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RCRA FACILITY ASSESSMENT (RFA)
NAS MEMPHIS
MILLINGTON, TENNESSEE

Prepared For:
Department of the Navy
Southern Division
Naval Facilities Engineering Command
Charleston, South Carolina
Contract No. N62467-88-C-0198

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REVISED FINAL REPORT

RCRA FACILITY ASSESSMENT (RFA)
NAS MEMPHIS
MILLINGTON, TENNESSEE

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GLOSSARY AND LIST OF ACRONYMS

ARAR - applicable or relevant and appropriate requirement.

Bench scale - Treatability tests performed on a small scale, usually in a laboratory, to better define parameters of a treatment technology.

CAA - Clean Air Act.

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund: Amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA).

CMS - Corrective Measures Study (RCRA Action).

CRP - Community Relations Plan.

CWA - Clean Water Act.

DERP - Defense Environmental Restoration Program.

DOD - Department of Defense.

DQO - Data quality objectives: Statements that specify the data needed to support decisions regarding remedial response activities.

Excess lifetime cancer risk - The potential for cargiongenic effects from exposure to one or more chemicals.

FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act of 1949.

FS - Feasibility Study.

General Response Action - General types of action, such as containment, that may be taken to achieve exposure limits specified by remedial action objectives.

GAC - Granular activated carbon; used for absorption of organic contaminants and trace heavy metals.

Innovative technologies - Technologies that are fully developed but lack sufficient cost or performance data for routine use at RCRA sites.

IRP - Installation Restoration Program.

Lead agency - The agency, either the EPA, Federal agency, or appropriate State agency having primary responsibility and authority for planning and executing the remediation at a site.

MCL - Maximum contaminant level: Established under the Safe Drinking Water Act.

MCLG - Maximum contaminant level goal: Established under the Safe Drinking Water Act.

NAAQS - National Ambient Air Quality Standards.

NACIP - Navy Assessment and Control of Installation Pollutants (Program; now the IRP).

NAS - Naval Air Station.

NCP - National Oil and Hazardous Substances Contingency Plan.

NEPA - National Environmental Policy Act.

NEESA - Navy Environmental and Energy Support Activity.

NPDES - National Pollutant Discharge Elimination System.

O&M - Operation and Maintenance.

OSHA - Occupational Safety and Health Administration.

OSWER - Office of Solid Waste and Emergency Response (USEPA).

Operable Unit - A discrete action that comprises an incremental step(s) toward a final remedy. Operable units may address geographic portions of a site, specific site problems, or this initial phase of an action.

Pilot scale - Treatability tests performed on a large scale to simulate the physical, as well as chemical, parameters of a process.

POTW - Publicly owned treatment works, as defined by US Environmental Protection Agency at 40 CFR 122 (see STP).

Present Worth Analysis - A summary of costs to be incurred over a period of time, discounted to the present.

PRD - Preliminary Review Document.

RCRA - Resource Conservation and Recovery Act.

RD - Remedial design.

Remedial Action Alternatives - A potential approach to preventing or mitigating site-specific contamination problems, defined in terms of a remedial action technology option or combination of options and the volumes or areas of media to which the option or options will be applied.

Remedial action objective - A description of remedial goals for each medium of concern at a site; expressed in terms of the contamination of concern exposure route(s) and receptor(s), and maximum acceptable exposure level(s).

Remedial action technology type (or technology type) - A general category encompassing a number of remedial action technology options that address a similar problem (e.g., capping, contaminant barriers, chemical treatment).

Remedial action technology process option (or process option) - A specific process, system, or action that may be used to clean up or mitigate contaminant problems (e.g., clay cap, slurry wall, neutralization).

RFA - RCRA Facility Assessment.

RFI - RCRA Facility Investigation.

RI/FS - Remedial investigation/feasibility study (CERCLA).

ROD - Record of Decision: Documents selection of cost-effective Superfund-financed remedy.

SARA - Superfund Amendments and Reauthorization Act of 1986. (See CERCLA).

SDWA - Safe Drinking Water Act.

Sensitivity Analysis - A test of a procedure to determine the overall changes that will result from any small change in one or more procedural elements.

STP - Sewage Treatment Plant; may or may not be publically owned (See POTW).

Support Agency - The agency, either the Federal EPA or the State agency, responsible for review and concurrence in developing and selecting a remedy at a CERCLA site.

SWDA - Solid Waste Disposal Act.

TCL - Target compound list.

Technology process option - See remedial action technology process option.

TSCA - Toxic Substances Control Act.

Treatability studies - Studies performed to better define the physical and chemical parameters of technology process options being evaluated.

USACE - US Army Corps of Engineers.

USATHAMA - US Army Toxic and Hazardous Materials Agency.

USN - US Navy.

VSI - Visual Site Inspection.

VSIR - Visual Site Inspection Report.

1.0 INTRODUCTION

Visual site investigations by the ERCE, accompanied by Navy representatives and TDHE representatives, were conducted on June 30 and July 17, 1989. Additional site visits were made in August 1989 and February 1990. The results of the site investigations were included in this report and the final Visual Site Inspection Report issued concurrently with this document.

1.1 PROJECT BACKGROUND

In September 1986, the U.S. Environmental Protection Agency issued Permit Number HSWA-TN002 to the Naval Air Station Memphis located at Millington, Tennessee. This permit was issued pursuant to the Federal Resource Conservation and Recovery Act (RCRA) of 1976 (as amended by the Hazardous and Solid Waste Amendments [HSWA] of 1984), and the Tennessee Solid Waste Disposal Act. It requires the permittee to prepare a report which identifies and characterizes all existing active and inactive solid waste management units (SWMUs) located at the facility.

In December 1986, the Engineering, Design and Geosciences Group, Inc. (EDGe; now a part of ERC Environmental and Energy Services Company, Inc.), was retained by the Southern Division Naval Facilities Engineering Command (SOUTHDIV NAVFACENGCOM) to address the requirements of Permit Number HSWA-TN002. Specifically, EDGe was to inventory the NAS Memphis installation and identify units, sites, activities or locations which meet the definition of Solid Waste Management Units (SWMUs). Following identification, description and analysis of the SWMUs, EDGe was to prepare investigation plans intended to evaluate SWMUs which are known, suspected or presumed to have releases of hazardous constituents.

1.2 SUMMARY OF WORK PERFORMED

During the inventory phase, the EDGe team identified fifty-eight potential SWMUs. The original draft report, dated April 1987, located and described each of these SWMUs and recommended thirty-four of them for further study. Since 1987, three additional sites were added and a formerly identified site was divided into two sites, to bring the total number of potential SWMUs to sixty-two.

1.3 REPORT ORGANIZATION

This report is organized to the extent feasible on EPA's current recommended RFA format. The sheer number of SWMUs identified in this report (sixty) necessitated compartmentalization of data for each SWMU. Sections 1.0 through 4.0 address the installation as a whole. Section 1.0 provides project background information relating to regulatory agency requirements, US Navy and DOD requirements, and US Navy Contractor requirements for producing the document. Section 2.0 provides additional background for the project and the installation. Section 3.0 is a description of the hydrogeologic setting of the installation as a whole (more detailed information is provided for each SWMU, as appropriate, in Section 7.0). Section 4.0 provides basic atmospheric data. Section 5.0 provides a general discussion of pathways of contaminant transport and exposure (more detailed information is provided for each SWMU, as appropriate, in Section 7.0). Section 6.0 provides general information on contaminant properties and effects.

Section 7.0 contains the detailed information for all 62 SWMUs. In each subsection, 7.1 through 7.61, site-specific information is presented and recommendations are made for site disposition (i.e., no further action or further study under an appropriate regulatory program).

Each subsection of Section 7.0 is formatted as follows, in keeping with the intent of the EPA RFA guidance on format and content (SWMU No. 1 is used as an example -- SWMUs No. 2 through 61 are formatted similarly):

7.1 SWMU No. 1: Fire Department Drill Area (FDDA)

7.1.1 Unit Characteristics
7.1.1.1 Type of Unit
7.1.1.2 Design Features
7.1.1.3 Operating Practices (Past and Present)
7.1.1.4 Period of Operation
7.1.1.5 Age of Unit
7.1.1.6 Location of Unit
7.1.1.7 General Physical Conditions
7.1.1.8 Closure Method
7.1.2 Waste Characteristics
7.1.2.1 Type of Waste
7.1.2.2 Migration Characteristics
7.1.2.3 Toxicological Characteristics
7.1.2.4 Physical/Chemical Characteristics
7.1.3 Migration Pathways
7.1.3.1 Geological Setting
7.1.3.2 Hydrogeologic Setting
7.1.3.3 Atmospheric Conditions
7.1.3.4 Topographic Characteristics
7.1.3.5 Pathways
Air
Soil
Surface Water
Groundwater
Subsurface Gas
7.1.4 Contaminant Release Identification
7.1.4.1 Prior Inspection Reports
7.1.4.2 Public Complaints

Section 8.0 is a brief summary of recommended action for this installation as a whole. A final Visual Site Inspection Report (VSIR) was prepared concurrently with this final RFA. It contains photographs and field notes on each site. It includes a location map of each site and a copy of the field log book. This log book was specially prepared beforehand with known site information for all 62 sites, so that field investigators could "fill in the blanks" during the site visual investigations. A Preliminary Review Document (PRD) containing past investigation information was also produced.

1.4 TERMINOLOGY

A "CERCLA" glossary and EPA/US Navy list of acronyms is included following the table of contents. In order to avoid confusion, the following project-specific terminology is used:

- Installation - NAS Memphis as a whole
- Facility - An engineered structure built for a specific purpose (e.g., building, landfill, etc.)
- Site - A discrete facility, location, or feature designated as a potential hazardous waste site (SWMU) in this RFA
- SWMU - As used in this report, the terms "site" and "SWMU" (Solid Waste Management Unit) are synonymous
- Unit/Operable Unit - As defined by EPA. As used in this RFA, may be used to refer to a site or a portion of a site, as appropriate.

This terminology should avoid misunderstandings between DOD/US Navy and regulatory agency personnel, and other reviewers of this document.

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2.0 BACKGROUND

2.1 PROJECT SETTING

NAS Memphis is a 3,490-acre facility located in Millington, Tennessee, approximately twenty miles northeast of the City of Memphis and thirteen miles east of the Mississippi River. The installation is bordered on the west and south by the City of Millington and the north and east by agricultural and residential areas. The general location is shown on Figure 1, a map prepared by Geraghty and Miller, Inc., in November 1985.

The primary source of potable water for both NAS Memphis and the City of Millington is the Fort Pillow Sand Aquifer, the top of which lies at a depth of approximately 1400 feet below land surface. The five NAS Memphis supply wells are all located on base property, and the city supply wells are located a short distance to the west and southwest of NAS Memphis. Three of the NAS wells are approximately 1500 feet deep, and two are approximately 500 feet deep. Shallow (unconfined aquifer) groundwater in the area generally has relatively high levels of iron; however, it is occasionally tapped for small-capacity wells for non-potable uses.

Six City of Millington supply wells are located within 1/2 mile of the NAS. One main and one standby well are located 0.3 miles west of the NAS; one main and three standby wells are located approximately 1/2 mile to the southwest. The two main wells draw from the Fort Pillow Aquifer (1400 feet below ground level [b.g.l]); the four standby wells draw from the Memphis Sand Aquifer (500 feet b.g.l.). In addition, the Memphis-Shelby County Health Department estimates there are approximately 20 private wells in the Millington area.

2.2 SITES STUDIED

Since it was commissioned in 1942, the mission of the NAS has been to provide services and material to support operations of aviation activities, units of the Naval Education and Training Command, and other activities and units as designated by the Chief of Naval Operations. The Naval Regional Medical Center is located adjacent to the NAS and is part of the entire installation which is the subject of this study. In support of these activities, some hazardous wastes have been generated.

Prior use of the site was also investigated. During World I, the U.S. Army constructed Park Field, a military aviation training facility. Between the World Wars, the site was used for approximately eight years as a civilian airfield and, beginning in 1929, as a government-supported agricultural facility.

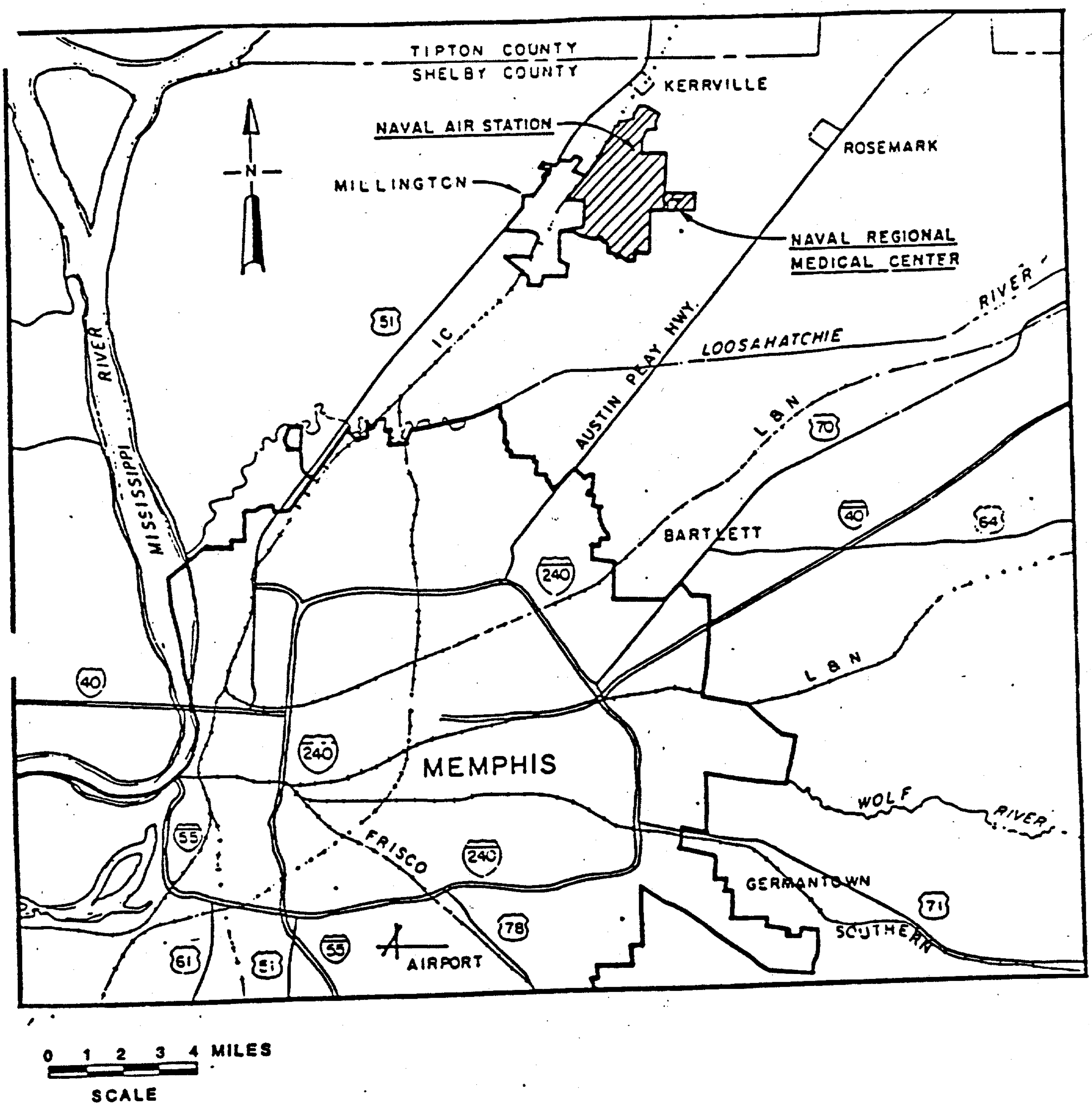

Figure 2-1. Regional Location of NAS Memphis

2.3 WORK PERFORMED

In January 1987, a review was undertaken of historic information available for the facility. Site visits, design drawings, construction records, personal interviews, environmental studies, analytical reports, aerial photos and maps were employed to determine the location and characteristics of potential SWMUs. This information was supplemented by data developed as part of the Navy Assessment and Control of Installation Pollutants (NACIP) Program and reported in 1983 and 1985.

Table 2-1 is the list of 62 sites (SWMUs) that have been identified during this RFA.

TABLE 2-1 LIST OF SOLID WASTE MANAGEMENT UNITS (SWMUs)

SWMU No. 1: Fire Department Drill Area
SWMU No. 2: South Side Landfill
SWMU No. 3: N-121 Plating Shop Dry Well
SWMU No. 4: N-121 Plating Shop Storm Sewer
SWMU No. 5: Fire Fighting Training Area
SWMU No. 6: N-126 Battery Shop Storm Sewer Ditch
SWMU No. 7: N-126 Plating Shop Dry Well
SWMU No. 8: Cemetery Disposal Area
SWMU No. 9: Sewage Lagoons
SWMU No. 10: North Side Landfill (Eastern Portion)
SWMU No. 11: Oiled, Dirt Roads
SWMU No. 12: Galley Disposal
SWMU No. 13: Building 499 Grease Pit
SWMU No. 14: S-104 Site and 7th Avenue Ditch
SWMU No. 15: N-94 Tank Farm
SWMU No. 16: N-94 Above Ground Waste Tanks
SWMU No. 17: S-9 Underground Waste Tank
SWMU No. 18: N-112 Underground Waste Tank
SWMU No. 19: 341 Underground Waste Tank
SWMU No. 20: 1594 Underground Waste Tank
SWMU No. 21: N-10 Underground Waste Tank
SWMU No. 22: S-75 Underground Fuel Tank
SWMU No. 23: S-8 Underground Fuel Tank
SWMU No. 24: Auto Shop Waste Oil Tank
SWMU No. 25: Big Creek Landfill
SWMU No. 26: N-102 Battery Acid Treatment
SWMU No. 27: North Side STP
SWMU No. 28: South Side STP
SWMU No. 29: Lakehouse STP
SWMU No. 30: Park Field Waste Treatment Tank
SWMU No. 31: Aircraft Wash Rack at 4th Street
SWMU No. 32: N-7 Aircraft Wash Rack
SWMU No. 33: H-10 Incinerator
SWMU No. 34: H-109 Incinerator
SWMU No. 35: 1579 Incinerator
SWMU No. 36: North STP Incinerator
SWMU No. 37: South STP Incinerator
SWMU No. 38: Industrial Drainage Ditch
SWMU No. 39: S-74 PCB Storage Area
SWMU No. 40: Salvage Yard No. 1
SWMU No. 41: Salvage Yard No. 2
SWMU No. 42: N-12 Hazardous Waste Storage
SWMU No. 43: S-176 Hazardous Waste Accumulation Points
SWMU No. 44: N-102 Hazardous Waste Accumulation Points
SWMU No. 45: S-142 Hazardous Waste Accumulation Points
SWMU No. 46: S-140 Hazardous Waste Accumulation Points
SWMU No. 47: 344 Hazardous Waste Accumulation Points
SWMU No. 48: S-9 Hazardous Waste Accumulation Points
SWMU No. 49: 757 Hazardous Waste Accumulation Points
SWMU No. 50: N-126, MAG-42 Hazardous Waste Accumulation Points

TABLE 2-1. (cont.)

SWMU No. 51:	N-126, VR-60 Hazardous Waste Accumulation Points
SWMU No. 52:	N-126, VP-67 Hazardous Waste Accumulation Points
SWMU No. 53:	N-126, AIMD Hazardous Waste Accumulation Points
SWMU No. 54:	Dental Clinic Hazardous Waste Accumulation Points
SWMU No. 55:	Medical Clinic Hazardous Waste Accumulation Points
SWMU No. 56:	352 Hazardous Waste Accumulation Points
SWMU No. 57:	S-183, Hazardous Waste Accumulation Points
SWMU No. 58:	S-360, Hazardous Waste Accumulation Points
SWMU No. 59:	Pesticide Storage Facility
SWMU No. 60:	North Side Landfill - Western Portion
SWMU No. 61:	Former Print Shop Building N-26
SWMU No. 62:	M-21 Arresting Gear

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3.0 HYDROGEOLOGIC SETTING

3.1 TOPOGRAPHY AND SOILS

NAS Memphis lies in the East Gulf Coastal Plain section of the Coastal Plain Province and is characterized by a gently sloping terrain and moderately steep hills. The majority of the installation has a slope of between one and five percent. In general, land surface elevations vary from 270 feet MSL (feet above mean seal level) in the southeast border along Big Creek Drainage Canal to 350 feet MSL in the northern portion of the base near Tanya Lake.

There are ten soil classifications found on the station; these within two major Soil Associations. In the proximity of the Big Creek Drainage Canal is the Falaya-Waverly-Colins Association. Soils in this association range from level, poor drainage to moderately well-drained, silty soils on first bottoms and are subject to high water tables. The balance of the Complex is composed of the Memphis-Granada-Loring Association. Soils in this association range from nearly level to sloping, well-drained and moderately well-drained, silty soils on broad uplands.

3.2 GEOLOGIC FRAMEWORK

NAS Memphis is located in the north-central part of the Mississippi embayment where the subsurface sediments are formed by depositional processes of wind and streams. This geologic and hydrogeologic setting was described by Geraghty and Miller, Inc., in 1985 (G&M, 1985).

The sequence of geologic sediments underlying NAS Memphis is illustrated in Figure 3-1, a generalized geologic column. The uppermost stratigraphic unit consists of sand, gravel, silt and clay and extends to a depth of approximately 175 feet in some areas. These units are underlain by clays of the Jackson Formation. This figure does not include the Fort Pillow Sand Aquifer, since, at its depth, it would not be affected by the NAS Memphis SWMUs.

The nature of the surficial sediments at the NAS are illustrated in the geologic cross section presented in Figure 3-2, which was prepared originally by Geraghty and Miller, Inc., from logs of the borings drilled during their 1985 investigation. The figure shows that the surficial sediments are composed of soft gray clay, firm silty blue clay and gravelly sand. Water contained within the uppermost aquifer is sometimes used for industrial and irrigation purposes.

Beneath these undifferentiated sediments lies the Jackson Formation, which consists primarily of gray, bluish-gray and tan clays. The low-permeability sediments of the Jackson Formation

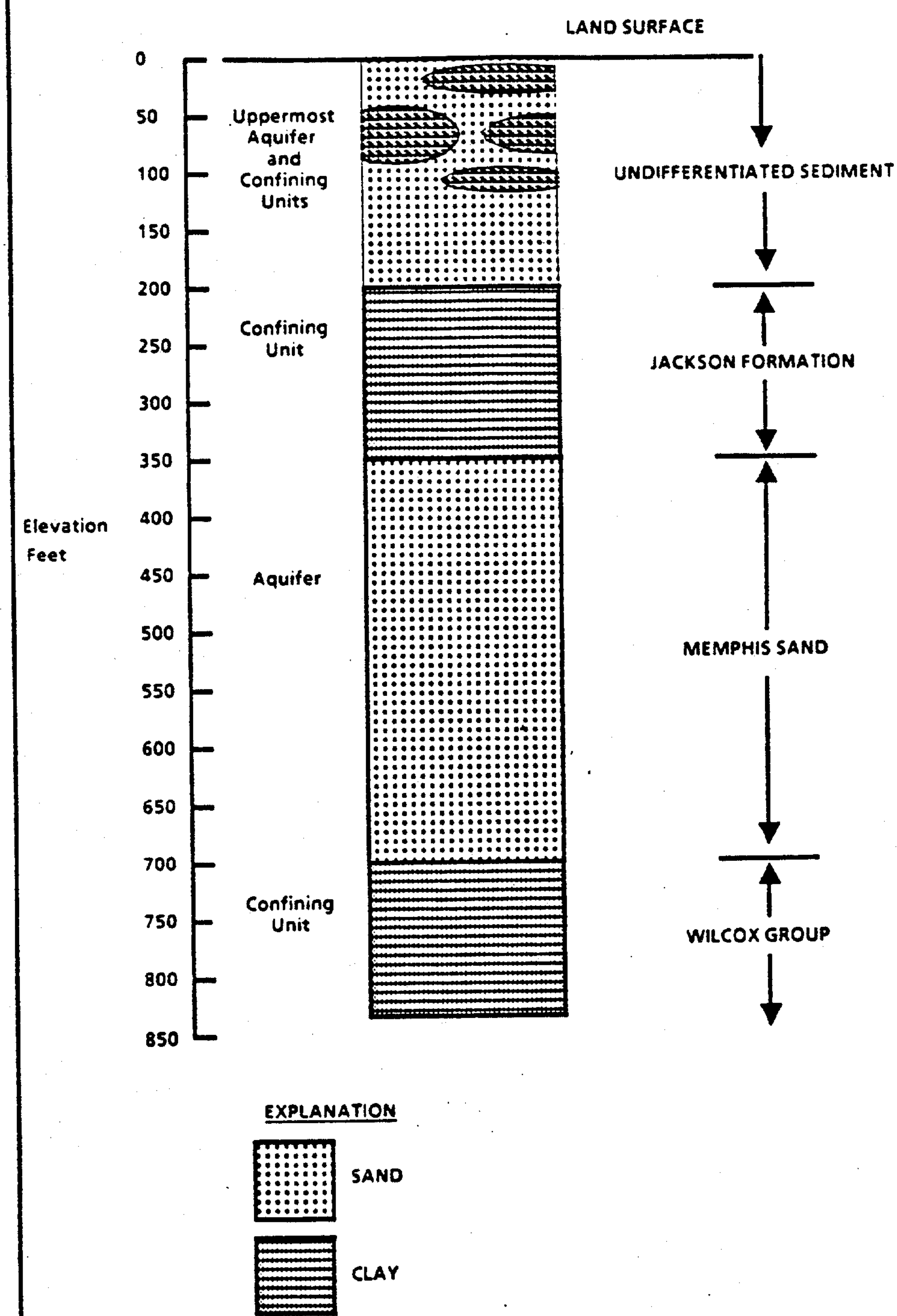

Figure 3-1. Generalized Geologic Column

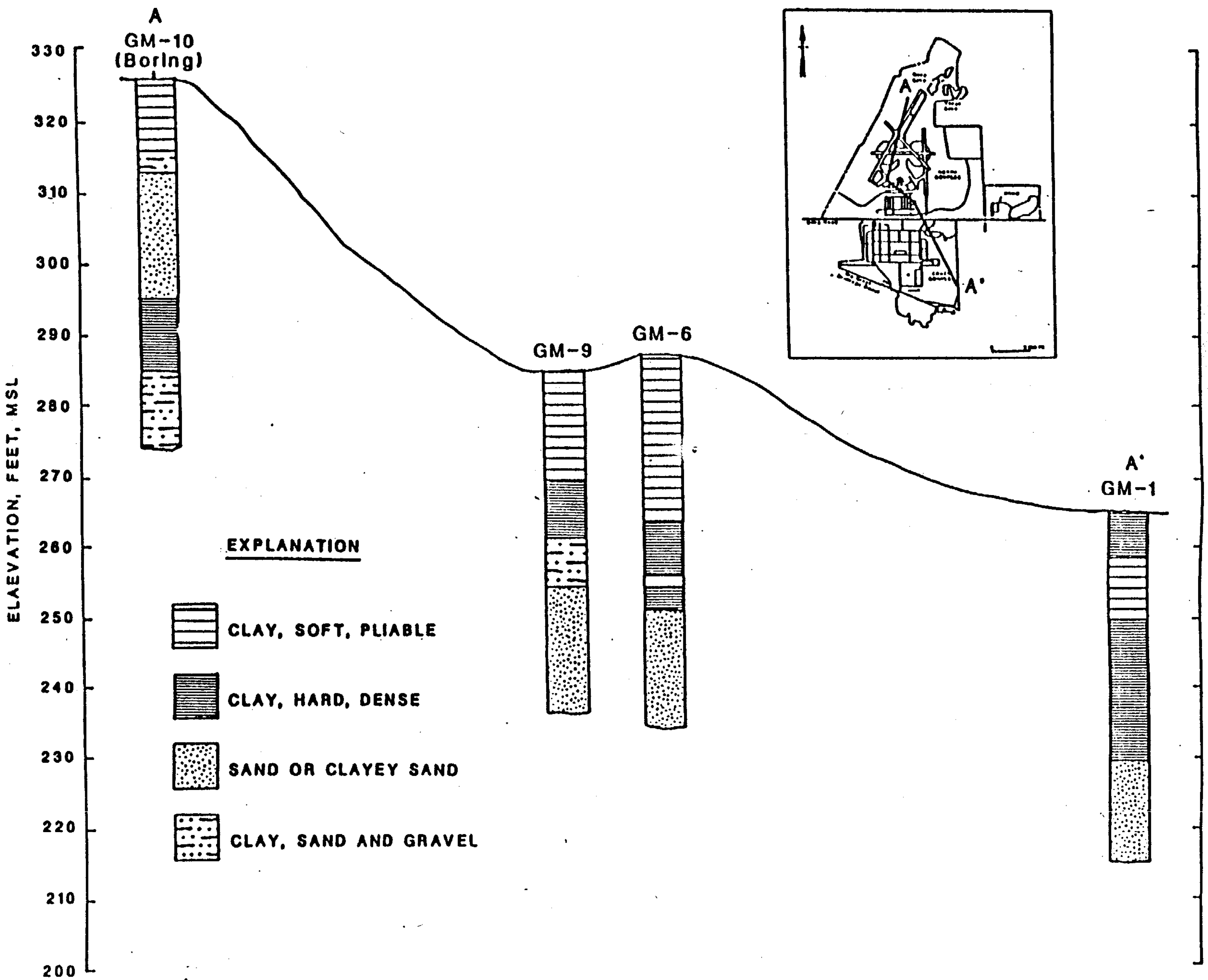

Figure 3-2. Geologic Cross Section of the Uppermost Surficial Sediments.

Geraghty & Miller, Inc.

comprise the confining deposits which retard vertical movements of water and hydraulically separate the uppermost aquifer from the underlying Memphis Sand. The Memphis Sand, or "500-foot Sand", which consists of fine to coarse grain sand, is the primary aquifer in the Memphis area. The Fort Pillow Sand is the primary NAS Memphis/Millington aquifer, with the Memphis Sand being the secondary aquifer (standby wells). The clayey confining bed located beneath the Memphis Sand is the Wilcox Group.

3.3 GROUNDWATER SYSTEM

Stratigraphic units within the upper sediments at NAS contain a perched zone and an uppermost aquifer. The perched zone located within the soft gray clay is formed due to the underlying firm blue clay which restricts vertical groundwater flow to the underlying sands which make up the uppermost aquifer. Permeability tests run on Shelby tube samples collected during monitor well installation suggests vertical permeabilities within the gray clay and blue clay that range from 1.5×10^{-6} to 5.2×10^{-7} cm/sec (centimeters per second) and 5.9×10^{-6} to 8.5×10^{-6} cm/sec, respectively.

3.4 SURFACE WATER

NAS Memphis consists of a total of over 3,490 acres of land. The topography on the station slopes gently downward from the northeast quadrant of the property to the southwest quadrant and the Big Creek Drainage Canal. Surface runoff is slow, particularly on the south side, due to minimal slopes and high water tables. Figure 3-3 illustrates local surface water bodies.

The station is surrounded on three sides by water courses, including the North Fork Creek to the west and the Big Creek Drainage Canal to the east and south. Casper Creek cuts through the eastern portion of the station, separating the Headquarters of Naval Technical Training and the Naval Regional Medical Center. Both North Fork Creek and Casper Creek drain into the Big Creek Drainage Canal. The flood plain of this drainage system covers a significant portion of the installation, limiting development potential both on and off the station. A levee has been constructed on the installation along the north edge of the Big Creek Drainage Canal. Because the levee does not follow the entire edge of the Canal, it serves as only a partial deterrent to on-site flooding.

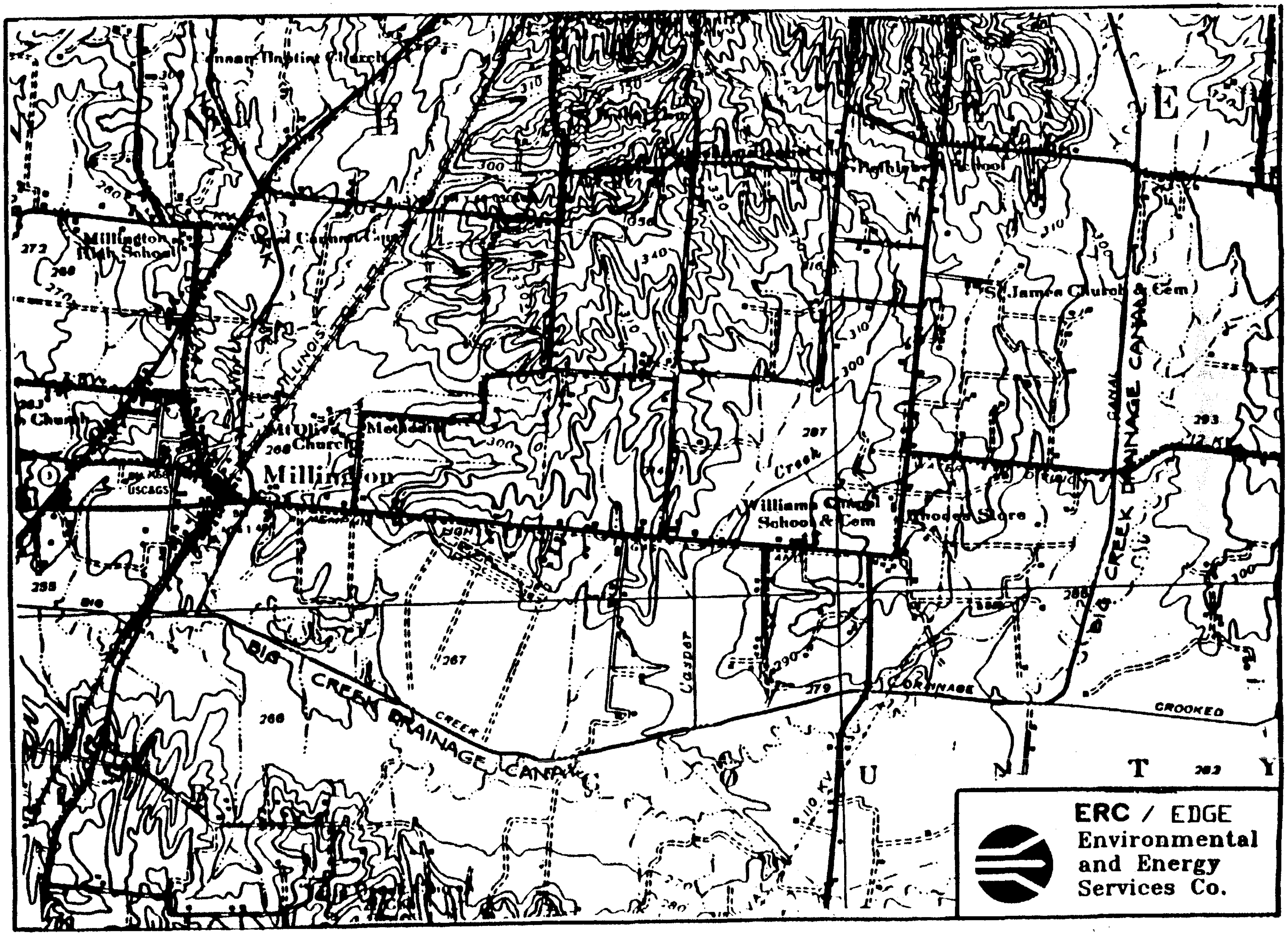

FIGURE 3-3. MAP OF SURFACE WATER FEATURES

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4.0 ATMOSPHERE

Atmosphere conditions at NAS Memphis are well understood. Meteorological and climatological records for the area are readily available. The wind rose (Figure 4-1) for the facility showing prevailing wind directions follows. Exhibits 4-1 and 4-2 are the current Climatic Data Summaries for the Memphis area and NAS Memphis, respectively.

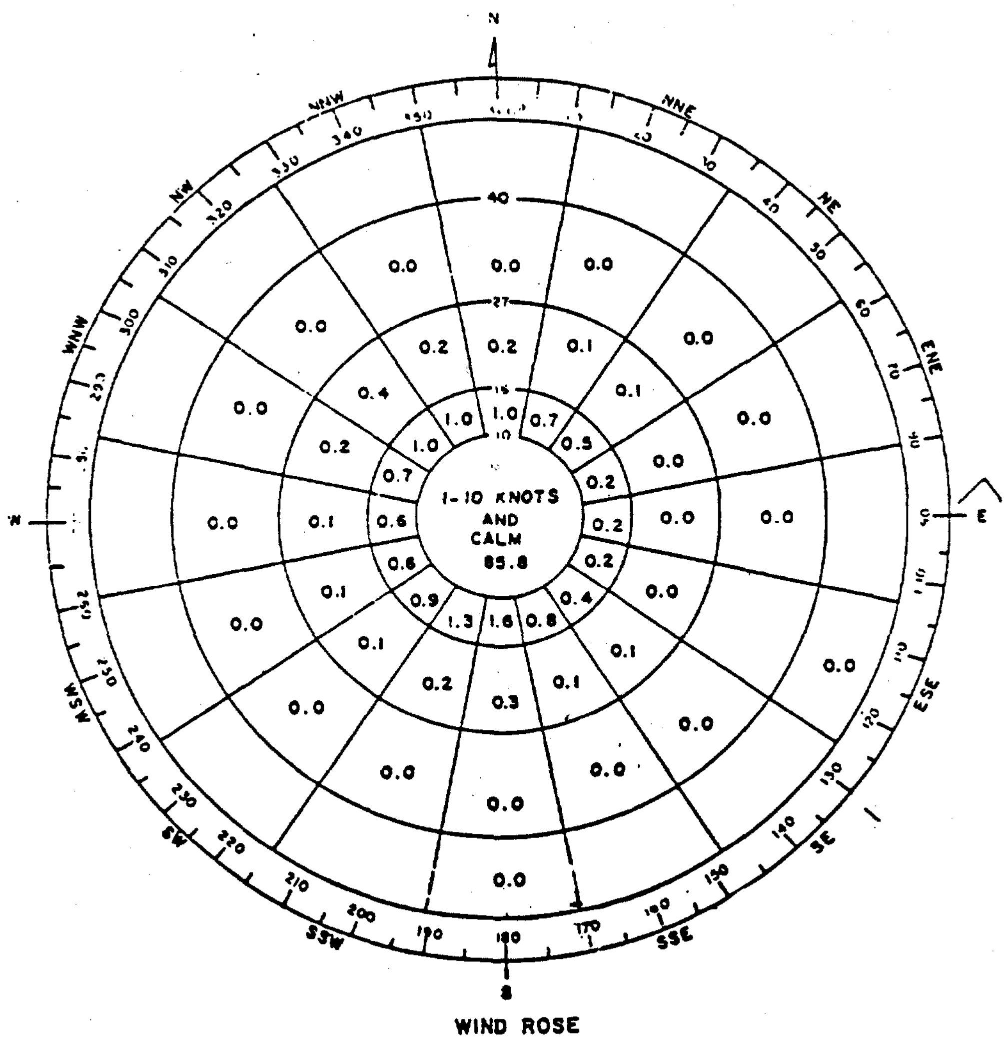

Figure 4-1. Wind Rose for NAS Memphis

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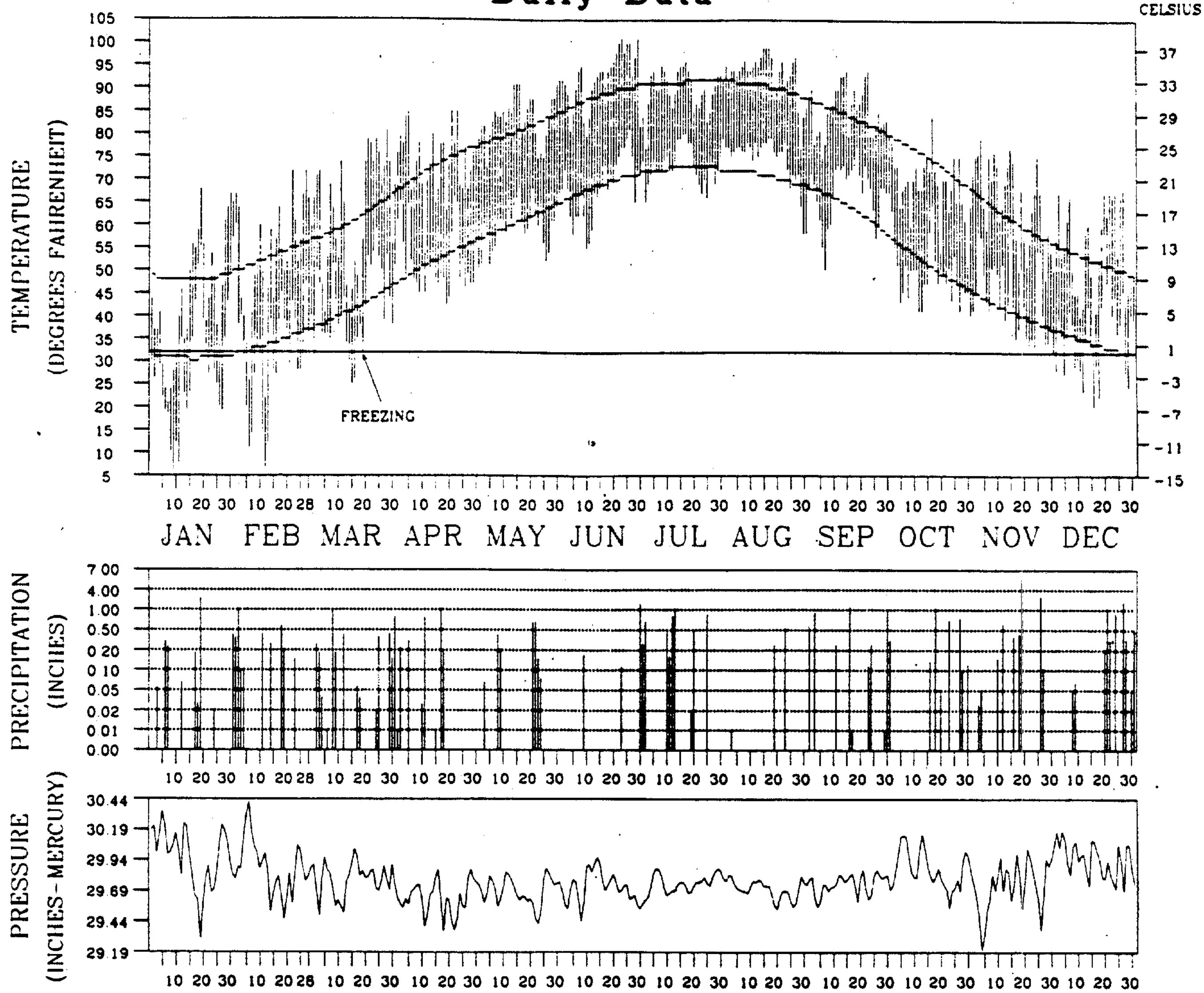
1988 LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA
MEMPHIS,
TENNESSEE

Daily Data



TEMPERATURE DEPICTS NORMAL MAXIMUM, NORMAL MINIMUM AND ACTUAL DAILY HIGH AND LOW VALUES (FAHRENHEIT)
PRECIPITATION IS MEASURED IN INCHES. SCALE IS NON-LINEAR
STATION PRESSURE IS MEASURED IN INCHES OF MERCURY

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC DATA CENTER, ASHEVILLE, NORTH CAROLINA, 28801

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Kenneth D Hadeen
DIRECTOR
NATIONAL CLIMATIC DATA CENTER

EXHIBIT 4-1. CLIMATIC DATA SUMMARY FOR MEMPHIS, TN

METEOROLOGICAL DATA FOR 1988

MEMPHIS, TENNESSEE

LATITUDE: 35°03' N LONGITUDE: 90°00' W ELEVATION: FT. GRND 258 BARO 271 TIME ZONE: CENTRAL WBAN: 13893

	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F:													
Averages													
-Daily Maximum	44.6	52.9	62.9	74.1	83.9	92.4	90.0	93.3	85.6	69.1	65.5	54.4	72.4
-Daily Minimum	29.0	31.4	41.7	51.5	59.6	68.2	73.1	74.1	67.0	49.1	43.7	35.[illegible]	52.0
-Monthly	36.8	42.2	52.3	62.8	71.8	80.3	81.6	83.7	76.3	59.1	54.6	44.9	62.2
-Monthly Dewpt	25.9	29.2	38.1	46.4	53.5	58.5	70.8	70.7	65.5	45.7	44.1	32.7	48.4
Extremes													
-Highest	68	72	81	85	92	101	96	99	94	84	79	68	101
-Date	19	27	28	23	31	29	17	17	23	17	4	27	JUN 29
-Lowest	6	6	25	42	50	55	65	58	50	40	33	20	6
-Date	9	12	15	19	1	10	2	31	7	31	28	16	FEB 12
DEGREE DAYS BASE 65 °F:													
Heating	867	657	393	108	0	0	0	0	1	202	314	619	3161
Cooling	0	0	7	52	221	469	518	586	347	24	8	0	2232
% OF POSSIBLE SUNSHINE													
AVG. SKY COVER (tenths)													
Sunrise - Sunset	6.5	5.4	5.5	5.1	4.1	3.7	6.7	4.7	5.5	4.8	4.8	4.9	5.1
Midnight - Midnight	5.7	4.7	5.3	4.9	3.6	3.1	5.8	3.9	4.9	4.3	4.5	4.9	4.6
NUMBER OF DAYS:													
Sunrise to Sunset													
-Clear	9	11	13	12	14	16	7	13	10	13	13	17	148
-Partly Cloudy	5	7	3	6	11	7	9	12	10	9	6	1	86
-Cloudy	17	11	15	12	6	7	15	6	10	9	11	13	132
Precipitation .01 inches or more	9	9	14	8	7	3	9	3	9	8	9	10	98
Snow, Ice pellets 1.0 inches or more	2	1	0	0	0	0	0	0	0	0	0	0	3
Thunderstorms	2	1	3	4	6	3	10	6	4	5	4	2	50
Heavy Fog, visibility 1/4 mile or less	3	1	0	0	0	0	1	0	0	1	2	2	10
Temperature °F													
-Maximum													
90° and above	0	0	0	0	5	23	18	27	9	0	0	0	82
32° and below	6	2	0	0	0	0	0	0	0	0	0	0	8
-Minimum													
32° and below	21	15	5	0	0	0	0	0	0	0	0	12	53
0° and below	0	0	0	0	0	0	0	0	0	0	0	0	0
AVG. STATION PRESS. (mb)	1014.6	1011.9	1008.5	1003.4	1005.3	1006.1	1007.3	1005.9	1007.5	1011.2	1006.4	1013.9	1008.5
RELATIVE HUMIDITY (%)													
Hour 00 (Local Time)	69	67	66	67	64	56	82	75	82	71	76	70	70
Hour 06	75	77	75	75	74	69	87	84	87	80	84	77	79
Hour 12	60	55	53	45	43	37	62	55	59	52	62	53	53
Hour 18	64	57	51	47	43	37	61	54	62	58	63	59	55
PRECIPITATION (inches):													
Water Equivalent													
-Total	4.25	3.49	4.20	2.85	2.38	2.15	5.21	0.85	4.73	3.62	10.52	5.99	50.24
-Greatest (24 hrs)	2.85	1.49	1.15	1.35	1.34	1.85	2.09	0.55	1.50	1.37	5.65	2.55	5.65
-Date	18-19	1- 2	8- 9	17-18	21-22	30	12-13	23	16	PM- 1	19-20	27-28	NOV 19-20
Snow, Ice pellets													
-Total	8.2	3.0	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	11.2
-Greatest (24 hrs)	7.7	3.0	T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	7.7
-Date	6- 7	11	17									28	JAN 6- 7
WIND:													
Resultant													
-Direction (!!!)	248	315	224	315	175	087	193	139	119	032	206	204	185
-Speed (mph)	0.9	1.4	1.6	1.3	1.5	1.4	2.6	1.9	2.1	1.0	2.7	0.7	0.7
Average Speed (mph)	9.8	9.4	9.6	8.4	8.0	7.0	6.6	6.0	6.8	7.6	9.5	9.3	8.2
Fastest Obs. 1 Min.													
-Direction (!!!)	21	20	18	28	18	02	22	03	08	35	18	34	34
-Speed (mph)	23	23	23	28	32	16	26	30	20	21	29	37	37
-Date	30	22	12	5	21	9	25	18	30	23	16	27	DEC 27
Peak Gust													
-Direction (!!!)	S	SW	S	W	W	N	NE	NE	SE	N	S	NW	W
-Speed (mph)	32	37	36	46	44	28	39	30	32	32	45	44	46
-Date	30	22	12	5	8	9	25	18	30	23	16	27	APR

(!!!) See Reference Notes on Page 68

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NORMALS, MEANS, AND EXTREMES

MEMPHIS, TENNESSEE

LATITUDE: 35°03'N LONGITUDE: 90°00'W ELEVATION: FT. GRND 258 BARO 271 TIME ZONE: CENTRAL WBAN: 13893

	(a)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F:														
Normals														
-Daily Maximum		48.3	53.0	61.4	72.9	81.0	88.4	91.5	90.3	84.3	74.5	61.4	52.3	71.6
-Daily Minimum		30.9	34.1	41.9	52.2	60.9	68.9	72.6	70.8	64.1	51.3	41.1	34.3	51.9
-Monthly		39.6	43.5	51.7	62.6	71.0	78.7	82.1	80.6	74.2	62.9	51.3	43.3	61.8
Extremes														
-Record Highest	47	78	81	85	94	99	104	108	105	103	95	85	81	108
-Year		1972	1962	1986	1987	1977	1954	1980	1943	1954	1954	1955	1982	JUL 1980
-Record Lowest	47	-4	-11	12	29	38	48	52	48	36	25	9	-13	-13
-Year		1985	1951	1943	1987	1944	1966	1947	1946	1949	1952	1950	1963	DEC 1963
NORMAL DEGREE DAYS:														
Heating (base 65°F)		787	602	433	126	25	0	0	0	9	137	415	673	3207
Cooling (base 65°F)		0	0	20	54	211	411	530	484	285	72	0	0	2067
% OF POSSIBLE SUNSHINE	35	50	54	56	64	69	74	74	75	69	70	58	50	64
MEAN SKY COVER (tenths)														
Sunrise - Sunset	38	6.8	6.4	6.5	6.0	5.8	5.3	5.4	5.0	5.0	4.6	5.6	6.3	5.7
MEAN NUMBER OF DAYS:														
Sunrise to Sunset														
-Clear	36	8.0	7.9	8.2	8.9	8.9	10.2	10.3	11.8	12.4	14.3	10.2	9.0	120.1
-Partly Cloudy	36	5.9	5.8	6.5	7.1	9.7	11.0	11.8	11.4	7.8	7.2	6.3	5.8	96.3
-Cloudy	36	17.2	14.6	16.3	14.0	12.4	8.8	8.9	7.7	9.9	9.5	13.5	16.2	149.0
Precipitation .01 inches or more	38	9.9	9.5	10.8	10.2	9.1	8.3	8.6	7.8	7.1	6.2	8.8	9.6	105.9
Snow, Ice pellets 1.0 inches or more	38	0.9	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.*	0.2	1.9
Thunderstorms	38	1.8	2.3	4.5	6.4	6.7	7.2	8.2	6.2	3.4	2.0	2.2	1.6	52.6
Heavy Fog Visibility 1/4 mile or less	38	2.1	1.3	0.8	0.3	0.2	0.2	0.3	0.4	0.6	1.1	1.4	1.8	10.4
Temperature °F														
-Maximum														
90° and above	47	0.0	0.0	0.0	0.1	3.2	14.7	21.6	18.5	7.8	0.7	0.0	0.0	66.6
32° and below	47	3.4	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.3	6.2
-Minimum														
32° and below	47	18.5	12.6	5.3	0.3	0.0	0.0	0.0	0.0	0.0	0.3	5.7	14.5	57.3
0° and below	47	0.1	0.*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
AVG. STATION PRESS. (mb)	16	1011.6	1009.7	1006.4	1005.6	1004.5	1005.4	1006.4	1006.8	1007.4	1009.4	1009.4	1010.9	1007.8
RELATIVE HUMIDITY (%)														
Hour 00	49	75	73	70	71	76	77	79	80	80	77	74	74	76
Hour 06 (Local Time)	49	78	78	76	78	82	82	84	86	86	83	80	78	81
Hour 12	49	63	60	56	53	55	56	57	57	56	51	56	61	57
Hour 18	49	67	62	56	54	56	57	58	60	62	60	63	67	60
PRECIPITATION (inches):														
Water Equivalent														
-Normal		4.61	4.33	5.44	5.77	5.06	3.58	4.03	3.74	3.62	2.37	4.17	4.85	51.57
-Maximum Monthly	38	12.21	9.39	12.08	12.29	11.58	6.88	8.84	9.65	7.61	7.75	10.52	13.81	13.81
-Year		1951	1956	1975	1955	1953	1951	1959	1978	1958	1984	1988	1982	DEC 1982
-Minimum Monthly	38	0.57	1.12	1.50	2.05	0.83	0.04	0.43	0.43	0.19	T	0.75	1.05	T
-Year		1986	1980	1966	1965	1977	1953	1954	1953	1953	1963	1965	1955	OCT 1963
-Maximum in 24 hrs	38	3.89	3.63	5.95	4.35	4.94	4.76	4.71	4.04	4.63	3.40	5.65	5.42	5.95
-Year		1974	1966	1975	1985	1958	1980	1980	1978	1957	1981	1988	1978	MAR 1975
Snow, Ice pellets														
-Maximum Monthly	38	12.4	8.3	17.3	T	0.0	0.0	0.0	0.0	0.0	0.0	1.5	14.3	17.3
-Year		1985	1985	1968	1971							1976	1963	MAR 1968
-Maximum in 24 hrs	38	8.1	5.8	16.1	T	0.0	0.0	0.0	0.0	0.0	0.0	1.2	14.3	16.1
-Year		1985	1960	1968	1971							1976	1963	MAR 1968
WIND:														
Mean Speed (mph)	40	10.2	10.2	10.9	10.4	8.8	8.0	7.5	7.0	7.5	7.7	9.1	9.8	8.9
Prevailing Direction through 1963		S	S	S	S	S	S	S	S	E	S	S	S	S
Fastest Obs. 1 Min.														
-Direction (!!!)	13	34	32	16	24	34	02	34	20	36	28	23	30	24
-Speed (MPH)	13	35	35	40	46	40	40	35	35	39	40	40	36	46
-Year		1976	1984	1973	1979	1979	1977	1982	1980	1972	1984	1979	1972	APR 1979
Peak Gust														
-Direction (!!!)														
-Speed (mph)														
-Date														

(!!!) See Reference Notes on Page 68.
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PRECIPITATION (inches)

MEMPHIS, TENNESSEE

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1959	4.34	5.21	3.56	3.73	1.85	4.82	8.84	4.56	2.73	1.57	2.66	5.33	49.20
1960	3.74	3.08	4.20	3.65	4.20	5.34	1.30	7.84	4.05	4.11	3.62	4.30	49.43
1961	0.84	6.89	7.13	4.65	4.40	1.49	3.97	1.71	0.66	1.28	8.06	8.56	49.64
1962	4.19	4.22	4.80	3.62	0.84	5.71	3.94	4.18	5.28	2.57	2.31	1.35	43.01
1963	1.28	2.91	6.17	5.60	3.77	4.33	4.38	2.15	2.06	T	2.72	3.31	38.68
1964	3.73	3.50	7.34	11.03	3.28	1.39	6.14	5.76	2.74	2.21	2.59	7.97	57.68
1965	4.79	6.78	5.35	2.05	7.42	0.98	1.60	3.98	7.38	0.54	0.75	1.17	42.79
1966	2.84	6.88	1.50	5.42	5.69	0.52	2.18	4.28	3.23	1.92	1.57	5.21	41.24
1967	2.23	2.33	4.65	4.46	6.38	1.70	6.01	5.17	1.86	2.38	1.90	7.37	46.44
1968	5.57	1.98	6.52	5.15	5.21	3.76	2.69	1.61	5.58	2.87	4.89	6.04	51.87
1969	3.14	3.20	2.63	8.29	1.34	1.60	1.92	6.62	0.90	1.24	4.19	7.05	42.12
1970	1.16	3.87	5.32	7.08	3.70	5.76	4.99	1.78	3.80	6.20	2.62	3.71	49.99
1971	2.15	7.21	3.64	2.89	3.90	3.82	2.90	6.00	3.42	0.06	1.49	6.71	44.19
1972	4.73	2.23	4.80	3.51	4.55	5.50	4.89	1.94	5.46	3.92	8.05	9.37	58.95
1973	4.62	3.62	7.63	9.44	6.23	1.00	4.49	4.88	5.06	3.37	8.49	5.35	64.18
1974	8.90	4.65	3.40	6.34	7.76	6.30	6.33	4.78	3.45	2.67	4.96	5.03	64.57
1975	4.65	5.53	12.08	4.98	8.72	2.42	2.26	2.03	2.62	2.69	7.77	2.93	58.68
1976	2.85	4.41	7.68	2.41	4.73	4.06	3.82	0.86	5.40	5.66	1.83	1.79	45.50
1977	2.57	1.99	4.13	5.42	0.83	3.38	3.41	1.62	6.43	2.02	6.01	3.39	41.20
1978	8.13	1.31	4.05	2.14	8.14	4.45	3.89	9.65	1.52	1.82	5.56	13.12	63.78
1979	5.98	5.66	6.60	11.47	7.78	4.93	3.12	5.92	4.49	2.60	7.42	4.92	70.89
1980	3.23	1.12	10.86	7.53	4.43	5.75	4.73	1.23	5.32	3.14	5.23	1.86	54.43
1981	1.38	3.66	4.98	3.67	7.06	2.93	1.71	4.21	0.61	5.83	2.12	1.84	40.00
1982	6.61	4.16	4.47	6.76	5.50	6.68	4.13	3.11	1.92	5.23	6.43	13.81	68.81
1983	2.32	2.61	3.66	8.84	9.58	3.50	3.83	0.61	1.52	2.94	9.56	8.68	57.65
1984	1.88	4.37	6.07	5.24	9.06	1.12	4.59	5.00	1.96	7.75	5.85	4.35	57.24
1985	3.78	4.10	4.96	6.51	2.23	4.55	3.50	3.50	4.03	3.36	3.87	3.27	47.66
1986	0.57	2.50	1.90	3.72	4.63	3.80	1.21	2.74	1.21	3.75	8.67	3.92	38.62
1987	1.76	5.81	3.38	3.78	2.96	3.66	2.06	4.12	2.01	1.96	10.45	11.39	53.34
1988	4.25	3.49	4.20	2.85	2.38	2.15	5.21	0.85	4.73	3.62	10.52	5.99	50.24
Record Mean	4.86	4.29	5.21	5.10	4.39	3.65	3.40	3.26	2.96	2.86	4.46	4.77	49.21

See Reference Notes on Page 6B.
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AVERAGE TEMPERATURE (deg. F)

MEMPHIS, TENNESSEE

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	ANNUAL
1959	39.5	44.4	51.7	61.5	74.4	77.4	79.3	81.1	75.7	64.5	46.6	45.4	61.8
#1960	41.9	40.8	40.2	64.8	68.5	77.8	81.8	81.6	76.1	63.8	50.8	37.2	60.4
1961	36.1	47.2	55.1	58.2	66.7	75.1	80.2	77.8	74.6	62.5	49.6	42.4	60.4
1962	36.2	50.3	47.3	58.8	76.8	77.1	81.3	80.8	73.4	65.9	50.2	39.9	61.5
1963	34.4	37.6	56.7	64.2	71.1	78.6	80.1	80.2	73.4	68.6	53.4	31.5	60.8
1964	41.1	40.2	51.7	64.0	71.9	79.3	80.6	78.6	72.9	58.9	54.4	44.3	61.5
1965	43.4	42.9	44.0	66.4	74.7	78.1	81.8	80.2	73.7	60.8	55.8	45.8	62.3
1966	34.2	42.2	52.8	60.6	67.9	76.6	84.7	76.9	70.8	58.1	53.7	41.4	60.0
1967	42.2	39.2	56.7	66.5	68.8	78.3	77.7	76.0	70.3	62.4	49.1	45.0	61.0
1968	38.9	37.3	50.9	62.7	69.7	79.5	80.8	82.0	71.3	62.2	50.9	41.7	60.7
1969	41.2	43.3	45.0	62.9	72.1	78.8	84.9	79.3	72.9	62.9	49.0	40.1	61.1
1970	35.3	41.7	48.7	65.0	72.3	77.3	79.7	81.2	77.9	61.7	49.8	46.4	61.4
1971	39.6	43.5	48.4	60.5	66.6	80.6	80.6	78.6	76.1	69.3	50.9	50.7	62.1
1972	42.3	44.7	52.2	63.1	69.7	77.5	79.4	79.7	75.9	61.4	45.5	40.0	60.9
1973	38.6	40.5	57.3	59.8	68.3	81.0	83.2	79.6	76.1	67.6	57.3	43.3	62.7
1974	45.7	45.6	58.7	61.8	72.1	74.7	82.5	79.2	68.5	62.4	53.3	45.2	62.5
1975	45.9	46.2	49.9	61.9	73.5	78.8	81.1	81.2	70.9	65.8	53.8	44.1	62.8
1976	39.5	53.8	58.5	63.6	65.6	76.4	81.5	78.9	73.0	58.9	45.5	41.9	61.5
1977	30.7	45.1	58.6	66.9	76.4	81.9	84.7	82.6	79.0	62.2	55.1	44.1	64.0
1978	32.7	35.0	50.3	66.3	70.9	79.8	83.8	80.9	77.7	62.5	57.7	44.0	61.8
1979	30.9	38.5	54.3	63.0	70.0	77.9	82.6	80.9	73.4	65.8	50.7	45.4	61.1
1980	43.2	39.5	49.4	60.9	72.5	80.9	88.8	87.2	80.5	62.7	53.3	45.9	63.8
1981	40.9	47.3	54.3	70.2	70.0	82.5	84.6	81.8	74.0	62.5	53.8	40.9	63.6
1982	36.6	40.5	55.5	58.5	74.5	78.0	85.0	82.9	73.3	63.7	53.4	49.5	62.6
1983	40.4	45.3	51.9	56.8	68.2	77.2	83.6	84.9	75.2	66.2	53.1	34.7	61.5
1984	35.9	47.6	51.1	61.0	69.5	80.9	80.9	79.8	71.9	68.4	50.9	53.8	62.6
1985	32.4	40.6	57.7	65.0	71.8	78.9	82.2	80.2	73.6	67.2	57.6	36.9	62.0
1986	41.9	48.0	55.2	64.4	72.5	81.0	86.5	79.2	79.1	64.2	51.1	42.6	63.8
1987	39.6	47.1	54.7	62.2	76.5	80.0	82.5	83.6	75.3	59.2	54.4	46.7	63.5
1988	36.8	42.2	52.3	62.8	71.8	80.3	81.6	83.7	76.3	59.1	54.6	44.9	62.2
Record Mean	40.8	44.0	52.4	62.2	70.6	78.4	81.4	80.2	74.2	63.5	51.8	43.5	61.9
Max	48.7	52.5	61.4	71.5	79.8	87.4	90.2	89.0	83.5	73.5	60.8	51.5	70.8
Min	32.8	35.6	43.4	52.9	61.4	69.3	72.7	71.3	64.9	53.4	42.7	35.6	53.

See Reference Notes on Page 6B.
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HEATING DEGREE DAYS Base 65 deg. F MEMPHIS, TENNESSEE

SEASON	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	TOTAL
1959-60	0	0	0	111	547	602	713	691	763	91	69	0	3587
# 1960-61	0	0	0	104	425	853	892	490	309	249	70	2	3394
1961-62	0	0	8	148	467	690	887	410	543	229	5	0	3387
1962-63	0	0	14	107	436	772	944	760	291	119	34	0	3477
1963-64	0	0	10	33	352	1034	739	713	406	91	13	0	3391
1964-65	0	0	13	202	335	634	666	614	645	72	0	0	3181
1965-66	0	0	22	162	275	590	947	634	382	175	47	5	3239
1966-67	0	0	9	227	344	732	707	715	301	60	35	0	3130
1967-68	0	0	34	144	469	613	803	795	444	114	21	0	3437
1968-69	0	0	1	149	423	716	733	601	608	103	12	0	3346
1969-70	0	0	0	151	473	768	917	648	500	97	20	0	3574
1970-71	0	0	7	150	455	571	781	593	509	171	50	0	3287
1971-72	0	0	9	13	432	435	698	582	391	146	27	0	2733
1972-73	0	0	12	172	583	766	809	679	237	200	32	0	3490
1973-74	0	0	8	67	244	665	599	535	235	150	1	0	2504
1974-75	0	0	28	121	367	607	591	521	463	180	2	0	2880
1975-76	0	0	40	90	352	643	783	326	238	100	58	0	2630
1976-77	0	0	0	231	581	708	1056	547	212	61	4	0	3400
1977-78	0	0	0	123	313	640	995	835	454	74	47	0	3481
1978-79	0	0	0	116	230	643	1049	734	345	121	23	0	3261
1979-80	0	0	0	76	426	598	669	733	478	156	7	0	3143
1980-81	0	0	5	146	362	586	739	492	342	18	23	0	2713
1981-82	0	0	9	153	331	739	873	680	324	215	2	0	3326
1982-83	0	0	20	134	352	500	759	543	406	273	25	0	3012
1983-84	0	0	27	73	368	935	894	499	426	162	24	0	3408
1984-85	0	0	37	48	423	367	1004	683	254	100	6	0	2922
1985-86	0	0	17	54	257	864	708	475	307	102	8	0	2792
1986-87	0	0	0	102	413	687	782	492	322	154	0	0	2952
1987-88	0	0	0	186	324	559	867	657	393	108	0	0	3094
1988-89	0	0	1	202	314	619							

See Reference Notes on Page 6B.
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COOLING DEGREE DAYS Base 65 deg. F MEMPHIS, TENNESSEE

YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC	TOTAL
1969	0	0	0	48	240	422	627	449	243	91	0	0	2120
1970	3	0	0	104	251	375	463	509	400	51	6	2	2164
1971	0	0	3	46	107	474	489	426	349	154	14	0	2062
1972	0	0	3	95	179	383	449	464	346	66	6	0	1991
1973	0	0	4	48	143	486	571	458	350	156	19	0	2235
1974	6	0	46	59	228	299	550	445	138	46	23	0	1840
1975	8	0	3	93	272	421	507	510	224	121	23	2	2184
1976	0	7	44	64	84	349	519	438	247	48	0	0	1800
1977	0	0	23	123	362	516	619	551	426	41	20	0	2681
1978	0	0	6	122	235	452	590	501	387	46	18	0	2357
1979	0	0	19	68	184	394	553	499	259	108	4	0	2098
1980	0	0	0	40	249	480	744	695	476	80	18	2	2784
1981	0	5	20	181	184	532	614	527	285	80	2	0	2430
1982	0	1	36	26	305	399	623	563	275	100	14	25	2367
1983	0	0	7	32	131	373	584	622	338	116	17	0	2220
1984	0	1	4	51	169	482	502	462	249	162	5	23	2110
1985	0	6	30	107	224	425	540	478	285	129	42	0	2266
1986	0	3	12	91	247	487	673	448	427	81	4	0	2473
1987	0	0	9	78	366	458	549	584	315	12	13	0	2384
1988	0	0	7	52	221	469	518	586	347	24	8	0	2232

See Reference Notes on Page 6B.
Page 5B

SNOWFALL (inches)

MEMPHIS, TENNESSEE

SEASON	JULY	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	TOTAL
1959-60	0.0	0.0	0.0	0.0	T	0.0	6.5	7.6	6.4	0.0	0.0	0.0	20.5
1960-61	0.0	0.0	0.0	0.0	0.0	1.2	T	0.2	0.0	0.0	0.0	0.0	1.4
1961-62	0.0	0.0	0.0	0.0	T	T	5.0	T	T	0.0	0.0	0.0	5.0
1962-63	0.0	0.0	0.0	0.0	0.0	3.0	1.2	0.8	0.0	0.0	0.0	0.0	5.0
1963-64	0.0	0.0	0.0	0.0	0.0	14.3	0.5	T	T	0.0	0.0	0.0	14.8
1964-65	0.0	0.0	0.0	0.0	T	T	T	3.3	4.6	0.0	0.0	0.0	7.9
1965-66	0.0	0.0	0.0	0.0	0.0	0.0	12.2	T	T	0.0	0.0	0.0	12.2
1966-67	0.0	0.0	0.0	0.0	T	0.7	0.6	T	0.3	0.0	0.0	0.0	1.6
1967-68	0.0	0.0	0.0	0.0	0.0	T	2.0	4.5	17.3	0.0	0.0	0.0	23.8
1968-69	0.0	0.0	0.0	0.0	0.0	0.0	T	T	T	0.0	0.0	0.0	T
1969-70	0.0	0.0	0.0	0.0	T	0.1	3.3	0.2	T	0.0	0.0	0.0	3.6
1970-71	0.0	0.0	0.0	0.0	T	1.0	T	6.7	1.6	T	0.0	0.0	9.3
1971-72	0.0	0.0	0.0	0.0	0.8	0.0	0.3	0.1	T	0.0	0.0	0.0	1.2
1972-73	0.0	0.0	0.0	0.0	T	T	1.4	T	0.0	0.0	0.0	0.0	1.4
1973-74	0.0	0.0	0.0	0.0	0.0	0.2	0.9	0.5	T	0.0	0.0	0.0	1.6
1974-75	0.0	0.0	0.0	0.0	T	0.2	3.9	0.5	1.4	0.0	0.0	0.0	6.0
1975-76	0.0	0.0	0.0	0.0	0.0	0.1	0.3	T	0.0	0.0	0.0	0.0	0.4
1976-77	0.0	0.0	0.0	0.0	1.5	0.3	3.5	T	0.0	0.0	0.0	0.0	5.3
1977-78	0.0	0.0	0.0	0.0	0.0	T	4.3	3.2	T	0.0	0.0	0.0	7.5
1978-79	0.0	0.0	0.0	0.0	0.0	T	3.0	7.4	0.0	0.0	0.0	0.0	10.4
1979-80	0.0	0.0	0.0	0.0	T	0.0	1.3	1.5	0.8	0.0	0.0	0.0	3.6
1980-81	0.0	0.0	0.0	0.0	T	T	T	T	0.0	0.0	0.0	0.0	T
1981-82	0.0	0.0	0.0	0.0	0.0	T	4.5	0.7	1.2	0.0	0.0	0.0	6.4
1982-83	0.0	0.0	0.0	0.0	0.0	T	7.3	T	0.2	0.0	0.0	0.0	7.5
1983-84	0.0	0.0	0.0	0.0	0.0	0.8	2.0	T	0.5	0.0	0.0	0.0	3.3
1984-85	0.0	0.0	0.0	0.0	0.0	T	12.4	8.3	0.0	0.0	0.0	0.0	20.7
1985-86	0.0	0.0	0.0	0.0	0.0	T	T	2.0	0.0	0.0	0.0	0.0	2.0
1986-87	0.0	0.0	0.0	0.0	0.0		T	T	0.4	0.0	0.0	0.0	
1987-88	0.0	0.0	0.0	0.0	0.0	T	8.2	3.0	T	0.0	0.0	0.0	11.2
1988-89	0.0	0.0	0.0	0.0	0.0	T							
Record Mean	0.0	0.0	0.0	0.0	0.1	0.7	2.6	1.5	0.9	T	0.0	0.0	5.8

See Reference Notes on Page 6B.

REFERENCE NOTES

MEMPHIS, TENNESSEE

GENERAL
T - TRACE AMOUNT.
BLANK ENTRIES DENOTE MISSING/UNREPORTED DATA.
# INDICATES A STATION OR INSTRUMENT RELOCATION. SEE STATION LOCATION TABLE ON PAGE 8.

SPECIFIC
PAGE 2
PM - INCLUDES LAST DAY OF PREVIOUS MONTH

PAGE 3
(a) - LENGTH OF RECORD IN YEARS, ALTHOUGH INDIVIDUAL MONTHS MAY BE MISSING.
* LESS THAN .05
NORMALS - BASED ON THE 1951-1980 RECORD PERIOD.
EXTREMES - DATES ARE THE MOST RECENT OCCURRENCE
WIND DIR - NUMERALS SHOW TENS OF DEGRESS CLOCKWISE FROM TRUE NORTH. "00" INDICATES CALM.
RESULTANT DIRECTIONS ARE GIVEN TO WHOLE DEGREES.

PAGE 4B
MAX AND MIN ARE LONG TERM MEAN DAILY MAXIMUM AND MEAN DAILY MINIMUM TEMPERATURES.

EXCEPTIONS

PAGES 4A, 4B, 6A
RECORD MEANS ARE THROUGH THE CURRENT YEAR, BEGINNING IN 1875 FOR TEMPERATURE
1872 FOR PRECIPITATION
1951 FOR SNOWFALL

MEMPHIS, TENNESSEE

Topography varies from the level alluvial area in east-central Arkansas to the slightly rolling area in northwestern Mississippi and southwestern Tennessee.

Agricultural interests are varied, with major crops being cotton, corn, hay, soybeans, peaches, apples, and a considerable number of vegetables. The climate is quite favorable for dairy interests, and for the raising of cattle and hogs.

The growing season is about 230 days in length. The average date for the last occurrence of temperatures as low as 32 degrees is late March. The average date of the first temperature of 32 degrees or below is early November.

Precipitation of nearly 50 inches per year is fairly well distributed. Crops and pastures receive, on the average, an adequate supply of moisture during the growing season, with lesser amounts during the fall harvesting period.

Sunshine averages slightly over 70 percent of the possible amount during the growing season. Relative humidity averages about 70 percent for the year.

Memphis, although not in the normal paths of storms coming from the Gulf or from western Canada, is affected by both, and thereby has comparatively frequent changes in weather. Extremely high or low temperatures, however, are relatively rare.

STATION LOCATION

MEMPHIS, TENNESSEE

Location	Occupied from	Occupied to	Airline distance and direction from previous location	Latitude North	Longitude West	Elevation above: Sea level: Ground at temperature site	Ground: Wind instruments	Extreme thermometers	Psychrometer	Sunshine Switch	Tipping bucket rain gage	Weighing rain gage	8" rain gage	Hygrothermometer	Automatic Observing Equipment *	Remarks
CITY																
Jackson Block Main and Gavoso	2/28/71	10/09/71		35° 08'	90° 03'	261?	80	49	49				70			Thermometers in North window.
Irwin (Irving) Block 54 North Second	10/09/71	5/14/79	1700' NNE	35° 09'	90° 03'	261?	*82	39	39				**62			Thermometers in North window. *80 feet to 9/7/76. **66 feet to 4/16/73 and 82 feet to 9/7/76.
McClellan Building Front near Court	5/14/79	2/01/89	800' West	35° 09'	90° 03'	270?	77	*58	*58				51			*In North window at 53 feet to 11/1/85, then roof exposure.
Cotton Exchange Second between South Court and Madison	2/01/89	6/30/95	700' ESE	35° 09'	90° 03'	264?	116	108	108				100			Triple register added 5/9/90. Porter Building built to west in early 1895 had some affect on wind.
Porter Building 10 North Main (Main and South Court)	7/01/95	3/31/05	300' West	35° 09'	90° 03'	268	154	*146	*146		#134		134			* 140 feet to 8/5/03. # Added 2/20/96.
Post Office Building Front at Madison	4/01/05	8/29/58	600' West	35° 09'	90° 03'	271	a86	b78	b78		c70 e	d70	c70			a - 97 feet to 10/29/31. b - 76 feet to 10/29/31, psychrometer discontinued 3/31/41. c - 67 feet to 2/11/08, 69 feet to 10/29/31. d - Added from Airport 9/11/50. e - Moved to Airport 9/11/50. Effect of tall buildings on easterly winds began about 1910 and became quite noticeable by 1924.
Shrine Building Front at Monroe	8/30/58	9/25/64 (A)	435' South	35° 09'	90° 03'	271		78				70	70			Instruments on Post Office roof. (A) Office moved to Airport. Climatological records from Post Office roof until 3/18/65.
AIRPORT																
Curtis-Wright Hangar 2nd floor Municipal AP	10/24/31	9/20/32		35° 03'	89° 59'	269	51	5	5				3			
American Airways Hangar Municipal Airport	9/20/32	9/21/36	800' West	35° 03'	89° 59'	263	49	5	5				3			
Dept. of Commerce Bldg. (Radio) Municipal AP	9/21/36	5/28/38	300' East	35° 03'	89° 59'	263	49	5	5				5			
Administration Building Municipal Airport * * International Airport Effective in 1969	5/28/38	4/17/73	100' West	35° 03'	89° 59'	e258	*22	**6	c5		a4 d	b4	3	#4		* 55 feet to 7/22/58. ** 5 feet to 11/7/47 and 7 feet to 11/10/59. Standby status after 9/30/60. # Commissioned about 1300 feet NE of thermometer site 10/1/60. a - Added 9/11/50. b - Decommissioned 9/11/50. c - Discontinued 9/30/60; sling psychrometer as standby. d - Effective 5/6/64. e - 263 feet to 10/1/60.
3171 Director's Row International Airport	4/17/73	10/12/85	0.3 mi. WNW	35° 03'	90° 00'	258	f22	NA	NA	60	58 h	NA g58	58	f4	NA	f - Same site as prior to 4/17/73. g - Installed on roof 4/1/81. h - Removed 4/1/81.
2488 Winchester Road International Airport	10/12/85	03/01/88	0.3 mi. ESE	35° 03'	89° 59'	258	i22	6	NA	NA	2	NA j4	2	4	NA	FAA operation eff. 10/12/85. Office returned to pre-1973 location. WSFO moved to 7777 Walnut Grove Rd. with no observing program. i - Not moved 10/12/85. Station type changed from FAA to FCWOS 9/1/87. j - Installed 10/01/87. k - Not moved 03/01/88.
2496 Winchester Road International Airport	03/01/88	Present	Unknown	35° 03'	89° 59'	258	k22	k6	NA	NA	4	4	4	k4	NA	

* Type: M = AMOS, T = AUTOB

SUBSCRIPTION: Price and ordering information available through: National Climatic Center, Federal Building, Asheville, N. C. 28801

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STATION CLIMATIC SUMMARY

PREPARED BY THE NAVAL OCEANOGRAPHY COMMAND DETACHMENT, ASHEVILLE, N.C.

PREPARED UNDER, COMMANDER, NAVAL OCEANOGRAPHY COMMAND, NSTL, MS 39529

NARRATIVE SUMMARY

Naval Air Station Memphis, Tennessee is located 22 miles north-northeast of Memphis International Airport in the southwestern corner of Tennessee on a relatively flat area of the Mississippi River basin. The terrain in the immediate vicinity of the station being a low rolling type with an elevation of 2[illegible]5 feet above mean sea level.

Dominating air masses for the local area are the continental polar air mass, and associated polar front, during the winter months and the maritime tropical air mass which is a part of the Bermuda high circulation during the summer months. Pre-frontal squall lines produce severe thunderstorms and tornado activity in the local area during the winter and spring. During the summer months, pre-frontal squall line thunderstorms are replaced by convective type thunderstorms. Occasionally, tropical cyclones moving inland produce heavy rains and gusty winds throughout the area.

The average mean temperature for the year is in the low 60's, varying from the upper 30's in January to the low 80's in July. A record high of 106 degrees F. has been recorded during both the months of June and July. Temporary relief from the high temperatures occur during the fall with cold fronts passing occasionally through the area. With the onset of winter, radical temperature changes become more common with a 50 degree temperature drop during a cold frontal passage being not at all uncommon.

Precipitation of about 49 inches per year is fairly well distributed throughout the year, with the only frozen or freezing precipitation occuring during the winter when the Texas panhandle lows pass just south of the station. Haze in the area usually reduces visibility to 5 miles.

Flying conditions are generally good with ceilings and visibilities greater than 1,000 feet and 3 miles more than 80% of the time even during the bad weather months of winter. During the months of May, June, and July Visual Flight Rules (VFR) are experienced more than 96% of the time. Thunderstorms are the principal cause of reduction in flight operations during the summer months. The low ceilings and visibilities brought on by these storms are usually of short duration.

MEMPHIS, TENNESSEE

EXHIBIT 4-2. CLIMATIC DATA SUMMARY FOR NAS MEMPHIS

PREPARED BY: NOAA ASHEVILLE
JUNE 1986

STATION NAME: MEMPHIS, TENNESSEE
LOCATION: 35 21N 89 59W

PERIOD: SEP 51 - DEC 82
ELEVATION: 322 FEET

STN LTRS KMEM
WBAN #: 93839
WMO #:

	TEMPERATURE (F)					PRECIPITATION (INCHES)							RELATIVE HUMIDITY		VAPOR PRESSURE	DEW POINT	PRESSURE ALTITUDE	SURFACE WIND (KTS)			MEAN CLOUD AMOUNT	MEAN NUMBER OF DAYS WITH									
	MEANS			EXTREME						SNOWFALL												PRECIPITATION		SNOWFALL		THUNDERSTORMS	VISIBILITY < 1/2 MI IN FOG	TEMPERATURE			
	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	MEAN	MAXIMUM	MINIMUM	24-HR MAXIMUM	MEAN	MAXIMUM	24-HR MAXIMUM	0300 LST	1200 LST				DIRECTION	SPEED	MAX GUST		>= 0.01	>= 0.50	>= 0.1	>= 1.5			>= 90	>= 75	<= 32	<= 00
JAN	47	30	30	71	-4	4.2	10.2	.8	3.7	*	13	9	77	66	.15	27	800	N	6	55	7	10	*	2	1	2	14	0	#	16	#
FEB	51	33	43	80	4	4.3	9.3	1.4	4.8	1	8	6	76	61	.17	31	800	N	6	55	6	9	3	1	#	3	12	0	1	12	0
MAR	61	42	51	87	12	5.1	12.4	.7	3.4	1	15	8	75	58	.26	41	850	S	7	58	7	11	3	1	#	5	11	0	3	5	0
APR	72	52	62	91	32	5.4	12.3	2.0	4.6	#	#	#	76	53	.34	48	750	S	7	107	6	11	4	0	0	7	10	#	13	#	0
MAY	80	61	71	98	38	5.0	11.9	.5	3.8	#	#	#	80	56	.49	58	700	S	5	58	6	10	3	0	0	7	11	3	24	0	0
JUN	88	68	79	106	49	3.6	9.3	.4	5.4	0	0	0	81	54	.63	65	550	S	5	60	6	8	2	0	0	7	11	14	29	0	0
JUL	91	72	82	106	58	3.5	6.5	.5	3.5	#	#	#	84	57	.74	70	450	S	4	56	5	9	2	0	0	9	15	20	31	0	0
AUG	90	70	80	108	54	3.1	7.4	.2	3.6	0	0	0	85	59	.69	68	450	E	4	49	5	7	2	0	0	7	17	16	31	0	0
SEP	84	63	74	104	40	3.6	9.5	1	3.6	0	0	0	84	59	.51	62	550	N	4	42	6	7	2	0	0	4	16	6	20	0	0
OCT	74	51	62	91	20	2.8	6.3	#	3.6	#	#	#	80	51	.34	40	600	N	4	44	5	6	2	0	0	2	13	#	11	#	0
NOV	61	41	51	83	16	4.1	9.5	1.4	2.6	#	2	2	78	58	.24	40	600	S	5	55	6	8	3	#	#	2	12	0	3	6	0
DEC	51	34	43	84	14	5.0	13.7	.5	4.7	1	13	13	76	62	.19	33	800	S	6	53	6	10	3	#	#	2	14	0	#	13	#
ANN	71	51	61	108	14	49.3	13.7	#	5.4	6	15	13	79	58	.39	49	750	S	5	107	6	106	33	4	1	57	156	59	177	54	#
EYR	31	31	31	31	31	31	31	31	31	31	31	31	810	810	810	810	8 10	810	810	31	810	31	31	31	31	29	29	31	31	31	31

REMARKS: * DATA NOT AVAILABLE # LESS THAN 0.5 DAYS, 0.5 OR 0.05 INCH, OR 0.5 PERCENT AS APPLICABLE

THE VALUE LISTED UNDER PRESSURE ALTITUDE INDICATES THAT VALUE IS EXCEEDED ONLY 0.05 % OF THE TIME

EYR IS EQUIVALENT YEARS OF RECORD (I.E. THE ACTUAL NUMBER OF YEARS UTILIZED IN THE CALCULATIONS

FROM THE OVERALL PERIOD OF RECORD & PERIOD OF RECORD ENDS 1982)

HAIL WAS INCLUDED IN SNOWFALL PRIOR TO JANUARY 1956 AND AFTER DECEMBER 1979

MEMPHIS, TENNESSEE

EXHIBIT 4-2. (continued)

FLYING WEATHER, - PERCENT OF HOURS

HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS*
CEILING LESS THAN 5000 FEET AND/OR VISIBILITY LESS THAN 5 MI														
00	41	36	33	22	23	13	17	24	27	19	31	32	26	10
03	41	39	35	26	25	21	22	33	35	24	37	36	31	10
06	45	42	45	34	38	40	50	58	62	44	43	40	45	10
09	44	50	44	32	36	32	32	36	42	30	41	45	40	10
12	44	46	40	34	37	32	34	41	42	22	38	41	38	10
15	42	42	37	31	31	22	26	29	30	19	35	40	32	10
18	38	38	35	25	23	17	22	21	29	17	33	35	28	10
21	36	33	28	20	19	16	19	21	25	16	30	33	25	10
ALL HRS	41	41	37	26	29	24	28	34	37	24	36	38	33	10
CEILING LESS THAN 3000 FEET AND/OR VISIBILITY LESS THAN 3 MI														
00	33	27	21	13	13	5	6	6	16	10	23	26	17	10
03	32	27	23	15	13	7	9	11	22	11	26	29	19	10
06	37	33	28	20	20	16	21	33	41	21	29	31	28	10
09	36	38	33	23	22	14	16	20	26	19	33	32	26	10
12	37	36	30	22	19	11	13	17	24	16	29	32	24	10
15	32	26	26	18	16	8	7	9	15	12	26	31	19	10
18	29	28	22	15	10	6	5	6	12	11	22	28	16	10
21	28	23	19	11	10	5	6	5	10	9	22	25	14	10
ALL HRS	33	30	25	17	16	9	10	13	21	14	26	29	20	10
CEILING LESS THAN 1000 FEET AND/OR VISIBILITY LESS THAN 3 MI														
00	18	14	10	5	6	3	4	2	12	4	10	12	8	10
03	20	11	9	8	7	4	5	7	13	5	14	13	10	10
06	22	17	12	11	16	13	16	30	35	14	16	14	10	10
09	25	20	10	7	9	5	9	15	17	9	18	17	13	10
12	21	14	8	5	4	2	3	4	9	4	14	13	8	10
15	16	11	7	4	4	3	3	2	7	3	11	11	7	10
18	16	14	7	5	4	2	3	2	4	3	10	10	7	10
21	15	13	8	3	4	1	4	2	5	3	10	10	7	10
ALL HRS	19	14	9	6	7	4	6	8	13	5	13	12	10	10
CEILING LESS THAN 500 FEET AND/OR VISIBILITY LESS THAN 1 MI														
00	6	3	1	1	1	0	1	0	2	1	2	2	2	10
03	6	0	2	1	1	1	1	0	3	1	3	2	2	10
06	6	4	4	1	2	1	4	4	8	3	3	2	4	10
09	9	3	2	0	0	0	0	1	3	0	3	2	2	10
12	4	1	1	0	0	0	1	1	1	0	2	1	1	10
15	5	0	1	0	0	0	0	0	1	0	1	2	1	10
18	5	1	1	1	0	0	0	0	0	1	1	2	1	10
21	6	1	0	1	0	0	0	0	0	1	2	1	1	10
ALL HRS	6	2	2	1	1	0	1	1	2	1	2	2	2	10
CEILING LESS THAN 200 FEET AND/OR VISIBILITY LESS THAN 1/2 MI														
00	2	1	0	0	0	0	0	0	0	0	0	0	0	10
03	3	0	0	0	0	0	0	0	1	0	1	1	1	10
06	2	1	1	0	1	0	0	1	2	1	1	1	1	10
09	2	1	0	0	0	0	0	0	0	0	1	0	0	10
12	1	0	0	0	0	0	0	0	0	0	0	0	0	10
15	1	0	0	0	0	0	0	0	0	0	0	0	0	10
18	2	0	0	0	0	0	0	0	0	0	0	1	0	10
21	2	0	0	0	0	0	0	0	0	0	1	0	0	10
ALL HRS	2	0	0	0	0	0	0	0	1	0	1	1	0	10

* PERIOD ENDS 1982

MEMPHIS, TENNESSEE

MEAN TEMPERATURE (F)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1951									73.4	63.8	45.5	45.2	M
1952	46.6	48.2	50.3	59.4	71.2	85.3	84.0	81.6	72.6	55.7	49.9	43.5	62.4
1953	45.4	46.7	56.0	58.1	71.9	85.4	82.1	M	74.9	65.4P	50.9	41.6	M
1954	41.6	50.3	50.9	67.1	66.2	81.5	86.8	85.0	77.7	63.7	51.4	43.4	63.8
1955	48.2	44.3	52.3	66.1	73.3	74.5	82.6	81.5	77.1	62.0	49.6	42.2	62.2
1956	36.4	47.5	51.4	60.2	73.3	77.3	82.8	82.0	73.1	66.1	50.5	48.6	62.6
1957	38.3	49.2	50.5	64.3	71.4	78.5	80.5	79.4	71.7	59.3	50.4	47.5	61.7
1958	37.4	33.4	45.2	60.1	71.2	78.1	81.3	80.2	73.1	62.4	54.0	38.2	59.6
1959	37.2	42.5	50.1	60.0	72.9	76.2	78.4	81.1	75.2	63.8	46.0	45.1	60.7
1960	40.4	39.5	39.5	64.0	68.4	77.7	81.1	80.9	76.1	64.0	51.1	37.7	60.0
1961	37.0	47.2	54.9	56.6	67.2	76.8	79.4	78.5	73.5	61.6	48.6	41.4	60.4
1962	36.5	49.1	48.2	55.8	77.4	77.9	81.1	80.1	72.7	64.7	50.0	38.3	61.3
1963	33.2	36.0	55.3	62.6	69.7	77.9	79.7	80.5	73.1	67.0	52.6	30.9	59.9
1964	40.3	40.0	51.5	64.2	71.9	78.2	79.6	77.2	70.5	59.2	53.5	42.8	60.7
1965	41.6	42.4	43.5	65.6	74.9	78.3	80.7	76.6	74.5	61.8	56.1	45.7	62.0
1966	33.5	42.0	53.5	61.1	68.5	78.0	84.1	77.0	71.4	58.4	53.4	40.8	60.2
1967	42.3	37.6	57.3	65.7	67.5	78.4	77.1	75.0	69.4	62.1	49.1	45.2	60.7
1968	37.9	36.1	50.3	63.6	70.1	79.0	80.2	81.0	71.2	63.0	49.9	39.8	60.2
1969	35.7	42.4	44.1	62.1	70.5	78.8	83.6	78.2	73.3	62.2	48.6	34.0	60.2
1970	33.8	40.2	48.4	63.9	71.7	74.9	77.9	79.6	75.7	60.9	48.6	46.5	60.2
1971	38.2	42.5	48.1	60.4	66.5	80.1	79.2	78.1	76.0	69.5	50.4	50.5	61.6
1972	41.2	33.8	52.2	63.4	69.8	76.7	78.7	79.4	75.6	61.0	45.6	39.7	60.6
1973	38.4	40.6	59.3	58.3	67.4	79.6	82.0	77.8	75.9	66.5	55.6	42.0	62.0
1974	43.2	43.9	57.6	61.4	72.0	73.7	82.2	78.8	67.6	60.5	51.4	43.5	61.3
1975	44.4	43.9	48.0	59.9	72.1	78.2	80.3	79.5	68.6	63.5	52.6	42.9	61.2
1976	37.7	51.6	56.8	61.4	64.5	75.1	80.1	76.3	70.6	55.2	41.7	39.1	59.2
1977	26.6	42.2	55.9	65.2	75.7	80.1	81.4	80.4	76.5	59.9	52.7	41.4	61.7
1978	29.3	33.0	47.6	64.2	69.5	78.6	82.0	78.7	75.9	60.2	55.7	42.8	59.6
1979	29.7	35.9	51.7	59.9	67.3	75.8	79.7	77.6	69.3	62.1	47.4	42.4	58.3
1980	39.9	36.3	46.4	58.7	71.2	80.2	87.2	85.0	77.6	59.8	50.3	43.0	61.3
1981	37.3	44.7	51.0	68.2	67.5	81.1	83.1	79.5	71.7	61.6	53.1	40.7	61.6
1982	35.9	40.3	56.3	57.7	74.5	76.2	83.7	80.7	72.6	63.5	52.5	40.6	61.9
MEAN	38.2	42.4	51.1	62.1	70.6	78.3	81.4	79.6	73.4	62.1	50.6	42.5	61.0

"M" INDICATES MISSING DATA, "P" DENOTES PARTIAL RECORD, I.E. LESS THAN 10 DAYS MISSING.
PARTIAL MONTHLY VALUES WERE NOT INCLUDED IN MEANS.

MEMPHIS, TENNESSEE

EXHIBIT 4-2. (continued)

TOTAL PRECIPITATION (INCHES)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1951									5.67	4.49	4.01	8.06	M
1952	3.23	4.41	7.01	2.34	2.05	.78	.67	2.19	2.92	.04	4.19	3.01	33.64
1953	5.02	5.42	7.50	7.12	11.91	3.08	4.79	M	.12	.30	1.89	5.27	M
1954	9.42	4.10	1.84	3.28	3.23	1.40	.57	2.31	2.78	.04	1.35	4.16	35.24
1955	1.63	6.62	7.04	6.53	4.09	5.45	2.54	1.54	1.44	1.58	2.27	1.12	43.85
1956	5.45	9.28	3.16	5.56	2.92	6.20	2.25	2.49	.41	1.37	3.08	3.81	45.98
1957	9.69	4.60	2.63	6.56	6.63	6.26	3.08	2.72	3.60	5.53	9.86	5.42	66.70
1958	2.66	3.17	4.55	6.38	4.79	2.52	3.35	2.71	7.13	1.10	3.50	2.37	44.23
1959	4.66	7.51	3.11	1.95	1.20	1.64	8.49	3.92	1.60	1.07	2.36	4.71	41.62
1960	4.20	2.39	3.14	3.10	3.56	3.48	3.19	3.19	2.58	5.67	3.70	5.21	43.49
1961	1.30	6.08	7.38	4.93	6.54	2.57	4.16	.55	.88	.77	6.77	9.72	52.03
1962	5.62	8.12	4.34	3.25	1.08	3.16	4.37	2.16	8.00	1.37	1.41	.93	44.01
1963	.87	2.08	4.28	2.87	6.30	3.26	3.07	1.08	1.75	.02	3.11	4.77	33.42
1964	3.52	3.07	8.34	9.32	3.01	2.66	2.26	5.22	2.26	2.09	2.74	6.46	50.35
1965	3.36	7.33	5.30	3.12	3.06	5.30	4.23	2.84	7.94	.36	2.01	.88	45.73
1966	3.49	5.00	.67	5.80	6.30	.41	3.26	.09	4.30	1.84	1.71	5.53	44.40
1967	1.56	1.78	3.56	5.25	5.07	1.63	6.90	.05	1.45	2.17	1.64	5.63	38.69
1968	5.09	1.49	7.31	6.35	4.68	2.00	1.39	.52	2.95	1.95	3.92	4.05	42.30
1969	2.77	1.66	1.96	4.23	.08	.90	1.28	7.40	.88	1.33	3.34	7.34	33.97
1970	1.56	3.08	5.39	7.80	3.53	8.23	4.95	2.29	4.69	6.29	2.68	4.68	55.17
1971	2.25	5.81	3.11	4.19	4.66	4.13	4.53	5.98	6.32	.13	2.17	7.06	50.34
1972	4.37	2.10	4.78	3.42	2.62	2.33	4.71	5.11	4.66	3.68	6.57	8.22	52.57
1973	5.13	3.68	6.57	11.05	7.72	1.14	5.06	1.55	5.06	2.33	9.38	4.46	63.13
1974	7.66	5.50	3.43	6.84	7.79	9.27	1.62	6.35	3.11	2.34	3.86	3.74	61.51
1975	4.19	5.15	12.37	3.27	7.48	1.04	4.23	1.91	4.43	2.73	6.59	2.67	56.06
1976	2.08	4.92	5.95	1.95	4.65	6.36	4.15	.10	3.31	6.22	1.87	1.93	44.37
1977	2.88	2.34	4.70	4.50	2.30	3.53	1.77	2.46	9.49	1.26	7.03	4.01	46.27
1978	10.24	1.40	5.16	2.06	8.67	5.39	3.60	5.03	4.06	1.19	5.46	10.93	64.01
1979	4.46	6.00	6.96	12.31	7.64	2.05	3.11	4.41	6.31	2.05	6.97	4.09	67.99
1980	2.60	1.40	10.01	6.29	4.10	2.21	2.71	.60	4.43	3.01	5.39	1.03	45.38
1981	1.65	5.09	5.17	3.44	10.54	5.11	4.51	1.60	.42	4.91	2.22	1.08	44.54
1982	6.24	3.92	3.48	9.92	4.69	8.03	4.57	5.40	1.58	3.40	6.65	13.71	68.09
MEAN	4.17	4.27	5.14	5.39	4.96	3.60	3.53	3.09	3.64	2.30	4.05	4.95	49.09

"M" INDICATES MISSING DATA, "P" DENOTES PARTIAL RECORD, I.E. LESS THAN 10 DAYS MISSING

PARTIAL MONTHLY VALUES WERE NOT INCLUDED IN MEANS.

MEMPHIS, TENNESSEE

EXHIBIT 4-2. (continued)

HEATING DEGREE DAYS

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL
51-52			8	130	582	618	569	481	454	210	21	0	M
52-53	0	0	2	294	457	660	604	505	282	232	31	0	3067
53-54	0	M	3	M	417	716	710	407	446	63	74	0	M
54-55	0	0	1	167	404	663	727	500	414	60	0	1	3017
55-56	0	0	6	158	488	703	816	498	425	190	7	1	3286
56-57	0	0	0	47	443	499	822	438	442	142	25	0	2058
57-58	0	0	7	195	431	537	847	678	608	164	38	0	3705
58-59	0	0	13	135	341	824	856	627	455	102	15	0	3448
59-60	0	0	2	125	567	608	761	733	791	99	72	0	3758
60-61	0	0	0	96	415	840	861	495	319	246	63	0	3337
61-62	0	0	16	152	497	725	878	446	516	202	1	0	3433
62-63	0	0	6	123	443	819	961	804	317	130	40	0	3663
63-64	0	0	11	39	369	1053	758	718	411	87	16	0	3462
64-65	0	1	33	190	358	683	720	627	659	81	0	0	3352
65-66	0	0	23	138	264	591	969	639	366	162	42	0	3194
66-67	0	0	2	214	348	747	701	705	293	75	46	0	3131
67-68	0	1	38	152	468	607	829	829	458	104	10	0	3496
68-69	0	0	1	118	448	724	780	627	642	112	14	0	3516
69-70	0	0	0	162	484	799	963	690	511	110	17	0	3736
70-71	1	0	15	152	484	569	823	622	522	100	42	0	3410
71-72	0	0	3	12	437	440	728	606	390	136	20	0	2772
72-73	0	0	11	100	576	775	817	676	184	225	31	0	3475
73-74	0	0	12	83	293	708	670	586	257	160	7	0	2776
74-75	0	0	35	161	420	664	634	586	523	214	2	0	3239
75-76	0	0	79	138	375	681	840	385	275	153	78	0	3004
76-77	0	0	10	309	689	799	1181	632	287	83	3	0	3493
77-78	0	0	0	175	371	725	1090	943	526	105	69	0	4012
78-79	0	0	0	165	279	680	1086	888	409	178	51	0	3656
79-80	0	0	14	147	522	693	771	824	570	216	16	0	3773
80-81	0	0	11	205	438	678	853	565	438	34	54	0	3276
81-82	0	0	18	166	351	746	896	688	313	236	6	0	3420
82-83	0	0	25	150	380	524							
MEAN	0	0	12	151	432	692	824	634	436	147	29	0	3357

THE DEGREE DAY TOTAL FOR THE MONTH IS THE SUM OF THE DEPARTURES OF THE DAILY MEAN TEMPERATURES FROM THE BASE OF 65 DEGREES F.
"M" INDICATES MISSING DATA

MEMPHIS, TENNESSEE

EXHIBIT 4-2. (continued)

EXHIBIT 4-2. (continued)

COOLING DEGREE DAYS

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1951									267	103	3	9	M
1952	6	0	6	50	221	616	595	521	230	14	7	0	2274
1953	0	0	8	43	252	617	537	M	304	M	1	0	M
1954	.	4	17	132	117	501	602	620	306	134	0	0	2601
1955	0	5	27	98	263	291	551	520	370	73	31	3	2232
1956	0	0	11	54	272	376	559	532	247	86	13	3	2153
1957	0	2	0	130	229	407	489	452	215	29	0	0	1953
1958	0	0	0	23	237	400	511	477	265	61	19	0	1993
1959	0	0	1	38	266	344	422	507	316	94	5	0	1991
1960	1	0	4	75	184	389	564	501	341	74	5	0	2078
1961	0	0	9	62	134	357	452	425	278	54	10	0	1781
1962	0	6	2	54	392	393	504	476	241	121	0	0	2189
1963	0	0	21	66	193	394	461	404	259	106	5	0	1989
1964	0	0	1	72	238	402	462	389	206	16	19	0	1805
1965	2	0	0	104	316	405	495	429	315	46	5	0	2117
1966	0	0	15	50	154	398	600	378	201	16	7	1	1820
1967	4	0	61	104	129	400	380	317	174	67	0	0	1644
1968	6	0	8	71	173	424	477	501	193	64	2	0	1913
1969	6	0	0	32	191	421	500	416	254	83	0	0	1977
1970	1	0	0	85	235	306	400	458	342	32	2	3	1872
1971	0	0	4	49	97	462	447	409	342	160	8	0	1978
1972	0	0	0	95	174	359	431	451	337	65	4	0	1916
1973	0	0	16	31	114	446	533	404	340	137	16	0	2045
1974	1	0	36	59	230	270	534	436	119	26	21	0	1737
1975	3	0	2	71	231	401	484	459	193	100	12	1	1957
1976	0	2	24	55	73	307	480	357	105	14	0	0	1502
1977	0	0	14	96	340	460	576	485	353	21	9	0	2356
1978	0	0	0	87	214	416	530	432	312	25	8	0	2044
1979	0	0	5	31	127	332	460	398	148	63	3	0	1567
1980	0	0	0	32	217	461	696	630	396	49	4	0	2485
1981	0	1	11	134	137	488	560	456	229	68	2	0	2094
1982	0	1	50	24	305	315	500	494	259	112	11	23	2212
MEAN	1	1	12	60	208	406	516	461	270	60	7	1	2019

THE DEGREE DAY TOTAL FOR THE MONTH IS THE SUM OF THE DEPARTURES OF THE DAILY MEAN TEMPERATURES FROM THE BASE OF 65 DEGREES F
"M" INDICATES MISSING DATA

MEMPHIS, TENNESSEE

WBAN NO: 93819	STATION NAME: MEMPHIS, TENNESSEE	LATITUDE: 35 21N	LONGITUDE: 89 52W	ELEVATION: 322	CALL SIGN: KNQA	WMO NO:

STATION LOCATION AND INSTRUMENTATION HISTORY

BAROMETER LOCATION NUMBER	GEOGRAPHICAL LOCATION & NAME	TYPE OF STATION	AT THIS LOCATION FROM	AT THIS LOCATION TO	LATITUDE	LONGITUDE	ELEVATION ABOVE MSL FEET	ELEVATION ABOVE MSL TYPE BAROMETER	OBS PER DAY
1.	Weather Service Office, main deck Ops bldg	Navy	1949	1960	35 21N	89 52W	295	Mercurial	24
2.	Moved within Weather Office	Navy	1960	1968	35 21N	89 52W	295	Mercurial	24
3.	Replacement installed	Navy	1968		35 21N	89 52W	295	Mercurial	24
1a.	Weather Service Office	Navy	1960		35 21N	89 52W	295	Aneroid	24

NUMBER OF LOCATION	DATE OF CHANGE	SURFACE WIND EQUIPMENT INFORMATION LOCATION	TYPE OF TRANSMITTER	TYPE OF RECORDER	HT ABV GROUND FEET
1.		Installed atop control tower	3-Cup		67
1a.	Unkn	Atop control tower	Selsyn	Triple	69
2.	1953	Atop control tower	AN/UMQ-5	RO-100	67
3.	1958	1500 feet from Ops bldg N-Z, bearing 350	AN/UMQ-5C	RO-100	12
4.	1962	Same as #3	AN/UMQ-5C	RO-100	8

REMARKS, ADDITIONAL EQUIPMENT, OR REASON FOR CHANGE

1. Barograph
2. Automatic Met Station(AN/GMQ-29)
3. Ceiling Light(ML-121)
4. Cloud Height Set(AN/GMQ-13B)
5. Transmissometer(AN/GMQ-10C)
6. Wind Measuring Set(AN/PMQ-3C)

MEMPHIS, TENNESSEE

EXHIBIT 4-2. (continued)

5.0 PATHWAYS OF CONTAMINANT TRANSPORT AND EXPOSURE

5.1 PATHWAYS OF CONTAMINANT TRANSPORT

The probable routes of transport of contaminants from the site for potential exposure of the receptors include the following:

1. Volatilization of organic waste substances to ambient air, with the polluted air moving off site, may affect areas downwind.
2. Contaminated dust migration in the air medium may reach a downwind receptor.
3. Contaminated surface run-off that may impact the surface water quality and the environment in the drainage basin.
4. Desorption or release of contaminants in the sediment that may cause the off-site transport via surface water flow.
5. Movement of contaminated groundwater in the uppermost aquifer (perched, unconfined) may transport contaminants downgradient.
6. During normal on-site activities, both remedial and operational, contaminants may be transported off-side.

A subsection which discusses the migration pathways is included in each SWMU summary section and addresses the four potential media which serve as pathways (e.g., air, soil, surface water, sediment, and groundwater). The SWMU summaries are presented in Section 7.0.

5.2 POTENTIAL RECEPTORS

Potable water at NAS Memphis is available from both on-site and off-site sources. In both instances, the source of supply is groundwater found in two geologic units known as the Memphis Sand (approximately 500 feet below the surface) and the Fort Pillow Sand (approximately 1500 feet below ground level).

The NAS uses five wells for water supply. Three wells are screened in the Fort Pillow Sand, and two in the Memphis Sand. All five wells are located in the developed area of the facility. Consequently, they are located near many of the SWMUs which are to be investigated. While contamination of these wells probably poses the greatest threat to potential human receptors, the depth to the first aquifer makes contamination from on-site sources unlikely. Shallow private wells near the NAS perimeter are of more concern.

The surface water flow regime is discussed in Section 3.4. Surface water is used primarily for livestock watering and to support aquatic life. According to a spokesman for the Memphis-Shelby County Health Department, no surface waters in Shelby County are used for public drinking water sources. Contamination of the Big Creek drainage system poses the greatest threat to potential environmental receptors.

The NAS has approximately 1100 family housing units. These units are located on the east side of the installation between the airfield and the hospital complex. The off-site housing units, which are nearest to the majority of the SWMUs, are located along the western boundary of the NAS. The distance from these potential receptors to the SWMUs varies from several hundred to several thousand feet, with the majority of the sites located at a greater distance.

The permanent population of the NAS is approximately 7500 persons, including dependents. The student population is approximately 10,000 persons. The SWMUs are primarily located in the "industrial" areas of the installation. Consequently, the persons at greatest risk of exposure are those assigned to work on a long-term basis in that area. These persons are the approximate 1500 civilian employees of the NAS. The opportunity for human contact with the SWMUs is limited because the SWMUs are commonly located within limited access areas of the installation.

Based on the available information and data presented in the Preliminary Review Document (PRD) and Visual Site Inspection Report (VSIR), potential human and environmental receptors include the following:

- Nearby users of shallow groundwater
- Users of the nearby surface water for body contact activities, i.e., swimming (dermal exposure) and fishing (dermal exposure and ingestion)
- On-site personnel during the training, operational and site remediation activities
- Environmental receptors include aquatic biota in affected surface waters, terrestrial fauna and affected vegetation
- Downwind residents.

These are discussed in the following report sections.

6.0 CONTAMINANT PROPERTIES AND EFFECTS

The contaminants of interest at NAS Memphis fall into a relatively small number of individual or groups of contaminants. These are:

- Fuel leaks and spills (JP-4, gasoline, diesel oil, kerosene)
- Heating oil or waste oils and oil/solvent mixtures
- Solvents - metal cleaning and degreasing agents, either halogenated or non-halogenated
- Metal plating solutions - cyanide-based solutions containing chromium, cadmium, nickel, or copper
- Battery electrolyte wastes (lead-acid and other batteries)
- "Household" wastes generated by routine office and training activities (trash, mess hall food wastes, etc.)
- Medical wastes
- Paint and paint thinner wastes
- Construction/Demolition Wastes

These are briefly described in the following paragraphs.

6.1 FUEL WASTES

6.1.1 JP-4

Jet fuel JP-4 is a "wide-cut" gasoline type fuel used by the military (in contrast to heavier kerosene type fuels used in civil aviation). JP-4 contains typical gasoline type constituents. It is free of heavy metals. Health and safety data is readily available and are not included here for brevity.

6.1.2 Other Jet Engine Fuels

Kerosene-based jet fuels are essential "light" kerosenes with various chemical fuel additions to bring the finished product to the required specification for vapor pressure, flash point, etc. Jet, or turbine, engine fuels are usually free of heavy metals. Health and safety data are readily available, and are not included here for brevity.

6.1.3 Aviation Gasoline (AVGAS)

Gasoline for piston-type aircraft engines is similar to automobile gasoline (MOGAS), except that it was typically higher in lead content to achieve higher octane rating specifications required for military aircraft engines. AVGAS is color-coded by octane rating.

6.2 HEATING OIL AND USED MOTOR OIL

6.2.1 Heating Oil

Heating oil is a moderately heavy and viscous oil used to fuel heaters and boilers. It is characterized by longer chain hydrocarbons. Heating oil is lighter than and only slightly soluble in water and is visible as a sheen on water in very small quantities. It generally presents little hazard due to low toxicity and low likelihood of ingestion.

6.2.2 Used Motor Oil

Used motor oil contains original constituents of motor oil, plus heavy metals from contact with engine parts and polynuclear aromatic hydrocarbons (PAHs) generated during engine operation (heat, pressure). EPA considered regulatory used motor oil as a hazardous waste (see Federal Register 51 FR 8206, 10 March 1986), but declined to promulgate regulations because such regulations would be counterproductive since it would discourage recycling and encourage uncontrolled disposal as "household" waste. The above FR citation provides good description of used oil characteristics and references on public health and environmental effects.

In the past, PCB-containing oils (i.e., electrical power transformer fluids) were routinely handled as waste oil and may have been combined with other waste oils.

Note: TDHE, unlike some states, does not regulate used motor oil as state-designated hazardous waste, unless it is mixed with a listed hazardous waste. It is generally regarded as a "special" waste, to be managed in a prudent manner.

6.3 SOLVENTS - HALOGENATED AND NON-HALOGENATED

6.3.1 Halogenated Solvents

Health effects data for solvents are readily available, and are not repeated here for brevity. Halogenated solvents are typically used in significant quantities as cleaners and degreasers in metal finishing operations or machine repair work. Use of halogenated solvents increased steadily throughout the 1950s and were in general use until the early 1980s when their use began to be curtailed because of worker health and environmental (waste management) concerns. Examples of commonly used halogenated solvents are trichloroethylene (TCE), trichloroethane (TCA), tetrachloroethane (PCE), and carbon tetrachloride.

6.3.2 Non-Halogenated Solvents

Non-halogenated solvents typically used are mineral spirits, alcohols, and terpenes. They are used variously as metal cleaners and degreasers, paint thinners, cleaning solutions, etc. Stoddard solvent, a common solvent in the DoD inventory, consists mostly of mineral spirits (mostly nonane), but may contain 15% chlorinated and/or non-chlorinated aromatic hydrocarbons (typically trimethyl benzene).

6.4 METAL PLATING WASTES

Metal plating wastes are typically cyanide-based solutions containing a particular dissolved metal used to plate other metal objects. Typical metals used in industry are nickel, chromium, cadmium, and copper. Platings are performed to achieve specific purposes on the finished object, such as corrosion inhibition, improved electrical conductivity, or aesthetic appeal. In concentrates and solutions, the primary threat is cyanide (inhalation). In dilute form (e.g., wastewater containing dilute solution, it may disperse as runoff and become a long-term environmental contaminant (due primarily to heavy metals) in surface soils and sediments. Disposal in dry wells can lead to build-up in soil and eventual contamination of groundwater (metals and cyanide).

6.5 BATTERY ELECTROLYTE WASTES

Battery electrolyte wastes vary, depending on the type of battery. The batteries of concern for this project are the lead-acid type, in which lead plates are suspended in a sulfuric acid solution. Contaminants of interest include sulfuric acid (until neutralized) and lead. Lead dissolved in "battery acid" is greatly immobilized during acid neutralization by formation of low-solubility salts (lead sulfate, lead carbonate).

Hazards from other types of batteries depend on battery type (e.g., nickel-cadmium [NICAD], mercury), construction (sealed or non-sealed), and disposal method.

6.6 "HOUSEHOLD" WASTES

Household wastes, as used in this report are those solid wastes typically generated in domestic households. They also include (in varying portions) wastes generated in office environments (paper, small amounts of solvents and oils, etc.), and small shops (oil-soaked rags, scrap metal, small amounts of cleaners and solvents). While the bulk of such wastes are non-hazardous, household wastes typically contain small amounts of hazardous materials.

6.7 MEDICAL WASTES

Medical wastes may include infectious (pathological) wastes, waste laboratory chemicals (flammable, toxic), "sharps" (used hypodermic needles, broken glassware), and low-level radioactive wastes. EPA's Guide for Infections Waste Management (EPA/530-SW-86-014; May 1986) provides a good discussion of waste characteristics, hazards, and recommended management. The Agency for Toxic Substances and Disease Registry (ASTDR) has summarized the relative hazards in a document entitled The Public Health Implications of Medical Waste: A Report to Congress. Hazards primarily include risk of infection through cuts and puncture wounds and are of primary concern to hospital workers and waste handlers. Although EPA has regulatory authority for infectious wastes under RCRA, EPA has yet to promulgate generally applicable waste management regulations. Medical wastes management has historically been regulated by state and local public health departments. Incinerators for medical wastes typically are required to obtain an air quality permit. Air quality permit requirements for medical waste incinerators were promulgated by TDHE in 1989.

Ash from medical waste incinerators may contain heavy metals, and can be expected to be very alkaline (pH > 12.5). Older incinerators may not incinerate waste completely due to uneven mixing and heating; however, the efficiency of newer incinerators is extremely good, and the ash can be assumed with confidence to be sterile. However, sharps may still present a simple cut and puncture threat if improperly handled. Incinerator off-gas will likely contain hydrologic acid (HCL) prior to scrubbing due to the combustion of plastics (chlorinated hydrocarbons), which are common in the waste stream as bags, gloves, syringe barrels, etc. Current TDHE medical waste incinerator regulation (Chapter 1200-3-25, "Standards for Infections Waste Incinerators") require an operating temperature of at least 1600 degree fahrenheit (°F) and a one-second detention time with a 15-minute minimum time limit from reaching operating temperature to initiating waste incineration. More stringent requirements apply for anti-neoplastic agents (chemotherapy drugs or other substances used in cancer treatment). By TDHE Policy; medical wastes may be disposed of in specifically approved sanitary landfills with the landfill owner/operator's permission.

6.8 PAINT AND PAINT THINNER WASTES

Paint wastes vary greatly in toxicity, depending on the type of paint. Lead-based general purpose paints and anti-fouling marine paints containing tributyl tin are toxic due to heavy metals content. See Section 6.3 for paint thinner information.

6.9 CONSTRUCTION/DEMOLITION WASTES

Construction and demolition wastes include the following:

- Brick, cinder block, concrete.
- Wood (preserved and non-preserved)
- Plastic
- Sheet metal, steel reinforcing bars (rebar) for concrete, metal frames (steel, aluminum) for doors and windows, and electrical wiring (copper, aluminum)
- Roofing material (may contain asbestos in an asphalt matrix)
- Floor tile (may contain asbestos in tile and/or adhesive)
- Ceramic tile
- Pipe insulation (typically fiberglass; newer building - styrofoam or rubber; older buildings - mineral wool, and asbestos for steam lines and fireproofing)
- Water piping (steel, copper, plastic; older installations may use lead for seals). Copper piping typically sealed with lead/tin solder.
- Glass (windows)
- Earth removed during foundation removal, grading, etc.
- Asbestos siding.

In general, these wastes are chemically inert, or are non-hazardous biodegradable material (e.g., wood). Some materials, such as asbestos, require special handling and disposal precautions.

6.10 POLYCHLORINATED BIPHENYLS (PCBs)

PCBs became a concern some 15 years ago because of their toxicity, combined with their tendency to accumulate in animal tissues (bioaccumulation factor on the order of 100,000). There are a number of specific PCBs, and variety of mixtures were as available in the past. Principal uses at the NAS were likely in coolants and dielelectric oils in electrical power step-down transformers, and in ballasts (capacitors) for fluorescent lights. Individual amounts of PCB-containing oils in use at any given location probably variety from a few gallons (transformers) to fractions of an ounce (light ballasts).

PCB toxicity varies according to the specific composition, with toxicity generally increasing with increasing chlorination. PCBs which are suspected carcinogens, are poisons by ingestion, inhalation, and skin contact. Principal harmful affects are on the skin (dermal contact), and the liver (inhalation and ingestion). Symptoms of dermal contact is a skin rash. Symptoms of systemic poisoning include nausea, vomiting, weight loss, jaundice, edema, and abdominal pain.

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7.0 SOLID WASTE MANAGEMENT UNITS (SWMUs)

The following are descriptions of the sixty (60) potentially contaminated sites (SWMUs) identified during preparation of this RFA. Following each subsection, 7.1 through 7.60, is a figure depicting the plan of the site described in the subsection. Additional background data from previous reports is provided in the Preliminary Review Document (PRD) issued concurrently with this document.

7.1 SWMU NO. 1: FIRE DEPARTMENT DRILL AREA (FDDA)

7.1.1 UNIT CHARACTERISTICS

7.1.1.1 TYPE OF UNIT

Former (inactive) Training Area. The FDDA was used to train firemen in crew rescue techniques for downed aircraft.

7.1.1.2 DESIGN FEATURES

The FDDA consisted of approximately 3,000 square feet of existing asphalt runway.

7.1.1.3 OPERATING PRACTICE (PAST AND PRESENT)

One training session per month was conducted at the FDDA from 1960 until 1984. During each training session, approximately 55 to 100 gallons of JP-4 and waste fuels were sprayed on and around a simulated aircraft in the FDDA and ignited.

7.1.1.4 PERIOD OF OPERATION

According to the November 1983 Initial Assessment Study, the FDDA was operated from 1960 until 1984. Fire training is currently conducted at the Fire Fighting Training Area (SWMU No. 5) located at the southwest corner of the North Complex.

7.1.1.5 AGE OF UNIT

Approximately 30 years.

7.1.1.6 LOCATION OF UNIT

The Fire Department Drill Area (FDDA) consisted of an area of asphalt runway and grass at the approach (west) end of Runway 09. Figure 7-1 indicates the approximate location of the FDDA.

7.1.1.7 GENERAL PHYSICAL CONDITIONS

From 1960 until the late 1970s there was no containment to prevent surface runoff from leaving the FDDA. In addition, deterioration of the asphalt was probably accelerated by the fuel and the fuel may have penetrated through the asphalt to the soil below.

7.1.1.8 CLOSURE METHOD

Structure continuing in use as part of an inactive runway. There are no definite plans to close the inactive unit.

7.1.2 WASTE CHARACTERISTICS

7.1.2.1 TYPE OF WASTE

According to the Department of the Navy's information, prior to 1981 it was common practice to mix waste fuels with waste solvents. The waste solvents known to have been used at Memphis NAS were petroleum naphtha, xylene, methyl ethyl ketone, toluene, and benzene. The waste fuel may have also contained lead, cadmium, chromium, and PCBs. It is likely that this waste fuel/waste solvent mixture was utilized at the FDDA.

7.1.2.2 MIGRATION CHARACTERISTICS

As previously discussed, the training area was sprayed with fuel once per month. From 1960 until the late 1970s, there was no containment device to prevent surface runoff from leaving the FDDA. Later, runoff of the fuel was prevented with curbing; however, the asphalt runway contained cracks and penetration of the fuel through the asphalt cracks probably occurred.

The JP-4 fuel and most waste fuels are volatile and reasonably mobile in the environment. Rainfall runoff can transport the less volatile fractions of the wastes into surface waters, ground water, or the soil.

7.1.2.3 TOXICOLOGICAL CHARACTERISTICS

The contaminations of concern for this SWMU include jet engine fuel constituents (benzene, toluene, xylene, naphtha); chlorinated solvents such as TCE, TCA, and PCE; and semivolatile hydrocarbon constituents of engine and transmission oils. Metals, if present, would be present in very low concentrations. PCBs would likewise be expected to exist at very low concentration.

These contaminants may produce one or more of the following human health effects, depending on the type of exposure (chronic or acute), the mode of exposure (inhalation, ingestion, or dermal absorption), and the amount (dose) received dizziness, nausea, drowsiness, agitation, liver damage, visual impairment, and dermal damage.

Combined effect of two or more chemicals is difficult to predict. In addition, several of the suspect substances are known or suspected carcinogens, mutagens, or teratogens.

7.1.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

These constituents would likely exist as contaminants adsorbed onto soil particles, as pore-space vapors, and possibly groundwater contaminants. The volatile constituents tend to evaporate quickly from the ground surface and near surface soil.

7.1.3 MIGRATION PATHWAYS

7.1.3.1 GEOLOGICAL SETTING

See Section 3.2.

7.1.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.1.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.1.3.4 TOPOGRAPHIC CHARACTERISTICS

The site is a paved section of inactive runway. Surrounding terrain is nearly level at a slightly lower elevation. Localized surface drainage is to the north and west.

7.1.3.5 PATHWAYS

AIR

Due to the volatile nature of most of the constituents of concern in SWMU No. 1, it is anticipated that any escape of the contaminants to the air medium would have occurred immediately following the release, and little or no residual would be present at this time.

SOIL

The waste fuel and solvent mixture was potentially released into the soil beneath the FDDA and into the drainageways leading away from the FDDA. Since the asphalt runway at the FDDA is not an impermeable surface, nothing was present to prevent the fuels from penetrating the asphalt pavement and entering the soil beneath.

SURFACE WATER

Since the FDDA was not curbed to contain runoff, it is likely that surface water runoff did transport the contaminants to adjacent drainage ways and nearby streams.

GROUNDWATER

If contamination was transported through the soil to the ground water, then the ground water could readily transport the contamination.

SUBSURFACE GAS

Limited migration of jet fuel VOCs could have occurred beneath the pavement, but would be inconsequential as a pathway.

7.1.4 CONTAMINANT RELEASE IDENTIFICATION

7.1.4.1 PRIOR INSPECTION REPORTS

The FDDA was studied in the Initial Assessment Study. The results of that study concluded that no Confirmation Study should be conducted.

7.1.4.2 PUBLIC COMPLAINTS

None.

7.1.4.3 MONITORING/SAMPLING DATA

No samples have been taken at the site.

7.1.4.4 EVIDENCE OF RELEASE

None observed.

7.1.5 EXPOSURE POTENTIAL

7.1.5.1 PROXIMITY TO AFFECTED POPULATION

The unit is in a restricted access area distant from residences.

7.1.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.1.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Presence of soil and/or groundwater contamination beneath the asphalt has not been determined. The exposure potential will be assessed when sufficient data has been generated.

7.1.6 DOCUMENTS REVIEWED

See Preliminary Review Document (PRD).

7.1.7 SUMMARIZED DATA GAP

7.1.7.1 SOIL

No soil data is available.

7.1.7.2 GROUNDWATER

No groundwater data for the immediate area is available.

7.1.7.3 SURFACE WATER/SEDIMENT

No available data.

7.1.7.4 AIR

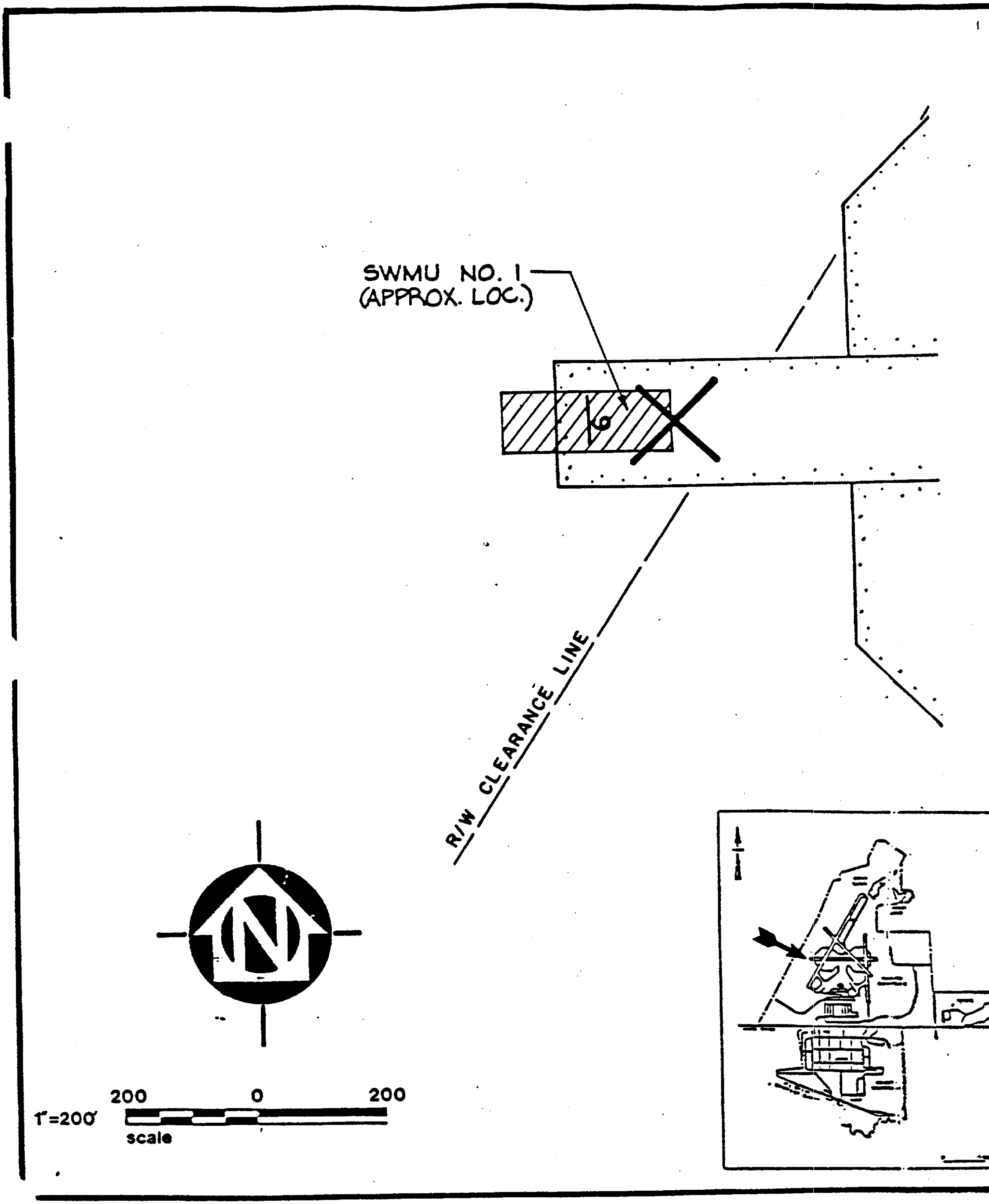
No available data.

7.1.7.5 SUBSURFACE GAS

Not applicable.

7.1.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 1 FIRE DEPARTMENT DRILL AREA
FIGURE 7-1 LOCATION MAP

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7.2 SWMU NO. 2: SOUTH SIDE LANDFILL

7.2.1 UNIT CHARACTERISTICS

7.2.1.1 TYPE OF UNIT

Inactive landfill.

7.2.1.2 DESIGN FEATURES

Based on photographs and past field investigations, the landfill covered approximately 40 acres. No data indicating the depth of the landfill has been located.

7.2.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The landfill was used as a disposal area for solid waste generated at NAS Memphis. Waste was disposed at the landfill using the trench and cover method. Combustible materials disposed at the landfill were burned before being covered. No effort was made to segregate the waste.

7.2.1.4 PERIOD OF OPERATION

The landfill was opened in 1942 and was utilized until 1970.

7.2.1.5 AGE OF UNIT

Forty-eight years (inactive unit), in use for 28 years.

7.2.1.6 LOCATION OF UNIT

The South Side Landfill is located on the NAS South Side Complex adjacent to the Big Creek Drainage Canal. Figure 7-2 shows the approximate location of the landfill.

7.2.1.7 GENERAL PHYSICAL CONDITIONS

Inactive. The surface of the site is covered with vegetation. The condition of the landfill bottom is unknown.

7.2.1.8 CLOSURE METHOD

Unknown.

7.2.2 WASTE CHARACTERISTICS

7.2.2.1 TYPE OF WASTE

The landfill was used for disposal of household, office, and industrial solid waste (used aircraft parts, etc.). In additional to the above, approximately two tons per year of wastewater treatment sludge (from trickling filter plant) were disposed in the landfill. Finally, waste oils, oily sludges and solvents generated from industrial operations were disposed in the landfill. Approximately one ton (maximum) of oils and oily sludges were disposed per year.

7.2.2.2 MIGRATION CHARACTERISTICS

All wastes, with the exception of liquid or contained gas, deposited within the landfill should remain stationary within the landfill unit. Liquid wastes, if present, could move both downward and horizontally, depending upon the proximity of the ground water table and existing subsurface condition. Any gases released due to container puncture or gases generated during waste decomposition will follow the path of least resistant through the ground or atmosphere.

7.2.2.3 TOXICOLOGICAL CHARACTERISTICS

Refer to Section 6.0. To be determined based on further site investigation. Some heavy metals are likely to be present.

7.2.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances would likely be residual solids, inerts, and leachates containing heavy metals and organics resistant to biodegration, such as chlorinated organics and PAHs.

7.2.3 MIGRATION PATHWAYS

7.2.3.1 GEOLOGIC SETTING

Refer to Section 3.0 for geologic setting.

7.2.3.2 HYDROGEOLOGIC SETTING

Monitoring of existing wells around the site indicates a south to southwesterly ground water flow. Flow is generally toward the Big Creek Drainage Canal located adjacent to Patrol Road as shown in Figure 7-2.

7.2.3.3 ATMOSPHERIC CONDITIONS

Refer to Section 4.0 for atmospheric conditions

7.2.3.4 TOPOGRAPHIC CHARACTERISTICS

Refer to Section 3.1 for general topographic characteristics. The site itself is nearly level and is being overgrown with native woody vegetation. Some larger demolition debris objects are visible at the ground surface.

7.2.3.5 PATHWAYS

AIR

Due to the nature of the wastes presumed to be deposited within the landfill, testing of the air is not required. Furthermore, as a closed landfill, previous deposition of waste which may be hazardous if airborne, such as asbestos, would no longer pose a threat to health or safety.

SOIL

Contaminant transport through the soil would most likely occur in a vertical movement beneath the landfill, until reaching an aquifer or perched water zone. At that time, contaminant movement would flow with the ground water or other water source.

SURFACE WATER/SEDIMENT

No surface water contamination due to storm water runoff is suspected. However, contamination through ground water transport into Big Creek Drainage Canal is possible.

GROUNDWATER

Although previous ground water testing indicated no significant contamination in the form of metals, cyanide, or VOCs, there is a possibility of contamination from other constituents.

SUBSURFACE GAS

The release of hazardous gases through the puncture of a landfilled container would quickly dissipate and, therefore, remain undetected during monitoring, unless the leak had recently occurred.

7.2.4 CONTAMINANT RELEASE IDENTIFICATION

7.2.4.1 PRIOR INSPECTION REPORTS

A November 1985 ground water study by Geraghty & Miller, Inc., showed little or no degradation in water quality down-gradient from the landfill. Parameters tested for included pH, specific conductance, VOCs, cyanide, cadmium, chromium, copper, nickel, lead, and zinc. (Refer to the PRD).

A site inspection was conducted on June 29, 1989. No visual evidence of release was observed.

7.2.4.2 PUBLIC COMPLAINTS

None.

7.2.4.3 MONITORING/SAMPLING DATA

Refer to the PRD for confirmation results for data from previous sampling efforts. Analytes included VOCs (Method 601), cyanide and metals.

7.2.4.4 EVIDENCE OF RELEASE

Not found.

7.2.5 EXPOSURE POTENTIAL

7.2.5.1 PROXIMITY TO AFFECTED POPULATION

The unit is located at some distance from residences.

7.2.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.2.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

To be determined.

7.2.7 SUMMARIZED DATA GAP

7.2.7.1 SOIL

No soil data available.

7.2.7.2 GROUNDWATER

Groundwater monitoring data from previous studies are presented in PRD.

7.2.7.3 SURFACE WATER/SEDIMENT

No data available.

7.2.7.4 AIR

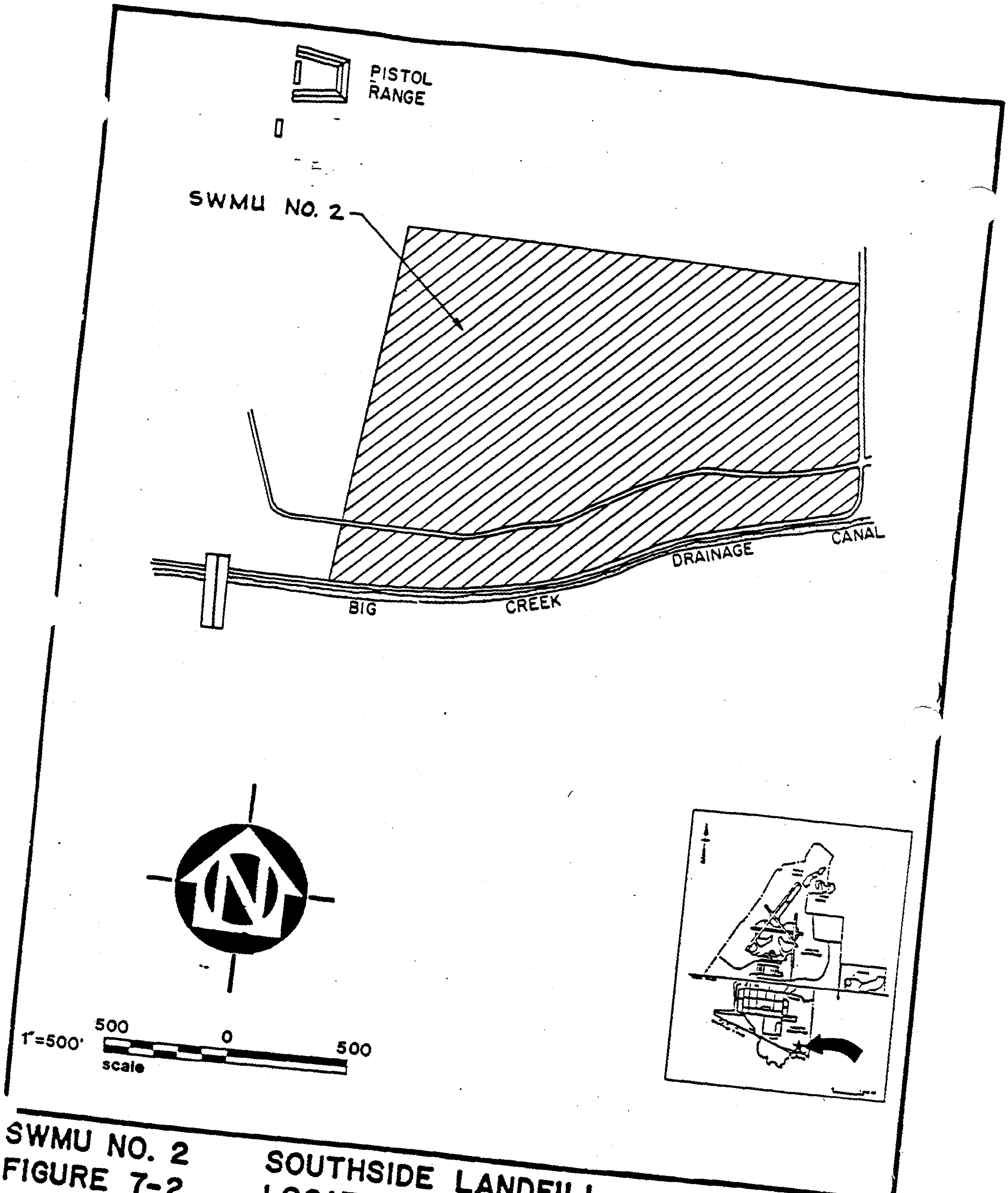
No data available.

7.2.7.5 SUBSURFACE GAS

No data available.

7.2.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 2
FIGURE 7-2

SOUTHSIDE LANDFILL
LOCATION MAP

7.3 SWMU NO.3: BUILDING N-121 PLATING SHOP DRY WELL

7.3.1 UNIT CHARACTERISTICS

7.3.1.1 TYPE OF UNIT

Dry well for waste disposal (inactive). Building N-121 contained a plating shop which conducted cadmium, chromium, copper, and nickel plating using cyanide based solutions. The dry well was used for disposal of both concentrated plating solutions and overflows from the plating tanks. The remaining wastewater discharged into the storm sewer and drainage ditch (SWMU No. 4).

7.3.1.2 DESIGN FEATURES

The dry well is approximately 10'x 10'x 6' deep and during operation was filled with gravel. The liquids were discharged into the dry well and percolated through the gravel and into the surrounding soil. The amount of waste that entered the well is estimated at 900 gallons per day. The remaining plating waste, approximately 17,000 gallons per day, was discharged into the storm sewer and drainage ditch. This brings the total amount of waste discharged from the plating shop to approximately 18,000 gallons per day.

7.3.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The dry well was used for the disposal of both concentrated plating solutions and overflow from the plating tanks. The liquids were discharged into the tank and percolated through the gravel and into the surrounding soil. The amount of waste that entered the well is estimated at 900 gallons per day.

The remaining plating waste, approximately 17,000 gallons per day, was discharged into the storm sewer and drainage ditch (SWMU No. 4). This brings the total amount of waste discharged to approximately 18,000 gallons per day.

7.3.1.4 PERIOD OF OPERATION

The exact dates of operation of the plating shop and dry well are unclear. One data source states operation from 1953-1965, while a second source states operation from 1951-1976.

7.3.1.5 AGE OF UNIT

Approximately 38 years old.

7.3.1.6 **LOCATION OF UNIT**

Building N-121 is located on the NAS North Side Complex on Casablanca Road as indicated on Figure 7-3.

7.3.1.7 **GENERAL PHYSICAL CONDITIONS**

Unknown.

7.3.1.8 **CLOSURE METHOD**

None.

7.3.2 **WASTE CHARACTERISTICS**

7.3.2.1 **TYPE OF WASTE**

As previously stated, the plating shop conducted cadmium, chromium, copper, and nickel plating using cyanide based solutions.

7.3.2.2 **MIGRATION CHARACTERISTICS**

The plating solutions and other wastes discharged into the dry pit are reasonably mobile in the environment. Rainfall percolating through the soil and/or the liquid wastes can transport contaminations into the soil and to the ground water.

7.3.2.3 **TOXICOLOGICAL CHARACTERISTICS**

The substances of concern are heavy metals (cadmium, chromium, copper, and nickel) and cyanide. Of these, cyanide can produce acute effects by blocking red blood cell uptake of oxygen, resulting in hypoxia and possibly death. Cyanide is a principally an inhalation hazard at this SWMU.

The metals produce toxic systemic effects in sufficient dosages, primarily by interfering with cellular enzymes or nerve function. Heavy metal poisoning usually results from chronic exposure to low concentrations in food and water.

7.3.2.4 **PHYSICAL/CHEMICAL CHARACTERISTICS**

Cyanides were initially present in solution but would now exist as soil contaminants. Under certain (acidic) conditions, hydrogen cyanide gas can be generated. Metals are likely to be present as chelates or adsorbed onto soil particles, or dissolved in groundwater.

7.3.3 MIGRATION PATHWAYS

7.3.3.1 GEOLOGIC SETTING

See Section 3.2.

7.3.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.3.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.3.3.4 TOPOGRAPHIC CHARACTERISTICS

The unit per se is a small subsurface unit. The surrounding area is nearly level, with man-made surface drainage to the south and west.

7.3.3.5 PATHWAYS

AIR

Most of the hazardous waste constituents of concern at WMU No. 3 do not readily escape to the air medium. The only possible exception is cyanide gas which can be formed when cyanide solutions are exposed to acidic waste streams. Since the plating shop has not been operated since 1976, any cyanide gas which have been formed during operation would no longer be present in the air. Also, the cyanide has likely been diluted sufficiently to prevent gas formation.

SOIL

The dry well outside Building N-121 was designed to transport waste plating solutions into the soil; therefore, considerable soil contamination is anticipated in the area around the dry well.

SURFACE WATER/SEDIMENT

As previously discussed, the plating shop dry well was designed to dispose of waste plating solutions below grade. However, it is suspected that some overflows in the area may have occurred which would have caused surface water contamination.

GROUNDWATER

Since liquid wastes were encouraged to percolate through the soil by the design of the dry well, contamination could have reached the ground water. Once in the ground water medium, the contaminants could be readily transported.

SUBSURFACE GAS

Not applicable.

7.3.4 CONTAMINANT RELEASE IDENTIFICATION

7.3.4.1 PRIOR INSPECTION REPORTS

The dry well and storm sewer/drainage ditch were analyzed in the November 1983 Initial Assessment Study. The result of this study was a recommendation for a confirmation study to be conducted. The results of the confirmation study stated that additional sampling and analysis should be conducted to further determine the existing ground water conditions and to determine the probability of future ground water contamination. A copy of the CERCLA 103c Notification is available. PWO drawings no. 1804-1805, 1925, and 3353 are the only available drawings showing N-121 details.

7.3.4.2 PUBLIC COMPLAINTS

None.

7.3.4.3 MONITORING/SAMPLING DATA

Confirmation Study results are included in the PRD.

Additional (limited) soil sampling and analyses was performed in 1988 for a portion of the storm sewer. Results are included in the PRD (11 August 1988 Sampling Report).

7.3.4.4 EVIDENCE OF RELEASE

Usage of unit during operational period.

7.3.5 EXPOSURE POTENTIAL

7.3.5.1 PROXIMITY TO AFFECTED POPULATION

This site is distant for the permanent NAS population. The persons subject to the exposure are downgradient groundwater users.

7.3.5.2 <u>PROXIMITY TO SENSITIVE ENVIRONMENTS</u>

The unit is distant from sensitive environments.

7.3.5.3 <u>LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS</u>

Determination can not be derived from previous investigation results.

7.3.6 <u>DOCUMENTS REVIEWED</u>

See PRD.

7.3.7 <u>SUMMARIZED DATA GAP</u>

7.3.7.1 <u>SOIL</u>

Data available in the IAS are inconclusive.

7.3.7.2 <u>GROUNDWATER</u>

Existing data are inconclusive.

7.3 7.3 <u>SURFACE WATER/SEDIMENT</u>

No data available. (See SWMU No. 4).

7.3 7.4 <u>AIR</u>

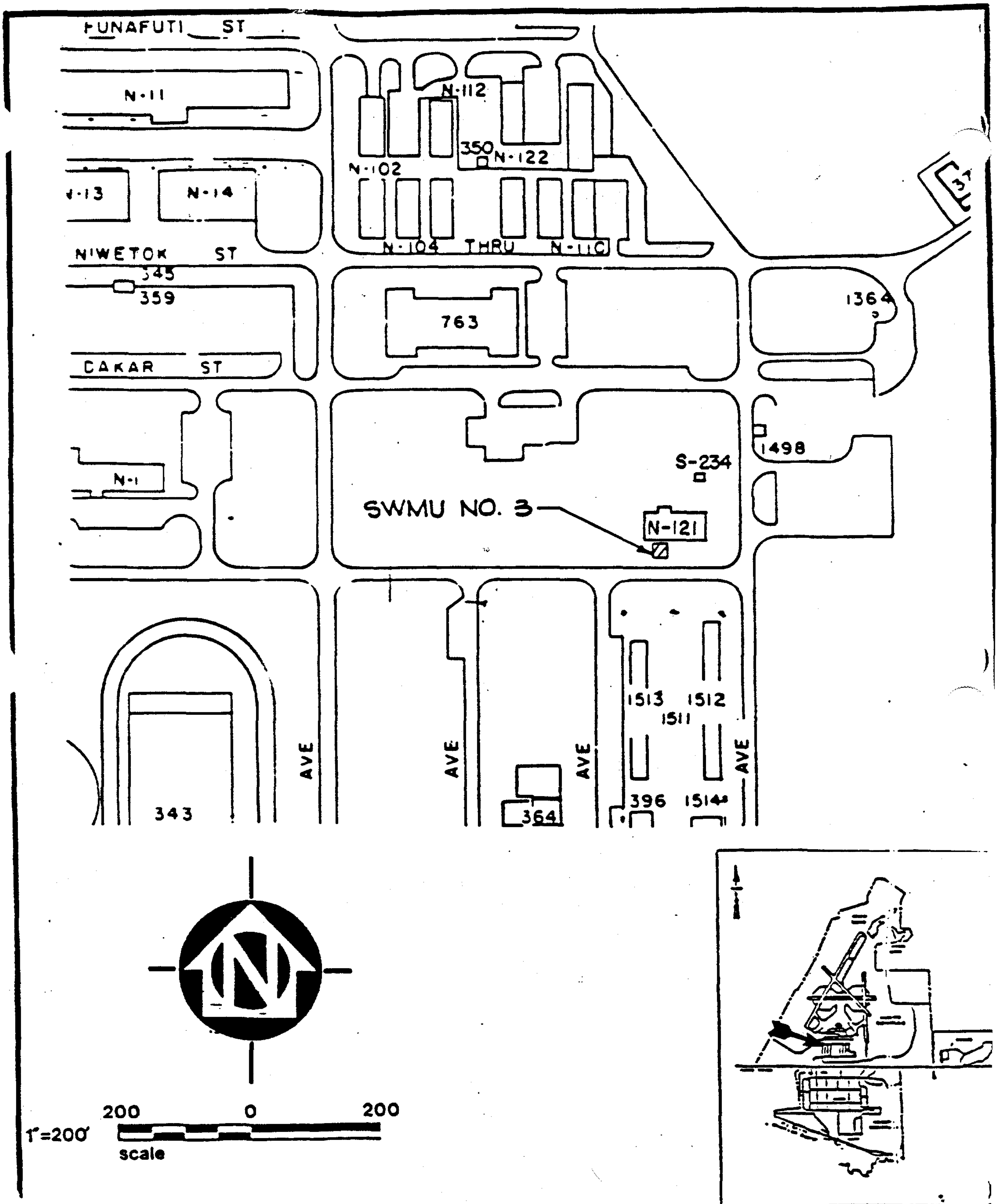
Not applicable.

7.3 7.5 <u>SUBSURFACE GAS</u>

Not applicable.

7.3.8 <u>RECOMMENDED ACTIONS</u>

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 3 N-121 PLATING SHOP DRY WELL
FIGURE 7-3 LOCATION MAP

7.4 SWMU NO. 4: BUILDING N-121 PLATING SHOP STORM SEWER AND DRAINAGE DITCH

7.4.1 UNIT CHARACTERISTICS

7.4.1.1 TYPE OF UNIT

Building N-121 contained a plating shop which conducted cadmium, chromium, copper, and nickel plating using cyanide based solutions. A dry well (SWMU No. 3) was used for disposal of both concentrated plating solutions from the plating tanks. The remaining wastewater discharged into the storm sewer and drainage ditch.

7.4.1.2 DESIGN FEATURES

The amount of waste that entered the dry well is estimated at 900 gallons per day. The remaining plating waste, approximately 17,000 gallons per day was discharged into the storm sewer and drainage ditch. Underneath the floor of Building N-121 are 4- and 6-inch drain lines which lead to either the dry well or storm sewer (exact discharge location unknown). There are approximately 3000 linear feet (each) of the storm sewer and drainage ditch.

7.4.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The dry well was used for the disposal of both concentrated plating solutions and overflow from the plating tanks. The liquids were discharged into the tank and percolated through the gravel and into the surrounding soil. The amount of waste that entered the well is estimated to have been 900 gallons per day.

The remaining plating waste, approximately 17,000 gallons per day, was discharged into the storm sewer and drainage ditch. This brings the total amount of waste discharged to approximately 18,000 gallons per day.

7.4.1.4 PERIOD OF OPERATION

The exact dates of operation of the plating shop are unclear. One data source states operation from 1953-1965 while a second source states operation from 1951-1976.

7.4.1.5 AGE OF UNIT

Approximately 38 years old.

7.4.1.6 <u>LOCATION OF UNIT</u>

Building N-121 is located on the North Complex on Casablanca Road. The storm sewer and ditch flow westerly from N-121 along Casablanca Road to First Avenue, then southwesterly to a section of open drainage ditch which eventually discharges to North Fork Creek. See Figure 7-4 for location of the storm sewer and ditch.

7.4.1.7 <u>GENERAL PHYSICAL CONDITIONS</u>

The existing storm sewer appears to be in good condition.

7.4.1.8 <u>CLOSURE METHOD</u>

Not applicable to this unit (Storm sewer system is in service).

7.4.2 <u>WASTE CHARACTERISTICS</u>

7.4.2.1 <u>TYPE OF WASTE</u>

As previously stated, the plating shop conducted cadmium, chromium, copper, and nickel plating using cyanide-based solutions.

7.4.2.2 <u>MIGRATION CHARACTERISTICS</u>

The plating solutions and other wastes discharged into the drainage ditch are reasonably mobile in the environment. Rainfall runoff to the ditch can transport the hazardous waste constituents into ground water, soil, or surface waters.

7.4.2.3 <u>TOXICOLOGICAL CHARACTERISTICS</u>

Contaminants of concern are sulfuric acid and the heavy metals cadmium, lead, and zinc. Sulfuric acid, at sufficient strength, is corrosive to tissue and can produce chemical burns. One neutralized, the constituents are relatively innocuous. Heavy metals produce toxic effects in sufficient dosages, primarily by interfering with cellular enzymes and nerve function. Heavy metal poisoning usually results from chronic exposure to low concentrations in food and water.

7.4.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

Sulfuric acid in likely no longer associated with this SWMU, given the time since operations ceased and the local meteorological conditions. Heavy metals would likely be present as adsorbate on soil particles.

7.4.3 MIGRATION PATHWAYS

7.4.3.1 GEOLOGIC SETTING

See Section 3.2.

7.4.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.4.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.4.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for area topography. The surrounding area is generally level, with surface drainage via manmade drainageways to the south and west. Construction was performed along the lower part of the SWMU in 1989.

7.4.3.5 PATHWAYS

AIR

Most of the hazardous waste constituents of concern at SWMU No. 4 do not readily escape to the air. The only exception is cyanide gas, which can be formed when cyanide containing solutions are exposed to acidic waste streams. Dilution of any cyanide solutions or acid solution during the past ten years would drastically reduce the possibility of gas formation. Also, since the plating shop has not been operated since 1976, any cyanide gas which may have been formed during operation would likely no longer be present in the air.

SOIL

The contaminants in SWMU No. 4 would be readily transported through the soil medium by surface water percolating through the soil or ground water movement.

SURFACE WATER/SEDIMENT

Contamination in the drainage ditch soil and sediments could be readily transported by surface water.

GROUNDWATER

Rainfall can likewise carry contaminants in drainage ditch sediments to the ground water below. Any contamination reaching ground water can be readily transported by the ground water.

SUBSURFACE GAS

Not applicable.

7.4.4 CONTAMINANT RELEASE IDENTIFICATION

7.4.4.1 PRIOR INSPECTION REPORTS

IAS, Confirmation Study, and Sampling Report results are included in PRD.

7.4.4.2 PUBLIC COMPLAINTS

None.

7.4.4.3 MONITORING/SAMPLING DATA

The dry well and storm sewer/drainage ditch were included in the November 1983 Initial Assessment Study. The result of this study was a recommendation for a Confirmation Study to be conducted. The results of the Confirmation Study stated that additional sampling and analysis should be conducted to further determine the existing ground water conditions and to determine the probability of future ground water contamination. A copy of 103c Notification is available. PWO Drawings No. 1804-1805, 1825, and 3353, are the only available drawings showing N-121 details.

7.4.4.4 EVIDENCE OF RELEASE

None observed.

7.4.5 EXPOSURE POTENTIAL

7.4.5.1 PROXIMITY TO AFFECTED POPULATION

Potentially affected populations will be identified in conjunction with follow-on field work.

7.4.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

There are no sensitive environment in the area.

7.4.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Slight; however, the potential of contaminant migration will be evaluated.

7.4.6 DOCUMENTS REVIEWED

See PRD.

7.4.7 SUMMARIZED DATA GAP

7.4.7.1 SOIL

Previous data are available in the Sampling Report, but are inconclusive.

7.4.7.2 GROUNDWATER

No previous data available.

7.4.7.3 SURFACE WATER/SEDIMENT

Data are available, but inconclusive.

7.4.7.4 AIR

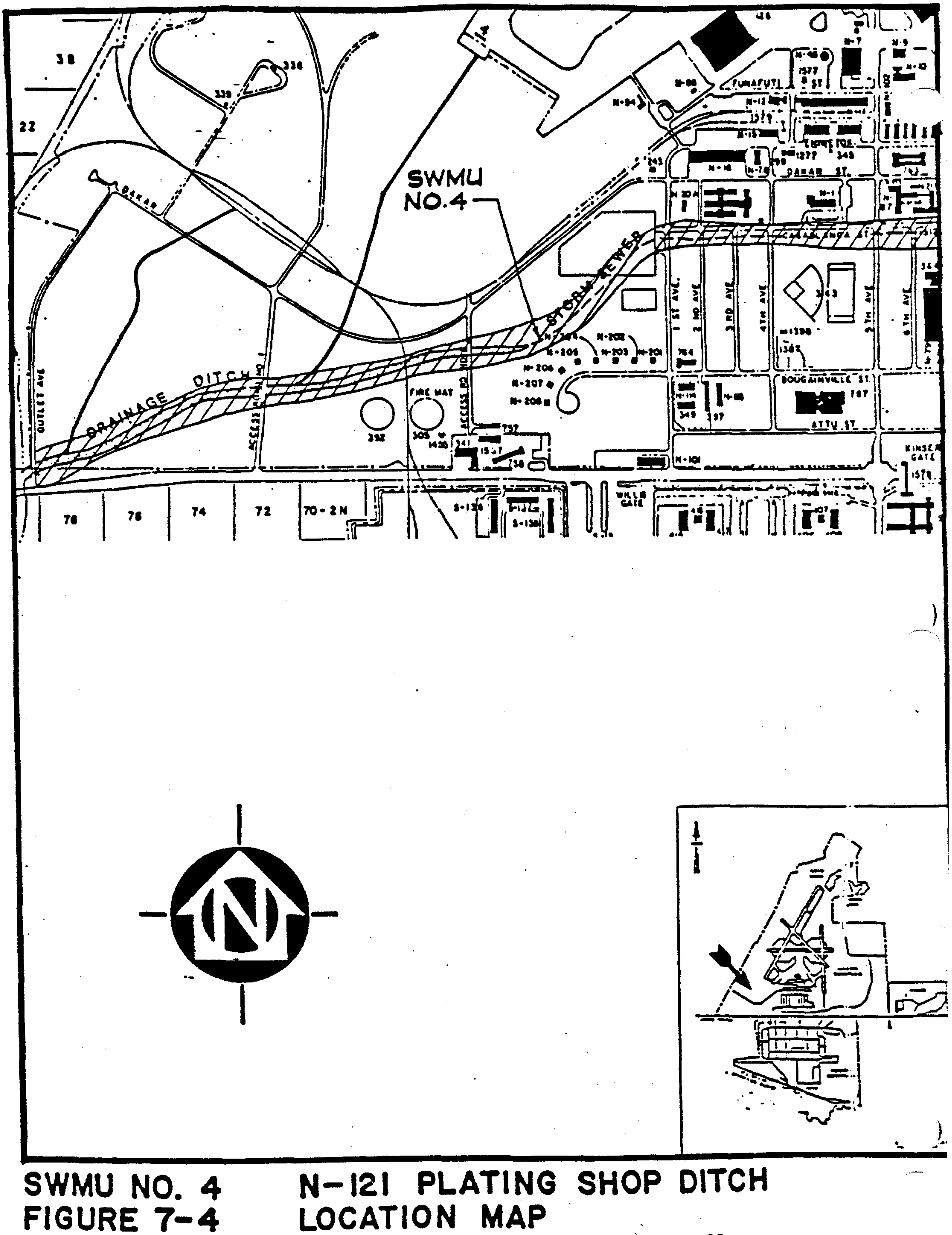
Not applicable.

7.4.7.5 SUBSURFACE GAS

Not applicable.

7.4.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 4 N-121 PLATING SHOP DITCH
FIGURE 7-4 LOCATION MAP

7.5 SWMU NO. 5: FIRE FIGHTING TRAINING AREA (FFTA)

7.5.1 UNIT CHARACTERISTICS

7.5.1.1 TYPE OF UNIT

Active training area. The FFTA is used to train firemen in rescue techniques. The procedure consists of extinguishing a fire set in one of two types of units: a rectangular concrete-lined pit or a circular concrete pit.

7.5.1.2 DESIGN FEATURES

The FFTA consists of three, 2' x 8' x 1' deep, rectangular, concrete-lined pits; and two 75-foot diameter circular concrete pits.

The three rectangular pits are unbermed and prior to 1977 overflow discharge of JP-4 fuel occurred. This overflow drained into the adjacent storm drainage system. The normal procedure consisted of placing approximately 40 gallons of fuel into one of the pits and igniting it. The fire was extinguished by a student and relit for the next student. The process continued until all students had participated and the remaining fuel was left in the pit. This remaining fuel occasionally overflowed into the drainage system. Since 1977, the fuel has been allowed to burn itself out following the last burn of the day thus preventing overflow discharge.

The two circular pits have a double-lip curbing to contain fuel during the burning operation. In 1977, an oil-water separator was installed and the facility was connected to the sanitary sewer system. After installation of the separator, numerous explosions occurred in the sewer as a result of ignition of unburned fuel. Cleaning of the separator and modification of operational procedures have eliminated the explosions. Prior to 1977, discharge from the training center flowed directly into the storm sewer system.

In September 1980, approximately 50 gallons of oil were spilled due to a malfunction of a drain line.

7.5.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Training at the FFTA is conducted in two ways. In the first method, the rectangular pits are filled with JP-4 fuel and ignited. Navy personnel extinguish the fires using hand held fire extinguishers. The second training method consist of spraying an aircraft fuselage (located inside one of the circular pits), with JP-4 fuel and igniting it. Navy personnel extinguish the aircraft using mobile fire fighting units.

7.5.1.4 **PERIOD OF OPERATION**

Training at the FFTA began in 1949 and continues to the present.

7.5.1.5 **AGE OF UNIT**

40 years.

7.5.1.6 **LOCATION OF UNIT**

The Fire Fighting Training Area (FFTA) is located in the southwest corner of the North Side Complex adjacent to Navy Road.
See Figure 7-5.

7.5.1.7 **GENERAL PHYSICAL CONDITIONS**

The general physical condition of the unit is good.

7.5.1.8 **CLOSURE METHOD**

Not applicable. This facility was upgraded in 1977 to include pollution control structures. It will remain in service indefinitely.

7.5.2 **WASTE CHARACTERISTICS**

7.5.2.1 **TYPE OF WASTE**

JP-4 fuel is utilized at the FFTA. Waste solvents and oils may also have been used in the past.

7.5.2.2 **MIGRATION CHARACTERISTICS**

JP-4 waste fuel and solvent material (all volatile) are reasonably mobile in the environment. Rainfall runoff can transport the hazardous waste constituents associated with this waste mixture into surface waters, ground water, or the soil.

7.5.2.3 **TOXICOLOGICAL CHARACTERISTICS**

The contaminants of concern for this SWMU include jet engine fuel constituents (benzene, toluene, xylene, naphtha); chlorinated solvents such as TCE, TCA and PCE; and semivolatile hydrocarbon constituents of engine and transmission oils.

These contaminants may produce one or more of the following human health effects, depending on the type of exposure (chronic or acute), the mode of exposure (inhalation, ingestion, or dermal absorption), and the amount (dose) received dizziness, nausea, drowsiness, agitation, liver damage, visual impairment, and dermal damage.

Combined effects of two or more chemicals is difficult to predict. In addition, several of the suspect substances are known or suspected carcinogens, mutagens, or teratogens.

7.5.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

These constituents would likely exist as contaminants adsorbed onto soil particles, as pore-space vapors, and groundwater contaminants. The volatile constituents tend to evaporate quickly from the ground surface and near surface.

7.5.3 MIGRATION PATHWAYS

7.5.3.1 GEOLOGIC SETTING

See Section 3.2.

7.5.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.5.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.5.3.4 TOPOGRAPHIC CHARACTERISTICS

The SWMU is located on nearly level ground just north of Navy Road. Surface drainage not captured by the storm sewer is to the south and west.

7.5.3.5 PATHWAYS

AIR

Due to the volatile nature of most of the hazardous waste constituents of concern in SWMU No. 5, it is anticipated that any escape of the constituents to the air medium would occur immediately following the release, with little residual from a release. However, because this SWMU is in active use, volatile fuel components will be released whenever the unit is in use.

SOIL

Due to the configuration of the facilities at SWMU No. 5, the soil is the most likely medium to initially receive a contaminant release to the environment. The soil would receive contaminated overflows from the SWMU. Once in the soil, the contaminants could be transported by percolation through the soil, by surface runoff, and/or by ground water movement through the soil.

SURFACE WATER/SEDIMENT

Surface contamination of the soil or other uncontained areas from SWMU No. 5 could be readily transported by surface runoff to nearby streams. It is possible that contaminant transport by surface water occurred at SWMU No. 5.

GROUNDWATER

If contamination from SWMU No. 5 penetrated through the soil to the ground water below, then the ground water could readily transport the contaminants associated with SWMU No. 5.

SUBSURFACE GAS

Not applicable.

7.5.4 CONTAMINANT RELEASE IDENTIFICATION

7.5.4.1 PRIOR INSPECTION REPORTS

The IAS did not recommend Confirmation Study. A copy of the CERCLA 103c Notification is available. The following drawings are available: PWO Drawing No. 8182, "Modifications to Fire Fighting Area, Location Plan - Oil/Water Separator Holding Tank"; and Piping Plan Profile PWO Drawing No. 8184-R, "Oil/Water Separator Holding Tank, Skimmer Belt and Sump Pumps at Fire Fighting Area."

7.5.4.2 PUBLIC COMPLAINTS

None.

7.5.4.3 MONITORING/SAMPLING DATA

None found.

7.5.4.4 EVIDENCE OF RELEASE

Prior use of facility.

7.5.5 EXPOSURE POTENTIAL

7.5.5.1 PROXIMITY TO AFFECTED POPULATION

The FFTA is located in a restricted portion of NAS Memphis. However, it is within a few hundred feet of a commercial section of Navy Road.

7.5.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The FFTA is not near environmentally sensitive areas.

7.5.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

This subject will be evaluated during future site work.

7.5.6 DOCUMENTS REVIEWED

See PRD.

7.5.7 SUMMARIZED DATA GAP

7.5.7.1 SOIL

No data available.

7.5.7.2 GROUNDWATER

No data available.

7.5.7.3 SURFACE WATER/SEDIMENT

No data available.

7.5.7.4 AIR

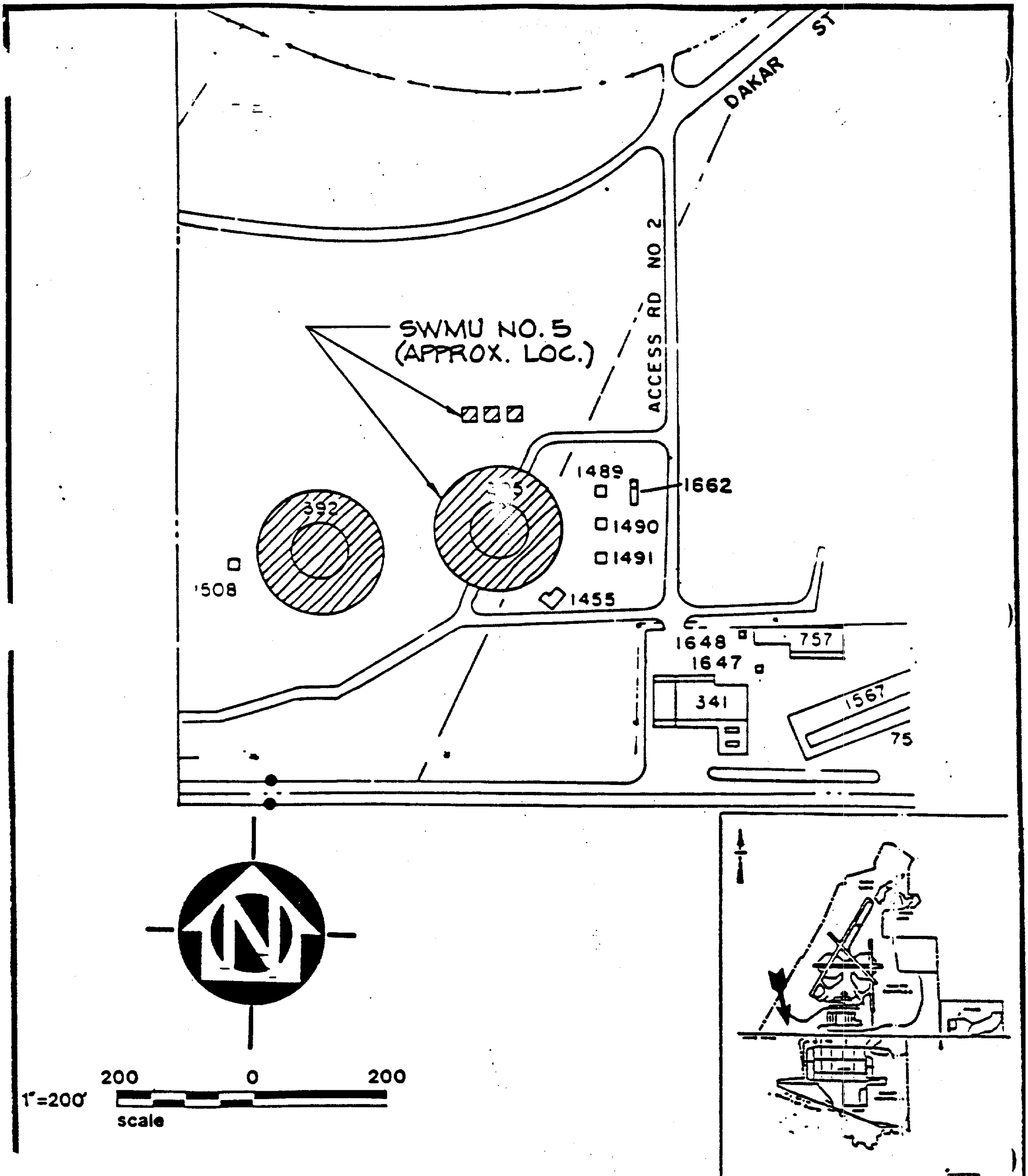
No data available.

7.5.7.5 SUBSURFACE GAS

No data available.

7.5.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 5 FIRE FIGHTING TRAINING AREA
FIGURE 7-5 LOCATION MAP

7.6 SWMU NO. 6: BUILDING N-126 BATTERY SHOP STORM SEWER AND DITCH

7.6.1 UNIT CHARACTERISTICS

7.6.1.1 TYPE OF UNIT

Existing storm sewer system.

7.6.1.2 DESIGN FEATURES

Approximately 100 gallons per day of a mixture of diluted and neutralized acid was discharged into the storm sewer.

Waste Characterization
According to Department of Navy information, spent electrolyte from batteries likely contained lead, cadmium, zinc, and sulfuric Acid

7.6.1.3 OPERATING PRACTICES (PAST AND PRESENT)

Electrolyte spills and drippings were discharged into floor drains located in Building N-126. These floor drains connected to 3- and 4-inch acid resistant pipes which empties into a storm sewer. The storm sewer discharged into a drainage ditch.

7.6.1.4 PERIOD OF OPERATION

The battery shop was operated from 1955 until 1981. The storm sewer system is currently in service.

7.6.1.5 AGE OF UNIT

Thirty-five years.

7.6.1.6 LOCATION OF UNIT

SWMU No. 6 (Figure 7-6) is located near Building N-126 on the NAS North Side.

7.6.1.7 GENERAL PHYSICAL CONDITIONS

Condition of the storm sewer is good. However, substantial erosion and scouring of the ditch has occurred at the sewer's discharge to the ditch.

7.6.1.8 CLOSURE METHOD

Not applicable. Unit is an active drainageway.

7.6.2 <u>WASTE CHARACTERISTICS</u>

7.6.2.1 <u>TYPE OF WASTE</u>

Waste electrolyte and neutralized waste acid solution.

7.6.2.2 <u>MIGRATION CHARACTERISTICS</u>

The contaminants contained in the battery electrolyte discharged to the drainage ditch are reasonably mobile in the environment. Rainfall runoff to the drainage ditch can easily transport the contaminants into the ground water, soil, or surface waters.

7.6.2.3 <u>TOXICOLOGICAL CHARACTERISTICS</u>

Contaminants of concern are sulfuric acid, and the heavy metals cadmium, lead, and zinc. Sulfuric acid, at sufficient strength, is corrosive to tissue and can produce chemical burns. One neutralized, the constituents are relatively innocuous. Heavy metals produce toxic effects in sufficient dosages, primarily by interfering with cellular enzymes and/or nerve function. Heavy metal poisoning usually results from chronic exposure to low concentrations in food and water.

7.6.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

Sulfuric acid in likely no longer associated with this SWMU, given the time since operations ceased and the local meteorological conditions. Heavy metals would likely be present as adsorbate on soil particles.

7.6.3 <u>MIGRATION PATHWAYS</u>

7.6.3.1 <u>GEOLOGIC SETTING</u>

See Section 3.2.

7.6.3.2 <u>HYDROGEOLOGIC SETTING</u>

See Section 3.3.

7.6.3.3 <u>ATMOSPHERIC CONDITIONS</u>

See Section 4.0.

7.6.3.4 <u>TOPOGRAPHIC CHARACTERISTICS</u>

See Section 3.1 for general information. The immediate area is nearly level with surface drainage to the south and west.

7.6.3.5 PATHWAYS

AIR

The hazardous waste constituents potentially released at SWMU No. 6 are not volatile in nature and do not readily escape into the air medium.

SOIL

Any contaminant in SWMU No. 6 would be readily transported in the soil medium by surface water percolating through the soil or by ground water.

SURFACE WATER/SEDIMENT

Contamination in the drainage ditch sediment can be readily transported by surface water.

GROUNDWATER

Rainfall can carry contaminants in drainage ditch sediments to the ground water below. Any contamination reaching the ground water table can be readily transported by the ground water.

SUBSURFACE GAS

Not applicable.

7.6.4 CONTAMINANT RELEASE IDENTIFICATION

7.6.4.1 PRIOR INSPECTION REPORTS

Per the IAS, substantial erosion and scouring of the ditch has occurred at the sewer's discharge to the ditch. Any contaminated sediment deposited during battery shop operations should have been removed by the scouring effects of high storm water flow. In addition, no indication of detrimental effects on the receiving stream, North Fork Creek, was noted in the area of discharge. Based on these results, the IAS did not recommend a confirmation study.

Based on the CERCLA 103c hazardous waste notification dated June 1981, the drains lines were plugged with concrete when the new shop in Building N-102 was opened. N-102 operations personnel would neutralize acid and discharge to the sanitary sewer.

A copy of 103c Notification is available. Y&D Drawing No. 559 324, "Maintenance and Operation Hangar, First Floor Plumbing", and PWO Drawing No. 8501-8502, "Relocate Battery Shop from Building N-126 to N-102", are available.

7.6.4.2 PUBLIC COMPLAINTS

None.

7.6.4.3 MONITORING/SAMPLING DATA

None available.

7.6.4.4 EVIDENCE OF RELEASE

None observed.

7.6.5 EXPOSURE POTENTIAL

7.6.5.1 PROXIMITY TO AFFECTED POPULATION

The unit is small, and remote from residences. It is in a restricted access industrial portion of the NAS.

7.6.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

There are no sensitive environment in the vicinity.

7.6.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

To be determined during future site work.

7.6.6 DOCUMENTS REVIEWED

See PRD.

7.6.7 SUMMARIZED DATA GAP

7.6.7.1 SOIL

No data available.

7.6.7.2 GROUNDWATER

No data available.

7.6.7.3 SURFACE WATER/SEDIMENT

No data available.

7.6.7.4 AIR

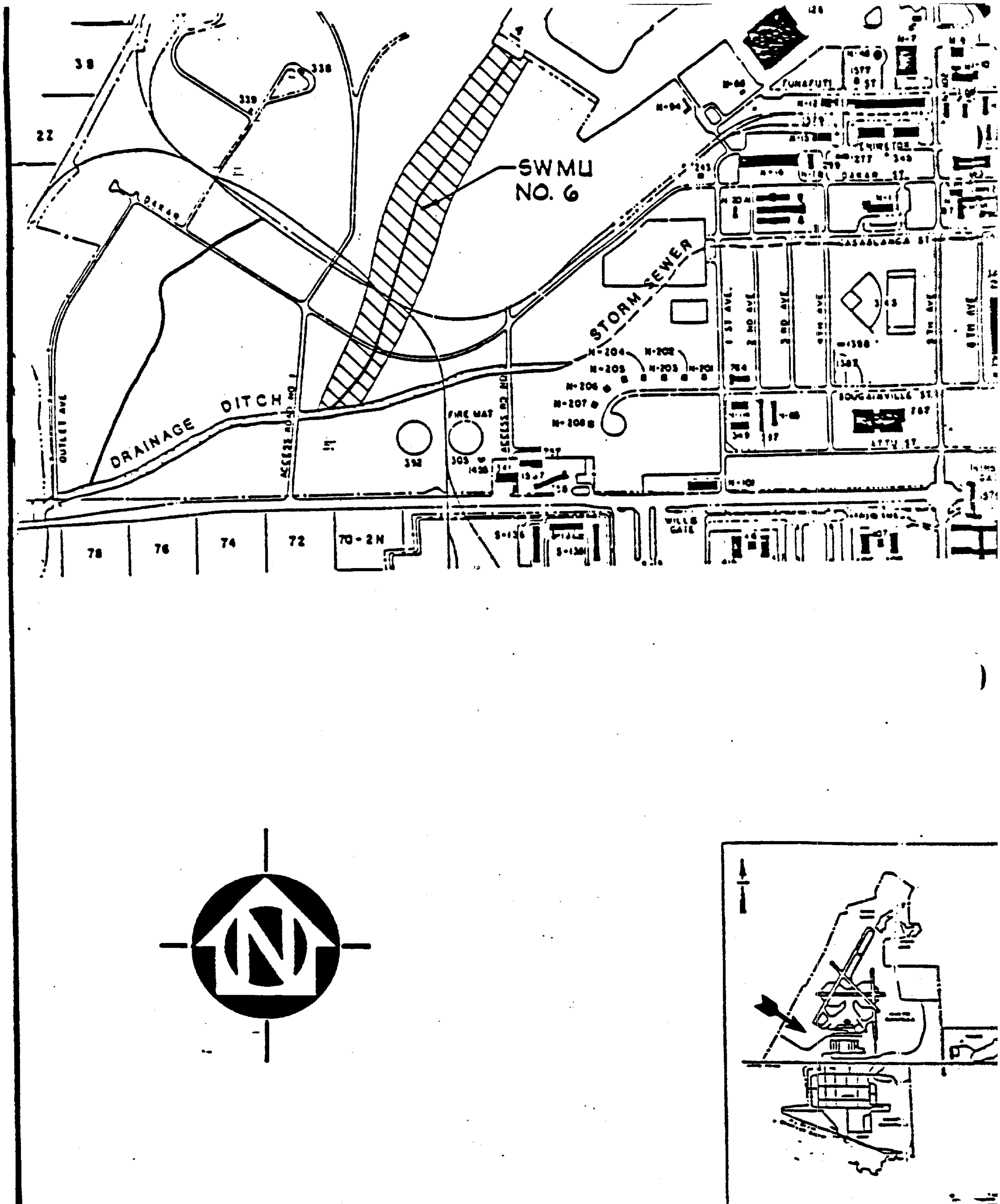
Not applicable.

7.6.7.5 SUBSURFACE GAS

Not applicable.

7.6.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 6 N-126 BATTERY SHOP STORM SEWER AND DITCH

FIGURE 7-6 LOCATION MAP

7.7 SWMU NO. 7: BUILDING N-126 PLATING SHOP DRY WELL

7.7.1 UNIT CHARACTERISTICS

7.7.1.1 TYPE OF UNIT

Inactive dry well for waste disposal.

7.7.1.2 DESIGN FEATURES

The plating wastes were discharged into the dry well. The dry well was a 10'x 10'x 6' deep pit filled with gravel. The waste were allowed to percolate into the soil surrounding the dry well.

7.7.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Building N-126 housed the plating operations of the Aircraft Intermediate Maintenance Department (AIMD). The dry well was used for the disposal of concentrated nickel, cadmium, and chromium cyanide-based plating solutions and rinse water from the plating operation. The waste from the plating operation was discharged into the dry well and allowed to percolate into the surrounding soil.

7.7.1.4 PERIOD OF OPERATION

The plating shop operated from 1955 until 1978.

7.7.1.5 AGE OF UNIT

Thirty-five years.

7.7.1.6 LOCATION OF UNIT

The unit is located adjacent to Building N-126 (NAS North Side). See Figure 7-7.

7.7.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.7.1.8 CLOSURE METHOD

None.

7.7.2 WASTE CHARACTERISTICS

7.7.2.1 TYPE OF WASTE

The plating operation produced waste containing concentrated nickel, cadmium, and chromium in cyanide-based plating solutions, as well as rinse water from the operation.

7.7.2.2 MIGRATION CHARACTERISTICS

The plating solutions and other wastes discharged into the dry pit are reasonably mobile in the environment. Rainfall soaking into the solid and/or the liquid wastes itself can transport the contaminants into the ground water or the soil.

7.7.2.3 TOXICOLOGICAL CHARACTERISTICS

The substances of concern are heavy metals (cadmium, chromium, copper, and nickel) and cyanide. Of these, cyanide can produce acute effects by blocking red blood cell uptake of oxygen, resulting in hypoxia and possibly death. Cyanide is a principally an inhalation hazard at this SWMU.

The metals produce toxic system effects in sufficient dosages, primarily by interfering with cellular enzymes and/or nerve function. Heavy metal poisoning usually results from chronic exposure to low concentrations in food and water.

7.7.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Cyanides were initially present as in solution. Under certain (acidic) conditions hydrogen cyanide gas can be generated. Metals are likely to be present as chelates or adsorbed onto soil particles, or dissolved in groundwater.

7.7.3 MIGRATION PATHWAYS

7.7.3.1 GEOLOGIC SETTING

Soil samples taken during the confirmation study showed the permeability of clay at a depth of 50 feet below the dry well to be 5.9×10^{-6} to 5.2×10^{-7} cm/sec (See Section 3.2).

7.7.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.7.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.7.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The dry well is beneath concrete pavement. The site is almost level, with surface drainage to the south and west.

7.7.3.5 PATHWAYS

AIR

Most of the contaminants of concern at SWMU No. 7 do not readily escape to the air medium. The exception is cyanide gas which can be formed when cyanide solutions are exposed to acidic waste streams. Since the plating shop has not been operated since 1976, any cyanide gas which may have been formed during operation would no longer be present in the air. It is also doubtful that any of the waste plating solutions discharged would be concentrated enough to cause cyanide gas to be formed.

SOIL

Since the dry well was designed to transfer the waste plating solutions into the soil around the dry well, the soil would be the most available medium to transport contaminants. Once in the soil, the contaminants would be transported by rainfall percolating through the soil or by ground water movement.

SURFACE WATER/SEDIMENT

Since the discharge to SWMU No. 7 is below grade, surface water contamination is not of concern.

GROUNDWATER

The design of dry well at SWMU No. 7 promotes transport of contaminants to the ground water. Therefore, transport of the contaminants within the ground water is possible.

SUBSURFACE GAS

Not applicable.

7.7.4 CONTAMINANT RELEASE IDENTIFICATION

7.7.4.1 PRIOR INSPECTION REPORTS

The November 1985 Geraghty and Miller, Inc., Confirmation Study presented the results of some limited sampling done at the site of SWMU No. 7. The report indicated that contamination of the soil beneath the dry well had occurred. The report also indicated that the soil immediately surrounding the dry well was clay. Sandy soil was found at a depth of 34 feet below the ground surface (approximately 24 feet below the bottom of the dry well). During the IAS, soil samples from the sump were collected and analyzed.

7.7.4.2 PUBLIC COMPLAINTS

None.

7.7.4.3 MONITORING/SAMPLING DATA

Confirmation study results are included in PRD.

7.7.4.4 EVIDENCE OF RELEASE

None.

7.7.5 EXPOSURE POTENTIAL

7.7.5.1 PROXIMITY TO AFFECTED POPULATION

This site is in the NAS industrial area, which is far away from the residential area.

7.7.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.7.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

To be determined during future site work.

7.7.6 DOCUMENTS REVIEWED

See PRD.

7.7.7 SUMMARIZED DATA GAP

7.7.7.1 SOIL

Data inconclusive.

7.7.7.2 GROUNDWATER

Data inconclusive.

7.7.7.3 SURFACE WATER/SEDIMENT

No data.

7.7.7.4 AIR

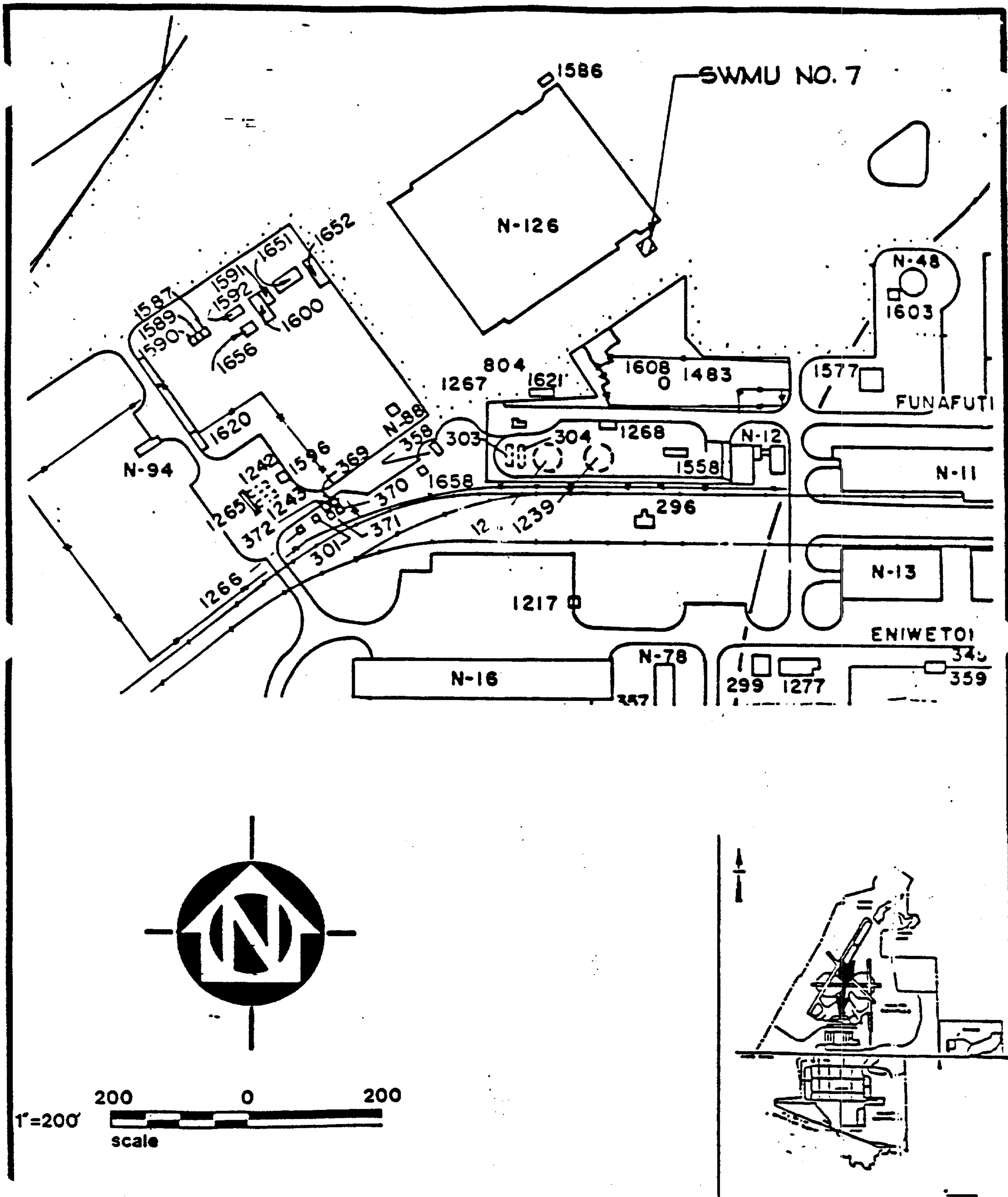
No data.

7.7.7.5 SUBSURFACE GAS

Not applicable.

7.7.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 7 N-126 PLATING SHOP DRY WELL
FIGURE 7-7 LOCATION MAP

7.8 SWMU NO. 8: CEMETERY DISPOSAL AREA

7.8.1 UNIT CHARACTERISTICS

7.8.1.1 TYPE OF UNIT

Inactive landfill.

7.8.1.2 DESIGN FEATURES

Reports indicate the disposal of wastes to a depth of eight feet below the original ground line.

7.8.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The Cemetery Disposal Area (CDA) is a five to eight-acre landfill area which was used for solid and hazardous waste disposal by the NAS in Memphis from 1965 to 1980.

A perched water table is also indicated at a depth of approximately ten feet. Flow appears to be in an easterly direction.

7.8.1.4 PERIOD OF OPERATION

The period of operation was from 1965 to 1980.

7.8.1.5 AGE OF UNIT

Twenty-four years.

7.8.1.6 LOCATION OF UNIT

This unit is located on the North Side adjacent to Runway 04/22 (See Figure 7-8).

7.8.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.8.1.8 CLOSURE METHOD

Unknown.

7.8.2 WASTE CHARACTERISTICS

7.8.2.1 TYPE OF WASTE

Although the CDA was originally intended for use as a hazardous waste burial area, three 25-pound canisters for ethylene oxide were the only recorded hazardous substance disposed of there. It is reported, however, that shop wastes such as metallic scrap, waste chemicals, waste oil, cleaning solution, transformers, and capacitors are also present in the fill.

7.8.2.2 MIGRATION CHARACTERISTICS

All wastes, with the exception of liquid or contained gas, deposited within the landfill should remain stationary within the landfill unit. Liquid wastes, if present, could move both downward and horizontally, depending upon the proximity of the ground water table and existing subsurface conditions. Any gases released due to container puncture or gases generated during waste decomposition will follow the path of least resistant through the ground or atmosphere.

7.8.2.3 TOXICOLOGICAL CHARACTERISTICS

Because of the lack of data on wastes disposed of in the CDA, it is not possible to describe toxicological characteristics of substances potentially present. Contaminants could include heavy metals, toxic volatile and semivolatile organics, PCBs, and leachates containing a variety of toxic organic and inorganic substances.

7.8.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Contaminated potentially present could be present as solid and semisolids, leachates, and well as containerized gaseous, liquid, or solid waste.

7.8.3 MIGRATION PATHWAYS

7.8.3.1 GEOLOGIC SETTING

See Section 3.2.

7.8.3.2 HYDROGEOLOGIC SETTING

See Sections 3.3 and 3.4.

7.8.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.8.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general area characteristics. The site terrain is rolling with native woody vegetation. Surface drainage is generally to the north and west.

7.8.3.5 PATHWAYS

AIR

As an inactive landfill, previous deposition of solid wastes which may be hazardous if airborne, such as asbestos, should no longer pose a threat to health or safety.

SOIL

Contaminant transport through the soil would most likely occur in a vertical movement beneath the landfill, until reaching an aquifer or perched water zone. At that time, contaminant movement would flow with the ground water or other water source.

SURFACE WATER/SEDIMENT

There are no nearby surface water sources.

GROUNDWATER

Contamination of the ground water is possible at the Cemetery Landfill if a sufficiently thick clay buffer zone does not exist beneath the fill, or if the buffer zone possesses a high permeability.

SUBSURFACE GAS

The release of hazardous gases through the puncture of a landfilled container would quickly dissipate and, therefore, be undetectable unless a release had recently occurred.

7.8.4 CONTAMINANT RELEASE IDENTIFICATION

7.8.4.1 PRIOR INSPECTION REPORTS

Previous testing of the ground water was conducted for VOCs, cyanide, and some metals. Although no VOCs or cyanide was detected a significantly higher concentration of the metals tested for was obtained in one of the two down-gradient wells. Only chromium, however, exceeded EPA's drinking water standard of 0.05 ppm with an analytical concentration 0.077 ppm.

7.8.4.2 PUBLIC COMPLAINTS

None.

7.8.4.3 MONITORING/SAMPLING DATA

Confirmation Study results are included in PRD.

7.8.4.4 EVIDENCE OF RELEASE

Inconclusive. Chromium concentration in ground water may or may not be due to Site No. 8 or other man-made source.

7.8.5 EXPOSURE POTENTIAL

7.8.5.1 PROXIMITY TO AFFECTED POPULATION

There are no nearby residents or work locations. Proximity to potentially affected population to be determined in follow-on work.

7.8.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is not located near any environmentally sensitive areas.

7.8.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

There has been a probable release of a hazardous constituent, as indicated by the degradation of ground water quality in one well. This, along with the documented disposal of a hazardous material within the site, warrant further site study.

7.8.6 DOCUMENTS REVIEWED

See PRD.

7.8.7 SUMMARIZED DATA GAP

7.8.7.1 SOIL

No data.

7.8.7.2 GROUNDWATER

Data from the 1985 Confirmation Study are inconclusive. Additional data are required.

7.8.7.3 SURFACE WATER/SEDIMENT

No data.

7.8.7.4 AIR

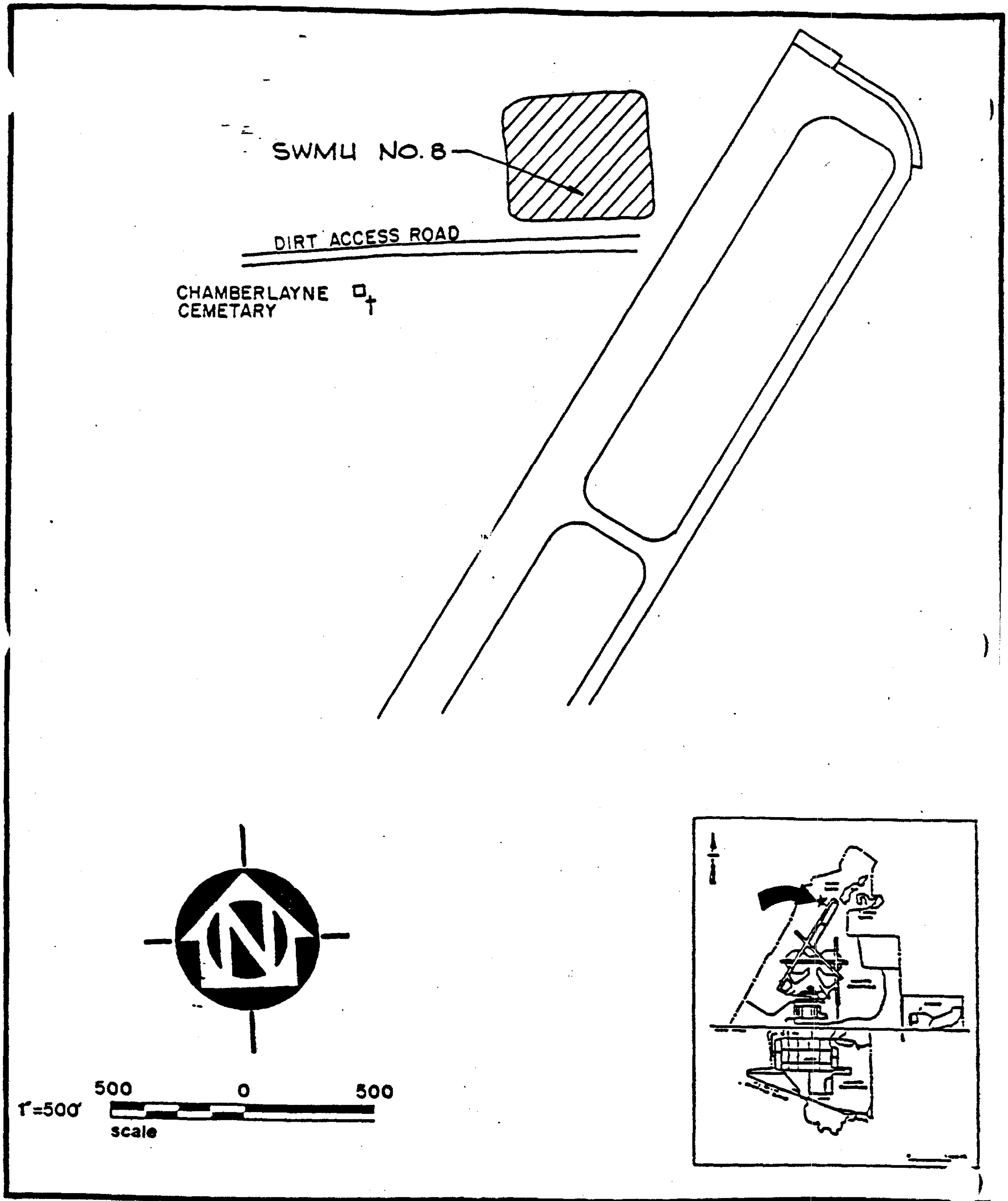
No data.

7.8.7.5 SUBSURFACE GAS

No data.

7.8.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 8 CEMETERY LANDFILL
FIGURE 7-8 LOCATION MAP

7.9 SWMU NO. 9: SEWAGE LAGOONS

7.9.1 UNIT CHARACTERISTICS

7.9.1.1 TYPE OF UNIT

Inactive lagoons for municipal and limited industrial wastewater treatment system.

7.9.1.2 DESIGN FEATURES

The larger lagoon is approximately 625 feet square, for a total area of 400,000 square feet. The smaller lagoon dimensions are approximately 250 feet by 560 feet for a total area of 141,000 square feet.

7.9.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The two lagoons were used as a part of the wastewater treatment system for NAS Memphis.

7.9.1.4 PERIOD OF OPERATION

The lagoons were used as a part of the treatment system from 1969 to 1978.

7.9.1.5 AGE OF UNIT

Thirty-one years.

7.9.1.6 LOCATION OF UNIT

The two inactive sewage lagoons are located on the South Side Complex, south of the Big Creek Drainage Canal.

7.9.1.7 GENERAL PHYSICAL CONDITIONS

The integrity of the lagoon dikes and liners should be evaluated. There are currently no visible problems except for uncontrolled growth of woody plants along the dikes.

7.9.1.8 CLOSURE METHOD

None.

7.9.2 WASTE CHARACTERISTICS

7.9.2.1 TYPE OF WASTE

Treatment residues from domestic sewage treatment process.

7.9.2.2 MIGRATION CHARACTERISTICS

Residues in unlined sewage sludge lagoons.

7.9.2.3 TOXICOLOGICAL CHARACTERISTICS

Because of the lack of data on wastes disposed of in the CDA, it is not possible to describe toxicological characteristics of substances potentially present. Contaminants could include heavy metals and toxic volatile and semivolatile organics.

7.9.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Contaminants potentially present could be present as solids and semisolids, and leachate.

7.9.3 MIGRATION PATHWAYS

7.9.3.1 GEOLOGIC SETTING

See Section 3.2.

7.9.3.2 HYDROGEOLOGIC SETTING

See Sections 3.3 and 3.4.

7.9.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.9.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general area characteristics. The site consists of two lagoons. Surrounding land slopes away on all sides for a short distance, with surface drainage being generally westward before joining the Big Creek Drainage Canal.

7.9.3.5 PATHWAYS

AIR

Because of the nature of wastes received and length of time since the site was active, the air pathway is unlikely.

SOIL

To be determined.

SURFACE WATER/SEDIMENT

Surface water migration is not applicable since the lagoons are closed basins. Sludge from the lagoon bottoms may contain persistent contaminants associated with past site usage.

GROUNDWATER

To be determined.

SUBSURFACE GAS

Not applicable.

7.9.4 CONTAMINANT RELEASE IDENTIFICATION

7.9.4.1 PRIOR INSPECTION REPORTS

The sewage lagoons were studied in the IAS but were not recommended for confirmation study.

7.9.4.2 PUBLIC COMPLAINTS

None.

7.9.4.3 MONITORING/SAMPLING DATA

Confirmation study results are included in PRD.

7.9.4.4 EVIDENCE OF RELEASE

None observed.

7.9.5 EXPOSURE POTENTIAL

7.9.5.1 PROXIMITY TO AFFECTED POPULATION

The SWMU is in a remote, wooded area.

7.9.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

To be determined during future site work.

7.9.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

To be determined during future site work.

7.9.6 DOCUMENTS REVIEWED

See PRD.

7.9.7 SUMMARIZED DATA GAP

7.9.7.1 SOIL

No data.

7.9.7.2 GROUNDWATER

No data.

7.9.7.3 SURFACE WATER/SEDIMENT

Limited sludge data are available.

7.9.7.4 AIR

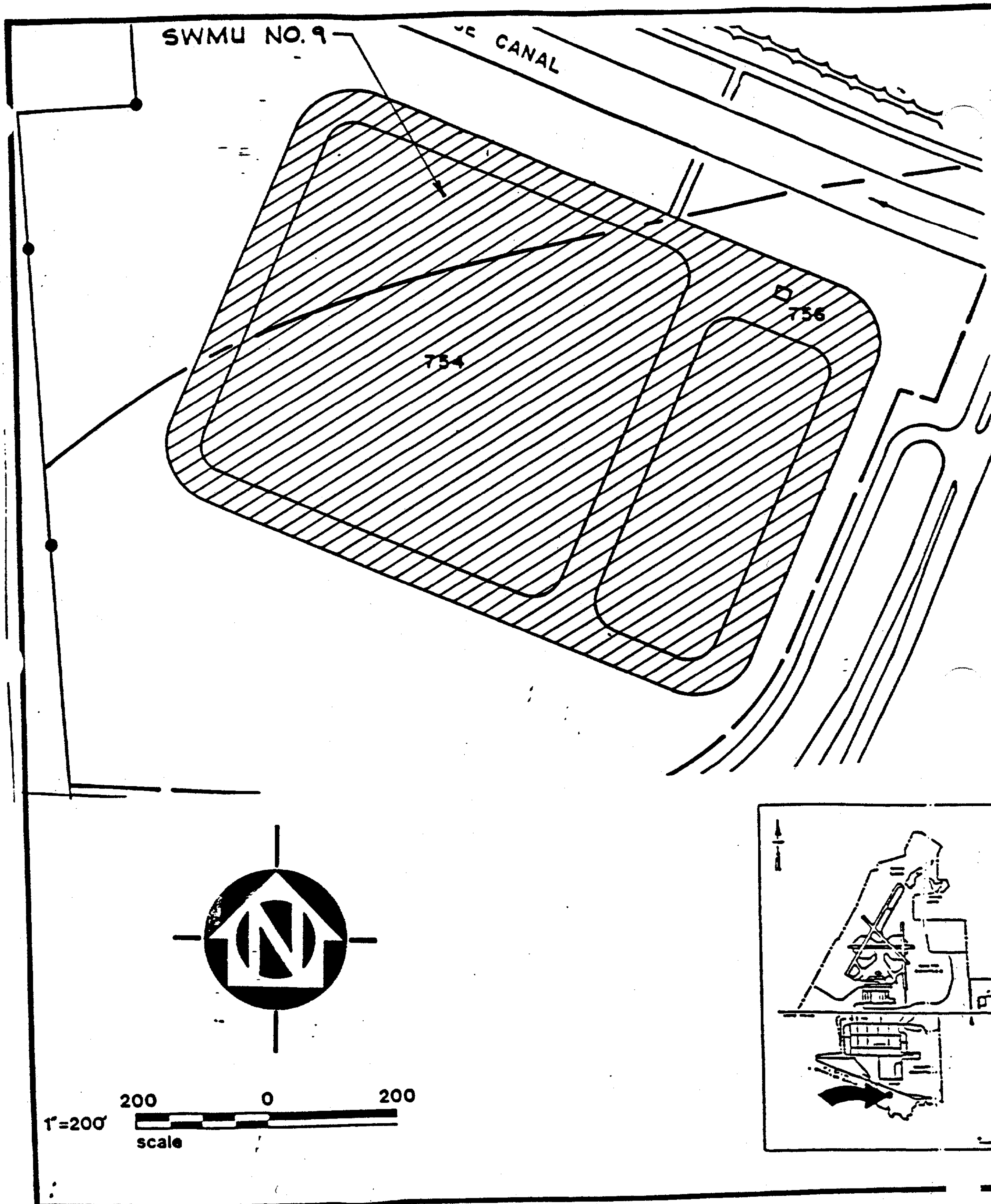
Not applicable.

7.9.7.5 SUBSURFACE GAS

Not applicable.

7.9.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 9 SEWAGE LAGOONS
FIGURE 7-9 LOCATION MAP

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7.10 SWMU NO. 10: DEMOLITION/CONSTRUCTION DEBRIS LANDFILL (EASTERN PORTION)

7.10.1 UNIT CHARACTERISTICS

7.10.1.1 TYPE OF UNIT

Inactive landfill.

7.10.1.2 DESIGN FEATURES

Although the specific boundaries of the landfill are unknown, approximate boundaries are depicted in Figure 7-10. The depth of the landfill is unknown, and there are no available records pertaining to the geologic conditions at the site.

7.10.1.3 OPERATING PRACTICE (PAST AND PRESENT)

It is reported that the area was originally a ravine used for the disposal of construction debris. The only documented description of waste disposal at this site is found in several 1980 contract documents which require contractors to use the area for disposal of rubbish and debris material, i.e., construction materials, paper, metal scrap, ashes, leaves, bones.

7.10.1.4 PERIOD OF OPERATION

The Demolition/Construction Debris Landfill is a thirteen- to twenty-acre site which was used as a disposal area from approximately 1951 to 1986.

7.10.1.4 AGE OF UNIT

Thirty-nine years.

7.10.1.5 LOCATION OF UNIT

The site is located on the NAS North Side, north of the existing Fire Fighting Training Facility and south of the main runway.

7.10.1.6 GENERAL PHYSICAL CONDITIONS

Unknown; unlined landfill. During late 1989, surface soil excavated from the NAS South Side housing area was used to fill and level the site, per an agreement with TDHE.

7.10.1.7 CLOSURE METHOD

Unknown.

7.10.2 **WASTE CHARACTERISTICS**

7.10.2.1 **TYPE OF WASTE**

There is no evidence that the site was used for the disposal of any materials other than construction debris.

7.10.2.2 **MIGRATION CHARACTERISTICS**

All known wastes deposited within the landfill are inert materials, which should remain stationary within the landfill unit.

7.10.2.3 **TOXICOLOGICAL CHARACTERISTICS**

Not applicable for construction debris.

7.10.2.4 **PHYSICAL/CHEMICAL CHARACTERISTICS**

Not applicable; inert materials are expected.

7.10.3 **MIGRATION PATHWAYS**

Due to the characteristics of construction/demolition debris, the release of any contaminant is not expected.

7.10.4 **CONTAMINANT RELEASE IDENTIFICATION**

7.10.4.1 **PRIOR INSPECTION REPORTS**

None available.

7.10.4.2 **PUBLIC COMPLAINTS**

None.

7.10.4.3 **MONITORING/SAMPLING DATA**

None available.

7.10.4.4 **EVIDENCE OF RELEASE**

None observed or suspected.

7.10.5 **EXPOSURE POTENTIAL**

Exposure potential from this site is insignificant.

7.10.6 **DOCUMENTS REVIEWED**

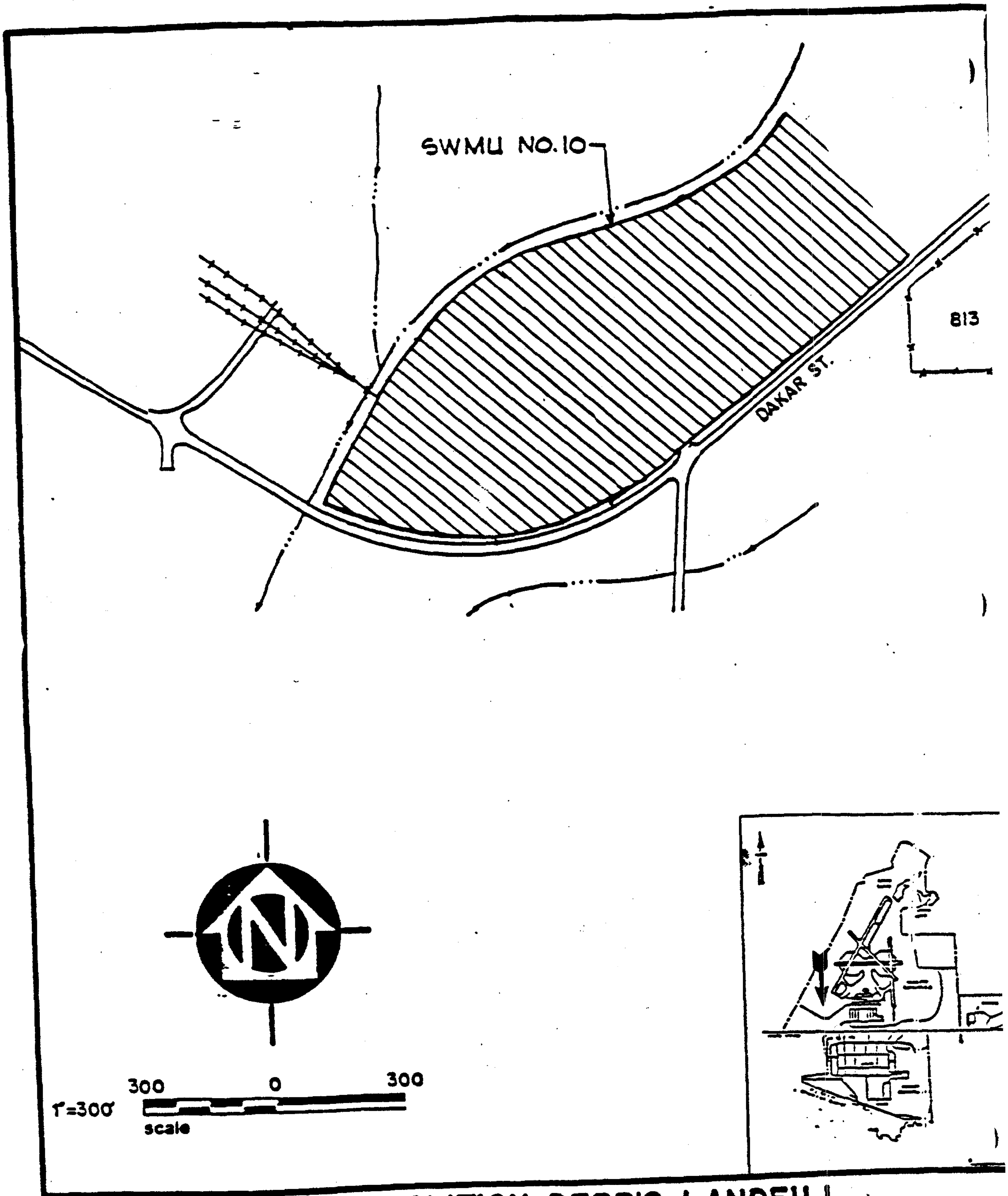
See PRD.

7.10.7 SUMMARIZED DATA GAP

Not applicable.

7.10.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 10 DEMOLITION DEBRIS LANDFILL
FIGURE 7-10 LOCATION MAP

7.11 SWMU NO. 11: OILED DIRT ROADS

7.11.1 UNIT CHARACTERISTICS

7.11.1.1 TYPE OF UNIT

Access Roads throughout periphery of NAS.

7.11.1.2 DESIGN FEATURES

The amount of road area sprayed with the oil is estimated at 150,000 square feet (from CERCLA 103c Notification).

7.11.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Waste oil was spread on roads to minimize dust.

7.11.1.4 PERIOD OF OPERATION

It is unknown as to the exact dates that the oil spreading occurred. It appears that the practice was started in 1942 and continued until the early 1970s.

7.11.1.5 AGE OF UNIT

Approximately 48 years (since oil first used for dust suppression).

7.11.1.6 LOCATION OF UNIT

The oil spreading practice was not confined to any specific area or road.

7.11.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.11.1.8 CLOSURE METHOD

Not applicable.

7.11.2 WASTE CHARACTERISTICS

7.11.2.1 TYPE OF WASTE

Waste oil was used to spray the roads. Since PCBs were not a concern at the time of spraying, it is assumed that oils containing PCBs were mixed with other waste oils and sprayed on the roads. The amount of PCB-containing oil, or the area sprayed with this oil, could not be determined.

7.11.2.2 MIGRATION CHARACTERISTICS

Low mobility, as applied for dust suppression.

7.11.2.3 TOXICOLOGICAL CHARACTERISTICS

Used motor oil toxic constituents include volatile aromatic hydrocarbons, other volatile and semivolatile organics, long-chain and branched hydrocarbon, polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Many of the hydrocarbons are known or suspected carcinogens.

PCBs are suspected carcinogens with unusually high (100,000) bioaccumulation factors. They are very heat-stable, and are resistant to biodegradation.

7.11.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

As applied, the waste oil would be a liquid with varying amounts of volatile, semivolatile, and nonvolatile constituents. Biodegradation, photo oxidation, and dispersal by wind tend to dissipate waste oils applied as a thin film on unpaved roads.

7.11.3 MIGRATION PATHWAYS

Not applicable.

7.11.4 CONTAMINANT RELEASE IDENTIFICATION

7.11.4.1 PRIOR INSPECTION REPORTS

During the IAS, samples were taken for PCBs analysis along the dirt roads which were most frequently subjected to the oil spreading. The roads were studied in the IAS but were not recommended for confirmation study. No PCBs were found.

7.11.4.2 PUBLIC COMPLAINTS

None.

7.11.4.3 MONITORING/SAMPLING DATA

None of these samples had detectable levels of PCBs.

7.11.4.4 EVIDENCE OF RELEASE

None observed.

7.11.5 EXPOSURE POTENTIAL

7.11.5.1 PROXIMITY TO AFFECTED POPULATION

The affected population is NAS workers who patrol perimeter roads.

7.11.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The roads are not in an environmentally sensitive area.

7.11.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Very unlikely.

7.11.6 DOCUMENTS REVIEWED

IAS completed in 1983. See Preliminary Review Document (PRD). A CERCLA draft Preliminary Assessment (PA) report was prepared for this site in 1989.

7.11.7 SUMMARIZED DATA GAP

7.11.7.1 SOIL

Sufficient data are available for evaluation.

7.11.7.2 GROUNDWATER

Not applicable.

7.11.7.3 SURFACE WATER/SEDIMENT

Sufficient data available for evaluation.

7.11.7.4 AIR

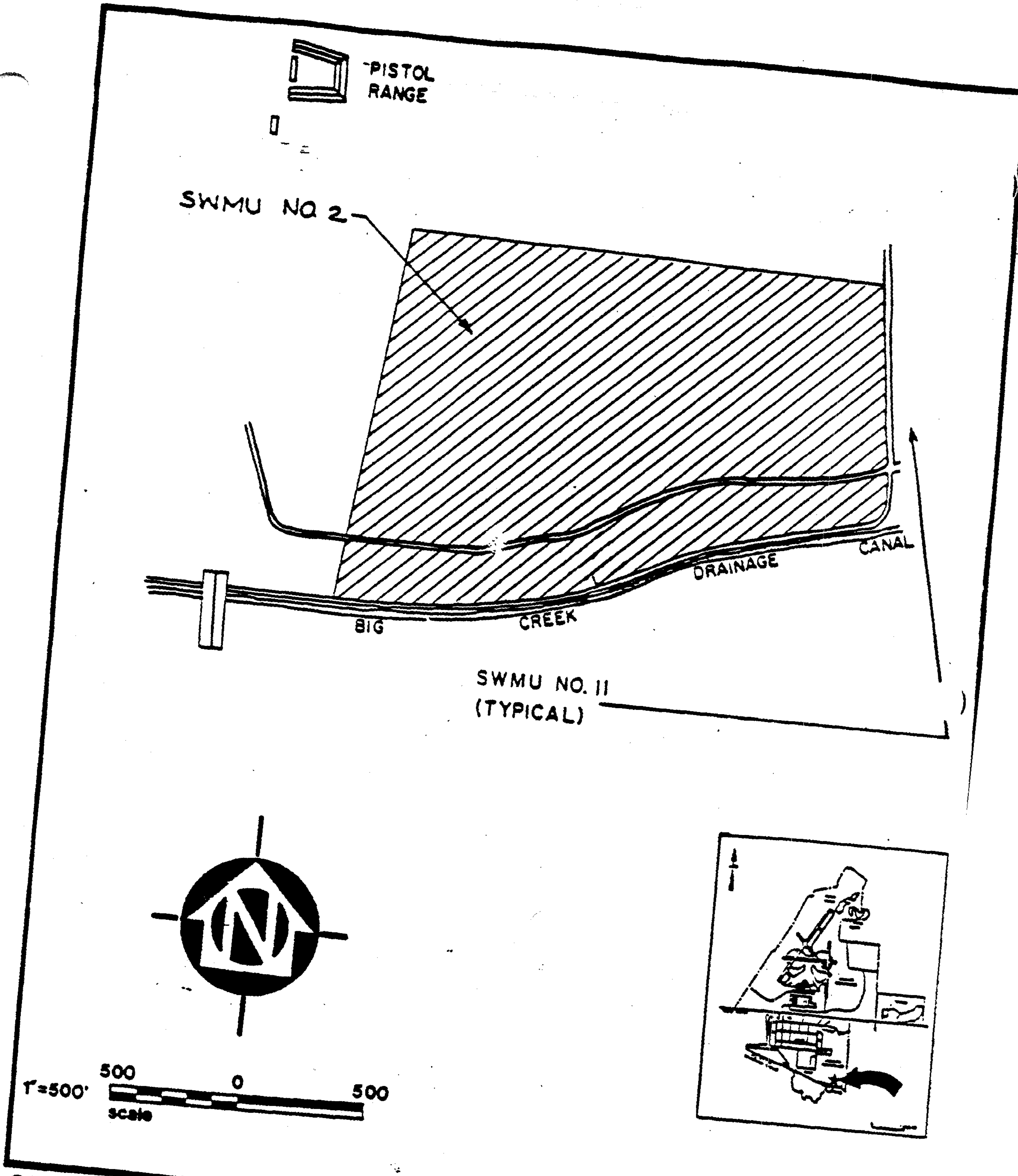
Not applicable.

7.11.7.5 SUBSURFACE GAS

Not applicable.

7.11.8 RECOMMENDED ACTION

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 11 OILED DIRT ROADS
FIGURE 7-11 LOCATION MAP

7.12 SWMU NO. 12: GALLEY DISPOSAL

7.12.1 UNIT CHARACTERISTICS

7.12.1.1 TYPE OF UNIT

Open disposal area.

7.12.1.2 DESIGN FEATURES

The roadside dump use was unsupervised and unrestricted. The affected area is less than one acre.

7.12.1.3 OPERATING PRACTICE (PAST AND PRESENT)

It was used to discard empty food cans from the galley.

7.12.1.4 PERIOD OF OPERATION

Unknown.

7.12.1.5 AGE OF UNIT

Unknown.

7.12.1.6 LOCATION OF UNIT

The Galley Disposal area is located on the NAS South Side Complex, adjacent to Perimeter Road, as shown in Figure 7-12.

7.12.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.12.1.8 CLOSURE METHOD

Not applicable.

7.12.2 WASTE CHARACTERISTICS

7.12.2.1 TYPE OF WASTE

This site was studied during the IAS in 1983. At that time there was no indication of any dumping other than food cans. The waste is believed to be limited to foodstuff and containers, the only wastes to ever be observed there.

7.12.2.2 MIGRATION CHARACTERISTICS

The constituents of the discarded materials described above are reasonably mobile in the environment. If present, they will move via surface runoff from the waste into the soil and off-site into the nearby Big Creek Drainage Canal. However, no hazardous materials have been identified as actual of potential contaminants.

7.12.2.3 TOXICOLOGICAL CHARACTERISTICS

None, except as temporarily septic wastes during biodegradation for days to weeks after disposals.

7.12.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Food and food container wastes.

7.12.3 MIGRATION PATHWAYS

Not applicable.

7.12.4 CONTAMINANT RELEASE IDENTIFICATION

7.12.4.1 PRIOR INSPECTION REPORTS

IAS report (1983).

7.12.4.2 PUBLIC COMPLAINTS

None.

7.12.4.3 MONITORING/SAMPLING DATA

See IAS Report.

7.12.4.4 EVIDENCE OF RELEASE

No evidence of actual or potential release of hazardous substance.

7.12.5 EXPOSURE POTENTIAL

Not applicable.

7.12.6 DOCUMENTS REVIEWED

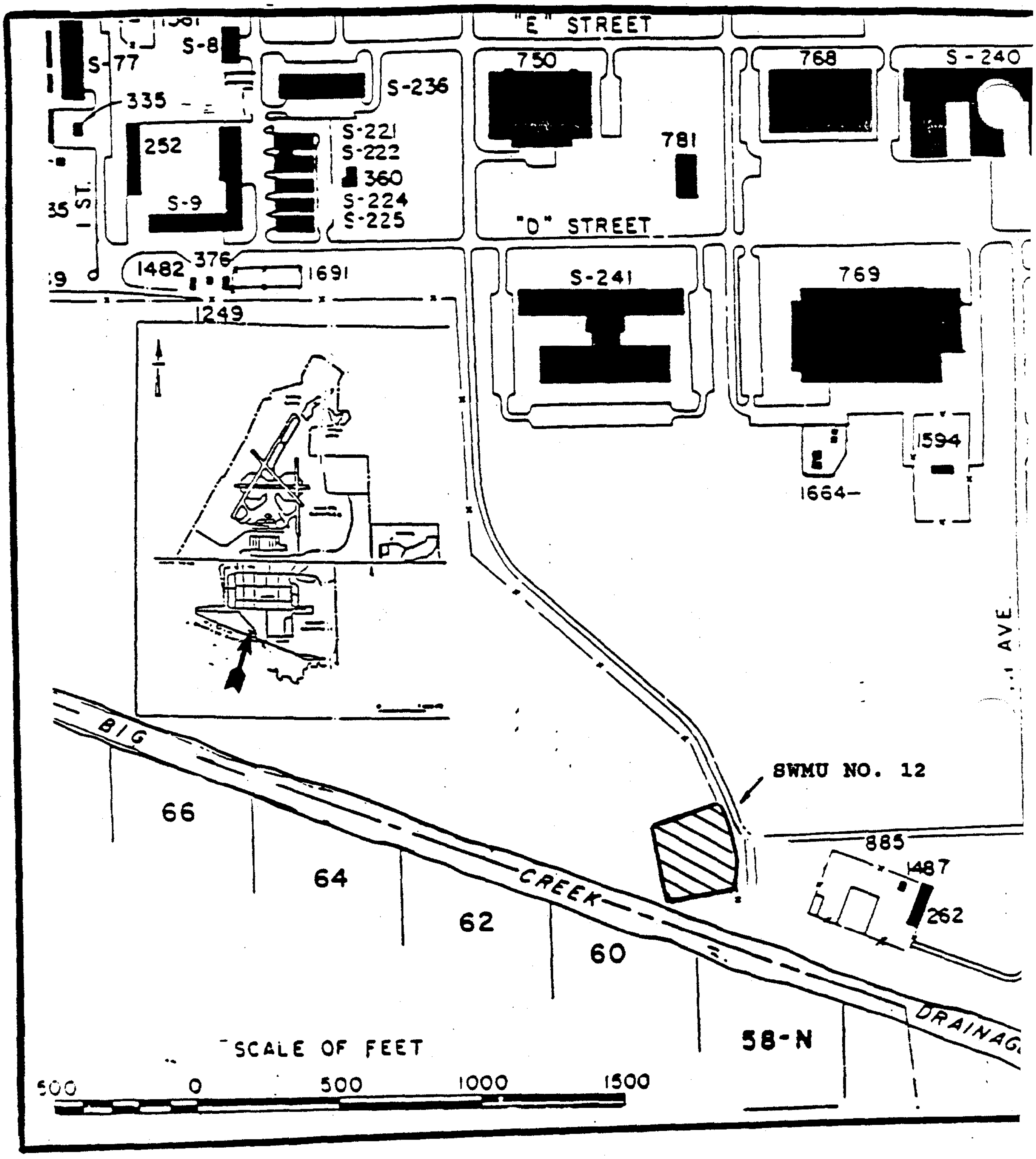
The 1983 IAS was reviewed by project personnel.

7.12.7 SUMMARIZED DATA GAP

No additional data needed.

7.12.8 RECOMMENDED ACTION

This site has been determined to require no further action by SOUTHDIV NAVFACENCGOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 12 GALLEY DISPOSAL
FIGURE 7-12 LOCATION MAP

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7.13 SWMU NO. 13: GREASE PIT AT BUILDING 499

7.13.1 UNIT CHARACTERISTICS

7.13.1.1 TYPE OF UNIT

Domestic waste disposal pit.

7.13.1.2 DESIGN FEATURES

118 cubic feet.

7.13.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Acts as a grease trap in the sewer line. The grease pit intercepts grease in the sewer line. Grease is periodically removed by a contractor for off-site disposal/reuse.

7.13.1.4 PERIOD OF OPERATION

Not determined.

7.13.1.5 AGE OF UNIT

Not determined.

7.13.1.6 LOCATION OF UNIT

Building 499, an enlisted personnel dining facility, is located on the NAS South Side on "G" Street.

7.13.1.7 GENERAL PHYSICAL CONDITIONS

The unit is in good condition.

7.13.1.8 CLOSURE METHOD

Not applicable.

7.13.2 WASTE CHARACTERISTICS

7.13.2.1 TYPE OF WASTE

Grease from kitchen.

7.13.2.2 MIGRATION CHARACTERISTICS

Very low mobility.

7.13.2.3 TOXICOLOGICAL CHARACTERISTICS

Nontoxic.

7.13.2.4 **PHYSICAL/CHEMICAL CHARACTERISTICS**

Liquid to semi-liquid; edible fats and oils of vegetable and animal origin.

7.13.3 **MIGRATION PATHWAYS**

Not applicable.

7.13.4 **CONTAMINANT RELEASE IDENTIFICATION**

7.13.4.1 **PRIOR INSPECTION REPORTS**

None available.

7.13.4.2 **PUBLIC COMPLAINTS**

None.

7.13.4.3 **MONITORING/SAMPLING DATA**

None available.

7.13.4.4 **EVIDENCE OF RELEASE**

There is no evidence of any hazardous materials presence on site.

7.13.5 **EXPOSURE POTENTIAL**

Not applicable.

7.13.6 **DOCUMENTS REVIEWED**

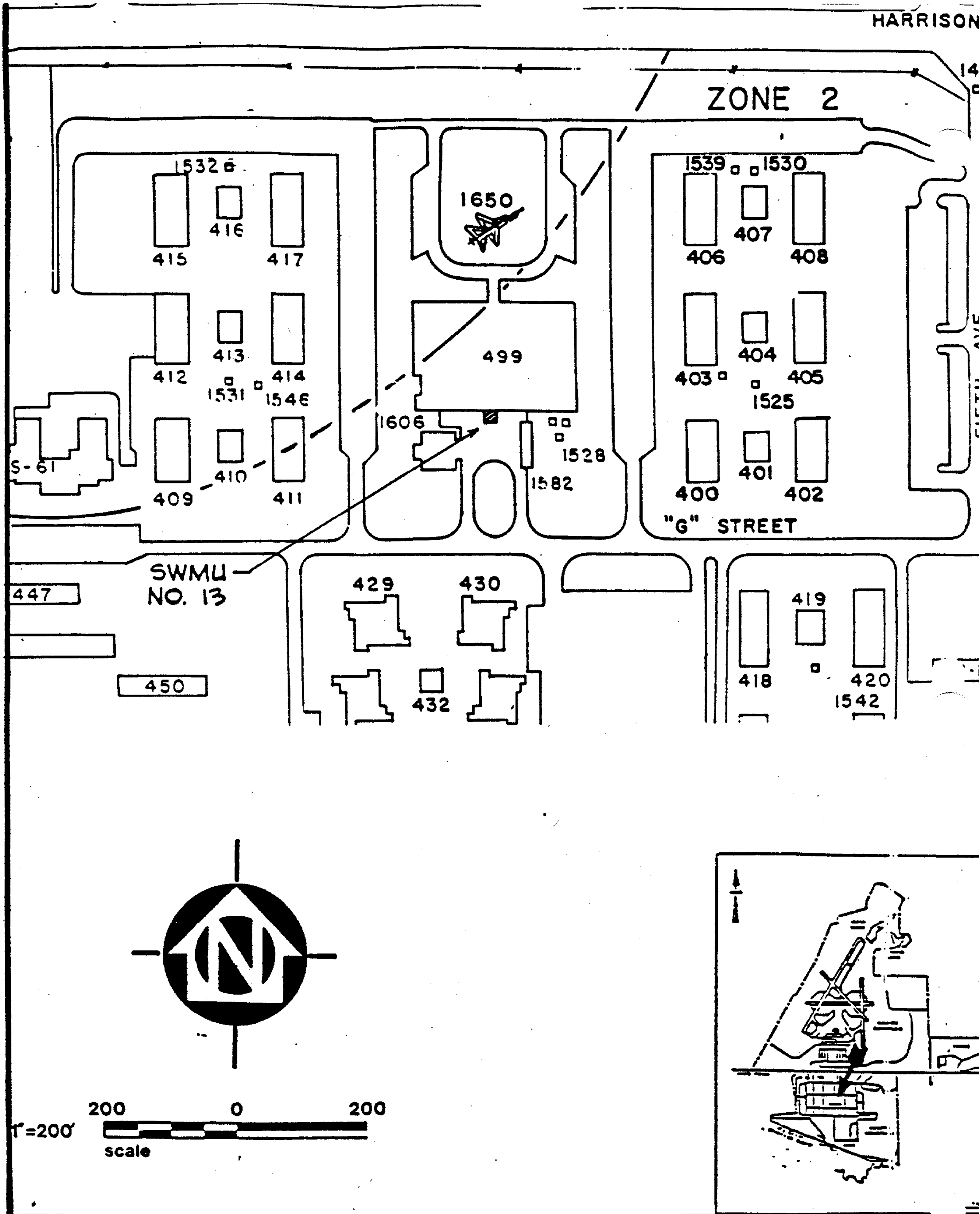
See PRD.

7.13.7 **SUMMARIZED DATA GAP**

No additional data is needed.

7.13.8 **RECOMMENDED ACTIONS**

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 13 BUILDING 499 GREASE PIT
FIGURE 7-13 LOCATION MAP

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7.14 SWMU NO. 14: FORMER SITE OF BUILDING S-140 & SEVENTH AVENUE DITCH

7.14.1 UNIT CHARACTERISTICS

7.14.1.1 TYPE OF UNIT

Inactive building site and existing storm sewer system.

7.14.1.2 DESIGN FEATURES

Included as part of SWMU No. 14 are the following: underground piping leading from the former site of Building S-140 to the sanitary sewer; a "paint separator" unit located in-line in this piping; and the Seventh Avenue Ditch into which this piping discharged until it was connected to the sewer in 1980.

7.14.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Building S-140 contained paint spray booth, paint removing area, and paint washdown area, all associated with training Navy personnel in various painting-related processes. Wastes from these activities were discharged either to two, 1885-gallon sumps or directly to a "paint separator" tank located underground on the north side of the building. The "paint separator" was intended to collect solid wastes. From 1943 until 1980, discharges from the paint separator and tanks went to the Seventh Avenue Ditch. After 1980 the discharges went to the sanitary sewer.

7.14.1.4 PERIOD OF OPERATION

SWMU No. 14 was utilized from 1943 when the building was constructed until 1985 when the building was demolished.

7.14.1.5 AGE OF UNIT

Forty-seven years.

7.14.1.6 LOCATION OF UNIT

SWMU No. 14 is located at the eastern end of D street, between Savitz Drive and Polaris Drive. (See Figure 7-14). Building S-140 was demolished in 1985.

7.14.1.7 GENERAL PHYSICAL CONDITIONS

Building S-140 no longer exists. The demolition plans for S-140 are very vague with respect to what was removed and what was left in place.

7.14.1.8 **CLOSURE METHOD**

Use discontinued when the building was demolished.

7.14.2 **WASTE CHARACTERISTICS**

7.14.2.1 **TYPE OF WASTE**

Waste paint and waste paint sludge containing chromium, lead, and various hydrocarbons. Waste paint solvents including mineral spirits, toluene, and phenols.

7.14.2.2 **MIGRATION CHARACTERISTICS**

The contaminants of concern in connection with SWMU No. 14 are reasonably mobile in the environment. Both surface water and ground water could potentially transport these contaminants. Hence, free material probably no longer exists in quantities of significance to human health or the environment.

7.14.2.3 **TOXICOLOGICAL CHARACTERISTICS**

During the period of operation, paints likely contained lead and various metallic pigments in a hydrocarbon (e.g., acrylic) matrix. Liquid paints probably included both oil-based and water-based (e.g., latex) types. Paint solvents probably included turpentine and/or other terpenes and mineral spirits. Lead, which is probably the most important toxic metal of concern at this SWMU, can result in systemic poisoning as a result of chronic exposure. Paint organic solvents can produce a number of acute and chronic effects, including headaches, nausea, dizziness, disorientation, liver or kidney damage, or nerve tissue damage.

7.14.2.4 **PHYSICAL/CHEMICAL CHARACTERISTICS**

At this SWMU, residuals would likely exist as solids or liquids adsorbed onto soil particles or as soil moisture/groundwater contaminants.

7.14.3 **MIGRATION PATHWAYS**

7.14.3.1 **GEOLOGIC SETTING**

See Section 3.2.

7.14.3.2 **HYDROGEOLOGIC SETTING**

See Sections 3.3 and 3.4.

7.14.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.14.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information on the NAS topography. In the immediate area, the topography is nearly level, with the 7th Avenue ditch drainage to the south toward Big Creek Drainage Ditch. The 7th Avenue Ditch is "V" shaped, approximately 7 feet deep and 15 feet wide.

7.14.3.5 PATHWAYS

AIR

Due to the volatile nature of most of the organic contaminants in SWMU No. 14, it is anticipated that any escape of the constituents to the air medium would have occurred immediately following the release and little or no residual of the release would be present at this time. The nature of the facilities identified as SWMU No. 14 are such that they would not be expected to release inorganic contaminants to air medium.

SOIL

Once released into the soil around the paint separator or beneath the Seventh Avenue drainage ditch, any contaminants would be transported by rainfall percolating through the soil or by ground waste movement through the soil.

SURFACE WATER/SEDIMENT

It is anticipated that surface water readily transported any contaminants discharged to the Seventh Avenue ditch.

GROUNDWATER

Contaminants released to the soil by either the paint separator or the drainage ditch would be readily transported by the ground water if the contaminants reach the ground water table.

SUBSURFACE GAS

Not applicable.

7.14.4 CONTAMINANT RELEASE IDENTIFICATION

7.14.4.1 PRIOR INSPECTION REPORTS

The 1983 Hazardous Waste Survey conducted by EnSafe, Inc., showed acidic paint strippers, ethyl acetate, methyl ethyl ketone, isopropyl alcohol, toluene, xylene, mineral spirits, and acidic stripper sludges were generated in the building.

7.14.4.2 PUBLIC COMPLAINTS

None.

7.14.4.3 MONITORING/SAMPLING DATA

Data associated with the NPDES permit for the S-140 discharge is available.

7.14.4.4 EVIDENCE OF RELEASE

None available.

7.14.5 EXPOSURE POTENTIAL

7.14.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU site is located in the vicinity of the NAS residential area.

7.14.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

This site is not located in an environmentally sensitive area.

7.14.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Contaminants identified by previous studies as potentially being released at SWMU No. 14 include acidic paint strippers, ethyl acetate, methyl ethyl ketone, isopropyl alcohol, toluene, xylene, mineral spirits, chromium, lead, and phenol.

Migration potential to potential receptors will be addressed in future work.

7.14.6 DOCUMENTS REVIEWED

The PRD documents and NAS Memphis historic records were reviewed.

7.14.7 SUMMARIZED DATA GAP

7.14.7.1 SOIL

No soil data available.

7.14.7.2 GROUNDWATER

No available data.

7.14.7.3 SURFACE WATER/SEDIMENT

No available data.

7.14.7.4 AIR

No available data.

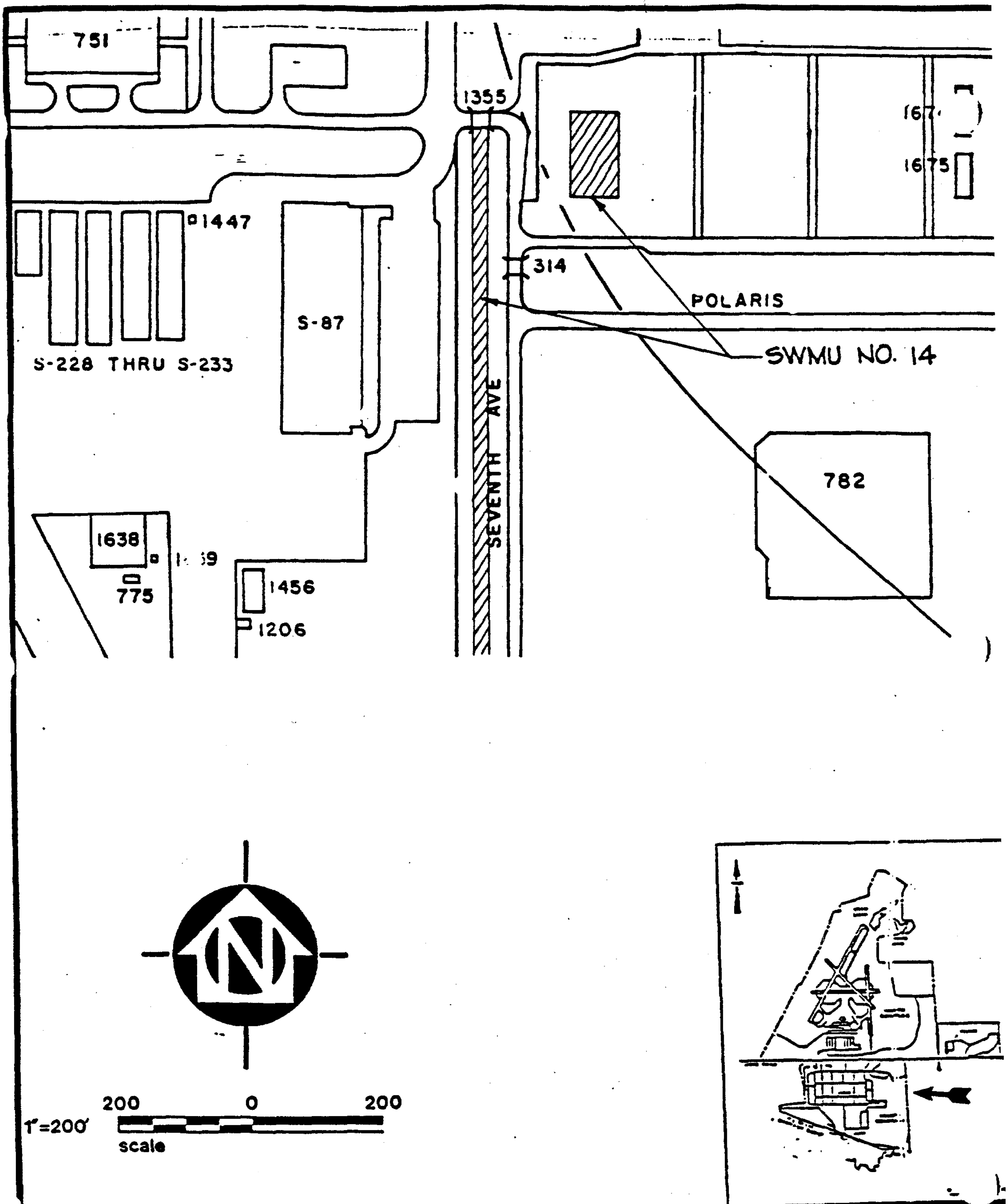
7.14.7.5 SUBSURFACE GAS

No methane gas monitoring is needed.

7.14.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.

Releases from the SWMU occurred under conditions of the NPDES permit previously referenced. Sampling is planned to determine if residual contamination exists. Additional sampling may be required to determine the extent of the release. Prior to initiating any sampling, it will first be necessary to attempt to locate the underground paint separator and any remaining underground piping in the area. A metal detector or other geophysical means will be utilized to locate the paint separator. If the separator can be located, the separator will be removed and the soil beneath the separator sampled to determine if a release occurred. Concurrently with the sampling of the separator, the Seventh Avenue drainage ditch sediment will be sampled to determined if evidence of a release to the ditch exists.



SWMU NO. 14 S-140 SITE & 7TH AVE. DITCH
FIGURE 7-14 LOCATION MAP

7.15 SWMU NO. 15: N-94 UNDERGROUND TANK FARM

7.15.1 UNIT CHARACTERISTICS

7.15.1.1 TYPE OF UNIT

Inactive underground tanks.

7.15.1.2 DESIGN FEATURES

The N-94 Tank Farm consists of an area of approximately 40,000 square feet areal extent in which are buried ten, 10,000- to 25,000-gallon underground storage tanks (USTs).

7.15.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Five of the tanks have been used to store general liquid wastes. These tanks are numbered 1250, 1255, 1256, 1257 and 1259. The remaining tanks (numbers 1251, 1252, 1253, 1254, and 302) contain gasoline mixed with water.

7.15.1.4 PERIOD OF OPERATION

The date the tanks were converted to waste usage is not known.

7.15.1.5 AGE OF UNIT

Forty-five years.

7.15.1.6 LOCATION OF UNIT

The unit is located on the North Side of the NAS (See Figure 7-15).

7.15.1.7 GENERAL PHYSICAL CONDITIONS

The tank farm area is generally level, graded, and covered with a layer of crushed stone to retard growth of vegetation and adsorb surface spills.

7.15.1.8 CLOSURE METHOD

Unknown.

7.15.2 WASTE CHARACTERISTICS

7.15.2.1 TYPE OF WASTE

According to Department of the Navy information, various types of liquid wastes have been stored in tanks numbered 1250, 1255, 1257, and 1528. These substances include liquid wastes generated by the Aircraft Intermediate Maintenance Department (AIMD); including paint waste, paint solvents, freon, paint strippers, waste oil, waste gasoline, and waste alodeine (dilute chromic acid).

7.15.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be leaking underground tanks or product lines. Therefore, the release point is likely to be below grade. Surface infiltrations of rain water can transport these wastes into the soil and ground water

7.15.2.3 TOXICOLOGICAL CHARACTERISTICS

The toxicological characteristics of substances potentially present could include any or all of those described previously for SWMUs No. 1, 5, and 14.

7.15.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.15.3 MIGRATION PATHWAYS

7.15.3.1 GEOLOGIC SETTING

See Section 3.2.

7.15.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.15.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.15.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.15.3.5 PATHWAYS

AIR

Visual inspection of this SWMU reveals no apparent surface releases of contaminants at this site. Therefore, no atmospheric releases of contaminants are anticipated.

SOIL

Should a leak exist, hazardous constituents of the waste fuels and solvents present at this location would likely be released into the soil mass around and beneath the tank. Soil bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attraction for these potential contaminants. Minor releases from this facility would be trapped in the vadose zone until natural driving forces were exerted (e.g., surface water infiltration) to transport these substances to the groundwater.

SURFACE WATER/SEDIMENT

Since the field inspections revealed no obvious surface spills at SWMU No. 15, the likelihood of surface water transport is remote. However, contaminants could be carried along existing surface ditches to streams and bodies of water.

GROUNDWATER

Contaminants contained in the USTs at this location are soluble in water and could be transported with the flow of ground water down-gradient.

SUBSURFACE GAS

VOCs from fuel or other liquid wastes could migrate.

7.15.4 CONTAMINANT RELEASE IDENTIFICATION

7.15.4.1 PRIOR INSPECTION REPORTS

The tanks are described in Appendix L of the NAS Memphis Underground Tank Survey Report. Their use as liquid waste storage tanks is also noted in the 1983 Hazardous Waste Survey by EnSafe, Inc. The survey report indicates that typical AIMD and squadron-level maintenance wastes were stored in some of the tanks.

7.15.4.2 PUBLIC COMPLAINTS

None.

7.15.4.3 MONITORING/SAMPLING DATA

None.

7.15.4.4 EVIDENCE OF RELEASE

None observed. Past and current usage; age of unit.

7.15.5 EXPOSURE POTENTIAL

7.15.5.1 PROXIMITY TO AFFECTED POPULATION

The site is located in the NAS industrial area, which is located at a distance from the NAS permanent population.

7.15.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

There are no environmentally sensitive areas in the vicinity of SWMU No. 15.

7.15.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

If releases to groundwater have occurred, uses of groundwater could be affected.

7.15.6 DOCUMENTS REVIEWED

The documents listed in the PRD and NAS Memphis historical records were reviewed.

7.15.7 SUMMARIZED DATA GAP

7.15.7.1 SOIL

No data.

7.15.7.2 GROUNDWATER

No data.

7.15.7.3 SURFACE WATER/SEDIMENT

No data.

7.15.7.4 AIR

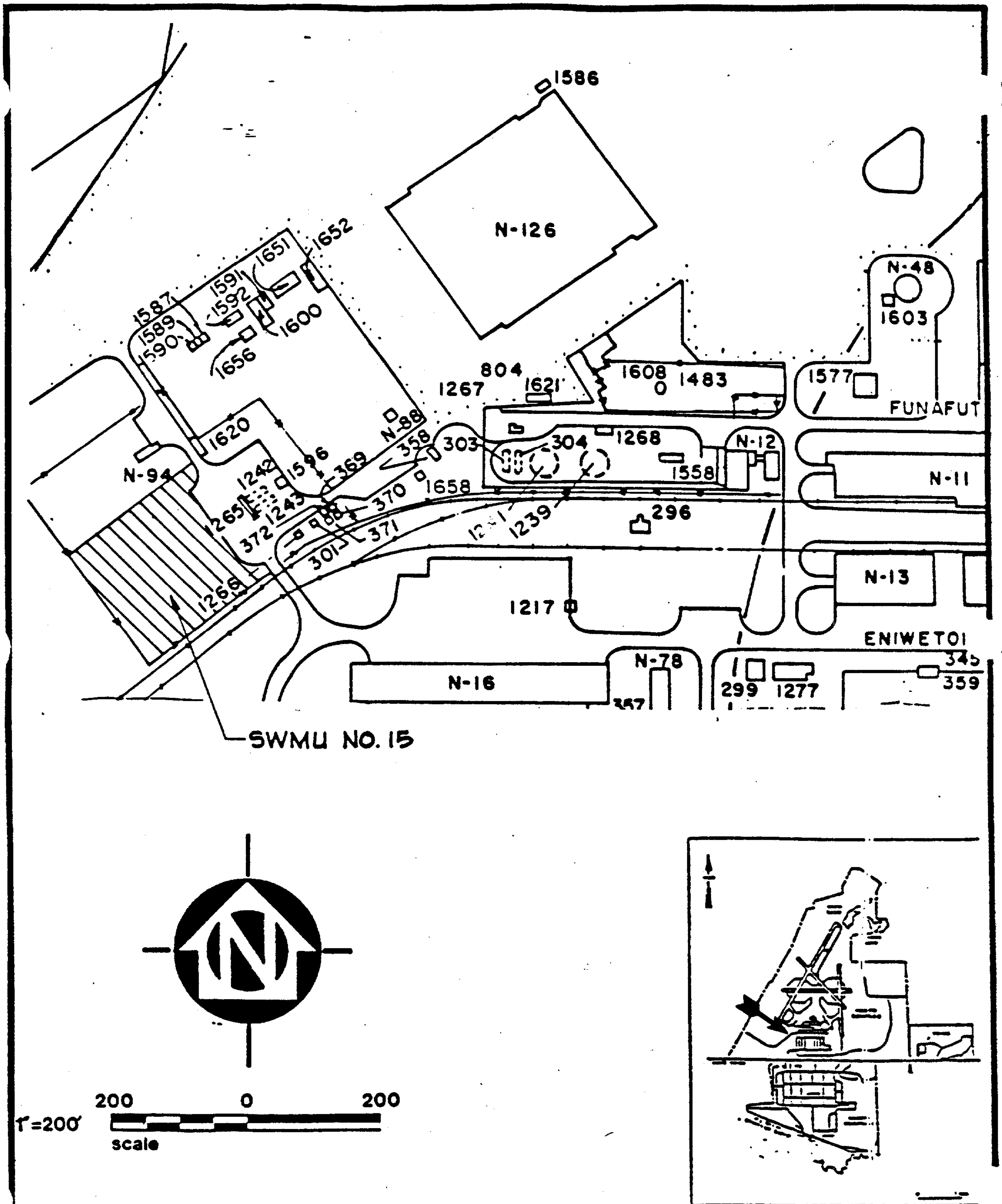
No data.

7.15.7.5 SUBSURFACE GAS

No data.

7.15.8 RECOMMENDED ACTIONS

Because of extreme age (45 years) of the tanks and product distribution system at this location, it is suspected that a release of hazardous waste or hazardous waste constituents may have occurred at this location. This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment. At a minimum groundwater and soil sampling are indicated.



SWMU NO. 15 N-94 TANK FARM
FIGURE 7-15 LOCATION MAP

7.16 SWMU NO. 16: N-94 ABOVE GROUND WASTE STORAGE TANKS

7.16.1 UNIT CHARACTERISTICS

7.16.1.1 TYPE OF UNIT

Active waste storage tanks.

7.16.1.2 DESIGN FEATURES

Two, 8000-gallon tanks.

7.16.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Both tanks have been used to store general liquid wastes.

7.16.1.4 PERIOD OF OPERATION

The date the tanks were converted to waste usage is not known.

7.16.1.5 AGE OF UNIT

Unknown.

7.16.1.6 LOCATION OF UNIT

Near Building N-94; see Figure 7-16.

7.16.1.7 GENERAL PHYSICAL CONDITIONS

Tanks are equipped with secondary containment.

7.16.1.8 CLOSURE METHOD

Not applicable (active).

7.16.2 WASTE CHARACTERISTICS

7.16.2.1 TYPE OF WASTE

One tank contains waste lubricating oil; the other contains waste jet fuel (JP-4 and JP-5).

7.16.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Preliminary investigation of this SWMU reveals no evidence of releases.

7.16.2.3 TOXICOLOGICAL CHARACTERISTICS

The contaminants of concern for this SWMU include jet engine fuel constituents (benzene, toluene, xylene, naphtha); chlorinated solvents such as TCE, TCA, and PCE; and semivolatile hydrocarbon constituents of engine and transmission oils.

These contaminants may produce one or more of the following human health effects, depending on the type of exposure (chronic, acute), the mode of exposure (inhalation, ingestion, or dermal absorption), and the amount (dose) received dizziness, nausea, drowsiness, agitation, liver damage, visual impairment, or dermal damage.

In addition, several of the suspect substances are known or suspected carcinogens, mutagens, or teratogens.

7.16.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

These constituents would likely exist as contaminants adsorbed onto soil particles, as soil-vapor pore vapors, and groundwater contaminants. The volatile constituents tend to evaporate quickly from the ground surface and near surface.

7.16.3 MIGRATION PATHWAYS

Visual inspection of this SWMU revealed no apparent surface releases of contaminants at this site. Also, the tanks are equipped with secondary containment systems. Therefore, no past environmental releases of contaminants are suspected.

7.16.4 CONTAMINANT RELEASE IDENTIFICATION

7.16.4.1 PRIOR INSPECTION REPORTS

Visual inspection of this SWMU revealed no apparent surface releases of contaminants at this site.

7.16.4.2 PUBLIC COMPLAINTS

None.

7.16.4.3 MONITORING/SAMPLING DATA

None available.

7.16.4.4 EVIDENCE OF RELEASE

None observed.

7.16.5 EXPOSURE POTENTIAL

Not expected.

7.16.6 DOCUMENTS REVIEWED

See PRD.

7.16.7 SUMMARIZED DATA GAP

7.16.7.1 SOIL

No data available.

7.16.7.2 GROUNDWATER

No data available.

7.16.7.3 SURFACE WATER/SEDIMENT

No data available.

7.16.7.4 AIR

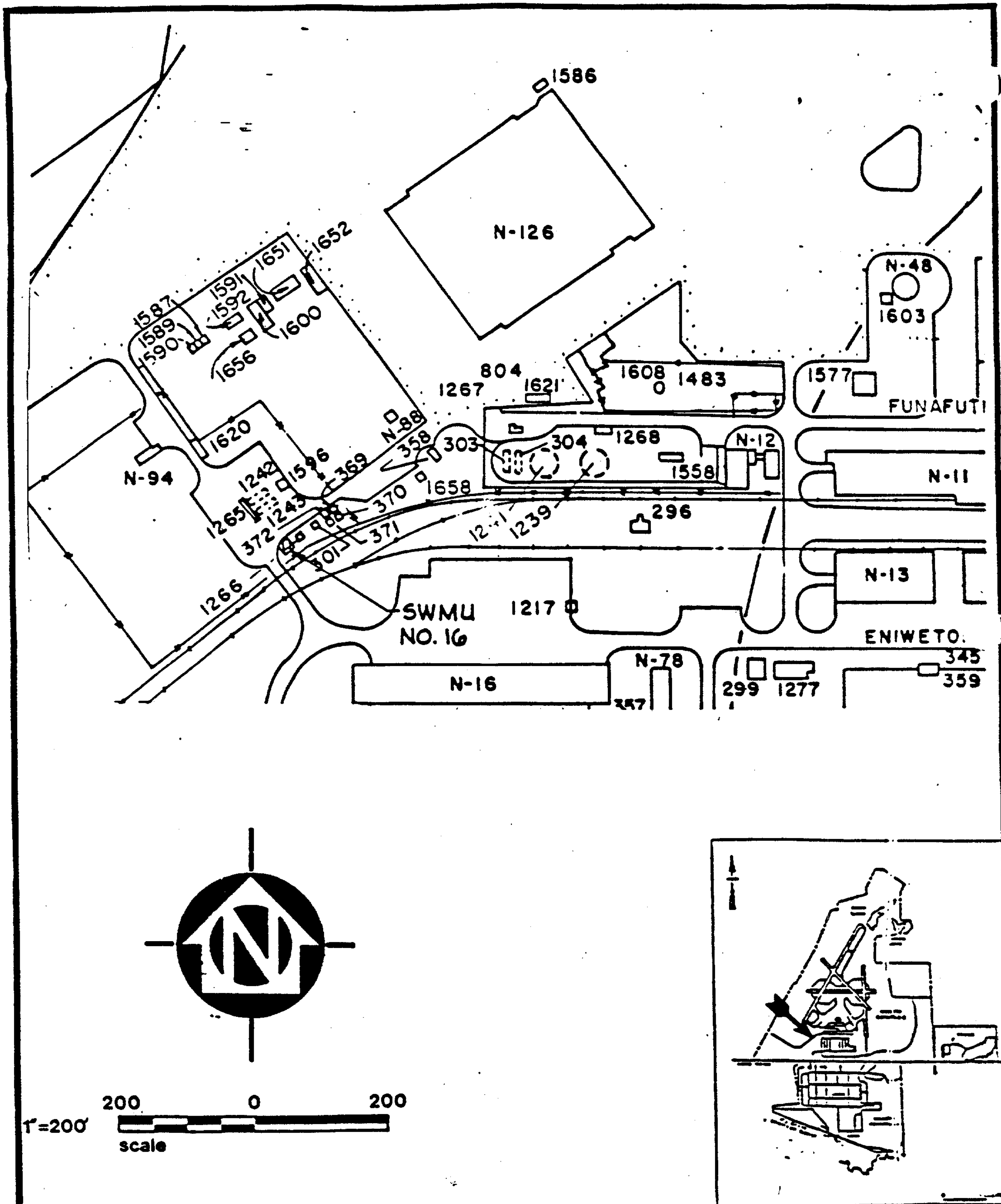
No data available.

7.16.7.5 SUBSURFACE GAS

No data available.

7.16.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 16 N-94 ABOVEGROUND WASTE TANKS
FIGURE 7-16 LOCATION MAP

7.17 SWMU NO. 17: BUILDING S-9 UNDERGROUND WASTE TANKS

7.17.1 UNIT CHARACTERISTICS

7.17.1.1 TYPE OF UNIT

Active underground storage tanks.

7.17.1.2 DESIGN FEATURES

Tank 1657 is a 550 gallon tank. The other tank located inside S-9 is presumed to be approximately the same size.

7.17.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Waste oil storage.

7.17.1.4 PERIOD OF OPERATION

Currently in use. The date the tanks were converted to waste oil usage is not known.

7.17.1.5 AGE OF UNIT

Unknown.

7.17.1.6 LOCATION OF UNIT

Building S-9. See Figure 7-17.

7.17.1.7 GENERAL PHYSICAL CONDITIONS

Not determined.

7.17.1.8 CLOSURE METHOD

Not applicable.

7.17.2 WASTE CHARACTERISTICS

7.17.2.1 TYPE OF WASTE

Primarily waste oil, including waste hydraulic fluid.

7.17.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be leaking underground tanks or product lines. Therefore, the release point is likely to be low grade. Surface infiltration of rain water can transport these wastes into the soil and groundwater.

7.17.2.3 <u>TOXICOLOGICAL CHARACTERISTICS</u>

Used engine oil and hydraulic fluid toxic constituents include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, or damage to nerves, liver, or kidney.

7.17.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.17.3 <u>MIGRATION PATHWAYS</u>

7.17.3.1 <u>GEOLOGIC SETTING</u>

See Section 3.2.

7.17.3.2 <u>HYDROGEOLOGIC SETTING</u>

See Sections 3.3 and 3.4.

7.17.3.3 <u>ATMOSPHERIC CONDITIONS</u>

See Sections 3.3 and 3.4.

7.17.3.4 <u>TOPOGRAPHIC CHARACTERISTICS</u>

See Section 3.1 for general information. Except for buildings, the topography in the immediate area is flat, with paved and unpaved areas.

7.17.3.5 <u>PATHWAYS</u>

<u>AIR</u>

Not applicable to this unit.

<u>SOIL</u>

Not applicable.

<u>SURFACE WATER/SEDIMENT</u>

Not applicable.

GROUNDWATER

Not applicable.

SUBSURFACE GAS

Not applicable.

7.17.4 CONTAMINANT RELEASE IDENTIFICATION

7.17.4.1 PRIOR INSPECTION REPORTS

None available.

7.17.4.2 PUBLIC COMPLAINTS

None.

7.17.4.3 MONITORING/SAMPLING DATA

Waste oil is tested for PCBs prior to disposal.

7.17.4.4 EVIDENCE OF RELEASE

None available.

7.17.5 EXPOSURE POTENTIAL

7.17.5.1 PROXIMITY TO AFFECTED POPULATION

None expected based on available information.

7.17.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

No known sensitive environments are located in the vicinity of the site.

7.17.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Migration to potential receptors is unlikely due to limited waste volume, limited waste mobility and distance to nearest receptors.

7.16.6 DOCUMENTS REVIEWED

See PRD.

7.17.7 SUMMARIZED DATA GAP

7.17.7.1 SOIL

No data.

7.17.7.2 GROUNDWATER

No data.

7.17.7.3 SURFACE WATER/SEDIMENT

Not applicable.

7.17.7.4 AIR

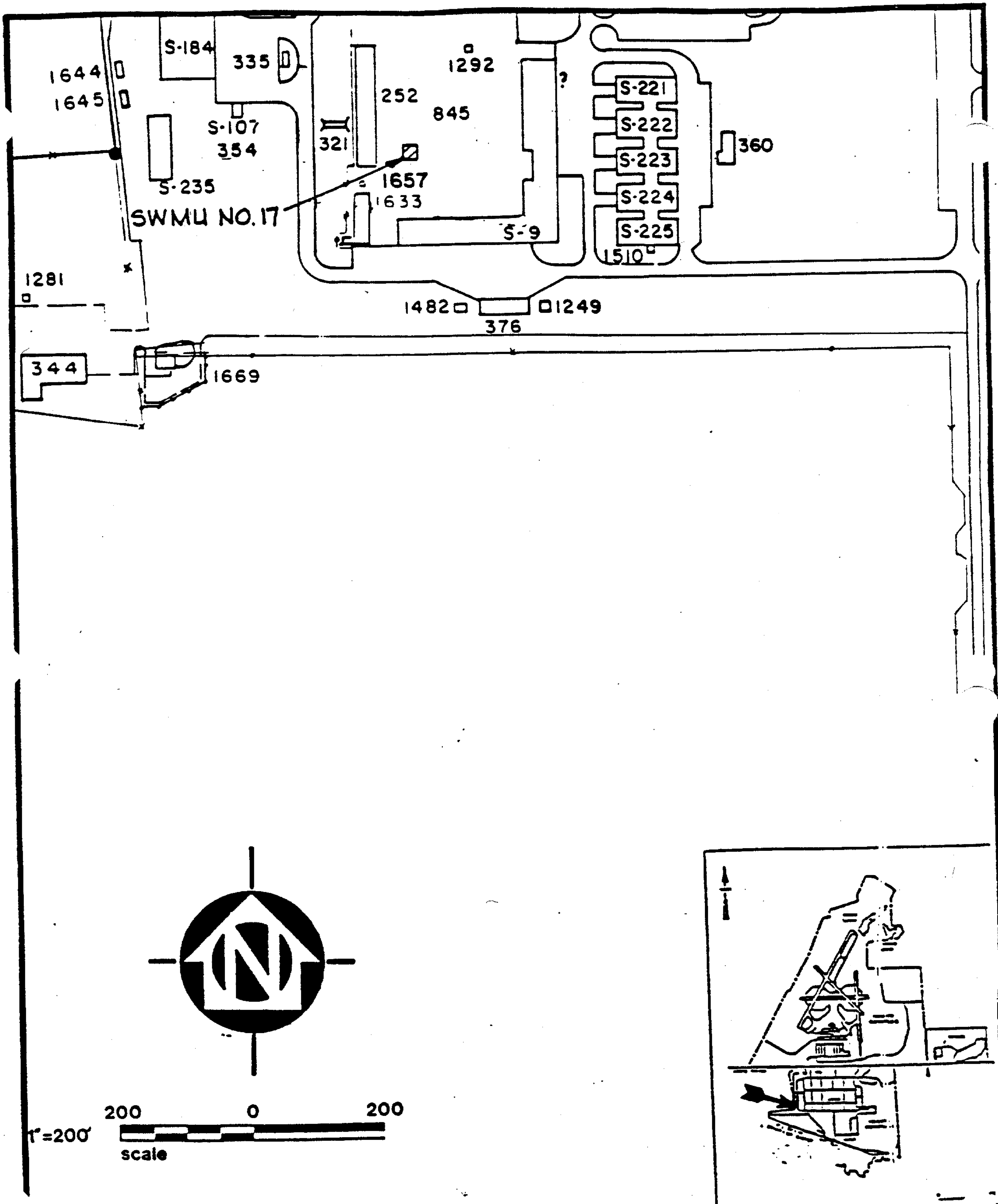
Not applicable.

7.17.7.5 SUBSURFACE GAS

Not applicable.

7.17.8 RECOMMEND ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 17 S-9 UNDERGROUND WASTE TANK
FIGURE 7-17 LOCATION MAP

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7.18 SWMU NO. 18: N-112 UNDERGROUND WASTE TANK

7.18.1 UNIT CHARACTERISTICS

7.18.1.1 TYPE OF UNIT

Active Underground Tank.

7.18.1.2 DESIGN FEATURES

This tank's capacity is 550 gallons; contents are waste oil and hydraulic fluid. The tank bottom is approximately 8 feet below grade, and it is anchored to an 8-inch thick concrete pad to prevent floatation in the event of high groundwater levels. Piping connected to the tank include feed lines which run from Building N-112 and a vent line which runs to the west side of Building N-112.

7.18.1.3 OPERATING PRACTICE (PAST AND PRESENT)

According to Department of the Navy information, this tank system is used to store waste oil and hydraulic fluid generated by the Ground Support Equipment (GSE) Shop. The shop repairs and maintains NAS vehicles used in aircraft maintenance.

7.18.1.4 PERIOD OF OPERATION

Tanks are in service.

7.18.1.5 AGE OF UNIT

Age of the tank is unknown.

7.18.1.6 LOCATION OF UNIT

Building N-112; see Figure 18-1.

7.18.1.7 GENERAL PHYSICAL CONDITIONS

General physical conditions of the UST is unknown.

7.18.1.8 CLOSURE METHOD

Not applicable at this time (active tank).

7.18.2 WASTE CHARACTERISTICS

7.18.2.1 TYPE OF WASTE

In addition to heavy hydrocarbons, waste material generated by this operation might contain volatile petroleum constituents such as benzene, xylene, and toluene; heavy metals such as lead and chromium; and possibly PCBs.

7.18.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be leaking underground tanks or product lines. Therefore, the release point is likely to be below grade. Surface infiltration of rain water can transport these wastes into the soil and groundwater.

7.18.2.3 TOXICOLOGICAL CHARACTERISTICS

Used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, or damage to nerves, liver, or kidney.

7.18.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.18.3 MIGRATION PATHWAYS

7.18.3.1 GEOLOGIC SETTING

See Section 3.2.

7.18.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.18.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.18.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.18.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the waste oils and fluids at this location would likely be released into the soil mass around and beneath the tank. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the groundwater surface.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the UST system at SWMU No. 18 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the UST at this SWMU are slightly soluble in water expected to be lighter. They would be transported generally down gradient with the flow of groundwater.

SUBSURFACE GAS

Not applicable.

7.18.4 CONTAMINANT RELEASE IDENTIFICATION

7.18.4.1 PRIOR INSPECTION REPORTS

None available.

7.18.4.2 PUBLIC COMPLAINTS

None.

7.18.4.3 MONITORING/SAMPLING DATA

Waste oil is tested for PCBs prior to final disposal. No PCBs have ever been detected.

7.18.4.4 EVIDENCE OF RELEASE

None.

7.18.5 EXPOSURE POTENTIAL

7.18.5.1 PROXIMITY TO AFFECTED POPULATION

The SWMU is located in the NAS North Side industrial area, which is distant from the NAS permanent population.

7.18.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.18.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this tank system.

7.18.6 DOCUMENTS REVIEWED

See PRD.

7.18.7 SUMMARIZED DATA GAP

7.18.7.1 SOIL

No available data.

7.18.7.2 GROUNDWATER

No available groundwater monitoring data.

7.18.7.3 SURFACE WATER/SEDIMENT

No available data. Surface water/sediment sampling is not needed for this site.

7.18.7.4 AIR

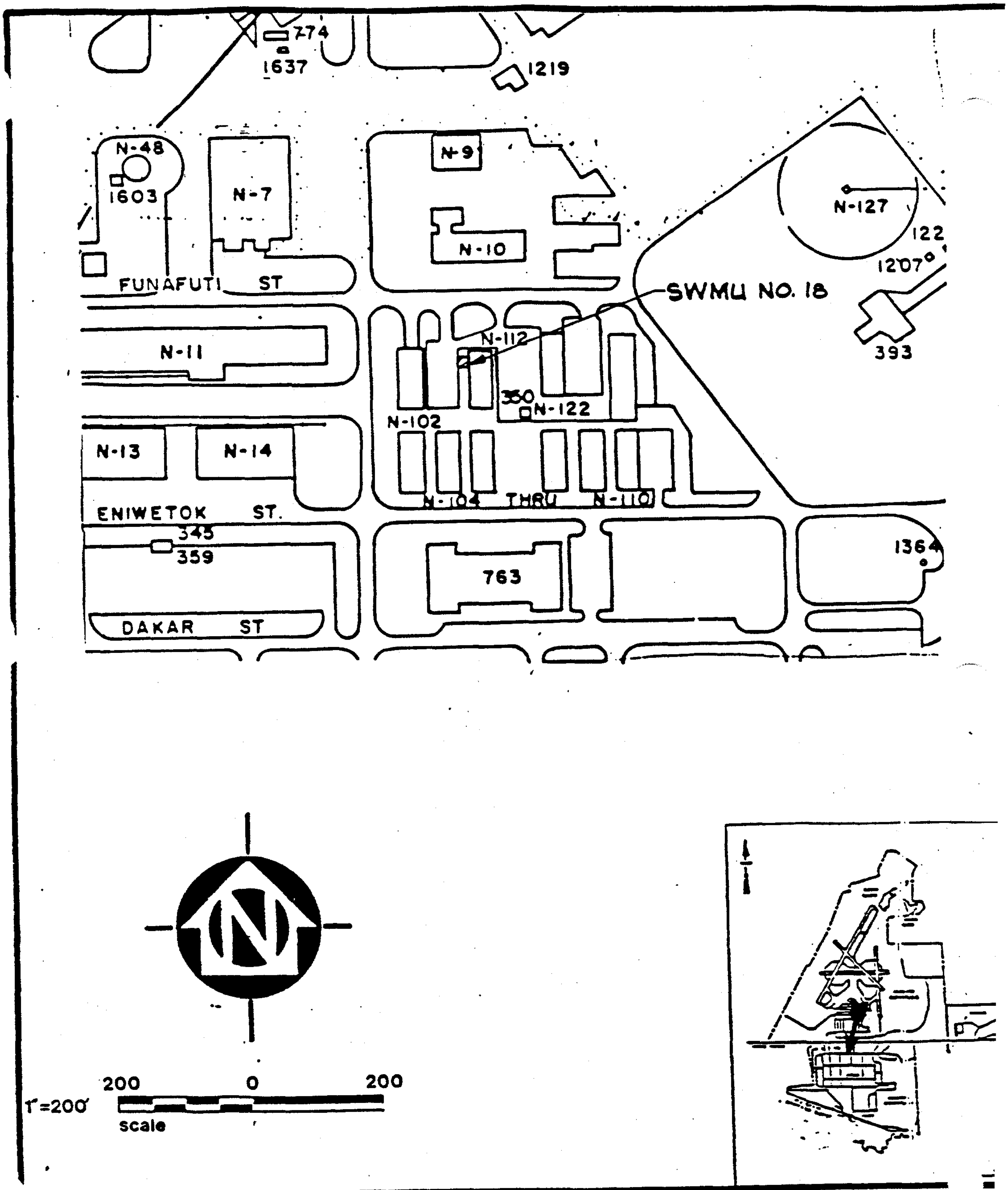
No air sampling is needed.

7.18.7.5 SUBSURFACE GAS

Not applicable.

7.18.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 18 N-112 UNDERGROUND WASTE TANK
FIGURE 7-18 LOCATION MAP

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7.19 SWMU NO. 19: BUILDING 341 UNDERGROUND WASTE TANK AND TANK 1648

7.19.1 UNIT CHARACTERISTICS

7.19.1.1 TYPE OF UNIT

Active Underground Tanks.

7.19.1.2 DESIGN FEATURES

The Building 341 UST is 280 gallons in capacity and holds waste automotive oil and hydraulic fluid. Piping connected to the tank include feed lines which run from Building 341 and a vent line which runs to the north side of Building 341.

Tank No. 1648 is a UST used to collect waste oil from Building 757. It consists of the UST and associated feed and vent lines.

7.19.1.3 OPERATING PRACTICE (PAST AND PRESENT)

According to Department of the Navy information, the Building 341 UST system is used to temporarily store waste oil and hydraulic fluid generated by the Navy Exchange Service Station as automobile maintenance wastes.

Tank No. 1648 is similarly used for storage of waste oil from Building 757 automobile maintenance operations.

7.19.1.4 PERIOD OF OPERATION

Period of operation is from approximately 1979 to the present.

7.19.1.5 AGE OF UNIT

The tank was installed within the last 11 years.

7.19.1.6 LOCATION OF UNIT

The Building 341 UST and Tank No. 1648 are located on the north side of Building 341 and the west side of Building 757, respectively. See Figure 7-19.

7.19.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.19.1.8 CLOSURE METHOD

Not applicable at the present time (active tank).

7.19.2 WASTE CHARACTERISTICS

7.19.2.1 TYPE OF WASTE

In addition to heavier hydrocarbons, waste material may include volatile petroleum constituents such as benzene, xylene, and toluene, and heavy metals. PCBs are possible but unlikely.

7.19.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be leaking underground tanks or product lines. Therefore, the release point is likely to be below grade. Surface infiltration of rain water can transport these wastes into the soil and groundwater.

7.19.2.3 TOXICOLOGICAL CHARACTERISTICS

Used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, damage to nerves, liver, or kidney.

7.19.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.19.3 MIGRATION PATHWAYS

7.19.3.1 GEOLOGIC SETTING

See Section 3.2.

7.19.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.19.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.19.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.19.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the waste oils and fluids at this location would likely be released into the soil mass around and beneath the tank. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the groundwater surface.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the UST system at SWMU No. 19 indicates no obvious points of surface contamination attributable to these units. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the UST at this SWMU are generally heavier than water and slightly soluble in water. They would be transported generally down gradient with the flow of groundwater.

SUBSURFACE GAS

There is a limited potential for migration of VOCs from the waste oil tanks. VOC source is limited by size of tanks.

7.19.4 CONTAMINANT RELEASE IDENTIFICATION

7.19.4.1 PRIOR INSPECTION REPORTS

None available.

7.19.4.2 PUBLIC COMPLAINTS

None.

7.19.4.3 MONITORING/SAMPLING DATA

None available.

7.19.4.4 EVIDENCE OF RELEASE

None.

7.19.5 EXPOSURE POTENTIAL

7.19.5.1 PROXIMITY TO AFFECTED POPULATION

SWMU No. 19 is located in the NAS North Side industrial area, which is distant from the permanent NAS population but near off-Station residences along Navy Road.

7.19.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.19.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this tank system.

7.19.6 DOCUMENTS REVIEWED

See PF .

7.19.7 SUMMARIZED DATA GAP

7.19.7.1 SOIL

No available data.

7.19.7.2 GROUNDWATER

No available data.

7.19.7.3 SURFACE WATER/SEDIMENT

No surface water/sediment sampling is needed.

7.19.7.4 AIR

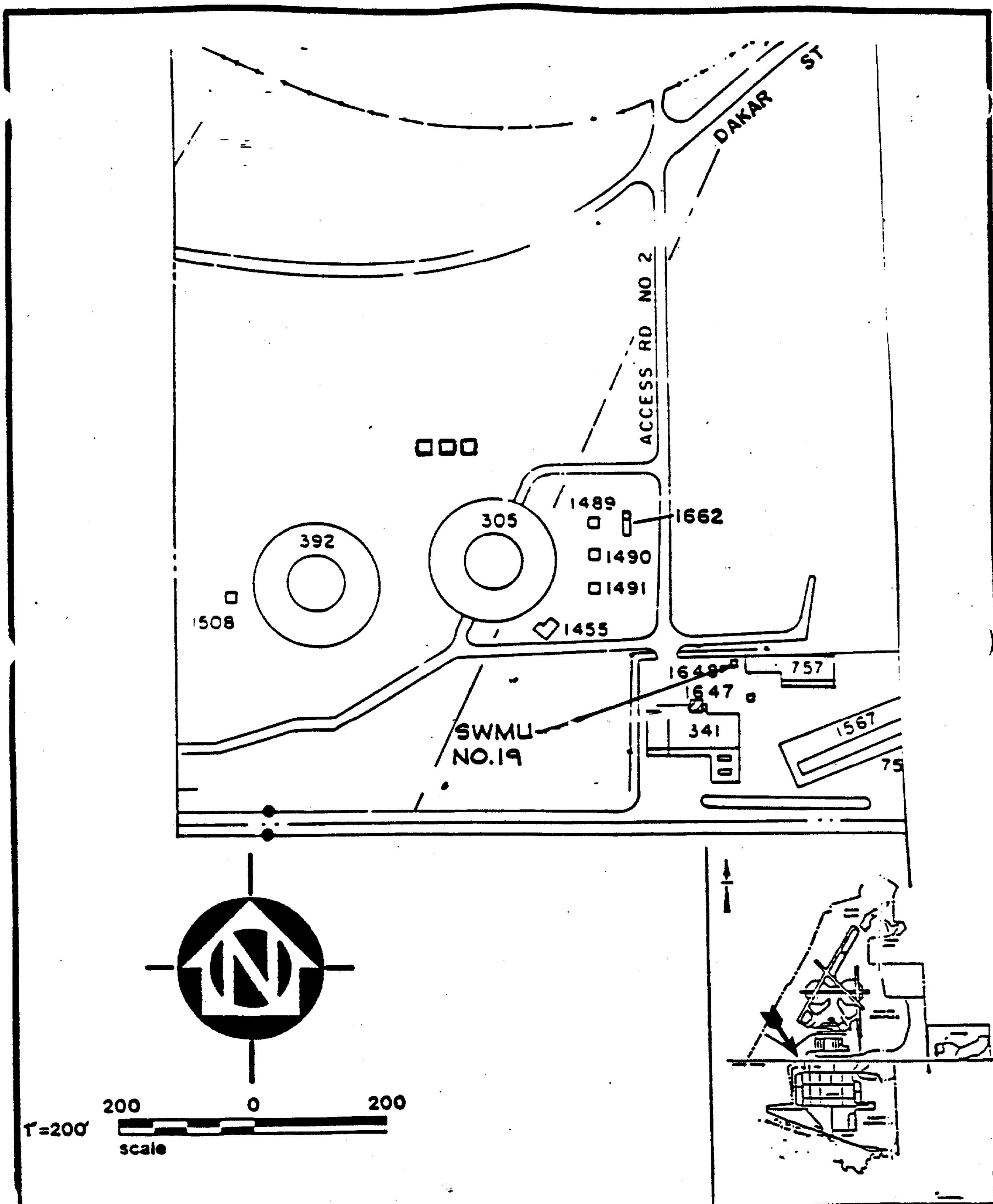
No air sampling is needed.

7.19.7.5 SUBSURFACE GAS

No data available in 1989.

7.19.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 19 341 UNDERGROUND WASTE TANK
FIGURE 7-19 LOCATION MAP

7.20 SWMU NO. 20: 1594 UNDERGROUND WASTE TANK

7.20.1 UNIT CHARACTERISTICS

7.20.1.1 TYPE OF UNIT

Underground Waste Storage Tank.

7.20.1.2 DESIGN FEATURES

This tank is estimated to be 100 gallons in capacity and holds waste oil and hydraulic fluid. Piping connected to the tank includes feed lines and a vent line which runs to Building 1594.

7.20.1.3 OPERATING PRACTICE (PAST AND PRESENT)

According to Department of the Navy information, this tank system is used to temporarily store waste oil and hydraulic fluid generated by the Air Traffic Control School.

7.20.1.4 PERIOD OF OPERATION

Not determined.

7.20.1.5 AGE OF UNIT

Age of the tank is unknown.

7.20.1.6 LOCATION OF UNIT

The 1594 underground waste tank is located at Building 1594. See Figure 7-20.

7.20.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.20.1.8 CLOSURE METHOD

Unknown.

7.20.2 WASTE CHARACTERISTICS

7.20.2.1 TYPE OF WASTE

In addition to heavier petroleum hydrocarbons, waste material generated by this operation might contain volatile petroleum constituents such as benzene, xylene and toluene, and heavy metals, PCBs are possible.

7.20.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in the above description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be tanks or feed line leakage. Therefore, the release point is likely to be below grade. Surface infiltration of rain water can transport these wastes into the soil and ground water.

7.20.2.3 TOXICOLOGICAL CHARACTERISTICS

Used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, damage to nerves, liver, or kidney, etc.

7.20.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.20.3 MIGRATION PATHWAYS

7.20.3.1 GEOLOGIC SETTING

See Section 3.2.

7.20.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.20.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.20.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.20.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the waste oils and fluids at this location would likely be released into the soil mass around and beneath the tank. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attraction for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water surface.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the UST system at SWMU No. 20 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the UST at this SWMU are generally heavier than water and slightly soluble in water. They would be transported generally down gradient with the flow of groundwater if released.

SUBSURFACE GAS

Because of the small tank size, there is a limited potential for POL VOCs migration.

7.20.4 CONTAMINANT RELEASE IDENTIFICATION

7.20.4.1 PRIOR INSPECTION REPORTS

None available.

7.20.4.2 PUBLIC COMPLAINTS

None.

7.20.4.3 MONITORING/SAMPLING DATA

None available.

7.20.4.4 EVIDENCE OF RELEASE

None observed.

7.20.5 **EXPOSURE POTENTIAL**

7.20.5.1 **PROXIMITY TO AFFECTED POPULATION**

This SWMU is located in the NAS North Side industrial area, which is far away from the permanent NAS population.

7.20.5.2 **PROXIMITY TO SENSITIVE ENVIRONMENTS**

The unit is distant from sensitive environments.

7.20.5.3 **LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS**

It has not been previously determined whether a release of hazardous material has occurred from this tank system.

7.20.6 **DOCUMENTS REVIEWED**

See PRD.

7.20.7 **SUMMARIZED DATA GAP**

7.20.7.1 **SOIL**

None available.

7.20.7.2 **GROUNDWATER**

No available data.

7.20.7.3 **SURFACE WATER/SEDIMENT**

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.20.7.4 **AIR**

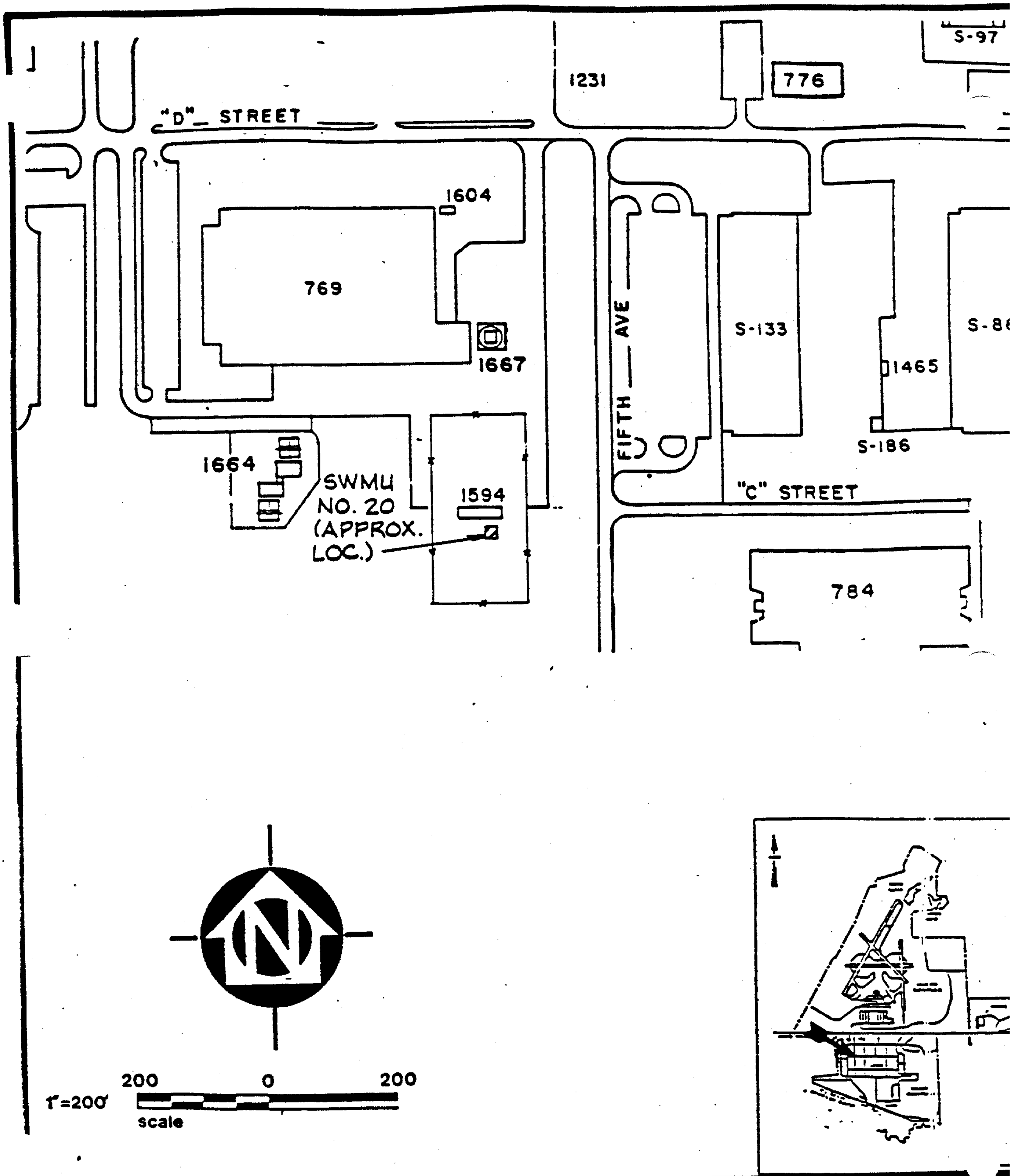
No previous data.

7.20.7.5 **SUBSURFACE GAS**

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.20.8 **RECOMMENDED ACTIONS**

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 20 1594 UNDERGROUND WASTE TANK
FIGURE 7-20 LOCATION MAP

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7.21 SWMU NO. 21: N-10 UNDERGROUND WASTE TANK

7.21.1 UNIT CHARACTERISTICS

7.21.1.1 TYPE OF UNIT

Underground Waste Storage Tank.

7.21.1.2 DESIGN FEATURES

This tank is 5,000 gallons in capacity and holds waste oil and hydraulic fluid. Piping connected to the tank may include feed lines and a vent line which runs to undetermined locations.

7.21.1.3 OPERATING PRACTICE (PAST AND PRESENT)

According to Department of the Navy information, this tank system is used to handle and store waste oil and hydraulic fluid generated by an automotive repair operation and possibly used later as an aircraft maintenance shop.

7.21.1.4 PERIOD OF OPERATION

This tank is presumed to have been installed in 1943.

7.21.1.5 AGE OF UNIT

Approximately 46 years.

7.21.1.6 LOCATION OF UNIT

The N-10 underground waste tank, presently located near Building N-10, served a building which no longer exists. See Figure 7-21.

7.21.1.7 GENERAL PHYSICAL CONDITIONS

To be determined.

7.21.1.8 CLOSURE METHOD

Not applicable.

7.21.2 WASTE CHARACTERISTICS

7.21.2.1 TYPE OF WASTE

In addition to heavy petroleum hydrocarbons, waste materials generated by the above described operation might contain volatile petroleum constituents such as benzene, xylene, and toluene, and heavy metals. PCBs are possible.

7.21.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in the above description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be tank or product lines leakage. Therefore, the release point is likely to be below grade. Surface infiltration of rain water can transport these wastes into the soil and ground water.

7.21.2.3 TOXICOLOGICAL CHARACTERISTICS

Used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, or damage to nerves, liver, or kidney.

7.21.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.21.3 MIGRATION PATHWAYS

7.21.3.1 GEOLOGIC SETTING

See Section 3.2.

7.21.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.21.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.21.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.21.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the waste oils and fluids at this location would likely be released into the soil mass around and under the tank. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the groundwater surface.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the UST system at SWMU No. 21 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the UST at this SWMU are slightly soluble in water and would be transported generally down gradient with the flow of ground water.

SUBSURFACE GAS

Migration of POL VOCs is possible if a release has occurred.

7.21.4 CONTAMINANT RELEASE IDENTIFICATION

7.21.4.1 PRIOR INSPECTION REPORTS

None available.

7.21.4.2 PUBLIC COMPLAINTS

None.

7.21.4.3 MONITORING/SAMPLING DATA

None available.

7.21.4.4 EVIDENCE OF RELEASE

None observed.

7.21.5 EXPOSURE POTENTIAL

7.21.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, which is far away from the permanent NAS population.

7.21.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.21.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this tank system.

7.21.6 DOCUMENTS REVIEWED

See PRD.

7.21.7 SUMMARIZED DATA GAP

7.21.7.1 SOIL

None available.

7.21.7.2 GROUNDWATER

No available data.

7.21.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.21.7.4 AIR

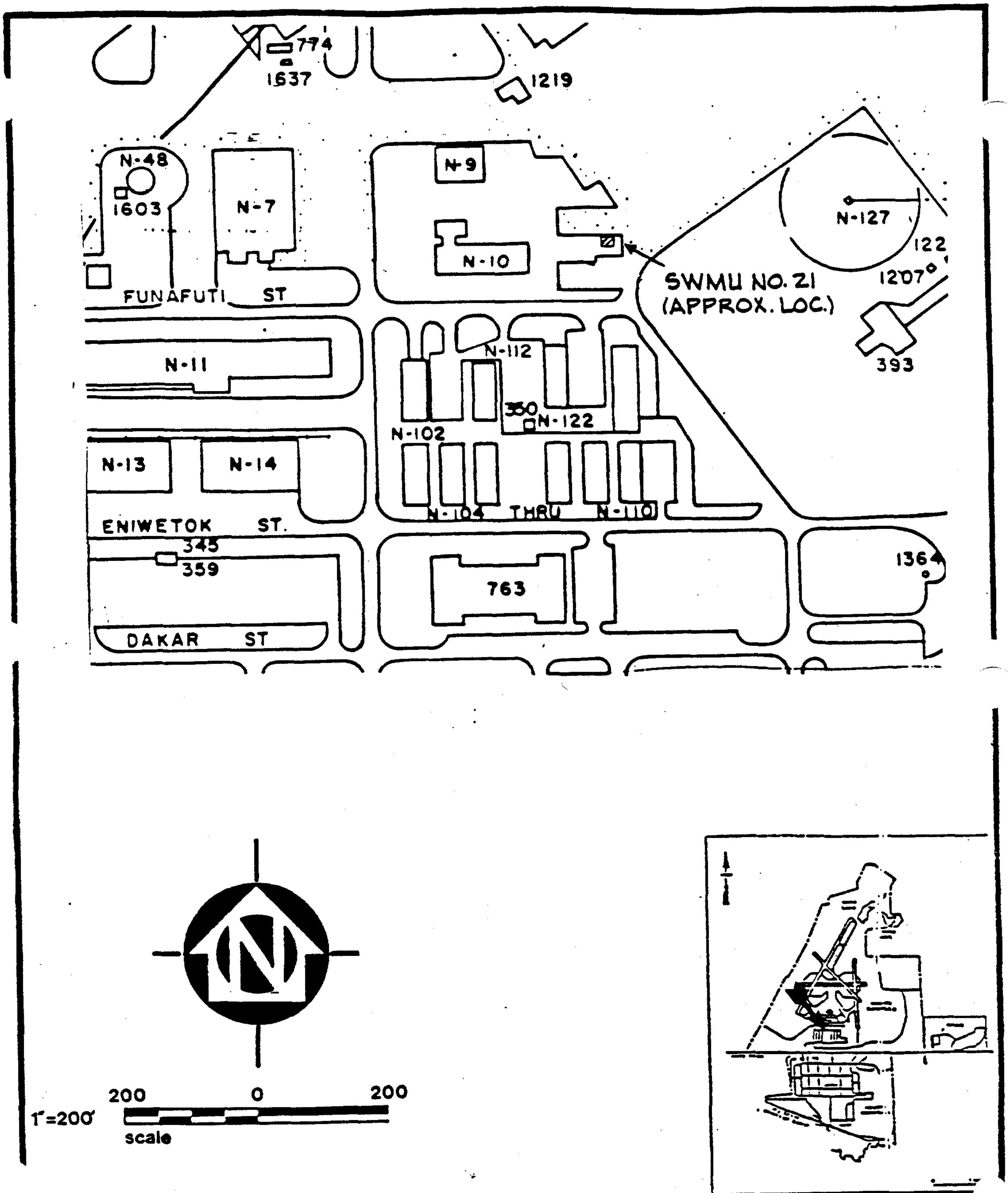
No previous data.

7.21.7.5 SUBSURFACE GAS

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.21.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 21 N-10 UNDERGROUND WASTE TANK
FIGURE 7-21 LOCATION MAP

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7.22 SWMU NO. 22: UNDERGROUND FUEL TANKS AT BUILDING S-75

7.22.1 UNIT CHARACTERISTICS

7.22.1.1 TYPE OF UNIT

Inactive Underground Tanks

7.22.1.2 DESIGN FEATURES

Two tanks (#1245 and #1246) are 25,000 gallons; one (#1244) is 50,000 gallon; and one is 280 gallons. Tanks large are concrete with steel piping, the small (280 gallon) tank is steel. As-built plans not available; piping diagrams may be available.

7.22.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Underground fuel tanks for Station boiler plan.

7.22.1.4 PERIOD OF OPERATION

The tanks are no longer in use. The boiler plant has not used these tanks since circa 1962. Contents (if any) are unknown. The large tanks may have held No. 6 fuel oil; the small tank held diesel fuel. Tanks were installed in 1942.

7.22.1.5 AGE OF UNIT

Forty-eight years.

7.22.1.6 LOCATION OF UNIT

Building S-75. See Figure 7.22.

7.22.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.22.1.8 CLOSURE METHOD

Unknown.

7.22.2 WASTE CHARACTERISTICS

7.22.2.1 TYPE OF WASTE

The three large tanks hold No. 2 fuel oil. The small tank holds diesel fuel.

7.22.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in the above description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be tank or feed line leakage. Therefore, the release point is likely to be below grade. Surface infiltration of rain water can transport these wastes into the soil and ground water.

7.22.2.3 TOXICOLOGICAL CHARACTERISTICS

Used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, or damage to nerves, liver, or kidney.

No. 6 fuel oil is viscous, and relatively nontoxic. However, prolonged dermal contact can cause tissue damage.

7.22.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.22.3 MIGRATION PATHWAYS

7.22.3.1 GEOLOGIC SETTING

See Section 3.2.

7.22.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.22.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.22.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.22.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the fuel oils at this location would likely be released into the soil mass around and under the tank. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water surface.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the UST system at SWMU No. 22 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the UST at this SWMU are lighter than water and are slightly soluble in water and would be transported generally down gradient with the flow of groundwater.

SUBSURFACE GAS

VOCs from waste POL could migrate if released in sufficient quantity.

7.22.4 CONTAMINANT RELEASE IDENTIFICATION

7.22.4.1 PRIOR INSPECTION REPORTS

Prior inspection report information is shown in Appendix L of the Station's Underground Tank Survey Report.

7.22.4.2 PUBLIC COMPLAINTS

None.

7.22.4.3 MONITORING/SAMPLING DATA

None. Verbal comments by Station personnel indicate tanks may now contain primarily water and fuel oil mixtures.

7.22.4.4 **EVIDENCE OF RELEASE**

None observed.

7.22.5 **EXPOSURE POTENTIAL**

7.22.5.1 **PROXIMITY TO AFFECTED POPULATION**

This SWMU is located in the NAS South Side industrial area, which is far away from the permanent NAS population.

7.22.5.2 **PROXIMITY TO SENSITIVE ENVIRONMENT**

The unit is distant from sensitive environments.

7.22.5.3 **LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS**

It has not been previously determined whether a release of hazardous material has occurred from this tank system.

7.22.6 **DOCUMENTS REVIEWED**

See PRD.

7.22.7 **SUMMARIZED DATA GAP**

7.22.7.1 **SOIL**

None available.

7.22.7.2 **GROUNDWATER**

No available data.

7.22.7.3 **SURFACE WATER/SEDIMENT**

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.22.7.4 **AIR**

No previous data.

7.22.7.5 **SUBSURFACE GAS**

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.22.8 **RECOMMENDED ACTIONS**

Site No. 22 is considered to be an area of concern by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment. Therefore, it will be included for investigation under the Navy's UST program.

7.22.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the fuel oils at this location would likely be released into the soil mass around and under the tank. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water surface.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the UST system at SWMU No. 22 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the UST at this SWMU are lighter than water and are slightly soluble in water and would be transported generally down gradient with the flow of groundwater.

SUBSURFACE GAS

VOCs from waste POL could migrate if released in sufficient quantity.

7.22.4 CONTAMINANT RELEASE IDENTIFICATION

7.22.4.1 PRIOR INSPECTION REPORTS

Prior inspection report information is shown in Appendix L of the Station's Underground Tank Survey Report.

7.22.4.2 PUBLIC COMPLAINTS

None.

7.22.4.3 MONITORING/SAMPLING DATA

None. Verbal comments by Station personnel indicate tanks may now contain primarily water and fuel oil mixtures.

7.22.4.4 EVIDENCE OF RELEASE

None observed.

7.22.5 EXPOSURE POTENTIAL

7.22.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS South Side industrial area, which is far away from the permanent NAS population.

7.22.5.2 PROXIMITY TO SENSITIVE ENVIRONMENT

The unit is distant from sensitive environments.

7.22.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this tank system.

7.22.6 DOCUMENTS REVIEWED

See PRD.

7.22.7 SUMMARIZED DATA GAP

7.22.7.1 SOIL

None available.

7.22.7.2 GROUNDWATER

No available data.

7.22.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.22.7.4 AIR

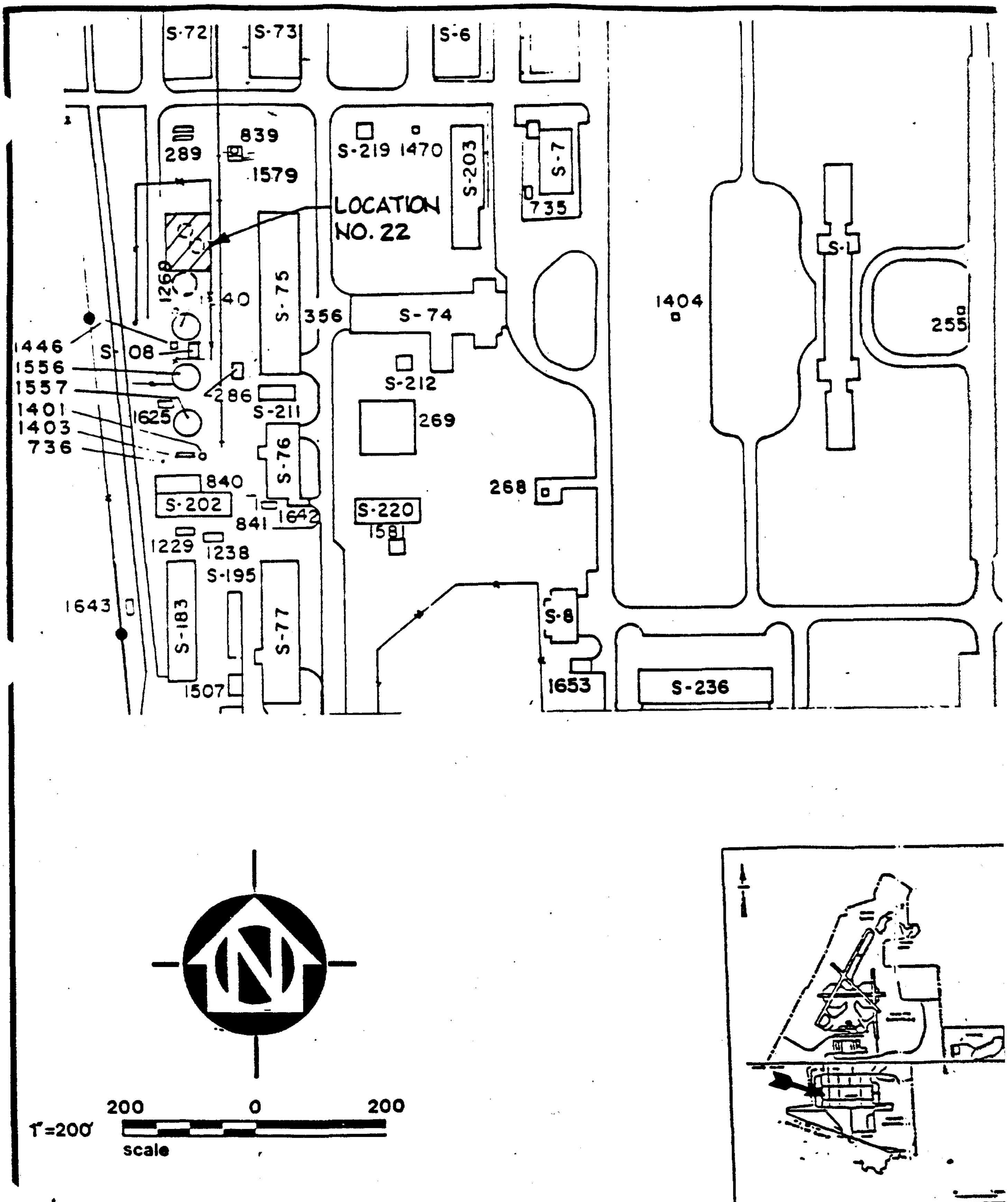
No previous data.

7.22.7.5 SUBSURFACE GAS

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.22.8 RECOMMENDED ACTIONS

Site No. 22 is considered to be an area of concern by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment. Therefore, it will be included for investigation under the Navy's UST program.



LOC. NO. 22 S-75 UNDERGROUND TANK
FIGURE 7-22 LOCATION MAP

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7.23 SWMU NO. 23: UNDERGROUND FUEL TANK AT BUILDING S-8

7.23.1 UNIT CHARACTERISTICS

7.23.1.1 TYPE OF UNIT

Inactive underground storage tank.

7.23.1.2 DESIGN FEATURES

The tank capacity is 500 gallons; tank and piping are steel.

7.23.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Storage of fuel prior to use. Fuel is no longer needed.

7.23.1.4 PERIOD OF OPERATION

No longer in use. The tank is no longer required and the Station intends to declare the contents to be surplus. The tank was installed in 1944.

7.23.1.5 AGE OF UNIT

Forty-six years.

7.23.1.6 LOCATION OF UNIT

Building S-8; See Figure 7-23.

7.23.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.23.1.8 CLOSURE METHOD

Not applicable.

7.23.2 WASTE CHARACTERISTICS

7.23.2.1 TYPE OF WASTE

Diesel fuel.

7.23.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be leaking underground tanks or feed line. Therefore, the release point is likely to be below grade. Surface infiltration of rain water can transport these wastes into the soil and ground water.

7.23.2.3 TOXICOLOGICAL CHARACTERISTICS

Diesel fuel (No. 2 fuel oil) is a light oil consisting primarily of long-chain hydrocarbons (unbranched paraffins); it may contain sodium dichromate (corrosion inhibitor). It is generally regarded as being low in toxicity.

7.23.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Diesel fuel could be present in the tank as a liquid and/or sludge. Fluid that had leaked to the underlying soil could be present as saturated soil.

7.23.3 MIGRATION PATHWAYS

7.23.3.1 GEOLOGIC SETTING

See Section 3.2.

7.23.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.23.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.23.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.23.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the waste oils and fluids at this location would likely be released into the soil mass around and beneath the tank. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water surface.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the UST system at SWMU No. 23 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the UST at this SWMU are lighter than water and slightly soluble in water. They would be transported generally down gradient with the flow of ground water.

SUBSURFACE GAS

VOCs from POL could migrate if released in sufficient quantity.

7.23.4 CONTAMINANT RELEASE IDENTIFICATION

7.23.4.1 PRIOR INSPECTION REPORTS

Information is shown in Appendix L of the Station's Underground Tank Survey Report.

7.23.4.2 PUBLIC COMPLAINTS

None.

7.23.4.3 MONITORING/SAMPLING DATA

Information is shown in Appendix L of the Station's Underground Tank Survey Report.

7.23.4.4 EVIDENCE

None.

7.23.5 EXPOSURE POTENTIAL

7.23.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS South Side industrial area, which is far away from the permanent NAS population.

7.23.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.23.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this tank system.

7.23.6 DOCUMENTS REVIEWED

See PRD.

7.23.7 SUMMARIZED DATA GAP

7.23.7.1 SOIL

None available.

7.23.7.2 GROUNDWATER

No available data.

7.23.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.23.7.4 AIR

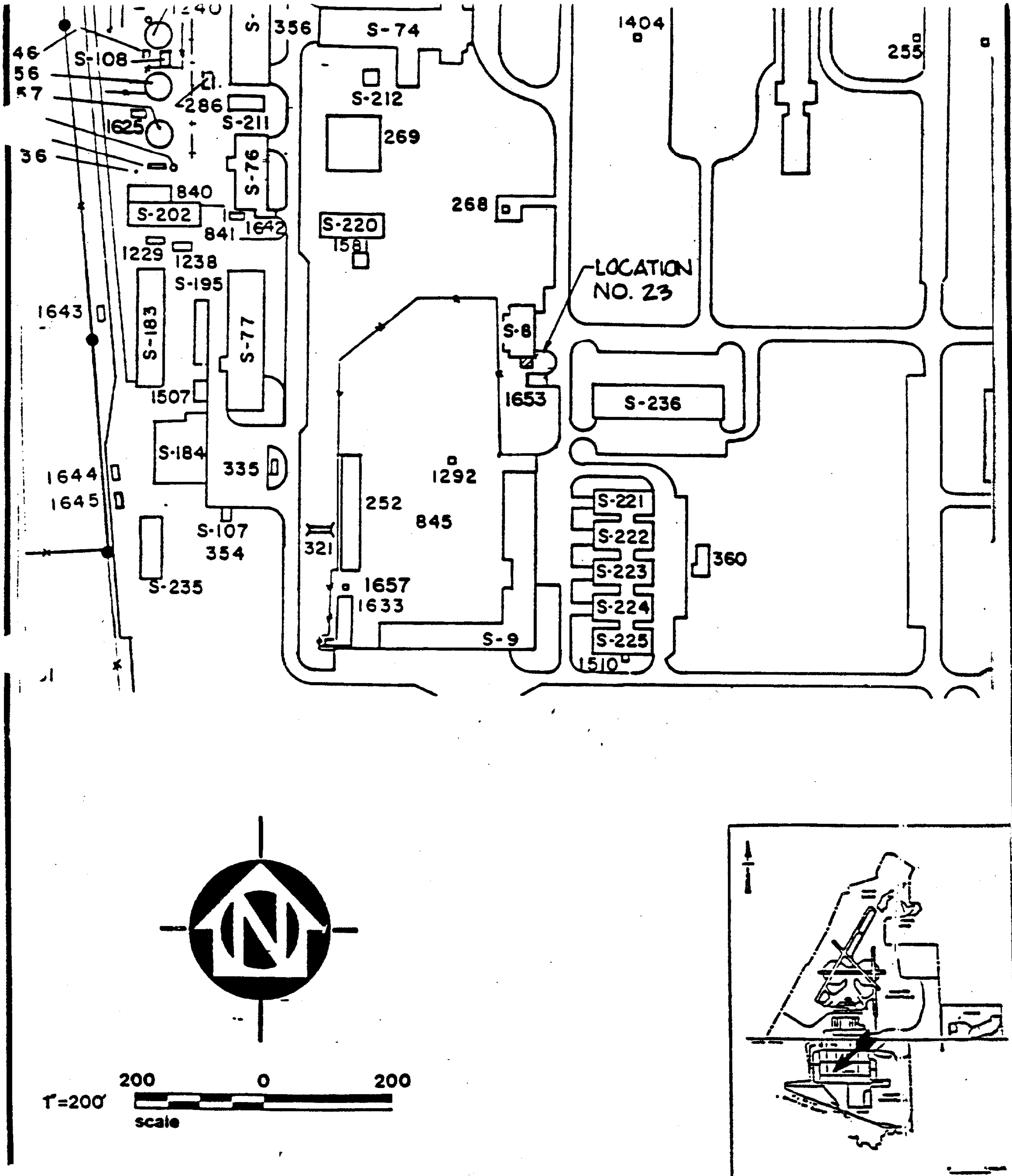
No previous data.

7.23.7.5 SUBSURFACE GAS

No previous data. Air Monitoring is not needed for this SWMU.

7.23.8 RECOMMENDED ACTIONS

Site No. 23 has been determined to be an "area of concern" by SOUTHDIV NAVFACENGCOM, EPA Region IV, and Tennessee Department of Health and Environment. Therefore, it will be included for investigation under the Navy's UST program.



LOC. NO. 23 S-8 UNDERGROUND WASTE TANK
FIGURE 7-23 LOCATION MAP

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7.24 SWMU NO. 24: AUTO HOBBY SHOP WASTE OIL TANKS-BUILDING N-114

7.24.1 UNIT CHARACTERISTICS

7.24.1.1 TYPE OF UNIT

Inactive waste oil tanks.

7.24.1.2 DESIGN FEATURES

Two, 500-gallon above-ground tanks.

7.24.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Building N-114 is the Station Auto Hobby Shop which is utilized by base personnel to repair their vehicles. Work performed at this location is "do it yourself" (DIY), and waste oils and fluids are deposited in the two previously mentioned tanks.

7.24.1.4 PERIOD OF OPERATION

Unknown.

7.24.1.5 AGE OF UNIT

Unknown.

7.24.1.6 LOCATION OF UNIT

The N-114 waste oil tanks consist of two, 500-gallon above-ground tanks located near Building N-114. See Figure 7-24.

7.24.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.24.1.8 CLOSURE METHOD

Not applicable.

7.24.2 WASTE CHARACTERISTICS

7.24.2.1 TYPE OF WASTE

According to Department of the Navy information, various waste oils and fluids are stored in these tanks. These wastes would include automotive non-lubricating oils, lubricating oils, grease and hydraulic fluids.

7.24.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be leaking tanks or product lines. Therefore, the release point is likely to be above grade. Rain water runoff can transport these wastes along the ground surface for dispersion/redeposition downgradient.

7.24.2.3 TOXICOLOGICAL CHARACTERISTICS

Used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, or damage to nerves, liver, or kidney.

7.24.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semiliquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.24.3 MIGRATION PATHWAYS

7.24.3.1 GEOLOGIC SETTING

See Section 3.2.

7.24.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.24.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.24.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. General surface drainage is toward the south and west, with local variations.

7.24.3.5 PATHWAYS

AIR

Because no surface releases of waste oil are evident at this location, it is felt that air is not a transport mechanism.

SOIL

Should a leak exist, hazardous constituents of the waste oils and fluids at this location would likely be released into the pavement beneath the tank. Any leak would be readily apparent and limited to maximum volume of the tank(s) involved. Soil is not an applicable migration pathway for this unit.

<u>**SURFACE WATER/SEDIMENT**</u>

Preliminary evaluation of the tanks at SWMU No. 24 indicates no points of appreciable surface contamination. Therefore, the likelihood of surface water transport is remote.

<u>**GROUNDWATER**</u>

Contaminants contained in the tank at this SWMU are slightly soluble in water and would be transported generally down gradient with the flow of surface water.

<u>**SUBSURFACE GAS**</u>

Not applicable. Source is relatively small and located above-ground over pavement.

7.24.4 CONTAMINANT RELEASE IDENTIFICATION

7.24.4.1 PRIOR INSPECTION REPORTS

None available.

7.24.4.2 PUBLIC COMPLAINTS

None.

7.24.4.3 MONITORING/SAMPLING DATA

None available.

7.24.4.4 EVIDENCE OF RELEASE

This facility is utilized by NAS employees on an unsupervised basis. Surface oil stains were visible around the subject tanks. An investigation plan would include one sample point located at the point of most significant staining.

7.24.5 EXPOSURE POTENTIAL

7.24.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS North Side industrial area, distant from the permanent NAS population.

7.24.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.24.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a significant release of hazardous material has occurred from this tank system.

7.24.6 DOCUMENTS REVIEWED

See PRD.

7.24.7 SUMMARIZED DATA GAP

7.24.7.1 SOIL

None available.

7.24.7.2 GROUNDWATER

No available data.

7.24.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.24.7.4 AIR

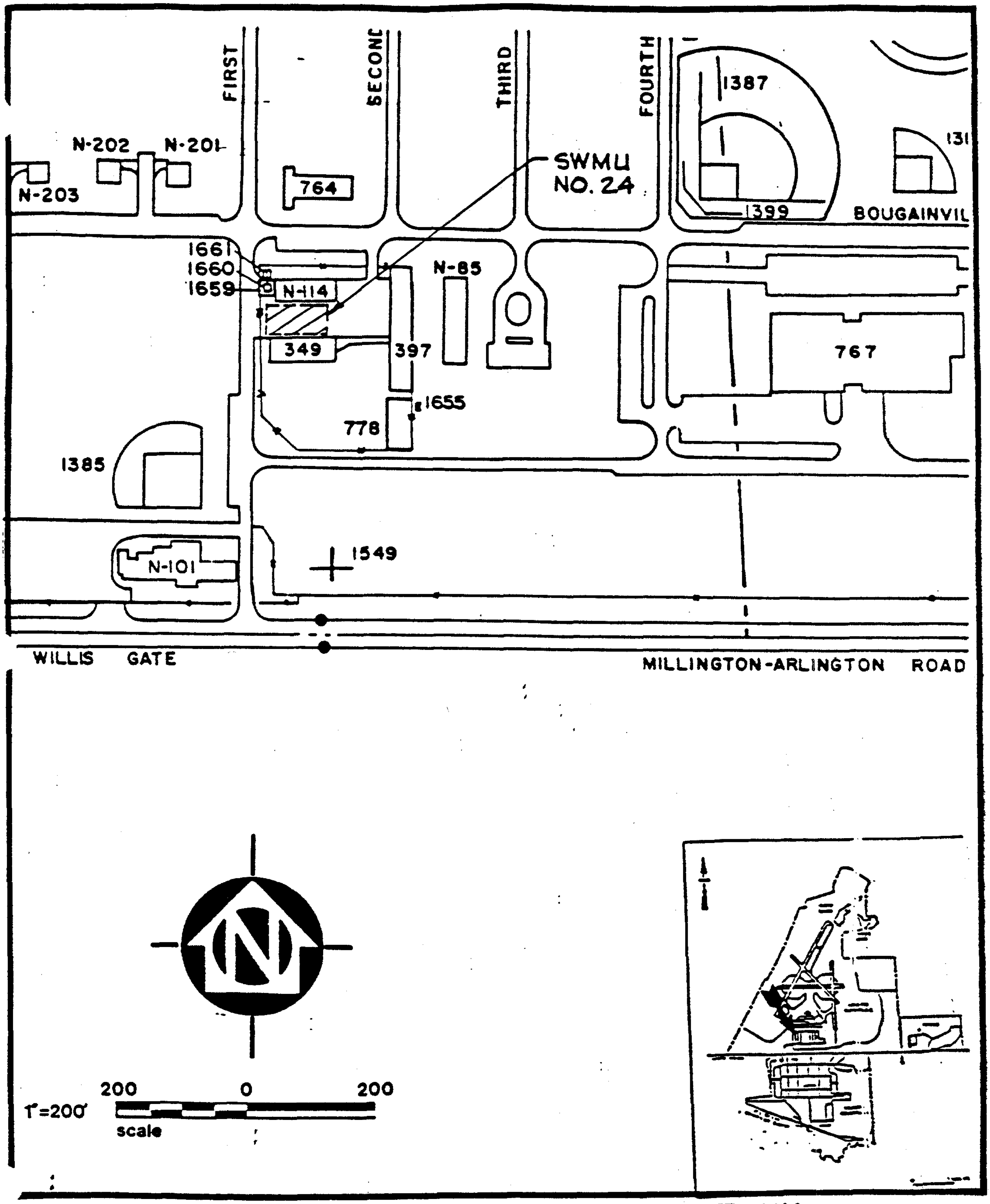
No previous data.

7.24.7.5 SUBSURFACE GAS

No previous data. Gas sampling is not needed for this SWMU.

7.24.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 24 AUTO SHOP WASTE OIL TANK
FIGURE 7-24 LOCATION MAP

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7.25 SWMU NO. 25: BIG CREEK DEMOLITION LANDFILL

7.25.1 UNIT CHARACTERISTICS

7.25.1.1 TYPE OF UNIT

Landfill.

7.25.1.2 DESIGN FEATURES

The boundaries and the depth of the landfill are unknown.

7.25.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Operation began in the 1960s with the intention of stabilizing the levee by allowing contractors to dispose of construction debris along the sides of the banks.

7.25.1.4 PERIOD OF OPERATION

This practice began in the 1960s and continued into the 1970s.

7.25.1.5 AGE OF UNIT

Approximately 25-30 years.

7.25.1.6 LOCATION OF UNIT

The Big Creek Demolition Landfill is located at the Big Creek Levee as indicated in Figure 7-25.

7.25.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.25.1.8 CLOSURE METHOD

Not applicable.

7.25.2 WASTE CHARACTERISTICS

7.25.2.1 TYPE OF WASTE

Known wastes at the landfill include construction/demolition debris such as concrete, steel, and asphalt. There exists no evidence or knowledge of any hazardous waste disposal at the site.

7.25.2.2 MIGRATION CHARACTERISTICS

All wastes deposited within the landfill should remain stationary within the landfill unit. Liquid wastes, if present, could move both downward and horizontally, depending upon the proximity of the groundwater table and existing subsurface conditions. Any gases generated during waste decomposition will follow the path of least resistant through the ground or atmosphere.

7.25.2.3 <u>TOXICOLOGICAL CHARACTERISTICS</u>

Not applicable for construction debris.

7.25.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

Inert materials are expected in the SWMU.

7.25.3 <u>MIGRATION PATHWAYS</u>

7.25.3.1 <u>GEOLOGIC SETTING</u>

See Section 3.2.

7.25.3.2 <u>HYDROGEOLOGIC SETTING</u>

See Section 3.3.

7.25.3.3 <u>ATMOSPHERIC CONDITIONS</u>

See Section 4.0.

7.25.3.4 <u>TOPOGRAPHIC CHARACTERISTICS</u>

See Section 3.1 for general information. The unit lies along Big Creek Drainage Canal, which flows to the west.

7.25.3.5 <u>PATHWAYS</u>

<u>AIR</u>

Due to the nature of the wastes presumed to be deposited within the landfill, testing of the air is not warranted. Furthermore, as an inactive demolition landfill, previous deposition of wastes which may be hazardous if airborne would no longer pose a threat to health or safety.

<u>SOIL</u>

Because of the nature of material landfilled, soil contamination is unlikely. Any small, localized "hot spots" of contamination that could exist would not pose a migration problem.

<u>SURFACE WATER/SEDIMENT</u>

Because of the nature of material landfilled, soil contamination is unlikely. If hazardous constituents are present within the landfill area as "hot spots", contamination of the surface water and sediment via groundwater transport unlikely.

GROUNDWATER

Because of the nature of the material landfilled, groundwater contamination is unlikely.

SUBSURFACE GAS

Biodegradable materials typically disposed of in demolition landfills generally do not constitute a significance source of methane.

7.25.4 CONTAMINANT RELEASE IDENTIFICATION

7.25.4.1 PRIOR INSPECTION REPORTS

None.

7.25.4.2 PUBLIC COMPLAINTS

None.

7.25.4.3 MONITORING/SAMPLING DATA

None available.

7.25.4.4 EVIDENCE OF RELEASE

None observed.

7.25.5 EXPOSURE POTENTIAL

7.25.5.1 PROXIMITY TO AFFECTED POPULATION

The unit is close to the Big Creek. The location of this SWMU is in a remote area far away from the NAS residential area.

7.25.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.25.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

None expected.

7.25.6 DOCUMENTS REVIEWED

See PRD.

7.25.7 <u>SUMMARIZED DATA GAP</u>

7.25.7.1 <u>AIR</u>

No data available, nor needed, for this unit.

7.25.7.2 <u>SOIL</u>

No data available; soil boring is not planned.

7.25.7.3 <u>GROUNDWATER</u>

No data available; ground water monitoring is not planned.

7.25.7.4 <u>SURFACE WATER/SEDIMENT</u>

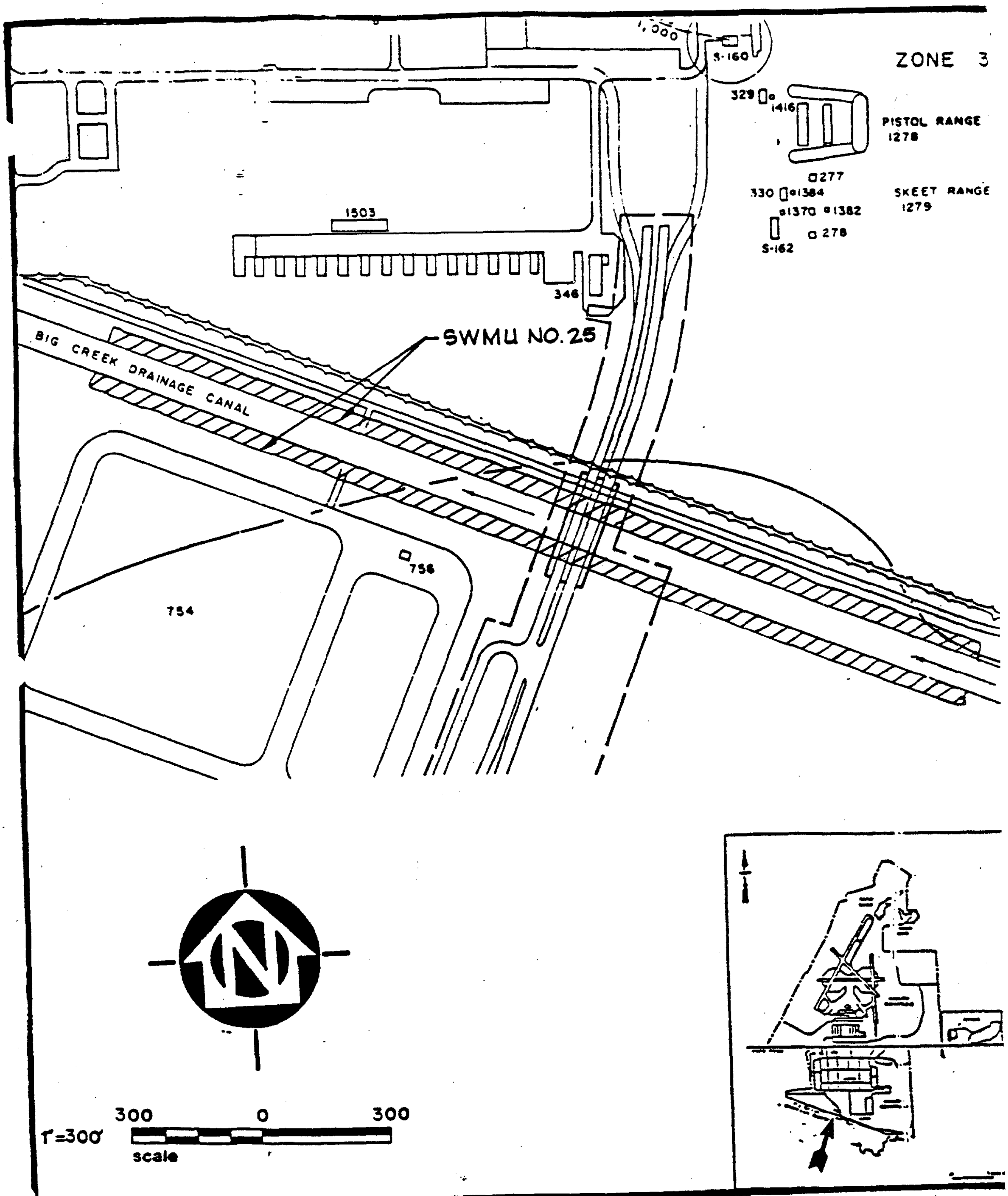
No data available.

7.25.7.5 <u>SUBSURFACE GAS</u>

No data available.

7.25.8 <u>RECOMMENDED ACTIONS</u>

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 25 BIG CREEK LANDFILL
FIGURE 7-25 LOCATION MAP

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7.26 SWMU NO. 26: N-102 BATTERY ACID NEUTRALIZATION UNIT

7.26.1 UNIT CHARACTERISTICS

7.26.1.1 TYPE OF UNIT

Active Treatment Unit

7.26.1.2 DESIGN FEATURES

This unit initially consisted of an obsolete lead-lined sink. There is an underground "water overflow" tank prior to entering the sewer.

7.26.1.3 OPERATING PRACTICE (PAST AND PRESENT)

A lead-lined sink in the building was used to neutralize battery acid prior to discharge to the sewer. This lead-lined sink was removed and replaced by a neoprene (plastic) sink between 1987 and 1989.

7.26.1.4 PERIOD OF OPERATION

Period of operation is 1980 to present.

7.26.1.5 AGE OF UNIT

Ten years.

7.26.1.6 LOCATION OF UNIT

Located at Building N-102, off 5th Avenue on the NAS North Side. See Figure 7-26.

7.26.1.7 GENERAL PHYSICAL CONDITIONS

The current neutralization tank structure is in good condition. Condition and disposition of the earlier lead-lined sink is unknown and not pertinent to this effort.

7.26.1.8 CLOSURE METHOD

Unknown.

7.26.2 WASTE CHARACTERISTICS

7.26.2.1 TYPE OF WASTE

Sulfuric acid and sodium carbonate.

7.26.2.2 MIGRATION CHARACTERISTICS

The waste constituents may be mobile under acidic condition.

7.26.2.3 TOXICOLOGICAL CHARACTERISTICS

Battery acid contains sulfuric acid in aqueous solution. It is corrosive to tissue on contact. Acid is neutralized with sodium carbonate prior to discharge to the sewer. Heavy metals (lead, zinc, cadmium) may be present in solution.

7.26.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Acid is in liquid form before, during, and after neutralization.

7.26.3 MIGRATION PATHWAYS

Not expected.

7.26.4 CONTAMINANT RELEASE IDENTIFICATION

7.26.4.1 PRIOR INSPECTION REPORTS

Visual inspection reveals area to be clean with no evidence of releases in this area.

7.26.4.2 PUBLIC COMPLAINTS

None.

7.26.4.3 MONITORING/SAMPLING DATA

None available.

7.26.4.4 EVIDENCE OF RELEASE

Visual inspection reveals area to be clean with no evidence of releases.

7.26.5 EXPOSURE POTENTIAL

None.

7.26.6 DOCUMENTS REVIEWED

See PRD.

7.26.7 SUMMARIZED DATA GAPS

7.26.7.1 AIR

No data. Air data is not needed for this unit.

7.26.7.2 **SOIL**

No data. Soil data is not needed for this unit.

7.26.7.3 **GROUNDWATER**

No data. Groundwater data is not needed for this unit.

7.26.7.4 **SURFACE WATER/SEDIMENT**

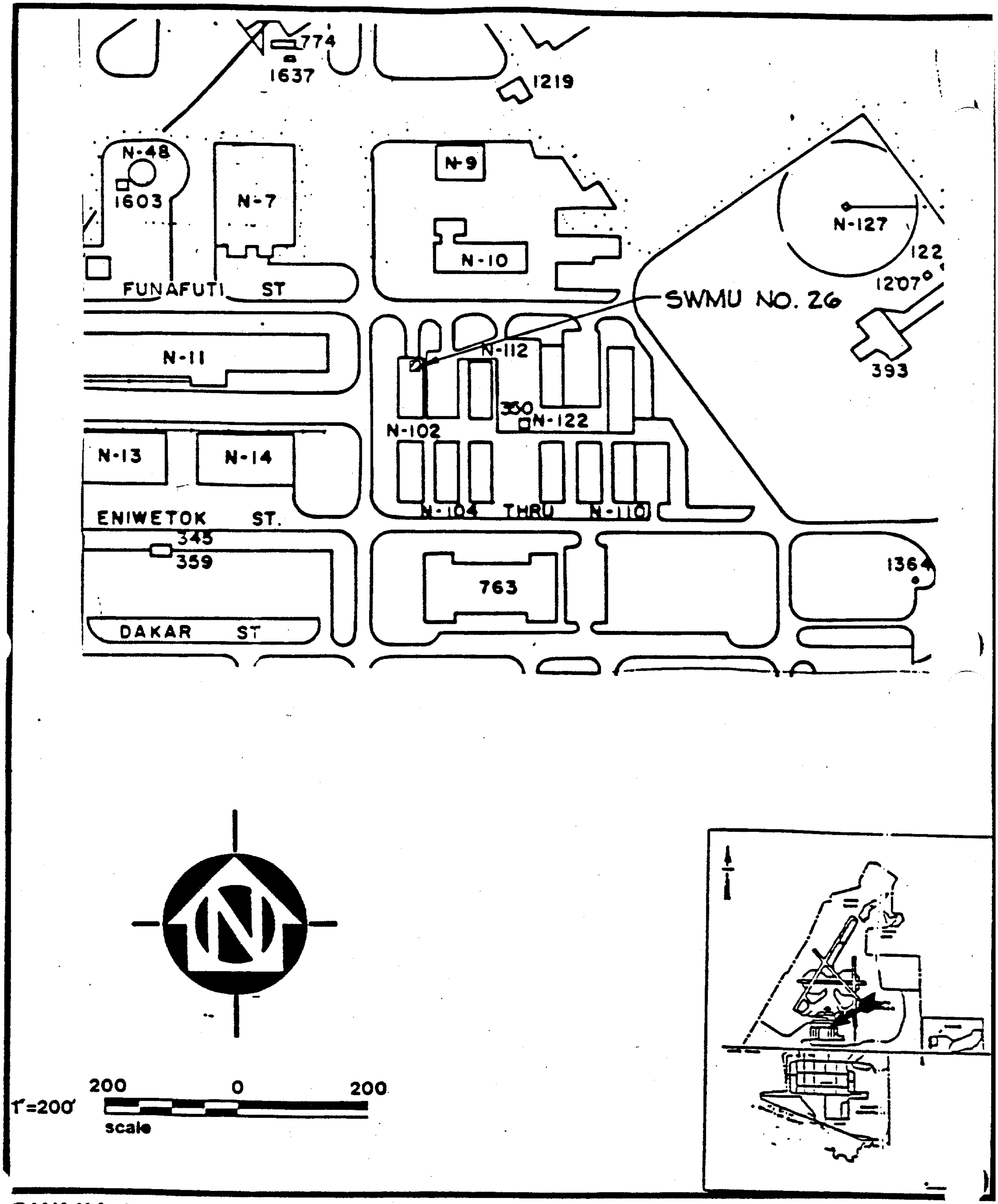
No data. Surface water or sediment data is not needed for this unit.

7.26.7.5 **SUBSURFACE GAS**

No data. Subsurface gas data is not needed for this unit.

7.26.8 **RECOMMENDED ACTIONS**

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 26 N-102 BATTERY ACID TREATMENT
FIGURE 7-26 LOCATION MAP

7.27 SWMU NO. 27: NORTH SIDE SEWAGE TREATMENT PLANT

7.27.1 UNIT CHARACTERISTICS

7.27.1.1 TYPE OF UNIT

Inactive Sewage Treatment Plant (NSSTP). Demolished in mid-1970s.

7.27.1.2 DESIGN FEATURES

The NSSTP included aeration tanks, digesters, polishing tanks and sludge drying beds.

7.27.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Sewage treatment.

7.27.1.4 PERIOD OF OPERATION

The NSSTP operated from 1943 to 1984.

7.27.1.5 AGE OF UNIT

The unit was approximately 41 years of age at time of demolition in 1984.

7.27.1.6 LOCATION OF UNIT

The North Side Sewage Treatment Plant site is located on the NAS North Side Complex on the northwest corner of property on Dakar Street Extended at Outlet Avenue, as shown in Figure 7-27.

7.27.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable (abandoned and demolished facility).

7.27.1.8 CLOSURE METHOD

Demolished on site.

7.27.2 WASTE CHARACTERISTICS

7.27.2.1 TYPE OF WASTE

The sewer system which discharged to the NSSTP served housing and some industrial areas. The industrial areas are presumed to have discharged a variety of oils, solvents, paints and other chemicals in addition to domestic sewage.

7.27.2.2 MIGRATION CHARACTERISTICS

The potential contaminants listed above are reasonably mobile in the environment. If released, they will migrate into the soil. Once in the soil, they will continue to move through it in response to the movement of ground water. Accordingly, the soil mass around the NSSTP and beneath it could be contaminated if a release occurred.

7.27.2.3 TOXICOLOGICAL CHARACTERISTICS

Toxicological characteristics of treated sewage are considerably different from those of the individual waste streams that comprise the incoming sewage. Potential toxic discharges to the system include oils, solvents, and paints. Residual contamination, if any, is probably limited to the sludge drying beds; heavy metals could potentially be present in the soil exposed to supernatant or leachate.

7.27.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contaminants would be present as particulates or adsorbate on soil particles.

7.27.3 MIGRATION PATHWAYS

7.27.3.1 GEOLOGIC SETTING

See Section 3.2.

7.27.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.27.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.27.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area is generaly level with some irregularities. Surface drainage is toward the south and west. A nearby drainage ditch flows to the southwest.

7.27.3.5 PATHWAYS

AIR

Because no surface releases of any hazardous materials are evident at this location, it is felt that air is not a transport mechanism.

SOIL

The potential contaminants listed above are reasonably mobile in the environment. If released, they will migrate into the soil. Once in the soil, they will continue to move through it in response to the movement of ground water. Should a release of hazardous constituents ever occur at this location, contaminants would likely be released into the soil. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water surface. Accordingly, the soil mass around the NSSTP and beneath it should be contaminated if a release has occurred.

SURFACE WATER/SEDIMENT

Visual assessment of SWMU No. 27 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants of interest that may have been contained in this SWMU are probably generally soluble in water and would be transported generally down gradient with the flow of ground water.

SUBSURFACE GAS

Not applicable due to the nature of the unit and time since the unit was deactivated.

7.27.4 CONTAMINANT RELEASE IDENTIFICATION

7.27.4.1 PRIOR INSPECTION REPORTS

None available.

7.27.4.2 PUBLIC COMPLAINTS

None.

7.27.4.3 MONITORING/SAMPLING DATA

None available.

7.27.4.4 **EVIDENCE OF RELEASE**

None.

7.27.5 **EXPOSURE POTENTIAL**

7.27.5.1 **PROXIMITY TO AFFECTED POPULATION**

This SWMU is located in a remote area, which is far away from the permanent NAS population.

7.27.5.2 **PROXIMITY TO SENSITIVE ENVIRONMENTS**

The unit is distant from sensitive environments.

7.27.5.3 **LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS**

It has not been determined whether or not a release of hazardous constituents has ever occurred at the NSSTP. Since the NSSTP served some industrial areas of the NAS, the potential for hazardous constituents to be present in the soil surrounding the NSSTP cannot be discounted.

7.27.6 **DOCUMENTS REVIEWED**

See PRD.

7.27.7 **SUMMARIZED DATA GAP**

7.27.7.1 **SOIL**

None available.

7.27.7.2 **GROUNDWATER**

No available data.

7.27.7.3 **SURFACE WATER/SEDIMENT**

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.27.7.4 **AIR**

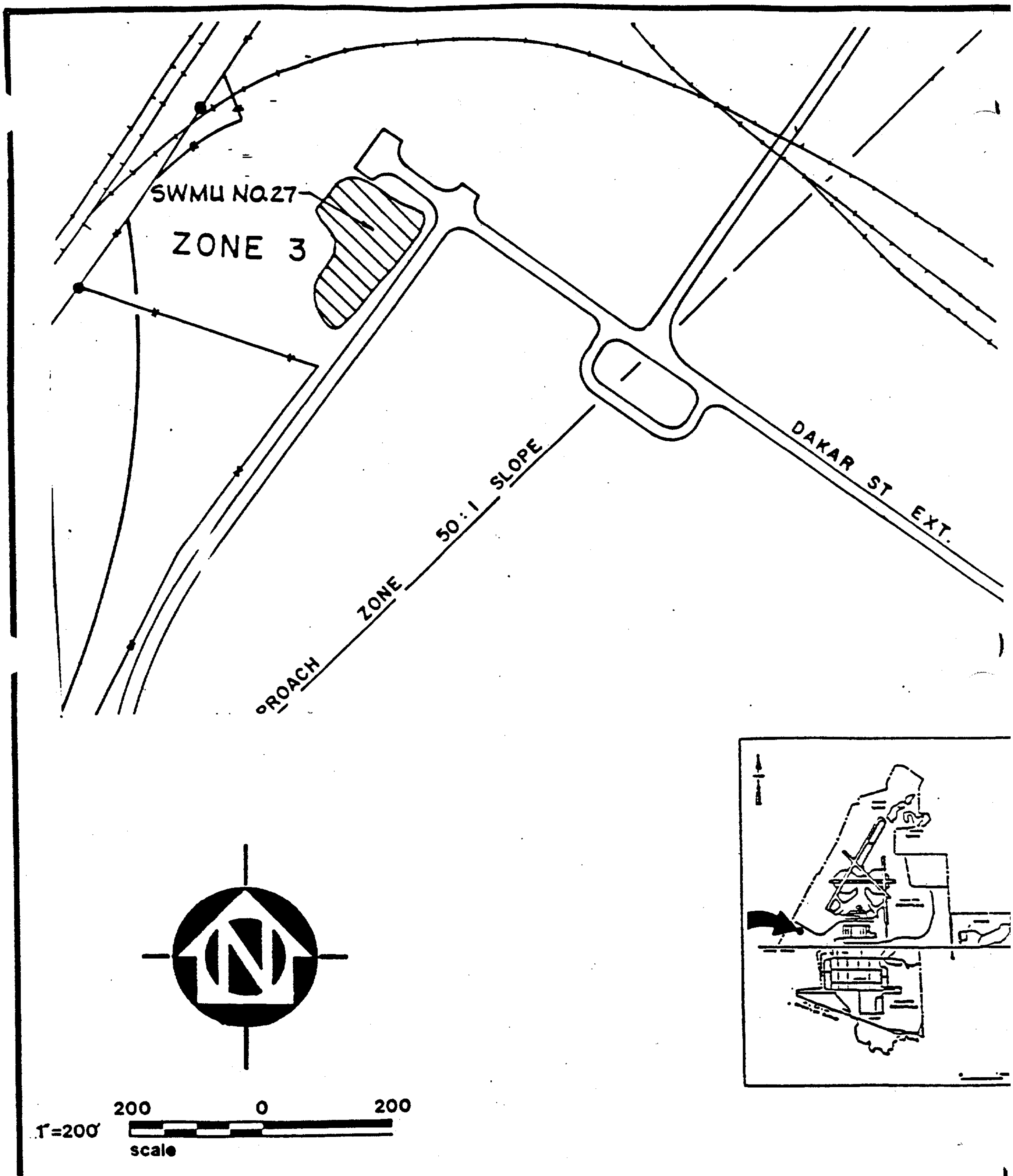
No previous data. Air sampling is not needed for this SWMU.

7.27.7.5 **SUBSURFACE GAS**

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.27.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 27 NORTHSIDE STP
FIGURE 7-27 LOCATION MAP

7.28 SWMU NO. 28: SOUTH SIDE SEWAGE TREATMENT PLANT

7.28.1 UNIT CHARACTERISTICS

7.28.1.1 TYPE OF UNIT

Inactive Sewage Treatment plant.

7.28.1.2 DESIGN FEATURES

The SSSTP included primary setting tanks, trickling filters, final setting tanks and sludge drying beds.

7.28.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Sewage treatment (1943 to 1984). Unit no longer exists.

7.28.1.4 PERIOD OF OPERATION

The SSSTP operated from 1943 to 1984.

7.28.1.5 AGE OF UNIT

Forty-one years at time of discontinued use; 47 years for site.

7.28.1.6 LOCATION OF UNIT

The South Side Sewage Treatment Plant was located on the NAS South Side Complex at the intersection of the Fifth Avenue and B Street.

7.28.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable (abandoned and demolished facility).

7.28.1.8 CLOSURE METHOD

Abandoned on site and demolished.

7.28.2 WASTE CHARACTERISTICS

7.28.2.1 TYPE OF WASTE

The sewer system which discharged to the SSSTP served housing and some industrial areas. The industrial areas are presumed to have discharged a variety of oils, solvents, paints and other chemicals in addition to domestic sewage.

7.28.2.2 MIGRATION CHARACTERISTICS

The potential contaminants listed above are reasonably mobile in the environment. If released, they will migrate into the soil. Once in the soil, they will continue to move through it in response to the movement of groundwater. Accordingly, the soil mass around the SSSTP and beneath it should be contaminated if a release had occurred.

7.28.2.3 TOXICOLOGICAL CHARACTERISTICS

Toxicological characteristics of treated sewage are considerably different from those of the individual waste streams that comprise the incoming sewage. Potential toxic discharges to the system included oils, solvents, and paints. Residual contamination, if any, is probably limited to the sludge drying beds; heavy metals could potentially be present in the soil exposed to supernatant or leachate.

7.28.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contaminants would be present as particulates or adsorbate on soil particles.

7.28.3 MIGRATION PATHWAYS

7.28.3.1 GEOLOGIC SETTING

See Section 3.2.

7.28.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.28.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.28.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west along drainage ditches.

7.28.3.5 PATHWAYS

AIR

Because no surface releases of any hazardous materials are evident at this location, it is felt that air is not a transport mechanism.

SOIL

The potential contaminants listed above are reasonably mobile in the environment. If released, they will migrate into the soil. Once in the soil, they will continue to move through it in response to the movement of ground water. Should a release of hazardous constituents ever occurred at this location, contaminants would likely be released into the soil. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water surface. Accordingly, the soil mass around the STP and beneath it should be contaminated if a release has occurred.

SURFACE WATER/SEDIMENT

Preliminary evaluation of SWMU No. 28 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in this SWMU are generally soluble in water and would be transported generally down gradient with the flow of ground water.

SUBSURFACE GAS

Methane could have been generated on site beneath sludge drying beds when the unit was active. However, its presence at this time is unlikely.

7.28.4 CONTAMINANT RELEASE IDENTIFICATION

7.28.4.1 PRIOR INSPECTION REPORTS

Sampling results are included in the PRD.

7.28.4.2 PUBLIC COMPLAINTS

None.

7.28.4.3 MONITORING/SAMPLING DATA

Sampling results are included in the PRD.

7.28.4.4 EVIDENCE OF RELEASE

See Site 28 investigation report in PRD.

7.28.5 <u>EXPOSURE POTENTIAL</u>

7.28.5.1 <u>PROXIMITY TO AFFECTED POPULATION</u>

This SWMU is located in a remote area of the NAS, at a distance from the NAS and off-base populations.

7.28.5.2 <u>PROXIMITY TO SENSITIVE ENVIRONMENTS</u>

The unit is distant from sensitive environments.

7.28.5.3 <u>LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS</u>

It has not been determined whether or not a release of hazardous waste has ever occurred at the SSSTP. Since the SSSTP had served some industrial areas of the NAS, the potential for hazardous constituents to be present in the surrounding soil could not be initially discounted. Accordingly, the soil around the SSSTP was sampled.

7.28.7 <u>SUMMARIZED DATA GAP</u>

7.28.7.1 <u>SOIL</u>

Soil samples were collected as described in the <u>Solid Waste Management Unit #28 Sampling Results</u> report completed in January 1989 (See PRD). Analyses were performed Extraction Procedure Toxicity Characteristics (EPTC) metals and the volatile petroleum hydrocarbons benzene, toluene, ethylbenzene, and xylene (BTEX). All results were below detection levels for the analyses performed.

7.28.7.2 <u>GROUNDWATER</u>

No available data; no ground water monitoring of this SWMU is proposed.

7.28.7.3 <u>SURFACE WATER/SEDIMENT</u>

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.28.7.4 <u>AIR</u>

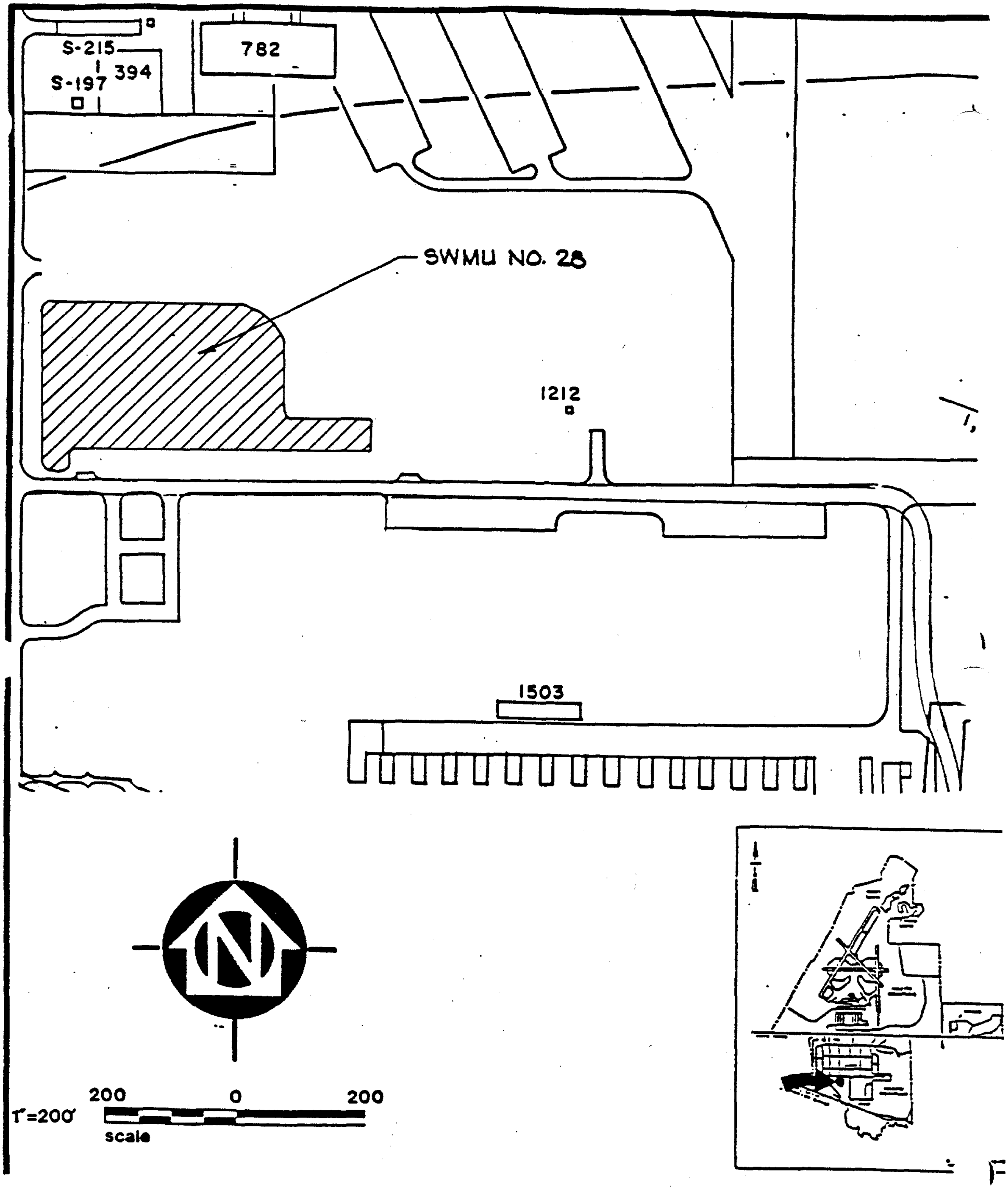
No previous data. Air sampling is not needed for this SWMU.

7.28.7.5 <u>SUBSURFACE GAS</u>

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.28.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 28 SOUTHSIDE STP
FIGURE 7-28 LOCATION MAP

7.29 SWMU NO. 29: LAKEHOUSE SEWAGE TREATMENT PLANT

7.29.1 UNIT CHARACTERISTICS

7.29.1.1 TYPE OF UNIT

Active Sewage Treatment Plant.

7.29.1.2 DESIGN FEATURES

The Lakehouse Sewage Treatment Plant (LSTP) is an OXIGEST package sewage treatment plant. The effluent from this plant discharges to a sanitary drain (leach) field.

7.29.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Domestic sewage treatment for a recreational area.

7.29.1.4 PERIOD OF OPERATION

The LSTP has been operated from 1969 to present.

7.29.1.5 AGE OF UNIT

Twenty-one years.

7.29.1.6 LOCATION OF UNIT

The Lakehouse Sewage Treatment Plant is located on the North Side at a recreational lake site north of the runways. See Figure 7-29.

7.29.1.7 GENERAL PHYSICAL CONDITIONS

The facility is in service.

7.29.1.8 CLOSURE METHOD

Not applicable.

7.29.2 WASTE CHARACTERISTICS

7.29.2.1 TYPE OF WASTE

Domestic sewage is expected.

7.29.2.2 MIGRATION CHARACTERISTICS

The potential contaminants of concern in domestic sewage, (bacteria, viruses, etc), while reasonably mobile in surface water or groundwater are biodegradable and pose a negligible threat of migration. If released, they will migrate into the soil and eventually be biodegraded. No industrial wastes are discharged to this unit.

7.29.2.3 TOXICOLOGICAL CHARACTERISTICS

Not applicable for domestic sewage (conventional parameters, e.g., BOD, TSS).

7.29.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Not applicable.

7.29.3 MIGRATION PATHWAYS

Not applicable.

7.29.4 CONTAMINANT RELEASE IDENTIFICATION

7.29.4.1 PRIOR INSPECTION REPORTS

None available.

7.29.4.2 PUBLIC COMPLAINTS

None.

7.29.4.3 MONITORING/SAMPLING DATA

None available.

7.29.4.4 EVIDENCE OF RELEASE

It has not been determined whether or not a release of hazardous waste has ever occurred at the SSTP. Since the SSTP receives predominantly domestic sewage, no hazardous materials are expected for this SWMU.

7.29.5 EXPOSURE POTENTIAL

7.29.5.1 PROXIMITY TO AFFECTED POPULATIONS

This unit poses no threat to the NAS or off-base population.

7.29.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.29.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Migration of contaminants from this unit to potential receptors is highly unlikely.

7.29.6 DOCUMENTS REVIEWED

See PRD.

7.29.7 SUMMARIZED DATA GAP

7.29.7.1 SOIL

None available. No soil boring is proposed.

7.29.7.2 GROUNDWATER

No available data; no ground water monitoring of this SWMU is proposed.

7.29.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.29.7.4 AIR

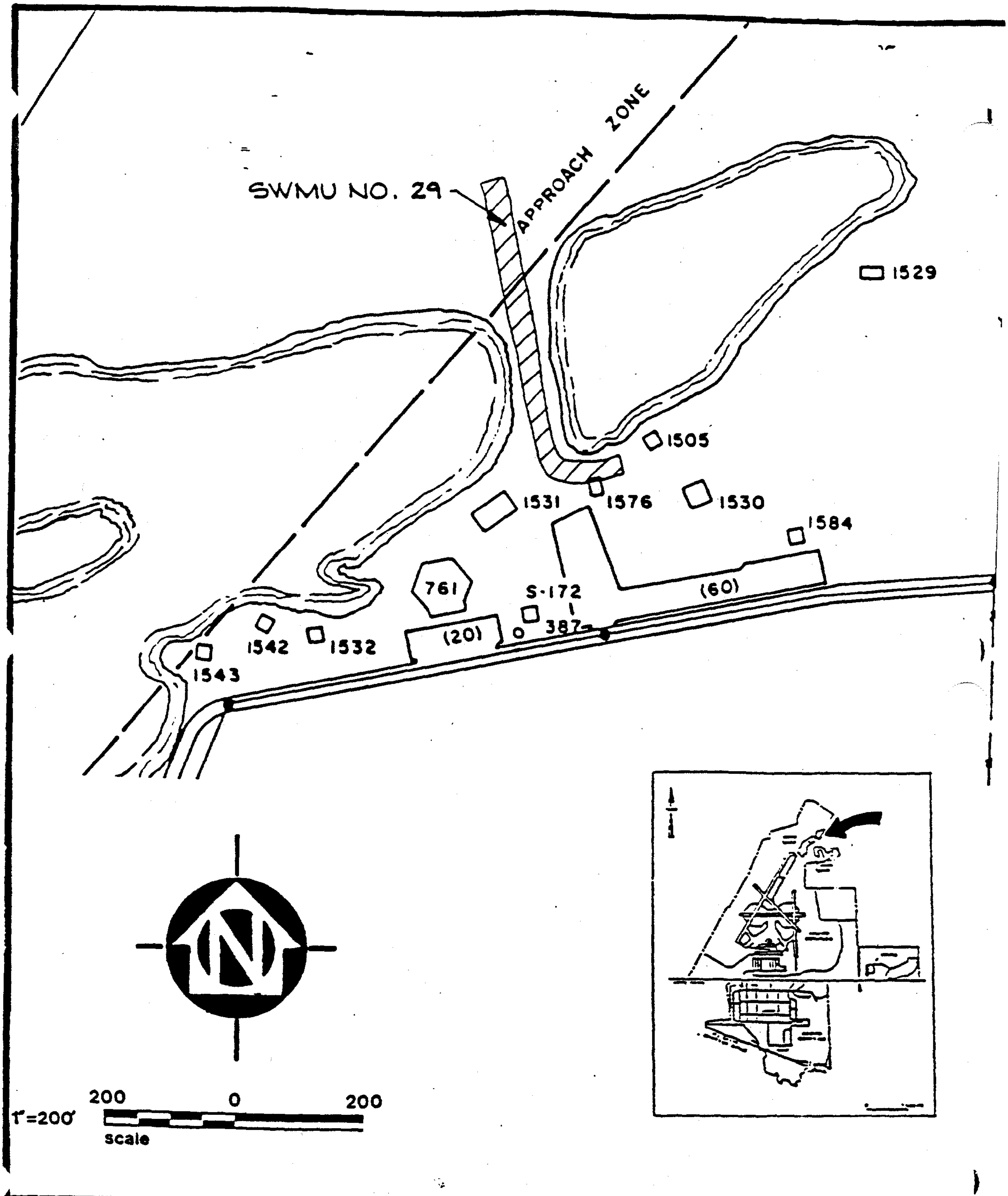
No previous data. Air sampling is not needed for this SWMU.

7.29.7.5 SUBSURFACE GAS

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.29.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 29 LAKEHOUSE STP
FIGURE 7-29 LOCATION MAP

7.30 SWMU NO. 30: PARK FIELD WASTE TREATMENT TANK

7.30.1 UNIT CHARACTERISTICS

7.30.1.1 TYPE OF UNIT

Inactive Sewage Treatment Unit.

7.30.1.2 DESIGN FEATURES

The tank, estimated to have a 36,000 gallons capacity, treated waste by anaerobic decomposition. The plans of the previous Park Field facilities which are available at NAS do not indicate that the tank was connected to a disposal field.

7.30.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Park Field contained more than 60 buildings. These buildings were served by a dedicated sewage system which was connected to an underground tank.

7.30.1.4 PERIOD OF OPERATION

The tank was constructed in 1917 to serve Park Field, an Army aviation training facility. It was used from 1917 until 1942, when NAS Memphis was constructed.

7.30.1.5 AGE OF UNIT

Seventy-three years.

7.30.1.6 LOCATION OF UNIT

The Park Field Waste Treatment Tank is located on the NAS South Side Complex east of building 420, as shown in Figure 7-30.

7.30.1.7 GENERAL PHYSICAL CONDITIONS

Unknown; abandoned unit.

7.30.1.8 CLOSURE METHOD

Abandoned in place.

7.30.2 WASTE CHARACTERISTICS

7.30.2.1 TYPE OF WASTE

The sewer system served the entire Park Field complex. This complex included a complete military maintenance facility for aircraft and ground vehicles. The "industrial" area of the base contained a variety of shops and garages which are presumed to have discharged a variety of oils, solvents, paints and other chemicals in addition to domestic sewage. Because this unit was abandoned in 1942, it is unlikely that synthetic chemicals were a significant portion of the waste stream.

7.30.2.2 MIGRATION CHARACTERISTICS

The potential contaminants listed above are reasonably mobile in the environment. If present, they will migrate from the tank outlet into the soil. Once in the soil, they will continue to move through it in response to the movement of groundwater. Accordingly, the soil mass around the tank and beneath it at the outlet end should be contaminated if a release has occurred.

7.30.2.3 TOXICOLOGICAL CHARACTERISTICS

At present, sewage and toxic organics that may have been discharged to the system have likely been anaerobically decomposed. Residuals could consist of weak organic acids and heavy metals in a sludge matrix. Of primary concern would be methane and/or hydrogen sulfide (if any) trapped inside the tank. At high concentrations, as in a confined space or pit, death by suffocation could result. Explosion could also be possible under certain conditions.

7.30.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Assuming the tank is intact, residuals could be either liquids and sludges, or dried sludge. Methane and hydrogen sulfide are gases.

7.30.3 MIGRATION PATHWAYS

7.30.3.1 GEOLOGIC SETTING

See Section 3.2.

7.30.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.30.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.30.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The immediate area is a level lawn area surrounded by streets and buildings.

7.30.3.5 PATHWAYS

AIR

Because no surface releases of any hazardous materials are evident at this location, it is felt that air is not a transport mechanism.

SOIL

The potential contaminants listed above are reasonably mobile in the environment. If released, they will migrate into the soil. Once in the soil, they will continue to move through it in response to the movement of ground water. Should a release of hazardous constituents ever occurred at this location, contaminants would likely be released into the soil. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water surface. Accordingly, the soil mass around and beneath the unit could be contaminated if a release has occurred.

SURFACE WATER/SEDIMENT

Preliminary evaluation of SWMU No. 30 indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in this SWMU are slightly soluble in water and would be transported generally down gradient with the flow of ground water.

SUBSURFACE GAS

Not applicable due to unit age. If intact, the septic tank could contain trapped gasses.

7.30.4 CONTAMINANT RELEASE IDENTIFICATION

7.30.4.1 PRIOR INSPECTION REPORTS

None available.

7.30.4.2 PUBLIC COMPLAINTS

None.

7.30.4.3 MONITORING/SAMPLING DATA

None available.

7.30.4.4 EVIDENCE OF RELEASE

It has not been determined whether or not a release of hazardous wastes has ever occurred from the Park Field Waste Treatment Tank. Because records of operations at Park Field are so limited, the potential for hazardous constituents to be present in the tank and soil surrounding it cannot be discounted. Accordingly, the soil at the outlet end of the tank should be sampled.

7.30.5 EXPOSURE POTENTIAL

7.30.5.1 PROXIMITY TO AFFECTED POPULATION

The site is in a student (transient) housing area on the NAS.

7.30.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

This unit is distant from sensitive environments.

7.30.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Because of the age, size, prior use, and time since the unit was removed from service, and vertical distance from receptors (via groundwater), migration of residual hazardous or toxic constituents that could be present in the unit to potential receptors is highly unlikely.

7.30.6 DOCUMENTS REVIEWED

See PRD.

7.30.7 SUMMARIZED DATA GAP

7.30.7.1 SOIL

None available.

7.30.7.2 GROUNDWATER

No available data.

7.30.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.30.7.4 AIR

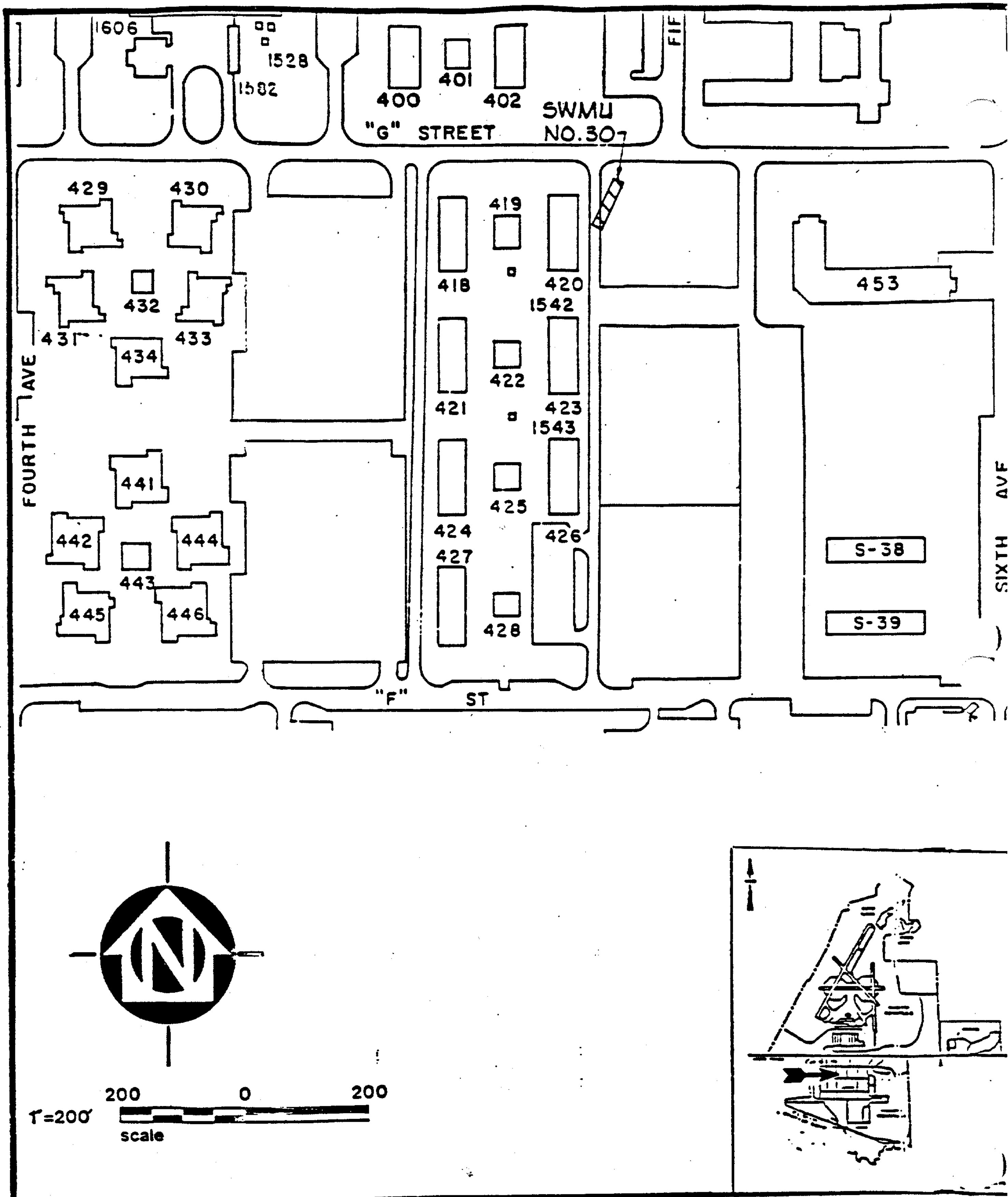
No previous data.

7.30.7.5 <u>SUBSURFACE GAS</u>

No previous data.

7.30.8 <u>RECOMMENDED ACTIONS</u>

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO.30 PARK FIELD WASTE TREATMENT TANK
FIGURE 7-30 LOCATION MAP

7.31 SWMU NO. 31: AIRCRAFT WASH RACK AT 4TH STREET

7.31.1 UNIT CHARACTERISTICS

7.31.1.1 TYPE OF UNIT

Active aircraft maintenance Unit

7.31.1.2 DESIGN FEATURES

This wash rack is used to clean very small amounts of residual corrosion inhibitor treatment chemical from aircraft.

7.31.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The aluminum parts of the aircraft are treated with chromic acid ("alodine") prior to arriving at the wash rack. The aircraft are washed using high pressure detergent water to remove the acid.

7.31.1.4 PERIOD OF OPERATION

The wash rack has been used since 1956 to clean treatment chemical from the aircraft.

7.31.1.5 AGE OF UNIT

33 years.

7.31.1.6 LOCATION OF UNIT

The aircraft wash rack is located in the North Complex at the intersection of Funafuti Street and 4th Street. See Figure 7-31.

7.31.1.7 GENERAL PHYSICAL CONDITIONS

The unit is structurally sound. The unit is presently serviceable, but does not appear to be in routine use.

7.31.1.8 CLOSURE METHOD

Not applicable.

7.31.2 WASTE CHARACTERISTICS

7.31.2.1 TYPE OF WASTE

According to Department of Navy information, dilute chromic acid and detergent were utilized at the wash rack.

7.31.2.2 MIGRATION CHARACTERISTICS

The dilute detergent and chromic acid solution would be relatively mobile in the environment. If not fully contained within the concrete slab of the aircraft wash rack, rainfall runoff or the wash water itself will readily transport contaminants into surface water, sediment, or soil.

7.31.2.3 TOXICOLOGICAL CHARACTERISTICS

Chromic acid is a systemic poison, a carcinogen, and a suspected mutagen. A sufficient concentrations, it is a powerful irritant of the skin, eye, and mucous membranes.

7.31.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

As this SWMU, chromic acid, which is water soluble, would likely be widely dispersed at very low concentrations, probably adsorbed onto concrete and soil particles.

7.31.3 MIGRATION PATHWAYS

7.31.3.1 GEOLOGIC SETTING

See Section 3.2.

7.31.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.31.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.31.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is generally toward the south and west.

7.31.3.5 PATHWAYS

AIR

Due to the nature of the waste, it is felt that air is not a transport mechanism.

SOIL

Should a release of hazardous constituents ever occurred at this location, contaminants would likely be released into the soil. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases from this system would be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the ground water. Accordingly, the soil mass around the unit and beneath it should be contaminated if a release has occurred.

<u>SURFACE WATER/SEDIMENT</u>

Preliminary evaluation of SWMU No.31 suggests the potential of surface contamination is unlikely.

<u>GROUNDWATER</u>

Contaminants contained in this SWMU are slightly soluble in water and would be transported generally down gradient with the flow of ground water.

<u>SUBSURFACE GAS</u>

Not applicable.

7.31.4 CONTAMINANT RELEASE IDENTIFICATION

7.31.4.1 PRIOR INSPECTION REPORTS

None available.

7.31.4.2 PUBLIC COMPLAINTS

None.

7.31.4.3 MONITORING/SAMPLING DATA

None available.

7.31.4.4 EVIDENCE OF RELEASE

None observed.

7.31.5 EXPOSURE POTENTIAL

7.31.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, which is distant from the permanent NAS population.

7.31.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.31.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been determined whether or not a release of hazardous constituents has ever occurred at the unit. Since the structure of the wash rack is in good condition the potential for hazardous constituents to be present in the soil surrounding the unit is low.

7.31.6 DOCUMENTS REVIEWED

See PRD.

7.31.7 SUMMARIZED DATA GAP

7.31.7.1 SOIL

None available.

7.31.7.2 GROUNDWATER

No available data; no ground water monitoring of this SWMU is proposed.

7.31.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling in the storm drainage ditch is not needed for this SWMU.

7.31.7.4 AIR

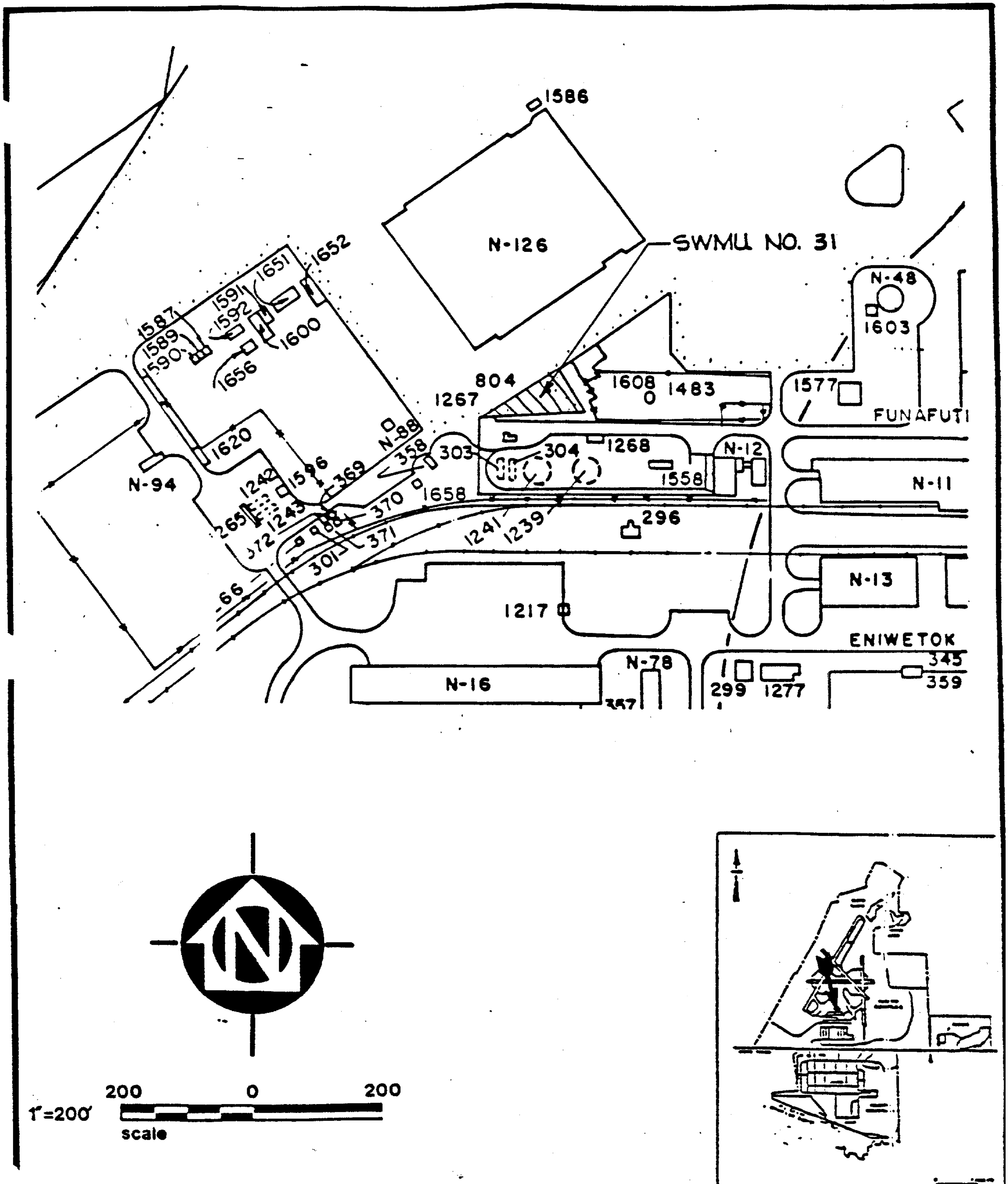
No previous data. Air Monitoring is not needed for this SWMU.

7.31.7.5 SUBSURFACE GAS

No previous data. Air Monitoring is not needed for this SWMU.

7.31.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 31 AIRCRAFT WASH RACK AT 4 TH STREET
FIGURE 7-31 LOCATION MAP

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7.32 SWMU NO. 32: N-7 AIRCRAFT WASH RACK

7.32.1 UNIT CHARACTERISTICS

7.32.1.1 TYPE OF UNIT

Active Aircraft Maintenance Unit.

7.32.1.2 DESIGN FEATURES

The wash rack has been used to clean very small amounts of residual corrosion inhibitor treatment chemical from the aircraft.

7.32.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The aluminum parts of the aircraft are treated with chromic acid ("alodine") prior to arriving at the wash rack. The aircraft are washed using high pressure detergent water to remove the acid.

7.32.1.4 PERIOD OF OPERATION

The wash rack has been used since 1979 to clean treatment chemical from the aircraft.

7.32.1.5 AGE OF UNIT

Twenty-one years.

7.32.1.6 LOCATION OF UNIT

The aircraft wash rack is located north of Building N-7 on the North Complex. The location of the wash rack is shown in Figure 7-32.

7.32.1.7 GENERAL PHYSICAL CONDITIONS

This unit is structurally sound; the unit is currently in service.

7.32.1.8 CLOSURE METHOD

Not applicable.

7.32.2 WASTE CHARACTERISTICS

7.32.2.1 TYPE OF WASTE

According to Department of Navy information, dilute chromic acid and detergent were utilized at the wash rack.

7.32.2.2 MIGRATION CHARACTERISTICS

The dilute detergent and chromic acid solution would be relatively mobile in the environment. If not fully contained within the concrete slab of the aircraft wash rack, rainfall runoff or the wash water itself will readily transport contaminants into surface water, sediment, or soil.

7.32.2.3 TOXICOLOGICAL CHARACTERISTICS

Chromic acid is a systemic poison, a carcinogen, and a suspected mutagen. A sufficient concentration, it is a powerful irritant of the skin, eye, and mucous membranes.

7.32.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

As this SWMU, chromic acid, which is water soluble, would likely be widely dispersed at very low concentrations, probably adsorbed into concrete and soil particles.

7.32.3 MIGRATION PATHWAYS

7.32.3.1 GEOLOGIC SETTING

See Section 3.2.

7.32.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.32.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.32.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is generally toward the south and west.

7.32.3.5 PATHWAYS

AIR

The hazardous waste constituents of concern at SWMU No. 32 do not readily escape into the air medium.

SOIL

If any contamination is transported by surface water runoff, it is likely that a portion of that contamination will be carried into nearby soils in the runoff path.

SURFACE WATER/SEDIMENT

If any surface water runoff from the aircraft wash rack concrete slab did escape into the adjacent drainage ways or ditches, it is probable that contaminants were transported into the nearby streams and/or into sediments. However, the total amount of contaminants released would be insignificant as a public health or environmental hazard.

GROUNDWATER

Should a release of a solution occurred at this location, contaminants would likely be discharged to the soil. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide strong attenuation for these potential contaminants. Minor releases would be attenuated in the soil until natural driving forces are exerted to transport the contaminants to the groundwater.

SUBSURFACE GAS

Not applicable.

7.32.4 CONTAMINANT RELEASE IDENTIFICATION

7.32.4.1 PRIOR INSPECTION REPORTS

None available.

7.32.4.2 PUBLIC COMPLAINTS

None.

7.32.4.3 MONITORING/SAMPLING DATA

None available.

7.32.4.4 EVIDENCE OF RELEASE

None.

7.32.5 EXPOSURE POTENTIAL

7.32.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, which is far away from the permanent NAS population.

7.32.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.32.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been determined whether or not a release of hazardous constituents has ever occurred at the unit. Because the structure of the wash rack is sound, the potential for hazardous constituents, mainly chromium, to be present in the soil surrounding the unit is low.

7.32.6 DOCUMENTS REVIEWED

See PRD.

7.32.7 SUMMARIZED DATA GAP

7.32.7.1 SOIL

None available. Soil sampling is not warranted because of the very small amounts of materials used at any one time or over time.

7.32.7.2 GROUNDWATER

No previous data; Groundwater monitoring of this SWMU is not warranted.

7.32.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not warranted for this SWMU.

7.32.7.4 AIR

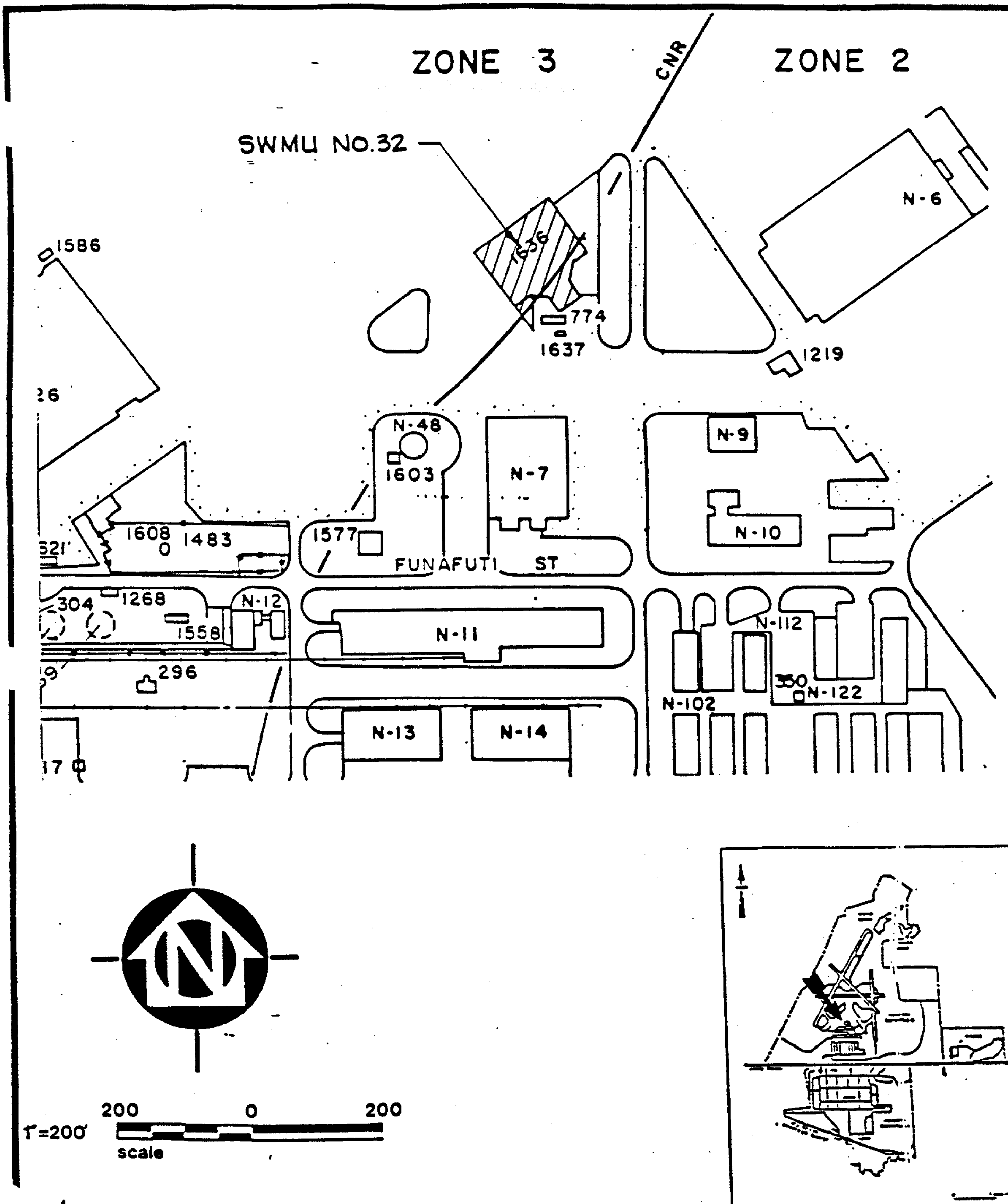
No previous data. Air monitoring is not warranted for this SWMU.

7.32.7.5 SUBSURFACE GAS

No previous data. Subsurface gas monitoring is not warranted for this SWMU.

7.32.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 32 N-7 AIRCRAFT WASH RACK

FIGURE 7-32 LOCATION MAP

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7.33 SWMU NO. 33: H-10 INCINERATOR

7.33.1 UNIT CHARACTERISTICS

7.33.1.1 TYPE OF UNIT

Inactive incinerator.

7.33.1.2 DESIGN FEATURES

Unknown.

7.33.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The incinerator was used to burn pathological waste.

7.33.1.4 PERIOD OF OPERATION

Not determined.

7.33. .5 AGE OF UNIT

N : determined.

7.33. .6 LOCATION OF UNIT

I cinerator Number 1 was located in Building Number 10 in the N val Regional Hospital. The building and incinerator have t en demolished. The attached map (Figure 7-33) shows the l cation of the incinerator building.

7.33. .7 GENERAL PHYSICAL CONDITIONS

N t applicable; this unit is obsolete.

7.33 ..8 CLOSURE METHOD

Unknown.

7.33.2 WASTE CHARACTERISTICS

7.33.2.1 TYPE OF WASTE

Pathological wastes incinerated to ash.

7.33.2.2 MIGRATION CHARACTERISTICS

Wastes of this nature can be mobile in the environment if released. Preliminary investigation of this SWMU does not indicate any release.

7.33.2.3 **TOXICOLOGICAL CHARACTERISTICS**

Refer to Section 6.7 for raw waste and ash characteristics.

7.33.2.4 **PHYSICAL/CHEMICAL CHARACTERISTICS**

Not Applicable. Ash was removed for land disposal.

7.33.3 **MIGRATION PATHWAYS**

7.33.3.1 **GEOLOGIC SETTING**

See Section 3.2.

7.33.3.2 **HYDROGEOLOGIC SETTING**

See Section 3.3.

7.33.. **ATMOSPHERIC CONDITIONS**

S ection 4.0.

7 3.... **TOPOGRAPHIC CHARACTERISTICS**

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level.

7 3.3.5 **PATHWAYS**

AIR

Because no surface release of waste is evident at this location, it is felt that air is not a transport mechanism.

SOIL

Because no surface release of waste is evident at this location, it is felt that soil is not a transport mechanism.

SURFACE WATER/SEDIMENT

Preliminary evaluation of the unit indicates no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Because no surface release of waste is evident at this location, it is felt that soil is not a transport mechanism.

SUBSURFACE GAS

Not applicable.

7.33.4 CONTAMINANT RELEASE IDENTIFICATION

7.33.4.1 PRIOR INSPECTION REPORTS

None available.

7.33.4.2 PUBLIC COMPLAINTS

None.

7.33.4.3 MONITORING/SAMPLING DATA

None available.

7.33.4.4 EVIDENCE OF RELEASE

None documented.

7.33.5 EXPOSURE POTENTIAL

7.33.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in a remote area, which is distant from the permanent NAS population.

7.33.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.33.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this unit.

7.33.6 DOCUMENTS REVIEWED

See PRD.

7.33.7 SUMMARIZED DATA GAP

7.33.7.1 SOIL

None available. No soil boring is proposed.

7.33.7.2 GROUNDWATER

No available data; ground water monitoring is not planned.

7.33.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.33.7.4 AIR

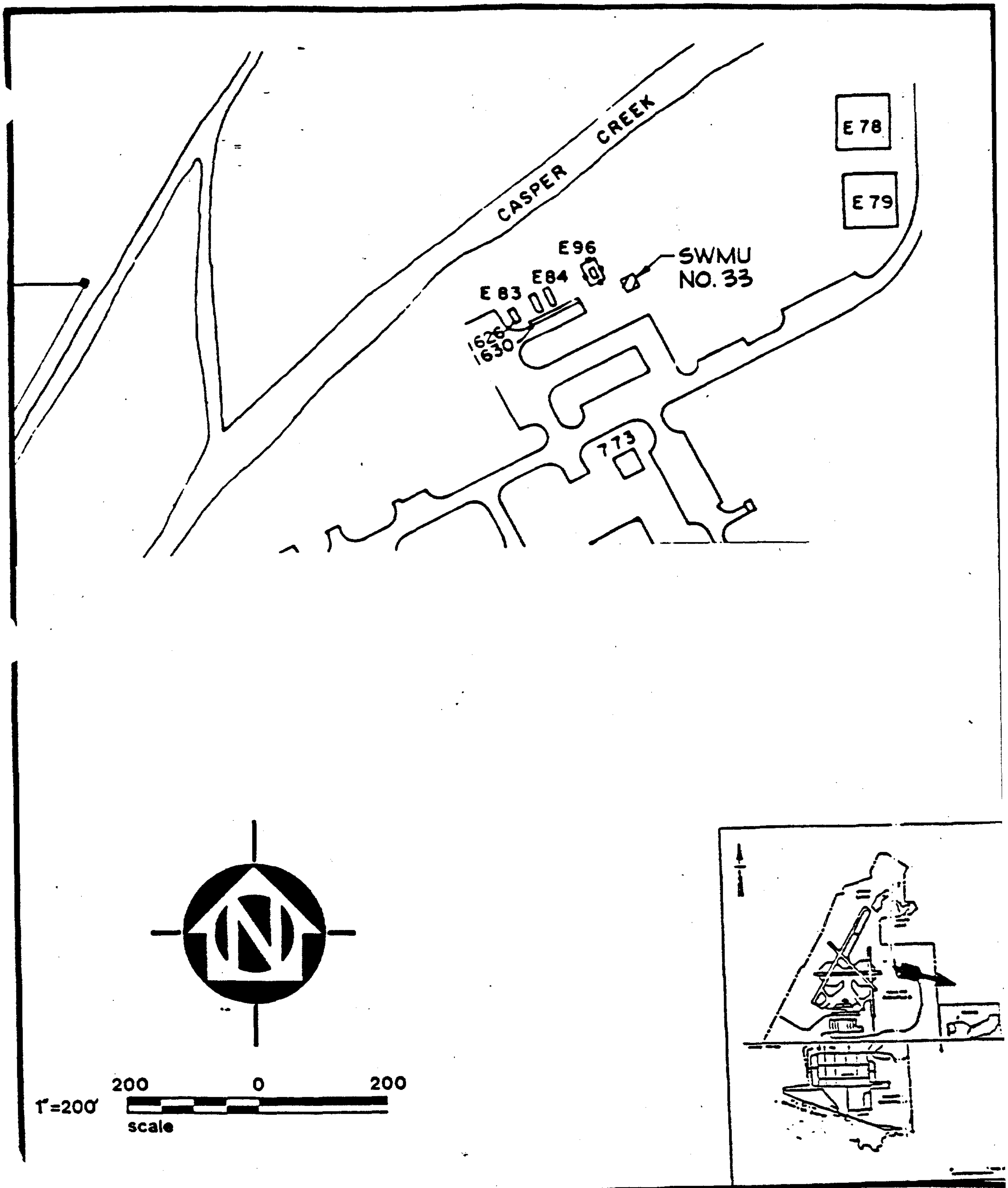
No previous data. Air Monitoring is not needed for this SWMU.

7.33.7.5 SUBSURFACE GAS

No previous data. Subsurface Gas Monitoring is not needed for this SWMU.

7.33.8 RECOMMENDED ACTION

This SWMU has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 33 FIGURE 7-33

H-10 INCINERATOR LOCATION MAP

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7.34 SWMU NO. 34: H-109 INCINERATOR

7.34.1 UNIT CHARACTERISTICS

7.34.1.1 TYPE OF UNIT

Active incinerator.

7.34.1.2 DESIGN FEATURES

Medical waste incinerator.

7.34.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The incinerator is used to burn pathological waste.

7.34.1.4 PERIOD OF OPERATION

Early 1980s to present.

7.34.1.5 AGE OF UNIT

Approx mately 9 years.

7.34.1.6 L CATION OF UNIT

Incine ator No. 2 is located in Building 109 in the Naval Region 1 Hospital area. See Figure 7-34.

7.34.1.7 G NERAL PHYSICAL CONDITIONS

Incine ator is in good condition; the unit is serviceable.

7.34.1.8 C OSURE METHOD

Not applicable.

7.34.2 WASTE CHARACTERISTICS

7.34.2.1 TYPE OF WASTE

Pathological wastes.

7.34.2.2 MIGRATION CHARACTERISTICS

Not applicable.

7.34.2.3 TOXICOLOGICAL CHARACTERISTICS

Refer to Section 6.7 for raw waste and ash information.

7.34.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Ash from the incinerator would be removed for land disposal.

7.34.3 MIGRATION PATHWAYS

Not applicable.

7.34.4 CONTAMINANT RELEASE IDENTIFICATION

7.34.4.1 PRIOR INSPECTION REPORTS

Periodic inspection was conducted by regulatory agency.

7.34.4.2 PUBLIC COMPLAINTS

None.

7.34.4.3 MONITORING/SAMPLING DATA

Limited data.

7.34.4.4 EVIDENCE OF RELEASE

None observed.

7.34.5 EXPOSURE POTENTIAL

7.34.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS Hospital, distant from the residential area.

7.34.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.34.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this unit.

7.34.6 DOCUMENTS REVIEWED

See PRD.

7.34.7 SUMMARIZED DATA GAP

7.34.7.1 SOIL

None available. No soil boring is proposed.

7.34.7.2 GROUNDWATER

No available data; ground water monitoring is not planned.

7.34.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.34.7.4 AIR

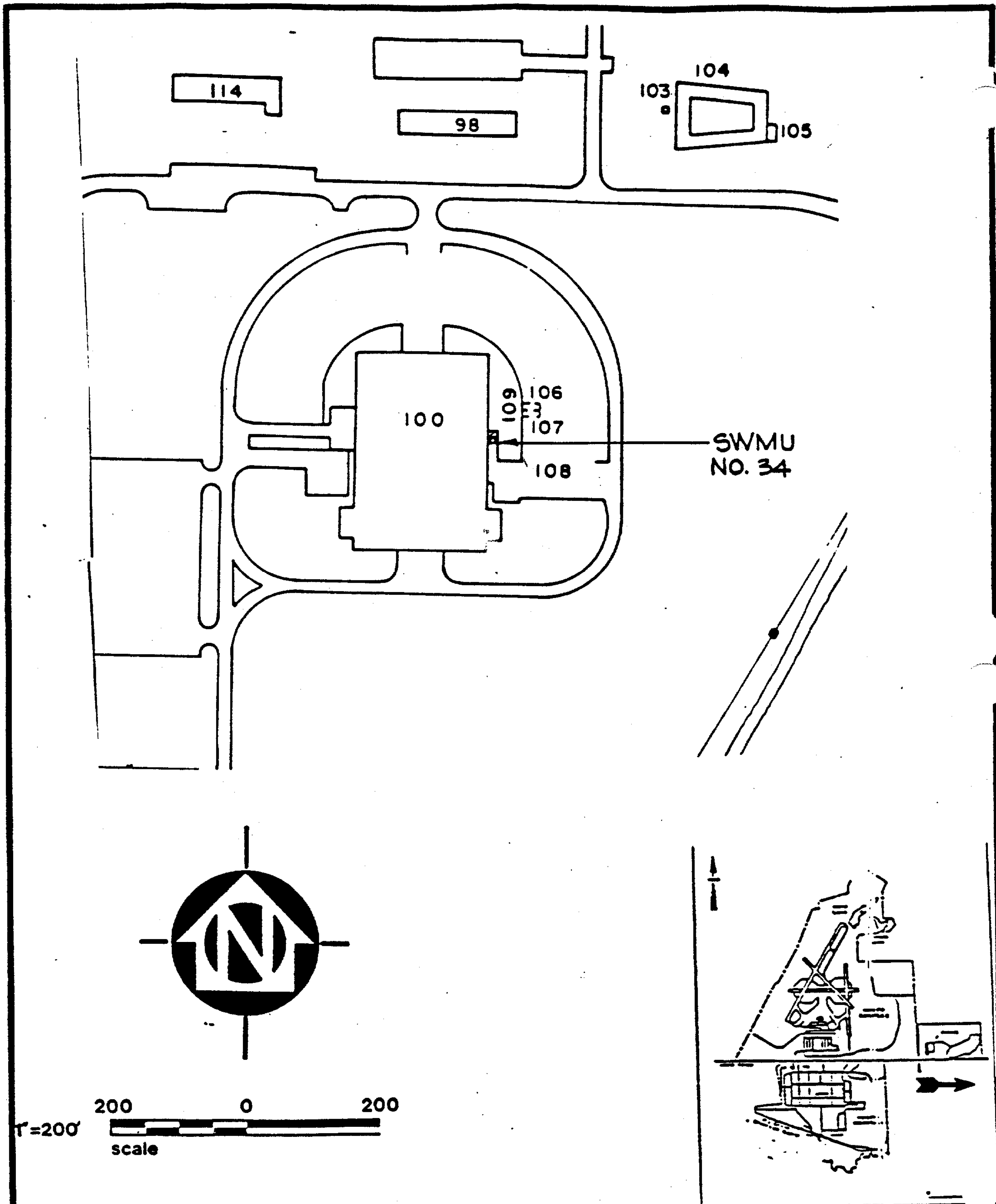
No previous data. Air Monitoring is not needed for this SWMU.

7.34.7.5 SUBSURFACE GAS

No previous data. Subsurface Gas Monitoring is not needed for this SWMU.

7.34.8 RECOMMENDED ACTION

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 34 FIGURE 7-34
H-109 INCINERATOR LOCATION MAP

7.35 SWMU NO. 35: BUILDING 1579 INCINERATOR

7.35.1 UNIT CHARACTERISTICS

7.35.1.1 TYPE OF UNIT

Active incinerator.

7.35.1.2 DESIGN FEATURES

Unknown.

7.35.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Incinerate classified paper and plastic materials.

7.35.1.4 PERIOD OF OPERATION

1970s to present.

7.35.1.5 AGE OF UNIT

Unknown.

7.35.1.6 LOCATION OF UNIT

Building 1579, Northwest of Building S-75, in NAS South Side.

7.35.1.7 GENERAL PHYSICAL CONDITIONS

Good to excellent.

7.35.1.8 CLOSURE METHOD

Not applicable.

7.35.2 WASTE CHARACTERISTICS

7.35.2.1 TYPE OF WASTE

Nonhazardous paper and plastic. Incinerator is used to burn classified materials and plastic identification cards.

7.35.2.2 MIGRATION CHARACTERISTICS

Not applicable to this study.

7.35.2.3 TOXICOLOGICAL CHARACTERISTICS

Nontoxic. Ash is generally caustic.

7.35.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

Ash from combustion of paper and plastic.

7.35.3 <u>MIGRATION PATHWAYS</u>

Not applicable.

7.35.4 <u>CONTAMINANT RELEASE IDENTIFICATION</u>

7.35.4.1 <u>PRIOR INSPECTION REPORTS</u>

None available.

7.35.4.2 <u>PUBLIC COMPLAINTS</u>

None.

7.35.4.3 <u>MONITORING/SAMPLING DATA</u>

None available.

7.35.4.4 <u>EVIDENCE OF RELEASE</u>

None.

7.35.5 <u>EXPOSURE POTENTIAL</u>

None.

7.35.6 <u>DOCUMENTS REVIEWED</u>

See PRD. Notification of Hazardous Waste Site form is available.

7.35.7 <u>SUMMARIZED DATA GAP</u>

7.35.7.1 <u>SOIL</u>

None available. No soil boring is proposed.

7.35.7.2 <u>GROUNDWATER</u>

No available data; ground water monitoring is not planned.

7.35.7.3 <u>SURFACE WATER/SEDIMENT</u>

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.35.7.4 AIR

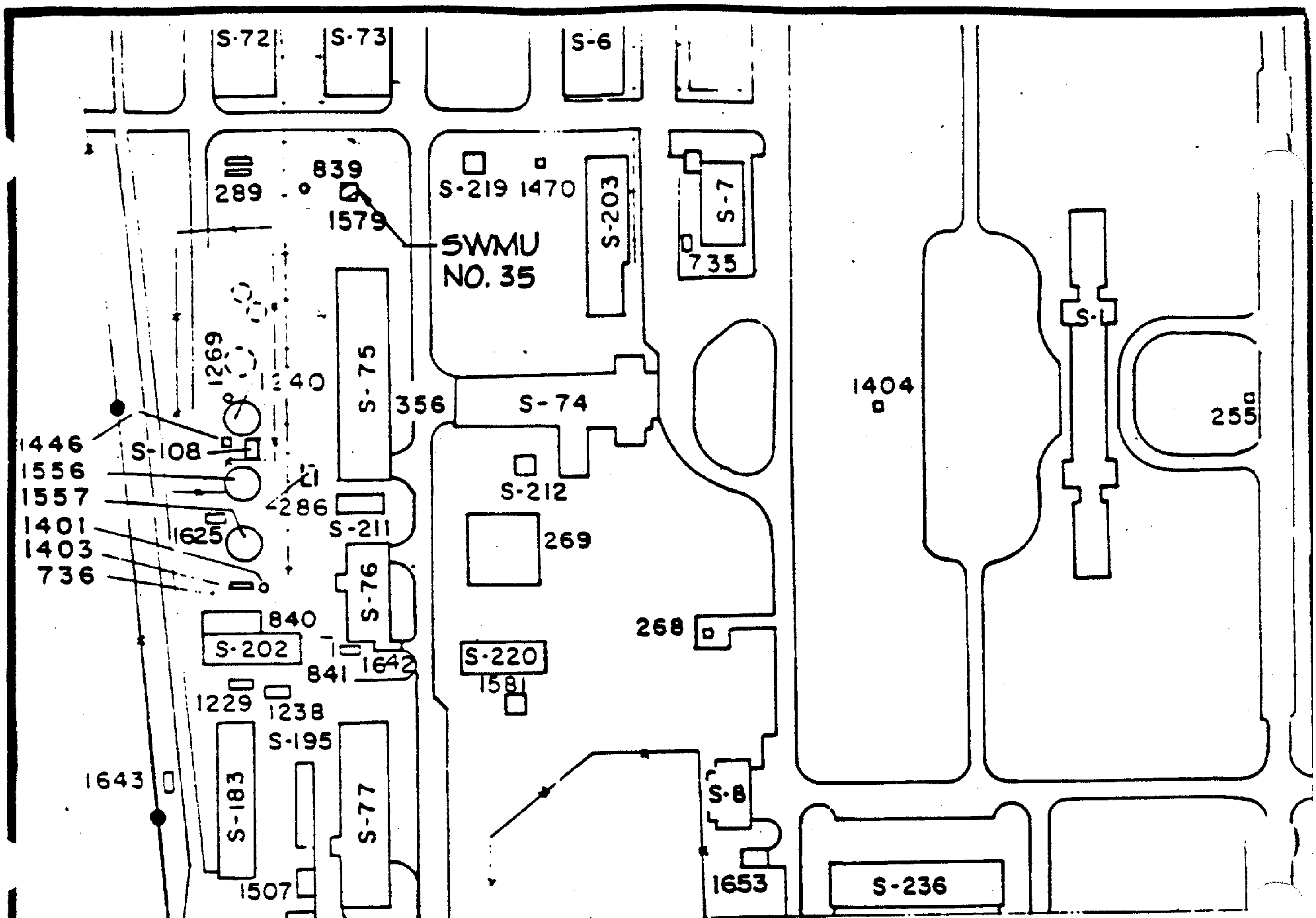
No previous data. Air Monitoring is not needed for this SWMU.

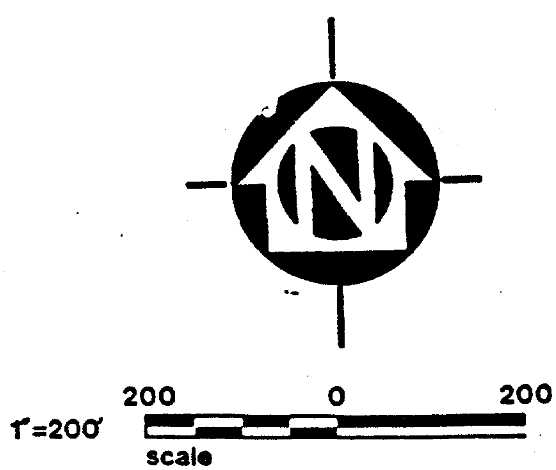
7.35.7.5 SUBSURFACE GAS

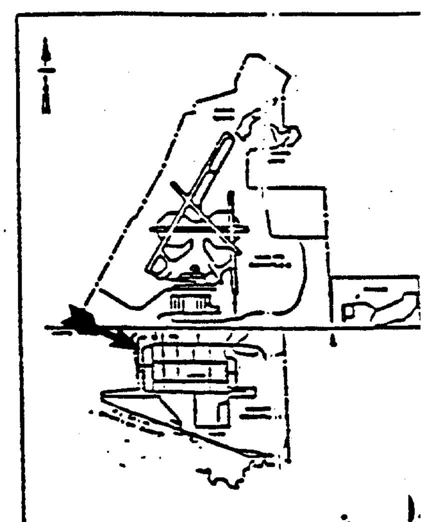
No previous data. Subsurface Gas Monitoring is not needed for this SWMU.

7.35.8 RECOMMENDED ACTION

This unit has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.







SWMU NO. 35 1579 INCINERATOR
FIGURE 7-35 LOCATION MAP

7.36 <u>SWMU NO. 36: NORTH STP INCINERATOR</u>

7.36.1 <u>UNIT CHARACTERISTICS</u>

7.36.1.1 <u>TYPE OF UNIT</u>

Inactive incinerator.

7.36.1.2 <u>DESIGN FEATURES</u>

Unknown.

7.36.1.3 <u>OPERATING PRACTICE (PAST AND PRESENT)</u>

The incinerator was probably used to burn classified material.

7.36.1.4 <u>PERIOD OF OPERATION</u>

1943 (approximately) to 1984.

7.36.1.5 <u>AGE OF UNIT</u>

Approximately 47 years.

7.36.1.6 <u>LOCATION OF UNIT</u>

Incinerator Number 4 was located within the North Side Sewage Treatment Plant complex. See Figure 7-36.

7.36.1.7 <u>GENERAL PHYSICAL CONDITIONS</u>

Unknown; closed unit.

7.36.1.8 <u>CLOSURE METHOD</u>

Clean closure.

7.36.2 <u>WASTE CHARACTERISTICS</u>

7.36.2.1 <u>TYPE OF WASTE</u>

Nonhazardous paper and plastic. Incinerator is used to burn classified materials and plastic identification cards.

7.36.2.2 <u>MIGRATION CHARACTERISTICS</u>

Not applicable.

7.36.2.3 <u>TOXICOLOGICAL CHARACTERISTICS</u>

Nontoxic.

7.36.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Not applicable.

7.36.3 MIGRATION PATHWAYS

Not applicable.

7.36.4 CONTAMINANT RELEASE IDENTIFICATION

7.36.4.1 PRIOR INSPECTION REPORTS

None available.

7.36.4.2 PUBLIC COMPLAINTS

None.

7.36.4.3 MONITORING/SAMPLING DATA

None available.

7.36.4.4 EVIDENCE OF RELEASE

None.

7.36.5 EXPOSURE POTENTIAL

7.36.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, distant from the residential area.

7.36.5.2 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this unit.

7.36.6 DOCUMENTS REVIEWED

See PRD. Y&D Drawings No. 204480, 204482, and 204483 are available.

7.36.7 SUMMARIZED DATA GAP

7.36.7.1 SOIL

None available. No soil boring is proposed.

7.36.7.2 GROUNDWATER

No available data. Groundwater monitoring is not planned.

7.36.7.3 **SURFACE WATER/SEDIMENT**

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.36.7.4 **AIR**

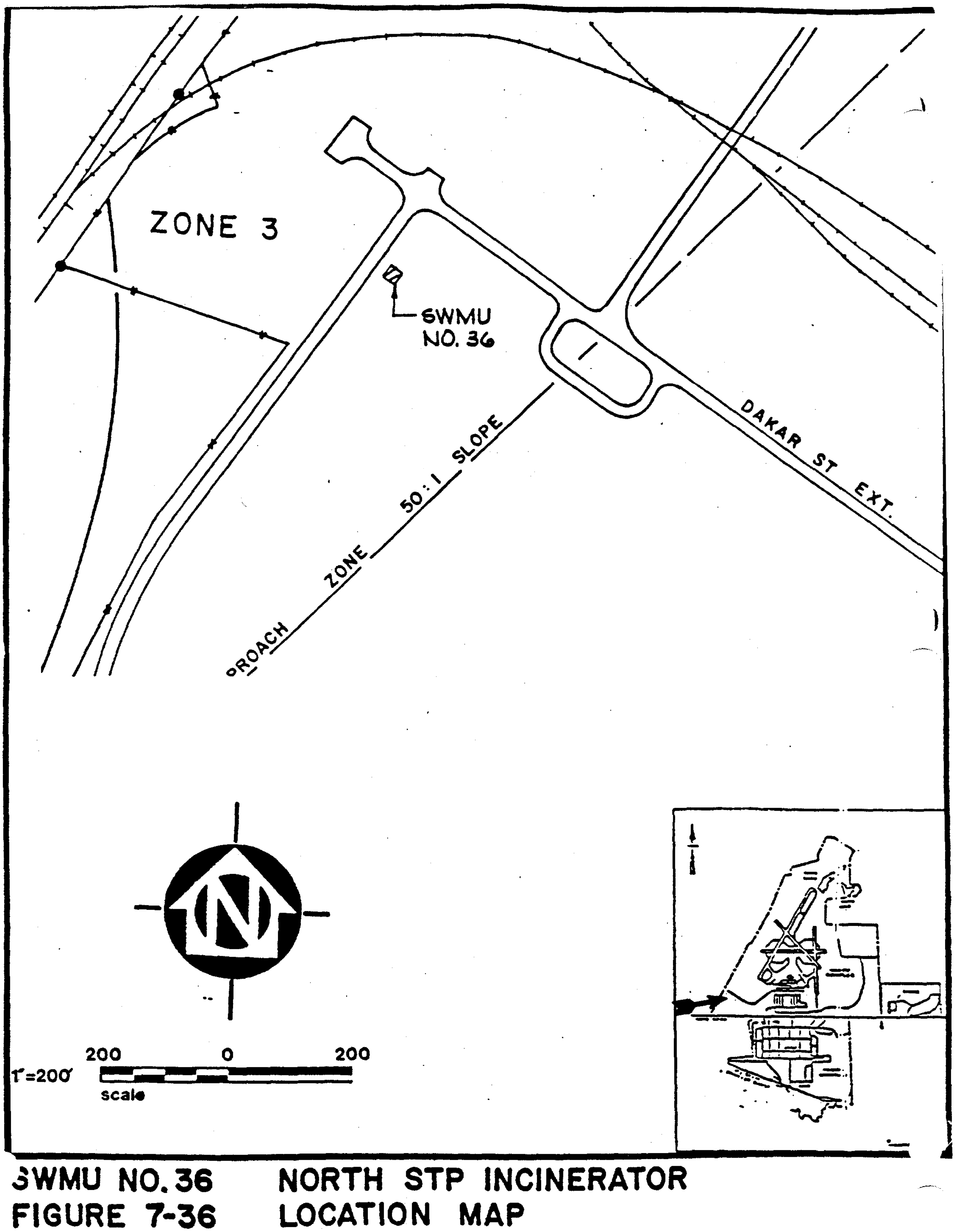
No previous data. Air Monitoring is not needed for this SWMU.

7.36.7.5 **SUBSURFACE GAS**

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.36.8 **RECOMMENDED ACTION**

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 36 NORTH STP INCINERATOR
FIGURE 7-36 LOCATION MAP

7.37 SWMU NO. 37: SOUTH STP INCINERATOR

7.37.1 UNIT CHARACTERISTICS

7.37.1.1 TYPE OF UNIT

Inactive incinerator.

7.37.1.2 DESIGN FEATURES

Ten tons per 8 hours.

7.37.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Incinerator was probably used to burn classified material.

7.37.1.4 PERIOD OF OPERATION

From 1943 (approximately) to 1984.

7.37.1.5 AGE OF UNIT

Approximately 47 years.

7.37.1.6 LOCATION OF UNIT

Formerly located at Southside Sewage Treatment Facility. See Figure 7-37.

7.37.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable for obsolete unit.

7.37.1.8 CLOSURE METHOD

Unknown.

7.37.2 WASTE CHARACTERISTICS

7.37.2.1 TYPE OF WASTE

Unknown; suspected to have been classified documents (nontoxic paper and plastic).

7.37.2.2 MIGRATION CHARACTERISTICS

Unknown.

7.37.2.3 TOXICOLOGICAL CHARACTERISTICS

Unknown; presumed nontoxic ash. Ash is generally caustic.

7.37.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

Unknown; ash removed for land disposal.

7.37.3 <u>MIGRATION PATHWAYS</u>

Not applicable.

7.37.4 <u>CONTAMINANT RELEASE IDENTIFICATION</u>

7.37.4.1 <u>PRIOR INSPECTION REPORTS</u>

None available.

7.37.4.2 <u>PUBLIC COMPLAINTS</u>

None.

7.37.4.3 <u>MONITORING/SAMPLING DATA</u>

None available.

7.37.4.4 <u>EVIDENCE OF RELEASE</u>

None observed.

7.37.5 <u>EXPOSURE POTENTIAL</u>

7.37.5.1 <u>PROXIMITY TO AFFECTED POPULATION</u>

This SWMU is located in an area close to the training activity but is far away from the residential area.

7.37.5.2 <u>PROXIMITY TO SENSITIVE ENVIRONMENTS</u>

The unit is distant from sensitive environments.

7.37.5.3 <u>LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS</u>

It has not been previously determined whether a release of hazardous material has occurred from this unit.

7.37.6 <u>DOCUMENTS REVIEWED</u>

See PRD. Also Y&D Drawings No. 225675 and 225676, "Incinerator".

7.37.7 <u>SUMMARIZED DATA GAP</u>

7.37.7.1 <u>SOIL</u>

None available. No soil boring is proposed.

7.37.7.2 GROUNDWATER

No available data; ground water monitoring is not planned.

7.37.7.3 SURFACE WATER/SEDIMENT

No previous data. Surface water/sediment sampling is not needed for this SWMU.

7.37.7.4 AIR

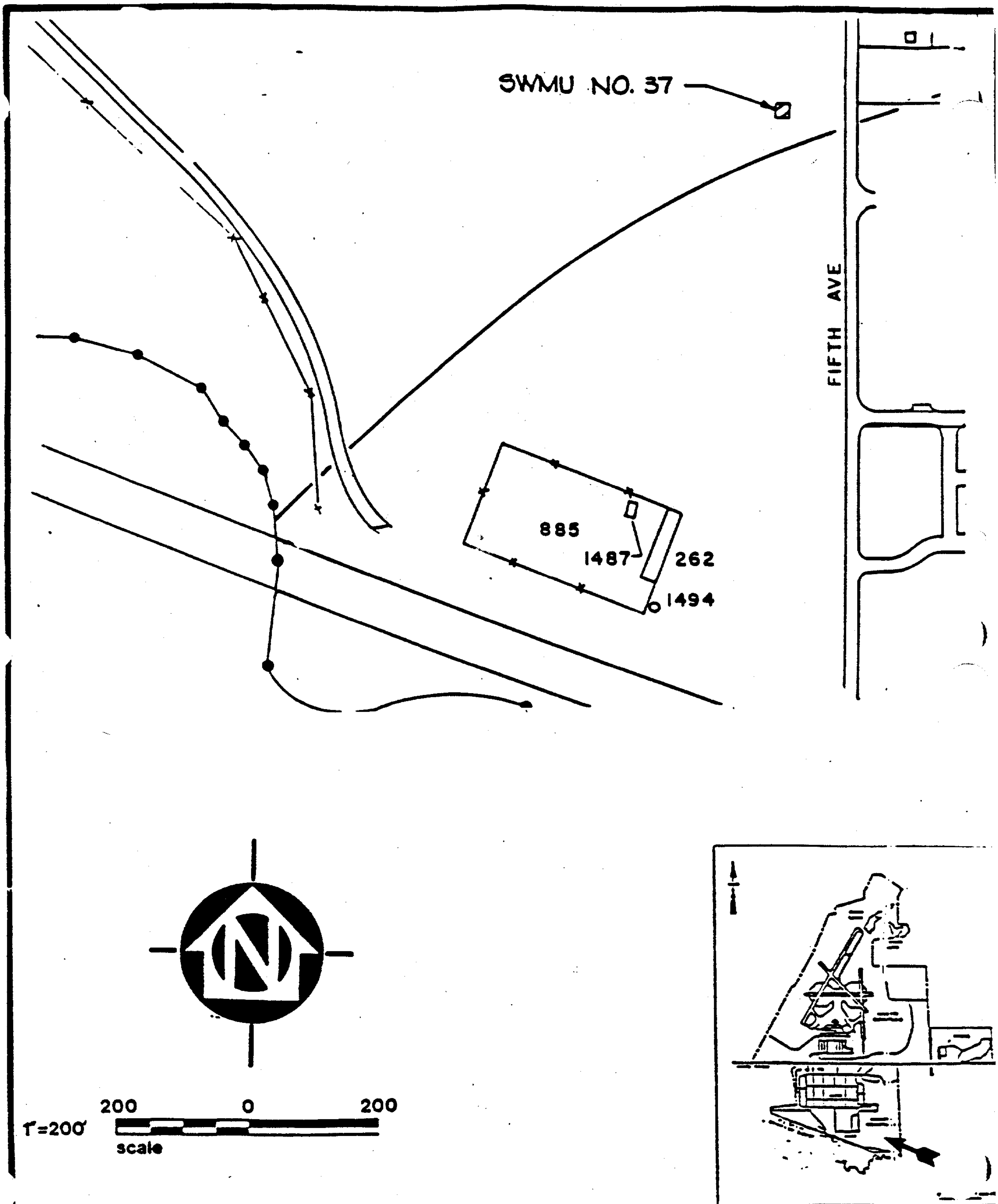
No previous data. Air Monitoring is not needed for this SWMU.

7.37.7.5 SUBSURFACE GAS

No previous data. Subsurface Gas Monitoring is not needed for this SWMU.

7.37.8 RECOMMENDED ACTION

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 37 SOUTH STP INCINERATOR
FIGURE 7-37 LOCATION MAP

7.38 SWMU NO. 38: INDUSTRIAL DRAINAGE DITCHES

7.38.1 UNIT CHARACTERISTICS

7.38.1.1 TYPE OF UNIT

Inactive Storm Sewer System

7.38.1.2 DESIGN FEATURES

Varied.

7.38.1.3 OPERATING PRACTICE (PAST AND PRESENT)

The stormwater ditches in industrial areas were probably subjected to occasional discharges of industrial wastes from these buildings. Examples include Building 341 auto repair bays whose floor drains are piped to the ditch adjacent to the Fire Training Mats; drains carrying backwash from deionizers at the old water treatment plant were piped to a storm drain adjacent to the plant; drains from S-60, paint spray booth were piped to "18 storm drain."

7.38.1.4 PERIOD OF OPERATION

The original design of a number of buildings at NAS Memphis in 1943 provided for floor drains in buildings which discharged to "storm sewers" and "storm drains." As buildings were remodeled and replaced these drains were eliminated or re-piped to the sanitary sewer. By 1980 most had been replaced.

7.38.1.5 AGE OF UNIT

Approximately 47 years.

7.38.1.6 LOCATION OF UNIT

The drainage ditches of concern are located throughout the northside industrial area and in portions of the southside. The location of these ditches are indicated in Figure 7-38.

7.38.1.7 GENERAL PHYSICAL CONDITIONS

Unknown.

7.38.1.8 CLOSURE METHOD

Unknown.

7.38.2 WASTE CHARACTERISTICS

7.38.2.1 TYPE OF WASTE

Various substances including solvents, degreasers, oils and paints were discharged down these drain lines into the drainage ditches. The industries located at the Naval Air Station are varied in terms of the hazardous wastes and substances which have been utilized in the past and which are presently utilized. Many organic and inorganic hazardous waste constituents may have been washed down floor or storm drains to area drainage ditches.

7.38.2.2 MIGRATION CHARACTERISTICS

Most wastes discharged into the drainage ditch would be readily transported by rainfall runoff down the ditch.

7.38.2.3 TOXICOLOGICAL CHARACTERISTICS

Unknown. Presumably, some residual heavy metal contamination in soil and sediment may exist near outfalls.

7.38.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual heavy metal contamination would likely exist as adsorbate on soil particles.

7.38.3 MIGRATION PATHWAYS

7.38.3.1 GEOLOGIC SETTING

See Section 3.2.

7.38.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.38.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.38.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The unit consists of several man-made drainage ditches. Drainage is toward Big Creek Drainage Canal to the south and west.

7.38.3.5 PATHWAYS

AIR

Any contaminants which would be prone to escape to the air medium would have done so shortly after their release and no residual would be expected at this time.

SOIL

The soil in and beneath the drainage ditches will readily transport contaminants when runoff water or ground water passes through it. The most likely area for contamination to accumulate is in the sediment. If significant contamination is found in the ditch sediment, then soil sampling will be done beneath the contaminated sediment to determine if contaminants were transported into the soil medium.

SURFACE WATER/SEDIMENT

The surface water in the ditches will readily transport contaminants.

GROUNDWATER

Contaminants may be readily be transported by groundwater if they are carried through the soil to the ground water table.

SUBSURFACE GAS

Not applicable.

7.38.4 CONTAMINANT RELEASE IDENTIFICATION

7.38.4.1 PRIOR INSPECTION REPORTS

None available.

7.38.4.2 PUBLIC COMPLAINTS

None.

7.38.4.3 MONITORING/SAMPLING DATA

Surface water/sediment samples were taken from the ditch in the Northside in 1989. No contamination was found.

7.38.4.4 EVIDENCE OF RELEASE

None.

7.38.5 <u>EXPOSURE POTENTIAL</u>

7.38.5.1 <u>PROXIMITY TO AFFECTED POPULATION</u>

This SWMU is located in the general NAS industrial area, which is far away from the permanent NAS population.

7.38.5.2 <u>PROXIMITY TO SENSITIVE ENVIRONMENTS</u>

The unit is distant from sensitive environments.

7.38.5.3 <u>LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS</u>

It has not been previously determined whether a release of hazardous material has occurred from this unit.

7.38.6 <u>DOCUMENTS REVIEWED</u>

See PRD.

7.38.7 <u>SUMMARIZED DATA GAP</u>

7.38.7.1 <u>SOIL</u>

None available.

7.38.7.2 <u>GROUNDWATER</u>

No available data.

7.38.7.3 <u>SURFACE WATER/SEDIMENT</u>

No previous data.

7.38.7.4 <u>AIR</u>

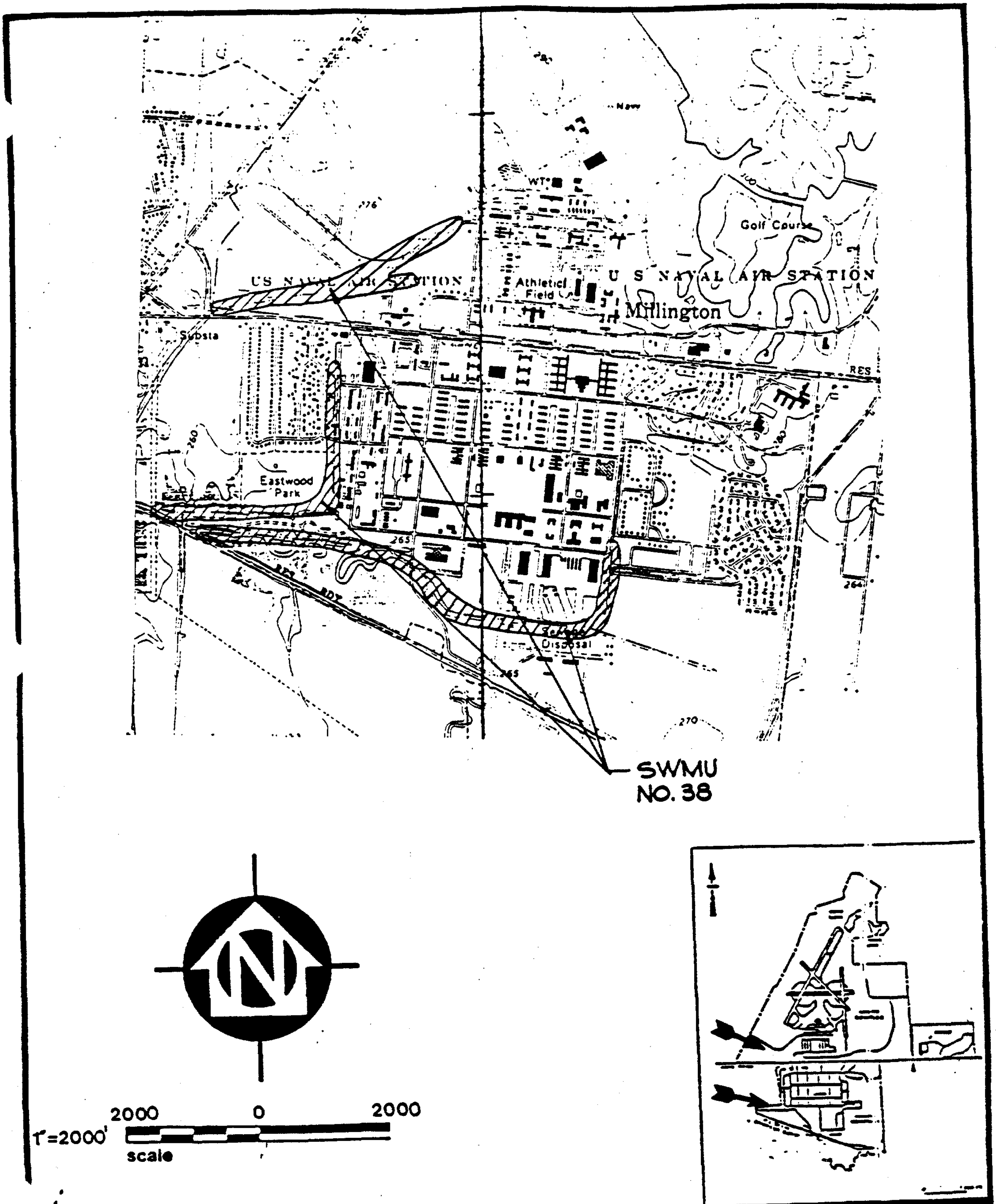
No previous data.

7.38.7.5 <u>SUBSURFACE GAS</u>

No previous data.

7.38.8 <u>RECOMMENDED ACTIONS</u>

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 38 INDUSTRIAL DRAINAGE DITCHES
FIGURE 38-1 LOCATION MAP

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7.39 SWMU NO. 39: S-74 PCB STORAGE AREA

7.39.1 UNIT CHARACTERISTICS

7.39.1.1 TYPE OF UNIT

Active Waste Storage Area

7.39.1.2 DESIGN FEATURES

The transformers, capacitors and drums are placed on wooden pallets which are on the ground. The area routinely inspected for evidence of leaks; there is and has been no evidence of leaks. Any such leaks would be readily apparent on either the ground or pallets.

7.39.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This small area, substantially less than one acre, has been used since 1980 to store transformers, capacitors and drums which may contain PCBs.

7.39.1.4 PERIOD OF OPERATION

1980 to present.

7.39.1.5 AGE OF UNIT

Ten years.

7.39.1.6 LOCATION OF UNIT

The S-74 PCB Storage Area is located at the north end of Building S-74 as shown in Figure 7-39.

7.39.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.39.1.8 CLOSURE METHOD

Not applicable.

7.39.2 WASTE CHARACTERISTICS

7.39.2.1 TYPE OF WASTE

The constituent of concern that would readily indicate any release to the ground is PCBs.

7.39.2.2 MIGRATION CHARACTERISTICS

Any release of oils from the containers stored in this area would be very immobile in the soil and not likely to reach groundwater. Transport via surface waters is a possibility for any release which coincided with a precipitation event.

7.39.2.3 TOXICOLOGICAL CHARACTERISTICS

PCBs are carcinogens with an unusually high (100,000) bioaccumulation factor. Toxic effects include skin rash (dermal contact) and liver damage (ingestion). See Section 6.10 for more detailed information.

7.39.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Contaminants in containers would be in liquid (oil) form. Contaminants on or in the ground would be present in oil-saturated soil or adsorbed soil particles.

7.39.3 MIGRATION PATHWAYS

7.39.3.1 GEOLOGIC SETTING

See Section 3.2.

7.39.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.39.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.39.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level.

7.39.3.5 PATHWAYS

AIR

The materials that might be released in this area are not volatile; contaminant transport via air is not likely.

SOIL

Any releases would initially impact the upper or surficial soils. The high affinity of soil for PCB oils would greatly inhibit transport to deeper soils. Any release in the area would be minor and would be absorbed by the surficial soils and trapped in the vadose zone. Thus, for this SWMU, transport into the soil below a depth of three-feet is not expected if in fact a release has occurred.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses.

GROUNDWATER

If a release has occurred, a plan of investigation would be indicated to incorporate a ground water assessment program for determining the vertical and horizontal extent of groundwater transport.

SUBSURFACE GAS

Not applicable for transformer oils.

7.39.4 CONTAMINANT RELEASE IDENTIFICATION

7.39.4.1 PRIOR INSPECTION REPORTS

Visual inspection showed no evidence of releases. Transformers stored outside have been tested and found negative for PCBs or were awaiting testing.

7.39.4.2 PUBLIC COMPLAINTS

None.

7.39.4.3 MONITORING/SAMPLING DATA

PCBs test data are available.

7.39.4.4 EVIDENCE OF RELEASE

Visual inspection showed no evidence of releases. Transformers stored outside have been tested and found negative for PCBs or were awaiting testing.

7.39.5 EXPOSURE POTENTIAL

7.39.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, distant from the permanent NAS population.

7.39.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.39.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Any release of hazardous constituents would be easily identified by surficial soil sampling. The units which might contain PCB oil are placed on pallets on unprotected ground; therefore, the surficial soils will have the highest contaminant concentrations if there has been a release. There was no visual evidence of a release nor is a release suspected.

7.39.6 DOCUMENTS REVIEWED

See PRD.

7.39.7 SUMMARIZED DATA GAP

7.39.7.1 SOIL

None available.

7.39.7.2 GROUNDWATER

No available data.

7.39.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.39.7.4 AIR

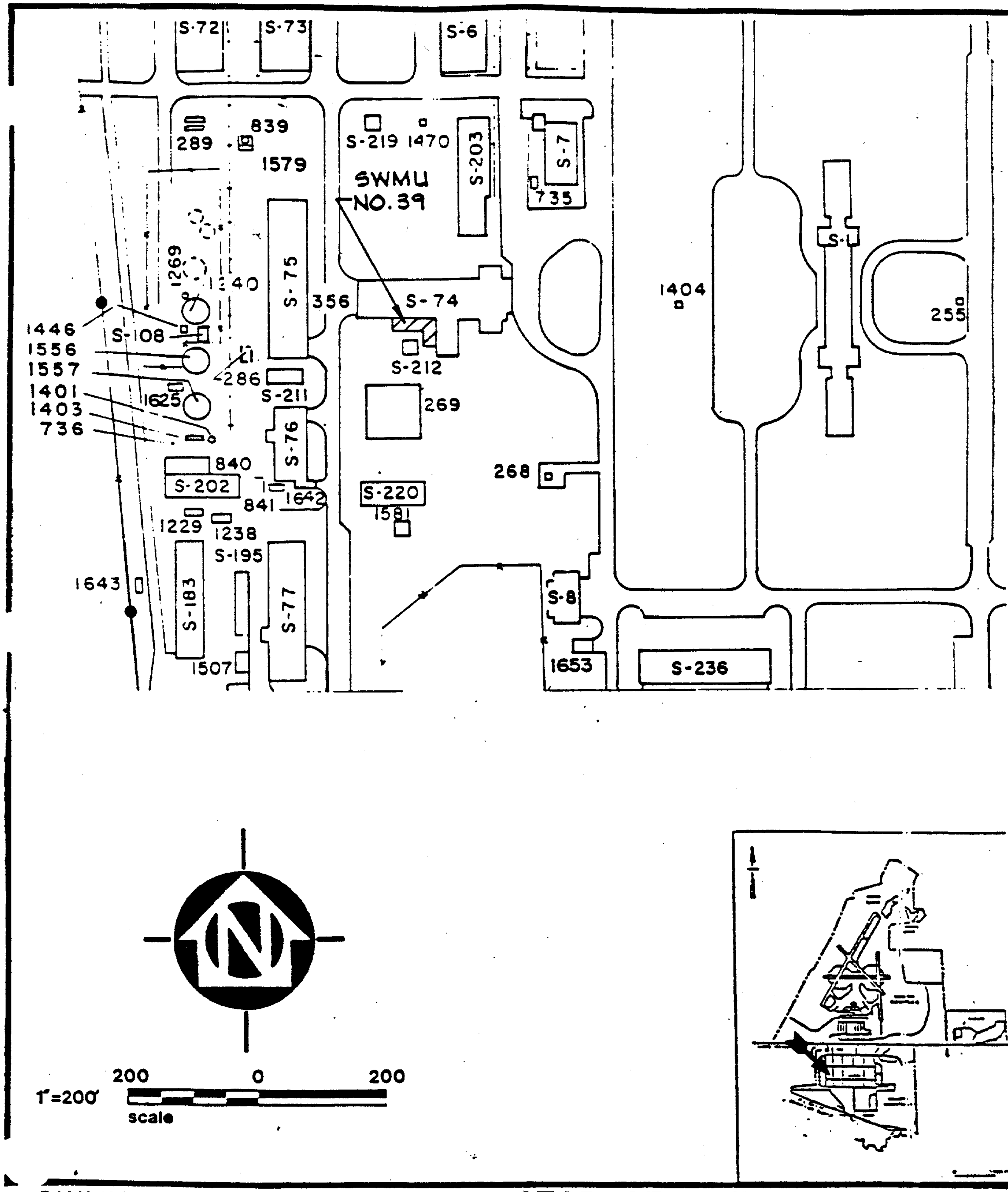
No previous data.

7.39.7.5 SUBSURFACE GAS

No previous data.

7.39.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 39 S-74 PCB STORAGE AREA
FIGURE 7-39 LOCATION MAP

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7.40 SWMU NO. 40: SALVAGE YARD NO. 1

7.40.1 UNIT CHARACTERISTICS

7.40.1.1 TYPE OF UNIT

Former waste storage area.

7.40.1.2 DESIGN FEATURES

The combined area is designated as Area No. 813 and Area No. 1666 in Figure 7-40.

7.40.1.3 OPERATING PRACTICE (PAST AND PRESENT)

Area No. 813 was formerly used as storage for scrap pieces of airplanes, anchor chains, etc., while Area No. 1666 was used as storage for P3 vans containing work benches, etc.

Site work completed in 1988-1989 has converted the site into a paved (asphalt) parking area for mobile trailers used for electronic communications training. Formerly stored wastes were removed.

7.40.1.4 PERIOD OF OPERATION

The salvage yard has been operated since 1945 and shows no evidence of buried wastes.

7.40.1.5 AGE OF UNIT

Forty-five years.

7.40.1.6 LOCATION OF UNIT

Salvage Yard No. 1 is a combination of two fenced-in, open storage areas, designated as Area No. 813 and Area No. 1666 in Figure 7-40.

7.40.1.7 GENERAL PHYSICAL CONDITIONS

See Subsection 7.40.1.3.

7.40.1.8 CLOSURE METHOD

Not applicable.

7.40.2 WASTE CHARACTERISTICS

7.40.2.1 TYPE OF WASTE

Since scrap cars and batteries have reportedly been stored within the area, and it is possible that gasoline, oil, or battery acid leaks may have occurred.

7.40.2.2 MIGRATION CHARACTERISTICS

Presumed contamination from batteries and vehicles would be in the form of a liquid. Contamination, therefore, would have been downward through the soil if leaks have actually occurred.

7.40.2.3 TOXICOLOGICAL CHARACTERISTICS

Soil sampling and analyses conducted prior to construction of the parking lot revealed petroleum hydrocarbons in the soil, presumably from used engine oil leakage. Used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, or damage to nerves, liver, or kidney.

7.40.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Contaminants would exist as substances adsorbed onto soil particles, vapors in soil pores, and possibly as low-concentration groundwater contaminants.

7.40.3 MIGRATION PATHWAYS

7.40.3.1 GEOLOGIC SETTING

See Section 3.2.

7.40.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.40.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.40.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the west and south.

7.40.3.5 PATHWAYS

AIR

Although the vapors produced by the presumed contaminants can be harmful, they also possess strong odors which would negate the need for testing. Furthermore, since these vapors are known to dissipate quickly, testing would not be meaningful unless a spill had very recently occurred.

SOIL

Due to the nature of the presume leaks, a portion of the contaminants would complex with the soil particles, thereby leaving traces of their pathway downward.

SURFACE WATER/SEDIMENT

There are no nearby surface water sources which would be effected by any of the presumed leaks.

GROUNDWATER

Although there is a possibility of groundwater contamination if large spills have occurred, no evidence exists to prove that they have. Initial testing should be limited to soil samples.

SUBSURFACE GAS

Since there is no visual evidence of buried waste, the presence of subsurface gas appears unlikely.

7.40.4 CONTAMINANT RELEASE IDENTIFICATION

7.40.4.1 PRIOR INSPECTION REPORTS

See PRD (11 August 1988, Sampling Report).

7.40.4.2 PUBLIC COMPLAINTS

None.

7.40.4.3 MONITORING/SAMPLING DATA

Limited analytical data and field observations/measurements are included in the 11 August 1988 Sampling Report, (See PRD).

7.40.4.4 EVIDENCE OF RELEASE

Visual staining of soil, and field and laboratory analytical data as reported in the 11 August 1988 Sampling Report.

7.40.5 EXPOSURE POTENTIAL

7.40.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the remote location distant from the permanent NAS population.

7.40.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.40.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a sizable release of hazardous material has occurred from this Unit.

7.40.6 DOCUMENTS REVIEWED

See PRD.

7.40.7 SUMMARIZED DATA GAP

7.40.7.1 SOIL

Limited soil data (3 near-surface samples) is available. See 11 August 1988 report in PRD.

7.40.7.2 GROUNDWATER

No available data.

7.40.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.40.7.4 AIR

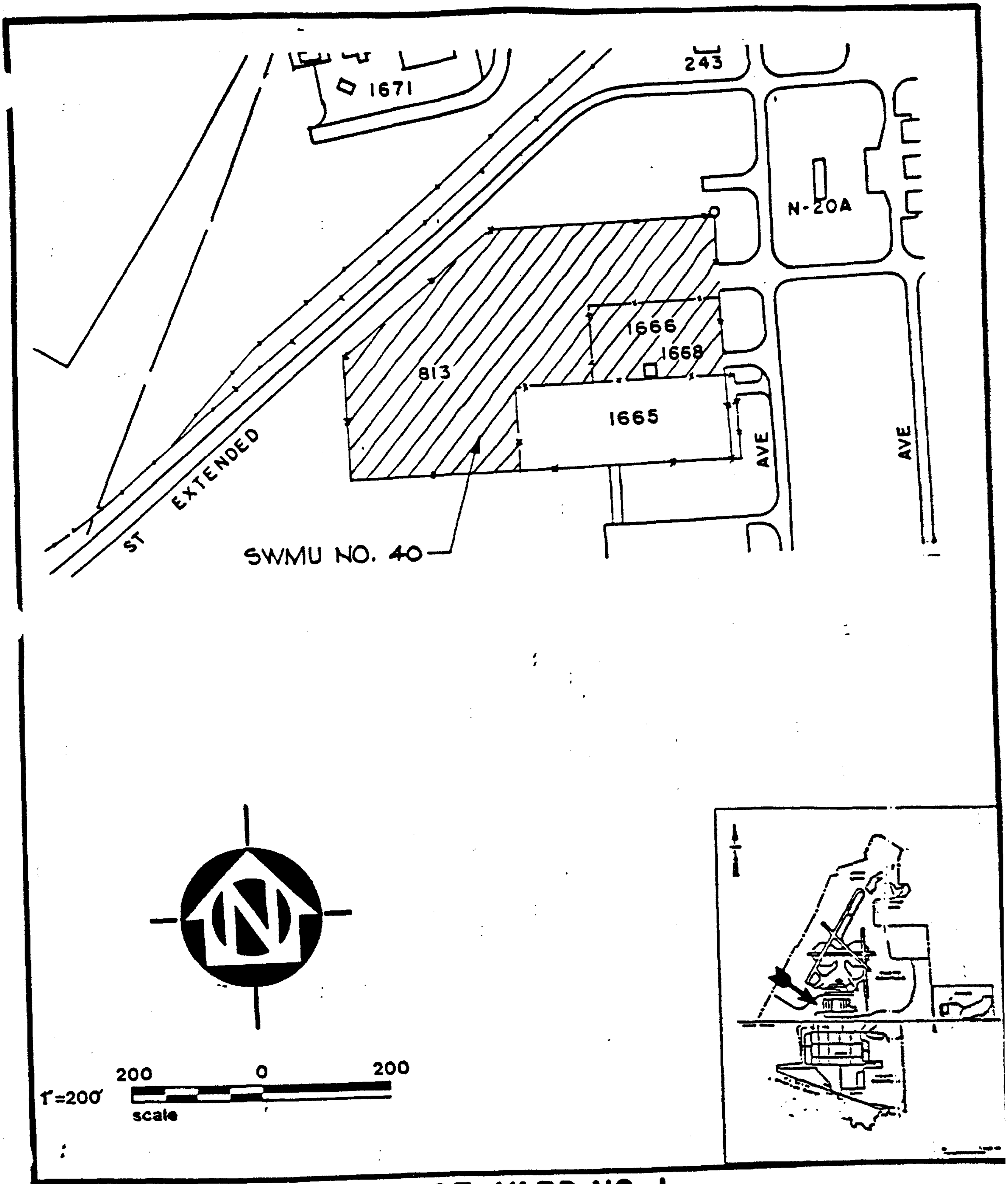
No previous data.

7.40.7.5 SUBSURFACE GAS

No previous data.

7.40.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 40 SALVAGE YARD NO. 1
FIGURE 7-40 LOCATION MAP

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7.41 SWMU NO. 41: SALVAGE YARD NO. 2

7.41.1 UNIT CHARACTERISTICS

7.41.1.1 TYPE OF UNIT

Waste storage area.

7.41.1.2 DESIGN FEATURES

The approximate salvage yard area was 5,700 square yards.

7.41.1.3 OPERATING PRACTICE (PAST AND PRESENT)

All storage was above ground with no evidence of buried wastes.

7.41.1.4 PERIOD OF OPERATION

The yard has been operated by DRMO since 1944.

7.41.1.5 AGE OF UNIT

Forty-six years old.

7.41.1.6 LOCATION OF UNIT

Salvage Yard No. 2 was a fenced-in open storage area, designated as Area No. 885 in Figure 7-41.

7.41.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.41.1.8 CLOSURE METHOD

Unknown.

7.41.2 WASTE CHARACTERISTICS

7.41.2.1 TYPE OF WASTE

Salvage Yard No. 2 is used to store scrap metal, tire, batteries, used furniture, etc. There is no evidence of any liquid wastes or chemical drums within the area. In addition, DRMO operated the salvage yard under a contract with the Navy which prohibited the admittance of any hazardous substance into the yard. However, as in Salvage Yard No. 1, the previous presence of scrap vehicles and batteries introduces the possibility of low-level contamination through leakage of gasoline, lubricating oil, or battery acid.

7.41.2.2 MIGRATION CHARACTERISTICS

Presumed contamination from batteries and vehicles would be in the form of a liquid. Contamination, therefore, would have been downward through the soil if leaks have actually occurred.

7.41.2.3 TOXICOLOGICAL CHARACTERISTICS

Unknown. No toxic substances have been identified. Refer to SWMUs No. 1, 5, and 6 for information on potential contaminants.

7.41.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Contaminants, if present, would necessarily be present as soil contaminants.

7.41.3 MIGRATION PATHWAYS

7.41.3.1 GEOLOGIC SETTING

See Section 3.2.

7.41.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.41.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.41.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area is generally level. Surface drainage is toward the south and west.

7.41.3.5 PATHWAYS

AIR

Although the vapors produced by the potential contaminants can be harmful, they also produce strong odors which would negate the need for testing. Furthermore, since these vapors are known to dissipate quickly, testing would not be meaningful unless a spill had very recently occurred.

SOIL

Due to the nature of the presumed leaks, a portion of the contaminants would complex with the soil particles, thereby leaving traces of their pathway downward.

SURFACE WATER/SEDIMENT

Salvage Yard No. 2 is located adjacent to the Big Creek Drain as shown on Figure 7-41. It is possible that contamination of the creek could occur from either overland flow or the groundwater movement. However, contamination could only occur by overland flow on a continuous basis, which would be visually apparent, or from storm water runoff, which would quickly be carried down stream.

GROUNDWATER

Although there is a possibility of groundwater contamination of large leaks have occurred, no evidence exists to indicate that they have.

SUBSURFACE GAS

Since there is no visual evidence of buried waste, the presence of subsurface gas appears unlikely.

7.41.4 CONTAMINANT RELEASE IDENTIFICATION

7.41.4.1 PRIOR INSPECTION REPORTS

None available.

7.41.4.2 PUBLIC COMPLAINTS

None.

7.41.4.3 MONITORING/SAMPLING DATA

None available.

7.41.4.4 EVIDENCE OF RELEASE

None observed.

7.41.5 EXPOSURE POTENTIAL

7.41.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the remote location distant from the permanent NAS population.

7.41.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.41.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this unit.

7.41.6 DOCUMENTS REVIEWED

See PRD.

7.41.7 SUMMARIZED DATA GAP

7.41.7.1 SOIL

None available.

7.41.7.2 GROUNDWATER

No available data.

7.41.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.41.7.4 AIR

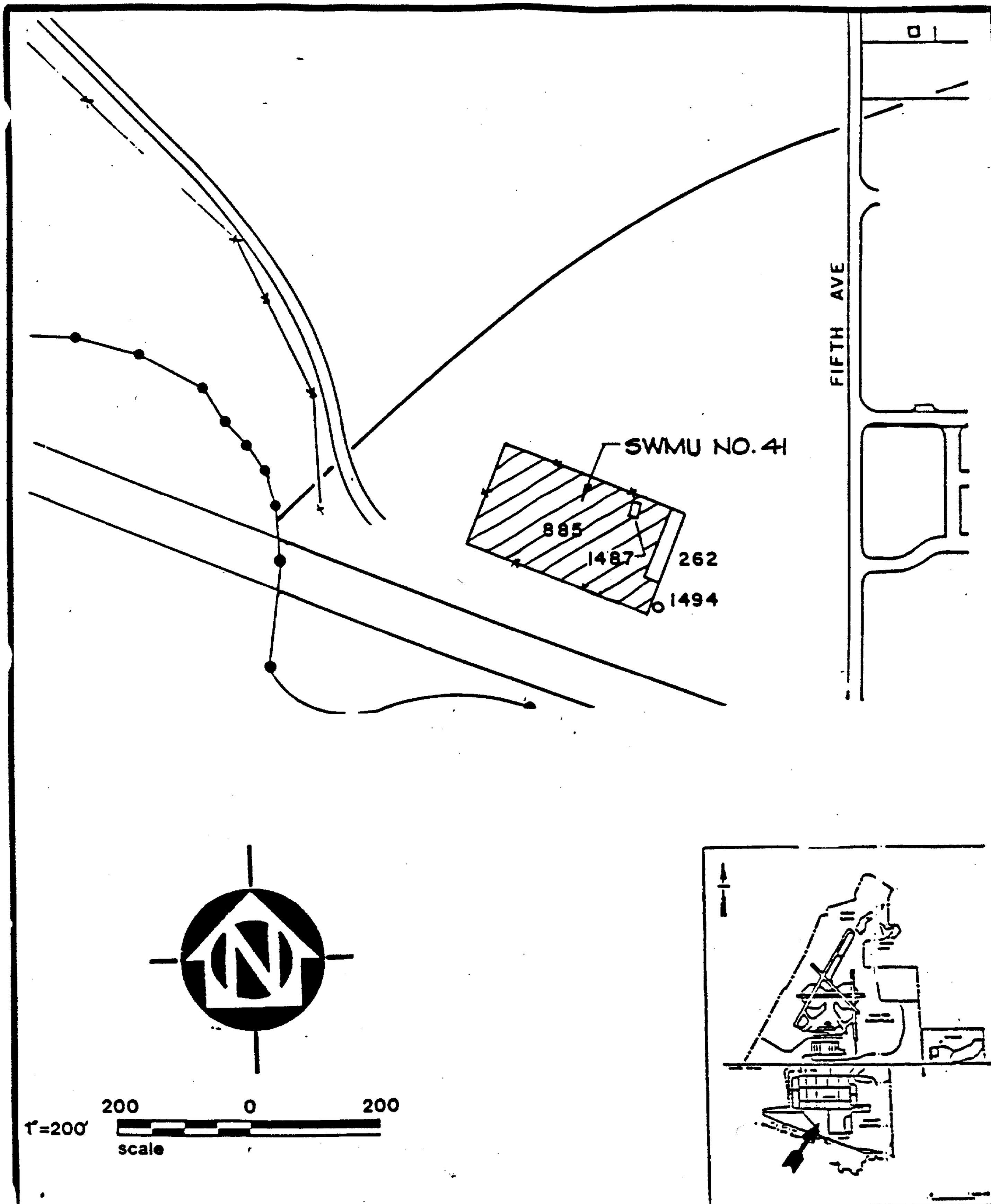
No previous data.

7.41.7.5 SUBSURFACE GAS

No previous data.

7.41.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 41 SALVAGE YARD NO. 2
FIGURE 7-41 LOCATION MAP

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7.42 SWMU NO. 42: N-12 HAZARDOUS WASTE STORAGE AREA

7.42.1 UNIT CHARACTERISTICS

7.42.1.1 TYPE OF UNIT

Active waste storage unit.

7.42.1.2 DESIGN FEATURES

SWMU No. 42 consists of a 70' x 45' paved storage apron and an adjacent quonset-type building.

7.42.1.3 OPERATING PRACTICE (PAST AND PRESENT)

SWMU No. 42 is an interim status hazardous waste storage facility where containerized hazardous waste are stored pending transport for off-site disposal.

7.42.1.4 PERIOD OF OPERATION

Use of the area is scheduled to be discontinued upon completion of a new hazardous waste container storage facility which is under construction.

7.42.1.5 AGE OF UNIT

The age of the unit as a SWMU is unknown. The building probably dates from the 1940s.

7.42.1.6 LOCATION OF UNIT

The facility is located just north of Building N-12. See Figure 7-42.

7.42.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.42.1.8 CLOSURE METHOD

Unit closed under RCRA regulations in accordance with TDHE-approved closure plan.

7.42.2 WASTE CHARACTERISTICS

7.42.2.1 TYPE OF WASTE

Various types of waste are stored in drums. The most prevalent type of waste is paint waste.

7.42.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Preliminary investigation of this SWMU indicates the most likely release mechanism to be leaking drums. Therefore, the release point is likely to be below grade. Surface infiltration of rain water can transport these wastes into the soil and groundwater.

7.42.2.3 TOXICOLOGICAL CHARACTERISTICS

SWMU was a temporary storage unit for NAS hazardous wastes. The wastes which may have included waste oils, paint and solvent wastes may have a variety of toxicological characteristics. See Section 6.0 for general information and SWMUs No. 5 and 14 for details.

7.42.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Unknown. Characteristics of drummed hazardous wastes could include liquids, solids, sludges, emulsions, etc.

7.42.3 MIGRATION PATHWAYS

7.42.3.1 GEOLOGIC SETTING

See Section 3.2.

7.42.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.42.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.42.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.42.3.5 PATHWAYS

AIR

Any contaminants which would be prone to escape to the air medium would have done so shortly after their release and no residual would be expected at this time.

SOIL

The soil in the storage area will readily transport contaminants when runoff water or ground water passes through it. The most likely area for contamination to accumulate is in the sediment.

SURFACE WATER/SEDIMENT

Past inspections of the unit indicated no obvious points of surface contamination attributable to this unit. Therefore, the likelihood of surface water transport is remote.

GROUNDWATER

Contaminants contained in the drums at this SWMU are slightly soluble in water and would be transported generally down gradient with the flow of ground water.

SUBSURFACE GAS

Not applicable.

7.42.4 CONTAMINANT RELEASE IDENTIFICATION

7.42.4.1 PRIOR INSPECTION REPORTS

Visual inspection shows no evidence of releases. Site is scheduled for closure when new hazardous waste storage building is erected.

7.42.4.2 PUBLIC COMPLAINTS

None.

7.42.4.3 MONITORING/SAMPLING DATA

1989 sampling data are available. No contamination was detected.

7.42.4.4 EVIDENCE OF RELEASE

None observed.

7.42.5 EXPOSURE POTENTIAL

7.42.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, which is far away from the permanent NAS population.

7.42.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.42.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this Unit.

7.42.6 DOCUMENTS REVIEWED

See PRD. RCRA Closure Plan for Hazardous Waste Interim Storage Area is available.

7.42.7 SUMMARIZED DATA GAP

7.42.7.1 SOIL

None available.

7.42.7.2 GROUNDWATER

No available data.

7.42.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.42.7.4 AIR

No previous data.

7.42.7.5 SUBSURFACE GAS

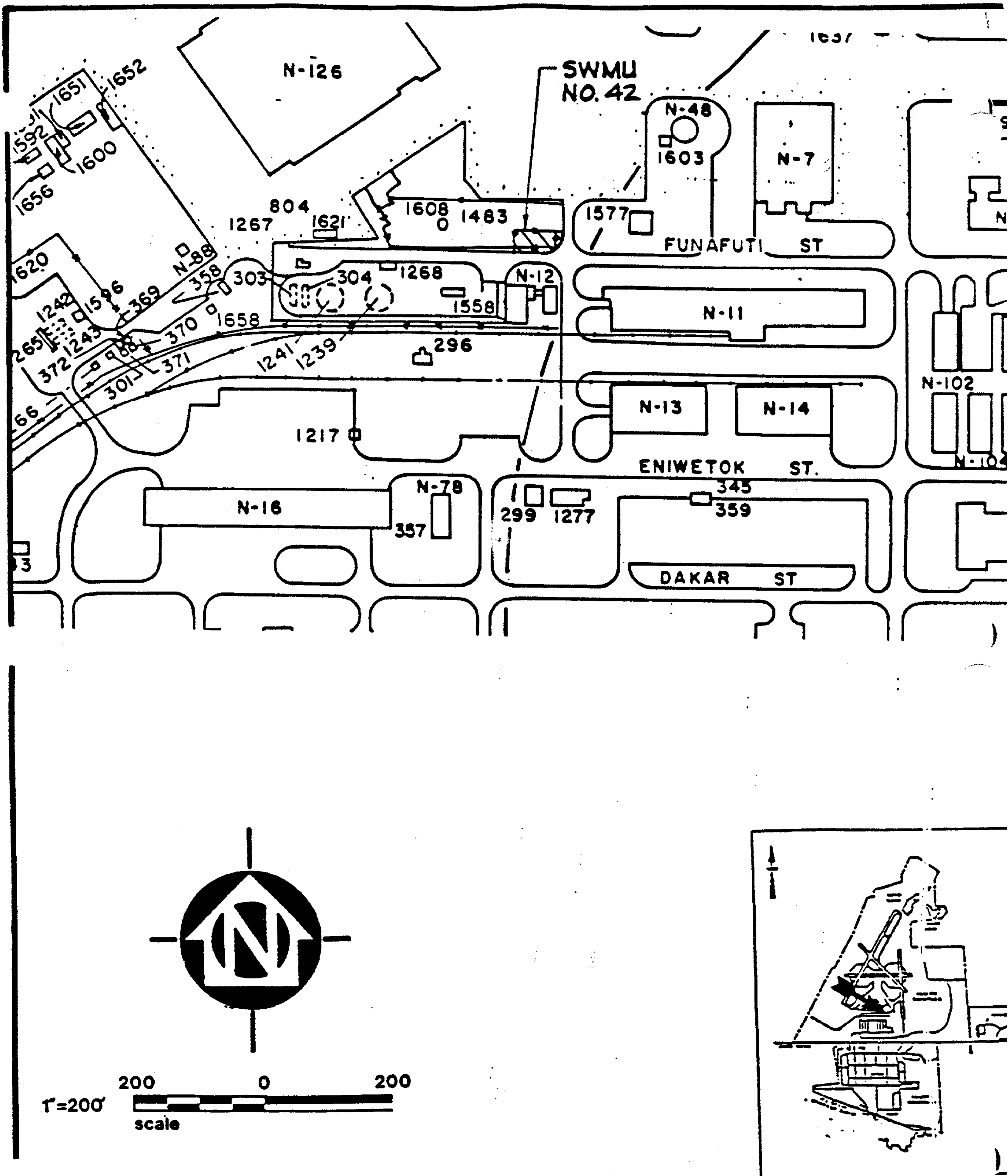
No previous data.

7.42.8 RECOMMENDED ACTIONS

The Department of the Navy has submitted to the Tennessee Division of Solid Waste Management a closure plan for the storage area, SWMU No. 42. The closure plan has been approved and closure will be initiated upon completion of the new, replacement facility. The closure plan presents a schedule of closure activities.

The closure plan establishes a detailed plan for investigation of the soil beneath and adjacent to the storage area. The closure plan also establishes cleanup criteria for any releases identified by the investigation. Upon terminating use of the facility, the closure plan will be executed; therefore, it would be redundant to initiate an investigative effort prior to closure. Since the closure plan provides an appropriate investigation of this SWMU, from which no release has been observed or reported, further investigations will not be proposed.

If the investigations associated with the closure reveal that a release to the soil associated with this facility has occurred and that the soil is contaminated to a depth of at least 10 feet, this plan will be amended to incorporate a groundwater assessment.



SWMU NO. 42 N-12 HAZARDOUS WASTE STORAGE
FIGURE 7-42 LOCATION MAP

7.43 SWMU NO. 43: S-176 HAZARDOUS WASTE ACCUMULATION POINT

7.43.1 UNIT CHARACTERISTICS

7.43.1.1 TYPE OF UNIT

Inactive waste storage area.

7.43.1.2 DESIGN FEATURES

Open, unpaved storage yard.

7.43.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as an accumulation point for drummed paint solvents. From this accumulation point, the drummed wastes were conveyed off-site for disposal. The area was unprotected ground surface with no containment.

7.43.1.4 PERIOD OF OPERATION

The area was inspected in 1983 with no visual evidence of any release. The area is no longer used as an accumulation point, and Building S-176 no longer exists.

7.43.1.5 AGE OF UNIT

Unknown.

7.43.1.6 LOCATION OF UNIT

SWMU No. 43 was located adjacent to Building S-176. See Figure 7-43.

7.43.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.43.1.8 CLOSURE METHOD

Not applicable.

7.43.2 WASTE CHARACTERISTICS

7.43.2.1 TYPE OF WASTE

According to Department of the Navy information, drummed paint solvents were placed in the accumulation area; however, it would be reasonable to assume that waste paint and perhaps paint strippers may have also been involved.

7.43.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event. If paint sludges were released, they would be very immobile in soil and less likely to be transported by surface waters. Also, they would be very apparent visually and such were not detected.

7.43.2.3 TOXICOLOGICAL CHARACTERISTICS

Paint solvents would likely have included mineral spirits, turpentine and other terpenes, phenols, kerosene, and possibly various alcohols. Gasoline-type substances (e.g., BTEX) are also possible.

Depending on substances present, symptoms of exposure could be headache; eye, skin, and mucous membrane irritation; drowsiness; agitation; and damage to nerve tissue, liver, or kidneys.

7.43.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contamination would exist as adsorbate on soil particles, as soil-pore vapors, and possibly as groundwater contaminants.

7.43.3 MIGRATION PATHWAYS

7.43.3.1 GEOLOGIC SETTING

See Section 3.2.

7.43.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.43.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.43.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.43.3.5 PATHWAYS

AIR

Any release of volatile constituents during SWMU operation would have volatilized promptly upon release. The SWMU has not been used as an accumulation point for many months. Therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any release would impact initially the upper or surficial soils with the potential for transport to the deeper soils only if the release was in a significant amount. There was no visual evidence of a release in 1983, and such would have been apparent had a release of a significant amount occurred. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water. If such a release had occurred, the time lapse would prevent detection at this time. Evidence of a past surface release may exist in ditch sediment.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the ground water.

7.43.4 CONTAMINANT RELEASE IDENTIFICATION

7.43.5 SUBSURFACE GAS

Not applicable.

7.43.4.1 PRIOR INSPECTION REPORTS

Visual inspections in 1987 and 1989 revealed no evidence of releases. Site is scheduled for closure when the planned hazardous waste storage building becomes operational.

7.43.4.2 PUBLIC COMPLAINTS

None.

7.43.4.3 MONITORING/SAMPLING DATA

None.

7.43.4.4 EVIDENCE OF RELEASE

None observed.

7.43.5 EXPOSURE POTENTIAL

7.43.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, which is far away from the permanent NAS population.

7.43.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.43.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this Unit. It is reasonable to assume that a release would be characterized by the organic volatile priority pollutants, xylene, heavy metals, and phenols.

7.43.6 DOCUMENTS REVIEWED

See PRD.

7.43.7 SUMMARIZED DATA GAP

7.43.7.1 SOIL

None available.

7.43.7.2 GROUNDWATER

No available data.

7.43.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.43.7.4 AIR

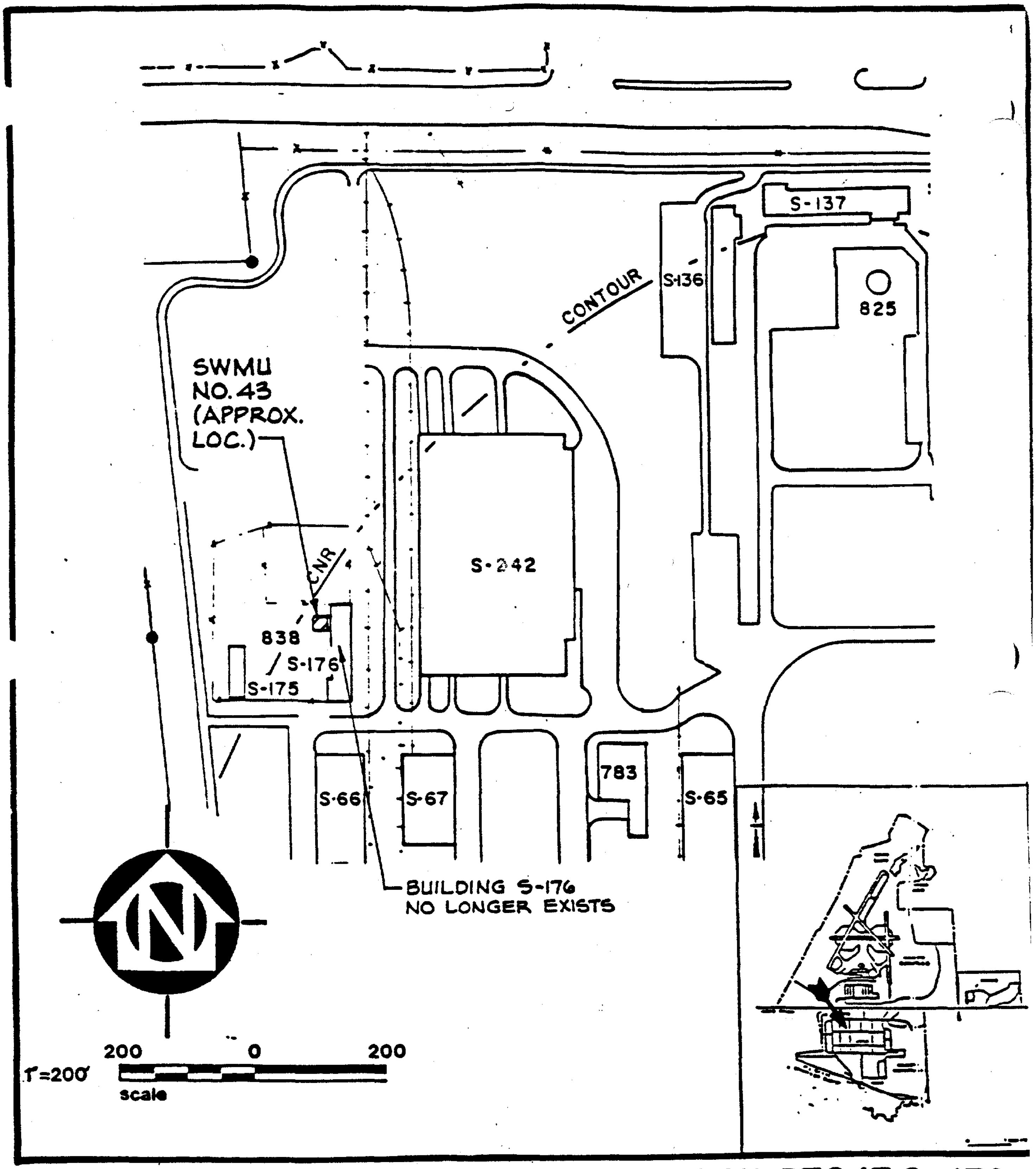
No previous data.

7.43.7.5 SUBSURFACE GAS

No previous data. Subsurface gas monitoring is not needed for this SWMU.

7.43.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 43 **HZ WASTE ACCUMULATION PTS AT S-176**
FIGURE 7-43 **LOCATION MAP**

7.44 SWMU NO. 44: N-102 HAZARDOUS WASTE ACCUMULATION POINT

7.44.1 UNIT CHARACTERISTICS

7.44.1.1 TYPE OF UNIT

Inactive waste storage area.

7.44.1.2 DESIGN FEATURES

Open storage facility.

7.44.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as an accumulation point for vehicle batteries. The batteries were stored or accumulated on pallets until being picked up by a battery salvager. This process has apparently been discontinued; no batteries were present at the time of inspections in 1987 and 1989.

7.44.1.4 PERIOD OF OPERATION

Unknown.

7.44.1.5 AGE OF UNIT

Unknown.

7.44.1.6 LOCATION OF UNIT

SWMU No. 44 is located adjacent to Building N-102. See Figure 7-44.

7.44.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.44.1.8 CLOSURE METHOD

Not applicable.

7.44.2 WASTE CHARACTERISTICS

7.44.2.1 TYPE OF WASTE

The primary hazardous constituents associated with scrap batteries are sulfuric acid and heavy metals.

7.44.2.2 MIGRATION CHARACTERISTICS

Releases from this area would be in the form of sulfuric acid containing dissolved and dissolved or suspended metals.

These constituents would be only moderately mobile in soil but if they reached the ground water, their mobility would increase. Surface transport is a possibility if releases coincided with precipitation events. Mobility of heavy metals decreases with increasing pH.

7.44.2.3 TOXICOLOGICAL CHARACTERISTICS

Contaminants of concern are sulfuric acid, and the heavy metals cadmium, lead, and zinc. Sulfuric acid, at sufficient strength, is corrosive to tissue and can produce chemical burns. One neutralized, the constituents are relatively innocuous. Heavy metals produce toxic effects in sufficient dosages, primarily by interfering with cellular enzymes and/or nerve function. Heavy metal poisoning usually results from chromic exposure to low concentrations in food and water.

7.44.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Sulfuric acid in likely no longer associated with this SWMU, given the time since operations ceased and the local meteorological conditions. Heavy metals would likely be present as adsorbate on soil particles.

7.44.3 MIGRATION PATHWAYS

7.44.3.1 GEOLOGIC SETTING

See Section 3.2.

7.44.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.44.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.44.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.44.3.5 PATHWAYS

AIR

Not applicable.

SOIL

Any releases would initially impact the upper soil with the potential for transport to the deeper soil over time. Even though there is no visual evidence of a release, the SWMU has been operated for many years, and the potential for deeper soil contamination exists. The soil will serve to attenuate the constituents. Many heavy metals, particularly lead, are absorbed by clay; therefore, the extent of mobility of some of the hazardous constituents may be less than other constituents.

SURFACE WATER/SEDIMENT

Any released acids and dissolved metals could be transported via surface waters. However, the volume of any such liquid, acid releases would be minor since only a small percentage of scrap lead-acid storage batteries leak. Also, large quantities of batteries were not accumulated since they are of economic value to the battery salvager. The possibility of surface water transport exists, but for the reasons cited, it is expected to be a minor avenue for off-site transport.

GROUNDWATER

A significant release of acid form the SWMU could have reached the ground water. However, it is anticipated that the volume of any release from this SWMU would have been very small. The amount of acid that might have been released from the battery storage area is small even though the acid is highly contaminated with heavy metals. The low liquid volume of any release coupled with the attenuation and adsorption capacity mitigates against any significant ground water impact or mobility via groundwater.

SUBSURFACE GAS

Not applicable.

7.44.4 CONTAMINANT RELEASE IDENTIFICATION

7.44.4.1 PRIOR INSPECTION REPORTS

Inspection of 1987.

7.44.4.2 PUBLIC COMPLAINTS

None.

7.44.4.3 MONITORING/SAMPLING DATA

None available.

7.44.4.4 **EVIDENCE OF RELEASE**

None observed.

7.44.5 **EXPOSURE POTENTIAL**

7.44.5.1 **PROXIMITY TO AFFECTED POPULATION**

This SWMU is located in the NAS industrial area, which is far away from the permanent NAS population.

7.44.5.2 **PROXIMITY TO SENSITIVE ENVIRONMENTS**

This unit is located distant from sensitive environments.

7.44.5.3 **LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS**

It has not been previously determined whether a release of hazardous material has occurred from this Unit.

7.44.6 **DOCUMENTS REVIEWED**

See PRD.

7.44.7 **SUMMARIZED DATA GAP**

7.44.7.1 **SOIL**

None available.

7.44.7.2 **GROUNDWATER**

No available data.

7.44.7.3 **SURFACE WATER/SEDIMENT**

No previous data.

7.44.7.4 **AIR**

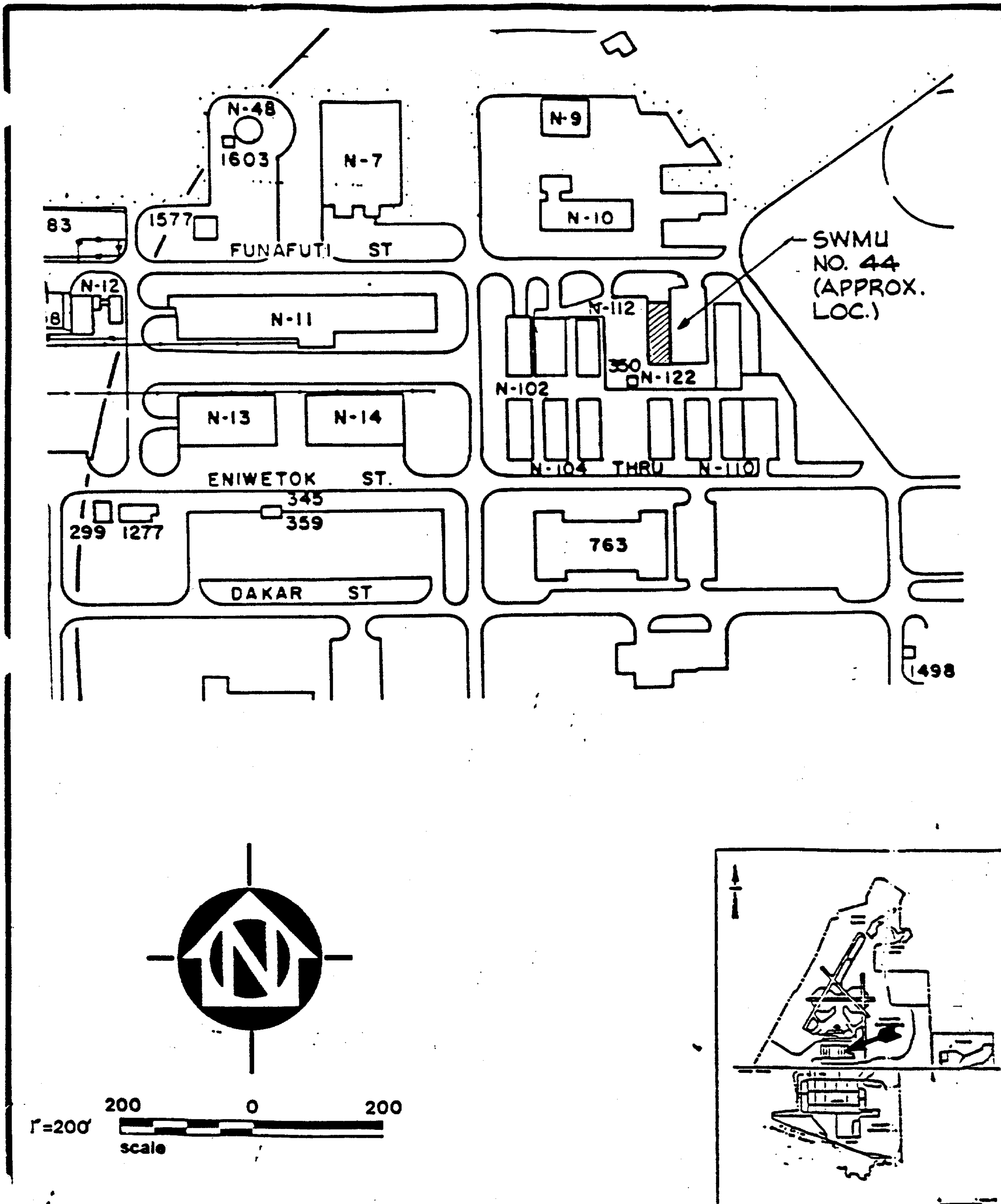
No previous data.

7.44.7.5 **SUBSURFACE GAS**

No previous data.

7.44.8 **RECOMMENDED ACTIONS**

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 44 HZ WASTE ACCUMULATION PTS AT N-102
FIGURE 7-44 LOCATION MAP

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7.45 SWMU NO. 45: S-142 HAZARDOUS WASTE ACCUMULATION POINTS

7.45.1 UNIT CHARACTERISTICS

7.45.1.1 TYPE OF UNIT

Inactive waste storage area.

7.45.1.2 DESIGN FEATURES

Metal storage shed on concrete slab.

7.45.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as an accumulation point for drummed paint waste. From this accumulation point, the drummed wastes were conveyed off-site for disposal.

7.45.1.4 PERIOD OF OPERATION

Unknown; not currently in use.

7.45.1.5 AGE OF UNIT

Unknown.

7.45.1.6 LOCATION OF UNIT

SWMU No. 45 is located adjacent to the Brig, Building S-142. See Figure 7-45.

7.45.1.7 GENERAL PHYSICAL CONDITIONS

During the June 1989 site inspection, the building was empty and appeared "clean" (no evidence of floor staining) and in good repair.

7.45.1.8 CLOSURE METHOD

Not applicable.

7.45.2 WASTE CHARACTERISTICS

7.45.2.1 TYPE OF WASTE

According to Department of the Navy information, drummed waste paint was placed in the accumulation area; however, it would be reasonable to assume that solvents and perhaps paint strippers may have also been involved. Therefore, a release from the area could be characterized by the presence of volatile pollutants including xylene and toluene, heavy metals, and phenols.

7.45.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil, and if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event. If paint sludges were released, they would be very immobile in soil and less likely to be transported by surface waters. Also, paint sludges would be very apparent visually and such were not detected during the 1983 survey nor upon reinspection on March 31, 1987.

7.45.2.3 TOXICOLOGICAL CHARACTERISTICS

Paint solvents would likely have included mineral spirits, turpentine and other terpenes, phenols, kerosene, and possibly various alcohols. Gasoline-type substances (e.g., BTEX) are also possible.

Depending on substances present, symptoms of exposure could be headache; eye, skin, and mucous membrane irritation; drowsiness; agitation; and damage to nerve tissue, liver, or kidneys.

7.45.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contamination would exist as adsorbate on soil particles, as soil-pore vapors, and possibly as groundwater contaminants.

7.45.3 MIGRATION PATHWAYS

7.45.3.1 GEOLOGIC SETTING

See Section 3.2.

7.45.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.45.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.45.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.45.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been used as an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water coursers. If such a release had occurred, the time lapse would prevent detection at this time.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the ground water.

SUBSURFACE GAS

Not applicable.

7.45.4 CONTAMINANT RELEASE IDENTIFICATION

7.45.4.1 PRIOR INSPECTION REPORTS

Visual inspection in 1983 and 1987 shows no evidence of releases.

7.45.4.2 PUBLIC COMPLAINTS

None.

7.45.4.3 MONITORING/SAMPLING DATA

None.

7.45.4.4 EVIDENCE OF RELEASE

None observed during the 1983 and 1987 inspections. It has not been established that a hazardous constituent release has ever occurred at SWMU No. 45 and, in fact, the possibility of a release is, at worst, only presumed.

7.45.5 EXPOSURE POTENTIAL

7.45.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS industrial area, which is far away from the permanent NAS population.

7.45.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.45.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

It has not been previously determined whether a release of hazardous material has occurred from this Unit. It is reasonable to assume that a release would be characterized by the organic volatile priority pollutants, xylene, heavy metals, and phenols.

7.45.6 DOCUMENTS REVIEWED

See PRD.

7.45.7 SUMMARIZED DATA GAP

7.45.7.1 SOIL

None available.

7.45.7.2 GROUNDWATER

No available data.

7.45.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.45.7.4 AIR

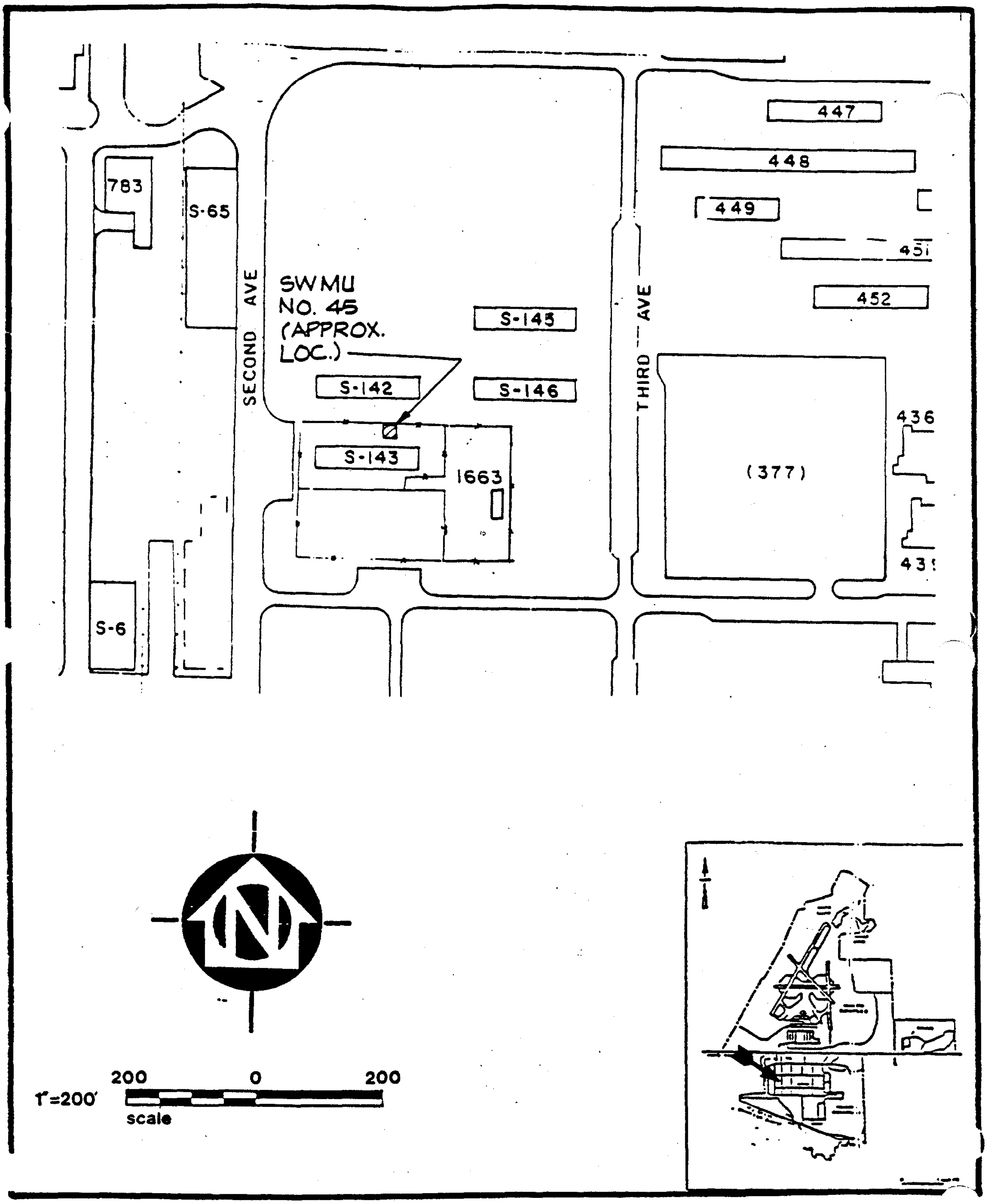
No previous data.

7.45.7.5 SUBSURFACE GAS

No previous data.

7.45.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 45 HZ WASTE ACCUMULATION PTS AT S-14_
FIGURE 7-45 LOCATION MAP

7.46 SWMU NO. 46: S-140 HAZARDOUS WASTE ACCUMULATION POINT

7.46.1 UNIT CHARACTERISTICS

7.46.1.1 TYPE OF UNIT

Inactive waste storage area.

7.46.1.2 DESIGN FEATURES

The area was unprotected ground surface with no containment. The building in question has been razed, and the area has been reseeded and landscaped to the extent that it now has a park-like appearance.

7.46.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU was used as a training facility. The SWMU served as an accumulation point for drummed waste paint and paint thinners. From this accumulation point, the drummed waste were conveyed off-site for disposal.

7.46.1.4 PERIOD OF OPERATION

Unknown.

7.46.1.5 AGE OF UNIT

Unknown.

7.46.1.6 LOCATION OF UNIT

SWMU No. 46 is located adjacent to Building S-140. See Figure 7-46.

7.46.1.7 GENERAL PHYSICAL CONDITIONS

Not applicable.

7.46.1.8 CLOSURE METHOD

Not applicable.

7.46.2 WASTE CHARACTERISTICS

7.46.2.1 TYPE OF WASTE

Waste paint.

7.46.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event. If paint sludges were released, they would probably be immobile in soil and less likely to be transported by surface waters. Also, paint sludges would be very apparent visually and such were not detected during the 1983 survey nor on March 31, 1987. No evidence was noted in the 1989 site visits.

7.46.2.3 TOXICOLOGICAL CHARACTERISTICS

Paint solvents would likely have included mineral spirits, turpentine and other terpenes, phenols, kerosene, and possibly various alcohols. Gasoline-type substances (e.g., BTEX) are also possible.

Depending on substances present, symptoms of exposure could be headache; eye, skin, and mucous membrane irritation; drowsiness; agitation; and damage to nerve tissue, liver, or kidneys.

7.46.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contamination would exist as adsorbate on soil particles, as soil pore-vapors, and possibly as groundwater contaminants.

7.46.3 MIGRATION PATHWAYS

7.46.3.1 GEOLOGIC SETTING

See Section 3.2.

7.46.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.46.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.46.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.46.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been as an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses. If such a release had occurred, the time lapse would prevent detection at this time.

GROUNDWATER

If there had been a very large release from this SWMU, solvents could possibly have reached the ground water. Had a release of such magnitude ever occurred, evidence in the soil should still exist.

SUBSURFACE GAS

Not applicable.

7.46.4 CONTAMINANT RELEASE IDENTIFICATION

7.46.4.1 PRIOR INSPECTION REPORTS

Visual inspection shows no evidence of releases.

7.46.4.2 PUBLIC COMPLAINTS

None.

7.46.4.3 MONITORING/SAMPLING DATA

None.

7.46.4.4 EVIDENCE OF RELEASE

None observed.

7.46.5 EXPOSURE POTENTIAL

7.46.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS South Side industrial area, some distance from the permanent NAS population.

7.46.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.46.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

At that of the IAS conducted in 1983, there was no evidence of a release having occurred at this accumulation point. A reinspection on March 31, 1987, confirmed no visual evidence of a release. It has not been previously determined whether a release of hazardous material has occurred from this Unit. It is reasonable to assume that a release would be characterized by the organic volatile priority pollutants, xylene, heavy metals, and phenols.

7.46.6 DOCUMENTS REVIEWED

See PRD.

7.46.7 SUMMARIZED DATA GAP

7.46.7.1 SOIL

None available.

7.46.7.2 GROUNDWATER

No available data.

7.46.7.3 SURFACE WATER/SEDIMENT

No previous data.

7.46.7.4 AIR

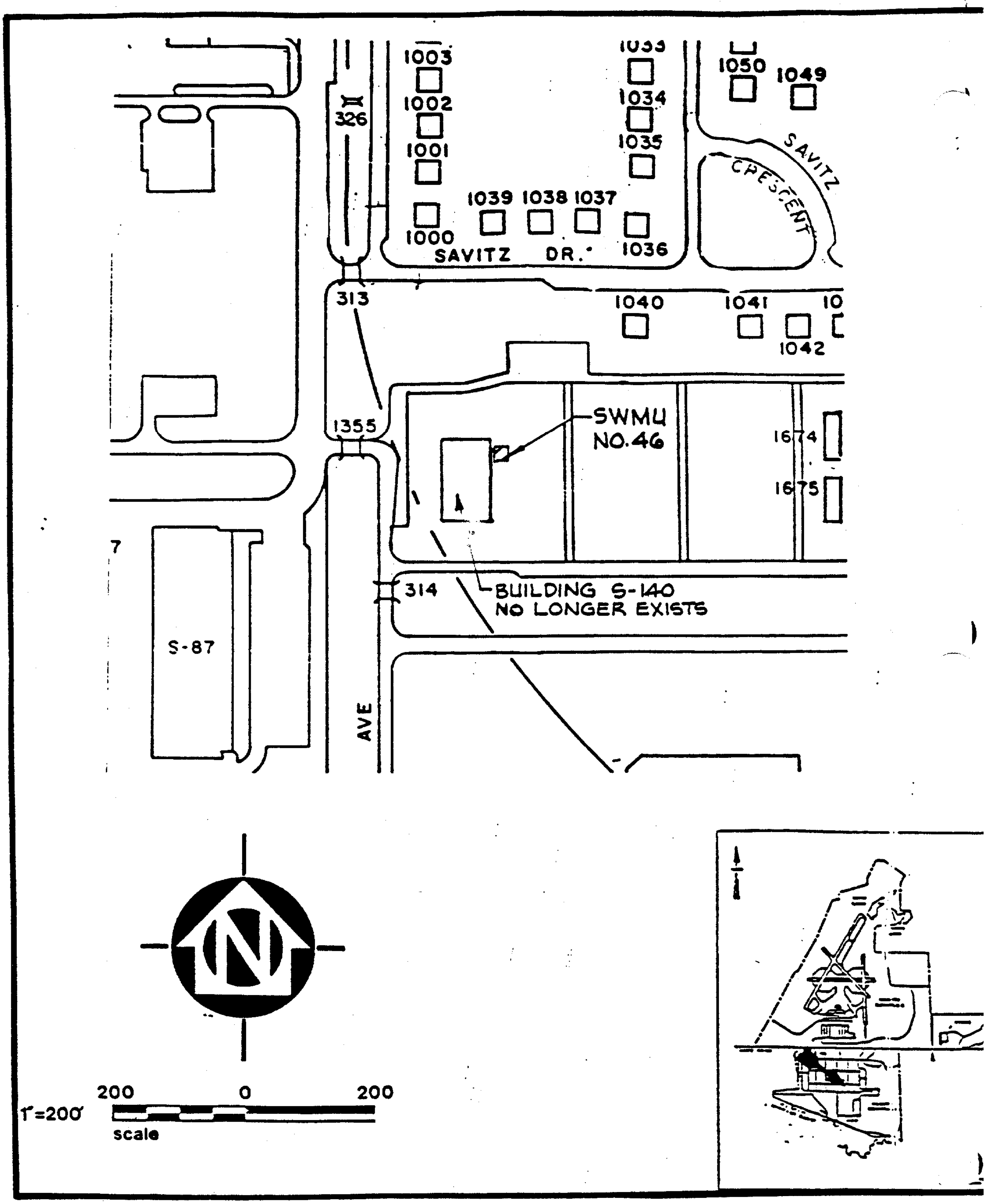
No previous data.

7.46.7.5 <u>SUBSURFACE GAS</u>

No previous data.

7.46.8 <u>RECOMMENDED ACTIONS</u>

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO.46 HZ WASTE ACCUMULATION PTS AT S-1
FIGURE 7-46 LOCATION MAP

7.47 SWMU NO. 47: BUILDING 344 HAZARDOUS ACCUMULATION POINT

7.47.1 UNIT CHARACTERISTICS

7.47.1.1 TYPE OF UNIT

Inactive waste storage area.

7.47.1.2 DESIGN FEATURES

The containers accumulated at this point ranged in size from one quart to five gallons; the accumulated wastes were ultimately conveyed off-site for disposal. The area was unprotected ground surface with no containment.

7.47.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulated point for containerized mineral spirits.

7.47.1.4 PERIOD OF OPERATION

The area is no longer used as an accumulation point.

7.47.1.5 AGE OF UNIT

Unknown.

7.47.1.6 LOCATION OF UNIT

SWMU No. 47 is located adjacent to Building 344. See Figure 7-47.

7.47.1.7 GENERAL PHYSICAL CONDITIONS

Physical condition was good at the time of the July 1989 site inspection.

7.47.1.8 CLOSURE METHOD

Not applicable.

7.47.2 WASTE CHARACTERISTICS

7.47.2.1 TYPE OF WASTE

Containerized mineral spirits.

7.47.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any previous release coincided with a precipitation event.

7.47.2.3 TOXICOLOGICAL CHARACTERISTICS

Mineral spirits are petroleum distillates similar to kerosene which are used as paint and varnish solvents and metal cleaner/degreaser. Prolonged dermal contact can lead to tissue damage. Prolonged inhalation of vapors can lead to liver and kidney damage.

7.47.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Any residual contamination would exist as adsorbate on soil particles, as soil-pore vapor, and possibly as groundwater contamination.

7.47.3 MIGRATION PATHWAYS

7.47.3.1 GEOLOGIC SETTING

See Section 3.2.

7.47.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.47.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.47.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.47.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been as an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses. If such a release had occurred, the time lapse would prevent detection at this time.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the ground water.

SUBSURFACE GAS

Not applicable.

7.47.4 CONTAMINANT RELEASE IDENTIFICATION

7.47.4 1 PRIOR INSPECTION REPORTS

The unit has been inspected in 1983, 1987, and 1989. No visual evidence of release was found.

7.47.4.2 PUBLIC COMPLAINTS

None.

7.47.4.3 MONITORING/SAMPLING DATA

None.

7.47.4.4 EVIDENCE OF RELEASE

None observed.

7.47.5 EXPOSURE POTENTIAL

7.47.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located in the NAS South Side industrial area, at a distance from the permanent NAS population.

7.47.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The site is not in or near environmentally sensitive areas.

7.47.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

The area was inspected in 1983, and there was no visual evidence of any releases. Inspections were conducted on 1983, 1987, and 1989. In absence of a release, migration is unlikely.

7.47.6 DOCUMENT REVIEWED

See PRD.

7.47.7 SUMMARIZED DATA GAP

7.47.7.1 SOIL

None available.

7.47.7.2 ROUNDWATER

No av ilable data.

7.47.7.3 URFACE WATER/SEDIMENT

No pr vious data.

7.47.7.4 IR

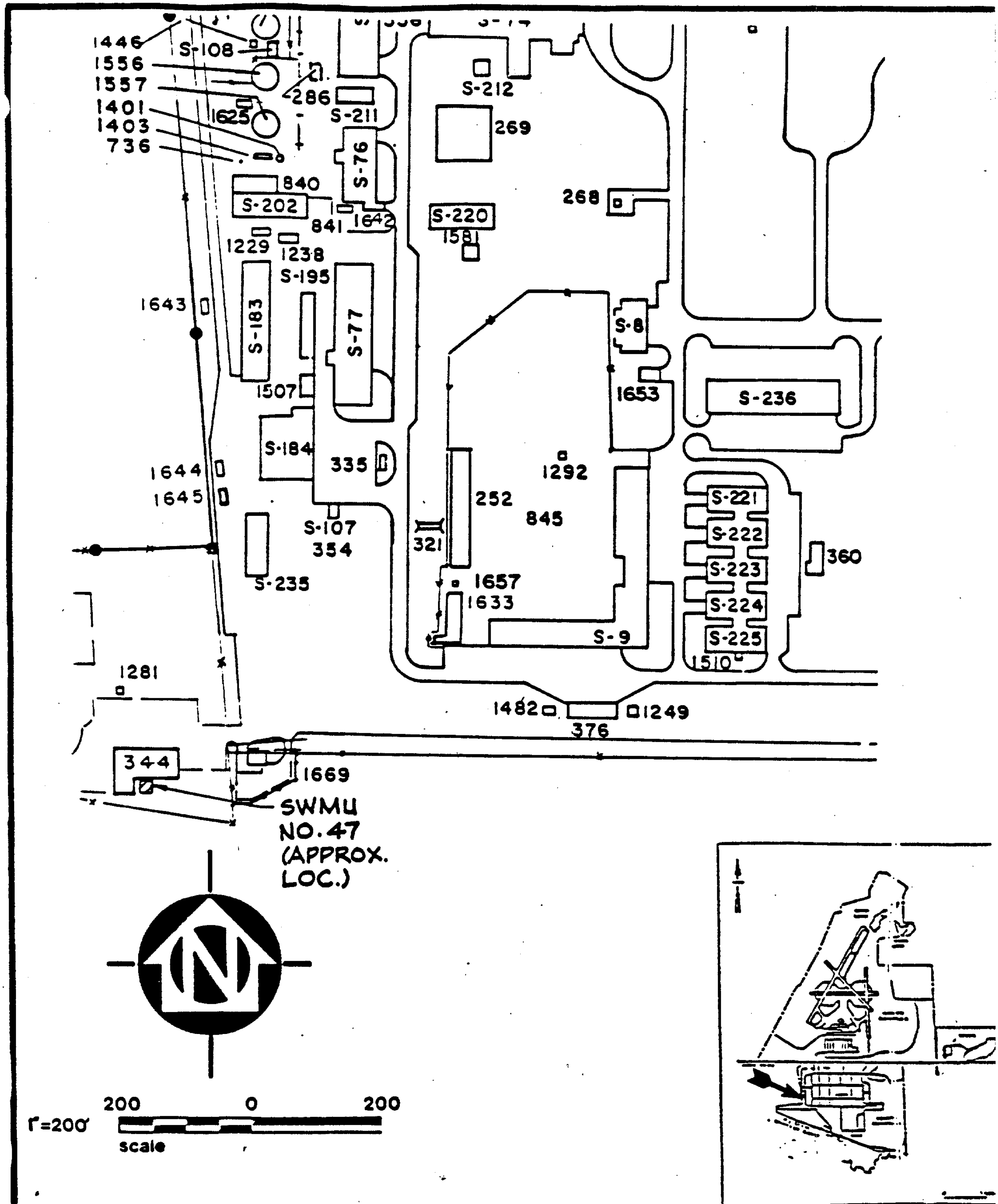
No pr vious data.

7.47.7.5 UBSURFACE GAS

No previous data.

7.47.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 47 HZ WASTE ACCUMULATION PTS AT 344

FIGURE 7-47 LOCATION MAP

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7.48 SWMU NO. 48: S-9 HAZARDOUS WASTE ACCUMULATION POINT

7.48.1 UNIT CHARACTERISTICS

7.48.1.1 TYPE OF UNIT

Inactive waste storage area for Public Works maintenance.

7.48.1.2 DESIGN FEATURES

Open storage area; unprotected surface ground with no containment.

7.48.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulated point for containerized paint thinner and degreasing agents.

7.48.1.4 PERIOD OF OPERATION

The area is no longer used as an accumulation point.

7.48.1.5 AGE OF UNIT

Unknown.

7.48.1.6 LOCATION OF UNIT

SWMU No. 48 is located adjacent to Building S-9. See Figure 7-48.

7.48.1.7 GENERAL PHYSICAL CONDITIONS

As of the last inspection (7 February 1990), the site was clean. However, a used automobile battery staging area had been set up on a graveled section of the parking area near Building 1292 a short distance to the north.

7.48.1.8 CLOSURE METHOD

Removal of containers.

7.48.2 WASTE CHARACTERISTICS

7.48.2.1 TYPE OF WASTE

Paint thinners and degreasers.

7.48.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event. If paint sludges were released, they would be very immobile in soil and less likely to be transported via surface waters. Also, paint sludges would be very apparent visually and such were not detected during the 1983 survey.

7.48.2.3 TOXICOLOGICAL CHARACTERISTICS

Paint solvents would likely have included mineral spirits, turpentine and other turpenes, phenols, kerosenes, and possibly various alcohols. Gasoline-type substances (e.g., BTEX) are also possible.

Depending on substances present, symptoms of exposure could be headache; eye, skin, and mucous membrane irritation; drowsiness; agitation; and damage to nerve tissue, liver, or kidneys.

7.48.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contamination would exist as adsorbate on soil particles, as soil pore-vapors, and possibly as groundwater contaminants.

7.48.3 MIGRATION PATHWAYS

7.4.3.1 GEOLOGIC SETTING

See Section 3.2.

7.4.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.4.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.4.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.4.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected, if a release did in fact occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the groundwater.

SUBSURFACE GAS

Not applicable.

7.48.4 CONTAMINANT RELEASE IDENTIFICATION

7.48.4 1 PRIOR INSPECTION REPORTS

None available.

7.48.4.2 PUBLIC COMPLAINTS

None.

7.48.4.3 MONITORING/SAMPLING DATA

None.

7.48.4.4 EVIDENCE OF RELEASE

None observed.

7.48.5 <u>EXPOSURE POTENTIAL</u>

7.48.5.1 <u>PROXIMITY TO AFFECTED POPULATION</u>

The affected population would be workers in the immediate area.

7.48.5.2 <u>PROXIMITY TO SENSITIVE ENVIRONMENTS</u>

The site is not in or near environmentally sensitive areas.

7.48.5.3 <u>LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS</u>

Because of the site location and small container sizes, migration to potential receptors is unlikely.

7.48.6 <u>DOCUMENTS REVIEWED</u>

See PRD.

7.48.7 <u>SUMMARIZED DATA GAP</u>

7.48.7.1 <u>SOIL</u>

No data.

7.48.7.2 <u>GROUNDWATER</u>

No data.

7.48.7.3 <u>SURFACE WATER/SEDIMENT</u>

No data.

7.48.7.4 <u>AIR</u>

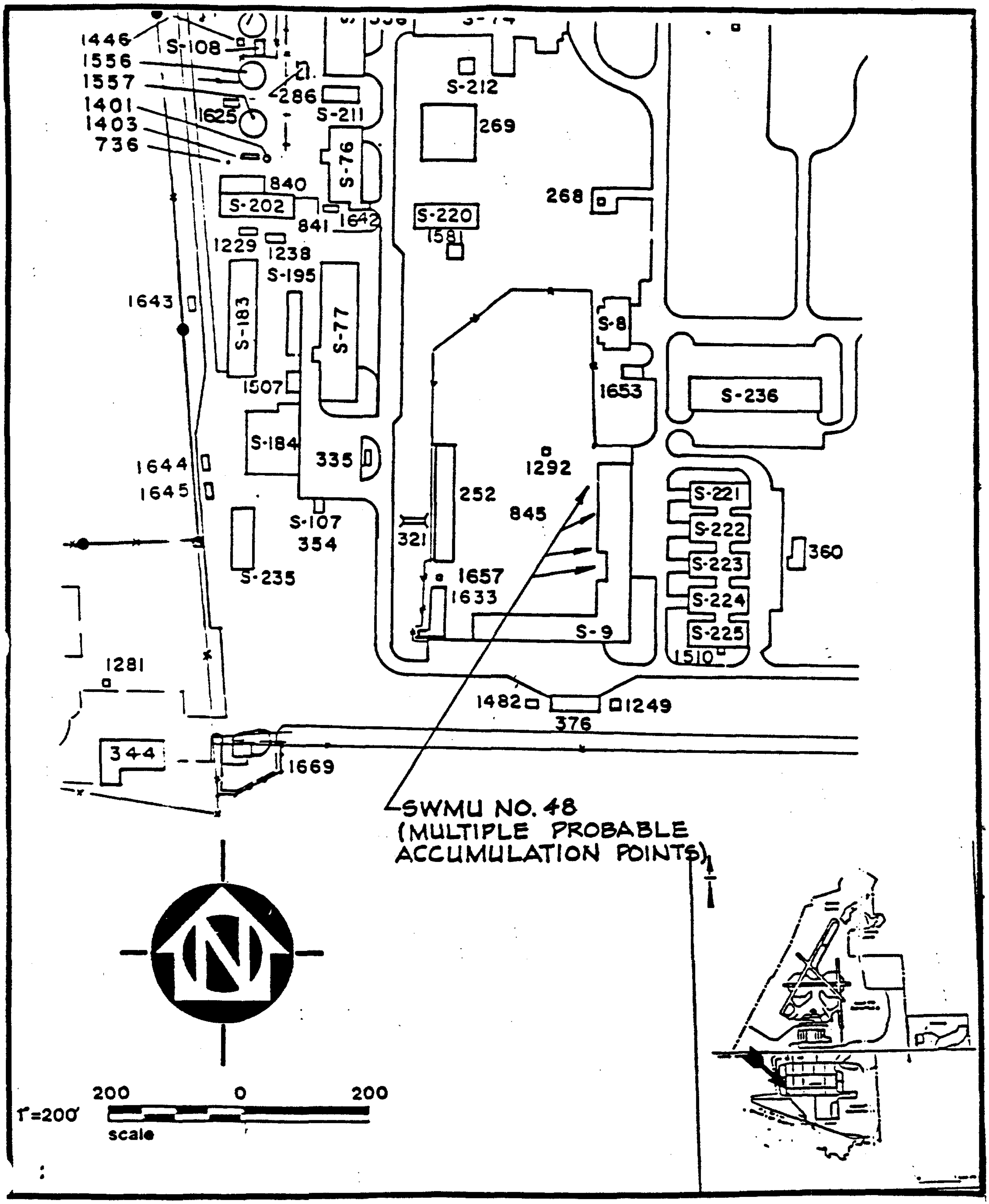
Not applicable.

7.48.7.5 <u>SUBSURFACE GAS</u>

Not applicable.

7.48.8 <u>RECOMMENDED ACTIONS</u>

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 48 HZ. WASTE ACCUMULATION PTS AT S-9

FIGURE 7-48 LOCATION MAP

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7.49 SWMU NO. 49: BUILDING 757 HAZARDOUS WASTE ACCUMULATION POINTS

7.49.1 UNIT CHARACTERISTICS

7.49.1.1 TYPE OF UNIT

Inactive waste storage area.

7.49.1.2 DESIGN FEATURES

The area was open storage with unprotected ground surface and no containment.

7.49.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulated point for used automobile batteries and containerized waste mineral spirits.

7.49.1.4 PERIOD OF OPERATION

The area is no longer used as an accumulation point.

7.49.1.5 AGE OF UNIT

Unknown.

7.49.1.6 LOCATION OF UNIT

SWMU No. 49 is located adjacent to Building 757. See Figure 7-49.

7.49.1.7 GENERAL PHYSICAL CONDITIONS

The SWMU was unused and appeared clean at the time of the last inspection (7 February 1990). SWMU usage and exact location have apparently changed several times over the past several years.

7.49.1.8 CLOSURE METHOD

To be determined.

7.49.2 WASTE CHARACTERISTICS

7.49.2.1 TYPE OF WASTE

Mineral spirits, waste paints, and used batteries.

7.49.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event. If mineral spirits were released, they would be very immobile in soil and less likely to be transported via surface waters. Also, mineral spirits would be very apparent visually and such were not detected during the 1983 survey or later site visits.

7.49.2.3 TOXICOLOGICAL CHARACTERISTICS

Contaminants of concern are sulfuric acid, and the heavy metals cadmium, lead, and zinc. Sulfuric acid, at sufficient strength, is corrosive to tissue and can produce chemical burns. One neutralized, the constituents are relatively innocuous. Heavy metals produce toxic effects in sufficient dosages, primarily by interfering with cellular enzymes and/or nerve function. Heavy metal poisoning usually results from chronic exposure to low concentrations in food and water.

During the period of operation, paints likely contained lead and various metallic pigments in a hydrocarbon (e.g., acrylic) matrix. Liquid paints probably included both oil-based and water-based (e.g., latex) types. Paint solvents probably included turpentine and/or other terpenes and mineral spirits. Lead, which is probably the most important toxic metal of concern at this SWMU, can result in systemic poisoning as a result of chronic exposure. Paint organic solvents can produce a number of acute and chronic effects, including headaches, nausea, dizziness, disorientation, liver or kidney damage, or nerve tissue damage.

7.49.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Sulfuric acid in likely no longer associated with this SWMU, given the time since operations ceased and the local meteorological conditions. Heavy metals would likely be present as adsorbate in soil particles.

At this SWMU, residuals would likely exist as solids or liquids adsorbed onto soil particles or as soil moisture/groundwater contaminants.

7.49.3 MIGRATION PATHWAYS

7.49.3.1 GEOLOGIC SETTING

See Section 3.2.

7.49.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.49.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.49.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.49.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been as an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses. If such a release had occurred, the time lapse would prevent detection at this time.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the groundwater. There is no indication that this ever occurred.

SUBSURFACE GAS

Not applicable.

7.49.4 CONTAMINANT RELEASE IDENTIFICATION

7.49.4.1 PRIOR INSPECTION REPORTS

None available.

7.49.4.2 PUBLIC COMPLAINTS

None.

7.49.4.3 MONITORING/SAMPLING DATA

None available.

7.49.4.4 EVIDENCE OF RELEASE

None observed.

7.49.5 EXPOSURE POTENTIAL

7.49.5.1 PROXIMITY TO AFFECTED POPULATION

The SWMU is located on Navy Road. While it is distant from the NAS residential area it is near residences on Navy Road.

7.49.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The site is not in or near environmentally sensitive areas.

7.49.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Migration to potential receptors is unlikely considering the locations and potential volumes involved.

7.49.6 DOCUMENTS REVIEWED

None available.

7.49.7 SUMMARIZED DATA GAP

7.49.7.1 SOIL

No data.

7.49.7.2 GROUNDWATER

No data.

7.49.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.49.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.49.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.49.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been as an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses. If such a release had occurred, the time lapse would prevent detection at this time.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the groundwater. There is no indication that this ever occurred.

SUBSURFACE GAS

Not applicable.

7.49.4 CONTAMINANT RELEASE IDENTIFICATION

7.49.4.1 PRIOR INSPECTION REPORTS

None available.

7.49.4.2 PUBLIC COMPLAINTS

None.

7.49.4.3 MONITORING/SAMPLING DATA

None available.

7.49.4.4 EVIDENCE OF RELEASE

None observed.

7.49.5 EXPOSURE POTENTIAL

7.49.5.1 PROXIMITY TO AFFECTED POPULATION

The SWMU is located on Navy Road. While it is distant from the NAS residential area it is near residences on Navy Road.

7.49.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The site is not in or near environmentally sensitive areas.

7.49.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Migration to potential receptors is unlikely considering the locations and potential volumes involved.

7.49.6 DOCUMENTS REVIEWED

None available.

7.49.7 SUMMARIZED DATA GAP

7.49.7.1 SOIL

No data.

7.49.7.2 GROUNDWATER

No data.

7.49.7.3 SURFACE WATER/SEDIMENT

No data.

7.49.7.4 AIR

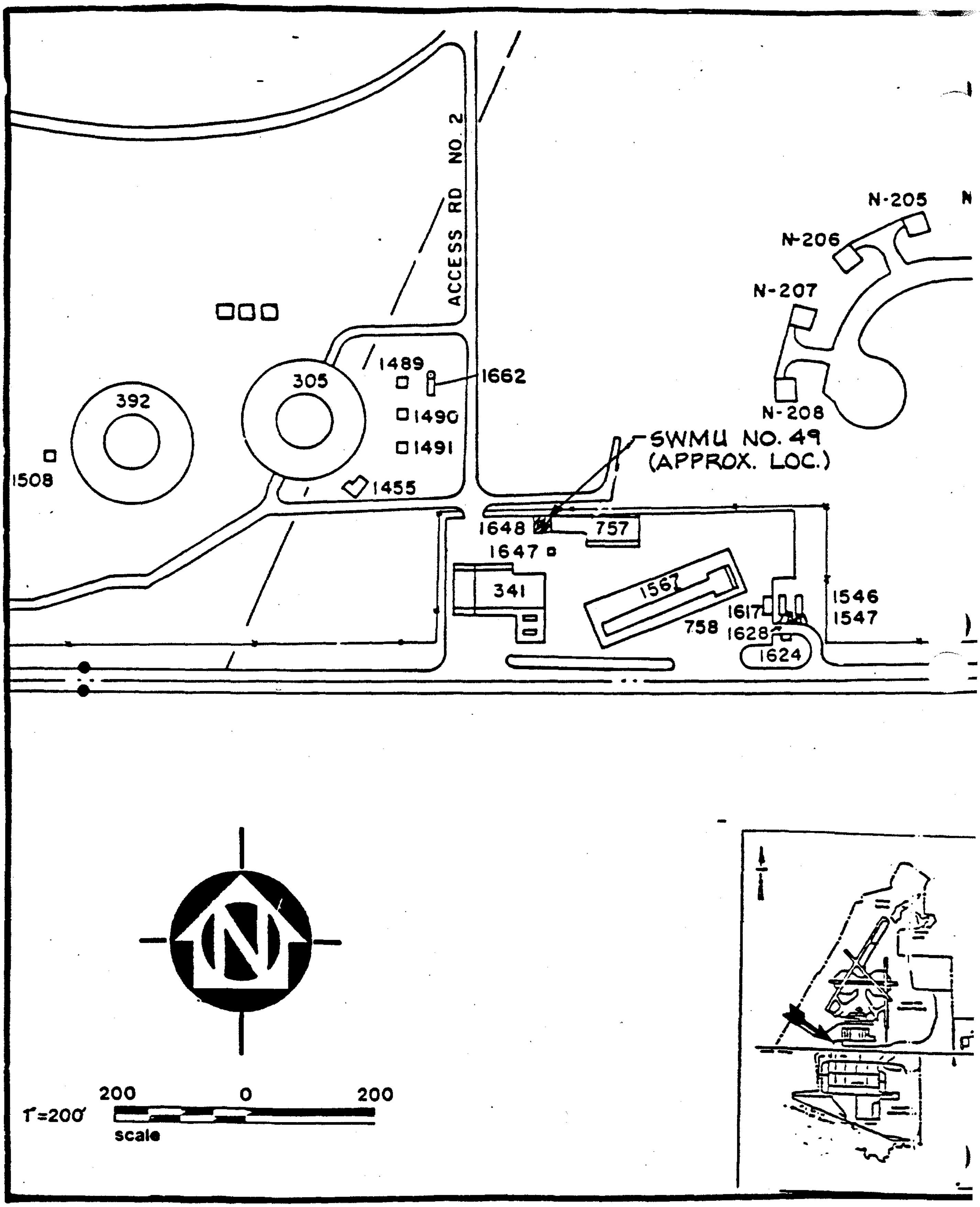
Not applicable.

7.49.7.5 SUBSURFACE GAS

Not applicable.

7.49.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 49 FIGURE 7-49 HZ WASTE ACCUMULATION PTS AT 757 LOCATION MAP

7.50 SWMU NO. 50: BUILDING N-126 HAZARDOUS WASTE ACCUMULATION POINT

7.50.1 UNIT CHARACTERISTICS

7.50.1.1 TYPE OF UNIT

Inactive waste storage area. Temporary storage has been moved from N-126 to a site south of SWMU No. 21.

7.50.1.2 DESIGN FEATURES

The area was open storage and no containment.

7.50.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulated point for automobile batteries and containerized mineral spirits and paint thinners for MAG 42 Squadron. Wastes were accumulated in drums and mobile bowsers.

7.50.1.4 PERIOD OF OPERATION

The area is no longer used as an accumulation point.

7.50.1.5 AGE OF UNIT

Unknown.

7.50.1.6 LOCATION OF UNIT

SWMU No. 50 is located adjacent to Building N-126. See Figure 7-50.

7.50.1.7 GENERAL PHYSICAL CONDITIONS

The old (N-126) site was inactive and appeared clean at the time of last inspection.

7.50.1.8 CLOSURE METHOD

The old (N-126) site is inactive. Storage activities have been moved to a site south of SWMU No. 21.

7.50.2 WASTE CHARACTERISTICS

7.50.2.1 TYPE OF WASTE

Mineral spirits and paint thinners.

7.50.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event.

7.50.2.3 TOXICOLOGICAL CHARACTERISTICS

Contaminants may include used engine oil and hydraulic fluid include toxic volatile and semivolatile organics, toxic polynuclear aromatic hydrocarbons, and heavy metals (lead, cadmium). Organic constituents include known and suspected carcinogens, and toxic liquids and vapors. Acute effects of exposure may include nausea, vomiting, dizziness, drowsiness, central nervous system, depression, and damage to nerves, liver, or kidney.

7.50.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Substances remaining in the tanks would be in the form of liquids or semi-liquids/sludges. Substances that may have leaked from the tanks could exist as waste-saturated soils or soil moisture/groundwater contaminants.

7.50.3 MIGRATION PATHWAYS

7.50.3.1 GEOLOGIC SETTING

See Section 3.2.

7.50.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.50.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.50.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.50.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the ground water. Had a release of such magnitude ever occurred, evidence in the soil would still exist.

SUBSURFACE GAS

Not applicable.

7.50.4 CONTAMINANT RELEASE IDENTIFICATION

7.50.4 1 PRIOR INSPECTION REPORTS

None available.

7.50.4.2 PUBLIC COMPLAINTS

None.

7.50.4.3 MONITORING/SAMPLING DATA

None available.

7.50.4.4 EVIDENCE OF RELEASE

None observed.

7.50.5 **EXPOSURE POTENTIAL**

7.50.5.1 **PROXIMITY TO AFFECTED POPULATION**

The SWMU is located in the NAS North Side industrial area at some distance from the residential area.

7.50.5.2 **PROXIMITY TO SENSITIVE ENVIRONMENTS**

The site is not in or near environmentally sensitive areas.

7.50.5.3 **LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS**

Unlikely.

7.50.6 **DOCUMENTS REVIEWED**

None available.

7.50.7 **SUMMARIZED DATA GAP**

7.50.7. **SOIL**

No ata.

7.50.7. **GROUNDWATER**

No ata.

7.50.7. **SURFACE WATER/SEDIMENT**

No ata.

7.50.7. **AIR**

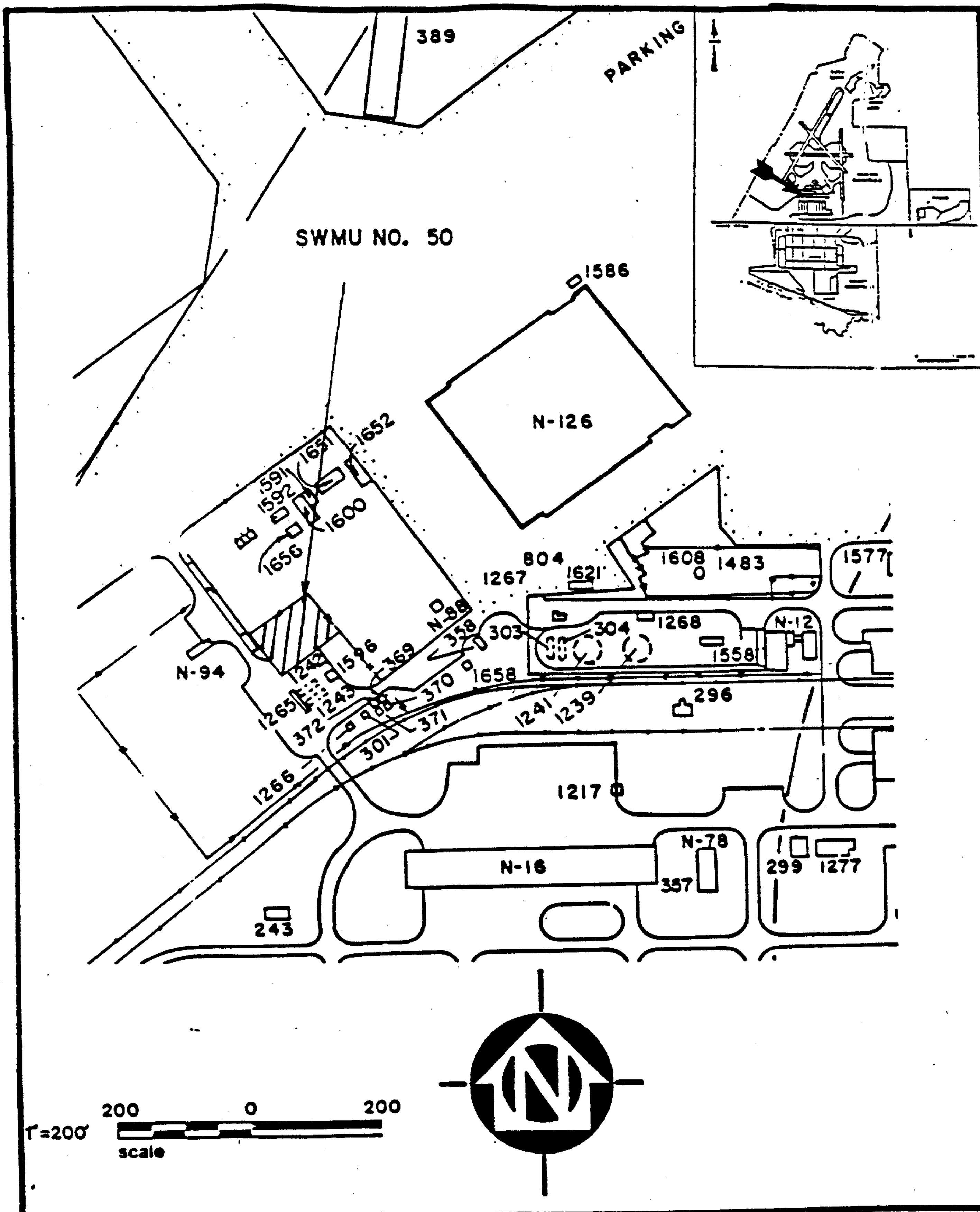
Not applicable.

7.50.7.5 **SUBSURFACE GAS**

Not applicable.

7.50.8 **RECOMMENDED ACTIONS**

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO.50. HZ WASTE ACCUMULATION PTS
FIGURE 7-50 LOCATION MAP

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7.51 SWMU NO. 51: N-126, VR-60 HAZARDOUS WASTE ACCUMULATION POINT

7.51.1 UNIT CHARACTERISTICS

7.51.1.1 TYPE OF UNIT

Inactive waste storage area. Temporary storage has been moved from an area west of Bldg. N-126 to self-contained paint lockers in front of Bldg. N-126.

7.51.1.2 DESIGN FEATURES

The old area was on asphalt with no containment.

7.51.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulated point for containerized mineral spirits and paint thinners for VR-60 Squadron.

7.51.1.4 PERIOD OF OPERATION

Unknown.

7.51.1.5 AGE OF UNIT

Unknown.

7.51.1.6 LOCATION OF UNIT

SWMU No. 51 is located adjacent to Building N-126. See Figure 7-51.

7.51.1.7 GENERAL PHYSICAL CONDITIONS

The old (N-126) site was inactive and appeared clean at the time of last inspection.

7.51.1.8 CLOSURE METHOD

The old (N-126) unit is inactive. Temporary storage activities have been moved in front of Building N-126.

7.51.2 WASTE CHARACTERISTICS

7.51.2.1 TYPE OF WASTE

Mineral spirits and paint thinners.

7.51.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event.

7.51.2.3 TOXICOLOGICAL CHARACTERISTICS

During the period of operation, paints likely contained lead and various metallic pigments in a hydrocarbon (e.g., acrylic) matrix. Liquid paints probably included both oil-based and water-based (e.g., latex) types. Paint solvents probably included turpentine and/or other terpenes and mineral spirits. Lead, which is probably the most important toxic metal of concern at this SWMU, can result in systemic poisoning as a result of chronic exposure. Paint organic solvents can produce a number of acute and chronic effects, including headaches, nausea, dizziness, disorientation, liver or kidney damage, or nerve tissue damage.

7.51.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

At this SWMU, residuals would likely exist as solids or liquids adsorbed onto soil particles or as soil moisture/groundwater contaminants.

7.51.3 MIGRATION PATHWAYS

7.51.3.1 GEOLOGIC SETTING

See Section 3.2.

7.51.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.51.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.51.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.51.3.5 **PATHWAYS**

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been as an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses. If such a release had occurred, the time lapse would prevent detection at this time.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the ground water. Had a release of such magnitude ever occurred, evidence in the soil would still exist.

SUBSURFACE GAS

Not applicable.

7.51.4 **CONTAMINANT RELEASE IDENTIFICATION**

7.51.4 1 **PRIOR INSPECTION REPORTS**

None available.

7.51.4.2 **PUBLIC COMPLAINTS**

None.

7.51.4.3 MONITORING/SAMPLING DATA

None available.

7.51.4.4 EVIDENCE OF RELEASE

None observed.

7.51.5 EXPOSURE POTENTIAL

7.51.5.1 PROXIMITY TO AFFECTED POPULATION

The SWMU is located in the NAS North Side industrial area at some distance from the residential area.

7.51.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The site is not in or near environmentally sensitive areas.

7.51.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Not likely.

7.51.6 DOCUMENTS REVIEWED

None available.

7.51.7 SUMMARIZED DATA GAP

7.51.7.1 SOIL

None available.

7.51.7.2 GROUNDWATER

None available.

7.51.7.3 SURFACE WATER/SEDIMENT

None available.

7.51.7.4 AIR

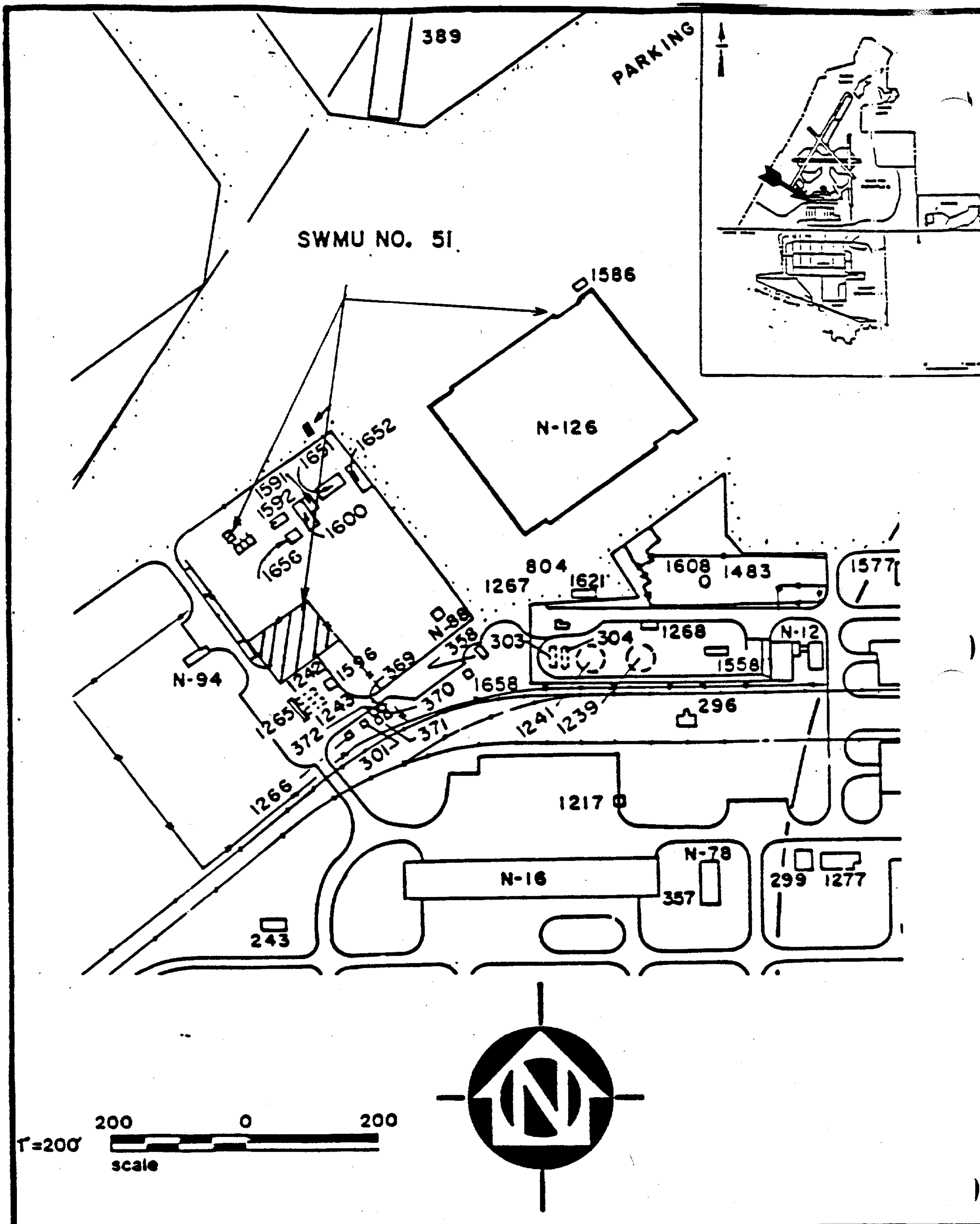
Not applicable.

7.51.7.5 SUBSURFACE GAS

Not applicable.

7.51.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 51. HZ WASTE ACCUMULATION PTS
FIGURE 7-51 LOCATION MAP

7.52 SWMU NO. 52: N-126, VP-67 SQUADRON HAZARDOUS ACCUMULATION POINT

7.52.1 UNIT CHARACTERISTICS

7.52.1.1 TYPE OF UNIT

Inactive waste storage area.

7.52.1.2 DESIGN FEATURES

The area is on asphalt with no containment.

7.52.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulated point for mineral spirits and paint thinners for VR-67 Squadron.

7.52.1.4 PERIOD OF OPERATION

Area has been used as an accumulation point since 1985.

7.52.1.5 AGE OF UNIT

Unknown.

7.52.1.6 LOCATION OF UNIT

SWMU No. 52 is located adjacent to Building N-126. See Figure 7-52.

7.52.1.7 GENERAL PHYSICAL CONDITIONS

The old N-126 site appeared to be clean at time of last inspection.

7.52.1.8 CLOSURE METHOD

The N-126 unit is active.

7.52.2 WASTE CHARACTERISTICS

7.52.2.1 TYPE OF WASTE

Mineral spirits and paint thinners.

7.52.2.2 <u>MIGRATION CHARACTERISTICS</u>

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event.

7.52.2.3 <u>TOXICOLOGICAL CHARACTERISTICS</u>

During the period of operation, paints likely contained lead and various metallic pigments in a hydrocarbon (e.g., acrylic) matrix. Liquid paints probably included both oil-based and water-based (e.g., latex) types. Paint solvents probably included turpentine and/or other terpenes and mineral spirits. Lead, which is probably the most important toxic metal of concern at this SWMU, can result in systemic poisoning as a result of chronic exposure. Paint organic solvents can produce a number of acute and chronic effects, including headaches, nausea, dizziness, disorientation, liver or kidney damage, or nerve tissue damage.

7.52.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

At this SWMU, residuals would likely exist as solids or liquids adsorbed onto soil particles or as soil moisture/groundwater contaminants.

7.52.3 <u>MIGRATION PATHWAYS</u>

7.52.3.1 <u>GEOLOGIC SETTING</u>

See Section 3.2.

7.52.3.2 <u>HYDROGEOLOGIC SETTING</u>

See Section 3.3.

7.52.3.3 <u>ATMOSPHERIC CONDITIONS</u>

See Section 4.0.

7.52.3.4 <u>TOPOGRAPHIC CHARACTERISTICS</u>

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west.

7.52.3.5 PATHWAYS

AIR

Any release of volatile constituents would have volatilized promptly upon release. The SWMU has not been as an accumulation point for many months; therefore, there would be no residual volatile constituents in the ambient air in the vicinity of the SWMU.

SOIL

Any releases would initially impact the upper or surficial soils with the potential for transport to the deeper soils only if the release were a significant amount. There was no visual evidence of a release in 1983 and such would have been apparent had a release of a significant amount occurred prior to the 1983 inspection. Minor releases would be trapped in the vadose zone and attenuated by the surficial soils. Thus, for this SWMU, transport into the soil below a depth of three feet is not expected if in fact a release did occur.

SURFACE WATER/SEDIMENT

Visual observations have revealed no apparent release of hazardous constituents to surface water courses. If such a release had occurred, the time lapse would prevent detection at this time.

GROUNDWATER

If there had been a significant release from this SWMU, solvents could have reached the ground water. Had a release of such magnitude ever occurred, evidence in the soil would still exist.

SUBSURFACE GAS

Not applicable.

7.52.4 CONTAMINANT RELEASE IDENTIFICATION

7.52.4 1 PRIOR INSPECTION REPORTS

None available.

7.52.4.2 PUBLIC COMPLAINTS

None.

7.52.4.3 MONITORING/SAMPLING DATA

None available.

7.52.4.4 EVIDENCE OF RELEASE

None observed.

7.52.5 EXPOSURE POTENTIAL

7.52.5.1 PROXIMITY TO AFFECTED POPULATION

The SWMU is located in the NAS North Side industrial area and is distant from the residential area.

7.52.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The site is not in or near environmentally sensitive areas.

7.52.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Not likely.

7.52.6 DOCUMENTS REVIEWED

None available.

7.52.7 SUMMARIZED DATA GAP

7.52.7.1 SOIL

None available.

7.52.7.2 GROUNDWATER

None available.

7.52.7.3 SURFACE WATER/SEDIMENT

None available.

7.52.7.4 AIR

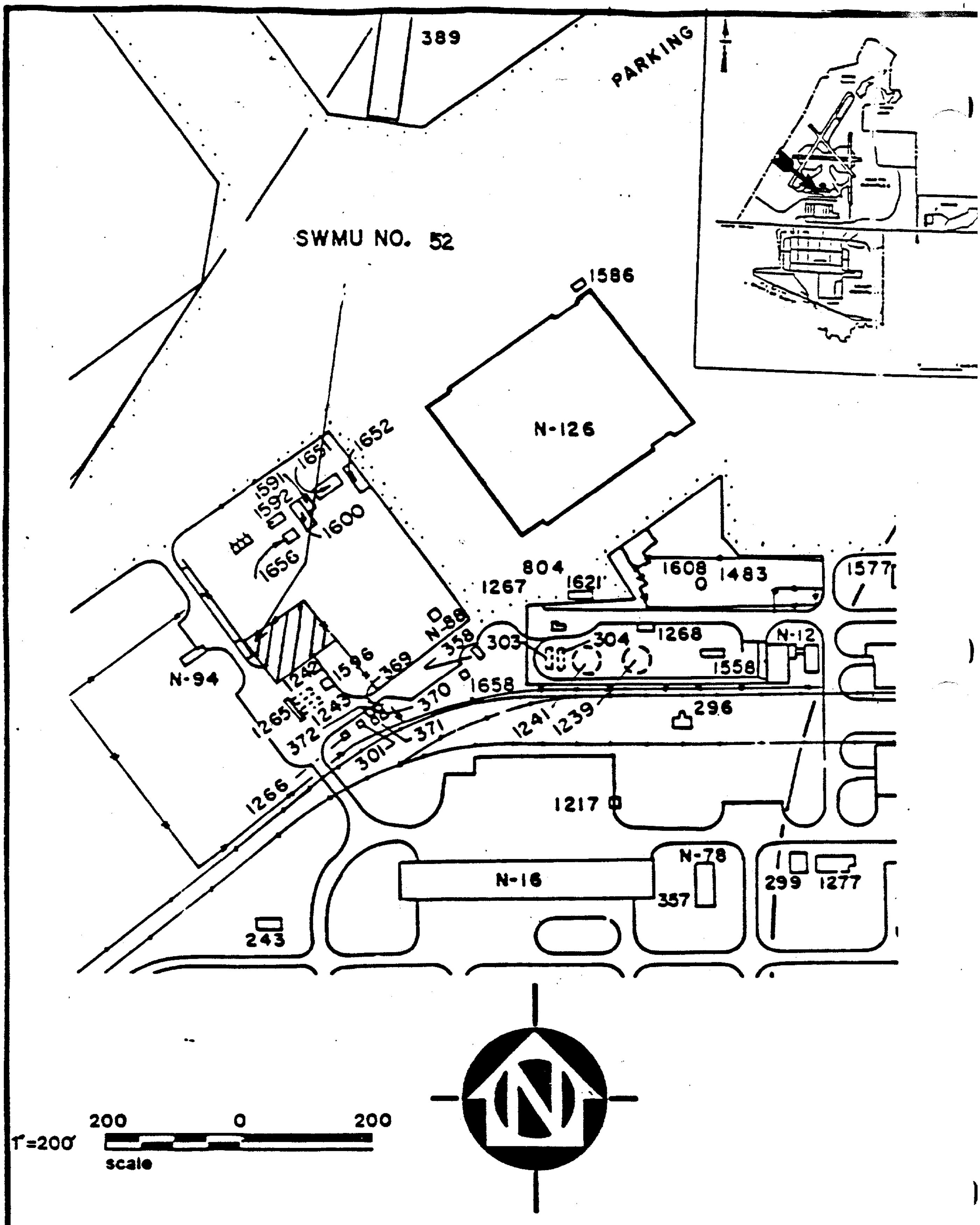
Not applicable.

7.52.7.5 SUBSURFACE GAS

Not applicable.

7.52.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 52. HZ WASTE ACCUMULATION PTS
FIGURE 7-52 LOCATION MAP

7.53 SWMU NO. 53: BUILDING N-126 HAZARDOUS ACCUMULATION POINT

7.53.1 UNIT CHARACTERISTICS

7.53.1.1 TYPE OF UNIT

Active waste storage area.

7.53.1.2 DESIGN FEATURES

Storage area for drums and mobile bowsers.

7.53.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulated point for mineral spirits, TCE, and paint thinners.

7.53.1.4 PERIOD OF OPERATION

The area is an active accumulation point.

7.53.1.5 AGE OF UNIT

Unit has been in operation since 1988.

7.53.1.6 LOCATION OF UNIT

SWMU No. 53 is located adjacent north of Building N-12 in part of the old hazardous waste storage building (Igloo on asphalt and concrete) Previous to 1988, it was located in a fenced-in, asphalt-paved compound west of Building N-126. See Figure 7-53.

7.53.1.7 GENERAL PHYSICAL CONDITIONS

At the time of the last inspection the old (N-126) site was clean.

7.53.1.8 CLOSURE METHOD

The old (N-126) unit is inactive.

7.53.2 WASTE CHARACTERISTICS

7.53.2.1 TYPE OF WASTE

TCE, mineral spirits, and paint thinners.

7.53.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event.

7.53.2.3 TOXICOLOGICAL CHARACTERISTICS

During the period of operation, paints likely contained lead and various metallic pigments in a hydrocarbon (e.g., acrylic) matrix. Liquid paints probably included both oil-based and water-based (e.g., latex) types. Paint solvents probably included turpentine and/or other terpenes and mineral spirits. Lead, which is probably the most important toxic metal of concern at this SWMU, can result in systemic poisoning as a result of chronic exposure. Paint organic solvents can produce a number of acute and chronic effects, including headaches, nausea, dizziness, disorientation, liver or kidney damage, or nerve tissue damage.

7.53.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

At this SWMU, residuals would likely exist as solids or liquids adsorbed onto soil particles or as soil moisture/groundwater contaminants.

7.53.3 MIGRATION PATHWAYS

Migration of contaminants is not expected.

7.53.4 CONTAMINANT RELEASE IDENTIFICATION

7.53.4.1 PRIOR INSPECTION REPORTS

None available.

7.53.4.2 PUBLIC COMPLAINTS

None.

7.53.4.3 MONITORING/SAMPLING DATA

None available.

7.53.4.4 EVIDENCE OF RELEASE

None.

7.53.5 EXPOSURE POTENTIAL

7.53.5.1 PROXIMITY TO AFFECTED POPULATION

The SWMU is located in the NAS North Side industrial area at some distance from the residential area.

7.53.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The site is not in or near environmentally sensitive areas.

7.53.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Not likely.

7.53.6 DOCUMENTS REVIEWED

None available.

7.53.7 SUMMARIZED DATA GAP

7.53.7.1 SOIL

None available.

7.53.7.2 GROUNDWATER

None available.

7.53.7.3 SURFACE WATER/SEDIMENT

None available.

7.53.7.4 AIR

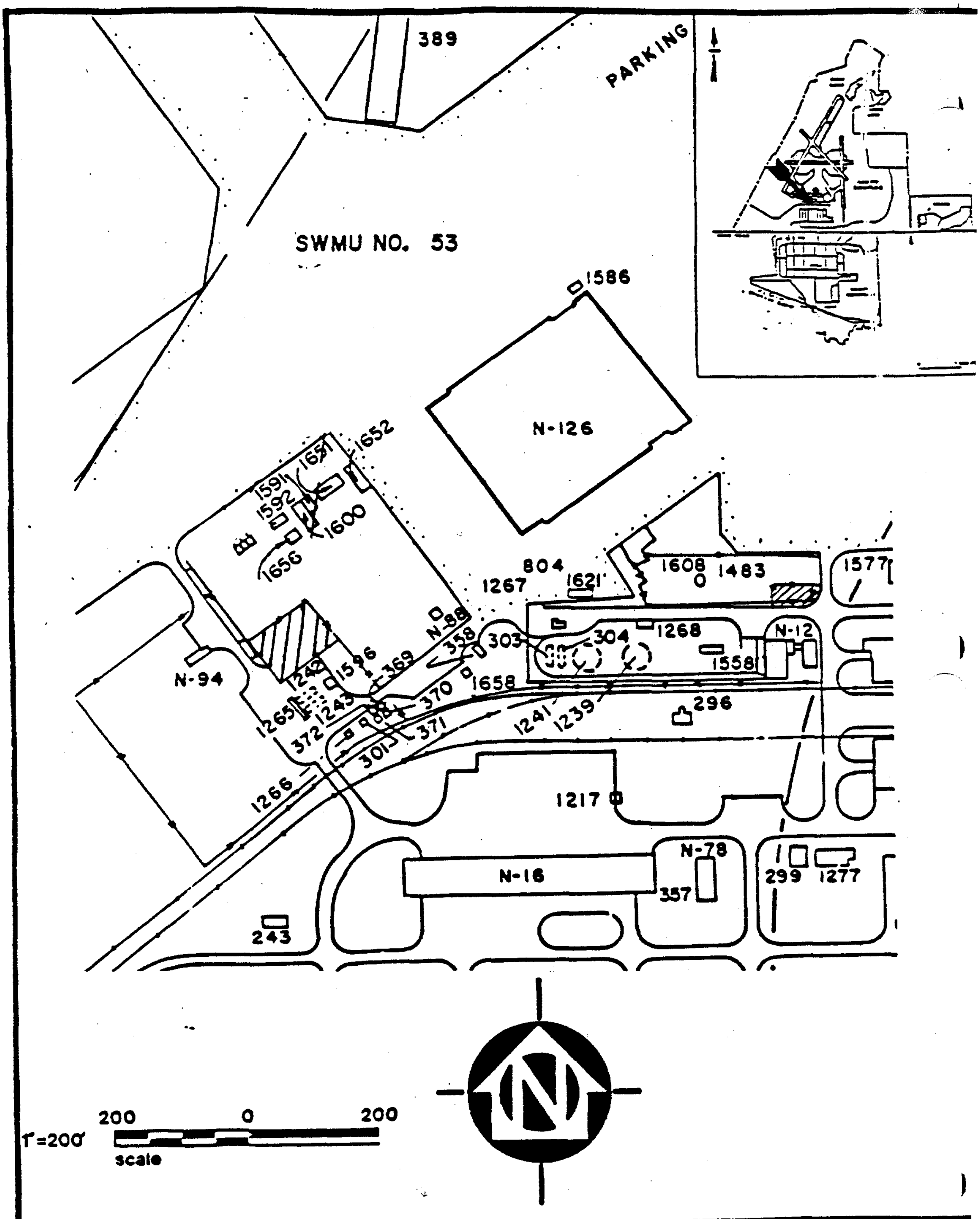
Not applicable.

7.53.7.5 SUBSURFACE GAS

Not applicable.

7.53.8 RECOMMENDED ACTIONS

This site has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 53 HZ WASTE ACCUMULATION PTS

FIGURE 7-53 LOCATION MAP

7.54 SWMU NO. 54: BUILDING 771 DENTAL CLINIC HAZARDOUS WASTE ACCUMULATION POINT

7.54.1 UNIT CHARACTERISTICS

7.54.1.1 TYPE OF UNIT

Temporary waste storage area in Dental Clinic.

7.54.1.2 DESIGN FEATURES

The unit consists of a silver recovery (ion-exchange) unit. The containers accumulated at this point are boxes used to accumulate X-rays film fixer and dental amalgam (contains elemental mercury and silver). The accumulated wastes are ultimately conveyed off-site for reprocessing and/or disposal.

7.54.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU serves as accumulation point for X-ray film fixer and dental amalgam wastes, and a silver recovery unit for used x-ray film.

7.54.1.4 PERIOD OF OPERATION

Presently in operation.

7.54.1.5 AGE OF UNIT

Unknown.

7.54.1.6 LOCATION OF UNIT

SWMU No. 54 is located inside Building 771. See Figure 7-54.

7.54.1.7 GENERAL PHYSICAL CONDITIONS

At the time of the 1989 site visit, the SWMU condition was good.

7.54.1.8 CLOSURE METHOD

Not applicable for active unit.

7.54.2 WASTE CHARACTERISTICS

7.54.2.1 TYPE OF WASTE

X-ray film fixer and dental amalgam (mercury/silver).

7.54.2.2 <u>MIGRATION CHARACTERISTICS</u>

Not applicable for this unit.

7.54.2.3 <u>TOXICOLOGICAL CHARACTERISTICS</u>

Amalgam, an elemental silver/mercury compound, is a nontoxic dental cavity filling material. X-ray developer typically consists of sodium carbonate (activator), hydroquinone (reducer), potassium bromide (restrainer), sodium sulfate (preservative), and gluteraldehyde (hardener), in an aqueous solution. Fixer typically consists of acetic acid (acidifer), sodium thiosulfate (cleaning agent), potassium alum (hardener), and chrome alum or aluminum chloride, and sodium sulfate (preservative). These solutions are generally regarded as nontoxic except when taken internally in quantity.

7.54.2.4 <u>PHYSICAL/CHEMICAL CHARACTERISTICS</u>

Used/excess/waste amalgam is a solid. X-ray fixer and developer are liquids. Used x-ray film is a solid.

7.54.3 <u>MIGRATION PATHWAYS</u>

Not applicable for this unit.

7.54.4 <u>CONTAMINANT RELEASE IDENTIFICATION</u>

7.54.4 1 <u>PRIOR INSPECTION REPORTS</u>

None available.

7.54.4.2 <u>PUBLIC COMPLAINTS</u>

None.

7.54.4.3 <u>MONITORING/SAMPLING DATA</u>

None available.

7.54.4.4 <u>EVIDENCE OF RELEASE</u>

None observed.

7.54.5 <u>EXPOSURE POTENTIAL</u>

7.54.5.1 <u>PROXIMITY TO AFFECTED POPULATION</u>

The SWMU is located in the NAS Dental Clinic building approximately 1/4 mile from the NAS residential area.

7.54.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The site is not in or near environmentally sensitive areas.

7.54.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

Not likely.

7.54.6 DOCUMENTS REVIEWED

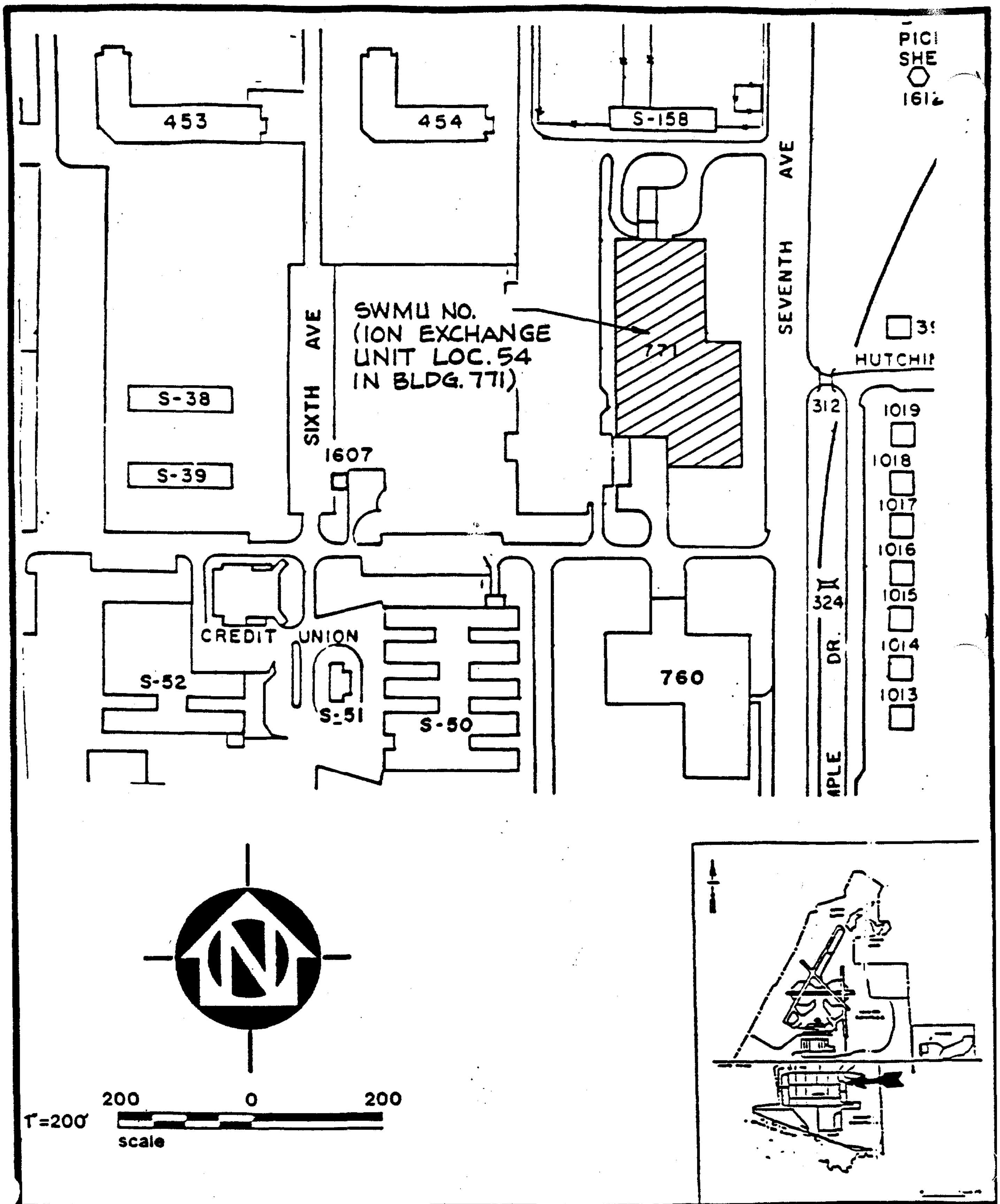
None available.

7.54.7 SUMMARIZED DATA GAP

No additional data is required.

7.54.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 54 HZ WASTE ACCUMULATION PTS AT DENTAL CLINIC

FIGURE 7-54 LOCATION MAP

7.55 SWMU NO. 55: BUILDING 771 MEDICAL CLINIC HAZARDOUS ACCUMULATION POINT

7.55.1 UNIT CHARACTERISTICS

7.55.1.1 TYPE OF UNIT

Inactive waste storage area for medical clinic X-ray film developing wastes (developer and fixer).

7.55.1.2 DESIGN FEATURES

Not applicable.

7.55.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU serves as accumulation point for X-ray film fixer.

7.55.1.4 PERIOD OF OPERATION

Presently in use.

7.55.1.5 AGE OF UNIT

Unknown.

7.55.1.6 LOCATION OF UNIT

SWMU No. 55 is located inside Building 771. See Figure 7-55.

7.55.1.7 GENERAL PHYSICAL CONDITIONS

At the time of the 1989 site visit, physical conditions of the SWMU were good.

7.55.1.8 CLOSURE METHOD

Not applicable.

7.55.2 WASTE CHARACTERISTICS

7.55.2.1 TYPE OF WASTE

X-ray film developer and fixer.

7.55.2.2 MIGRATION CHARACTERISTICS

Not applicable.

7.55.2.3 TOXICOLOGICAL CHARACTERISTICS

X-ray developer typically consists of sodium carbonate (activator), hydroquinone (reducer) potassium bromide (restrainer), sodium sulfate (preservative), and gluteraldehyde (hardener), in an aqueous solution. Fixer typically consists of acute acid (acidifer), sodium thiosulfate (cleaning agent), potassium alum (hardener), and chrome alum or aluminum chloride, and sodium sulfate (preservative). These solutions are generally regarded as nontoxic except when taken internally in quantity.

7.55.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

X-ray fixer and developer are liquids. Used x-ray film is a solid.

7.55.3 MIGRATION PATHWAYS

Not applicable for this unit.

7.55.4 CONTAMINANT RELEASE IDENTIFICATION

7.55.4.1 PRIOR INSPECTION REPORTS

None available.

7.55.4.2 PUBLIC COMPLAINTS

None.

7.55.4.3 MONITORING/SAMPLING DATA

None available.

7.55.4.4 EVIDENCE OF RELEASE

None observed.

7.55.5 EXPOSURE POTENTIAL

Not expected.

7.55.6 DOCUMENTS REVIEWED

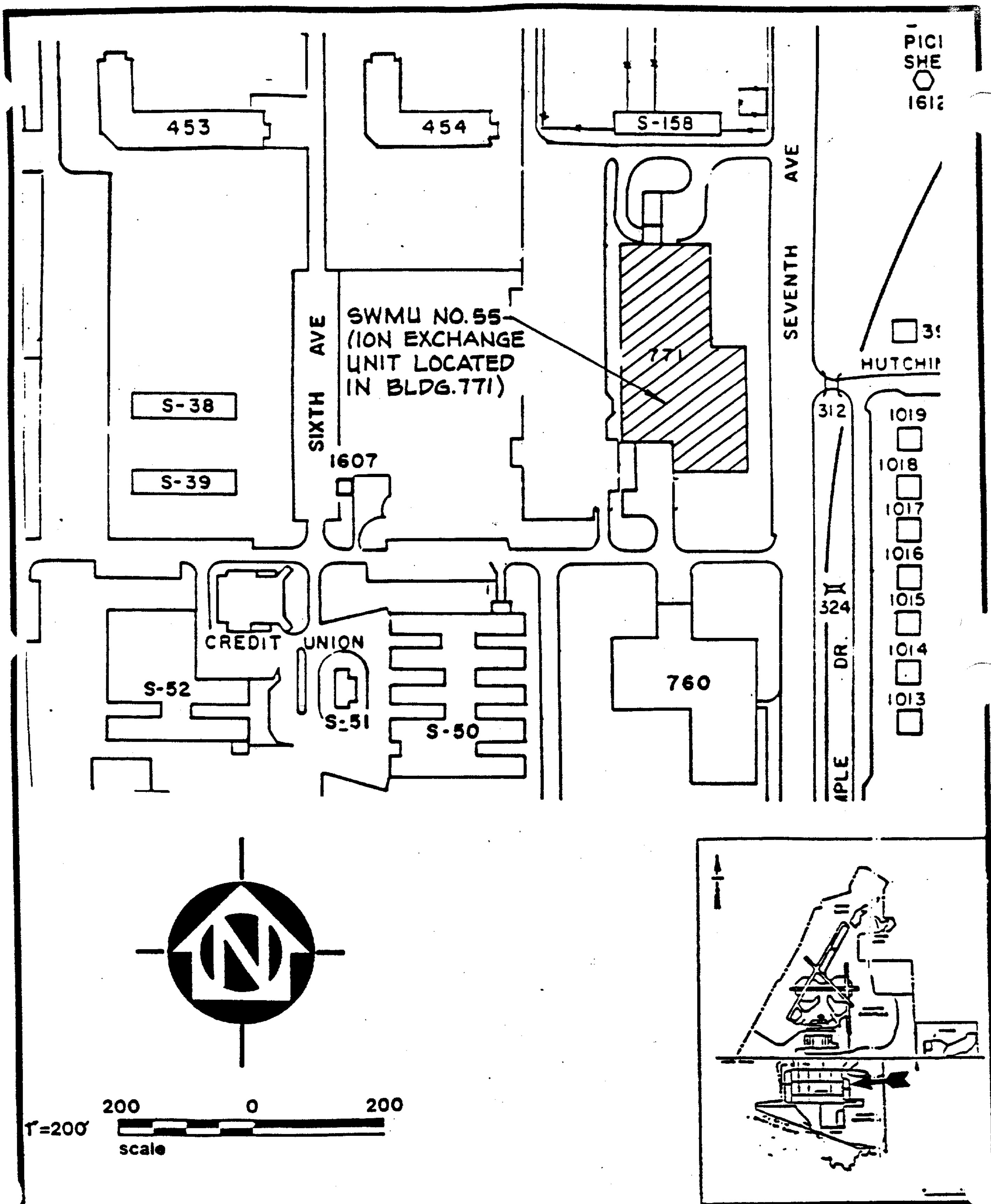
None available.

7.55.7 SUMMARIZED DATA GAP

No additional data is required.

7.55.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 55 **HZ WASTE ACCUMULATION PTS AT MEDICAL CLINIC**

FIGURE 7-55 **LOCATION MAP**

7.56 SWMU NO. 56: BUILDING 352 HAZARDOUS WASTE ACCUMULATION POINT

7.56.1 UNIT CHARACTERISTICS

7.56.1.1 TYPE OF UNIT

Building 352 (Golf Course Shack). Waste storage area for used batteries.

7.56.1.2 DESIGN FEATURES

Concrete floor for scrap batteries storage.

7.56.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulation point for used batteries.

7.56.1.4 PERIOD OF OPERATION

Unknown.

7.56.1.5 AGE OF UNIT

Unknown.

7.56.1.6 LOCATION OF UNIT

SWMU No. 56 is located at Building 352. See Figure 7-56.

7.56.1.7 GENERAL PHYSICAL CONDITIONS

Use of unit had been discontinued at the time of the July 1989 site visit. No used batteries, drums, or pallets were present. Building and grounds conditions were good.

7.56.1.8 CLOSURE METHOD

The unit was inactive in July 1989. Used batteries had been removed.

7.56.2 WASTE CHARACTERISTICS

7.56.2.1 TYPE OF WASTE

Used automotive batteries from golf course vehicles.

7.56.2.2 MIGRATION CHARACTERISTICS

Any released electrolyte would be mobile in the soil and, if in sufficient volume, could reach ground water. However, this possibility is remote due to the small number of batteries stored. Transport via surface waters is a possibility if any release coincided with a precipitation event. Metal contents in the waste would be very immobile in soil and less likely to be transported via surface waters.

7.56.2.3 TOXICOLOGICAL CHARACTERISTICS

Contaminants of concern are sulfuric acid, and the heavy metals cadmium, lead, and zinc. Sulfuric acid, at sufficient strength, is corrosive to tissue and can produce chemical burns. One neutralized, the constituents are relatively innocuous. Heavy metals produce toxic effects in sufficient dosages, primarily by interfering with cellular enzymes and/or nerve function. Heavy metal poisoning usually results from chronic exposure to low concentrations in food and water.

7.56.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Sulfuric acid in likely no longer associated with this SWMU, given the time since operations ceased and the local meteorological conditions. Heavy metals would likely be present as adsorbate on soil particles.

7.56.3 MIGRATION PATHWAYS

Migration of contaminants is not expected.

7.56.4 CONTAMINANT RELEASE IDENTIFICATION

7.56.4 1 PRIOR INSPECTION REPORTS

None available.

7.56.4.2 PUBLIC COMPLAINTS

None.

7.56.4.3 MONITORING/SAMPLING DATA

None available.

7.56.4.4 EVIDENCE OF RELEASE

None observed.

7.56.5 EXPOSURE POTENTIAL

Not expected.

7.56.6 DOCUMENTS REVIEWED

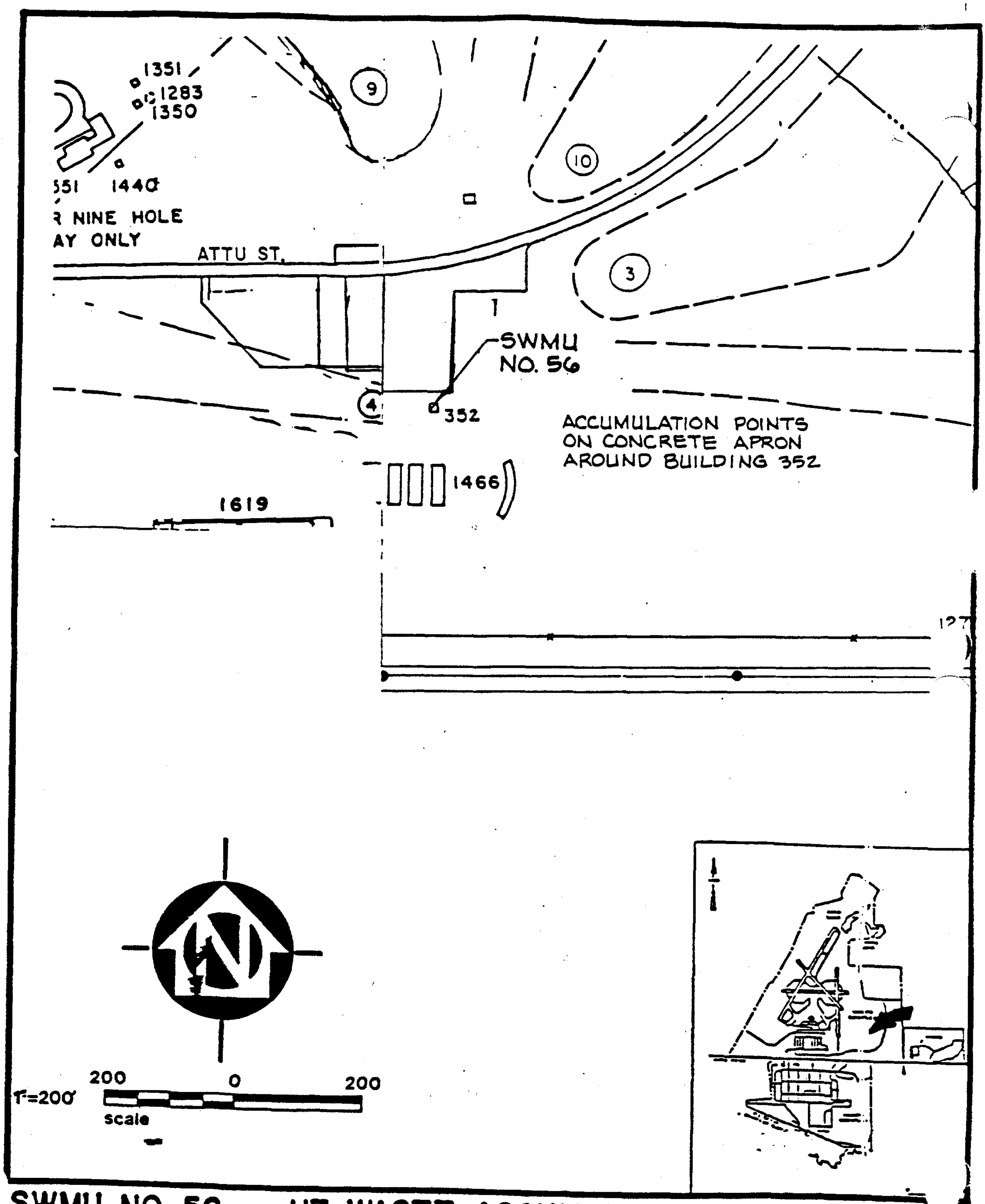
None available.

7.56.7 SUMMARIZED DATA GAP

No additional data is required.

7.56.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 56 HZ WASTE ACCUMULATION PTS AT 352
FIGURE 7-56 LOCATION MAP

7.57 SWMU NO. 57: S-183 HAZARDOUS WASTE ACCUMULATION POINT

7.57.1 UNIT CHARACTERISTICS

7.57.1.1 TYPE OF UNIT

Inactive waste storage area.

7.57.1.2 DESIGN FEATURES

Drums were used for accumulation and temporary storage of wastes. Drums were located on concrete aprons.

7.57.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU serves as accumulation point for used waste paint and thinners.

7.57.1.4 PERIOD OF OPERATION

Unknown.

7.57.1.5 AGE OF UNIT

Unknown.

7.57.1.6 LOCATION OF UNIT

SWMU No. 57 is located at Building S-183. See Figure 7-57.

7.57.1.7 GENERAL PHYSICAL CONDITIONS

At the time of the 1989 site inspection, the area was clean and in good repair.

7.57.1.8 CLOSURE METHOD

Not applicable.

7.57.2 WASTE CHARACTERISTICS

7.57.2.1 TYPE OF WASTE

Waste paint and thinners.

7.57.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event. If paint sludges were released, they would be immobile in soil and less likely to be transported via surface waters. Also, paint sludges would be very apparent visually and such were not detected during the 1983 survey.

7.57.2.3 TOXICOLOGICAL CHARACTERISTICS

Paint solvents would likely have included mineral spirits, turpentine and other terpenes, phenols, kerosene, and possibly various alcohols. Gasoline-type substances (e.g., BTEX) are also possible.

Depending on substances present, symptoms of exposure could be headache; eye, skin, and mucous membrane irritation; drowsiness; agitation; and damage to nerve tissue, liver, or kidneys.

7.57.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contamination would exist as adsorbate on soil particles, as soil pore-vapors, and possibly as groundwater contaminants.

7.57.3 MIGRATION PATHWAYS

Migration of contaminants is not expected.

7.57.4 CONTAMINANT RELEASE IDENTIFICATION

7.57.4.1 PRIOR INSPECTION REPORTS

None available.

7.57.4.2 PUBLIC COMPLAINTS

None.

7.57.4.3 MONITORING/SAMPLING DATA

None available.

7.57.4.4 EVIDENCE OF RELEASE

None observed.

7.57.5 EXPOSURE POTENTIAL

Not expected.

7.57.6 DOCUMENTS REVIEWED

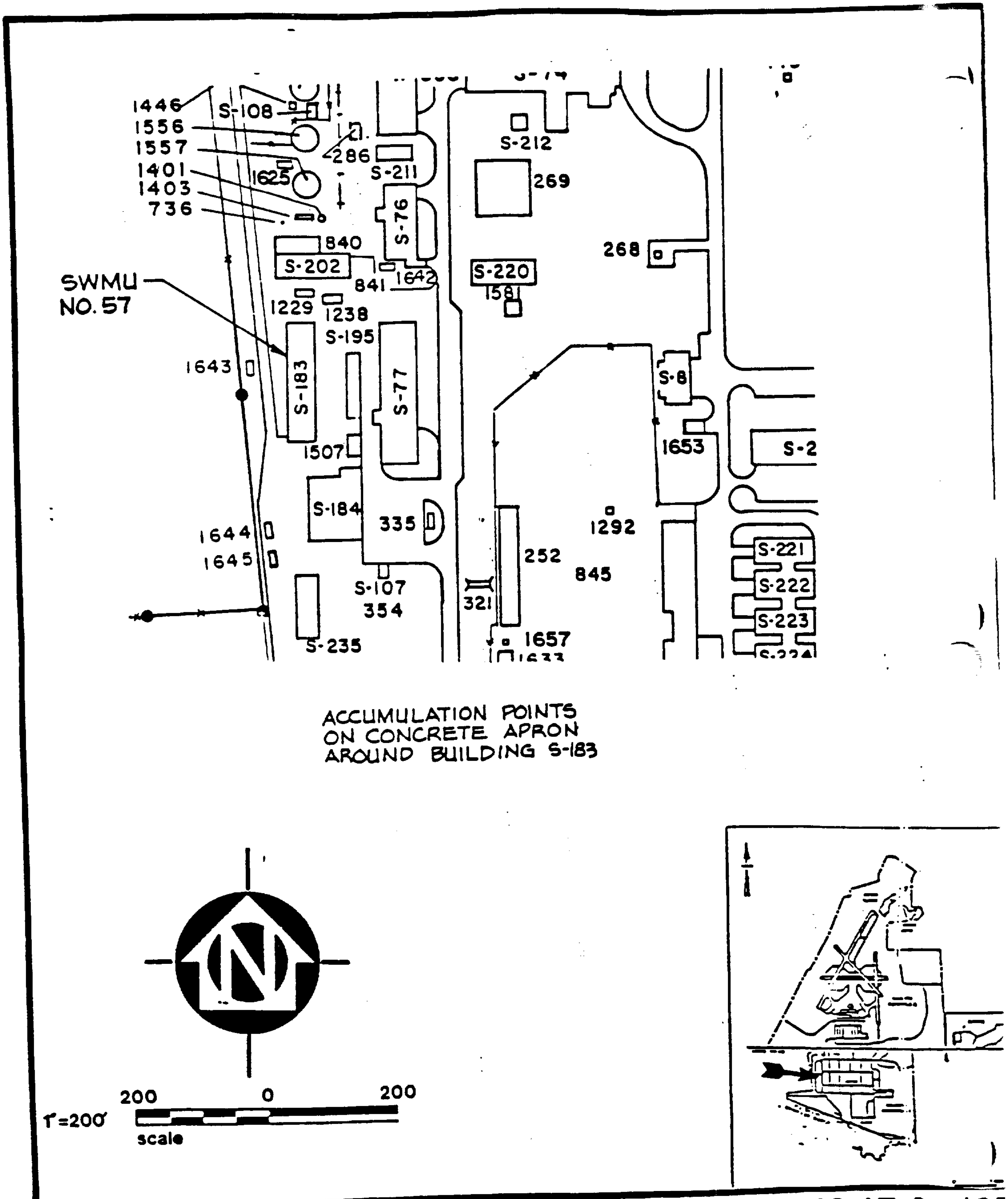
None available.

7.57.7 SUMMARIZED DATA GAP

No additional data is required.

7.57.8 RECOMMENDED ACTIONS

This site has been determined to require no further action by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 57 **HZ WASTE ACCUMULATION PTS AT S-183**
FIGURE 7-57 **LOCATION MAP**

7.58 SWMU NO. 58: S-360 HAZARDOUS WASTE ACCUMULATION POINT

7.58.1 UNIT CHARACTERISTICS

7.58.1.1 TYPE OF UNIT

Inactive waste storage area.

7.58.1.2 DESIGN FEATURES

Drums were used for accumulation and temporary storage of wastes. Drums were located on concrete aprons.

7.58.1.3 OPERATING PRACTICE (PAST AND PRESENT)

This SWMU served as accumulation point for containerized waste paint and thinners.

7.58.1.4 PERIOD OF OPERATION

Unknown.

7.58.1.5 AGE OF UNIT

Unknown.

7.58.1.6 LOCATION OF UNIT

SWMU No. 58 is located at Building S-360. See Figure 7-58.

7.58.1.7 GENERAL PHYSICAL CONDITIONS

At the time of the 1989 site visit, the site was clean and in good repair.

7.58.1.8 CLOSURE METHOD

Not applicable.

7.58.2 WASTE CHARACTERISTICS

7.58.2.1 TYPE OF WASTE

Mineral spirits and paint wastes.

7.58.2.2 MIGRATION CHARACTERISTICS

Any released solvents would be mobile in the soil and, if in sufficient volume, could reach ground water. Transport via surface waters is a possibility if any release coincided with a precipitation event. If paint sludges were released, they would be immobile in soil and less likely to be transported via surface waters. Also, paint sludges would be very apparent visually and such were not detected during the 1983 survey.

7.58.2.3 TOXICOLOGICAL CHARACTERISTICS

Paint solvents would likely have included mineral spirits, turpentine and other terpenes, phenols, kerosene, and possibly various alcohols. Gasoline-type substances (e.g., BTEX) are also possible.

Depending on substances present, symptoms of exposure could be headache; eye, skin, and mucous membrane irritation; drowsiness; agitation; and damage to nerve tissue, liver, or kidneys.

7.58.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Residual contamination would exist as adsorbate on soil particles, as soil pore-vapors, and possibly as groundwater contaminants.

7.58.3 MIGRATION PATHWAYS

Migration of contaminants is not expected.

7.58.4 CONTAMINANT RELEASE IDENTIFICATION

7.58.4 1 PRIOR INSPECTION REPORTS

None available.

7.58.4.2 PUBLIC COMPLAINTS

None.

7.58.4.3 MONITORING/SAMPLING DATA

None available.

7.58.4.4 EVIDENCE OF RELEASE

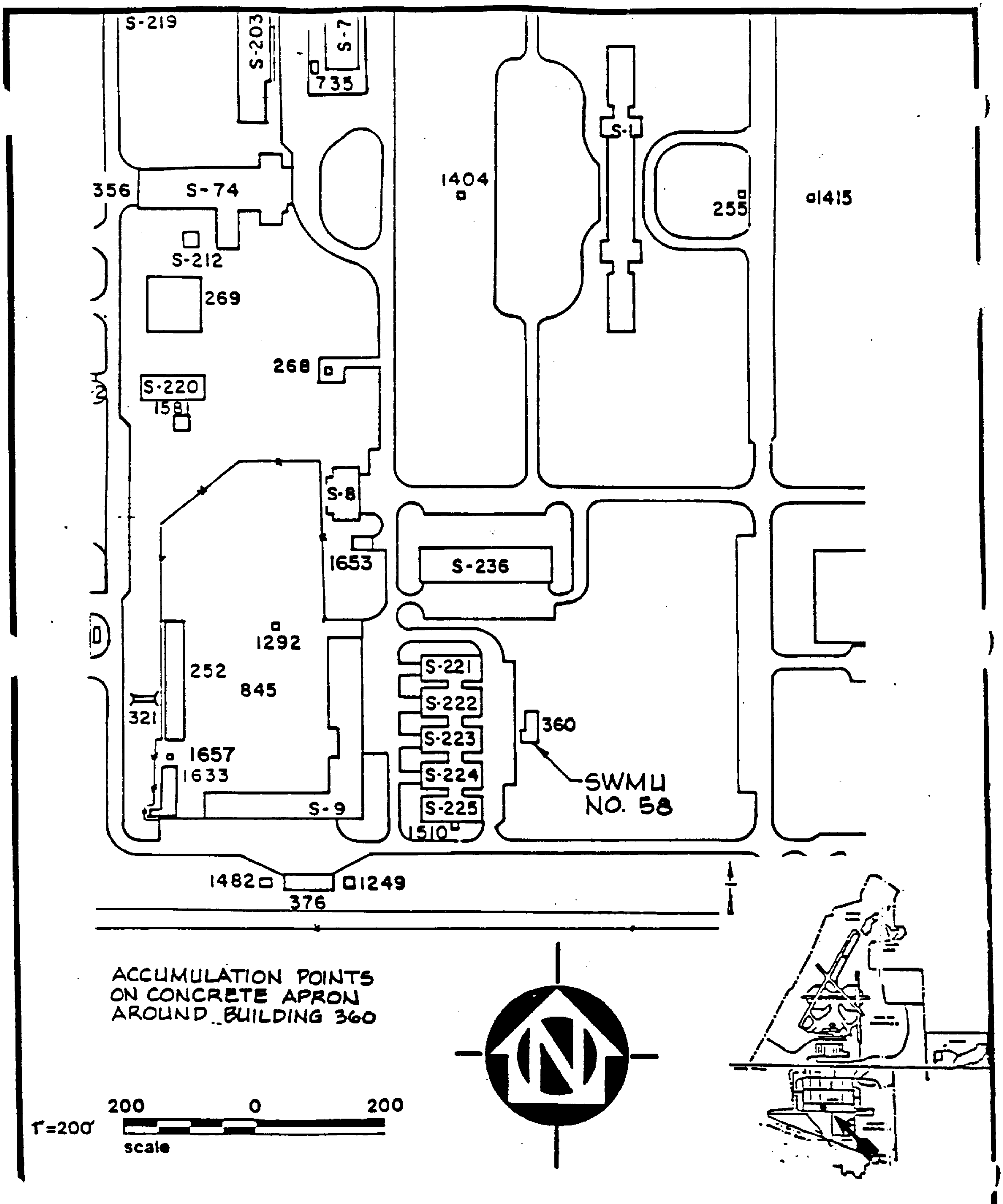
None observed.

7.58.5 EXPOSURE POTENTIAL

Not expected.

7.58.6 DOCUMENTS REVIEWED

None available.



SWMU NO. 58 HZ WASTE ACCUMULATION PTS AT S-360

FIGURE 7-58 LOCATION MAP

7.59 SWMU NO. 59: S-335 OLD PESTICIDE SHOP

7.59.1 UNIT CHARACTERISTICS

7.59.1.1 TYPE OF UNIT

Former pesticide storage building.

7.59.1.2 DESIGN FEATURES

The old pesticide shop is a Quonset building (hemisperical cross-section) on a concrete slab base.

7.59.1.3 OPERATING PRACTICES (PAST AND PRESENT)

The facility was utilized as a typical pesticide utilization and storage shop. The pesticide shop and storage facility were used for routine pesticides application program at NAS Memphis. It was used as a support services building (pesticide application) for NAS Memphis pesticide usage. The building is scheduled for demolition in 1990. A RFI is planned in order to determine if the building or grounds surface present a threat to human health (particularly demolition works). The results of the RFI will be used to formulate final demolition plans, determine site remediation needs (if any), and determine proper disposal requirements for demolition rubble and contaminated soils (if any).

7.59.1.4 PERIOD OF OPERATION

The building is not currently utilized as a pesticide shop. The date of building construction has not been determined but is likely in excess of 30 years. The building has not been used for the past few years. However, as of 1989, some materials (chemical fertilizers) were still being stored and the building had a "pesticide" odor.

7.59.1.5 AGE OF UNIT

Not determined; probably in excess of 30 years.

7.59.1.6 LOCATION OF UNIT

The old pesticide building is located at the First Avenue near Building S-184. Figure 7-59 indicates the location of the building.

7.59.1.7 GENERAL PHYSICAL CONDITIONS

To be determined.

7.59.1.8 CLOSURE METHOD

The unit will be closed by 1) removing all stored materials, 2) performing surface cleaning of structures (if warranted), 3) demolition of building, and 4) removal and disposal of rubble and contaminated soil (if applicable).

7.59.2 WASTE CHARACTERISTICS

7.59.2.1 TYPE OF WASTE

The Navy presumes that the building and grounds may be contaminated with pesticides stored in and used around the building in the past. Pesticides used include DDT, Dieldrin, Chlordane, and Arsenic-based pesticides.

7.59.2.2 MIGRATION CHARACTERISTICS

To be determined.

7.59.2.3 TOXICOLOGICAL CHARACTERISTICS

Pesticides used at NAS Memphis may have included herbicides, insecticides, and rodenticides. Most of the earlier and many current herbicides are known or suspected carcinogens. Insecticides are generally potent blocking agents for insect nervous systems. At sufficient concentrations they may also adversely effect mammalian nervous systems by blocking nerve impulse transmission. Rodenticides typically include agent(s) that inhibit blood clotting and cause death by internal bleeding.

Arsenic poisoning can result from chronic exposure to arsenic. Symptoms include damage to nerve and muscle tissue. Petroleum distillates (e.g., mineral spirits) were often used as a carrier in commercial preparations. See SWMU No. 14 information for mineral spirits.

7.59.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Pesticides may have been present as fine solids, liquid concentrates, and dilute mixtures prepared for application. Residuals would exist as adsorbate on soil particles and possible soil moisture/groundwater contaminants.

7.59.3 MIGRATION PATHWAYS

To be determined.

7.59.4 CONTAMINANT RELEASE IDENTIFICATION

To be determined during planned RFI.

7.59.5 EXPOSURE POTENTIAL

To be determined.

7.59.5.1 PROXIMITY TO AFFECTED POPULATION

Affected population is nearby workers.

7.59.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

This unit is distant from sensitive environments.

7.59.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

To be determined.

7.59.6 DOCUMENTS REVIEWED

See PRD.

7.59.7 SUMMARIZED DATA GAP

7.59.7.1 SOIL

No data.

7.59.7.2 GROUNDWATER

No data.

7.59.7.3 SURFACE WATER/SEDIMENT

No data.

7.59.7.4 AIR

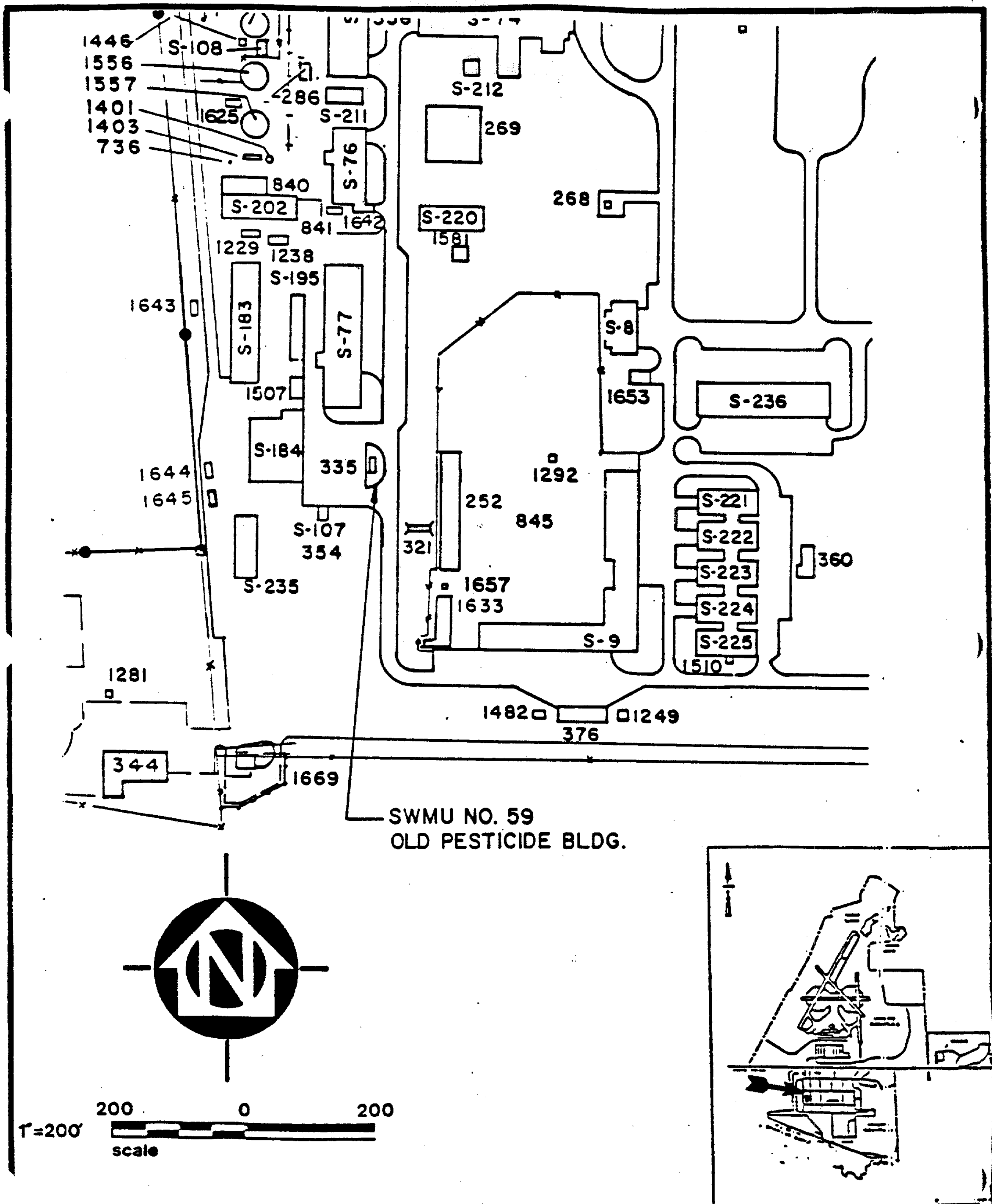
Air sampling is not needed.

7.59.7.5 SUBSURFACE GAS

Not applicable.

7.59.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.



SWMU NO. 59 BUILDING NO. 335 (OLD PESTICIDE SHOP)
FIGURE 7-59

7.60 SWMU No. 60: NORTH SIDE LANDFILL (WESTERN PORTION)

7.60 UNIT CHARACTERISTICS

7.60.1.1 TYPE OF UNIT

This portion of North Side Landfill, also known as the Demolition Debris Landfill, was included as a part of SWMU No. 10 in the April 1987 preliminary draft RFA. It has been redesignated as a separate SWMU as the only portion of the North Side Landfill area requiring further study. The drainage ditch separates SWMUs No. 10 and 60.

7.60.1.2 DESIGN FEATURES

Although the specific boundaries of the landfill are unknown, approximate boundaries are depicted in Figure 7-60. The depth of the landfill is unknown, and there are no available records pertaining to the localized geologic conditions at the site.

7.60.1.3 OPERATING PRACTICES (PAST AND PRESENT)

It is reported, however, that the area was originally a ravine used for the disposal of construction debris. The only documented description of waste disposal at this site is found in several 1980 contract documents which require contractors to use the area for disposal of rubbish and debris material, i.e. construction materials, paper, metal scrap, ashes, leaves, bones.

7.60.1.4 PERIOD OF OPERATION

The period of operation is considered to be the same as that of the landfill -- from 1951 to 1986.

7.60.1.5 AGE OF UNIT

The Age of SWMU 60 is considered to be 38 years (same as SWMU No. 10).

7.60.1.6 LOCATION OF UNIT

SWMU No. 60 is located west SWMU No. 10. See Figure 7-60.

7.60.1.7 GENERAL PHYSICAL CONDITIONS

Unknown; unlined fill area.

7.60.1.8 CLOSURE METHOD

Unknown. Unit has been inactive since 1986.

7.60.2 WASTE CHARACTERISTICS

7.60.2.1 TYPE OF WASTES

In 1980, the discovery was made of an abandoned tank containing hydrocarbons. Other than this tank, there is no evidence that the site was used for the disposal of any materials other than construction debris.

7.60.2.2 MIGRATION CHARACTERISTICS

All wastes, with the exception of liquid or contained gas, deposited within the landfill should remain stationary within the landfill unit. Liquid wastes, if present, could move both downward and horizontally, depending upon the proximity of the groundwater table and existing subsurface conditions. Any gases released due to container puncture or gases generated during waste decomposition will follow the path of least resistants through the ground or atmosphere.

7.60.2.3 TOXICOLOGICAL CHARACTERISTICS

No specific wastes have been identified. An abandoned tank containing hydrocarbons (liquid heating oil?) was discovered in 1980 during past site work. It is possible that small quantities of almost all NAS-generated wastes may have been deposited in this SWMU between 1951 and 1986.

7.60.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

No specific wastes have been identified other than construction debris and the tank that contained hydrocarbons. Most materials should be solids and chemically inert or innocuous. Contaminated leachate and/or groundwater may be present.

7.60.3 PATHWAYS

7.60.3.1 GEOLOGIC SETTING

See Section 3.2.

7.60.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.60.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.60.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area has been disturbed by past activities, but is generally level. Surface drainage is toward the south and west in the drainage ditch which forms the eastern boundary of the unit.

7.60.3.5 PATHWAYS

AIR

Due to the nature of the wastes presumed to be deposited within the landfill, airborne movement of contaminants is unlikely. Furthermore, as an inactive landfill, previous deposition of wastes which may be hazardous if airborne would no longer pose a threat to health or safety.

SOIL

Contaminant transport through the soil would most likely occur in a vertical movement beneath the landfill, until reaching an aquifer or perched water zone. At that time contaminant movement would flow with the groundwater.

SURFACE WATER/SEDIMENT

No surface water contamination due to stormwater runoff is suspected. The landfill site is currently overgrown with grass, weeds, and young woody vegetation. However, contamination through groundwater transport into the drainage ditch is possible.

GROUNDWATER

Contamination of the groundwater is possible at the landfill, if there is not a sufficiently thick clay buffer zone beneath the fill or if the buffer zone possesses a high permeability.

SUBSURFACE GAS

The release of hazardous gases through the puncture of a landfilled container (which should not exist in the site) would quickly dissipate and, therefore, be undetectable unless it had recently occurred.

7.60.4 CONTAMINANT RELEASE IDENTIFICATION

7.60.4.1 PRIOR INSPECTION REPORTS

None available.

7.60.4.2 PUBLIC COMPLAINTS

None.

7.60.4.3 MONITORING/SAMPLING DATA

None available.

7.60.4.4 EVIDENCE OF RELEASE

None observed.

7.60.5 EXPOSURE POTENTIAL

7.60.5.1 PROXIMITY TO AFFECTED POPULATION

This landfill is located in a remote area distant from the permanent NAS population.

7.60.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

This unit is located distant from sensitive environments.

7.60.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

The most likely migration pathway from this unit would be seepage to the drainage ditch, and flow downstream. A less important pathway would be groundwater transport from beneath the site. Likelihood of migration would depend on properties of any contaminants present.

7.60.6 DOCUMENTS REVIEWED

See PRD.

7.60.7 SUMMARIZED DATA GAP

7.60.7.1 SOIL

None available.

7.60.7.2 GROUNDWATER

None available.

7.60.7.3 SURFACE WATER/SEDIMENT

None available.

7.60.7.4 AIR

Air sampling is not indicated.

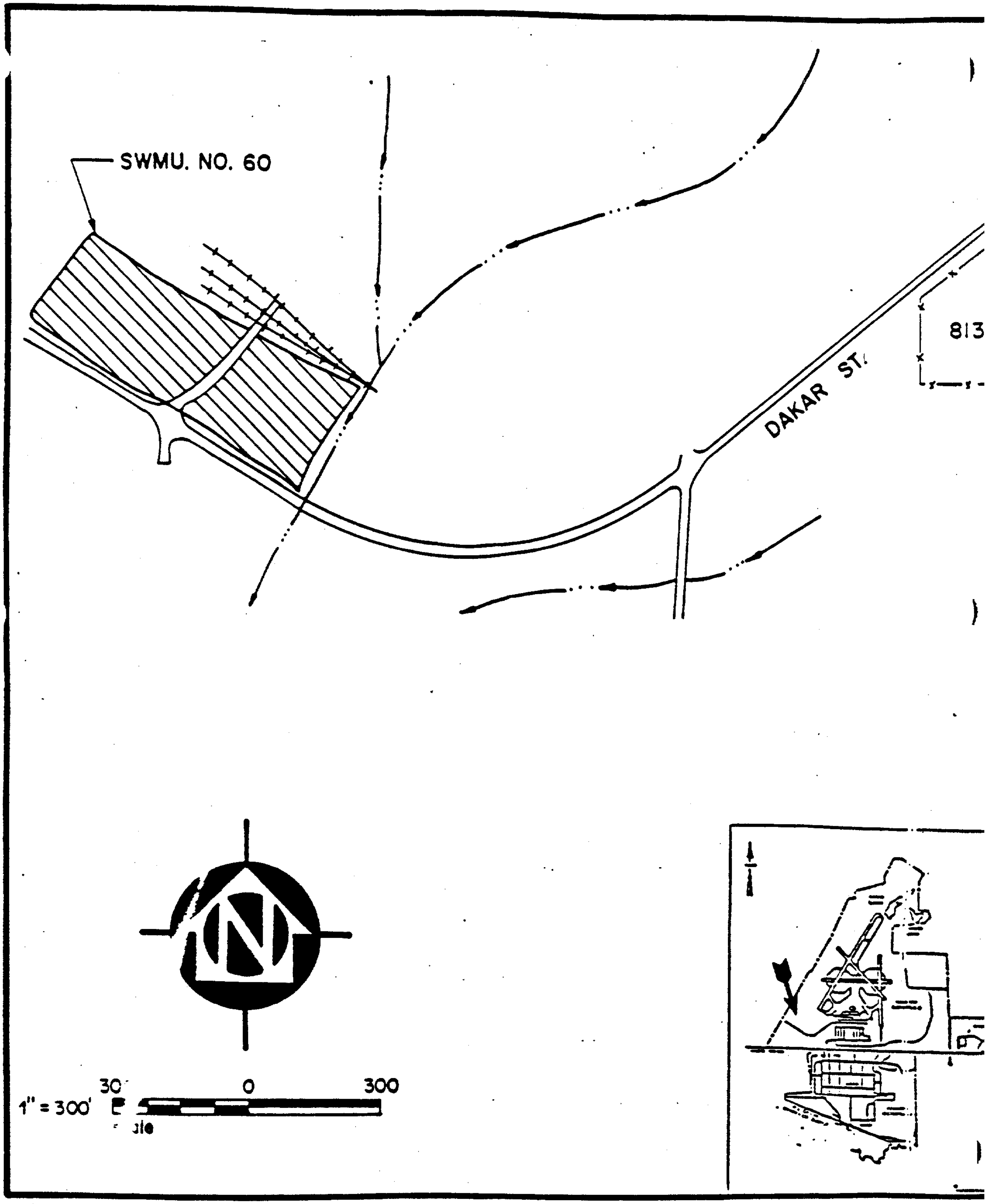
7.60.7.5 SUBSURFACE GAS

None available.

7.60.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for characterization by SOUTHDIV NAVFACENGCOM, EPA Region IV, and the Tennessee Department of Health and Environment.

Since disposal was not carefully monitored from the years between 1951 and 1980, the possibility of hazardous substances being present within the landfill cannot be ruled out at this time.



SWMU NO. 60 DEMOLITION DEBRIS LANDFILL
FIGURE 7-60 LOCATION MAP

7.61 SWMU No. 61: FORMER PRINTING SHOP BUILDING N-26

7.61 UNIT CHARACTERISTICS

7.61.1.1 TYPE OF UNIT

This unit was an operational area where systematic cleaning was conducted on a routine basises.

7.61.1.2 DESIGN FEATURES

The unit is a concrete pad with two inch sides at grade sloping towards the center of the pad where a drain exist which discarges into the sewer.

7.61.1.3 OPERATING PRACTICES (PAST AND PRESENT)

It is reported that the area was used in the early 80's as an area to clean printing equipment. Prior uses have been for washing garbage cans and cleaning mops. Presently, the unit is not being used.

7.61.1.4 PERIOD OF OPERATION

The period of operation is considered to be the early 1980's.

7.61.1.5 AGE OF UNIT

The Age of the SWMU is not known.

7.61.1.6 LOCATION OF UNIT

SWMU No. 61 is located east of building N-26 which is located east of 8th Ave. on the North Complex.

7.61.1.7 GENERAL PHYSICAL CONDITIONS

The unit is in good condition. However, there is some staining surrounding the unit.

7.61.1.8 CLOSURE METHOD

Closure is not required for this unit.

7.61.2 WASTE CHARACTERISTICS

7.61.2.1 TYPE OF WASTES

The type of waste likely at the SWMU is printers inks and solvents. The inks may contain some solvent and heavy metals such as lead, chromium, and cadimium.

7.61.2.2 MIGRATION CHARACTERISTICS

Solvents, if present could move downward and horizontally, depending upon the proximity of the groundwater table and existing surface conditions. The metals will bond to the clayee soils and not migrate below a couple of feet.

7.61.2.3 TOXICOLOGICAL CHARACTERISTICS

No specific waste have been identified. However, the toxicological characteristics of printing inks and solvents is provided in a number of documents available.

7.61.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

No specific wastes have been identified other than printing inks and releated solvents. The waste when generated would have been liquid. However, the waste may be a solid due to the evaporation of the liquid.

7.61.3 MIGRATION PATHWAYS

7.61.3.1 GELOGICAL SETTING

See Section 3.2.

7.61.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.61.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0.

7.61.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general information. The area surface drainage is towards the east.

7.61.3.5 PATHWAYS

AIR

Due to the nature of the wastes presumed to be deposited within the unit and surrounding area, airborne movement of contaminants is unlikely.

SOIL

Contaminant transport through the soil would most likely occur in a vertical movement beneath the unit, until reaching the aquifer or pearched water zone. At that time contaminant movement would flow with the groundwater.

SURFACE WATER/SEDIMENT

No surface water contamination due to stormwater runoff is suspected. The nearest surface water is over a 1000 feet away over land.

GROUNDWATER

Contamination of the groundwater is not likely. Most of the waste should have gone down the drain into the sewer. Additionally, since the soils are clayee with low permeabilities.

SUBSURFACE GAS

Subsurface gas in not suspected. Most of the solvent would have volatilized off.

7.61.4 CONTAMINANT RELEASE IDENTIFICATION

7.61.4.1 PRIOR INSPECTION REPORTS

None available.

7.61.4.2 PUBLIC COMPLAINTS

None.

7.61.4.3 MONITORING/SAMPLING DATA

None.

7.61.4.4 EVIDENCE OF RELEASE

Staining of soil observed.

7.61.5 EXPOSURE POTENTIAL

7.61.5.1 PROXIMITY TO AFFECTED POPULATION

This unit is located approximately one mile from the nearest permanent population.

7.61.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is located distant from sensitive environments.

7.61.5.3 LIKELYHOOD OF MIGRATION OF POTENTIAL RECEPTORS

The most likely migration pathway from the unit would be direct contact and the transport of the soil by overland flow by storm water. A less important pathway would be groundwater transport. Likelyhood of migration would depend on proprities of any contaminants present.

7.61.6 DOCUMENTS REVIEWED

See PRD.

7.61.7 SUMMARIZED DATA GAP

7.61.7.1 SOIL

None available.

7.61.7.2 GROUNDWATER

None available.

7.61.7.3 SURFACE WATER/SEDIMENT

None available.

7.61.7.4 AIR

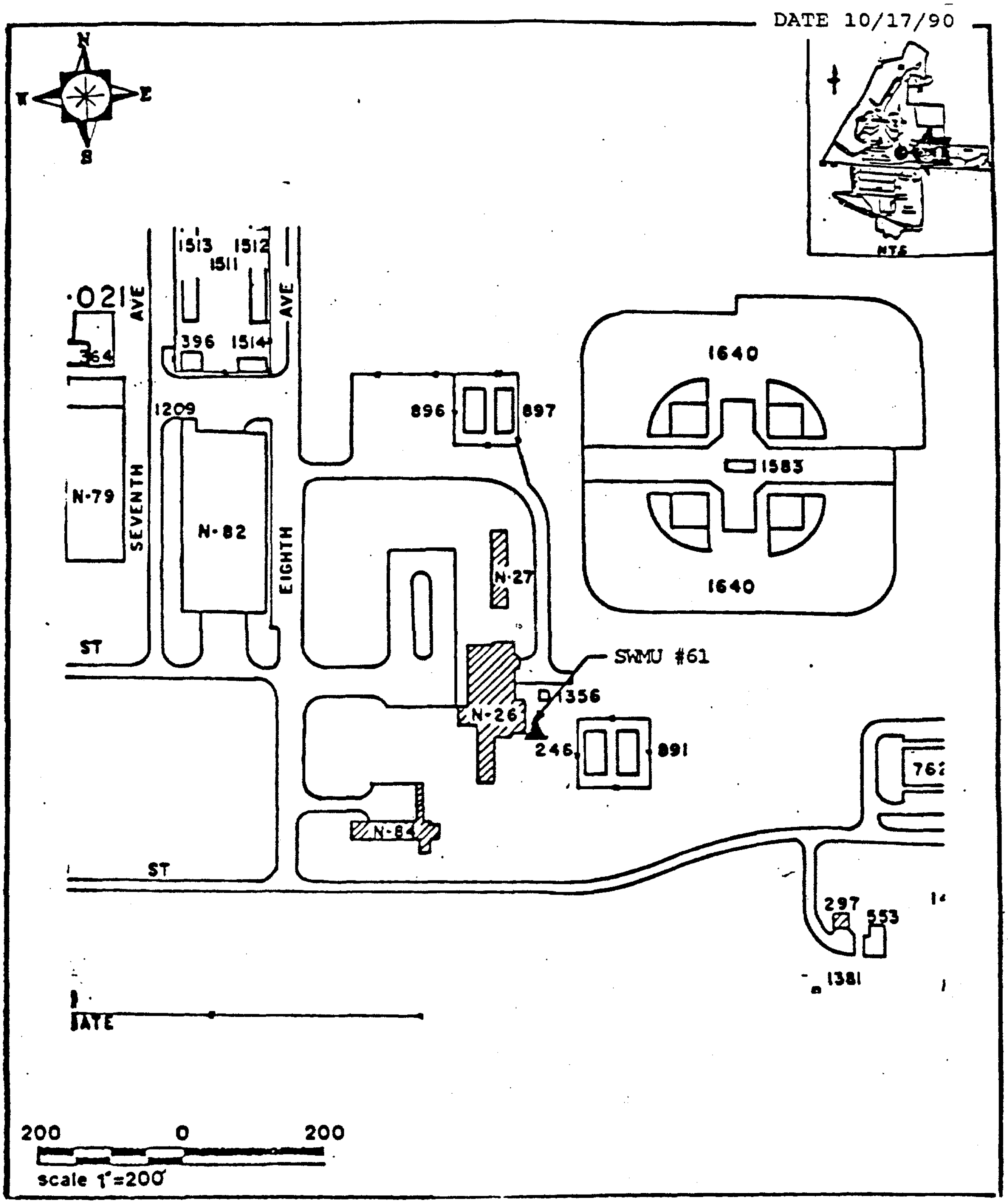
Air sampling is not indicated.

7.61.7.5 SUBSURFACE GAS

None available.

7.61.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (sampling and analysis) for verification by SOUTHDIV NAVFACENGCOM.



SWMU NO. 61 FORMER PRINT SHOP BUILDING N-26

FIGURE 7-61 LOCATION MAP

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7.62 SWMU No. 62: M-21 ARRESTING GEAR

7.62 UNIT CHARACTERISTICS

7.62.1.1 TYPE OF UNIT

Inactive Arresting Gear drainage unit.

7.62.1.2 DESIGN FEATURES

There are two units on either side of the runway. Each one consists of a 6-inch plastic pipe drain to a containment structure. The containment structure involves three 55-gallon drums welded together (top of one drum to bottom of another), buried approximately twelve feet deep over pea gravel.

7.62.1.3 OPERATING PRACTICES (PAST AND PRESENT)

Rainwater and residual waste from the operation of arresting gear would drain from a 6-inch pipe drain into a containment structure. The containment structure's base 55-gallon drum included holes to allow water to seep out into the field (With water being heavier than the residual waste generated, the residual waste floated on the surface of the water and was periodically removed). The arresting gear drain was plugged on 17 December 1990. Presently, the arresting gear will continue to be used with the drain closed. Any rainwater and residual waste contained in the sealed concrete arresting gear containment pit will be pumped, tested, and disposed of properly.

7.62.1.4 PERIOD OF OPERATION

The period of operation is from the summer of 1985 to 17 December 1990.

7.62.1.5 AGE OF UNIT

The age of SWMU 62 is approximately 5 & 1/2 years.

7.62.1.6 LOCATION OF UNIT

This unit is located on Runway 04/22, North Side Complex (See Figure 7-62).

7.62.1.7 GENERAL PHYSICAL CONDITIONS

The condition of the underground drain pipe and 55-gallon drums is unknown. There is slightly stressed vegetation surrounding the unit.

7.62.1.8 CLOSURE METHOD

None.

7.62.2 WASTE CHARACTERISTICS

7.62.2.1 TYPE OF WASTES

Hydraulic fluid, lubricating oil, and diesel fuel.

7.62.2.2 MIGRATION CHARACTERISTICS

Wastes such as those previously characterized in this description are reasonably mobile in the environment. Surface infiltration of rain water can transport these wastes into the soil and ground water.

7.62.2.3 TOXICOLOGICAL CHARACTERISTICS

The contaminants of concern are used hydraulic fluid, lubricating oil, and diesel fuel. These contaminants may produce one or more of the following human health effects, depending on the type of exposure (chronic or acute), the route of entry (inhalation, ingestion, or skin absorption), and the dose received - slight to moderate eye irritation; dermal irritation with possible redness, edema, or drying of the skin; and acute-central nervous system depression. Studies with rodents have shown that petroleum distillates have caused kidney damage and kidney or liver tumors.

7.62.2.4 PHYSICAL/CHEMICAL CHARACTERISTICS

Waste hydrocarbons that may have leaked from the base drum could exist as waste-saturated soils or groundwater contaminants.

7.62.3 MIGRATION PATHWAYS

7.62.3.1 GEOLOGIC SETTING

See Section 3.2.

7.62.3.2 HYDROGEOLOGIC SETTING

See Section 3.3.

7.62.3.3 ATMOSPHERIC CONDITIONS

See Section 4.0

7.62.3.4 TOPOGRAPHIC CHARACTERISTICS

See Section 3.1 for general area characteristics. The surrounding area is generally level with surface drainage via manmade drainageways to the west.

7.62.3.5 PATHWAYS

AIR

No surface releases were evident. Therefore, it is felt that air is not a transport mechanism.

SOIL

Hazardous constituents of the waste oils/fuel at this location would be released into the soil mass after transporting through the pea gravel. Soil particle bonding, which naturally exists in the silt and clay type soils typical to this area, provide a strong attenuation for these potential contaminants. Minor releases from this system would most probably be trapped in the vadose soil zone until natural driving forces are exerted (surface water infiltration) to transport these substances to the groundwater surface.

SURFACE WATER/SEDIMENT

The field inspection revealed slightly stressed vegetation surrounding the unit. Therefore, contaminants could have been carried along the existing surface ditches.

GROUNDWATER

These contaminants are slightly soluble in water and would generally be transported down gradient with the flow of groundwater.

SUBSURFACE GAS

Limited migration of VOCs could have occurred but would be inconsequential as a pathway.

7.62.4 CONTAMINANT RELEASE IDENTIFICATION

7.62.4.1 PRIOR INSPECTION REPORTS

None available.

7.62.4.2 PUBLIC COMPLAINTS

None.

7.62.4.3 MONITORING/SAMPLING DATA

None.

7.62.4.4 EVIDENCE OF RELEASE

Slightly stressed vegetation.

7.62.5 EXPOSURE POTENTIAL

7.62.5.1 PROXIMITY TO AFFECTED POPULATION

This SWMU is located on an active runway remote from any affected population.

7.62.5.2 PROXIMITY TO SENSITIVE ENVIRONMENTS

The unit is distant from sensitive environments.

7.62.5.3 LIKELIHOOD OF MIGRATION TO POTENTIAL RECEPTORS

The most likely migration pathway from this unit would be seepage to the drainage ditch or groundwater transport.

7.62.6 DOCUMENTS REVIEWED

NAS Memphis historical records.

7.62.7 SUMMARIZED DATA GAP

7.62.7.1 SOIL

No data available.

7.62.7.2 GROUNDWATER

No data available.

7.62.7.3 SURFACE WATER/SEDIMENT

No data available.

7.62.7.4 AIR

No data available.

7.62.7.5 SUBSURFACE GAS

No data available.

7.62.8 RECOMMENDED ACTIONS

This SWMU has been determined to require a RCRA Facility Investigation (preliminary sampling and analysis) by SOUTHDIV NAVFACENGCOM.

8.0 SUMMARY OF RECOMMENDED ACTIONS

The following summary of recommended action for SWMUs No. 1 through 62 consists of recommendations that each SWMU either be removed from further consideration as a hazardous SWMU, or considered for further investigation under RCRA or the Navy's UST program. Table 8-1 is a tabular synopsis of recommendations. The four right-hand columns of Table 8-1 contain recommendations for (1) RFI site characterization sampling (CHAR); (2) limited RFI verification sampling (VER) (3) investigation under the Navy's UST program; or (4) no further action.

Preliminary RFI sampling and analysis is a limited, media-specific effort to determine the presence or absence of contaminants at locations deemed most likely to have maximum residual concentrations. Characterization RFI sampling and analysis is a more extensive effort to determine type, extent, and degree of contamination at sites known or strongly suspected of being contaminated. Sites that shown evidence of contamination on preliminary RFI results will be scheduled for a characterization RFI. Characterization RFI's may consist of a one-time field sampling event, or may be planned as multi-phase efforts, depending on site characteristics and contaminants of interest.

8.1 SOLID WASTE MANAGEMENT UNITS REQUIRING NO FURTHER STUDY

This RFA identifies 62 SWMUs at NAS Memphis. SOUTHDIV NAVFACENGCOM, EPA Region IV, and TDHE have identified 20 as requiring no further study. The following explanation is offered as the basis for this determination.

SWMU No. 10 - North Side Landfill - Eastern Section - There is no indication that wastes other than demolition debris was disposed in this area.

SWMU No. 11 - Oiled, Dirt Roads - The subject roads were sprayed with an unknown amount of waste oil (some of which may have contained PCBs). After this practice was discontinued, some of the roads were paved with asphalt. During the IAS phase of the NACIP program, some unpaved road sections were sampled and analyzed for PCBs. No PCBs were found. Consequently, no further study is required.

SWMU No. 12 - Galley Disposal - There is no indication that wastes other than empty food cans were disposed in this area. Such waste would not be hazardous, nor would it generate hazardous breakdown or decay products.

TABLE 8-1 NAS MEMPHIS SWMU INVENTORY

SWMU NO.	SWMU NAME	NIRP STUDY CHAR	NIRP STUDY VER	UST STUDY	NO STUDY REQUIRED
1	Fire Dept Drill Area	RCRA			
2	South Side Landfill	RCRA			
3	N-121 Plating Shop	RCRA			
4	N-121 Plating Shop Ditch	RCRA			
5	Fire Fighting Training Area	RCRA			
6	N-126 Battery Shop	RCRA			
7	N-126 Plating Shop	RCRA			
8	Cemetery Landfill	RCRA			
9	Sewage Lagoons	RCRA			
10	North Side Landfill (Eastern Portion)				X
11	Oiled, Dirt Roads				X
12	Galley Disposal				X
13	Building 499 Grease Pit				X
14	S-140 Site & 7th Avenue Ditch	RCRA			
15	N-94 Tank Farm			UST	
16	N-94 Above Ground Waste Tanks				X
17	S-9 Underground Waste Tank		RCRA		
18	N-112 Underground Waste Tank		RCRA		
19	341 Underground Waste Tank		RCRA		

TABLE 8-1 NAS MEMPHIS SWMU INVENTORY (cont.)

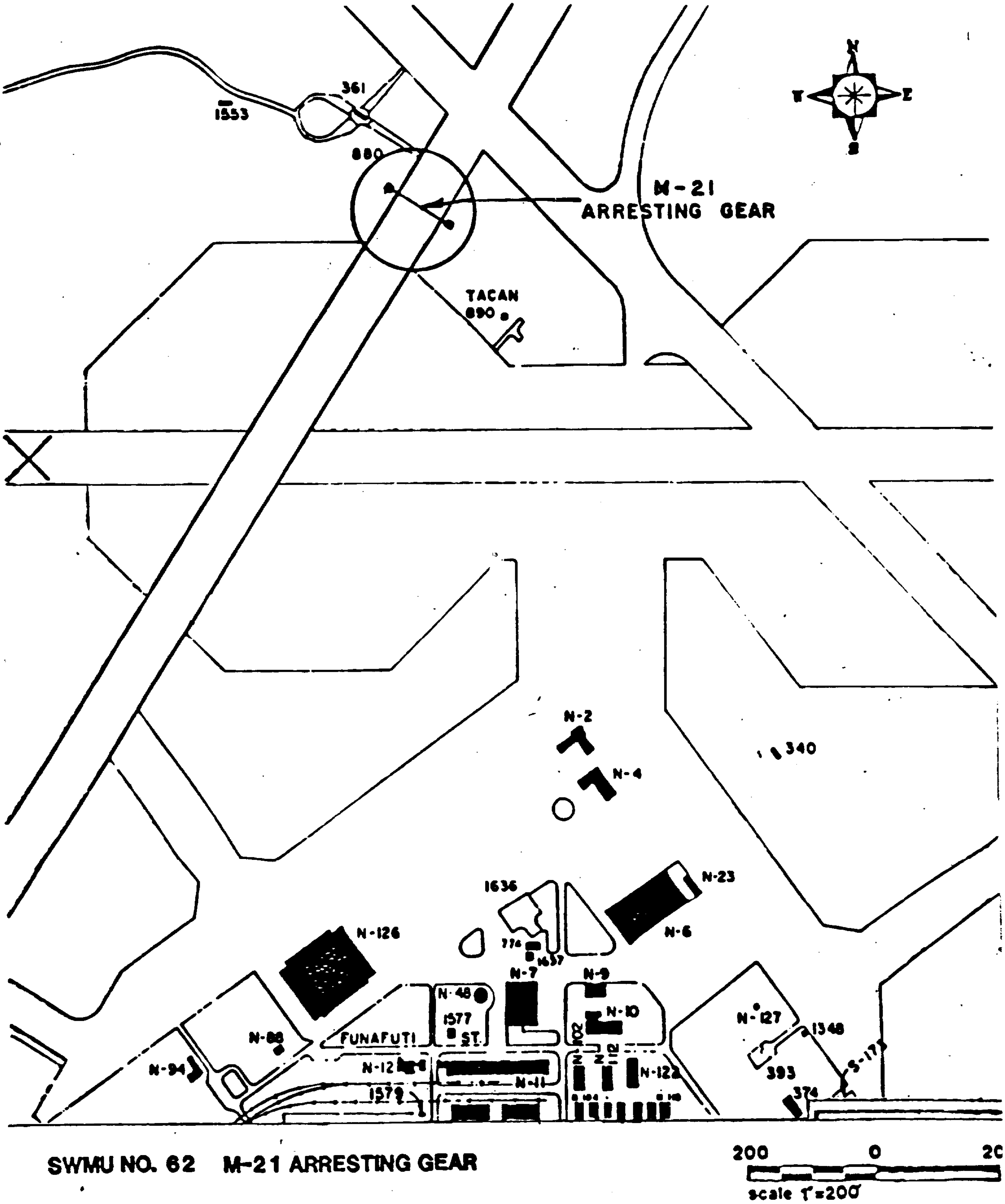
SWMU NO.	SWMU NAME	NIRP STUDY CHAR	NIRP STUDY VER	UST STUDY	NO STUDY REQUIRED
20	1594 Underground Waste Tank			UST	
21	N-10 Underground Waste Tank			UST	
22	S-75 Underground Fuel Tanks			X	
23	S-8 Underground Fuel Tank			X	
24	Auto Shop Waste Oil Tank		RCRA		
25	Big Creek Landfill				X
26	N-102 Battery Acid Treatment		RCRA		
27	Northside STP		RCRA		
28	Southside STP				X
29	Lakehouse STP				X
30	Park Field Waste Treatment Tank		RCRA		
31	Aircraft Wash Rack @ 4th Street				X
32	N-7 Aircraft Wash Rack				X
33	H-10 Incinerator				X
34	N-109 Incinerator				X
35	1579 Incinerator				X
36	North STP Incinerator				X
37	South STP Incinerator				X

TABLE 8-1 NAS MEMPHIS SWMU INVENTORY (cont.)

SWMU NO.	SWMU NAME	NIRP STUDY CHAR	NIRP STUDY VER	UST STUDY	NO STUDY REQUIRED
38	Industrial Drainage Ditches	RCRA			
39	S-74 PCB Storage Area		RCRA		
40	Salvage Yard No. 1	RCRA			
41	Salvage Yard No. 2		RCRA		
42	N-12 Hazardous Waste Storage				Close per approved closure plan
43	H W Accum PT @ S-176		RCRA		
44	H W Accum PT @ N-102		RCRA		
45	H W Accum PT @ S-142		RCRA		
46	H W Accum PT @ S-140		RCRA		
47	H W Accum PT @ 344		RCRA		
48	H W Accum PT @ S-9		RCRA		
49	H W Accum PT @ 757		RCRA		
50	H W Accum PT @ N-126 MAG42		RCRA		
51	H W Accum PT @ N-126, VR-60		RCRA		
52	H W Accum PT @ N-126, VP-67		RCRA		
53	H W Accum PT @ N-126, AIMD		RCRA		
54	H W Accum PT @ Dental Clinic				X

TABLE 8-1 NAS MEMPHIS SWMU INVENTORY (cont.)

SWMU NO.	SWMU NAME	NIRP STUDY CHAR	NIRP STUDY VER	UST STUDY	NO STUDY REQUIRED
55	H W Accum PT @ Medical Clinic				X
56	H W Accum PT @ 352				X
57	H W Accum PT @ S-183				X
58	H W Accum PT @ S-360				X
59	Old Pesticide Shop @ S-335	RCRA			
60	North Side Landfill (Western Portion)	RCRA			
61	Former Print Shop		RCRA		
62	M-21 Arresting Gear		RCRA		



SWMU NO. 62 M-21 ARRESTING GEAR

FIGURE 7-62 LOCATION MAP

disposed of in one of the on-site landfills. This unit was demolished in 1972. No further study is recommended because of the absence of any evidence of release.

SWMU No. 34 - H-109 Incinerator - This incinerator replaced the H-10 incinerator. It operated under appropriate air pollution control permits and is periodically monitored by the Memphis/Shelby County Health Department. Ash from the incinerator is disposed of in the Millington municipal landfill. This SWMU has never had a release; therefore, no further study is required. The unit was inactive in 1989 due to inability to meet 1989 TDHE operating parameters.

SWMU No. 35 - Building 1579 Incinerator - This incinerator burns classified paper materials and plastic identification cards only. It is permitted and monitored by the Memphis/Shelby County Health Department. Ash is disposed of in the Millington landfill. No study is required, because the facility has never had a release.

SWMU No. 36 - North STP Incinerator - This incinerator was used to burn classified paper materials. It was not used to incinerate STP sludge. Ash from the incinerator was buried in an on-site landfill and in the Millington landfill. The incinerator was replaced by SWMU No. 35 in 1971-72. No study is required, because there is no evidence that the facility received hazardous constituents or waste.

SWMU No. 37 - South STP Incinerator - This incinerator, which was located at the South STP, was identical to SWMU No. 36. No further study is required for the same reasons cited above.

SWMU No. 54 - Hazardous Waste Accumulation Point at Building 771, Dental Clinic - This facility is included on the SWMU list because as part of the dental clinic operations, an ion exchange unit is operated to recover silver from x-ray processing chemicals. Silver is a hazardous constituent, and the ion exchange silver recovery process could be considered treatment. Due to the value of silver, the recovery unit has been operated many years. The Memphis Naval Air Station maintains accurate inventory records relative to silver use and recovery, and no discrepancies have been detected. There is no visual evidence of any release, nor do the records suggest that a release has ever occurred. For these reasons, further investigations associated with this SWMU are not warranted. X-ray developer and fixer solutions are not items of concern.

SWMU No. 55 - Hazardous Waste Accumulation Point at Building 771 Medical Clinic - Same as No. 54 above.

SWMU No. 56 - Building 352 Hazardous Waste Accumulation Point -Building 352 is a storage shack near the golf course and has been listed as SWMU due to the fact that used batteries were at one time stored in the shack awaiting pick-up by a salvager. Scrap batteries are no longer stored in this facility. The potential for a hazardous constituent release of any consequence having occurred at this facility is very remote, and conducting an investigation of the area would not be cost effective. Evidence of release of battery acid on the concrete floor or obvious vegetative distress was not apparent, nor are there records evidencing a release. This SWMU is of no environmental significance and warrants no further consideration.

SWMU No. 57 - Building S-183 Hazardous Waste Accumulation Point -Building S-183 is a maintenance building associated with painting operations at the NAS. Until 1983, surplus paint and possibly paint thinners were accumulated on the concrete aprons surrounding the building prior to their off-site disposal. Any release of the paint wastes would have caused staining of the concrete aprons, and such was not evident when inspected in 1983. Paint wastes are no longer accumulated in the area. Inspections conducted on 31 March 1987, and 30 June 1989 revealed no accumulated waste materials and no evidence of any prior releases. This SWMU is not of environmental significance and warrants no further investigation.

SWMU No. 58 - Building S-360 Hazardous Waste Accumulation Point -Building 360 is used to train naval personnel to paint. Until 1983, paint wastes were occasionally accumulated on the concrete apron surrounding the building prior to their off-site disposal. Any release of the waste materials would have caused staining of the concrete aprons and vegetative distress in the areas surrounding the aprons. Such was not evident when inspected in 1983. Paint wastes are no longer accumulated in the area. Inspections conducted on 31 March 1987 and 30 June 1989 revealed no accumulated waste materials and no evidence of any prior releases. This SWMU is of no environmental significance and further investigation is not indicated.

8.2 SWMUs RECOMMENDED FOR FURTHER INVESTIGATION UNDER THE NAVY's UST PROGRAM

SWMU No. 22 - S-75 Underground Fuel Tanks - These tanks contain surplus No. 2 (diesel) fuel oil and No. 6 heating oil. The tanks contain a product. Consequently, an RFI is not required, because the SWMU has never received a hazardous waste.

SWMU No. 23 - S-8 Underground Fuel Tank - This tank's status is the same as SWMU No. 22.

8.3 SWMUs RECOMMENDED FOR PRELIMINARY RFI SAMPLING AND ANALYSIS

SWMU No. 15 - Tanks at Abandoned Gasoline Fuel Farm - This unit is recommended for further study to determine if releases are occurring now or have occurred in the past. Work would be performed under TDHE rules and guidelines (petroleum and used motor oil tanks) and EPA's RCRA regulations and guidelines (hazardous waste tanks, or other tanks containing hazardous constituents as defined under RCRA).

SWMU No. 17 - Underground Waste Oil Tank at Building S-9 - This unit is recommended for further study to determine if releases are occurring now or have occurred in the past. Work would be performed under TDHE rules and guidelines (petroleum and used motor oil tanks) and EPA's RCRA regulations and guidelines (hazardous waste tanks, or other tanks containing hazardous constituents as defined under RCRA).

SWMU No. 18 - Underground Waste Oil Tank at Building N-112 - This unit is recommended for further study to determine if releases are occurring now or have occurred in the past. Work would be performed under TDHE rules and guidelines (petroleum and used motor oil tanks) and EPA's RCRA regulations and guidelines (hazardous waste tanks, or other tanks containing hazardous constituents as defined under RCRA).

SWMU No. 19 - Underground Waste Oil Tank at Building 341 - This unit is recommended for further study to determine if releases are occurring now or have occurred in the past. Work would be performed under TDHE rules and guidelines (petroleum and used motor oil tanks) and EPA's RCRA regulations and guidelines (hazardous waste tanks, or other tanks containing hazardous constituents as defined under RCRA).

SWMU No. 20 - Underground Waste Oil Tank at Building 1594 - This unit is recommended for further study to determine if releases are occurring now or have occurred in the past. Work would be performed under TDHE rules and guidelines (petroleum and used motor oil tanks) and EPA's RCRA regulations and guidelines (hazardous waste tanks, or other tanks containing hazardous constituents as defined under RCRA).

SWMU No. 21 - Underground Waste Oil Tank at Building N-10 - This unit is recommended for further study to determine if releases are occurring now or have occurred in the past. Work would be performed under TDHE rules and guidelines (petroleum and used motor oil tanks) and EPA's RCRA regulations and guidelines (hazardous tanks, or other tanks containing hazardous constituents as defined under RCRA).

SWMU No. 24 - Auto Hobby Shop Tanks - The tanks are two 500-gallon above ground tanks in formerly used for temporary storage of waste motor oil, hydraulic fluid, etc., prior to off-site sale or disposal. These tanks are now empty.

SWMU No. 26 - N-102 Battery Acid Treatment - The treatment unit was originally a lead-lined sink. It was replaced in 1988 by a neoprene sink. The sink was located completely above a concrete floor. The concrete floor should have stopped any leaks from the sink from penetrating into the soil beneath. No cracks or openings in the concrete floor slab were observed.

SWMU No. 27 - North Side Sewage Treatment Plant - The NSSTP was used for biological treatment of sanitary sewage and liquid wastes generated during aircraft maintenance activities. It consisted of a primary digester, aerator, polishing unit, and sludge drying unit.

SWMU No. 30 - Park Field Septic Tank Box - The septic tank box, dating from the old Park Field Complex, was operated from 1915 to 1929 (approx.). It was used for reception of sanitary sewage, but limited light industrial waste from Park Field operations may have been discharged into it as well.

SWMU No. 39 - PCB Transformer Storage Area - Oil-filled electrical transformers containing polychlorinated biphenyls (PCBs) have been stored both inside and outside Building S-74 from 1980 to present. PCB-containing electrical capacitors and drums containing PCBs/oils are also stored at this location.

SWMU No. 41 - Salvage Yard No. 2 - The site is a fenced-in open storage yard used for storage of scrap metal, tires, batteries, furniture, etc. Minor leaks from items may have occurred in the past.

SWMU No. 43 - Building S-176 Hazardous Waste Accumulation Points - This SWMU is a former hazardous waste accumulation point at the former site Building S-176. The site was a drum storage yard for waste paint solvents.

SWMU No. 44 Building N-102 Hazardous Waste Accumulation Points -This unit is recommended for further study to determine if the site is "clean," or if additional study is included.

SWMU No. 45 - Building S-142 Hazardous Waste Accumulation Points - This unit is recommended for further study to determine if the site is "clean," or if additional study is included.

SWMU No. 46 - Building S-140 Hazardous Waste Accumulation Points - This unit is recommended for further study to determine if the site is "clean," or if additional study is included.

SWMU No. 47 - Building 344 Hazardous Waste Accumulation Points -This unit is recommended for further study to determine if the site is "clean," or if additional study is included.

SWMU No. 48 - Building S-9 Hazardous Waste Accumulation Point -Building S-9 is used for public works maintenance. Until 1983, drummed paint thinners, waste paint and possibly degreasers were apparently accumulated at multiple points on the concrete aprons surrounding the building. The drummed wastes were picked up for off site disposal. Any releases of these materials would have been evident by staining of the concrete aprons. The area was inspected in 1983, March 1987, June 1989, and February 1990 and paint staining was not in evidence. Waste materials are now transported from the site to the interim hazardous waste storage area promptly upon generation with no intervening accumulation or storage.

SWMU No. 49 - Building 757 Hazardous Waste Accumulation Point -Building 757 is an automobile repair garage. It has been listed due to the fact that scrap automobile batteries were periodically staged on the concrete garage approach apron pending pick-up by a battery salvager.

SWMU No. 50 - Hazardous Waste Accumulation Point Near Building N-126, MAG 42 Squadron - The waste accumulations associated with the aircraft repair activities have been given four different SWMU numbers because four different commands conduct repair activities in the hangar, Building N-126. The four commands are identified as MAG 42 Squadron, VR-60 Squadron, VP-67 Squadron and AIMD. The aircraft repair activities result in waste fuels, lubricants, hydraulic fluids and to a lesser extent, solvents and mineral spirits. The petroleum based wastes are collected in mobile, wheeled containers known as bowsers. The accumulated waste is conveyed to N-94, SWMU No. 16. These bowsers have no permanent location and in fact are moved from place to place outside the hangar. Prior to 1983, the Bowser contents may have included solvents and were conveyed to N-94, SWMU No. 15. The storage area is currently located at a fenced-in asphalt-paved area across the main N-126 parking lot to the west.

In 1987, containerized solvent wastes were accumulated in random and various locations within the hangar. The drummed (normally 55 gallon drums) wastes were conveyed off-site for disposal. Currently, containers of solvent are no longer accumulated. The hangar floor is concrete, and the hangar is roofed. Over the years there may have been spills/leaks of petroleum products and possibly solvents onto the concrete floor. Currently, such spills are promptly cleaned up.

SWMU No. 51 - Hazardous Waste Accumulation Point at Building N-126 for VR-60 Squadron - Wastes are containerized mineral spirits and paint thinners. The SWMU has been moved from Building N-126 to a site south of SWMU No. 21 near Building N-112. It has been "moved" several times.

SWMU No. 52 - Hazardous Waste Accumulation Point at Building N-126 for VP-67 - Wastes similar to SWMU No. 51 above. The unit has been moved from Building N-126 (original location) to self-contained paint lockers in front of Building N-126.

SWMU No. 53 - Hazardous Waste Accumulation Point at Building N-126 for AIMD - Wastes similar to SWMU No. 50 above and included TCE. The unit has been moved since 1987 from Building N-126 to a location north of Building N-12, in a part of the NAS's old hazardous waste storage building (an igloo on concrete and asphalt base).

SWMU No. 61 - Former Print Shop Building N-26 - This SWMU is located east of 8th Ave. on the North Complex. Printing inks and solvents were used at this location. Printing equipment may have been cleaned just outside the back door of the building on a concrete pad.

SWMU No. 62 - M-21 Arresting Gear - This SWMU is located on Runway 04/22, North Side Complex. Hydraulic Fluid, Lubricating Oil, and Diesel Fuel were used at this location.

8.4 SWMUs RECOMMENDED FOR CHARACTERIZATION RFI SAMPLING AND ANALYSIS

SOUTHDIV NAVFACENGCOM, EPA Region IV, and TDHE have determined that the following sites are to be characterized by an RFI sampling and analysis:

SWMU No. 1 - Fire Department Drill Area (FFDA) - The FFDA was used for fire fighter training from 1960 to 1981. Waste fuels seepage into the ground may have resulted in site contamination.

SWMU No. 2 - South Side Landfill - The South Side Landfill (SSLF) was used for general solid waste disposal for waste generated at NAS Memphis from 1942 to 1970.

SWMU No. 3 - Building N-121 Plating Shop Dry Well - The dry well, located adjacent to Building N-121, was used for disposal of both concentrated plating solutions and overflows from plating tanks. The cyanide-based plating solutions contained cadmium, chromium, copper and nickel. The plating shop may have operated from 1951 to 1976.

SWMU No. 4 - Building N-121 Plating Shop Storm Sewer and Drainage Ditch - The storm sewer and ditch received plating shop wastewater not otherwise disposed in SWMU No. 3, the dry well. The plating shop may have operated from 1951 to 1976.

SWMU No. 5 - Fire Fighting Training Area (FFTA) - The FFTA has been in use from 1949 to present. In 1977, the facility was modified to prevent release of substances used as flammables (JP-4 since 1977; possibly JP-4 and waste oils and solvents prior to 1977). Investigation of SWMU No. 5 is recommended since environmental contamination could have resulted from the pre-1977 facility operation.

SWMU No. 6 - N-126 Battery Shop Storm Sewer and Ditch - The battery shop, which was operated from 1955 to 1981, discharged battery electrolyte spills and drippings into floor drains in Building N-121. The floor drains discharged to a dry well, which in turn discharged to a storm sewer. The storm sewer discharged to a drainage ditch.

SWMU No. 7 - Building N-126 Plating Shop Dry Well - The dry well was a 10' x 10' x 6' deep gravel-filled pit that received plating shop wastes from 1955 to 1978. Wastes were cyanide-based solutions containing nickel, chromium, and cadmium solutions and rinse waters.

SWMU No. 8 - Cemetery Disposal Area (CDA) - The CDA was used for disposal of solid and hazardous waste from 1965 to 1980. Uncertainties is site use and materials discarded indicate that further investigation (characterization) is prudent.

SWMU No. 9 - Sewage Lagoons - The two inactive sewage lagoons, located on the NAS South Side Complex south of the Big Creek Drainage Canal, were used form 1969 to 1978 in the treatment of sludges from the NAS Memphis wastewater treatment system (WWTS). The WWTS was used for biological treatment of sanitary and industrial wastes.

SWMU No. 14 - Former Site of Building S-140 and 7th Avenue Ditch - This unit is recommended for further study to determine if residual contamination is present.

SWMU No. 38 - Drainage Ditches in Industrial Areas - This SWMU consists of various drainage ditches located throughout the North Side industrial area and in portions of the South Side area. These ditches received stormwater and various liquid industrial wastes from 1943 to 1980.

SWMU No. 40 - Salvage Yard No. 1 - In 1987, the site was a fenced in open storage yard used for storage of scrap metal (pieces of aircraft, anchor chains, etc.). It has since been paved with asphalt and is used for storage of mobile military equipment. It is suspected that past operations may have resulted in site contamination hazard to human health or the environment. Petroleum hydrocarbons were detected in near-surface soils in 1988, prior to paving.

SWMU No. 59 - Old Pesticide Shop - This site is the subject of an RFI currently (April 1990) being planned by the Navy. This RFI will be completed prior to planned building demolition, and results used to determine worker health and safety requirements, waste management requirements, and need (if any) for removal or treatment of contaminated soil.

SWMU No. 60 - North Side Landfill (Western Portion) - This site is recommended for further study because of possible disposal of hazardous substances in the past.

8.5 SWMUs TO BE CLOSED UNDER EXISTING RCRA CLOSURE PLAN

SWMU No. 42 - Hazardous Waste Interim Storage Area - This SWMU, located adjacent to Building N-12, is used for temporary storage of hazardous wastes (mostly paints) in drums. It will be closed in accordance with the existing TDHE-approved closure plan.

REFERENCES

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