 Megawatts) at power from PEPCO in conjunction with the generating capacity at 5,000 kW.

The existing emergency diesel generator at the Goddard Plant is out of service. This generator served as a back-up power source for electrically driven boiler auxiliaries and power plant control systems. Currently the emergency power requirement is being met by a 1500kW generator being leased from the Naval Energy and Environmental Support Activity through FY91. At that time, a new generator must be in place or the loan extended.

The facility will consist of a new generator, transformer substation, diesel fuel pumping system, and associated electrical synchronization equipment. It will provide the ability to restart the steam boiler plant within thirty minutes of a power failure. Normal boiler operation is required to provide the steam pressure necessary to maintain service to essential facilities. Without the emergency power, a cold restart of the power plant is impossible.

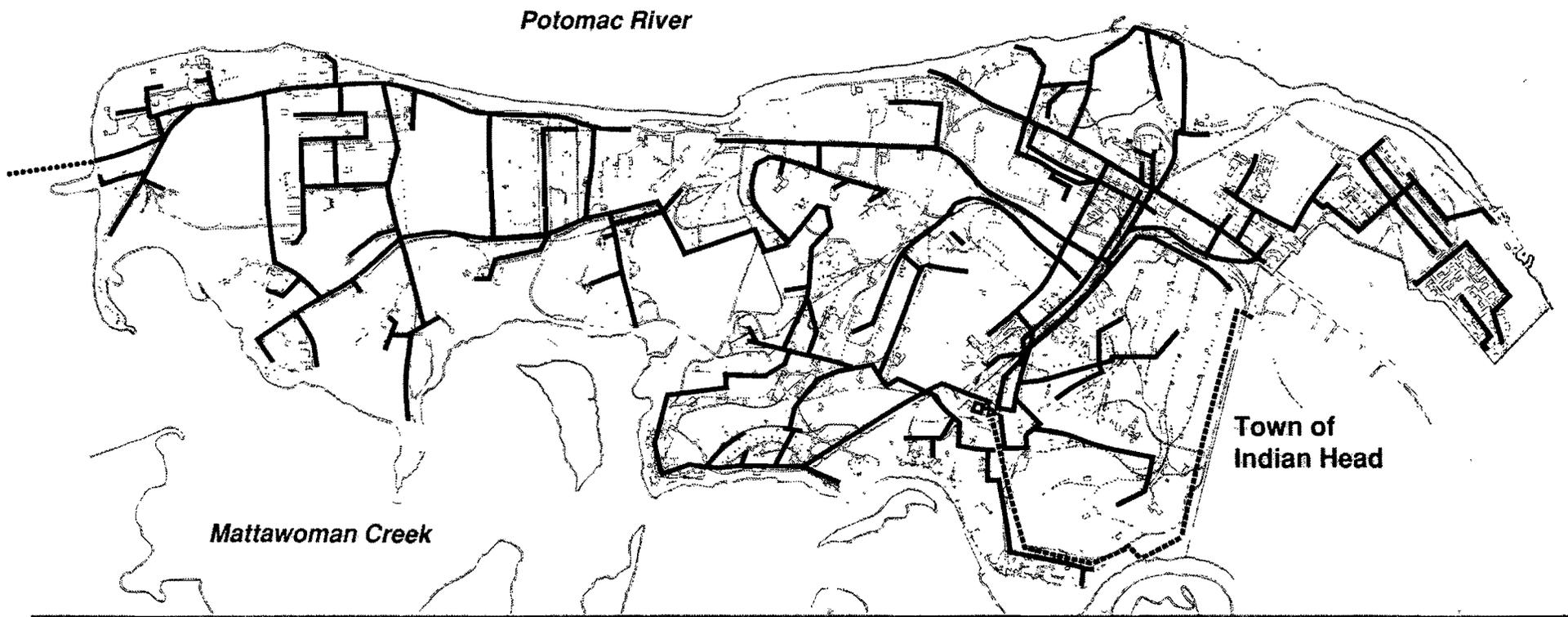
The electrical distribution system (shown in Figure 7-10) consists of eight 13.2kV feeders extending from buses A and B. The distribution network is a simple radial configuration. Each branch operates independently, but has an interconnect to another branch to provide an alternate feed in the event of an outage. A total of eight substations and several individual facilities are served by the feeders. From the substations, 2.3kV distribution lines serve each facility.

Electrical use at Indian Head has steadily increased over the last several years. During the summer of 1988 the peak load was 10,900kW, double the capacity of the power plant during normal, single generator operation. The additional power was purchased from

PEPCO. Running both generators would require the use of two boilers and create a steam load of 250,000 lbs/hr. During the summer months, normal steam usage is 100,000 lbs/hr. Operation of the second generator would create a steam surplus of 150,000 lbs/hr. Condenser capacity at the plant is only 40,000 lbs/hr.

Demand for electrical service is beginning to exceed the system capacity at the west end of Indian Head. The cast plant area is where the problem is most critical, followed by the extrusion, housing, and administration areas. This additional demand is due to the increased requirement for air conditioned computer rooms. Another factor is the installation of Integrated Dehumidification Systems (IDS) in the production area. IDS is required for many of the processes in operation at Indian Head. MILCON project P-059, Mix, Assemble and Cure Facility includes a new Transmission line from the Goddard Plant to the cast plant area. This improvement is expected to fill the power requirements in the area of highest demand on NOS.

The distribution system typically consists of weatherproofed single copper conductors mounted on conventional wooden utility poles. A 4,600 foot submarine cable connects feeder 7-D with a 2500kVA substation in the Stump Neck area. This cable is now abandoned and, because it is damaged in its submerged section, cannot be economically repaired. Essentially there is no backup feeder. Due to load growth at NOS, the Stump Neck demand was removed from the network to allow the expansion of electrical service at Indian Head. Electrical service at Stump Neck is provided by a feeder from SMECO to a 1500kVA substation, where it is reduced to 2.4 kVA for distribution throughout the area (see Figure 7-11). The feeder enters Stump Neck as an overhead line and follows Archer Avenue to the intersection with Howard Road, where it becomes a buried cable and continues along Archer Avenue to the substation. A May, 1988 study



INDIAN HEAD

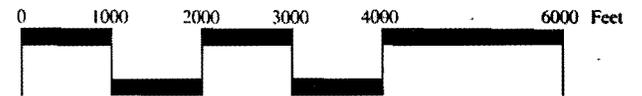
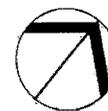
Electrical System

Source: Master Plan Update (1982), Power Generation and Distribution Branch and Engineering Design Branch (Dept. 09)

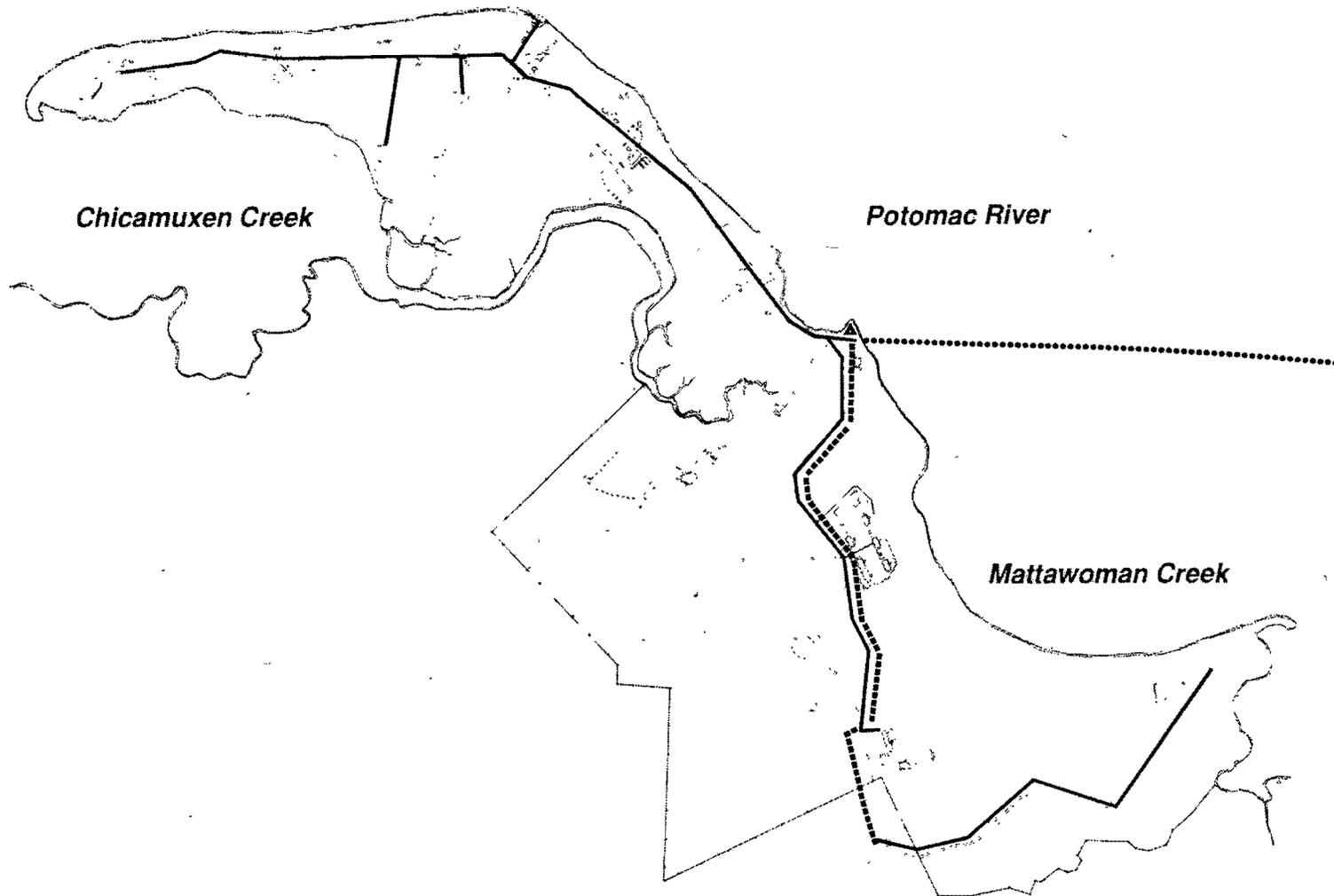
LEGEND

- ▣ Goddard Power Plant
- ▲ Goddard Substation
- Pepco Feeder
- Primary Circuit
- Submarine Cable

Figure 7-10



Naval Ordnance Station, Indian Head



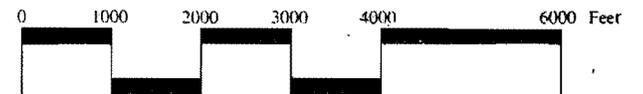
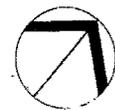
STUMP NECK Electrical System

Source: Master Plan Update (1982), Power Generation and Distribution Branch
and Engineering Design Branch (Dept. 09)

LEGEND

- | | |
|--------------------------|-----------------------|
| — Main Distribution Line | Submarine Cable |
| SMECO Feeder | ▲ Main Substation |

Figure 7-11



Naval Ordnance Station, Indian Head

indicated a peak demand of 1077 kVA; a 72% loading of the existing Transformer substation served by SMECO.

The Rum Point area is fed separately by a second SMECO feeder. The last section of this feeder is only single phase.

Potable Water Supply

Water supply is one of the more critical issues facing NOS. By an agreement with the Maryland Department of Natural Resources, Indian Head is allocated an average daily limit of 1.4 million gallons, with a maximum daily limit of 2.3 million gallons per day. The term of the agreement is through July 10, 1991. Water consumption is currently over 95% of the allotment for the thirteen wells at Indian Head and Stump Neck. Consumption has been above 90% for the last five years (see Figure 7-12). Over the last ten years the water table has lowered by 30 feet. This drop, and the appearance of brackish water in some wells, make it unlikely that the allotment will be increased.

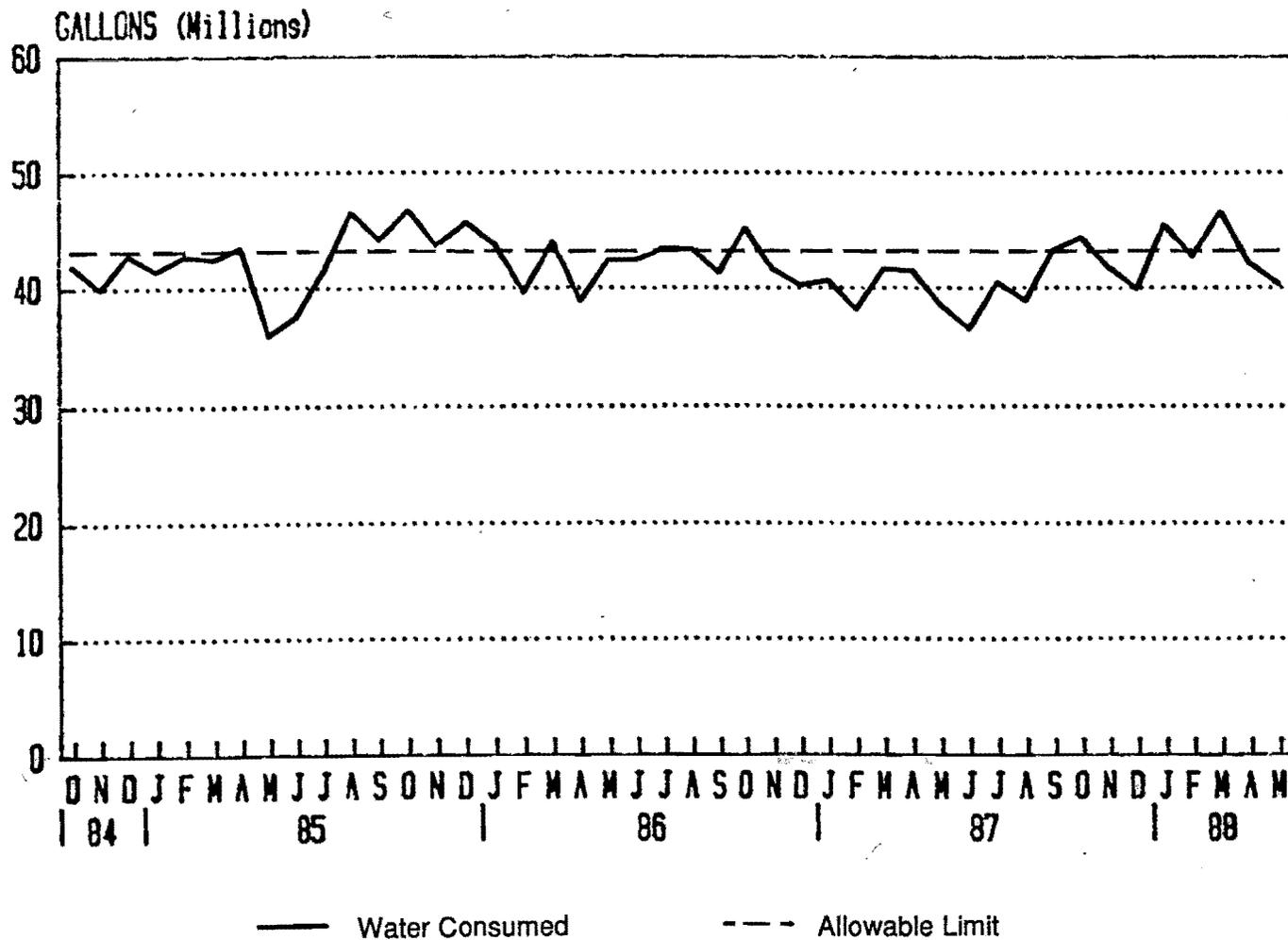
There are three distinct water systems at Indian Head: low silica (Figure 7-13), high silica (Figure 7-14), and river water (Figure 7-15). Low silica water is used primarily for the power house boilers and steam system and industrial process water. High silica water is used for domestic water. River water is used for fire protection and industrial cooling applications. Leaks are considered to be a problem in all three systems but the extent of water loss is unknown. High silica water is pumped from seven wells on Indian Head. Water is chlorinated at each well house and stored in two 150,000-gallon elevated tanks, nos. 897 and 896 (tanks 1 and 3). Wells A, 2, 6, 7, 9, and 12 feed the distribution system. Well 3A is connected to a 200,000-gallon elevated tank, no. 1533 (tank 4) and is dedicated to the Steam 'B' Plant. Design is underway to eliminate well 3A because of

its poor water quality, and to feed the steam B elevated storage tank with low silica water from well 15.

Low silica water is pumped from three wells located on Indian Head and is used primarily as boiler feedwater for the Goddard Steam Plant. The low silica water must be used at the Power Plant to prevent the formation of scale on the turbine generator. Current low silica capacity is 718,000 gallons per day. Water from wells 15, 17, and 18 is chlorinated at the well house and pumped to a 150,000-gallon elevated tank, no. 874 (tank 2). From this tank, water is sent to the distribution system or to a 300,000-gallon ground-level reservoir. This reservoir, no. 898, is dedicated storage for the Goddard Steam Plant. Well 16A was designed to be a low silica well but, when put into continuous service, its silica concentration was unacceptable for use at the Power Plant. The well has a 700,000 gallon per day capacity but is not currently in use except for emergencies. Plans are being developed to connect 16A to the high silica system. Well 15 has a hole and severe offset in its casing and is programmed for replacement in FY90.

River Water Supply

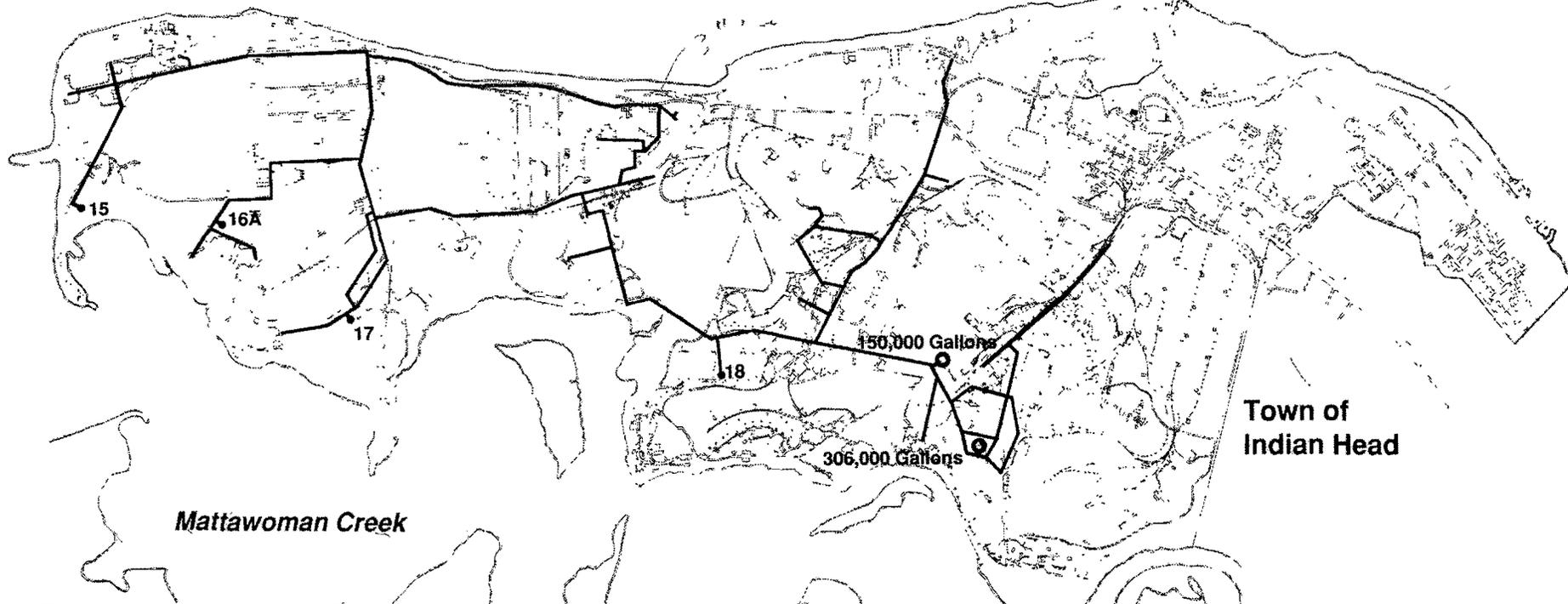
The river water system is supplied by two pump houses located on the Potomac River. Pump house A (Building 100) contains four electric pumps with a total capacity of 8,400 gallons per minute (gpm). Two are constant speed pumps with a capacity of 2,000 gpm each, and one a variable speed with a capacity of 2,000 gpm. The fourth is a constant speed diesel pump with a capacity of approximately 2,000 gpm. A back-up system in Building 254 uses two variable speed diesel-powered pumps rated at 1,000 gpm each. Pump house B (bldg. 739) uses two electric driven pumps, one constant speed and the other variable, each with a capacity of 2,000 gpm, and a constant speed diesel powered pump with a capacity of 1,800 gpm. The water is



Comparison since beginning of FY85

Figure 7-12
Water Consumption Vs. Allowable Limits - NOS, Indian Head

Potomac River



Mattawoman Creek

Town of Indian Head

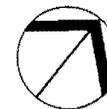
INDIAN HEAD Low Silica Water System

Source: Master Plan Update (1982), Water and Wastewater Operations Branch (Dept. 09)

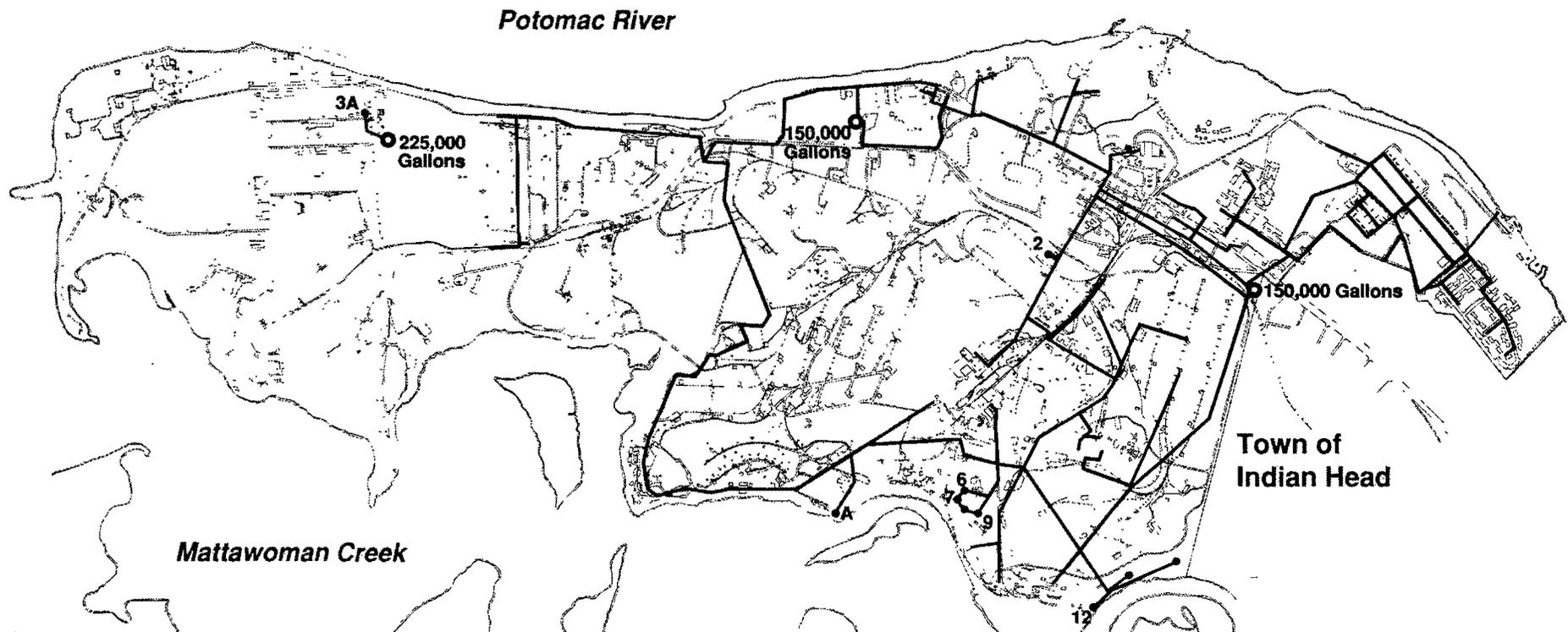
LEGEND

- Main Distribution Line
- Well
- ◉ Storage Tank

Figure 7-13



Naval Ordnance Station, Indian Head



INDIAN HEAD

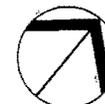
High Silica Water System

Source: Master Plan Update (1982), Water and Wastewater Operations Branch (Dept. 09)

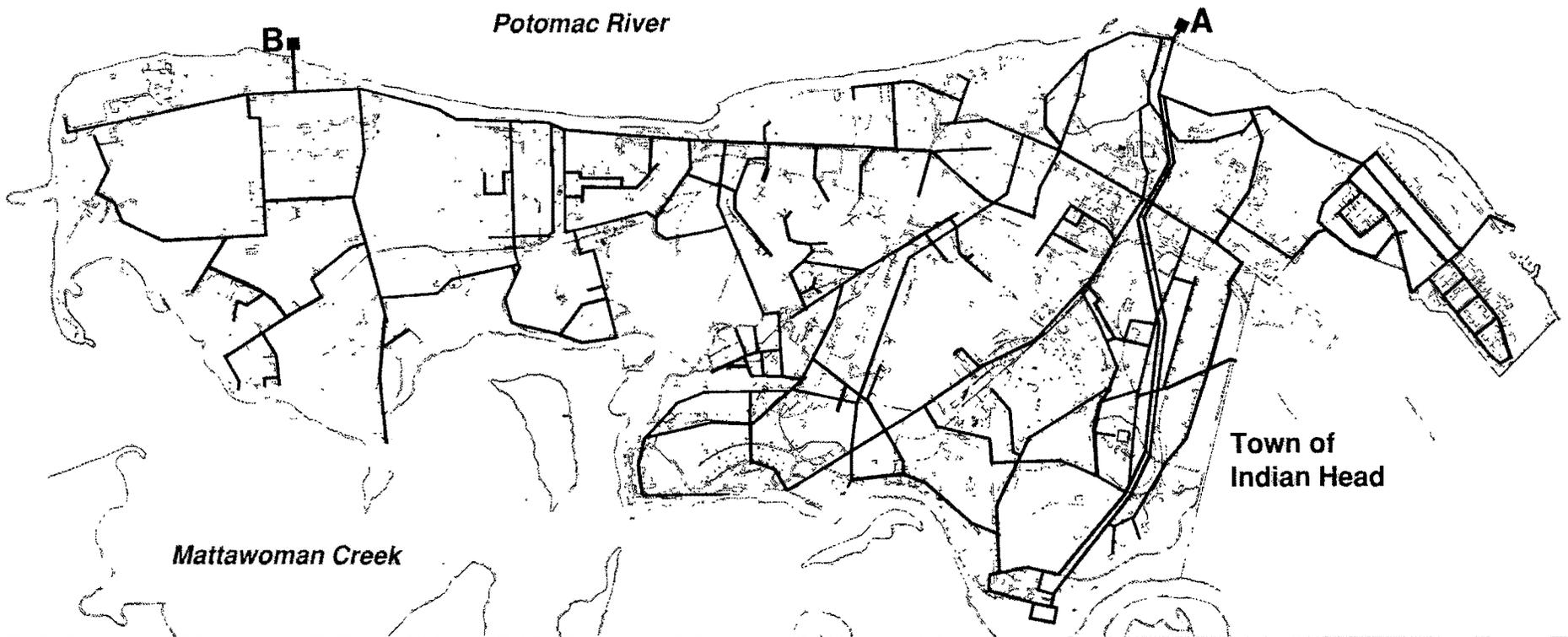
LEGEND:

- Main Distribution Line
- Well
- ◉ Storage Tank

Figure 7-14



Naval Ordnance Station, Indian Head



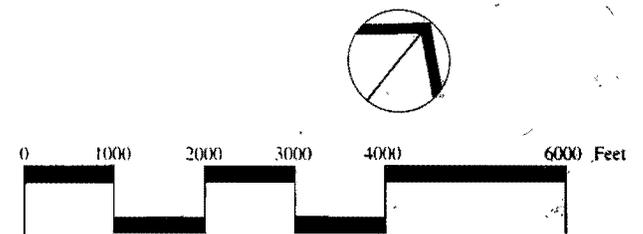
INDIAN HEAD River Water System

Source: Master Plan Update (1982), Water and Wastewater Operations Branch (Dept. 09)

LEGEND

- Main Distribution Line
- Pump House
- Abandoned Treatment Plant

Figure 7-15



Naval Ordnance Station, Indian Head

chlorinated at each pump house before entering the distribution system. At one time, a portion of the river water was given further treatment in a plant (Buildings 483 and 484) consisting of clarifiers, chemical dosing chambers, and pressure filters. Treated water from the plant was stored in a ground level, concrete storage tank with a capacity of two million gallons. The treatment plant and storage tank are in poor condition and considered unusable. They are scheduled for demolition in FY90.

The poor quality of the water removed from the Potomac River has taken its toll on the river water distribution system. The system, built 20-30 years ago, is made of steel pipe. The highly turbid water has reacted with the pipe forming a coating which has reduced the pipe size by 20 to 35%. Regular maintenance keeps the lines operable, but the only solution to the problem is repair or replacement with cement lined piping or construction of a river water treatment facility (MILCON P-056, currently unprogrammed). A large portion of the river water mains were relined or replaced in FY87.

A river water system upgrade program was started in FY85. Phase I included piping in the housing area; Phase II, in FY86/87, upgraded piping in the Main Industrial area. Phase III, in FY90, will completely upgrade the two pump houses including replacement of several pumps. These efforts must continue to assure continued use at the river water system.

The Stump Neck area has its own wells and water distribution system (Figure 7-16). Two wells provide water for this area. Only one well is in service; it has a capacity of 300 gpm which is more than adequate. The backup pump has not been operated in several years and has an unknown capacity. Water is chlorinated at the pump house, and stored in a 250,000 gallon elevated tank. This water system provides water for domestic, industrial and fire protection use at

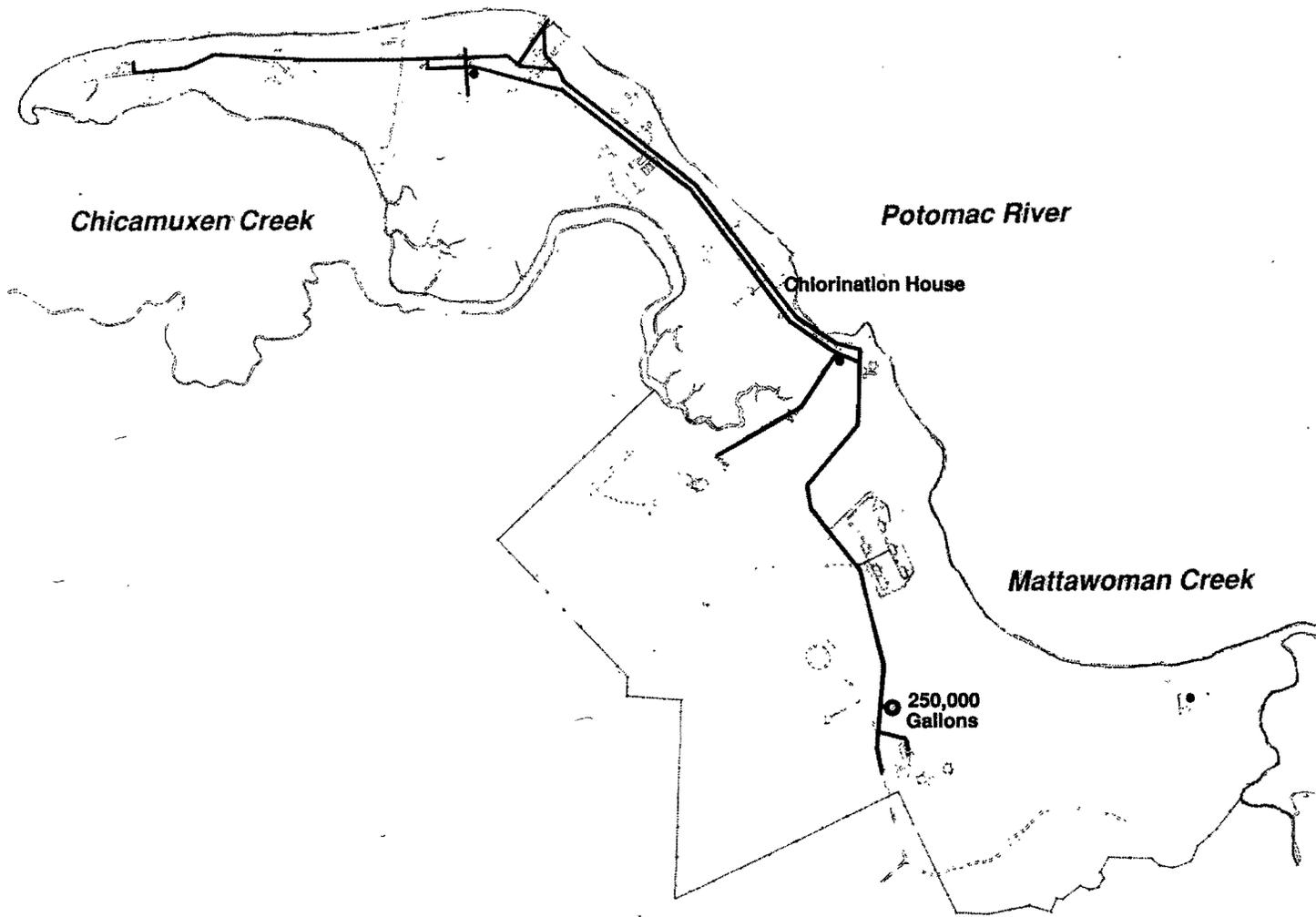
Stump Neck. Water distribution does not extend into the Rum Point area. Buildings in this area are served by a separate deep well. Water supply in the Stump Neck area is sufficient to meet current needs, but it must be considered in the overall water usage at NOS.

A study of the water supply and usage at Indian Head was conducted in May 1982. The survey showed that the largest consumer of well water at NOS is the Goddard Power Plant. Sanitary use by Station residents and employees is the next largest demand. Several recommendations for reducing water use were made:

1. Elimination of the use of once through cooling water.
2. Installation of water-saving sanitary fixtures.
3. Increased awareness of water conservation methods by employees.
4. Include on-site waste water recycling systems in large scale projects.
5. Reduction of water pressure in housing areas.

Planning for future facilities at NOS Indian Head will be extremely difficult without current and accurate water use figures. The water appropriation and use permit with the State of Maryland will expire in July, 1991, and current conditions make it unlikely that the allotment will be increased. Thus, new facilities will have to be provided for by an overall reduction in water use. The conservation measures recommended in the 1982 study should be implemented. NOS should also conduct a leakage survey of the existing water system.

On July 14, 1988, a meeting was held to discuss the problem of brackish water in the Indian Head area as described in a 1984 study by the Maryland Water Resources Administration. The meeting was attended by representatives of NOS Command Staff, Public Works, and the Town of Indian Head. The 1984 study reported an increase in

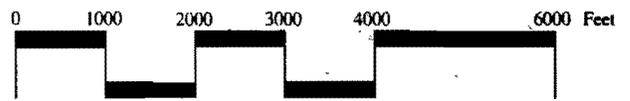
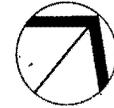


STUMP NECK Water System

Source: Master Plan Update (1982), Water and Wastewater Operations Branch (Dept. 09)

- LEGEND**
- Main Distribution Line
 - Well
 - Storage Tank

Figure 7-16



Naval Ordnance Station, Indian Head

chloride (CL) concentration and total dissolved solids (TDS) in two of four town wells and three of twelve NOS wells. The NOS wells cited were 3A, 3B, and 17. The highest levels were in well 3A, with CL at 146 mg/L and TDS at 430 mg/L, compared with 1971 levels of CL at 95 mg/L and TDS at 400 mg/L. These concentrations are very close to the EPA recommended limits for CL and TDS. While these levels do not cause any serious health problems, the town and NOS are concerned that they may continue to increase. If the problem is not dealt with soon, it may be necessary to provide costly water treatment, construct replacement wells, or find a new water source for the area. The Water Resources Administration suspects that the source of the CL and TDS is intrusion from the Potomac River. Brackish water may be seeping into the Patapsco aquifer as it passes beneath the river flowing southeast to the Indian Head area. Current hydrogeologic data on the area is not sufficient to determine the future impact of continued pumping from the aquifer.

The result of the meeting was a proposal for a preliminary study to determine the requirements of a detailed study of the brackish water problem in the Indian Head area. The following actions have been taken;

1. Historic data on pumpage, water-levels, and CL and TDS concentrations has been assembled.
2. The hydrogeologic make-up of the aquifers has been documented.
3. Wells are monitored for water levels and CL and TDS concentrations.

NOS is proceeding with the second phase of the Brackish Water Intrusion Study with the U.S. Geological Survey.

Steam System

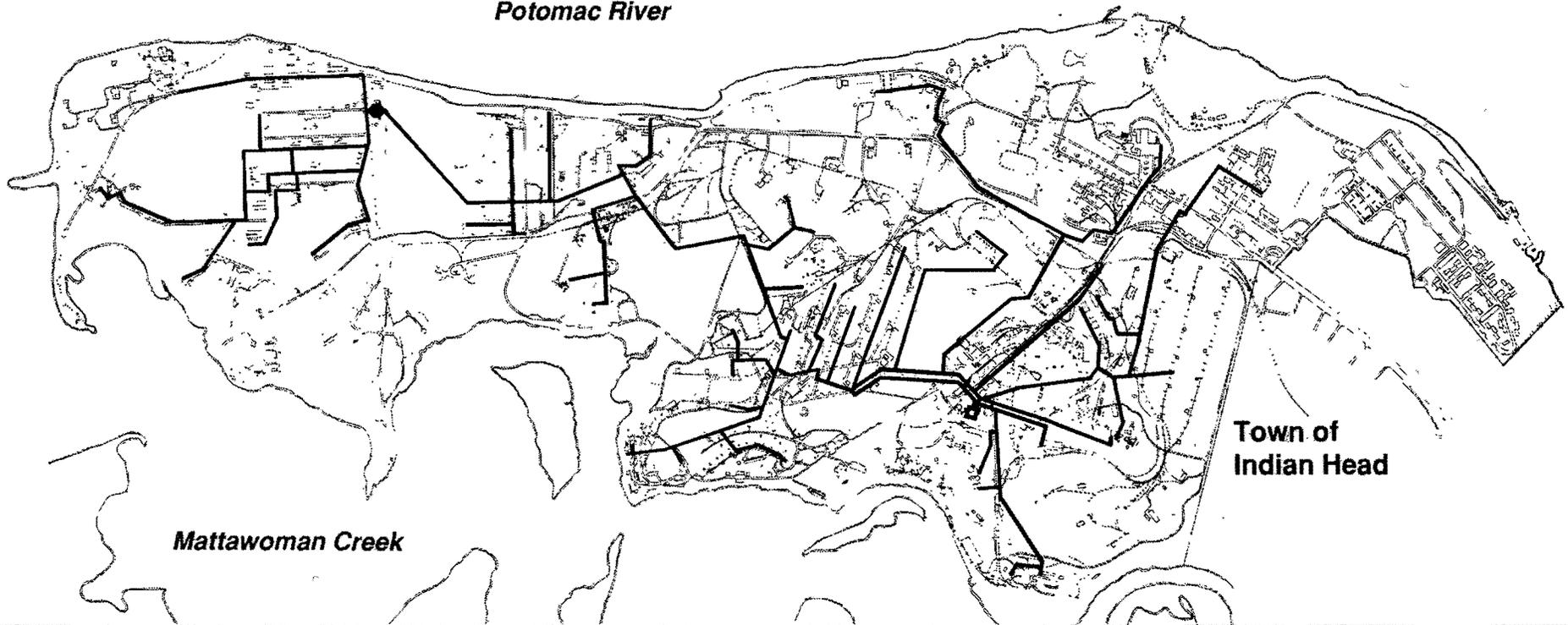
Steam is produced at the Goddard Power Plant where it is used to drive turbine generators. It is then distributed throughout the Station for heating and production uses. The distribution system consists of 32 miles of piping ranging in size from 1" to 18" diameter (see Figure 7-17).

The Goddard Power Plant, building 873, has three boilers, installed in 1957. Each is capable of producing steam at the rate of 150,000 lbs/hr. During normal operation, one boiler will be on line, one on stand-by, and one down for maintenance. Use of the boilers is rotated to allow a continuing maintenance program. Each of the boilers has a dual fuel capability. Pulverized coal is the primary fuel with #6 oil as the secondary fuel. The boilers can switch fuel sources with no interruption in service.

During the winter months, supplemental steam is generated in the Steam B plant, building 712. A dual fuel boiler produces up to 30,000 lbs/hr, of steam to boost steam pressure during the winter heating season.

Steam is distributed radially from the Goddard plant by 32 miles of piping. Ninety percent of the system is above ground and in generally good condition. A problem area is external valves and reducing stations where insulation has deteriorated or been removed for service and not replaced. Approximately 30 smaller boilers of assorted sizes are located throughout NOS. These boilers serve housing, specific facilities, or processes with a combined capacity of 32,000 lbs/hr.

Potomac River



Mattawoman Creek

Town of Indian Head

INDIAN HEAD

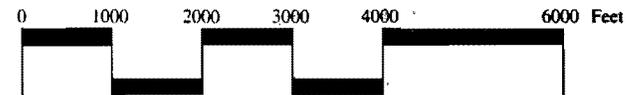
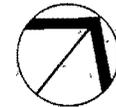
Steam System

Source: Facilities Planning Branch and Power Generation and Distribution Branch (Dept. 09),
Master Plan Update (1982).

LEGEND

- Main Distribution Lines
- Goddard Power Plant
- Steam 'B' Plant

Figure 7-17



Naval Ordnance Station, Indian Head

Compressed Air System

Industrial facilities in the restricted area of Indian Head are served by a compressed air system (See Figure 7-18). The system is supplied, in part, by two compressors located in Building 111, near the Goddard Power Plant. One is a 700hp compressor with a 3,200 cfm capacity at 100 psi and is less than five years old. The other is a 500hp Chicago-Pneumatic compressor with a 2,200 cfm capacity at 100 psi installed in the early 50's. Distribution lines extend radially from the main compressors in Building 111 to the industrial and research areas. The lines generally follow the steam lines, extending to a length of 27 miles. Pipe sizes for the air system vary from 1" to 6" in diameter.

An additional 800hp compressor with a 3,130 cfm capacity at 100 psi in Building 1647, near the Steam B plant, helps to maintain pressure in the west end of the restricted area. The two facilities are connected by a 6" line. This interconnection provides a means to balance the system and to assure a reliable and consistent supply of compressed air throughout the Station.

The overall condition of the compressed air system is good. The system is well maintained, but is beginning to fall short of meeting the current demand. Users at the west end of the system have had a problem with an insufficient volume of air being available.

As compressed air requirements have grown, many new taps have been made into the system. Often these taps are made without being recorded or notification given to the physical plant. The total compressed air requirement at NOS is unknown. The plant has continued to keep up with the demand but no record of compressed air usage has ever been made.

Due to the size of the system, there is a problem with condensation in the lines. The effects of this problem are especially felt during the winter months when the water may freeze, blocking the line.

The compressed air system is being evaluated under Contract Number, N62477-88-C-3824 (ES). Work to be accomplished under this contract includes:

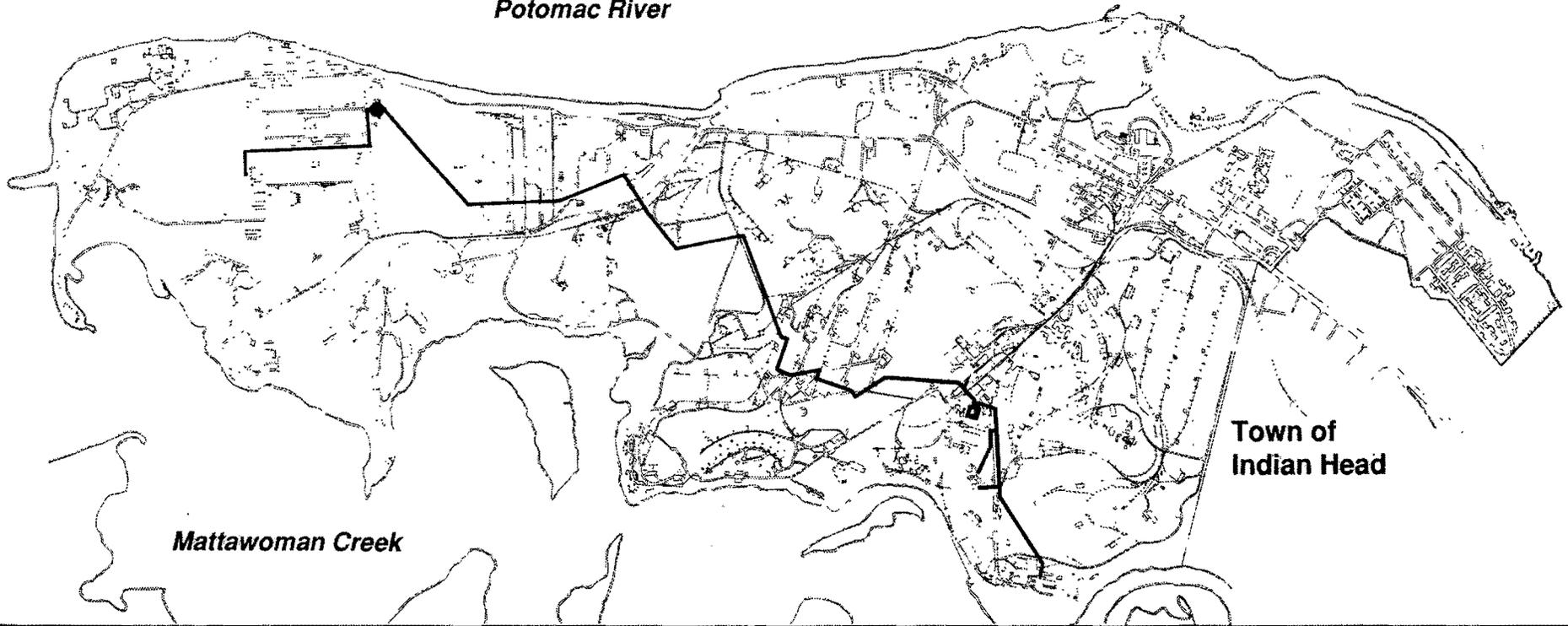
1. Mapping the system
2. Checking for leaks
3. Testing all valves
4. Finding low points
5. Determining capacity
6. Determining NOS compressed air requirements over the next five years

Sewer System

The FY83 completion of MILCON Project P-950 expanded the Station's largest treatment plant (Figure 7-19). Combined with the construction of new force mains, gravity mains, and pumping stations, the new plant meets all sanitary sewer requirements for the Indian Head area. All but one septic system at Indian Head have been disconnected and abandoned in place. The remaining active system services Building 313. The new treatment plant has a capacity of 500,000 gallons per day, and meets all State and Federal requirements. Discharge from the plant is to the Potomac River.

Groundwater infiltration and storm water inflow into the sanitary sewer system has been identified as a significant problem at NOS. A Sanitary Sewer Evaluation Survey (SSES), completed in July, 1988 studied in detail the Pump Station 11 Basin, (see Figure 7-19), and performed flow monitoring throughout Indian Head. During the two

Potomac River



Mattawoman Creek

Town of Indian Head

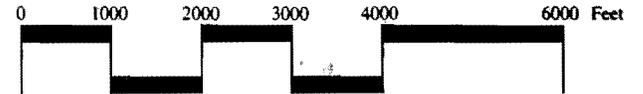
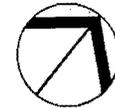
INDIAN HEAD Compressed Air System

Source: Master Plan Update (1982), Power Generation and Distribution Branch
and Engineering Design Branch (Dept. 09)

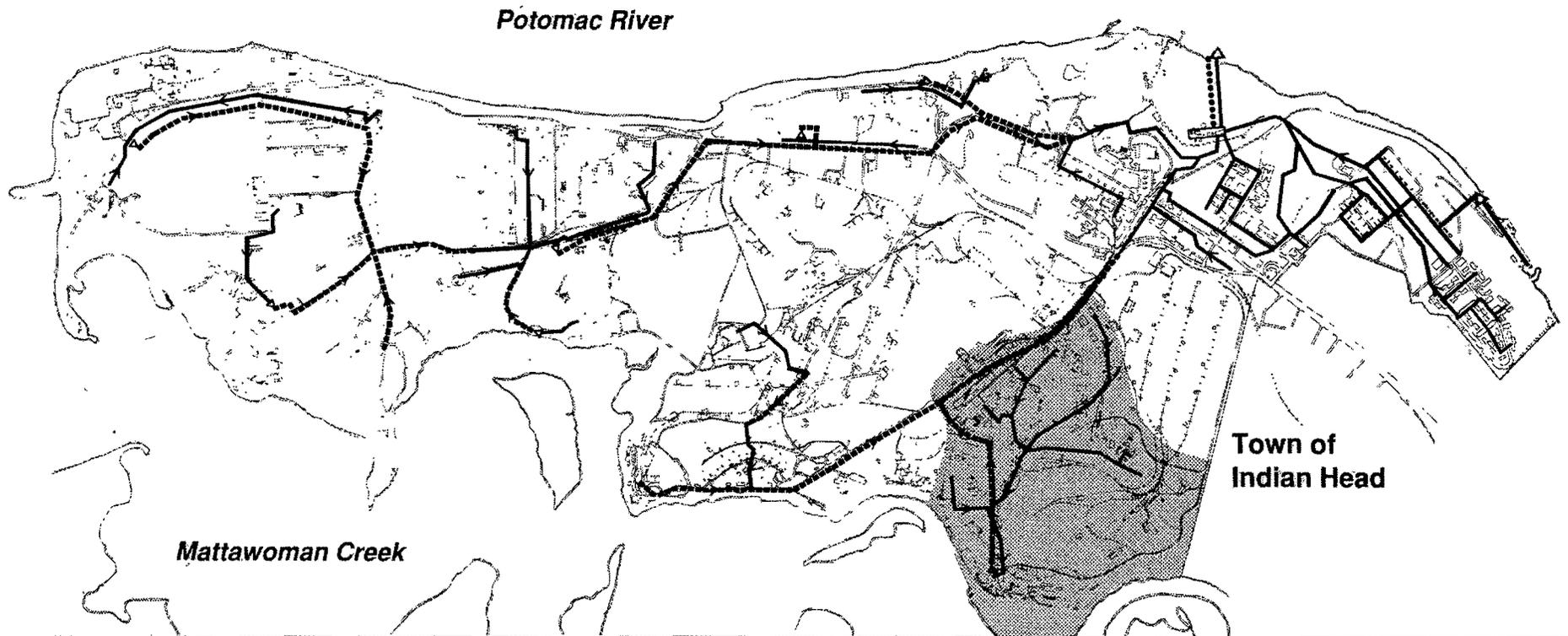
LEGEND

- Main Distribution Lines
- Goddard Power Plant
- Steam 'B' Plant

Figure 7-18



Naval Ordnance Station, Indian Head



INDIAN HEAD

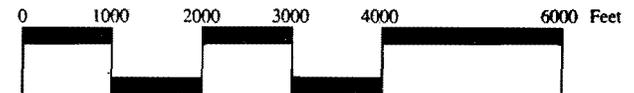
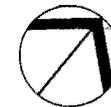
Sanitary Sewer System

Source: Water and Wastewater Operations Branch (Dept. 09), Sanitary Sewer Evaluation Survey, RJN Environmental Assoc. (1988); Master Plan Update (1982).

LEGEND

- > Force Main
- Gravity Main
- Outfall
- △ Pump Station
- ▭ Sewage Treatment Plant
- ▨ PS 11 Basin

Figure 7-19



Naval Ordnance Station, Indian Head

month monitoring period, the average flow to the treatment facility was 0.46 million gallons per day (mgd), 92% of the facility's 0.50 mgd design capacity. The study showed that 66% of the average daily flow came from infiltration and inflow. The base, or actual sewage flow to the treatment plant is 0.156 mgd.

The report projects that during a one year storm, sewer flows could increase to an instantaneous peak of 2.7 mgd due to storm water inflow.

Continued rehabilitation of the sanitary sewer system at Indian Head can significantly reduce the rate of flow to the NOS treatment plant. Reducing flow in this manner will assure that the plant will continue to meet NOS sanitary sewer requirements well into the future.

Design for the rehabilitation of the Pump Station No. 11 subarea is underway and scheduled for construction FY90. Detailed evaluation of five other subareas will be completed in mid FY90. Design contracts for those projects will be awarded the same year for construction of the projects in FY91 and FY92. NOS has programmed \$300,000 for repair of sanitary sewers over the next three years.

Production facilities at Indian Head release waste water that contains organics, nitrogen, or explosive nitrate esters. Current operations are subject to National Pollution Discharge Elimination System (NPDES) permit which requires these waste products to be treated with the "best available technology".

To meet this requirement, MILCON Project P-963, Industrial Waste Water Treatment Facility - Phase I, was proposed. When completed, this project will provide a collection system and treatment facility for industrial waste water generated by explosives and propellant

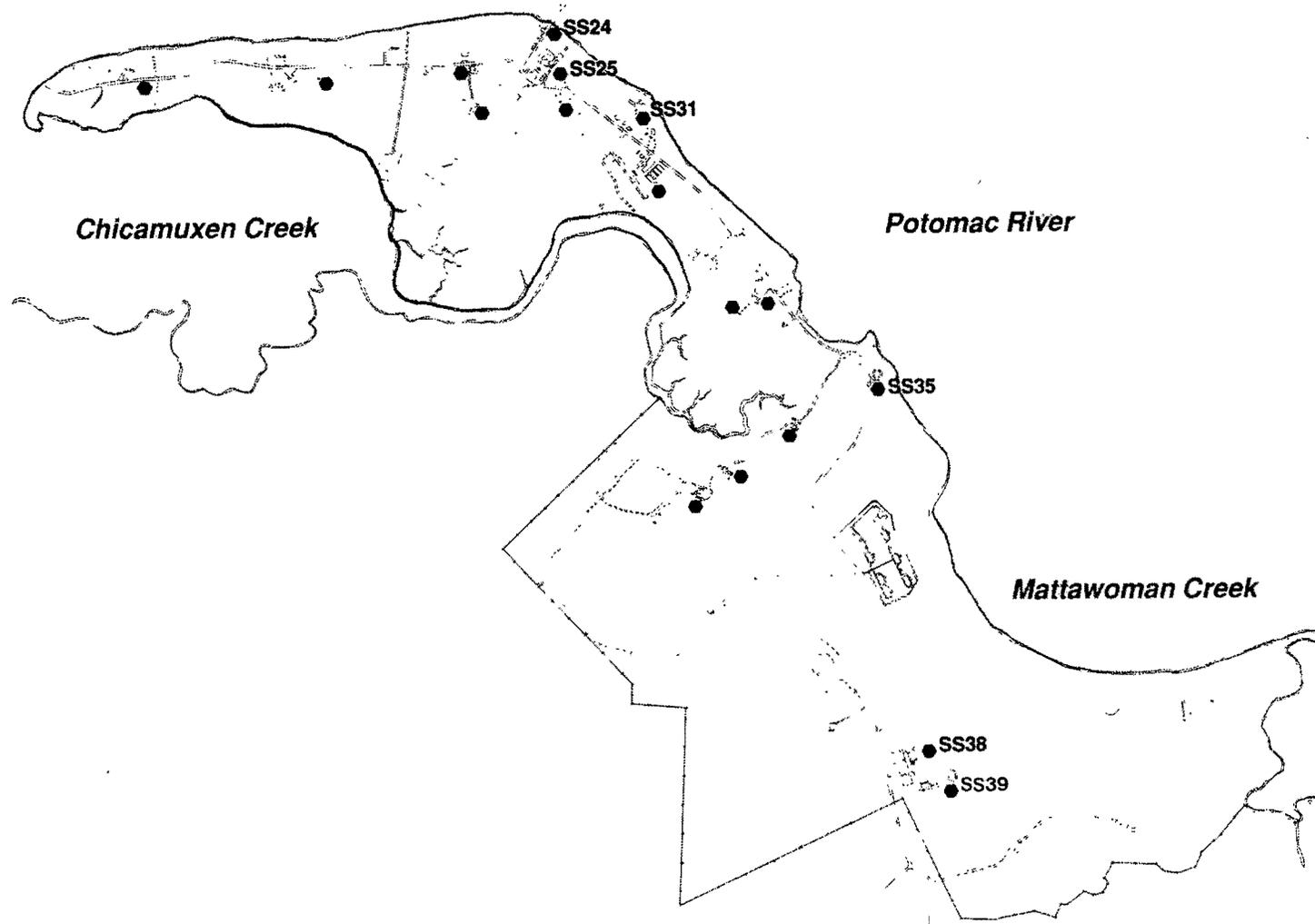
operations at the Biazzi and Moser plants and extrusion plant buildings #215 and #874. The proposed facility consists of a carbon absorption process followed by evaporation. Condensate from the evaporation process will be reused by the plants or released to the storm sewer system. Also included are sanitary sewer connections for other industrial facilities.

Phase II of the Waste Water Treatment Facility, project no. P-106, has been proposed for FY92 funding. This project will provide additional connections of ordnance and inert operations to the existing sanitary sewer system. Wastewater from ordnance operations will flow into a holding tank where it will be tested. Results will determine if the waste water is transferred to the Industrial Treatment Facility or allowed to flow into the NOS sanitary sewer system. Inert operations will be tied directly to the sanitary sewer system.

The Stump Neck area does not have a central sanitary sewage system because the buildings are so widely dispersed. Sewage treatment is handled by 17 septic systems (Figure 7-20). Six of these systems, SS24, SS25, SS31, SS35, SS38, and SS39 are surface discharge systems operated under permits from the State of Maryland. Effluent is monitored on a regular basis to track compliance with the permit limits.

Replacement of the six surface drainage systems is underway with an estimated completion date of September, 1990. With the completion of this project only SS31 will discharge to the surface requiring an NPDES permit. The new system at SS31 will use an ultraviolet radiation disinfection process to eliminate the toxic effects of chlorination on aquatic life.

The remaining eleven septic systems are sub-surface discharge systems which do not require permits.



STUMP NECK Sanitary Sewer

Source:

LEGEND

- Septic System

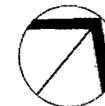


Figure 7-20

Naval Ordnance Station, Indian Head

Construction of any major new facility in the Stump Neck area requires a new septic system, although finding a location with soils suitable for septic systems is difficult. Building additions or small scale projects can sometimes be added to existing systems, but most of these systems are working near capacity.

The use of water conserving sanitary fixtures is essential for all new construction at Stump Neck. Measures such as this will minimize the size of new septic systems and preserve the remaining capacity in existing systems. The Charles County Health Department performs percolation tests prior to the design of any new subsurface septic system and must review and approve all designs for new systems.

Communications

Telecommunications service is provided to NOS, Indian Head through the Chesapeake and Potomac Telephone Company of Maryland (C&P). The main cable into the Station as well as all distribution cables are owned and operated by C&P. Switching equipment is leased from AT&T and installed in the Base Telephone Central Office (BTCO), Building 698. All communications at NOS are handled through two pieces of switching equipment, an AT&T 701-B and an AT&T Dimension 2000 with Feature Package 8.

The 701-B is an electromechanical device installed in 1967. It takes up about two-thirds of the space in Building 698. This older technology equipment is limited to accepting only rotary dial pulse dialing. It is wired for 1300 lines and is currently used at 88% of its capacity. Because this equipment is no longer manufactured, the system cannot be expanded.

Two Western Electric 608 cord board operator positions, located in the BTCO, are supported by the 701-B. Trunking from the 701-B includes:

- 34 Direct Inward Dial trunks
- 54 Direct Outward Dial trunks
- 21 Washington Foreign Exchange trunks
- 16 Two-way Dial AUTOVON trunks
- 13 Incoming only AUTOVON trunks

The 701-B requires daily maintenance to stay in operation. AT&T has a technician on site to keep the switch in operation.

The Dimension 2000 with Feature Package 8 is an electronic Private Branch Exchange (PBX), installed in 1984. Wired for 640 lines, the Dimension 2000 is at 98% of its capacity. The 12 remaining lines are reserved for emergency service requests and maintenance use. It can be expanded to 1064 lines under the AT&T lease by adding more cabinets and circuit cards. This system is also at capacity for trunking. The following trunks are served by the Dimension 2000:

- 18 Direct Inward Dial trunks
- 10 Direct Outward Dial trunks
- 15 Two-way Dialing trunks
- 25 Tie lines to the 701-B switch
- 4 Direct Inward Dial AUTOVON trunks

Neither of the switches meets current NOS requirements for voice/data transmission. Access to the Defense Data Network is not available through the 701-B. This link is currently made through SEAADSA in Building 1581. NOS has a broadband Local Area Network (LAN) known as NOSNET, which serves over 400 users. The network interfaces a number of smaller LANs and Digital

Terminal Equipment (DTE) devices throughout the Station. Current plans call for the NOSNET to be expanded to serve 87 buildings with the capacity to add the NAVSCOLEOD, Mix House, Cast Plant and CAD test facility.

There is no source of emergency power for the BTCO. Building 698 has no emergency generator or uninterrupted power source. The 701-B switch has an internal battery system which will provide power for up to eight hours. The Dimension 2000 system has 10 power failure trunk-to-station connections to provide emergency service.

Use of the Station telephone distribution lines, known as the outside plant (OSP), is saturated. The Station is working to provide additional pole space in the central administration area, but space is limited. Direct buried cable has been installed primarily in the storage areas paralleling the existing pole distribution system. Stump Neck is served by a 200-pair copper submarine cable which crosses the Mattawoman Creek. The cable is being used at its capacity. The NAVEODTEHCEN has an immediate need for 194 more lines which cannot be met by the existing cable.

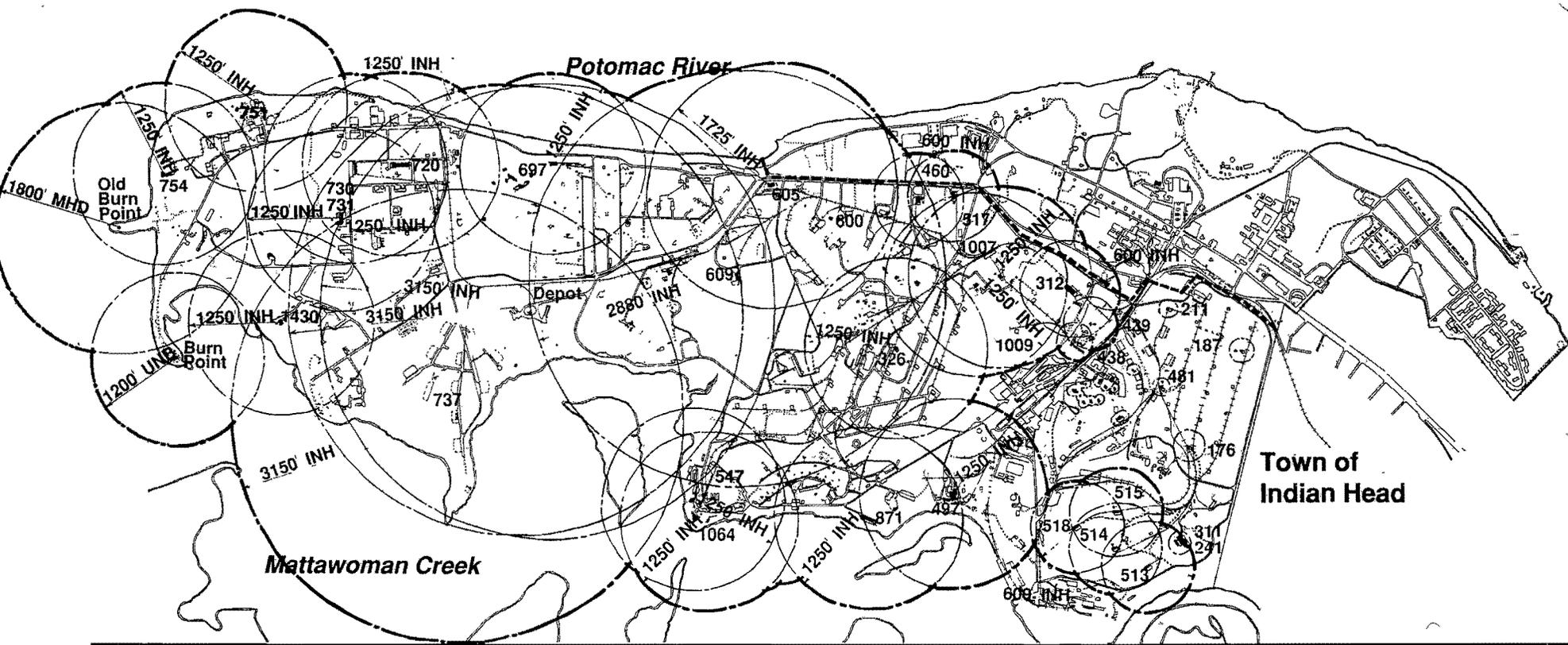
Long-term plans for the base communications system are to upgrade the system through two major projects. The first is to replace the existing 701-B and Dimension 2000 switches with a Digital Switching System (DSS). The DSS will increase the number of available lines to meet Station requirements and be capable of handling voice and data transmissions. The second project is to develop a new OSP. The new plant is to be based on a fiber optic system. Phase One will connect the BTCO with Building 22SN, allowing the connection of the Stump Neck and Indian Head LANs. Additional phases will allow the connection of voice, data, fire, security, and energy monitoring equipment.

ESQD

The primary mission of NOS Indian Head is the design, development, testing, evaluation, and manufacture of various ordnance components for the Department of Defense (DOD). Tenant activities include the EOD School and EOD Technology Center, which conduct training, research, and development in the operation and disposal of explosive materials and devices. To meet this mission, NOS requires many different munitions manufacturing, testing, and storage facilities. These range from storage magazines to explosives processing plants and test detonation ranges. Explosive Safety Quantity Distance (ESQD) arcs are established to provide for the safety of personnel and protection of facilities.

On the Indian Head site (Figure 7-21) all arcs are produced by production, testing, and storage facilities. These arcs are generated within the restricted area, but extend beyond the fence into the unrestricted area. Existing arcs range in distance from 50 feet to 3,150 feet. Two storage magazines, Buildings 494 and 523, are located outside the restricted area but are not currently used for explosives storage. Some of the arcs extend out over the Potomac River and the Mattawoman and Chicamuxen Creeks. The Station maintains a navigational danger zone in these areas, described more fully in the next section.

ESQD arcs at Stump Neck (Figure 7-22) are generated by storage magazines and two detonation ranges. The test ranges are used primarily by the NAVEODTEHCEN for research and by the EOD School for training. While the detonation of explosives is a small part of the activity, it plays an important role in the work accomplished here.



INDIAN HEAD

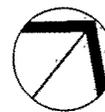
Inhabited Distance ESQD Arcs

Source: Explosives Quantity Distance Maps, 1987

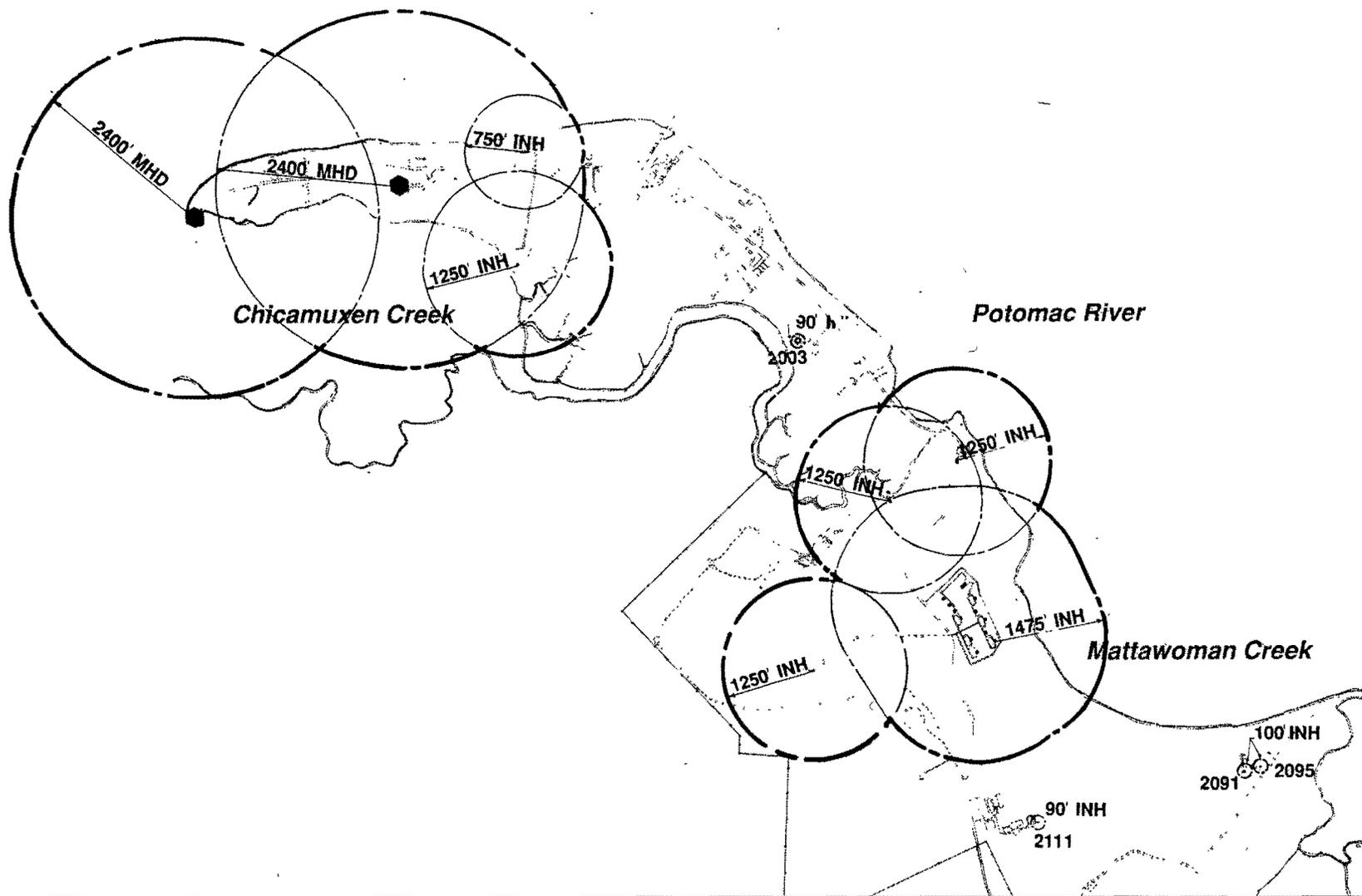
LEGEND

- INH Inhabited Distance
- UNB Unbarricaded Distance
- MHD Missile Hazard Distance
- Existing Restricted Area Line

Figure 7-21



Naval Ordnance Station, Indian Head



STUMP NECK

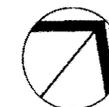
Inhabited Distance ESQD Arcs

Source: Explosives Quantity Distance Maps, 1987

LEGEND

- INH Inhabited Distance
- MHD Missile Hazard Distance
- Field Area Where Explosives Are Used

Figure 7-22



Naval Ordnance Station, Indian Head

The regulation governing the establishment of ESQD arcs and the overall storage and handling of explosive materials is NAVSEA OP5. Arcs are determined by calculations based on the amount and type of material, type of operation, and construction and use of adjacent facilities. Because of its unique mission, NOS, Indian Head must be concerned with explosive material in all stages of the manufacturing process. There are also explosive test ranges and disposal sites.

NAVSEA OP5 defines Quantity Distance as a relationship between the quantity of material stored and the distance required to provide a given level of protection. The relationships are based on acceptable levels of risk for different types of exposure. ESQD arcs do not determine absolute safe distances, but reduce the risk based on the type of exposure.

ESQD arcs limit the location and occupancy of structures, and play an important role in installation development. Approximately 66% of Indian Head and 41% of Stump Neck are located within the inhabited distance ESQD arcs. The inhabited distance arc is the most restrictive. It prohibits construction that is not related to ordnance-related facilities. An area of particular concern is where arcs extend outside the restricted area along Farnum Road.

All siting within ESQD arcs, and establishment of new or revision of existing arcs is reviewed on-station by the Safety Department (CODE 04). Final approval is from NAVFAC, with prior concurrence from the Department of Defense Explosive Safety Board or Chief of Naval Operations. The OP-5 rules are currently being interpreted and enforced more conservatively, resulting in the need for more barricading and greater distances. Waivers or exemptions may be issued for temporary conditions or mission essential requirements. NOS currently has 7 waivers and 11 exemptions in effect. Exemptions of particular interest include: use of the Burn Point at less

than 1,800 feet from Station Buildings, and occupancy of Buildings 2019 and 22SN at less than the distance required between inhabited buildings and explosive storage sites.

Navigational Danger Zone

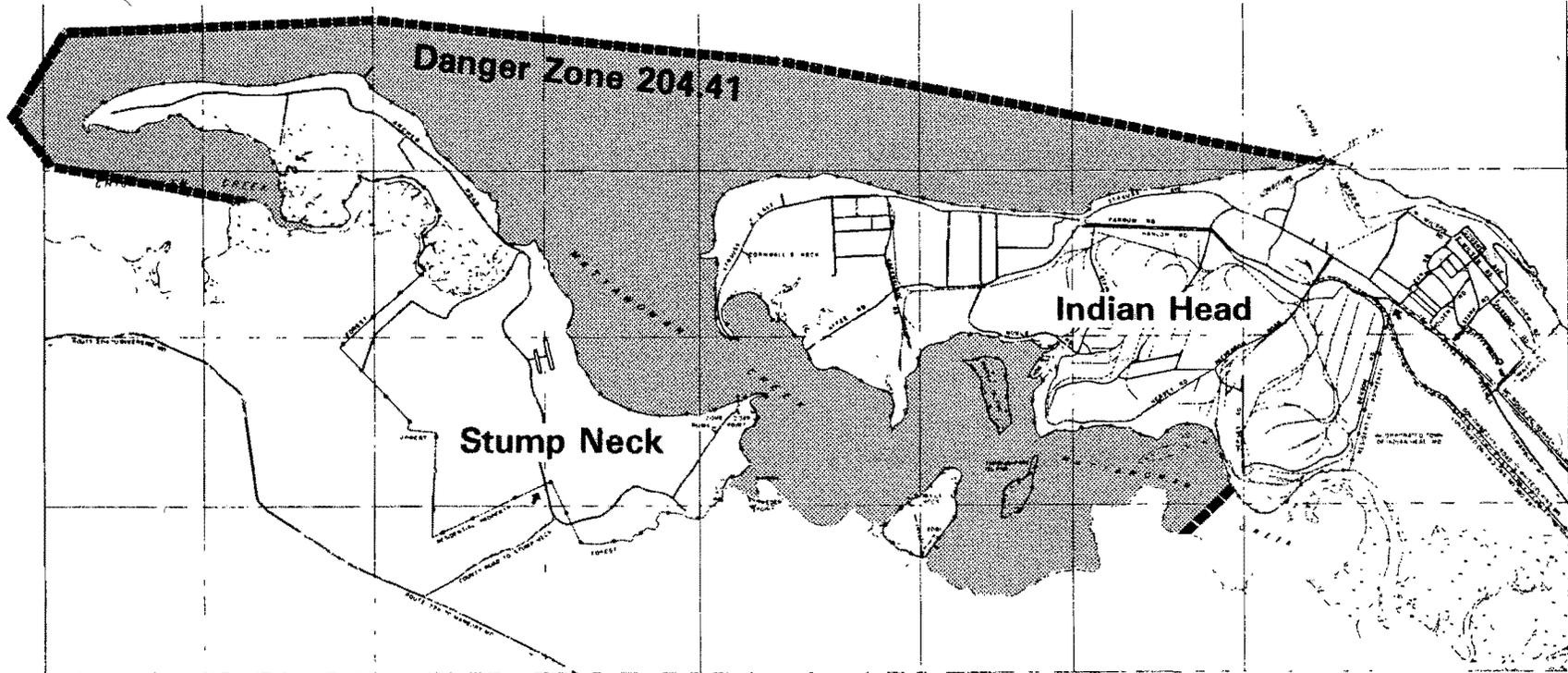
A navigational danger zone has been defined by the U.S. Coast Guard for portions of the Potomac River, Mattawoman Creek, and Chicamuxen Creek in the vicinity of Indian Head and Stump neck. The extent of the navigational danger zone is shown in Figure 7-23. This zone may be redefined once current plans to dredge an alternate boating channel outside of existing ESQD area have been implemented.

Regulations that apply within the navigational danger zone (33CFR334.240) are as follows:

- (1) Firings consisting of controlled explosions within the danger zone, and controlled shore operations, or accidental explosions, hazardous to vessel traffic within the limits of the danger zone, may take place at any time of the day or night and on any day of the week.
- (2) Flashing red lights, horns, and signs established at appropriate points will warn vessels of impending tests or operations considered to be hazardous to vessels within the danger zone.
- (3) No vessel except vessels of the United States or vessels authorized by the enforcing agency shall enter or remain in the danger zone while lights are flashing, when warning horns are in operation, or when warned or directed by a patrol vessel.

Potomac

River

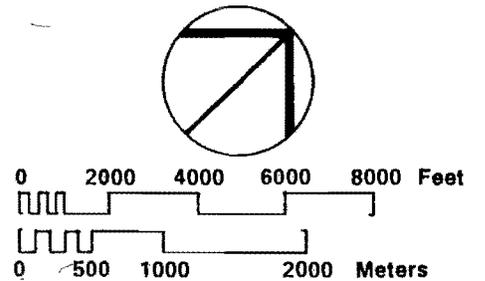


NAVIGATIONAL DANGER ZONE

 Danger Zone Area Limits

Source: 33 CFR 334.240

Figure 7-23



- (4) Nothing in this section shall prohibit the use of Mattawoman Creek or Chicamuxen Creek as a harbor refuge because of stress of weather.
- (5) Except as prescribed in paragraph (3) of this section, vessels may enter and proceed through the danger zone without restriction; however, accidental explosions may occur at any time and vessels entering the area do so at their own risk.
- (6) Fishermen operating in the danger zone when warning signals are sounded shall evacuate the area immediately.
- (7) The regulations in this section shall be enforced by the Commanding Officer, U.S. Naval Ordnance Station, Indian Head, Maryland.

Development of Concepts for Land Use Alternatives

DEVELOPMENT OF CONCEPTS FOR LAND USE ALTERNATIVES

Development concepts are guiding policies or plans that will result in a particular pattern of land use. In a situation where much undeveloped land is available, planners can project future land use patterns under different development concepts, then select the optimum land use pattern based on analysis of the alternatives. However, at NOS, Indian Head, much of the Navy's land is already developed or is severely restricted due to natural or man-made constraints. Consideration of alternative "build-out" scenarios is not a realistic approach. Instead, each development concept has been applied to current conditions at the Station to determine how each can affect future conditions. The result will be a gradual evolution of land use patterns over time, to achieve those conditions agreed to be most advantageous to the Station and its mission.

Concepts considered during the planning process were the following (this list is not intended to imply relative priorities):

- Improvements to circulation, safety, and security;
- Reduction of the potential for conflicts with off-station uses;
- Consolidation of uses;
- Revision of explosive storage restrictions (ESQD arcs); and
- Environmental compliance.

Each of these concepts, and its application to NOS, Indian Head under current conditions, is discussed in the following sections.

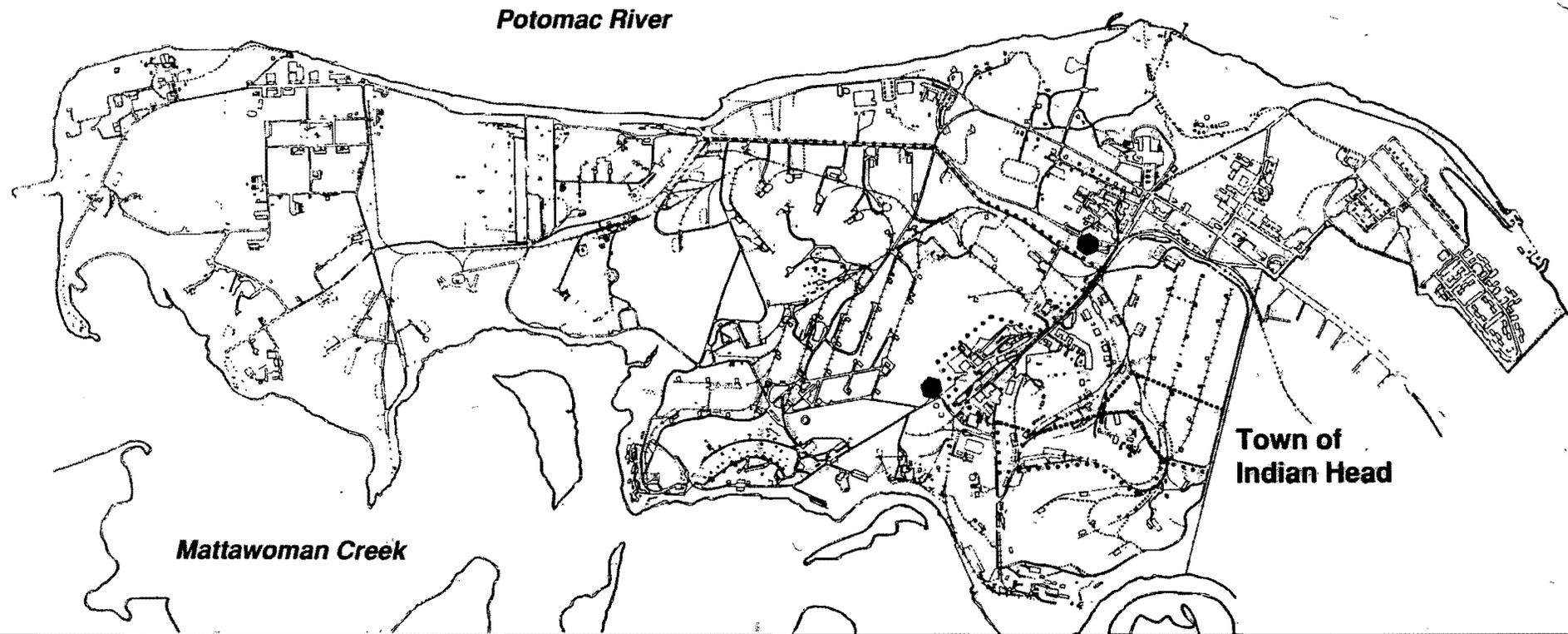
Circulation, Safety and Security

These related issues involve consideration of how vehicles and individuals gain access to the Station and the restricted area, and how security personnel monitor security status.

One component of this issue is the need to minimize traffic in and out of the restricted area. The restricted area is defined based on safety and, to a lesser extent, security. For the most part, the restricted area fence is located to keep people out of ESQD arcs. However, many functions currently located within the restricted area do not generate arcs and do not require restriction based on special security needs. The current situation causes unnecessary traffic congestion at the restricted area access gate and other locations within the restricted area, such as the supply depot.

Alternative restricted area boundaries have been considered. The basic concept is to relocate the fence to the south of the Public Works compound on Patterson Road, leaving the Goddard Plant within the restricted area. Other considerations were leaving the Safety Department within the restricted area, and freeing up some land for other uses if possible. The alternatives shown in Figure 8-1 accomplish the latter result to varying degrees: a phased approach to realigning the fence is recommended if explosive storage cannot be moved elsewhere in the near future.

Fence realignments at Patterson and Hanlon Roads can relieve the problem of access to the restricted area. Figure 8-1 shows two new gates to replace the existing Patterson Road gate. A 12-hour gate is proposed for Hanlon Road, to facilitate access to the western portion of the Station and to prevent an increase in traffic through the Public Works area. A 24-hour gate at the terminus of Patterson Road is



INDIAN HEAD

Fence Realignment

Source:

LEGEND

..... Restricted Area Fence

..... Restricted Area Fence (Phasing Alternates)

● Security Gate

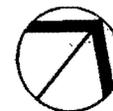


Figure 8-1

Naval Ordnance Station, Indian Head

located to minimize congestion at the gate while controlling access to the Goddard Plant and the southeastern portion of the Station.

At the southeastern portion of the Station within the restricted area, traffic circulation may be improved by providing a loop through the area. This may be accomplished by making minor improvements to Hersey, Atkins, Noble, Caffee, and Greenslade Roads as shown in Figure 8-2. This system of secondary roads makes it possible to travel to different points within the restricted area without having to leave the area. The result will be less traffic through the security gates.

The next component is the improvement of traffic between the main gate and the intersection of Patterson and Hanlon Roads. The two areas of greatest concern are on Strauss Avenue at the intersections of Jackson and Patterson Roads. Recommended improvements are shown in Figure 8-3.

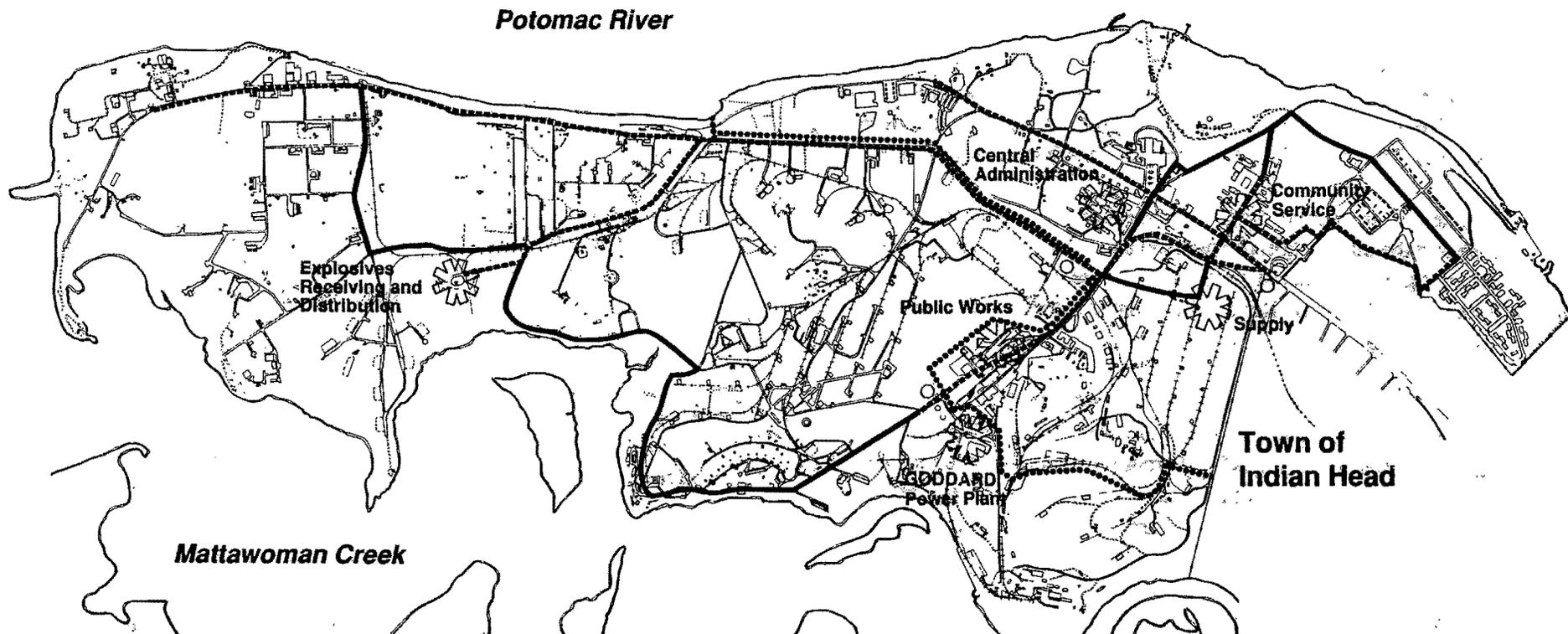
Strauss Avenue should become one-way inbound from the Main Gate to Jackson Road to alleviate congestion resulting from cross-traffic turns. For traffic leaving NOS, Farnum Road should become one-way between Jackson Road and the gate. Jackson Street should be widened to accommodate the increased traffic providing a right turn lane at Farnum Road. Jackson Street should also be extended southeast from Farnum Road to serve the proposed supply facility (P-891). Long range planning should also call for the extension of Hanlon Road northeast to meet the Jackson Road extension.

The intersection of Patterson and Strauss consists of approaches including four which merge together to form the northwest side of the intersection: Wilroy Lane, Lloyd Road, Patterson Road, and the access to the parking lot on the north corner of the intersection. The following actions should be taken to improve safety and circulation:

- Realign Wilroy Lane to meet Lloyd Road a minimum of 60 feet from Strauss Avenue.
- Eliminate the corner access to the parking lot at the north corner of the intersection. Widen the other existing access from Strauss Avenue.
- Realign the service access to Building D 323 away from the intersection by a minimum of 60 feet. Some grade change will be required for the new access.
- The main gate at Indian Head is another area that can be modified to minimize unnecessary traffic. By expanding facilities outside the Station's fence, some of the traffic onto the Station can be eliminated. Phase I of this process, is shown in Figure 8-4, Phase II, Figure 8-5, includes the relocation of the existing fence to allow the construction of a Public Service Area outside the fence line. This area will be developed for NOS functions oriented to the general public such as the civilian personnel office or contractor bid rooms. The plan also includes a truck inspection area and additional parking outside the gate.

A proposed parking area inside the fence will relieve parking and traffic congestion on Patton Road West. Residences along this portion of Strauss Avenue should be phased out and the buildings remodeled for office use. Access to these buildings should be changed from Strauss Avenue to Patton Road West.

The question of station-wide security has also been raised recently. Although the rugged shoreline and remote location of Indian Head serve to isolate the Station from unwanted visitors, increasing boat traffic on the Potomac River and Mattawoman Creek is cause for concern. Perimeter fencing, although ineffective against determined



INDIAN HEAD

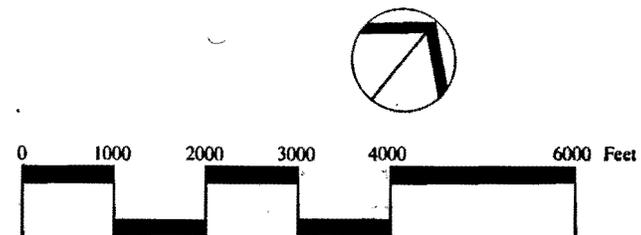
Proposed Circulation

Source:

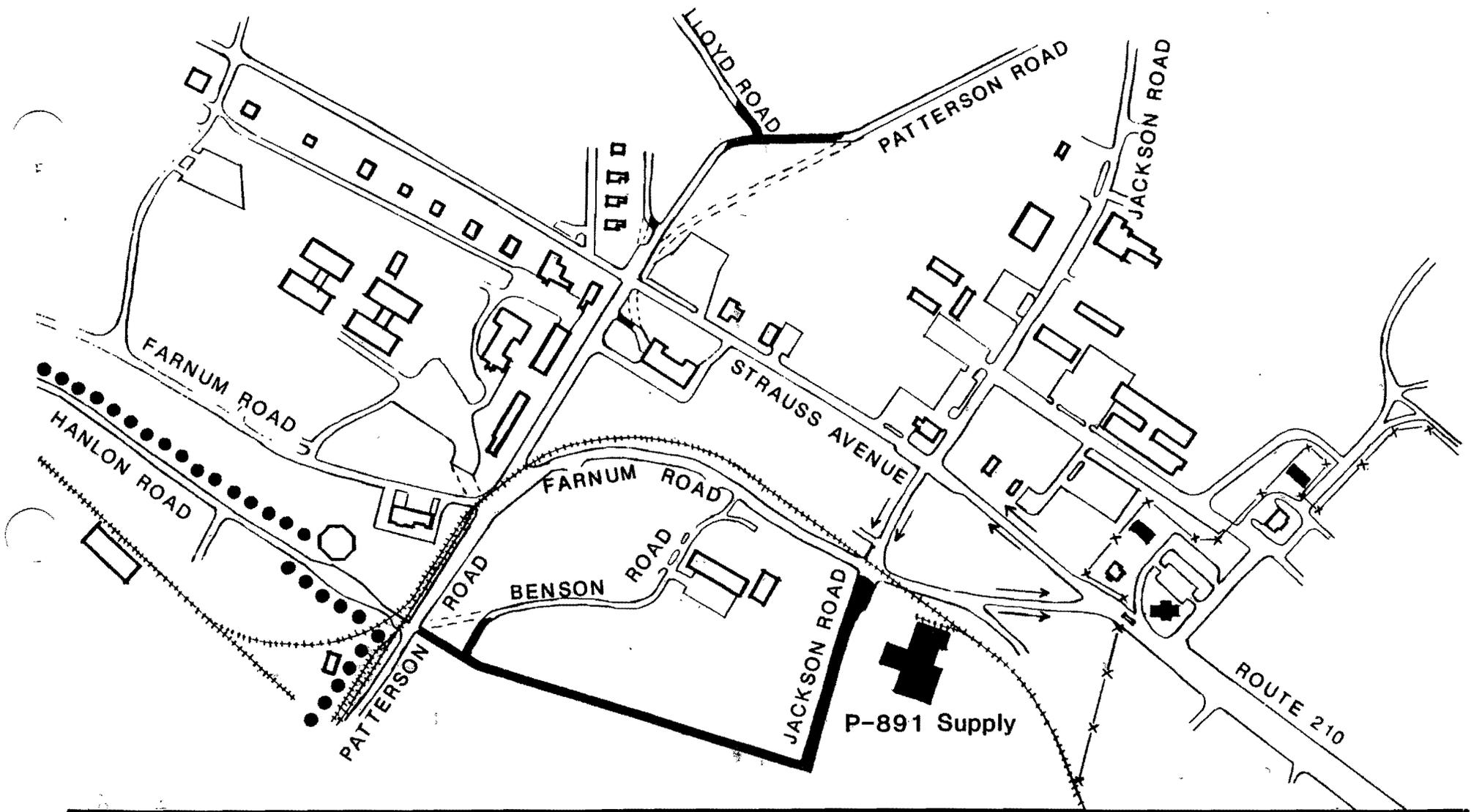
LEGEND

- Primary Traffic Routes
- Secondary Traffic Routes
- Restricted Area Fence
- ★ Primary Traffic Destinations
- Security Gate

Figure 8-2



Naval Ordnance Station, Indian Head

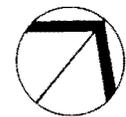


INDIAN HEAD

Recommended Improvements

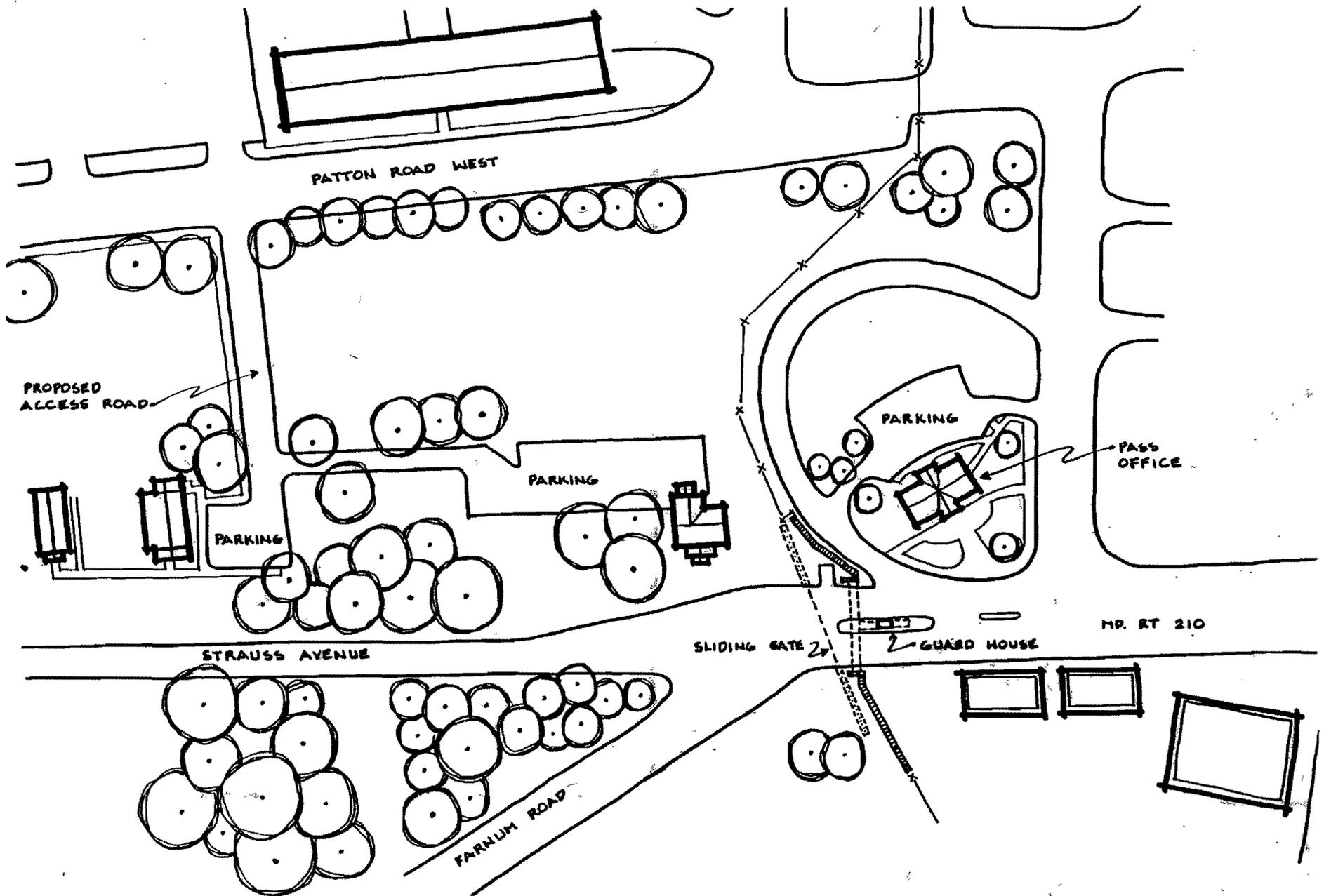
LEGEND

- | | |
|---|---|
|  Existing Roads |  NOS Perimeter |
|  Proposed Roads |  Restricted Area |
|  Abandoned Roads |  Security Gate |

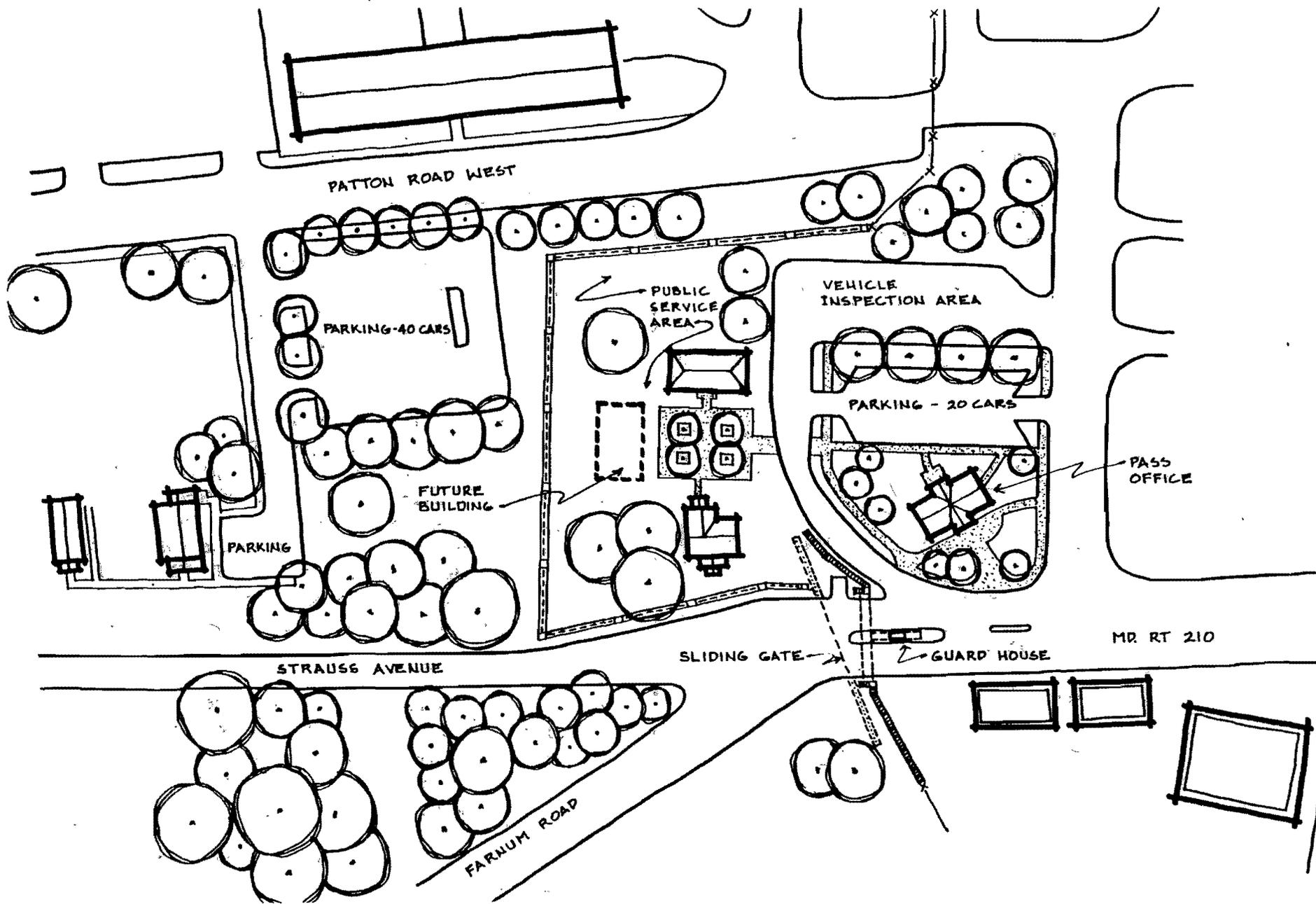


NOT TO SCALE

Figure 8-3



INDIAN HEAD
Main Gate Phase I
 Figure 8-4



INDIAN HEAD

Main Gate Phase II

Figure 8-5

intruders, would be useful to discourage casual or inadvertent trespassers. The primary problem with perimeter fencing is the erosion occurring along much of the shoreline of Indian Head, and along Stump Neck as well. If perimeter fencing is installed, it *must* be installed in conjunction with erosion control measures. In the absence of erosion control, the fencing is likely to exacerbate the problem, resulting in loss of both land and fencing.

Perimeter patrols are also needed. A new security docking facility, if relocated from the Potomac River shoreline, should be located on the Old Burn Point if available. This location will provide good access to all NOS shorelines, and will minimize the need for dredging, which may disturb accumulated sediments. A feasibility study is needed to determine an appropriate alignment of a perimeter path to minimize shoreline impacts. This study should also address perimeter fence location and shoreline protection plans.

Security for the existing Stump Neck facilities can be improved with minor modifications to the area surrounding the entrance to Stump Neck. Access to the small arms range and RDT&E facilities is currently unrestricted. Rum Point Road should be relocated to intersect with Archer Avenue inside the security gate. The new road, shown in Figure 8-6, combined with new perimeter fencing will significantly increase safety and security at Stump Neck.

A skeet and trap range will be relocated to Rum Point. The existing small arms range at Stump Neck should be expanded and upgraded to assure the safety of personnel and property both on and off-station. The existing small arms range location should be maintained; however, NOS should request that NAVFACENCOM conduct a range evaluation report for both ranges. The evaluation will make recommendations to assure that the ranges meet the design criteria in

Military Handbook 1027/3; Range Facilities and Miscellaneous Training facilities, Other than Buildings.

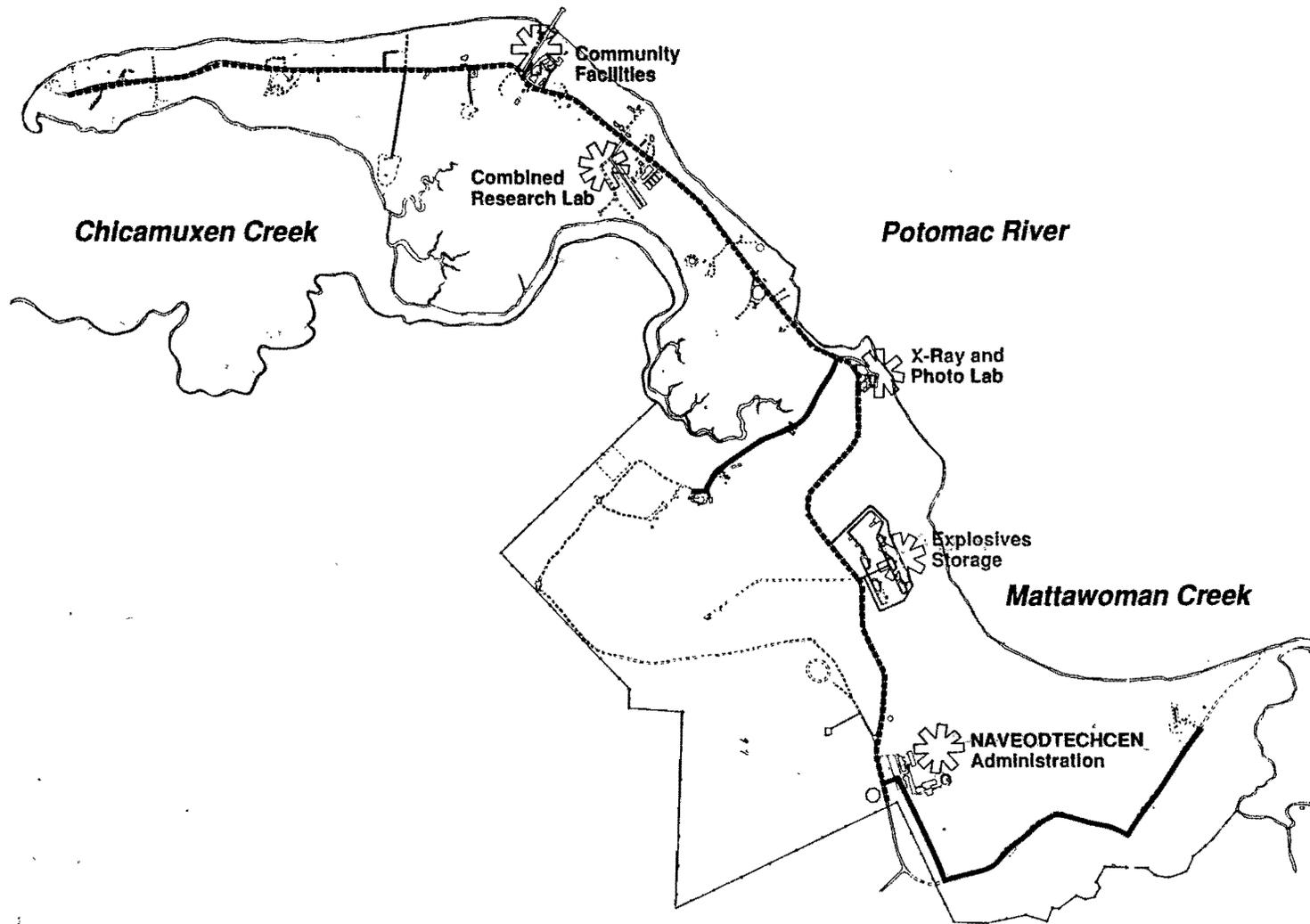
Conflicts with Off-Station Uses

The potential for off-station uses to inhibit NOS activities is a realistic concern. Given the current level of build-out at NOS, on-station land use options for limiting conflicts with off-site uses are limited. However, some basic principles should be applied when making land use decisions that may have an impact on off-site uses:

Explosive storage and industrial-type facilities should be located away from Station boundaries. Navy land adjacent to the boundary fence between the Station and off-site properties should be maintained in (or returned to) an undeveloped state to serve as a visual and acoustical buffer. These efforts will reduce the level of risk perceived by owners of property adjacent to NOS. While the actual risk to adjacent property is limited by ESQD arcs and compliance with state permitting requirements, reducing the perceived or psychological risk will further enhance NOS' image as a "good neighbor."

When possible, ESQD arcs over Mattawoman Creek should be reduced. Although the creek is a declared Navigational Danger Zone, public disregard of the potential hazard areas may have adverse impacts on operations. Land use decisions should reflect a realization that public use of this waterway is increasing.

Beyond these simple measures, there is little that can be done with on-station development to protect against conflicts with off-site parties. NOS should undertake efforts recommended in the Land Use



STUMP NECK

Proposed Circulation

Source:

LEGEND

- Primary Traffic Route
- Secondary Traffic Route
- ★ Primary Traffic Destinations
- Security Gate

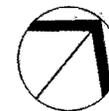


Figure 8-6

Naval Ordnance Station, Indian Head

Compatibility Study (1987), including close monitoring of nearby development and other proposals, and frequent contact with local officials and the community. These efforts will ensure that NOS is involved in local decision-making, and will improve relations between the Station and the public.

Stump Neck Expansion

Although Stump Neck has undeveloped land, land use alternatives involving development of Stump Neck are not recommended due to two overriding constraints: lack of groundwater allocations and severe limitations on the use of septic systems. Because of these restraints, any proposed development should be carefully studied and of a limited scale.

The restriction on groundwater withdrawal is the primary limitation for development. NOS, Indian Head is subject to a groundwater withdrawal permit that covers both Indian Head and Stump Neck. The permit limit on withdrawals is very close to actual Station usage, so it is not currently realistic to plan on expanding development at Stump Neck without a simultaneous reduction of water use at Indian Head. Any new projects sited at Stump Neck should incorporate strict water conservation techniques as discussed in the Utility System Assessment completed by CHESDIV Code II for NOS.

If it were deemed reasonable to fully explore the option of developing Stump Neck, the second major limitation, lack of soils suitable for septic systems, would come into play. The frequency with which NOS exceeds its septic discharge permits is a reflection of this inherent limitation. Additional development at this location should be accompanied by construction of a sewage treatment system

appropriate to the location. Development at Stump Neck would also entail significant expenditures for other infrastructure, such as power and water.

Consolidation

A problem that affects many organizations at NOS is the degree to which personnel are scattered over wide areas. As a general rule, future land use decisions should result in consolidation of NOS departments where appropriate, and the consolidation of similar land uses where feasible. Exceptions should be made for situations in which maximum efficiency or another Station objective would be achieved by separating similar functions. For example, separation of personnel recruitment and routine employment information services (by moving the latter to a near-gate location) can minimize on-station traffic and potential security breaches.

A corollary to consolidating uses is consideration of land use compatibility. This concept was discussed earlier in this chapter. Some uses benefit from a location near a particular type of use. For example, production and RDT&E find it advantageous to have explosive storage nearby, and personnel occupying on-station housing benefit from having recreational facilities nearby. Conversely, certain uses are incompatible. Housing, for example, should never be located near industrial-type facilities (production, maintenance, testing) due to actual or perceived risks to well-being. Figure 8-7 displays the relationships among land uses in matrix form. This matrix should be used to guide future land use siting decisions.

The possible land use relationships shown in Figure 8-7 fall into one of 6 categories:

A	B											
	Production	RDT&E	Training	Explosive Storage	Supply/Non-Explosive Storage	Maintenance	Administration	Community Facilities and Services	Housing	Utilities	Undeveloped Land	Off-Station
Production		+	○	+	+	+	○	○	-	+	+	-
RDT&E	+		○	+	+	+	○	○	-	+	+	-
Training	-	-		-	+	○	○	+	+	○	+	○
Explosive Storage	○	○	-		○	○	○	-	-	○	+	-
Supply/Non-Explosive Storage	○	○	○	-		○	○	○	○	○	○	+
Maintenance	-	-	○	-	+		○	○	○	+	○	○
Administration	-	-	○	-	-	○		+	○	○	+	○
Community Facilities and Services	-	-	○	-	○	○	○		+	○	+	○
Housing	-	-	○	-	○	-	○	+		-	+	○
Utilities	○	○	○	○	○	+	○	○	○		○	○
Undeveloped Land	○	○	○	○	○	○	○	○	○	○		○
Off-Station	-	-	○	-	○	○	○	○	○	○	+	

Figure 8-7

Land Use Compatibility Matrix
NOS, Indian Head

- +** = A benefits from proximity to B
- = A is not adversely affected by B
- = A is adversely affected by B

+/+ Each land use benefits from proximity to the other. At NOS, these uses are housing and community facilities; and production and RDT&E. Land uses whose relationship is described this way should definitely be adjacent to each other.

+/0 In this case, one land use benefits from proximity to another use; the other use neither benefits nor suffers from proximity to the first. At NOS, utility functions do not improve due to proximity to production, although the reverse may in fact be true of production functions. Land uses whose relationship is described this way should be adjacent to each other, or should be sufficiently linked such that distance from one use does not diminish the effectiveness of another.

0/0 No benefits accrue for either use as a result of being adjacent to each other. For example, administrative functions and training functions do not improve significantly due to proximity to each other; nor do these functions suffer as a result of proximity. Land uses whose relationship is described this way may be located adjacent to each other if no better location is available.

0/- Land uses whose relationship is described this way should not be adjacent. However, depending on the nature of the incompatibility, mitigation may be possible to minimize conflicts. For example, if it is not possible to avoid locating a maintenance facility near housing, visual screening and traffic rerouting should be employed to minimize disturbances to residents.

-/- Land uses whose relationship is described this way should not be adjacent.

+/- Conflicting needs: one function improves while another suffers due to proximity. In this situation, some case-specific resolution is necessary to meet the needs of both uses. For example, production and RDT&E benefit from proximity to maintenance functions, maintenance facilities cannot be adjacent due to ESQD arcs. In this case, distant maintenance workers must minimize response times to avoid impairment to production and RDT&E functions.

Use consolidations have been projected for the Station consistent with the land use compatibility matrix. The general approach toward consolidating uses as part of the planning process was to allow current land use patterns to guide the consolidation process. In other words, outlying or scattered uses were generally relocated to existing concentrations of that use. The results are general in nature. The personnel and facility moves required to achieve these results are not specified. Instead, it is expected that future land use decisions will be made within this overall framework so over time, the desired land use pattern will gradually be achieved.

Explosive Safety

A significant factor in all land use decisions at NOS, Indian Head is the location of ESQD arcs (see Figures 7-21 and 7-22). These arcs reflect potential explosive quantities, rather than actual quantities which may in fact be lower due to logistical problems such as stacking limits.

All land use recommendations made in this update reflect the currently drawn arcs shown in Figures 7-21 and 7-22. However, it is

recommended that these arcs be reviewed in light of actual conditions, and revised if appropriate. Such revisions may result in a less constrained development potential than is currently presented.

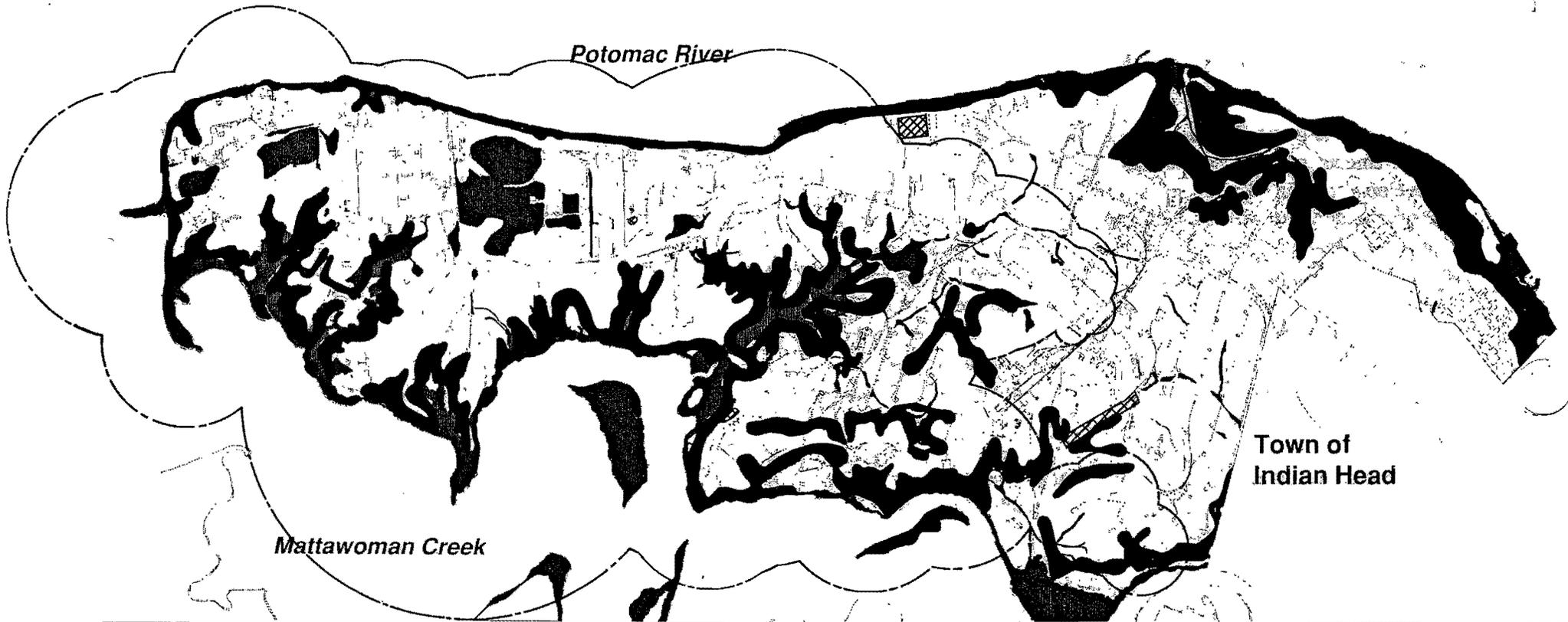
Environmental Protection

The degree to which NOS actions are subject to environmental requirements is increasing at a rapid rate. However, rather than develop a specific "environmental alternative", it is assumed that all actions undertaken will as a matter of course comply with all relevant environmental requirements such as permitting and notification. On-site land use constraints posed by environmental features are shown in Figures 8-8 and 8-9 and apply to all land uses at NOS. The Architect of the Station and the Natural Resources Manager (Code 09) review all siting decisions to ensure that environmental constraints have been considered. In summary, the following guidance should be followed in all siting decisions:

- Construction of buildings or roads should avoid slopes exceeding 15%. This will limit erosion and sedimentation, and keep construction costs low.
- Disturbance of wetlands or construction in the 100-year floodplain is restricted by law, and should only occur for water-dependent facilities.
- Avoid construction near eroding shoreline, unless effective erosion control measures are put in place.
- Due to the potential for environmental and safety risks, construction suitability should be verified for all projects planned near former waste disposal sites.

- Septic systems will not be approved in soils that are unsuitable for them.
- All construction will be in compliance with ESQD requirements.

In addition to these general land planning principles, all new construction regardless of location should include water conservation techniques such as water saving devices, cooling water recycling and water recycling in other industrial operations. All construction must be in compliance with the NOS Best Management Practices Plan and all other environmental regulations.



INDIAN HEAD Development Constraints

Source: Master Plan Update Maps: Topography, Hydrology, ESQD Arcs, Former Waste Disposal Sites

LEGEND

 Legal Constraints (floodplains, wetlands)

 Engineering Constraints (steep slopes)

 Safety Constraints
(former waste sites, ESQD arcs)

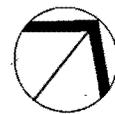
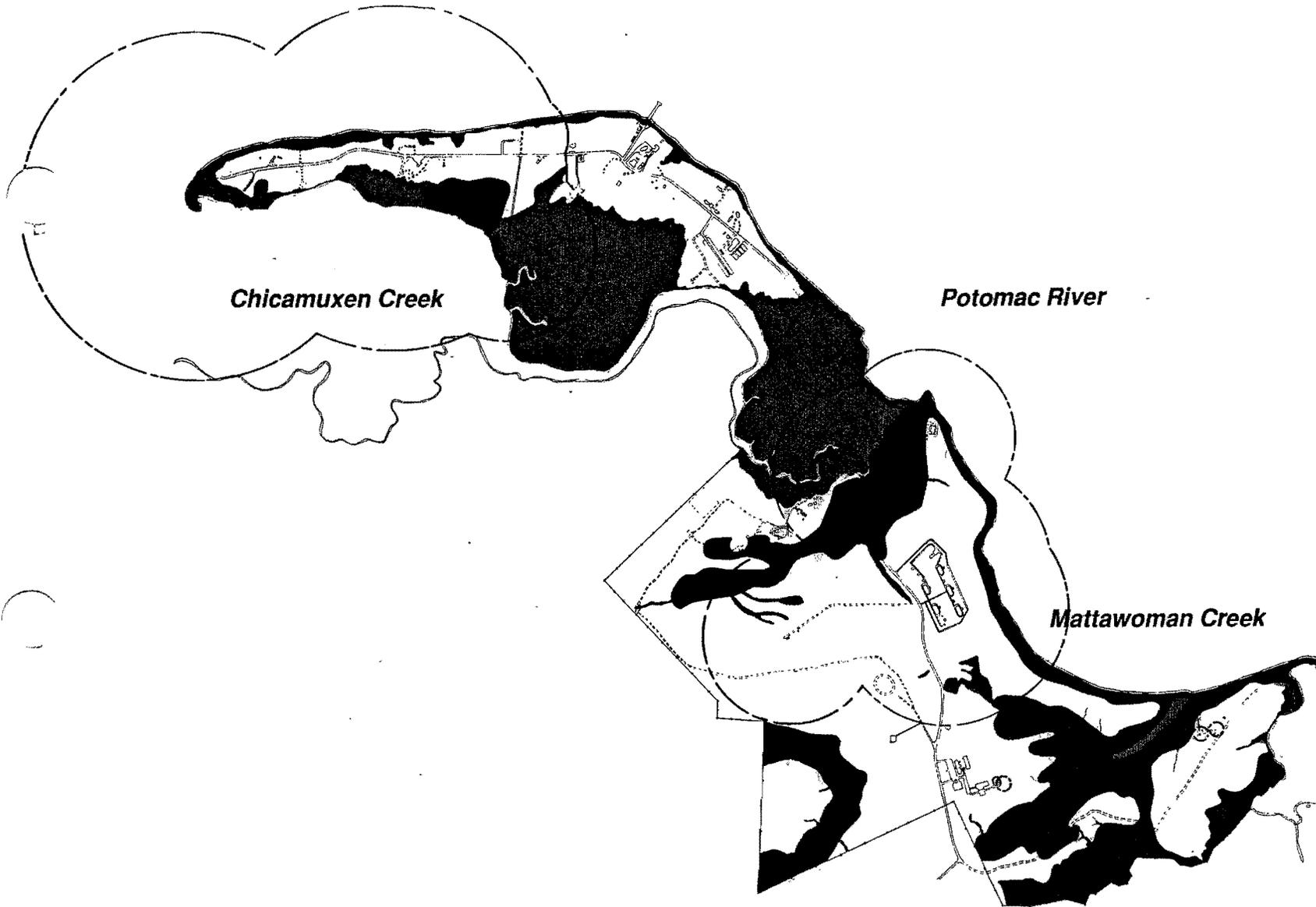


Figure 8-8

Naval Ordnance Station, Indian Head



STUMP NECK

Development Constraints

Source: Master Plan Update Maps: Topography, Hydrology, ESQD Arcs, Former Waste Disposal Sites

LEGEND

- Legal Constraints (floodplains, wetlands)
- Safety Constraints (former waste sites, ESQD arcs)
- Engineering Constraints (steep slopes)

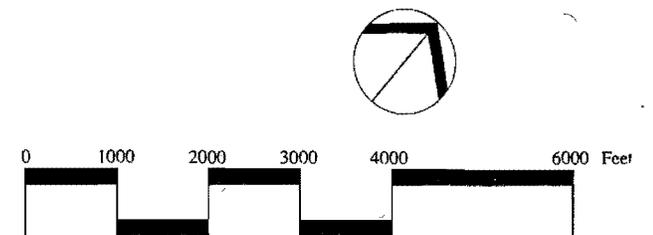


Figure 8-9

Naval Ordnance Station, Indian Head

9

Proposed Land and Facility Use Plan

PROPOSED LAND AND FACILITY USE PLAN

The Land Use Plans proposed for Indian Head and Stump Neck (Figures 9-1 and 9-2) evolved from study of the land use concept alternatives. It consolidates existing land use patterns and eliminates "islands" of incompatible development within larger areas. The plan should be used as a guide for facility planning and site selection. The objective of the plan is not to develop every square foot of Indian Head, but to make the best and most appropriate use of available land.

Land use at NOS is driven by many factors, some of which are unique to the installation. Construction at Indian Head has occurred in clusters throughout the Station. The primary mission of ordnance production and testing requires that these facilities be separated to provide for the safety of personnel. In turn, each facility may consist of several structures requiring varying degrees of separation. Meeting this requirement is made more difficult by the limited amount of land available for development. Other constraints, natural and man-made, are presented in Figures 8-8 and 8-9.

For the purpose of study, land use has been divided into eleven categories. Each category is based on the functional use of the area and may contain several NOS organizations:

- Operations/Training
- Production
- Research, Development, Test and Evaluation (RDT&E)
- Explosives Storage
- Supply/Non-Explosive Storage
- Maintenance/Utilities
- Administration

- Community Facilities and Services
- Housing
- Limited Development

The functions and interrelations of each NOS organization and tenant have been studied and applied to the development of this proposed land use plan. Anticipated growth, utility requirements, access, security, and established growth patterns play a role in development of the land use plan.

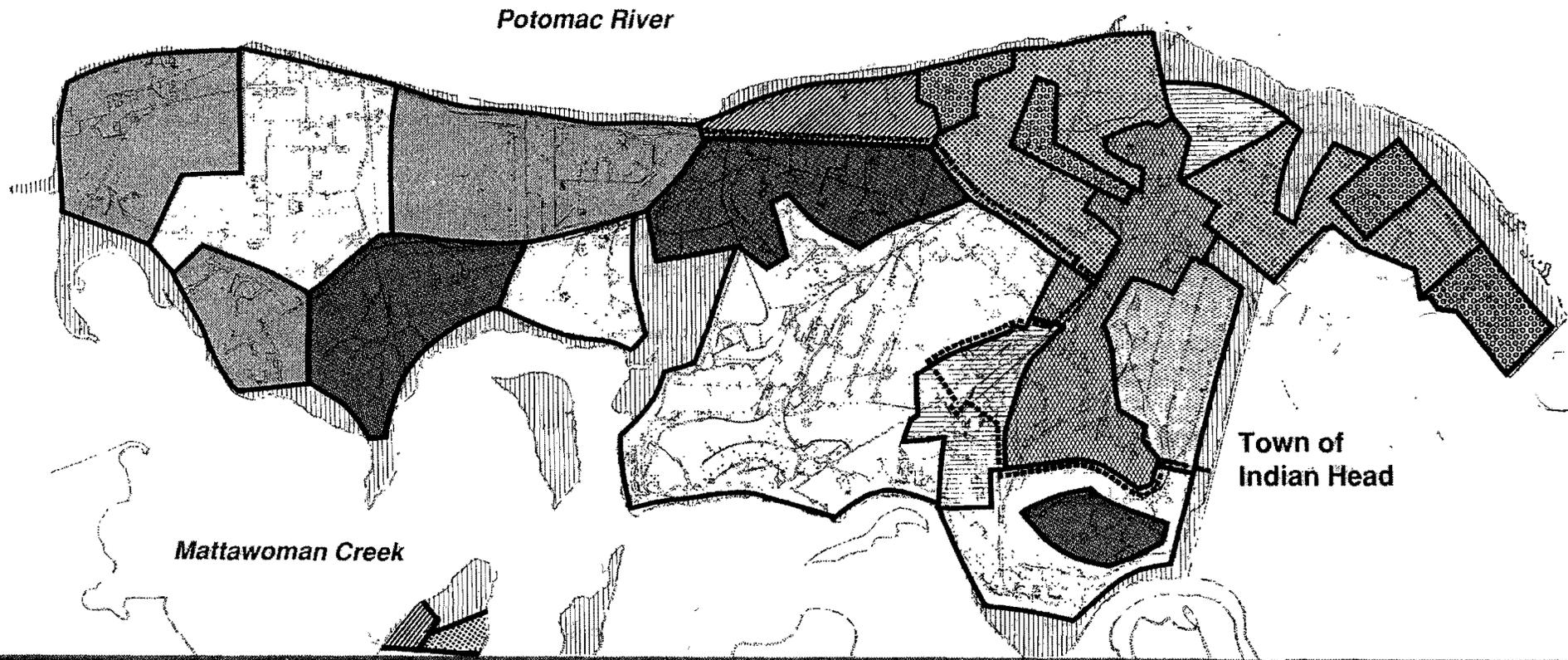
In addition to these Master Plan recommendations, other planning processes are undertaken at NOS, Indian Head. Specific recommendations resulting from these planning activities, including the NOS Strategic Planning Process, and the Base Exterior Architecture Plan, are incorporated into this Master Plan Update by reference.

NOS has designated an Architect of the Station at Indian Head. The Architect of the Station (Code 092A) is responsible for ensuring that all actions that may affect land use and the visual environment at NOS are undertaken in a manner consistent with the Master Plan, the Base Exterior Architecture Plan, and other relevant planning documents.

Proposed Land Use Plan - Indian Head

Production

Land use identified as Production includes all facilities used for the manufacture, loading, assembly, and disassembly of explosive materials and ordnance. Most production facilities generate ESQD arcs and must therefore be within the restricted area.



INDIAN HEAD

Proposed Land Use

Source: 1989 Master Plan Update

LEGEND

- Operations / Training
- Production
- Maintenance / Utilities

- RDT & E
- Explosives Storage
- Supply / Non-Explosive Storage
- Administration

- Community Facilities and Services
- Housing
- Limited Development
- Proposed Restricted Area Boundary

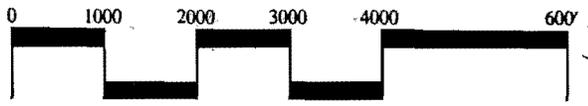
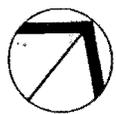
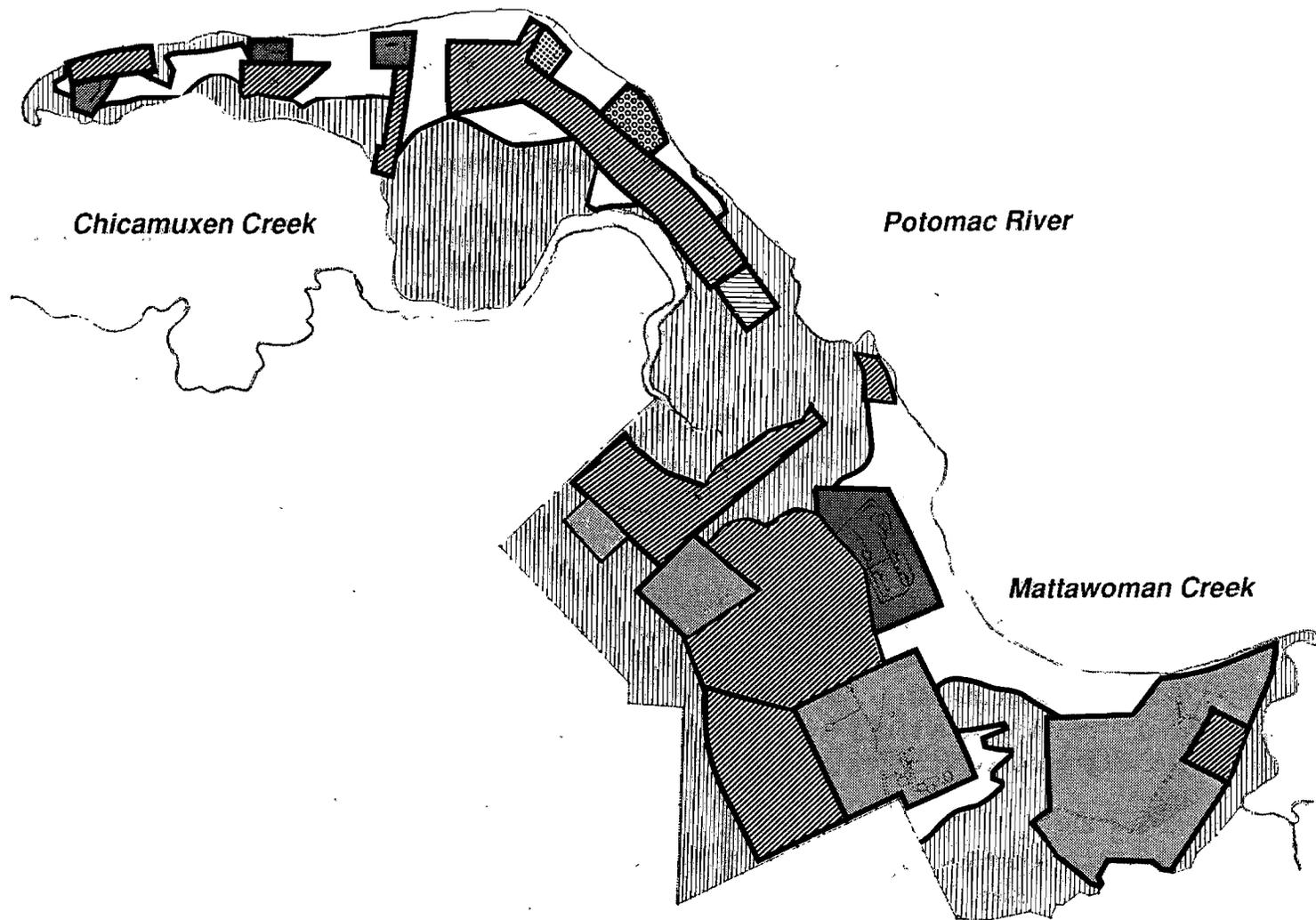


Figure 9-1

Naval Ordnance Station, Indian Head



STUMP NECK Proposed Land Use

Source: 1989 Master Plan Update

LEGEND

Operations / Training

RDT & E

Explosives Storage

Community Facilities and Services

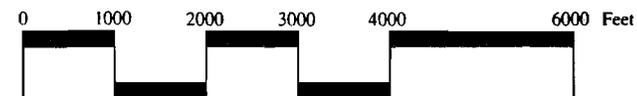
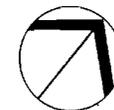
Housing

Maintenance / Utilities

Limited Development

Open Space

Figure 9-2



Naval Ordnance Station, Indian Head

The Proposed Land Use Plan groups Production facilities into four areas based on existing land use patterns. No major changes are recommended since most of these structures are one-of-a-kind and relocation would not be cost-effective. The CAD/PAD area will remain as the only restricted area function at the east end of the Station. CAD/PAD operates separately from other production functions in its role as East Coast CAD Stock and Issue point.

Test facilities currently located at the intersection of Bronson and Hersey Roads will become production facilities as test operations are consolidated at the west end of Indian Head. The remaining production areas are separated by Limited Development and Explosives Storage areas.

Research Development Test and Evaluation (RDT&E)

RDT&E facilities include laboratories for destructive and non-destructive testing of ordnance. Also included are pilot manufacturing facilities for the development of manufacturing processes.

RDT&E functions have been consolidated into three areas. The first is the pilot plant area bordered by Strauss Avenue, Caffee Road, and Greenslade Road. The remaining two are at the west end of Indian Head.

Upon completion of MILCON P-068, Chemical Laboratory Replacement, at the west end of Indian Head, buildings in the area of Evans Road could be converted to engineering office space.

Explosives Storage

Facilities for the storage of explosive materials, ordnance, and test items are located throughout the restricted area. Small explosive storage facilities are operated by Production and RDT&E for storage of small amounts of explosive material.

Magazines for explosive ordnance storage are grouped into two areas on Indian Head. These facilities are well established and have little space for expansion. Any expansion that does occur should be sited at the western location so that no new ESQD arcs will encroach on the unrestricted area.

MILCON Project P-833 continues this development pattern.

Under no conditions should Explosives Storage be located outside the restricted area.

Operations and Training

This area consists of functions including the EOD School and EOD Technology Center. Both of these tenant activities provide training and conduct research in explosive ordnance recovery, evaluation and disposal.

On Indian Head, Operations and Training consists of the area now occupied by the EOD School between Strauss Avenue and Farnum Road. Facilities now located in Building 841 are being relocated to this area. Much of this area is in ESQD arcs extending from the adjacent Explosives Storage area. Since no significant expansion of the school is anticipated at Indian Head, this area should accommodate minor additions to the school.

Administration

Functions considered to be administrative land use include the Command Staff, accounting office, comptroller, personnel services, data processing and engineering support for production, RDT&E, and some tenant activities.

Command functions and NOS administration will be developed as a corridor along Strauss Avenue between Jackson and Patterson Roads. Consolidation of NOS administrative offices in this area will allow easier access from both on and off station. This location also allows the Command offices to become the "front door" to NOS.

Relocation of the restricted area fence will allow easier access to existing engineering office facilities and allow further development of this area. As the need for this type of facility increases at NOS, the area between Patterson Road and the old Single Base Line could be developed to meet this need.

Housing

Two categories of housing exist at Indian Head: Family Housing for NOS and tenant personnel, and temporary housing for enlisted personnel and officers assigned to the EOD School and the EOD Technology Center.

Family housing is located in the northeast corner of the Station. The existing trailer park area should remain as housing but trailer use should be phased out and permanent family housing constructed. Trailers along Cogswell Avenue between Welch Street and Stark Road should be moved and the area used for recreation.

Community Facilities and Services

Community Facilities and Services include medical, dental, commercial, and recreational facilities.

Two areas have been set aside for service and recreational facilities. Family-oriented functions should be located adjacent to the family housing areas. Typical uses would be the Chapel, Child Care, and Arts and Crafts Center.

Athletic facilities such as the gym, racquetball courts, and fitness center should be developed in a more central location to allow access from both the family housing area and the temporary quarters associated with the EOD School.

Supply/Non-Explosive Storage

Supply facilities are used for receiving, storing, and distributing all non-explosive supplies at NOS.

Currently, receiving and storage facilities are dispersed throughout NOS. These functions should be consolidated into one general area to improve control and circulation by reducing the number of times material is handled. The area proposed for supply functions is south of Farnum Road, along the east perimeter fence. The first step in this process is the construction of P-891, Consolidated Supply Facility. Development of this area for supply functions is also dependent on the relocation of the restricted area fence. By locating the supply functions outside the restricted area, truck traffic has much easier access. Security within the fence is improved by reducing the number of vehicles entering the restricted area.

Adjacent to the site is the main line of the NOS rail system. Construction of a short spur is recommended to serve the proposed supply facility. The Supply Department will benefit from having the rail option for delivery of materials in large quantities or oversized or heavy loads.

As supply functions are consolidated, space will be made available in existing buildings to meet other NOS needs.

Maintenance/Utilities

This land use includes all Public Works offices and shops, utility production facilities, and distribution systems.

Relocation of the security fence will put Public Works offices and shops outside the restricted area. The new fence location will provide contractors better access to Public Works facilities. The Goddard Power Plant, fuel storage, and main substation, will remain inside the restricted area. These facilities benefit from the additional security, to assure uninterrupted delivery of utilities.

Limited Development

Many areas of Indian Head are limited for construction due to slope or hydrologic conditions. These areas have been designated as Limited Development to prevent development and consequent environmental or safety impacts.

Proposed Land Use Plan - Stump Neck

Stump Neck's isolated location makes it suitable for functions that require high security or a large amount of open space. However, development opportunities at Stump Neck are limited. Much of the land is unbuildable due to hydrologic conditions. Undeveloped areas consisting mostly of wetlands have therefore been designated as wildlife preservation areas. This will allow protection of Stump Neck's endangered species, while providing a buffer against encroachment.

In other areas of Stump Neck, a substantial capital investment would be required for water, sewer, and electrical systems before any significant development can be accomplished. ESQD arcs also take up much space and limit the type of development that may occur.

RDT&E

RDT&E functions are carried out by the EOD Technology Center and by the NOS Test and Evaluation Department at Rum Point. Technology Center facilities are located on Archer Avenue adjacent to the front gate. Future projects should also be sited in this area.

The NOS Test and Evaluation Department maintains facilities at Rum Point. MILCON P-920 will expand these facilities with a 2,000-foot gun range. This area can be further developed, but will require a new water source and increased electrical service.

Operations and Training

These facilities are used by both the EOD School and the EOD Technology Center for advanced training in ordnance recovery, evaluation, and disposal.

Development of Operations and Training facilities may continue to a limited extent along Archer Avenue at the east end of Stump Neck. Many of these facilities, however, are already on land that is development-restricted.

MILCON P-797 will create a 15-acre pond for Operations and Training, making use of an otherwise development-restricted area.

Explosives Storage

Magazines at Stump Neck support RDT&E and Operations and Training functions. One large magazine complex located on the east half of Stump Neck provides most of the explosives storage space for these functions. This area may be expanded, although detailed soils and ESQD studies would be required. The two remaining magazines are at the east end of Archer Avenue. They are located adjacent to operation and training facilities and cannot be expanded.

Housing

Housing at Stump Neck consists of one single family residence and one duplex. These units are managed by NOS and occupied by military personnel stationed by NAVEODTEHCEN.

Community Facilities and Services

MILCON P-064 will provide a new dining facility for enlisted personnel in the Stump Neck area. Existing recreation and fire protection will support limited growth in the area.

Maintenance/Utilities

A small Public Works maintenance facility is now located at Stump Neck. With the exception of utility improvements, no expansion of this land use area is required. since primary support is provided from the Indian Head site.

Limited Development

In addition to the proposed wildlife refuge location, there is much of Stump Neck that poses constraints for construction due to the presence of floodplains, wetlands and hydric soils. These areas have been designated as Limited Development. The area along the boundary of Stump Neck has also been designated development-limited to provide a buffer between naval activities and the surrounding community.

10

Preliminary Environmental Assessment (PEA)

PRELIMINARY ENVIRONMENTAL ASSESSMENT (PEA)

Prepared by: The Chesapeake Division, Naval Facilities Engineering Command for the Naval Ordnance Station, Indian Head, Maryland, in accordance with OPNAVINST 6240.3E in compliance with the National Environmental Policy Act of 1969. The Chesapeake Division may be contacted at the following address:

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Summary

The purpose of any PEA is to alert the activity and the Navy to potential environmental impacts and additional investigations that may be required in order to implement the Master Plan. The highlights of this PEA are listed below:

Eight MILCONs are programmed through FY92. Of these, four are programmed for construction at Stump Neck and Rum Point, and four are programmed for construction at Indian Head.

The primary issue at Stump Neck/Rum Point is the current reliance on septic systems for wastewater disposal. The availability of soils capable of renovating water quality is limited at Stump Neck especially, and care should be taken to ensure that septic systems are not sited on constrained soils. Consideration should be given to construction of a centralized, or several localized wastewater

treatment plants. If this approach is taken, adequate operator training will be an important environmental consideration.

Air emission restrictions, while not currently onerous, may become so as the regulatory framework for air quality evolves. Regulatory developments should be closely monitored, and planned projects reevaluated in light of proposed and actual restrictions.

A summary of environmental concerns that should be considered for all projects is provided in Table 10-1. Environmental concerns that will need to be addressed for specific MILCONs are summarized in Table 10-2. More detailed information is provided under Project Descriptions and Potential Environmental Consequences.

Table 10-1. Environmental Concerns for all Projects

Compliance with NEPA process Coastal Zone Consistency review Wetland and floodplain avoidance Threatened and endangered species protection Cultural resource protection Sediment and erosion control

Table 10-2. Potential Environmental Concerns for Specific Projects

FY	MILCON NO.	Air Emissions	Wastewater Treatment	Water Use	Hazardous Waste	Spill Control	Shoreline Erosion
89	P-064	-	X	X	-	-	-
	P-088	X	X	X	X	-	-
90	P-034	X	X	X	X	-	-
	P-059	X	X	-	X	-	-
91	P-963	X	X	-	X	-	-
92	P-106	X	X	-	X	-	-
	P-109	X	X	-	X	-	-
	P-759	-	X	-	-	-	-

Introduction

The major objectives of the Master Plan for the Naval Ordnance Station, Indian Head, Maryland, are listed below:

- To provide a comprehensive Master Plan designed to support current and projected mission requirements.
- To provide recommendations useful in assisting in the improvement of the Station's operational capabilities, management of its natural resources, protection of the natural environment, conservation of energy, aesthetic enhancement of the Station's buildings, streets and landscape, and the maintenance of a safe working environment.

- To demonstrate the Navy's commitment to the implementation of the Department of Defense, Federal, and State policies.
- To document the planning process which is the result of planning efforts that have taken into consideration the regional, local and site-specific manmade and natural land use constraints, and that alternative locations, configurations, and uses for plan recommendations have been pursued.
- To develop a Capital Improvements Plan (CIP).

Existing Environment

Topography

Indian Head and Stump Neck are two separate peninsulas of land emerging from the eastern shoreline of the Potomac River. The Indian Head site consists of 1,974 acres and Stump Neck 1,171 acres. Both Indian Head and Stump Neck have relatively low topographic profiles. From its northeastern highpoint of over 100', the Indian Head terrain slopes to the Mattawoman Creek shoreline. The Potomac shoreline, however, is characterized by severely eroded bluffs up to 90' high. The highest elevations at Stump Neck, over 110', are located in its northeastern corner. The terrain then slopes gradually to the Mattawoman and Chicamuxen Creek shorelines.

Soils

The soils at NOS are derived from the unconsolidated sediments of the coastal plain geologic province. Soils vary from sandy to clayey in texture and from excessively drained to poorly drained. Hard pans,

high water tables, and severe erosion are common problems. Crystalline rock occurs 600' beneath the Station. Many soils at Stump Neck are constrained for septic systems.

Vegetation

Five major categories of vegetation have been identified at NOS. Sixty-one percent is made up of pine, hardwood, and pine/hardwood forest. Remaining vegetated areas are tidal wetlands and landscaped areas. Non-vegetated land area is considered "developed" with man-made structures including roads, railroads, buildings, and parking lots.

Wildlife

The wildlife at NOS may be described as abundant and typical of the open field and shrub, forest, and marsh eco-systems that make up the Station. White-tailed deer are over-abundant, and may have exceeded the habitat carrying capacity at the station. There are three known Federally listed endangered species resident to the Station, all at Stump Neck. There is one species of special concern (listed by the State of Maryland), also at Stump Neck.

Hydrology

The hydrology of NOS is dominated by the Potomac River, Mattawoman Creek, and Chicamuxen Creek. These brackish water systems are subject to tidal action and the area is characterized by swamps, wetlands, floodplains, and numerous tributary streams. Areas within the 100-year floodplain, and areas classified as wetlands at NOS have been identified in the Master Plan as being inappropriate for development.

Cultural Resources

There are four sites at NOS considered to be eligible for nomination to the National Register of Historic Places. An additional eight sites might be eligible but need further investigation. The entire region of Bullets Neck is considered eligible for registration as a prehistoric site district which should be preserved as a unit.

Project Descriptions and Potential Environmental Concerns

This section of the PEA will review the potential environmental impacts to be expected from the programmed MILCONs at NOS. Each project is evaluated in accordance with environmental criteria outlined in NAVFACINST 11010.63B. Projects included in this PEA are programmed through FY 92. These are projects that are approved, or for which approval is anticipated. Specific environmental documentation will be accomplished as the design of each project advances. At this time only general information can be provided, as projects are in the concept stage.

MILCON projects for FY93-95 are currently unprogrammed, although priorities have been assigned, as demonstrated by their inclusion in the Capital Improvements Plan. These projects have been included in the Master Plan and Capital Improvements Plan to establish future planning goals for NOS. MILCON projects for FY93 and later have not been included in the PEA.

All projects described below, unless otherwise specified, must be reviewed for Coastal Zone Consistency, due to location in Charles County, Maryland; must provide for sediment and erosion control both

during and after construction; and may affect ambient air quality during construction. On-site surveys of each project location should be conducted to verify that construction will not affect wetlands. All projects that involve water use should incorporate strict water conservation techniques. Other environmental concerns, specific to each project, are described below.

FY89

P-064 Auxillary Enlisted Dining Facility (Stump Neck)

Description: A dining facility for enlisted personnel. This project will replace a WWII structure in poor structural condition. The existing dining facility was damaged by fire in 1946 and never fully repaired.

Environmental Concerns: Wastewater streams will require treatment prior to discharge to surface waters. Soil capability to renovate water quality or other form of wastewater treatment will be necessary. Water demand may be of concern due to limited availability.

P-088 Munitions Disassembly Facility (Stump Neck)

Description: A facility to accommodate the accomplishment of high pressure washout of ordnance, radiography, and remote disassembly of munitions and removal of explosives.

Environmental Concerns: Wastewater streams will require treatment prior to discharge to surface waters. Soil capability to renovate water quality or other form of wastewater treatment will be necessary. Hazardous wastes will require treatment prior to shipment off-site.

Air emissions may affect ambient air quality. Water demand may be of concern due to limited availability.

FY90

P-034 Ordnance Countermeasures Lab (Stump Neck)

Description: A facility housing laboratory space, exploitation facilities, and support space for research, development, testing, documentation, and preparation of render safe procedures, tools, and equipment for foreign and domestic ordnance.

Environmental Concerns: Wastewater streams will require treatment prior to discharge to surface waters. Soil capability to renovate water quality or other form of wastewater treatment will be necessary. Hazardous chemical wastes will require treatment prior to shipment off-site. Air emissions may affect ambient air quality. Water demand may be of concern due to limited availability.

P-059 Mix, Assembly, Cure Facility (Indian Head)

Description: New construction and upgrade of existing buildings for start-up production of high-energy composite propellant and warhead production. The project provides assembly and curing areas for torpedo and missile components.

Environmental Concerns: Industrial wastewater streams will require treatment prior to discharge to surface waters. Hazardous wastes will require treatment prior to shipment off-site. Air emissions (especially volatile organics) may affect ambient air quality.

FY91

P-963 Industrial Wastewater Treatment Facility Phase I

Description: A collection system and additional treatment facility for industrial wastewater generated by operations conducted at the Biazzi and Moser plants and extrusion plant buildings 215 and 874. The facility will use a carbon absorption process followed by evaporation. Condensate from the process will be revised by the plants or released to the storm sewer system.

Environmental Concerns: This facility will result in significant improvement of NOS surface water discharges. Pretreatment is required prior to effluent discharge to the existing sanitary system. Wastes generated during the treatment process will be hazardous and will require treatment prior to shipment off-site. Air emissions may affect ambient air quality.

FY92

P-106 Industrial Wastewater Treatment Facility Phase II

Description: Phase II of this project will provide connections of additional ordnance and inert operations to the existing sanitary sewer system. Wastewater from ordnance operations will flow into holding tanks. When a tank is full, the water will be tested to determine if it should be pumped out and transferred to the Industrial Treatment Facility or allowed to flow into the sanitary sewer system.

Environmental Concerns: This facility will result in significant improvement of NOS surface water discharges. Pretreatment is required prior to effluent discharge to the existing sanitary system.

Wastes generated during the treatment process will be hazardous and will require treatment prior to shipment off-site. Air emissions may affect ambient air quality.

P-109 Propellant and Related Chemical Plant (Classified Ordnance Facility)

Description: A secure operations building for inert and live ordnance processing. Facility will support production of high energy composite propellant warhead explosive systems for Navy tactical weapons with classified components.

Environmental Concerns: Industrial wastewater streams will require treatment prior to discharge to surface waters. Hazardous chemical wastes will require treatment prior to shipment off-site. Air emissions may affect ambient air quality.

P-759 Influence Fused Ordnance Facility (Stump Neck)

Description: A magnetically clean test cell and a test building. The facility will be used by the EODTECHCEN for testing of magnetic, acoustic, and seismic influences on fuses, mines and bombs.

Environmental Concerns: Wastewater streams will require treatment prior to discharge to surface or subsurface waters. Soil capability to renovate water quality or other form of wastewater treatment will be necessary. No generation of hazardous waste or airborne emissions is anticipated.

ENERGY CONSERVATION PLAN

Understanding the key energy challenges which NOS will face in the 1990's, and developing the appropriate strategies to meet them are central to the energy management plan. The following three issues have been identified as being important to NOS' energy performance:

1. **Energy Costs.** Many opportunities exist to reduce energy use and costs. One approach is to conserve energy at the source and end use. Strategies for accomplishing this goal include: reduction of power generation and system losses, efficient equipment operation, proper equipment maintenance, use of energy efficient equipment, energy recovery, and application of new technologies.

Strategies to accomplish energy cost avoidance include demand control, increased cogeneration efficiency and potential, and use of interruptable service where feasible.

2. **Fuel Shortages.** Heavy reliance on coal and fuel oils #6 and #2 could have an adverse affect on the Station's mission if the delivery of these fuels were interrupted for even a short period of time. Strategies to insure a reliable fuel supply and to develop flexibility in energy use include: converting to natural gas as an alternative fuel, maintaining adequate fuel oil and coal storage, using natural gas as an alternative to electricity where feasible, electric utility competition, and use of combustion equipment capable of burning alternative fuels.
3. **Anticipated Electric Peak Demand Increases and Associated Increases in Utility Costs.** The projected increase in peak demand at Goddard Power Plant substation is 9426 KVA between August 1988 and the end of 1992. At the present peak demand

rates this would be a monthly utility bill increase of \$124,425 in the summer and \$33,000 in the winter.

Strategies to minimize the impact of peak demand increases on monthly peak utility costs include load management, peak demand limiting (shifting peak demand to off peak time of day), favorable electric utility rates (purchasing electricity at transmission voltages to get the most advantageous rate) increasing electrical power generation capabilities at Goddard Power Plant, and thermal energy storage (generate and store energy during off-peak hours for use during peak hours).

Action Programs

The Action Programs to implement the energy strategy measures are specified in NAVORDSTA Instruction 4100.1E and the Design Guidelines for Energy Conservation. These guidelines detail engineering design, application, operation, maintenance and planning actions that NOS must follow to attain the desired results.

This centralized approach coupled with "tailored" energy actions at specified activities allows emphasis to be placed where common weaknesses occur. NOS activities should have the ability to implement an energy action program specific to their energy requirements and opportunities (for example, using heat exchangers to capture heat from process exhaust air and heat a building.)

The effectiveness of energy management should be realized in the next several years. As new buildings are constructed and existing ones upgraded energy conservation must be an integral part of each project.

Policy Statement

The energy policy statement is the focal point that creates identity, provides direction and builds consensus and commitment. The station's energy conservation policy as set forth by NAVORDSTA Instruction 4100.1E and the Design Guidelines for Energy Conservation contains the following elements:

- Reduce energy at source and end use equipment through energy conscious operating procedures and control equipment.
- Ensure that energy conservation related practices and products have been incorporated into new designs and renovations.
- Evaluate previous energy surveys and studies to determine potential for energy savings.
- Formulate recommendations for funding of worthwhile energy projects.

Emphasis is placed on reducing source and end use energy consumption through operation, maintenance and energy-conscious designs. Energy surveys and studies are designated as the focal point from which energy actions evolve.

Sensitivities And Assumptions

The energy management guidelines specified in NAVORDSTA Instruction 4100.1E and the Design Guidelines for Energy Conservation assume energy use and costs are largely controllable. Energy actions internal to NOS are emphasized. Energy measures

external to NOS are much more limited as they are mostly beyond the control of NOS.

While management guidelines emphasize energy actions internal to NOS, energy management is also sensitive to changes in the market external to the Station. These factors include increasing dependence on imported oil, new energy technologies, and government regulatory policies. Changes in these areas have the potential to affect energy availability and cost. The energy management guidelines recognize this and outline measures to address external factors such as fuel shortages.

Energy Conservation Projects Completed Or In Progress

1. Fluorescent Lighting Demonstration Project.

This project, completed in April, 1988, involved the modification of fifty four-tube light fixtures in Buildings 551 and 351. Two inner lamps and their associated ballasts were removed, and a 3M Corporation Silver Lux reflector installed. The supplier has guaranteed an energy savings of 40% to 50%. The total cost of the project was \$2992, the payback period is expected to be about 20 months.

2. Renovate/Repair Central Laundry Insulation & Heat Recovery

Bldg. 154
N 62477-87-C-3568

This project will replace existing roofing and siding with new insulating materials. Incandescent light fixtures are to be replaced with energy efficient high pressure sodium lights.

A heat recovery system has been designed for the dryers. Heat from the dryer exhaust will be collected by an air to air heat exchanger and used to preheat intake air. During the summer months, intake air will be taken from the room providing ventilation and cooling.

3. Renovate/Repair Machine SHops Bldg. 268
Window Replacement & Insulation N 62477-87-C-3654

Large, single pane, industrial windows are to be removed. The window area will be replaced with insulated walls and smaller insulated glass window units. Project design is complete and awaiting final approval. Through energy savings the \$111,000 project will pay for itself in four years.

4. Renovate/Repair Motor Facility Bldg. 292
Window Replacement & Insulation N 62477-88-C-3852

This project is similar to Building 268. The payback period of this \$49,000 project is three years.

5. Steam Trap Survey Station-Wide Survey

This survey will catalog all steam traps on Station and record the location, size, purpose, manufacture and condition of each. The information will be added to the Station's preventive maintenance program. The report will include a list of all malfunctioning traps, and the estimated repair cost. Finally the report will provide an estimate of the potential energy savings if all the necessary repairs were made. Similar projects have shown a payback period of as little as four months. This project is underway.

Engineering Service Requests

1. ESR 9-87

Study the steam heating systems in seven buildings on Station to determine the feasibility of converting from steam heat to hydronic systems. The benefits of conversion are expected to come from the elimination of steam traps within buildings, and the implementation of a more efficient heating system. In an earlier study 45% of the steam traps within the selected buildings were found to be inoperable or in poor condition. The final report will be used to develop a list of buildings in which it is economically feasible to convert to hydronic systems.

2. ESR 10-87

This study was to determine the feasibility of installing Single Building Controllers (SBC's) in seven buildings on station. An SBC is an environmental monitoring and control system to monitor and adjust energy and environmental systems. The report, submitted in December 88, included cost estimates, economic analysis, and a scope of work for future ECIP/ETAP projects.

Proposed Energy Conservation Projects

1. Energy Survey of NAVORDSTA Production Areas

The Energy Conservation Office is undertaking an Energy Efficiency Study of the NOS production facilities. The object of the study is to determine how efficiently the Station's production facilities are operating. The study will include a survey of each

department's production facilities and equipment. Each piece of machinery is to be examined to determine its energy requirements and determine whether it is operating properly. With this information, a statistical analysis will be made of energy consumption trends correlating production rate increases and weather factors.

2. Metering Project

Currently, all departments at NOS are charged for utility consumption based on engineering estimates. There is little incentive for conservation because no department knows how much energy they actually use. Under this project, meters are to be installed on the steam, water, and electric systems. The products under consideration are designed to control up to four energy consuming items as well as record and report data on usage. The data will be used as a management tool charge departments for the utilities actually used and to measure conservation efforts. Similar projects have been successful at DOD and Naval Facilities nationwide. CHESDIV strongly supports this effort.

3. Condensate Return System

This is another former MILCON project, P-023, which was submitted in 1977. The design included a condensate return system to serve 39 buildings and oil tanks in the area of the Goddard Power Plant. As energy prices fell and construction costs rose, the cost benefit ratio dropped below 1. CHESDIV is reviewing the condensate return system for current feasibility. Energy costs are rising and that trend is expected to continue. The groundwater supply for NOS is also a serious issue. By providing a condensate return system, the amount of groundwater used for steam production could be dramatically reduced.

4. Steam System Upgrade

NOS Public Works has estimated that it will cost \$500,000 to repair the steam system. The return on that investment is expected to be recovered from energy savings within 4-6 months.

5. Fluorescent Lighting Conversion

The Energy Conservation Office plans to expand the Fluorescent Lighting Demonstration Project to all office areas at NAVORDSTA, EODS, NAVEODTECHCEN, and NAVFAC housing. The demonstration project proved that the modified fixtures meet or exceed lighting levels set in NAVORDSTAINST 4100.1E, Appendix A. The short payback period could be reduced by using the in-house work force rather than a contractor.

6. Roof and Wall Insulation Project

MILCON Project P-039, submitted in 1980, was designed to provide insulation to 39 buildings, bringing them up to NAVFAC standards. The project was not completed due to lowering energy costs and renovation projects which included insulating seven of these buildings. The Energy Conservation Office is planning to combine work on the buildings with the highest Savings Investment Ratios into one or two A/E design projects.

7. Shared Savings Program

This is an industry program for energy conservation projects in which the capital outlay is from a third party source. Under this plan a private firm will develop a management plan, provide on site personnel, and install and monitor utility meters. The cost of the contract is a percentage of the energy savings realized.

The Shared Savings Program allows NOS to realize significant energy savings with no capital outlay.

Employee Awareness Programs

1. Building Energy Monitor Program

This program was started in August, 1988 and reorganized in February, 1989. Each department head has assigned an energy monitor for the buildings under their cognizance. There are 120 monitors in the program, each responsible for one or several buildings. Duties of the Energy Monitors include:

- a. Be familiar with their assigned building(s) and energy-using equipment such as HVAC, lighting, process and test equipment.
- b. Monitor the use of heat, air conditioning and lighting by building occupants to assure compliance with government mandated energy use standards.
- c. Observe and report situations which cause a waste or inefficient use of energy.
- d. Increase energy awareness among civilian and military personnel.

2. Energy Awareness Week

NOS observes Department of Navy and American Energy Awareness Week during the month of October. This program receives support from all administrative levels at the Station. Information

is distributed through NAVORDSTA Notices, articles in the Profile (the Station newspaper), bulletins and posters. Although information is being distributed, active participation by Monitors and NOS personnel is low. The energy conservation office is considering a number of incentives to increase participation in the program.

Incentives and employee recognition for conservation efforts will draw more attention to the program and provide examples for NOS employees. Energy Awareness programs should continue throughout the year and be appropriate for each session.

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CIP

Capital Improvements Plan

CAPITAL IMPROVEMENTS PLAN (CIP)

Planning Objectives

As NOS Indian Head continues to evolve from a mission centered on ordnance production to a research and development center, the Master Plan will play a role in facilitating a smooth transition. Because of its unique mission, NOS is made up of many one-of-a-kind facilities. Production and test facilities have developed as clusters of small buildings to limit the amount of explosive material in any one building. Safety considerations require that many of these facilities be widely dispersed. ESQD arcs play an important role in the site selection process. Adaptive reuse of abandoned structures is hampered by the extensive decontamination process required before a facility may be reused.

Goals of the Master Plan have been identified as:

1. Consolidation of departments into a single or cluster of buildings
2. Redefine the restricted area to allow access to organizations that have no restricted area requirement
3. Improve circulation at NOS
4. Identify development restricted areas
5. Improve the infrastructure system
6. Provide facilities to meet mission changes and expansion

The Capital Improvements Plan presents projects to be implemented to accomplish the goals of the Master Plan. All but one MILCON project through FY91 are approved. Design is complete on most

approved projects, with the remaining projects at least 35% designed. Approval of projects programmed for FY92 is anticipated.

Priorities for MILCON projects have been established for FY93-95. These projects are currently unprogrammed, but are important for meeting planning goals at NOS. Project locations are shown in Figures CIP-1 and CIP-2.

MILCON Project Descriptions

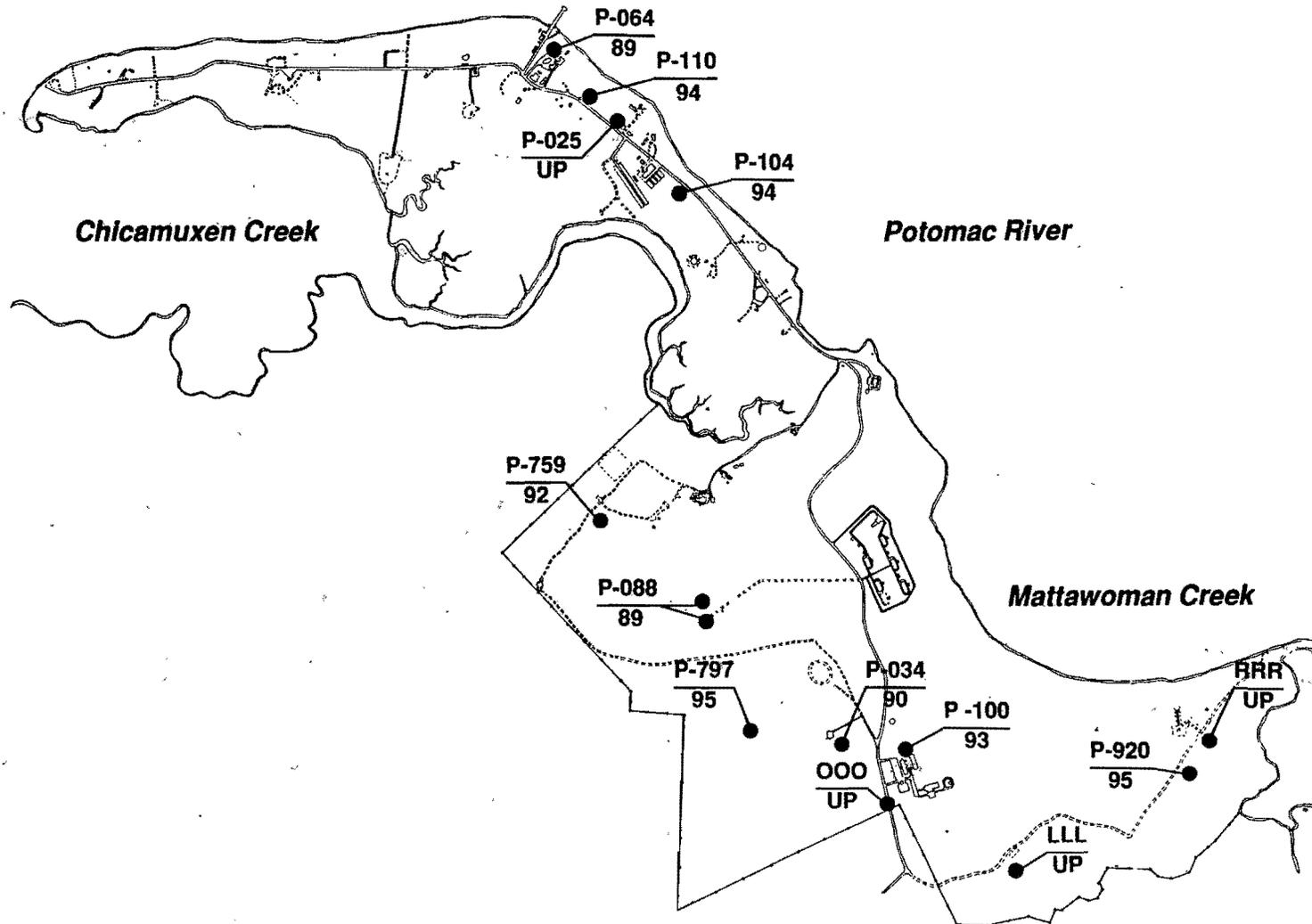
FY89

Title: Auxiliary Enlisted Dining Facility (Stump Neck)
Project No.: P-064 Estimated Cost: \$1,300,000

Description: Provide a dining facility for enlisted personnel. This project will replace a WWII structure in poor structural condition. The existing dining facility was damaged by fire in 1946 and never fully repaired. Buildings D3SN and 15SN will be demolished.

Title: Munitions Disassembly Facility (Stump Neck)
Project No.: P-088 Estimated Cost: \$7,400,000
ESQD Approval Required

Description: Provide a facility to accommodate the accomplishment of high pressure washout of ordnance, radiography, and remote disassembly of munitions and removal of explosives.



STUMP NECK

Project Locations

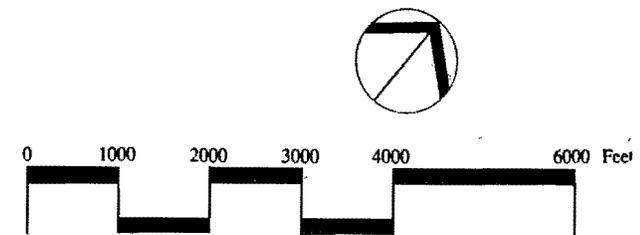


Figure CIP-2

Naval Ordnance Station, Indian Head

FY90

Title: Ordnance Countermeasures Lab (Stump Neck)
Project No.: P-034 Estimated Cost: \$7,700,000

Description: Provide a facility housing laboratory space, exploitation facilities, and support space for research, development, testing, documentation, and preparation of render safe procedures, tools, and equipment for foreign and domestic ordnance.

Title: Mix, Assembly, Cure Facility (Indian Head)
Project No.: P-059 Estimated Cost: \$10,700,000
ESQD Approval Required

Description: New construction and upgrade of existing buildings (728 and 292) for start-up production of high-energy composite propellant and warhead production. The project provides assembly and curing areas for torpedo and missile components.

Recommend Building 292 functions be moved out of CAD/PAD area and consolidated with the rest of the facility.

FY91

Title: Industrial Wastewater Treatment Facility Phase I (Indian Head)
Project No.: P-963 Estimated Cost: \$6,400,000

Description: Provide a collection system and additional treatment facility for industrial wastewater generated by operations conducted in the Biazzi and Moser plants and extrusion plant buildings 215 and 874. The treatment facility, currently in design, will consist of a carbon absorption process followed by evaporation. The facility's

discharge of condensate from the evaporation process will be reused by the plants or released to the storm sewer system. The project also includes sanitary sewer connections for industrial facilities. Inert operations will have direct ties, while ordnance operations will be connected through holding tanks.

FY92

Title: Industrial Wastewater Treatment Facility Phase II (Indian Head)
Project No.: P-106 Estimated Cost: \$5,700,000

Description: Phase II will provide a collection system for wastewater from miscellaneous explosive and propellant operations. Wastewater from ordnance operations will flow into holding tanks. When a tank is full, the water will be tested to determine if it should be pumped out and transferred to the Industrial Treatment Facility, or allowed to flow into the sanitary sewer system for subsequent treatment at the existing sewage treatment facility.

Title: Propellant and Related Chemical Plant (Classified Ordnance Facility) (Indian Head)
Project No.: P-109 Estimated Cost: \$2,400,000
ESQD Approval Required

Description: Provide a secure operations building for inert and live ordnance processing. Facility will support production of high energy composite propellant warhead explosive systems for Navy tactical weapons with classified components.

Title: Influence Fused Ordnance Facility (Stump Neck)
Project No.: P-759 Estimated Cost: \$700,000

Description: Provide a magnetically clean test cell and a test building. The facility will be used by the NAVEODTEHCEN for testing of magnetic, acoustic, and seismic influences on fuses, mines and bombs. This project must be sited in a remote location to be clear of electromagnetic radiation sources.

FY93

Title: Chemical Laboratory Replacement (Indian Head, to be sited)
Project No.: P-068 Estimated Cost: \$5,900,000
ESQD Approval Required

Description: Replace five operating buildings (101, 102, 103, 108, and 596), three of which are over 80 years old. The new facility will be a consolidated laboratory for chemical and physical analysis. Buildings 101, 102, and 103 will be assigned to other NOS organizations. Buildings 108 and 596 will be retained by the Chemical Laboratory, but should be used only for administrative/engineering functions.

Title: Combined Research Lab (Stump Neck)
Project No.: P-100 Estimated Cost: \$1,000,000

Description: Provide a facility to consolidate the Special Operations Special Technology (SOST) program office. The building will provide office, conference, laboratory, and storage space for work at the Top Secret level, including Special Access Programs.

FY 94

Title: Consolidated Recreation Facility (Indian Head)
Project No.: P-028 Estimated Cost: \$2,200,000

Description: Demolish the existing gymnasium (Building D328) and storage building (Building 260). Construct a 19,600 SF consolidated recreation facility and a 2,400 SF storage building. The new project will include a gym, weight room, aerobics area, locker rooms, and office space.

Recommend Building 261 be demolished and the area used for parking.

Title: Nuclear Incident Technical Response Center (Stump Neck)
Project No.: P-104 Estimated Cost: \$5,600,000
ESQD Approval Required

Description: The Navy EOD Tech Center does research and development in the area of access and disablement of Improvised Nuclear Devices. The response center will provide office, conference, and technical meeting space to support this mission. Also included are storage areas, a multi-story sensor test building, an outdoor enclosed test area, and an indoor explosive test facility.

Title: Construct Special Project Building (Stump Neck)
Project No.: P-108 Estimated Cost: N/A

Description: Not available.

Title: Equipment Management Facility (to be sited)
Project No.: P-110 Estimated Cost: \$5,300,000

Description: Not available.

Title: Consolidated Supply Building
Project No.: P-891 Estimated Cost: \$6,600,000

Description: Provide a Consolidated Supply Building to consolidate existing deteriorated and widely separated structures. The project will accommodate warehouse, storage, shipping, and office functions.

FY95

Title: Environmental Test Facility (Indian Head)
Project No.: P-066 Estimated Cost: \$3,800,000

Title: CAD/PAD Plant Modernization (Indian Head)
Project No.: P-073 Estimated Cost: \$4,400,000
ESQD Approval Required

Title: CAD Depot Facility (Indian Head)
Project No.: P-076 Estimated Cost: \$1,000,000
ESQD Approval Required

Title: Technical Information Center (Indian Head)
Project No.: P-105 Estimated Cost: \$3,200,000

Title: Clear Vision Test Pond Facility (Stump Neck)
Project No.: P-797 Estimated Cost: \$600,000
ESQD Approval Required

Title: Ballistic Test Range (Stump Neck)
Project No.: P-920 Estimated Cost: \$7,200,000
ESQD Approval Required

FY96

Title: Replace Cast Plant Buildings (Indian Head)
Project No.: P-074 Estimated Cost: \$2,000,000
ESQD Approval Required

Title: Fuel Oil Storage Tank (Indian Head)
Project No.: P-091 Estimated Cost: \$800,000
ESQD Approval Required

Title: Igniter R & D Facility (to be sited)
Project No.: P-092 Estimated Cost: \$6,000,000
ESQD Approval Required

Title: Bachelor Enlisted Quarters (Indian Head)
Project No.: P-093 Estimated Cost: \$4,500,000
ESQD Approval Required

Title: Extruded Composite Mixing Facility (Indian Head, to be sited)
Project No.: P-107 Estimated Cost: \$2,900,000
ESQD Approval Required

Title: Outer Perimeter Security (Indian Head, various sites)
Project No.: P-328 Estimated Cost: \$3,000,000

Title: Lightning Protection for Explosives Operating Buildings -
Phase I (NOS, various sites)
Project No.: P-987 Estimated Cost: \$2,900,000

FY97

Title: Upgrade Fire Protection Deficiencies (NOS, various sites)
Project No.: P-006 Estimated Cost: \$6,700,000

Title: Emergency Generator Facility (Indian Head)
Project No.: P-097 Estimated Cost: \$1,400,000

Title: Continuous Energetics Facility (Indian Head, to be sited)
Project No.: P-099 Estimated Cost: \$8,000,000
ESQD Approval Required

Title: High Explosives Magazines (Indian Head)
Project No.: P-833 Estimated Cost: \$2,400,000
ESQD Approval Required

Title: Lightning Protection - Phase II (NOS, various sites)
Project No.: P-990 Estimated Cost: \$6,100,000

Title: Fire Station at Stump Neck (Stump Neck)
Project No.: P-025 Estimated Cost: \$1,000,000

Title: Upgrade Security for Category II Magazines (NOS, various sites)
Project No.: P-030 Estimated Cost: \$1,800,000

Title: Upgrade Security of Category I and II Facilities
(NOS, various sites)
Project No.: P-038 Estimated Cost: N/A

Title: Fire Alarm System (Stump Neck, various sites)
Project No.: P-046 Estimated Cost: \$300,000

Title: River Water Treatment Facility (to be sited)
Project No.: P-056 Estimated Cost: \$1,700,000

Title: Extrusion Plant Modernization (to be sited)
Project No.: P-061 Estimated Cost: \$5,000,000

Title: Ammunition Disassembly Facility (to be sited)
Project No.: P-070 Estimated Cost: \$500,000

Title: Command Engineering Center (Indian Head)
Project No.: P-078 Estimated Cost: \$5,000,000

Title: Unaccompanied Officer Personnel Housing (Indian Head)
Project No.: P-086 Estimated Cost: \$3,000,000

Title: Range Operations Center (to be sited)
Project No.: P-089 Estimated Cost: N/A

Title: ADP Technology and Training Center (Indian Head)
Project No.: P-102 Estimated Cost: \$4,000,000

Title: Aerothermal Test Facility (RAMJET) (to be sited)
Project No.: P-102 Estimated Cost: \$4,000,000

Title: Weapons Simulation Engineering Center (Indian Head)
Project No.: P-103 Estimated Cost: \$N/A

Title: Chapel and Religious Education Facility (Indian Head)
Project No.: P-825 Estimated Cost: \$1,600,000

Title: Power Line Protection - Explosive Buildings
(NOS, various sites)
Project No.: P-992 Estimated Cost: \$4,100,000

Unprogrammed Projects

Title: Upgrade Fire Protection Deficiencies (NOS, several locations)

Project No.: P-006 Estimated Cost: \$6,700,000

Title: Fire Station at Stump Neck (Stump Neck)

Project No.: P-025 Estimated Cost: \$1,000,000

Title: Upgrade Security for Category II Magazines
(NOS, several locations)

Project No.: P-030 Estimated Cost: \$1,800,000

Title: Propulsion Engineering Office

Project No.: P-032 Estimated Cost: \$400,000

Title: Denitration Facility

Project No.: P-036 Estimated Cost: Not Available

Title: Upgrade Security of Category I and II Facilities
(NOS, several locations)

Project No.: P-038 Estimated Cost: Not Available

Title: Facility Energy Improvements

Project No.: P-039 Estimated Cost: \$300,000

Title: Fire Alarm System (Stump Neck, several locations)

Project No.: P-046 Estimated Cost: \$250,000

Title: Automated Nitration Facility (Indian Head)

Project No.: P-050 Estimated Cost: \$22,000,000
ESQD Approval Required

Title: River Water Treatment Facility (not sited)

Project No.: P-056 Estimated Cost: \$1,700,000

Title: Extrusion Plant Modernization (not sited)

Project No.: P-061 Estimated Cost: \$4,980,000

Title: Environmental Test Facility (Indian Head)

Project No.: P-066 Estimated Cost \$3,800,000

Title: Ammunition Disassembly Facility (not sited)

Project No.: P-070 Estimated Cost: \$500,000

Title: CAD/PAD Plant Modernization (Indian Head)

Project No.: P-073 Estimated Cost: Not Available
ESQD Approval Required

Title: Replace Cast Plant Buildings (Indian Head)

Project No.: P-074 Estimated Cost: Not Available
ESQD Approval Required

Title: CAD Depot Facility (Indian Head)

Project No.: P-076 Estimated Cost \$990,000
ESQD Approval Required

Title: Command Engineering Center (Indian Head)

Project No.: P-078 Estimated Cost: \$5,000,000

Title: Community Recreation/Bowling Facility (Indian Head)

Project No.: P-080 Estimated Cost: \$1,500,000

Title: Unaccompanied Officer Personnel Housing (Indian Head)

Project No.: P-086 Estimated Cost: Not Available

Title: Range Operations Center (not sited)
Project No.: P-089 Estimated Cost: Not Available

Title: Fuel Oil Storage Tank (Indian Head)
Project No.: P-091 Estimated Cost: \$1,100,000
ESQD Approval Required

Title: Bachelor Enlisted Quarters (Indian Head)
Project No.: P-093 Estimated Cost: \$3,900,000

Title: Emergency Generator Facility (Indian Head)
Project No.: P-097 Estimated Cost: \$1,400,000

Title: ADP Technology and Training Center (not sited)
Project No.: P-098 Estimated Cost: \$3,000,000

Title: Continuous Energetics Facility (Indian Head)
Project No.: P-099 Estimated Cost: \$8,000,000
ESQD Approval Required

Title: Aerothermal Test Facility (RAMJET) (not sited)
Project No.: P-102 Estimated Cost: \$4,000,000

Title: Weapons Simulation Engineering Center (Indian Head)
Project No.: P-103 Estimated Cost: \$ Not Available

Title: Extruded Composite Mixing Facility (Indian Head)
Project No.: P-107 Estimated Cost: \$2,900,000
ESQD Approval Required

Title: Rocket Test Facility
Project No.: P-744 Estimated Cost: \$1,600,000

Title: Clear Vision Test Pond Facility (Stump Neck)
Project No.: P-797 Estimated Cost: \$680,000
ESQD Approval Required

Title: Chapel and Religious Education Facility (Indian Head)
Project No.: P-825 Estimated Cost: \$1,900,000

Title: High Explosives Magazines (Indian Head)
Project No.: P-833 Estimated Cost: \$900,000
ESQD Approval Required

Title: Consolidated Supply Building (Indian Head)
Project No.: P-891 Estimated Cost: \$6,200,000

Title: Ballistic Test Range (Stump Neck)
Project No.: P-920 Estimated Cost: \$4,200,000
ESQD Approval Required

Title: Lightning Protection for Explosives Operating Buildings -
Phase I (NOS Several Locations)
Project No.: P-987 Estimated Cost: \$4,400,000

Title: Lightning Protection - Phase II (NOS, several locations)
Project No.: P-990 Estimated Cost \$9,700,000

Title: Power Line Protection - Explosive Buildings
(NOS, several locations)
Project No.: P-992 Estimated Cost: \$6,400,000

Other Facilities Projects (Non-MILCON)

Project No.	Description		
		N/A	Construct Uninterrupted Power Supply UPS Facility for Computers in Building #D-323
C27-88	Construct Addition to Building #482 for Safety	CER56-86	Install Braiding Machine in Building #1054
C35-84	Construct Support Building for Large Test Motors	CR7-85	Convert Rear of Building #D-332 for Photo lab
C35-88	Construct Addition to Building #303	R57-86	Addition/Upgrade to Building #863 for Engineering Offices
CR24-88	Construct Addition to Building #20	C19-85	Construct Addition to Building #1557 for Logistics and Acquisition
RC25-88	Upgrade Building #62 for Conference Facilities	CR38-84	Modify Building #310 for RSSI Packout Facility
CR70-88	Construct Addition Upgrade Building #D-339 for Security Site Preparation for ROB Near Building #D-340	C27-86	Construct Facility to Replace Changehouse Trailers at Building #1134
N/A	Site Preparation for ROB near Bldg. D-340	C24-86	Construct CAD Test Fixture Storage Building
RCXX-90	OTTO Fuel Bulk Loading Facility	CR32-88	Addition/Upgrade to Changehouse Facility, Bldg. #864
C25-89	Addition to Building #1662 for Classrooms	CR33-88	Construct Addition to Building #1576 for Test Offices
ECR37-88	Upgrade Building #1122 for 150-Gallon Mixer Installation	CR30-88	Addition/Upgrade to Building #302 for Engineering Offices
RCE35-83	Upgrade Building #717 for Case Preparation Facility	C36-88	Construct Addition to Building #D-28 for Engineering Offices
CR26-88	Construct New Pass Office and Gatehouse	C21-85	Install Fresh Water Line for Low Silica Water Conservation
C34-88	Construct Inert Process and Preparation Building Near #744	CE5-82	Alter Warhead and Rocket Motor Reclamation Facility
CR31-88	Addition to Building #1557 for AEPS	CR29-88	Addition/Upgrade to Building #436 for Chemical Engineering
RC16-88	Addition/Upgrade to Building #435 for Engineering Offices	C39-88	Construct Fire Department Training Facility
CR23-88	Construct Addition/Repairs to Building #765	C40-88	Construct Propellant Thermal Dryer Facility
N/A	Construct Canopy at Building #878 for Ambulance Protection	C38-88	Construct Facility for N-Ray to Support Testing
N/A	Install Guardrail at White Plains RR Trackage	C52-88	Construct Additional Test Bays at Building #751
N/A	Install Fence at Building #731 for X-Ray	C53-88	Acoustic Test Building for Test Department
N/A	Install Fence and Gates at Building #731 for X-Ray	C54-88	Construct Large Motor Test Office
N/A	Install Concrete Pad at Buildings #1654/889	C55-88	Vibration Building for Test Department
C26-84	Construct Manufacturing Office Building	C56-88	Shock Test Building for Test Department
N/A	Construct Concrete Walks at Building #160	CR48-88	Upgrade Building #678/1001 Mixer and Control Facility
N/A	Construct Concrete Walks at Building #160	RC47-88	Upgrade Building #545 for Offices
N/A	New Gatehouse to Replace Building #872		
N/A	Conversion of 2.4 KV Line to 13.2 KV Line		
RCE30-83	Upgrade Pilot Plant Labs in Building #855		

RC28-88 Renovate Building #453 for Supply Warehouse
 N/A Increase Air Line Capacity at Building #720
 N/A New Water Lines to Buildings #760 and 1472
 N/A Improvements to Office Buildings #D-326 and D-71
 C27-89 Construct Addition to Building #D-31 for Engineering
 CR17-85 Renovate Extrusion Plant Changehouses
 N/A Alterations/Repairs to CP Buildings #D-69, D-70
 and D-71
 N/A Upgrade Building #1182 for Pilot Plant
 N/A Communication Center Upgrade in Building #20
 N/A Alterations to Building #714 for Offices
 RC31-84 Upgrade Building #444 for Chemical Analysis
 N/A Upgrade Dryhouse Building #215 for LOVA
 CR11-84 Upgrade to Building #D-323 for Engineering Offices
 RC11-85 Repair Ordnance Devices
 N/A Upgrade Oil Pumping Facilities at Building #873
 C21-86 Upgrade Line Offices in Building #331
 N/A Renovate Machine Shop
 RC44-88 Upgrade/Repair Riverwater Pumphouses
 EC21-87 Environmental Control in Extrusion Buildings #332
 and 333
 RC6-87 Upgrade Buildings #479 and 1384 for Grain Packout
 REC28-84 Upgrade Building #744 for UFAP
 RECE38-84 Upgrade Building #743 for Cast Plant
 RC15-87 Relocate #3 Air Compressor to Building #113
 RC4-88 Upgrade Central Laundry Facility in Building #154
 RC43-88 Upgrade Building #D-327 for Resources and Planning
 Offices
 RC18-85 Upgrade Building #696 for Pilot Plant Processes
 RC46-88 Refurbish 100-Gallon Horizontal Mixer
 CER11-87 Upgrade Bldg. #721 for Continuous Processing
 C5-86 Cooling Tower Facility in Pilot Plant for Low Silica
 Water Conservation
 CR17-87 Renovate Building #685 for Igniter Loading

Recommended Projects

A need for the following projects has been identified through the master planning process.

Relocate Security Fence (Indian Head) Project No.: CCC

This project will increase security in the restricted area by eliminating unnecessary traffic. Departments such as Public Works, Supply, and Weapons Simulation as well as other engineering functions have many off-station visitors that would not be required to pass through a second security gate.

Two new gates will be provided in this project. The first will be located on Hanlon Road west of Patterson Road, the second on Patterson Road near the Goddard Power Plant.

Steam Condensate Return Line (Indian Head) Project No.: DDD

NOS, Indian Head is using the maximum quantity of water allowed by agreement with the State of Maryland. Steam condensate should be returned from the densely developed area around the Goddard Steam Plant.

Security Police Boat House (Indian Head) Project No.: EEE

Sited at the Old Burn Point, this facility will provide a boat house and dock for three Security Police patrol boats. The project is located to provide a protected marina with easy access to Indian Head and Stump Neck shorelines. A study of the ESQD arcs in the area is required.

Main Gate Development - Phase II**Project No.: FFF**

The second phase of the Main Gate Development will provide a personnel office and contractors bid room, and will include development of a truck inspection area and parking.

Renovate Soda Sheds - Phase I**Project No.: GGG**

The proposed Land Use Plan calls for two of the sheds to be part of the Administrative functional area and the other two in the Community Support functional area. These four unique structures are a landmark at NOS and provide an opportunity for redevelopment. A growing need for secure office space can be met by adaptive reuse of these buildings. The concrete base of the soda sheds provides a wall enclosure meeting security requirements. Addition of a concrete floor slab completes the enclosure. The second floor may be used for non-secure office space.

Child Development Center**Project No.: JJJ**

Consolidate three existing separate child care facilities into one meeting current criteria.

Bicycle Path/Fitness Trail**Project No.: KKK****Small Arms Range Improvements****Project No.: LLL****Continue Marina Development****Project No.: MMM****Credit Union****Project No.: NNN**

Third party construction of a new credit union in the community service area.

Stump Neck Gate**Project No.: OOO**

Increase security at the entrance to Stump Neck. Re-route Rum Point Road so traffic to Rum Point must pass through security gate. Includes a new gate house and a pass office.

Navy Exchange**Project No.: PPP**

Construct a new Navy Exchange retail store in the community service area. The existing facility is old, cramped (about half the size required for the military population served) and contains entirely inadequate storage space. The new facility should include approximately 15,800 SF in retail store area, with a contiguous warehouse area of about 5,000 SF. An exchange gasoline service/repair station of about 2,500 SF, with 3 fuel pumps (one each for regular unleaded, super unleaded and diesel fuel) and at least one repair bay, should also be included near the exchange store. NOS currently has no Exchange Service Station.

Carpool Shelter**Project No.: QQQ**

Construct a carpool shelter of about 500 SF in the carpool staging area to provide shelter in inclement weather to NOS employees while waiting for carpools; this will facilitate the station goal of encouraging ridesharing and thus reducing on-station traffic and parking problems.

Skeet Range**Project No.: RRR**

Construct a Skeet Range for recreational use by military personnel stationed at NOS with a skeet range building of about 3,900 SF to include office, storage, sales area, gun maintenance shop and a lounge and toilet facilities. The land area required for the range itself is about 1100 x 2400 feet.

Officers Club**Project No.: SSS**

Enlarge the current Officers Club facility. The current facility is just over one-half the (maximum) size required to serve the number of officers stationed at NOS (including tenants).

Enlisted Club**Project No.: TTT****(Consolidated Open Mess, Enlisted)**

Enlarge or replace the current Enlisted/NCO Club facility in the community services area; should include food preparation, dining area, lounge and related storage space. The current facility is rated substandard, and is approximately 20,000 SF smaller than the (maximum) size facility required to serve the enlisted and NCO population on NOS.

Recreation (Picnic) Pavilion**Project No.: UUU**

Construct one or more picnic pavilions in the community services/recreation area, up to a total of about 1,300 SF; this SF would include at least one concession stand and lounge area, plus toilet facilities in each, and sufficient storage space. Locate at least one near outdoor sports facilities such as tennis courts or ball fields.

Golf Club House and Equipment Storage**Project No.: VVV**

Expand the existing Golf Club House, up to 6,500 SF for the Golf Club House, including a lounge, concession area, equipment storage, a golf shop and merchandise storage, plus up to 1,500 SF (attached or in a separate facility) for grounds-keeping equipment storage. The existing facility is too small for a 9-hole golf course.

Swimming Pool and Bath Houses**Project No.: WWW**

Enlarge the current bath houses and consider constructing another swimming pool. NOS currently has a 31-meter swimming pool (with a wading pool) and 2 bath houses of 748 and 120 SF each, but is authorized (based on military population) to have a 25-meter pool and a 50-meter pool, with bath houses of 3,700 SF and 9,700 SF each. The current bath houses are not large enough to serve the military population, and lack sufficient storage space for pool equipment and supplies for the current swimming pool. (As the enlargement is done, parking space should also be expanded, since parking is already a problem between the existing pool and other facilities in the immediate vicinity.)

Data Processing Center**Project No.: XXX**

Construct a new, modern data processing facility, up to about 16,000 SF (OR 23,000 SF including all administrative offices for Department 03). Included is: Data Processing Center, Information Users Center (PC and CAD training) and all necessary support areas.

Oil Spill Response Facility**Project No.: ZZZ**

Provide a permanent response facility to provide general equipment storage and a boom wash-down/storage area that includes a rack-type holding area where booms can be pressure cleaned after clean up operations. The wash down floor area will direct waste water to a holding tank for appropriate disposal.

SUMMARY OF COMMAND REVIEW COMMENTS

Naval Ordnance Station, Indian Head
Master Plan Update - 1990

REVIEWING COMMAND	POC ON COMMENT LTR	REC'D VIA	COMMENT	ACTION
Chief of Naval Operations	R. L. Wernsman By Direction	8020 Ser 411F/9U587083 20 Nov 1989	1. The absence of a referenced "Appendix B" was noted.	Changed on Page 7-37
Naval Investigative Service Command	C. O. Castells By Direction	Ser: NISCOM/24-0434 21 Nov 1989	2. References to site plan approvals recommend wording modification	Changed on Page 7-40
			1. Recommendation that security needs and requirements be expounded upon in either Chapter 1 or 2.	Security is highlighted as a key issue in the text.
			2. Recommend inclusion of additional OPNAV instructions related to security.	The NOS Security Organization is noted in the text.
			3. Levels of restricted areas are not identified in plan.	The restricted areas were highlighted as a prelude to a recommendation.
			4. Recommended usage of OPNAVINST 5530.13 in planning for Naval Facilities.	Guidance was utilized in developing the plan.
NAVSEASYS COM	Richard T. Adams By Direction	8020 OPR 6651 Ser 665/1132	1. Review of CIP with changes to reflect current MILCON programming.	CIP has been revised to reflect current MILCON programming.
Chief of Naval Operations	Alston S. Kirk By Direction of the Chief of Chaplains	11000 Ser 972C/4864 30 November 1989	1. Recommend inclusion of Mission Statement for Command Chaplain and other Staff Specialists.	The Plan focused on those departments that related to the station's primary mission.
			2. Recommendation on considerations to take in account when locating proposed RMF (FY97).	The location of the proposed RMF is still under review by the activity.
NAVFACENG COM	Harriet Jane Brattain By Direction	2002RU 02 FEB 1990	1. There is no Appendix B. More information should be provided on navigational danger zone. Paragraph (3) on pages 7-40 and 7-42 are redundant.	Changed on Page 7-37. Paragraphs (3) on pages 7-40 and 7-42 are quoted verbatim from 33 CFR 334.240.
			2. Incorrect symbol on legend for Figure 9-1.	Changed on Page 9-2
			3. The Natural Resources Management Plan should be referred to and specific information provided.	All related plans were reviewed and the pertinent information was included in the text.
			4. CIP should be reviewed/ revised to reflect the latest available data.	CIP has been revised to reflect current MILCON programming.