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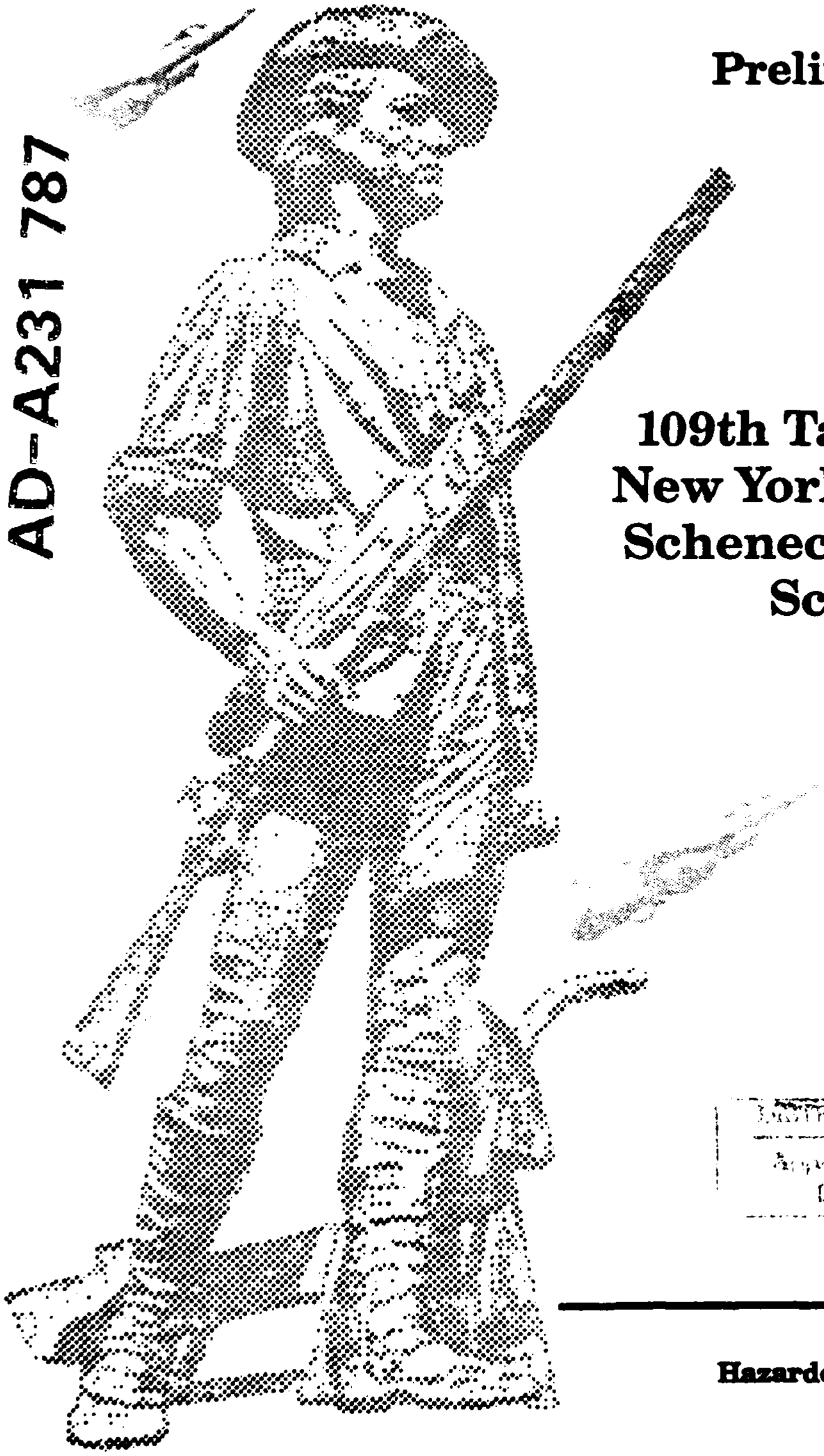
INSTALLATION RESTORATION PROGRAM

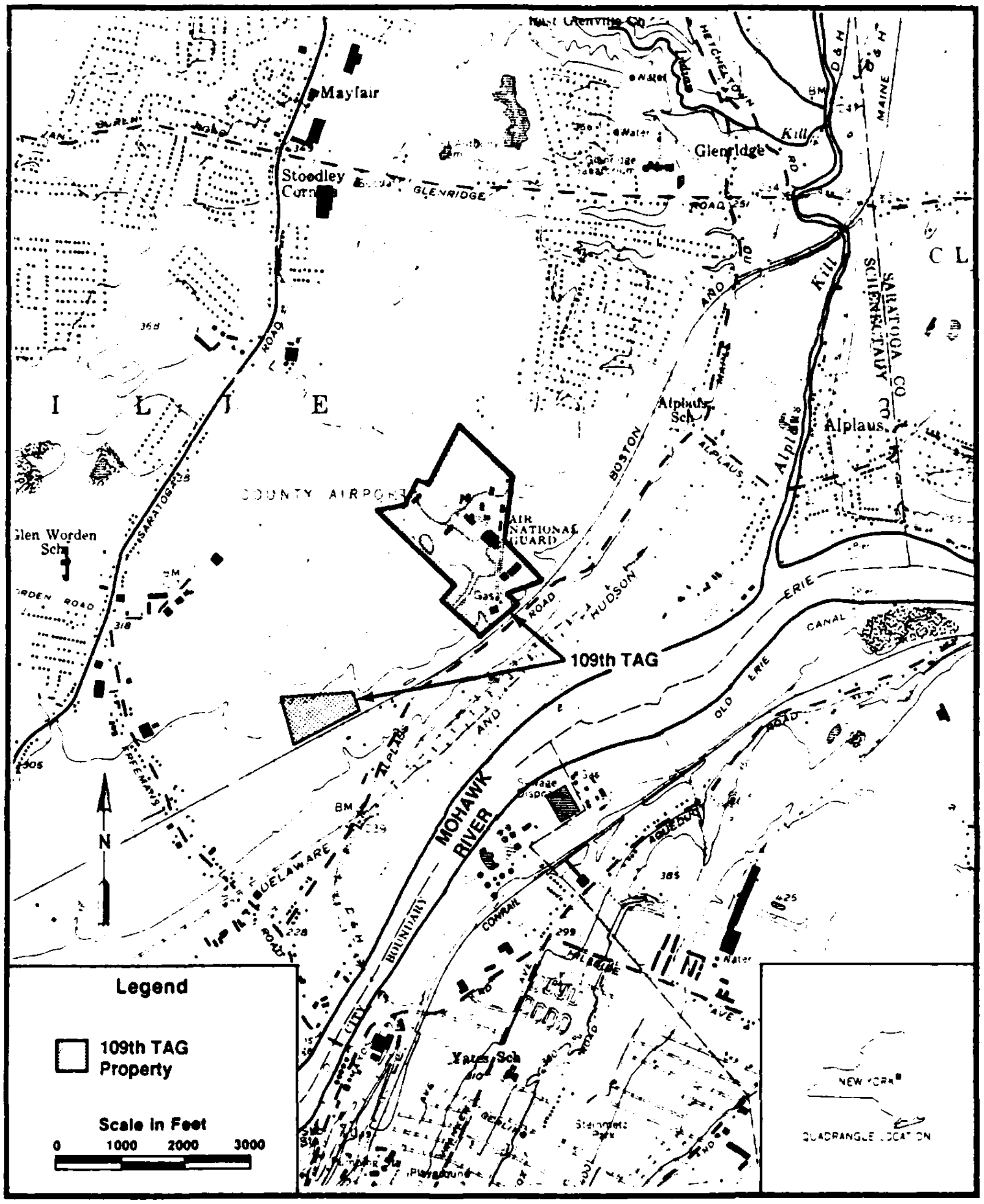


Preliminary Assessment

109th Tactical Airlift Group
New York Air National Guard
Schenectady County Airport
Scotia, New York

Hazardous Materials Technical Center

June 1989



This report has been prepared for the National Guard Bureau, Andrews Air Force Base, Maryland by the Hazardous Materials Technical Center for the purpose of aiding in the implementation of the Air Force Installation Restoration Program.

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June 1989 | Final Preliminary Assessment

Preliminary Assessment
109th Tactical Airlift Group
New York Air National Guard
Schenectady County Airport, Scotia, New York

N/A

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The Dynamac Building
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Preliminary Assessment of suspected hazardous waste sites at the Schenectady County Airport. The study was conducted under the Air National Guard's Installation Restoration Program.

Installation Restoration Program
Preliminary Assessment
New York Air National Guard

ABSTRACT

Unclassified

INSTALLATION RESTORATION PROGRAM
PRELIMINARY ASSESSMENT

FOR

109th TACTICAL AIRLIFT GROUP
NEW YORK AIR NATIONAL GUARD
SCHENECTADY COUNTY AIRPORT
SCOTIA, NEW YORK

June 1989

Prepared for

National Guard Bureau
Andrews Air Force Base, Maryland 20310

Prepared by

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Contract No. DLA 900-82-C-4426

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EXECUTIVE SUMMARY

A. Introduction

The Hazardous Materials Technical Center (HMTC) was retained in August 1988 to conduct the Installation Restoration Program (IRP) Preliminary Assessment (PA) of the 109th Tactical Airlift Group (TAG), New York Air National Guard, Schenectady County Airport, Scotia, New York (hereinafter referred to as the Base), under Contract No. DLA-900-82-C-4426. The Preliminary Assessment included:

- an onsite visit, including interviews with 28 past and present Base employees conducted by HMTC personnel during 1 to 4 August 1988;
- the acquisition and analysis of pertinent information and records on hazardous material use and hazardous waste generation and disposal at the Base;
- the acquisition and analysis of available geologic, hydrologic, meteorologic, and environmental data from pertinent Federal, State, and local agencies; and
- the identification of sites on the Base that are potentially contaminated with hazardous materials/hazardous wastes (HM/HW).

B. Major Findings

Past Base operations involved the use and disposal of materials and wastes that were subsequently categorized as hazardous. The Base shops that use and dispose of HM/HW include Aircraft Maintenance; Vehicle Maintenance; Petroleum, Oils, and Lubricants (POL) Management; Aerospace Ground Equipment (AGE) Maintenance; Nondestructive Inspection (NDI); and Photography Lab. Varying quantities of waste oils; recovered fuels; spent cleaners; and solvents are generated by these activities.

Interviews with past and present Base personnel and a field survey resulted in the identification of two disposal and/or spill sites at the Base that are potentially contaminated with HM/HW. Each of these sites was assigned a Hazard Assessment Score (HAS) according to the U.S. Air Force Hazard Assessment Methodology (HARM).

Site No. 1 - Fire Training Area (HAS-62)

From the early 1950s to about 1959, the Base used a fire training area (FTA) located approximately 300 feet west of Building No. 18. Training exercises were conducted approximately 11 times per year using 100 to 200 gallons of flammable liquid per exercise. Aviation gasoline was the primary fuel burned at this site; however, waste liquids from the Base shops, such as waste oil, PD-680 solvent, and paint thinners were also occasionally burned at this site. At the time of the site visit, no visible signs of contamination were observed at this site.

Site No. 2 - Drum Storage Area (HAS-51)

The area between Building Nos. 12 and 13 was identified as a storage area where drums of both new and waste PS-661 and PD-680 solvent were stored in the 1950s and 1960s. Drums of waste oil were also stored in this area before it was paved. The site was originally bare soil, but was paved in 1958. Small spills resulting from day-to-day operations were reported to have occurred in this area before it was paved. No visible evidence of contamination was observed at this area during the site visit.

C. Conclusions

Information obtained through interviews with past and present Base personnel resulted in the identification of two areas on the Base that are potentially contaminated with HM/HW. At each of the identified sites, the potential exists for contamination of soils, surface water, or groundwater and subsequent contaminant migration. Each site was, therefore, assigned as HAS according to HARM.

D. Recommendations

Further IRP investigation is recommended for each of the two identified sites.

I. INTRODUCTION

A. Background

The 109th Tactical Airlift Group (TAG) is located at the New York Air National Guard Base at the Schenectady County Airport, Scotia, New York (hereinafter referred to as the Base). The 109th TAG was established in 1948 and has been located at the Schenectady County Airport since 1950. Past operations at the Base involved the use and disposal of materials and wastes that subsequently were categorized as hazardous. Consequently, the National Guard Bureau has implemented its Installation Restoration Program (IRP). The IRP consists of the following:

- Preliminary Assessment (PA) - to identify past spill or disposal sites posing a potential and/or actual hazard to public health or the environment.
- Site Investigation/Remedial Investigation/Feasibility Study (SI/RI/FS) - to acquire data via field studies, for the confirmation and quantification of environmental contamination that may have an adverse impact on public health or the environment and to select a remedial action through preparation of a feasibility study.
- Research, Development and Demonstration (RD & D) - if needed, to develop new technology for accomplishment of remediation.
- Remedial Design/Remedial Action (RD/RA) - to prepare designs and specifications and to implement site remedial action.

B. Purpose

The purpose of this Preliminary Assessment is to identify and evaluate suspected problems associated with past hazardous waste handling procedures, disposal sites, and spill sites on the Base. Personnel from the Hazardous Materials Technical Center (HMTC) visited the Base, reviewed existing environmental information, analyzed Base records concerning the use and generation of hazardous material/hazardous waste (HM/HW), and conducted interviews with past and present Base personnel familiar with past hazardous materials management activities. A physical inspection was made of the various facilities and of the suspected sites. Relevant information collected and analyzed as a part of the Preliminary Assessment included the history of the Base, with special emphasis on the history of the shop operations and their past HM/HW management procedures; local geologic, hydrologic, and meteorologic conditions that may affect migration of contaminants; local land use and public utilities that could affect the potential for exposure to contaminants; and the ecologic settings that indicate environmentally sensitive habitats or evidence of environmental stress.

C. Scope

The scope of this Preliminary Assessment is limited to operations at the Base and includes:

- An onsite visit;
- The acquisition of pertinent information and records on hazardous materials use, hazardous wastes generation, and disposal practices at the Base;
- The acquisition of available geologic, hydrologic, meteorologic, land use, critical habitat, and utility data from various Federal, State, and local agencies;
- A review and analysis of all information obtained; and
- The preparation of a report to include recommendations for further actions.

The onsite visit and interviews with past and present Base personnel were conducted during the period 1 through 4 August 1988. The Preliminary Assessment site visit was conducted by Ms. Kathryn Gladden, Task Manager/Staff Engineer; Mr. Mark Pape, Program Manager; and Ms. Betsy Briggs, Hazardous Waste Specialist. Other HMTC personnel who assisted in the Preliminary Assessment include Ms. Janet Emry, Hydrogeologist; Mr. Raymond G. Clark; P.E./Department Manager; and Mr. Mark Johnson, P.G./Program Manager (Appendix A). Mr. Basit Ghori of the Air National Guard Support Center (Project Officer) and various Base personnel assisted in the Preliminary Assessment . A Point of Contact (POC) at the Base is the Public Affairs officer of the 109th TAG.

D. Methodology

A flow chart of the Preliminary Assessment Methodology is presented in Figure 1. This methodology ensures a comprehensive collection and review of pertinent site-specific information and is used in the identification and assessment of potentially contaminated hazardous waste spill/disposal sites.

The Preliminary Assessment begins with a site visit to the Base to identify all shop operations or activities on the installation that may use hazardous materials or generate hazardous wastes. Next, an evaluation of both past and present HM/HW handling procedures is made to determine whether any environmental contamination has occurred. The evaluation of past HM/HW handling practices is facilitated by extensive interviews with past and present employees familiar with the various operating procedures at the Base. These interviews also define the areas on the Base where any HM/HW, either intentionally or inadvertently, may have been used, spilled, stored, disposed of, or otherwise released into the environment.

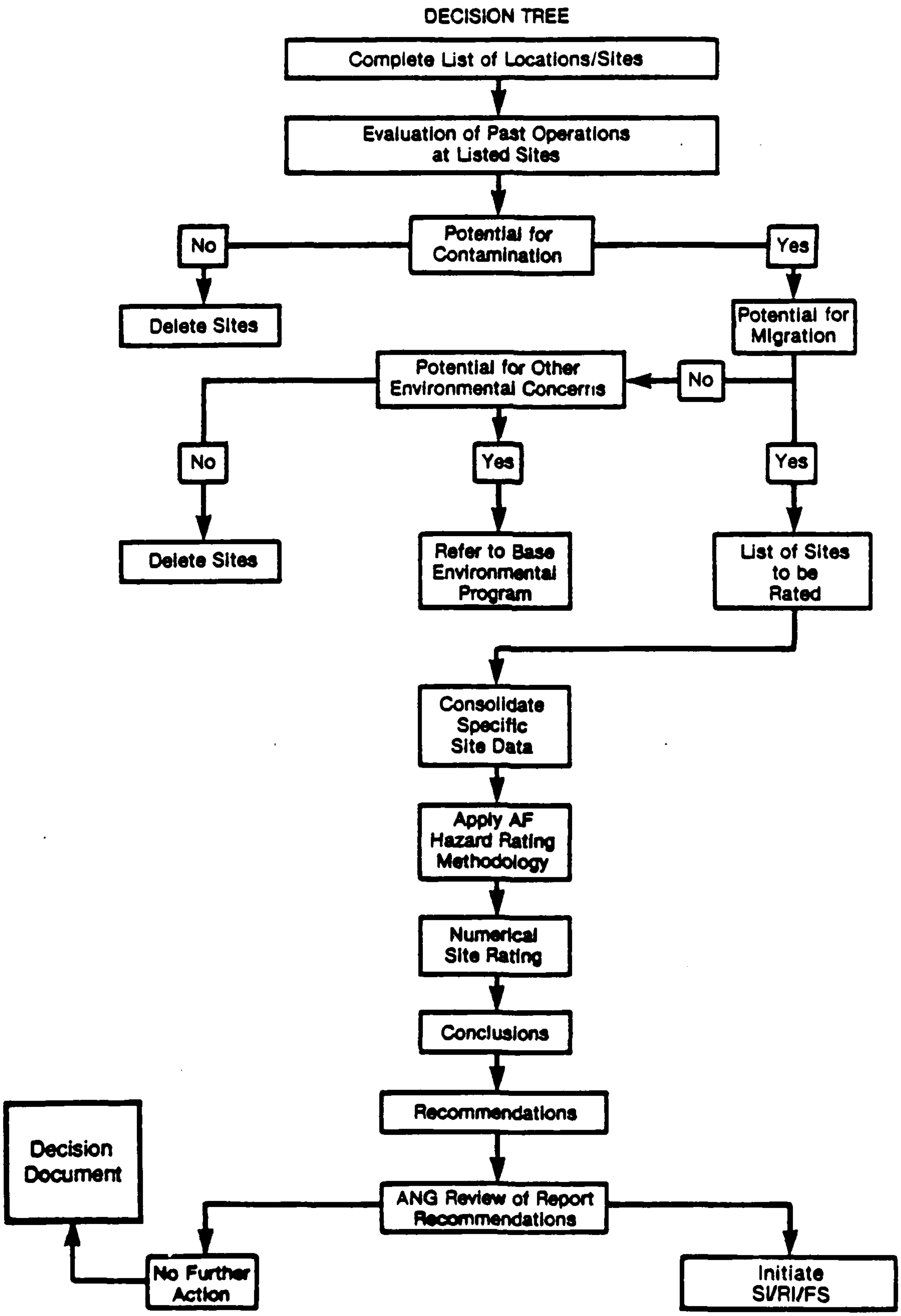
Historic records contained in the Base files are collected and reviewed to supplement the information obtained from interviews. Using this information, a list of past waste spill/disposal sites on the Base is identified for further evaluation. A general survey tour of the identified sites, the Base, and the surrounding area is conducted to determine the presence of visible contamination and to help assess the potential for contaminant migration. Particular attention is given to locating nearby drainage ditches, surface water bodies, residences, and wells.

Detailed geologic, hydrologic, meteorologic, land use, and environmental data for the area of study is also obtained from the Base, and from appropriate Federal, State, and local agencies. A list of outside agencies contacted is in Appendix B. Following a detailed analysis of all the information obtained, areas

HMTC PRELIMINARY ASSESSMENT INSTALLATION RESTORATION PROGRAM

Figure 1.

Preliminary Assessment Methodology Flow Chart.



are identified as suspect areas where HM/HW disposal and/or spills may have occurred. Where sufficient information is available, sites are assigned a Hazard Assessment Score (HAS) using the U.S. Air Force Hazard Assessment Rating Methodology (HARM) and the HARM Guidelines (Appendix C). However, the absence of a HAS does not necessarily negate a recommendation for further IRP investigation, but rather may indicate a lack of data. The HAS is computed from the data included in the Factor Rating Criteria. (Appendix D).

II. INSTALLATION DESCRIPTION

A. Location

The Base occupies a total of 106 acres on two separate land parcels on the eastern and southern portions of the Schenectady County Airport, in the city of Scotia, New York. This area has not been divided into Townships and Sections. The land to the north and east of the Base is agricultural and residential. South of the Base is the Mohawk River, a railway, and commercial and residential property. West of the Base is the airport and residential property. The property on which the Base was built was agricultural land prior to the construction of the Base in 1949. Figure 2 shows the location and boundaries of the Base property covered by the Preliminary Assessment.

The population within 1,000 feet of the Base boundaries is calculated by counting the residential property in Figure 2 and assuming each dwelling has 3.8 residents (47 FR 31233). The residential population within 1,000 feet of the Base is approximately 34; there is no housing on the Base. The Base has 218 full-time personnel and approximately 1,000 part-time personnel who participate in Unit Training Activities (UTA) weekends.

B. History of Base Operations

The National Guard Bureau authorized the formation of the 139th Fighter Squadron of the New York National Guard in November of 1948. The unit was first located at the Scotia Navy Depot, which is approximately 3 miles west of the present Base (Figure 2). The first aircraft for the new unit, the F-47 "Thunderbolt," arrived in 1949, along with an assortment of support aircraft including the T-6, the B-26, and the C-47.

By September of 1950, permanent facilities for the unit were completed at the Schenectady County Airport. These facilities consisted of the present Administration Building, Hangar, Motor Pool, and Supply Buildings.

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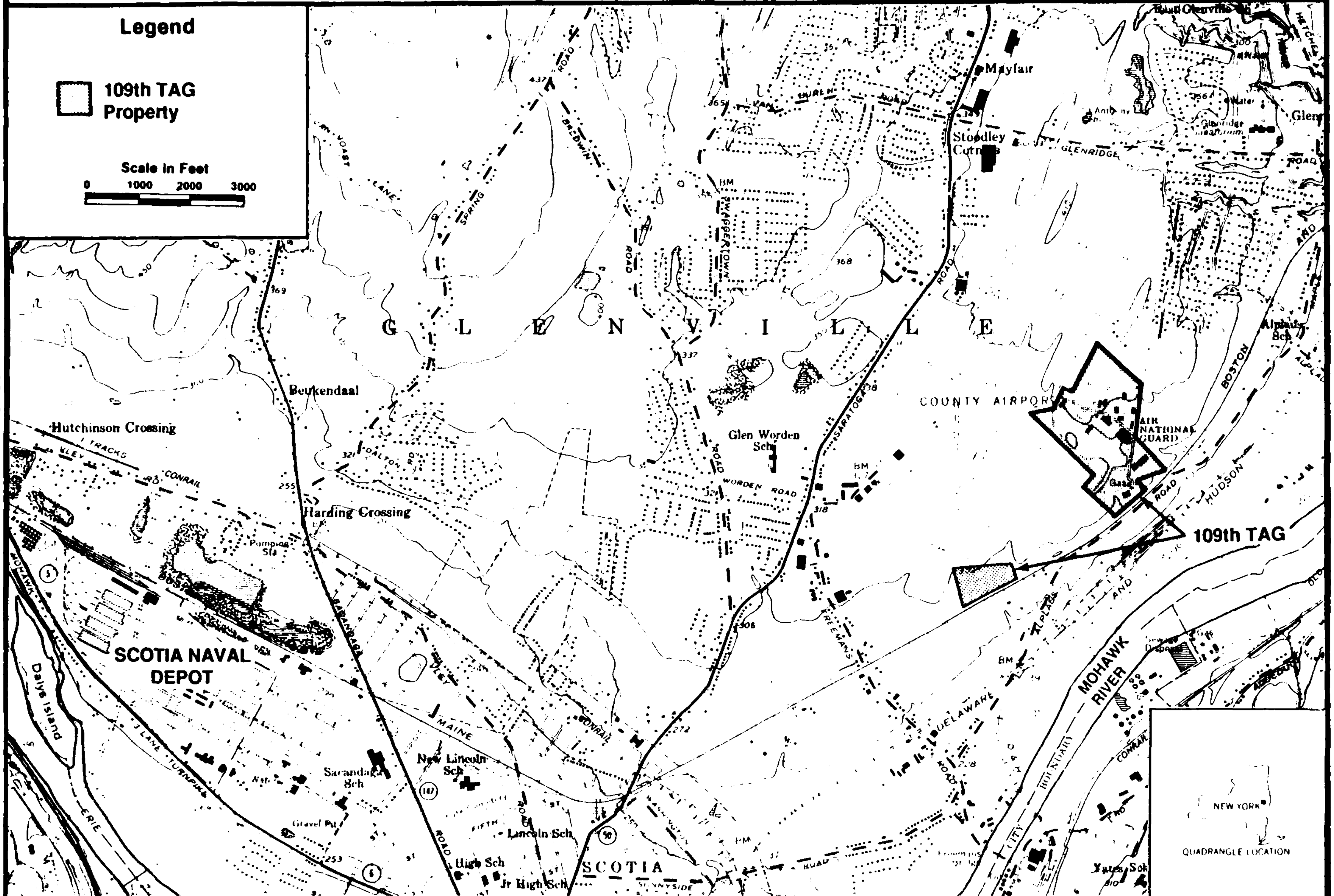
Source:
USGS 7.5 Minute
Schenectady Quadrangle (1980)

Figure 2.
Location Map of the 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.



In 1951, the F-47s were replaced by the F-51H "Mustang." By 1954, the Base had received the F-94 "Starfire" jets. In order to accommodate the new aircraft, a 7,000-foot runway with overruns was constructed.

In 1960, the unit was redesignated the 109th Tactical Airlift Group and acquired the four engine C-97A "Stratocruiser." In October 1961, the 109th TAG was called to active duty in support of the Berlin Airlift. The unit was deactivated and resumed guard status on 31 August 1962. At that time, the aging C-97A aircraft were replaced with the C-97G model.

A new mission was undertaken by the unit in 1971 with the replacement of the C-97G by the C-130A "Hercules" turboprop transport. In 1972, the C-130A models were converted to the C-130D by Lockheed Aircraft to facilitate the use of skis on the Greenland Polar Ice Cap. In 1984, the 109th TAG received its first C-130H aircraft, which replaced the older model C-130D.

III. ENVIRONMENTAL SETTING

A. Meteorology

The meteorological data presented below is from local climatological data for the Schenectady County area compiled by the National Oceanic and Atmospheric Administration (NOAA). The climate of Schenectady County is humid and continental, although it is tempered somewhat by oceanic influences. Winters are generally long and cold with below zero temperatures occurring on about 10 to 20 days. Summers are warm with temperatures of 90°F or higher on an average of 8 to 12 days per year.

The annual precipitation in the Schenectady area averages 36.2 inches. Net precipitation is calculated by subtracting the mean annual lake evaporation from the average annual precipitation (47 FR 31224). Mean annual lake evaporation in the Schenectady area is 27 inches (47 FR 31227) and net precipitation, therefore, is 9.2 inches per year. Maximum rainfall intensity, based on a 1-year, 24-hour rainfall, is 2.25 inches (47 FR 31235). Total seasonal snowfall averages 60 to 65 inches and snow cover is typical from mid-December to early March (Davis and Landry, 1978).

B. Geology

Regional Geology

The Base is located in east-central New York within the Mohawk Valley section of the Hudson-Mohawk Lowlands physiographic province. This lowland region formed between the metamorphic rocks of the Adirondack mountains to the north, the erosion-resistant limestones of the Helderberg escarpment defining the Catskill Mountains to the south, and the slate-schist belt of the Rensselaer-Taconic uplands to the east. The general topography resulted from erosion of the southward-dipping outcrop belt of weak Ordovician rocks below the stronger, cuesta-forming Silurian and Devonian limestones (Winslow and others, 1965).

The Mohawk River and its tributaries are entrenched within their valleys, providing significant local relief in the Schenectady region. Elevation ranges from a high of 1,104 feet northwest of the Base on Glenville hill to a low of 200 feet on the Mohawk River.

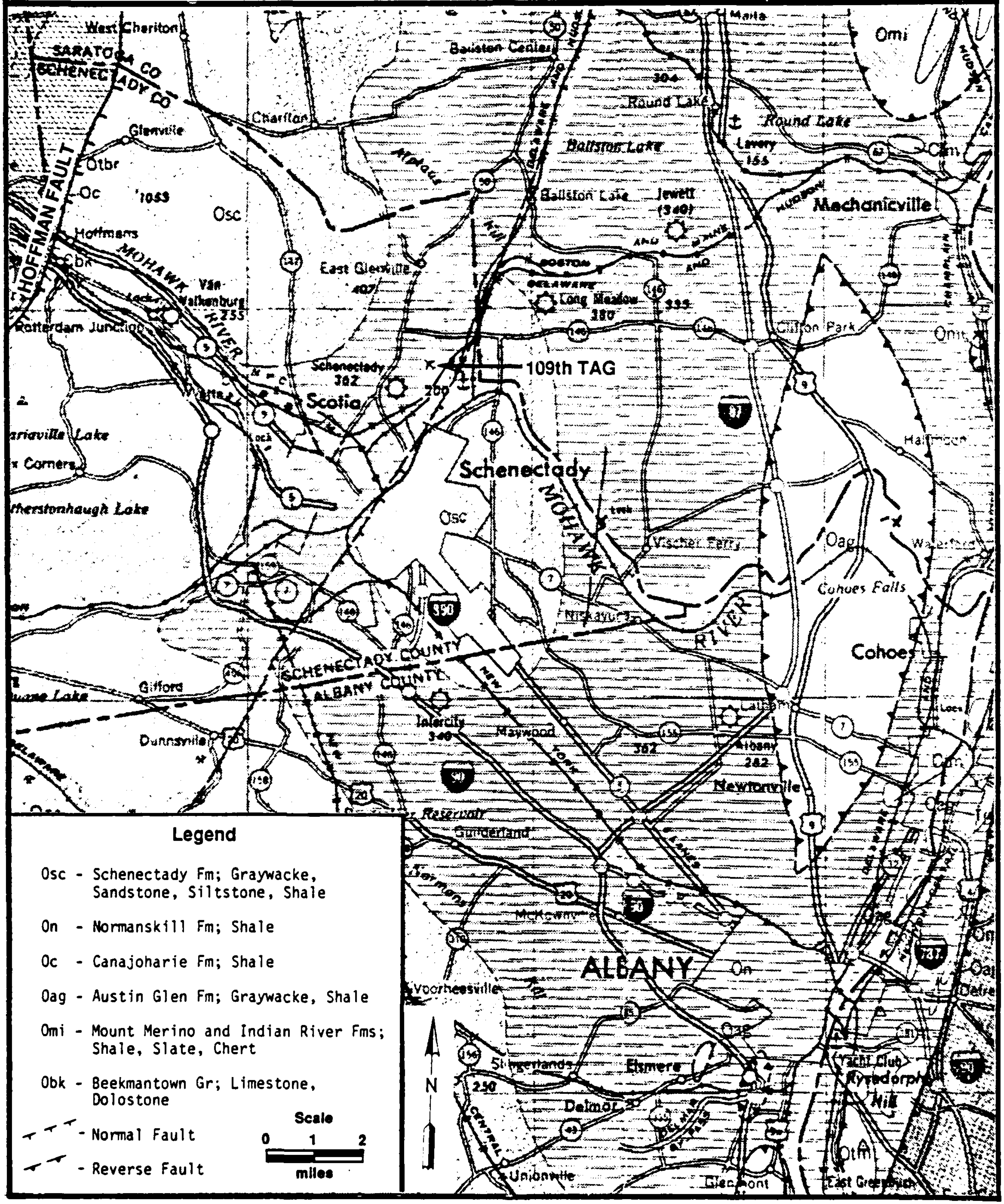
Bedrock in the region is of Ordovician age and is mainly represented by the Schenectady Formation, the Canajoharie Shale, and the Normanskill Shale. The Schenectady Formation is a thick black to gray shale alternating with coarse-grained sandstone lenses, graywackes, and siltstones. The Normanskill Formation is a dark gray to black shale with minor amounts of chert-indurated mudstone and coarse-grained, fragmental, dirty sandstone. The Canajoharie Formation is a soft, very thick, black, carbonaceous, slightly calcareous shale with very minor interbeds of sandstone or chert. Older units, exposed to the north and northwest of the Hoffman fault, are predominantly limestone, dolomite and minor shales. The Hoffman fault, which trends southwest-northeast, is located approximately 8 miles northwest of the Base. Figure 3 is a geologic map showing the bedrock formations in the vicinity of the Base.

Two different ages of unconsolidated materials are present in the region; the first are of Pleistocene age and are related to the advance and retreat of the glaciers, and the other materials are of Recent age and are alluvial deposits associated with the major rivers and streams. Figure 4 delineates the occurrence of these surficial deposits within the vicinity of the Base. Table 1 lists the sequence of unconsolidated and bedrock stratigraphic units, and their water-bearing characteristics, in the vicinity of the Base.

Glacial till is one of the most widespread Pleistocene deposits in the region. This material is a mixture of bedrock materials and soils that was deposited directly beneath a moving glacier. The rock particles that make up the till are strongly influenced by the composition of the bedrock over which the glacier travelled. The tills in this region contain resistant igneous and metamorphic cobbles and boulders that originated in the Adirondack Mountains, but mostly consist of a heterogeneous mixture of silty or sandy clay resulting from the grinding action on the underlying shales and interbedded sandstones.

Source: Geologic Map of New York State, Hudson-Mohawk sheet, New York Education Dept., Chart Series, No.15, 1970.

Figure 3.
Geologic Map of the 109th TAG, New York Air National Guard, and Vicinity.



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Adapted from: State of New York Conservation Department (1965).

Figure 4.
Surficial Materials Map of 109th TAG, and Vicinity

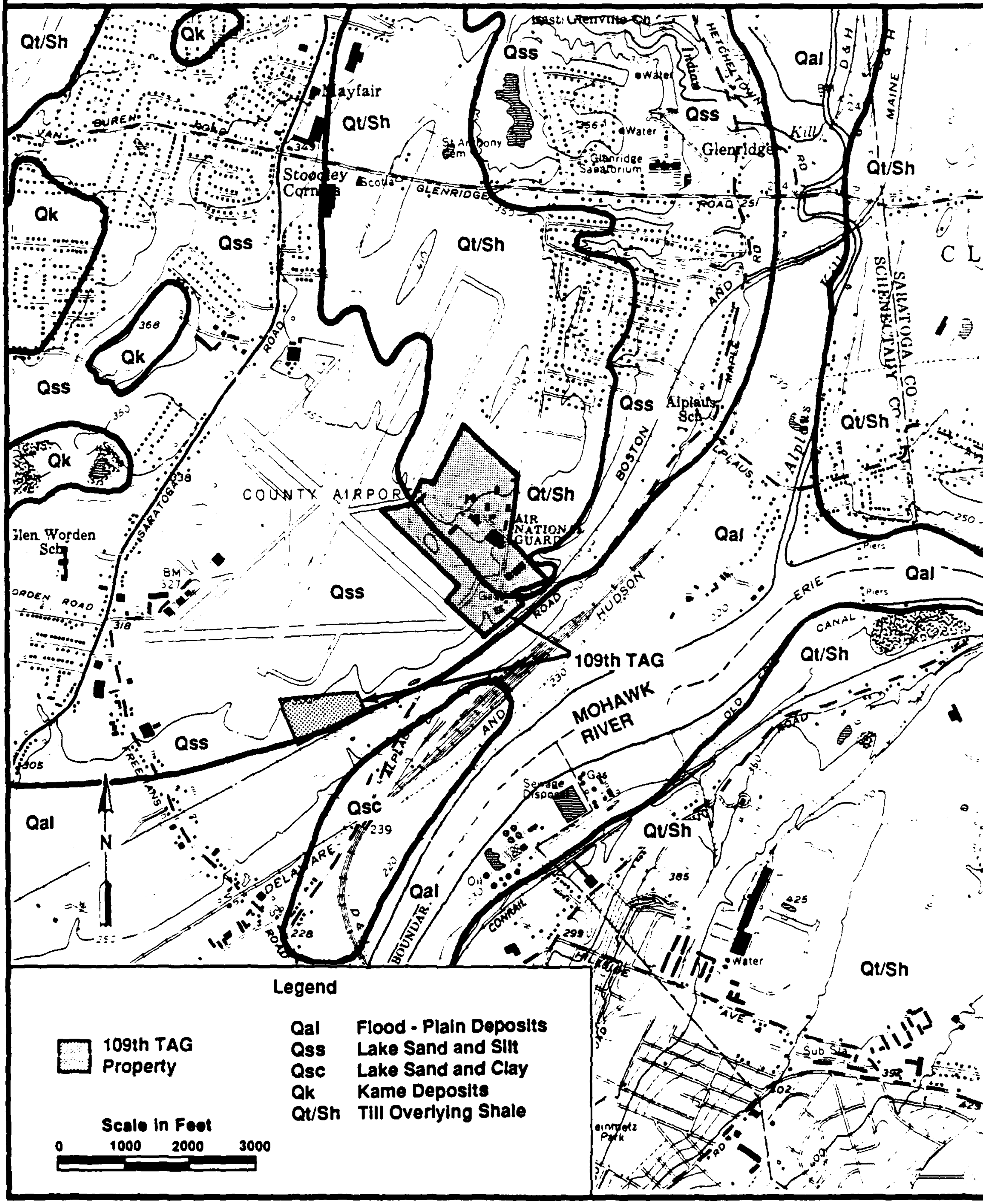

Table 1. Geologic Formations in Eastern Schenectady County and Their Water-bearing Characteristics

Class	Age		Geologic formation or unit 1/	Maximum thickness 2/ (feet)	Character of material	Water-bearing properties
Unconsolidated deposits	Quaternary	Recent	Flood plain deposits	50	Silt and sand, clayey. Contains a few thin beds of sand and gravel. Includes some organic material.	Not important as a source of ground-water because of limited thickness in most areas. Dug and shallow drilled wells generally yield sufficient water for domestic needs. In areas where deposits contain a considerable amount of sand and some fine gravel, wells may yield more than 100 gpm.
		Pleistocene	Coarse channel deposits	150	Interbedded sand, sand and gravel, Includes a few thin beds of finer-grained material.	Exceptionally permeable materials restricted principally to the Mohawk valley upstream from the Schenectady and Rotterdam well field area. Yields of more than 3,500 gpm may be drawn from properly constructed wells where infiltration from the Mohawk River is possible.
			Lacustrine sand and silt	200	Principally sand and silt. Contains beds of medium- to coarse-grained sand and a few thin, narrow and discontinuous lenses of sand and gravel. Where thick, the lower parts of the deposit contain some beds of clay.	Wells generally yield between 5 and 20 gpm, but wells that penetrate one of the few discontinuous lenses of sand or gravel may yield more than 100 gpm.
			Kame deposits	80	Principally medium-grained sand. Contains beds and lenses of coarse-grained sand and some fine gravel.	Wells generally yield between 20 and 100 gpm. Wells that penetrate one or more layers of the coarse sand and gravel may yield as much as 350 gpm.
			Laminated silt and clay	50	Alternating laminae, or thin beds, of silt and clay. Contains some beds of sand.	Generally yields less than 1 gpm. Most wells in areas of laminated silt and clay are drilled through these deposits into the underlying till or bedrock.

1/ Names of the bedrock units conform with usage of the U.S. Geological Survey. It also conforms with the nomenclature used on the geologic map of New York (Fisher and others, 1962).

2/ Thickness of bedrock units in eastern Schenectady County were provided by D.W. Fisher, State Paleontologist, New York State Museum and Science Service (oral communication, 1962).

Table 1. Geologic Formations in Eastern Schenectady County and Their Water-bearing Characteristics (Continued)

Class	Age		Geologic formation or unit 1/	Maximum thickness 2/ (feet)	Character of material		Water-bearing properties
Unconsolidated deposits	Quaternary	Pleistocene	Till	170	Unsorted mixture of all grain sizes (clay to boulders) deposited by glacial ice. Usually contains thin, narrow, and discontinuous lenses of silt, sand, or sand and gravel.		Generally yields only small amounts of water. The yield of a well in till is largely determined by the number of water-bearing properties of lenses of silt, sand, or sand and gravel that are intersected by the well. The yield of wells in till is usually sufficient for limited domestic requirements except in late summer and fall when some are inadequate.
Bedrock	Ordovician		Schenectady Formation	1,500	Black and gray shale and some beds of dense siltstone and sandstone. Forms the bedrock surface in most of eastern Schenectady County.		Poor source of groundwater. Water occurs principally in openings along joints and the yield of a well largely depends upon the number of joints that are intersected by the well. Inasmuch as the rock itself is relatively impermeable, and the number and width of joints decreases with depth, deepening a well in bedrock more than 100 to 200 feet below the rock surface usually does not result in increased yield. The yield of wells in limestone or dolomite may be slightly greater than those in shale owing to enlargement of joint openings by solution of the rock. The yield of wells in bedrock is usually adequate for limited domestic requirements. Water from bedrock may contain objectionable amounts of hydrogen sulfide gas (H_2S) or dissolved mineral constituents.
			Snake Hill Formation	600-800	Dark gray silty shale, intensely folded. Forms the bedrock surface east of a north-south trending fault approximately through Lock 7.		
			Canajoharie Shale	400-500	Black shale, carbonaceous and more or less calcareous.	Form rock surface west of Hoffmans Fault	
			Undifferentiated limestone and dolomite units of the Trenton and Black River Groups	45-55	Limestone and dolomite.		
			Tribes Hill Limestone	175-200	Limestone and dolomite.		
	Cambrian		Little Falls Dolomite	400	Dolomite.		

1/ Names of the bedrock units conform with usage of the U.S. Geological Survey. It also conforms with the nomenclature used on the geologic map of New York (Fisher and others, 1962).

2/ Thickness of bedrock units in eastern Schenectady County were provided by D.W. Fisher, State Paleontologist, New York State Museum and Science Service (oral communication, 1962).

Outwash deposits form as material carried in or on the glacier ice is carried away as the glacier melts. The major deposits of outwash are in the Mohawk and Hudson River drainages. Outwash deposits commonly overlie till in their drainages and generally are well stratified deposits of sand and gravel.

Kame deposits also result from deposition from a melting glacier. These low, elliptical-shaped deposits of medium- to coarse-grained sands and gravels were laid down by streams that flowed directly off the retreating or melting ice mass.

During the retreat of the glacial ice, a large section of the Mohawk-Hudson lowlands was covered by meltwater lakes that formed behind ice or drift dams that plugged the older drainages. The largest glacial lake in this region has been called Lake Albany. Sediments that were deposited in the lake were derived from the melting glacier and from erosion of the surrounding till-covered plains. Various processes were active in the lakes to distribute the different size materials moving into the lake and changing the shore line conditions as water levels in the lakes changed. Generally, these lake deposits are younger than the till deposits so that the tills frequently are found below the lake deposits.

Recent alluvial deposits are associated with all the major drainages and their tributaries in the region. Channel deposits are usually medium- to coarse-grained sands and reflect reworking and redeposition of older valley fill or glacial deposits. Flood plain deposits are commonly fine-grained silts and sands with some clay and organic materials deposited in quiet water areas as overbank or flood deposition.

Local Geology

The bedrock units beneath the Base are 2,000 to 3,500 feet thick, generally with gentle south to southwest dips. The Ordovician Schenectady Formation and Canajoharie Shale underlie the Base and form a bedrock surface of shale with some interbedded dense siltstones and sandstones. The topography of the bedrock surface reflects the scouring action of moving ice during Pleistocene glaciation and also represents the ancient valleys of preglacial drainage systems. These valleys are presently filled with unconsolidated materials. The nearest ancient valley is three miles southwest of the Base on the south side of the present Mohawk River. The scouring action of the ice has left linear ridges and depressions parallel to the local direction of ice movement. Several linear bedrock ridges, aligned in a northeast-southwest directions, are located in the vicinity of the Base.

Glacial till covers and subdues the bedrock topography over much of the Base and the surrounding area (see Figure 4, page III-4). The unweathered till near the Base is usually gray to dark gray, compact, tough, stony, silty to sandy clay with some cobbles and boulders. Thin (1 to 3 feet) sand or gravelly lenses are randomly scattered through the till, but usually cover only limited areas. Till is thinnest on the uplands surrounding the Base, generally 10 to 30 feet, and is thickest in the depressions of the bedrock surface.

Overlying the tills on the southern and southwestern portion of the Base are deposits of glacial lake Albany sands and silts, usually less than 45 feet but up to 130 feet thick (see Figure 4, page III-4). The sands are predominantly silty, generally medium- to fine-grained with local areas of thin, discontinuous coarse sand and gravel.

South of the Base, thin alternating beds of silts and clays were deposited in the quiet zones of glacial lake Albany. The separate layers are fairly uniform in thickness but distinctly different in composition. The clay-rich layers may contain minor amounts of silt and are usually 1 to 3 inches thick. The silt beds may contain some fine sand, especially when the thickness of these beds increases above the average 1 inch.

Several small kame deposits exist within two miles northwest of the Base. These deposits are predominantly medium-grained sand and some fine gravel with only minor amounts of silt or clay. These deposits occur as small, low elliptical-shaped hills that are partially buried by lake sands and silts.

As the glaciers continued to melt, and after the dams forming the Pleistocene lakes were broken, the older Mohawk River transported a large bedload as represented by the coarse sands and gravels in certain parts of the river channel. These coarse channel deposits occur about 3 miles west-southwest of the Base and consist of an irregular sequence of beds of sand, sand and gravel, or gravel. These beds are fairly well sorted, but are irregular and discontinuous in distribution, reflecting changes in velocity or volume of the older Mohawk River. The channel deposits average between 50 to 70 feet thick, with some deposits greater than 100 feet thick. Till or bedrock commonly underlies the channel deposits; these deposits grade into the overlying silty-sand and gravel of the flood plain deposits.

The present day drainage systems have deposited a moderately thick (20 to 30 feet) sequence of silt and sand containing some clay, organic matter, and minor lenses of gravel. In some locations, the sands and gravel lenses are at least 50 feet thick. These alluvial deposits represent erosion and redeposition of older channel and till deposits. The Base boundary is within a 0.25 miles of some of these alluvial deposits in the Alplaus Kill and Mohawk Valley.

C. Soils

According to the U.S. Soil Conservation Service Soil Survey of Montgomery and Schenectady Counties, New York, the soils at the Base consist of the Urban land-Colonie complex (UR), the Lordstown gravelly silt loam (LoB), the Hornell silt loam (HoB), the Tuller-Brockport complex (TvA), the Burdette-Scriba association (BXB), and the Nunda extremely stony soils (NWC). Figure 5 delineates the occurrence of these soils within the vicinity of the Base. Soil boring logs from the Base are included as Appendix E.

The Urban land-Colonie complex (UR) consists of 70 percent Urban land, soils under structures or pavements, and 30 percent Colonie soils. The Urban land is dominantly underlain by sandy material. The Colonie soils are deep, well drained to excessively drained, sandy soils used for residences, parking lots, and parks. These soils are typically level, but some areas range from gently

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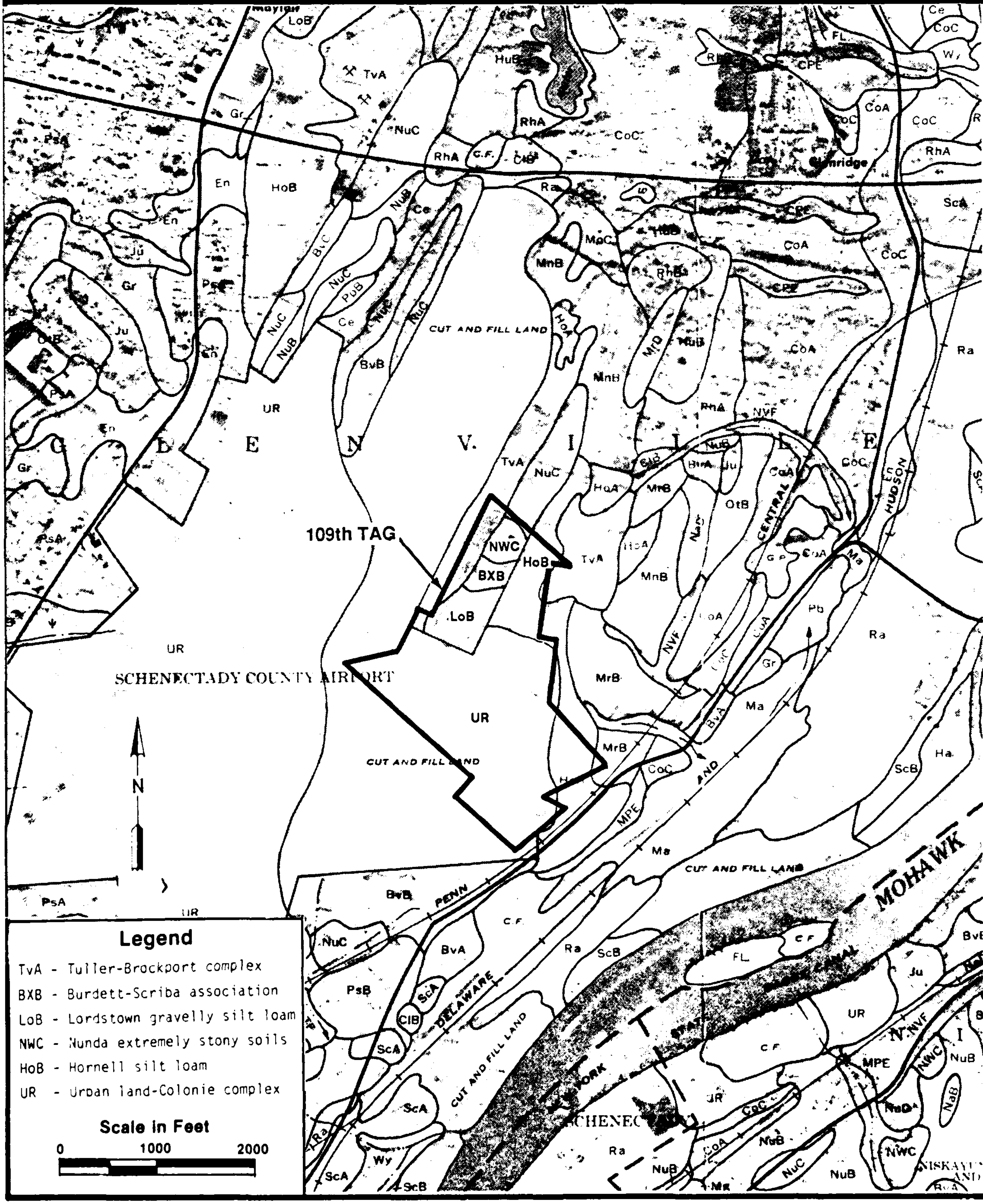
Source:
Survey of Schenectady and
Montgomery Counties (1978)

Figure 5.
Soils Map of the 109th TAG, New York Air National Guard, and Vicinity.



sloping to steep. Permeability of the Urban land is variable; permeability of the Colonie soils is rapid (over 4.24×10^{-3}cm/sec) and the hazard of erosion is low.

The Lordstown gravelly silt loam (LoB) is a moderately deep, well drained, medium textured soil on benches and hilltops with slopes of 3 to 8 percent. This soil formed on bedrock-controlled landforms on glaciated, dissected plateaus. The surface layer of the Lordstown soil is a strongly acid, dark grayish-brown gravelly silt loam about 7 inches thick. The subsoil consists of 4 inches of strongly acid, yellowish-brown gravelly silt loam underlain by 11 inches of strongly acid, dark yellowish-brown channery silt loam. The substratum is a very strongly acid, dark-grayish-brown gravelly silt loam about 4 inches thick with strong brown and dark brown mottles. Depth to bedrock ranges from 20 to 40 inches. Permeability of the Lordstown soil is moderate ($4.45 \times 10^{-4}$to 1.41×10^{-3}cm/sec) and the hazard of erosion is low.

The Hornell silt loam (HoB) is a moderately deep, somewhat poorly drained or moderately well drained, medium textured soil on bedrock-controlled uplands with slopes of 3 to 8 percent. This soil formed in acidic glacial till derived from sandstone and shale. The surface layer of the Hornell soil is a very strongly acid, very dark grayish-brown silt loam about 4 inches thick underlain by 4 inches of strongly acid friable, grayish-brown silt loam. The subsoil, to a depth of 27 inches, is a strongly acid yellowish-brown silty clay loam with strong brown and light brownish-gray mottles, underlain by strongly acid strong brown and dark yellowish-brown silty clay with yellowish-brown and dark gray mottles. The substratum consists of about 5 inches of medium acid, dark gray and dark yellowish-brown, highly weathered silty clay loam. Depth to soft or hard shale bedrock ranges from 20 to 40 inches. Permeability of the Hornell soil is moderately slow ($1.41 \times 10^{-4}$to 4.45×10^{-4}cm/sec) in the upper part of the profile and very slow (less than 4.24×10^{-5}cm/sec) in the lower part of the profile. The hazard of erosion is high.

The Tuller-Brockport complex (TvA) consists of 60 percent Tuller soils and 40 percent Brockport soils. The Tuller soils are shallow and somewhat poorly drained to poorly drained. The Brockport soils are moderately deep and somewhat poorly drained. These soils occur on flat, bedrock-controlled benches and hilltops on uplands with slopes of 0 to 3 percent. They formed in glacial till that are underlain by sandstone, siltstone, and shale at a depth of 10 to 40 inches. The surface layer of the Tuller soil is a dark grayish-brown channery silt loam about 7 inches thick. The subsoil to bedrock is a medium acid, grayish brown channery silt loam with dark brown and dark yellowish-brown mottles. The surface layer of the Brockport soil is a very dark gray heavy silt loam about 8 inches thick. The subsoil is a slightly acid, gray silty clay with many strong brown mottles to a depth of 22 inches. The substratum to bedrock is a gray very shaly silty clay loam. Permeability of the Tuller soil is moderate (4.45×10^{-4} to 1.41×10^{-3} cm/sec); permeability of the Brockport is moderately slow (1.41×10^{-4} to 4.45×10^{-4} cm/sec) in the upper part of the profile and slow (4.24×10^{-5} to 1.41×10^{-4} cm/sec) in the lower part. The hazard of erosion for these soils is high.

The Burdette-Scriba association (BXB) consists of 65 percent Burdette soils and 35 percent Scriba soils. The Burdette soils are moderately deep, somewhat poorly drained, and medium textured. The Scriba soils are deep, somewhat poorly drained, and medium textured. These soils formed on glacial till plains with gentle slopes. The surface layer of the Burdette soil is a strongly acid dark brown channery silt loam with 3 to 15 percent stones. The subsoil, to approximately 44 inches, is a light olive-brown, light brownish gray, or gray gravelly silty clay loam with mottles. The substratum is a calcareous olive brown and grayish-brown gravelly silty clay loam. The surface layer of the Scriba soils, to a depth of 7 inches, is a strongly acid dark brown channery silt loam with 3 to 5 percent stones. The subsoil is a strongly acid light olive brown to light brownish-gray channery silt loam about 8 inches thick. The substratum, to a depth of 54 inches, is a neutral, olive brown very gravelly loam with yellowish-brown mottles. Depth to bedrock is more than 40 inches. Permeability of these soils is moderate (4.45×10^{-4} to 1.41×10^{-3} cm/sec) in the upper part of the soil profile and very slow to slow (less than 1.41×10^{-4} cm/sec) in the lower part of the profile. The hazard of water erosion is high in these soils.

The Nunda soils (NWC) are deep, moderately well drained, sloping, medium textured, extremely stony soils on calcareous glacial till plains. The surface layer of the Nunda soils is a dark brown channery silt loam about 7 inches thick. The subsoil, to a depth of 25 inches, is a strongly acid, yellowish-brown channery silt loam underlain by mottled olive gray channery loam and mottled grayish-brown gravelly loam. The substratum, to a depth of 54 inches, is dark grayish-brown to grayish-brown gravelly silty clay loam with yellowish-brown mottles. Permeability of the Nunda soil is moderate (4.45×10^{-4} to 1.41×10^{-3} cm/sec) in the upper part of the soil profile and moderately slow (1.41×10^{-4} to 4.45×10^{-4} cm/sec) in the lower part. The hazard of erosion is high.

D. Hydrology

Surface Water

Because most of the Schenectady area drains to the Mohawk River or its tributaries, the Base is within the Mohawk River's drainage basin. The flood plain of the Mohawk River is approximately 0.5 miles south of the Base. The main tributary to the Mohawk River in this area is the Alplaus Kill, which drains a large part of the upland on which the Base is located. The Alplaus Kill is situated 0.75 miles east of the Base. The Base is not located with the 100-year flood plain of either of these two drainages.

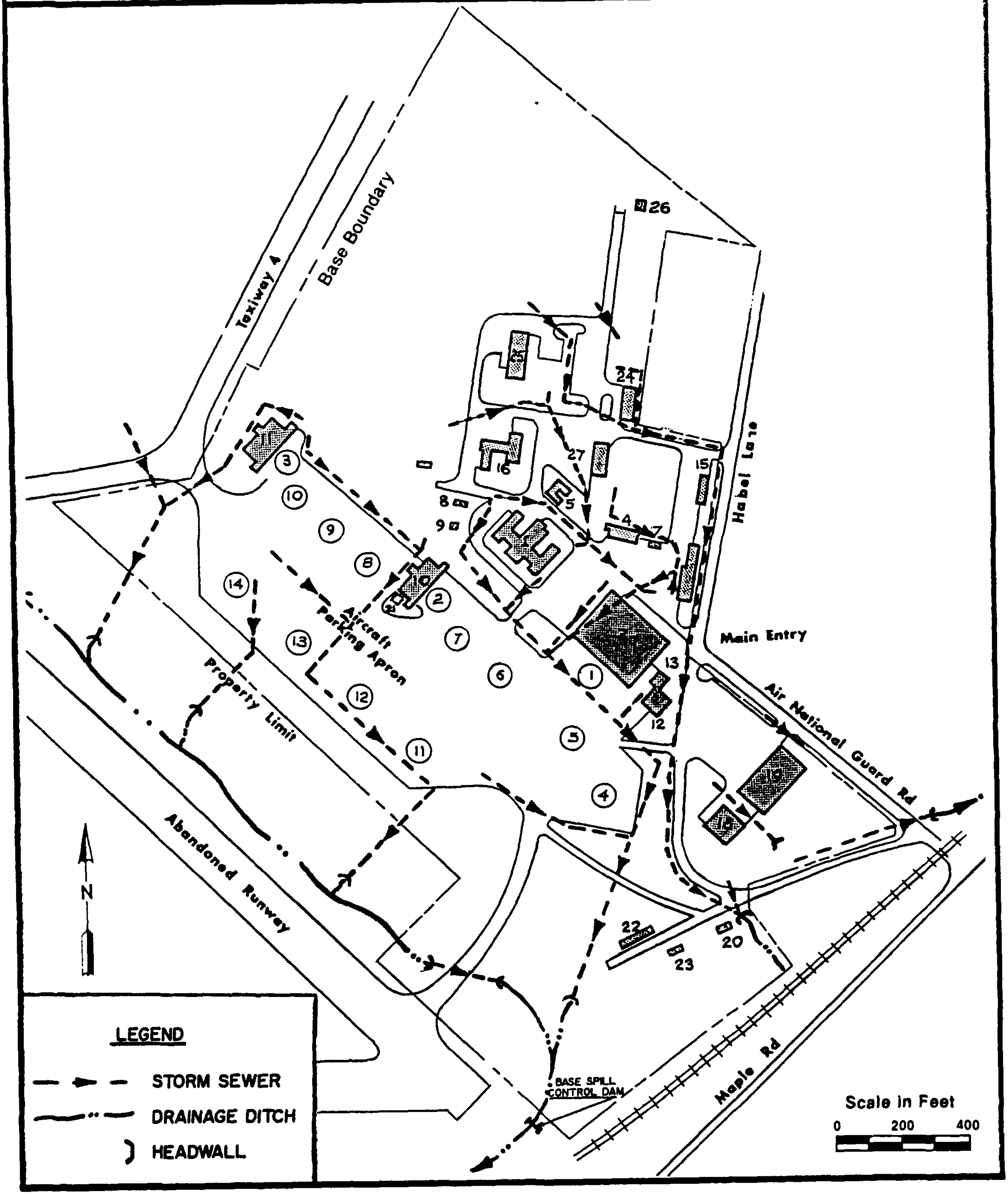
Surface runoff at the Base is collected by the storm sewer system and is discharged to an unnamed creek south of the Base (Figure 6). The creek is a tributary to the Mohawk River. Treated wastewater from the Base sanitary sewage treatment facility is also discharged to this creek.

Flow in the Mohawk River is regulated by two navigation dams and one hydroelectric dam. The navigation season, which is the period of greatest regulated flow, usually extends from early April to the early or middle part of December. The highest annual discharges usually occur from snowmelt between December 1 and April 15. The greatest instantaneous discharge ever

HMTC

Source:
Base Master Plan (1985)

Figure 6.
Storm Drainage Map, 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.



recorded on the Mohawk River at Cohoes (as of 1965) was 130,000 cubic feet per second during flooding on March 19, 1936.

The Alplaus Kill drains an area of 54.3 square miles above Glenridge. The flow characteristics and records of the Alplaus Kill indicate that 95 percent of the time a streamflow rate of 0.028 million gallons per day per square miles will exist or be exceeded.

Groundwater

Specific information on the occurrence and movement of groundwater on the Base is only poorly developed. The town of Glenville, which has four municipal water wells, supplies water to the Base and to most of the residences north and east of the Base. The Glenville wells are located approximately 5 miles west of the Base and each is between 50 and 60 feet deep. One private residence with a 76-foot deep drinking water well is located approximately 50 feet from the eastern boundary of the Base (see Figure 9, page IV-5, for well locations). Three additional residences within 600 feet of the Base's eastern boundary previously used drinking water wells, but recently have been supplied with municipal water; these three wells are now used for gardening and lawn maintenance. Figure 7 shows the potential yields in the vicinity of the Base.

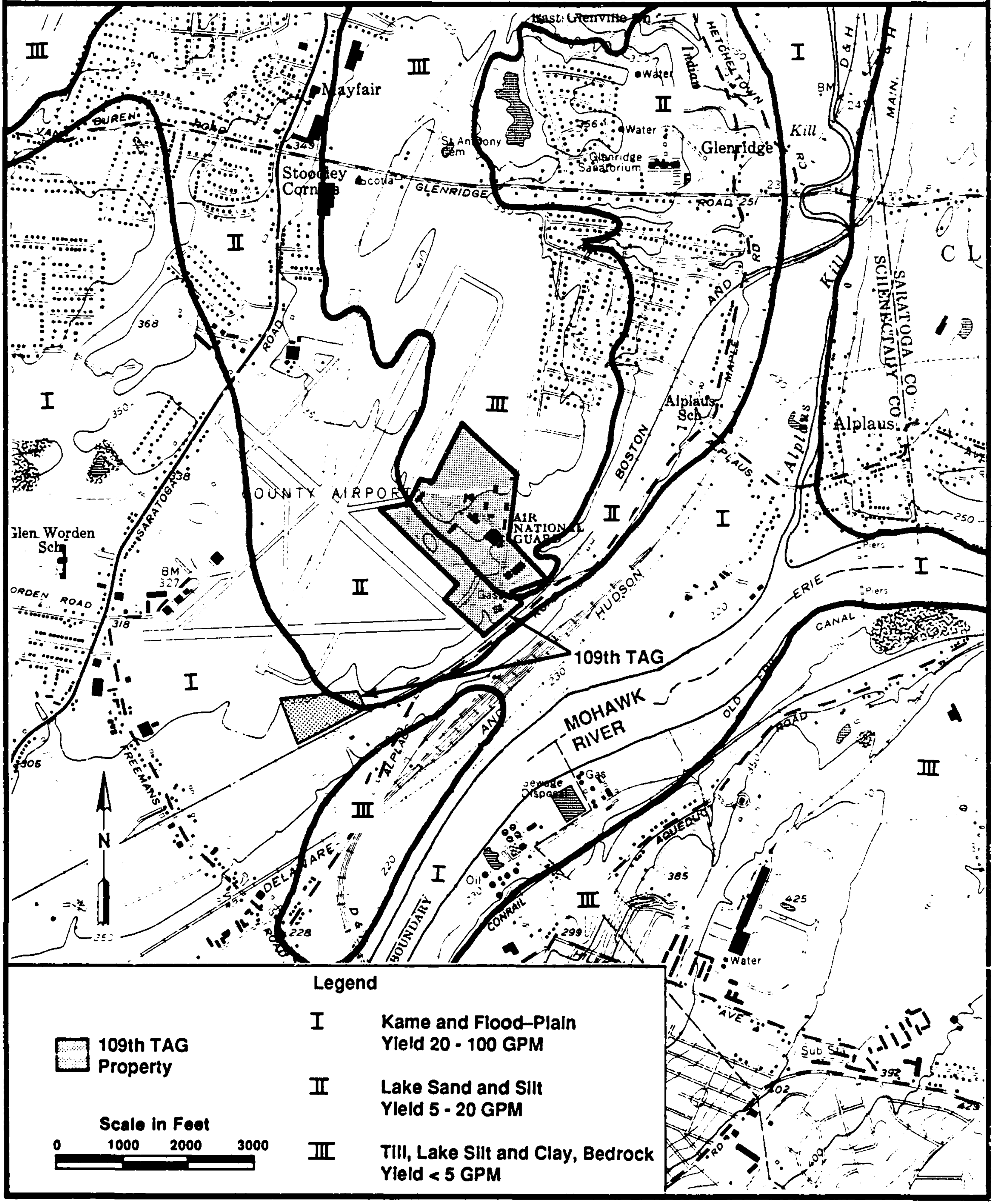
All of the bedrock formations in the Schenectady area are poor sources of water, because these rocks are relatively impermeable. Water occurs principally in openings along joints and fractures in the bedrock. A weathered or fractured zone generally occurs in the upper few feet of the bedrock and this is the most common zone to contain groundwater. The frequency and size of joints and fractures decreases with depth due to the pressure of the overlying rock (Winslow and others, 1965).

In most of the area, till that does not contain lenses of sand and silt is essentially impermeable, with hydraulic conductivity in the range of 1.9×10^{-7} to 4.7×10^{-8} cm/sec. On the Base property, a clayey silt till, with some sand and shaly gravel, covers the entire area and ranges in thickness from 1

HMTC

Adapted from: State of New York Conservation Department (1965).

Figure 7.
Hydrologic Map Showing Potential Well Yields from Geologic Materials; 109th TAG, and Vicinity.



to greater than 12 feet. In some localities on the Base, groundwater in this till may be encountered at less than 1 foot deep during the wet season.

The old Lake Albany sands and silts overlie either the shale bedrock or the tills in the area surrounding the Base. The sands are generally less than 45 feet thick in this area but can be over 100 feet thick. Permeability of these deposits is very high, and these deposits are excellent sources of groundwater. The sands are medium- to coarse-grained in the upper section of the deposit and grade to medium- to fine-grained in the lower section. Hydraulic conductivity in the silts and fine sand may range from 9.4×10^{-4} to 4.7×10^{-3} cm/sec. In coarser grained sands, the hydraulic conductivity may be up to 4.7×10^{-2} cm/sec.

The kame deposits northwest of the Base consist principally of medium-grained sand with beds of coarse-grained sand and gravel. The hydraulic conductivity of the kame deposits is generally greater than that of the lake sands and has been estimated in some deposits to be 6.6×10^{-2} cm/sec.

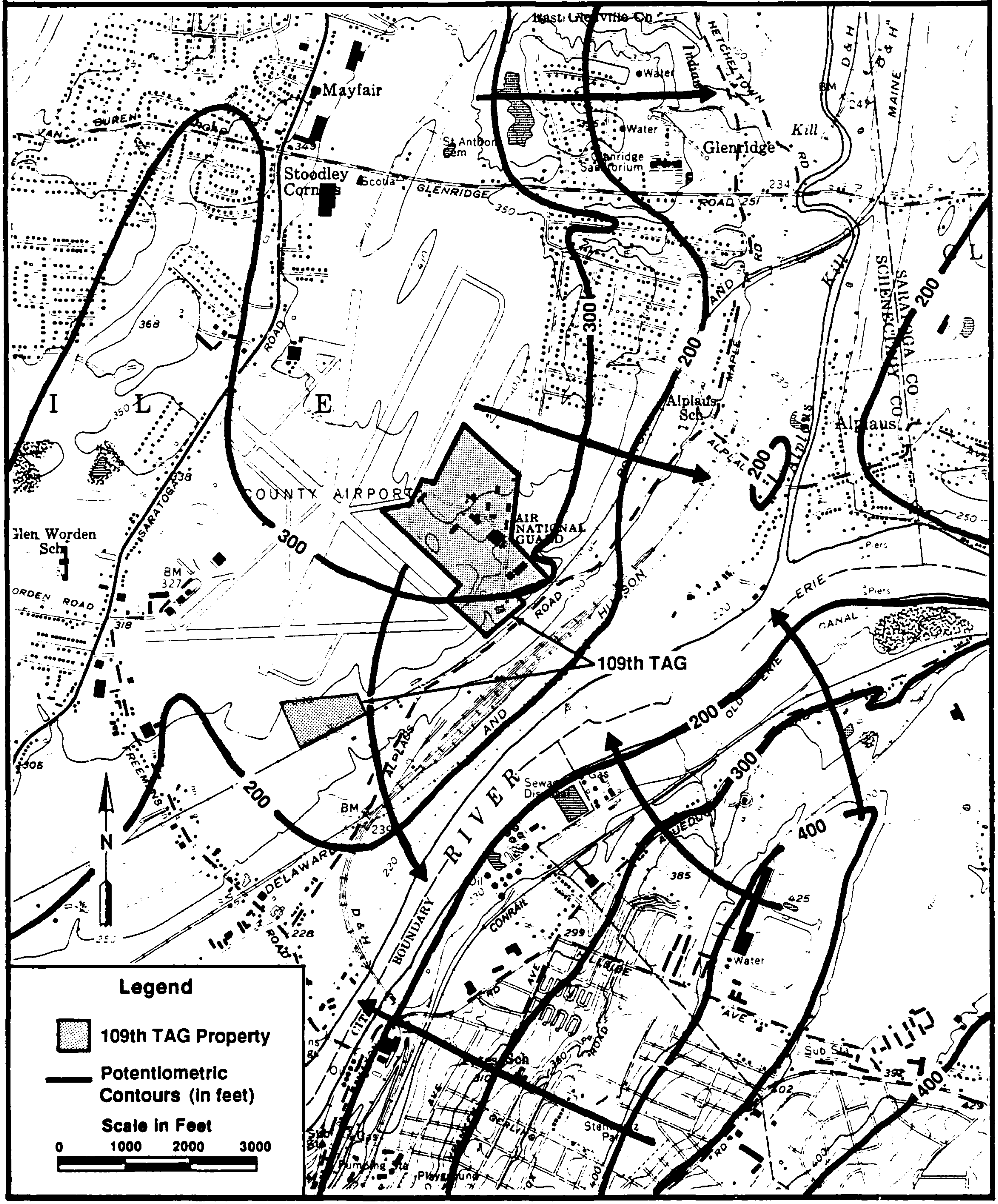
Recent flood plain alluvium occurs in both the Mohawk River and in the Alplaus Kill that border the Base on the south and east. These deposits are 20 to 30 feet thick and consist of silt and sand with some clay and organics. Wells in flood plain deposits usually yield 20 to 100 gpm and pumping of these wells can create direct infiltration of surface waters from rivers or streams. Coarser channel sediments were deposited by the Mohawk River during the Pleistocene epoch. These older channel deposits are exceptionally permeable and are in direct connection to the present Mohawk River.

The water table in the Schenectady area generally mimics the topography of the land surface and, therefore, groundwater moves in the direction of land-surface slope. Regional groundwater flow at the Base is southeast toward the Mohawk River (Winslow and others, 1965). Water table contours and groundwater flow directions are illustrated in Figure 8.

HMTC

Adapted from: State of New York Conservation Department, 1965.

Figure 8. Potentiometric Map of the 109th TAG, and Vicinity.



E. Critical Environments

According to the New York State Department of Environmental Conservation, Bureau of Wildlife, there are no endangered or threatened species of flora or fauna within a 1-mile radius of the Base. Furthermore, there are no other critical environments within a 1-mile radius of the Base.

IV. SITE EVALUATION

A. Activity Review

A review of Base records and interviews with Base personnel resulted in the identification of specific operations at the Base in which the majority of industrial chemicals are handled and hazardous wastes are generated. A total of 28 past and present Base personnel with an average of 16 years experience at the Base were interviewed. These personnel were representative of the following Base shops: Aircraft Maintenance; Vehicle Maintenance; Corrosion Control; Aerospace Ground Equipment (AGE) Maintenance; Petroleum, Oils, and Lubricants (POL) Management; Photography Lab; and Nondestructive Inspection (NDI). Table 2 provides estimates of the quantities of waste currently being generated by these shops and describes the past and present disposal practices for the wastes. Based on information gathered, any shop that is not listed in Table 2 has been determined to produce negligible quantities of wastes requiring disposal.

B. Disposal/Spill Site Identification, Evaluation, and Hazard Assessment

Interviews with Base personnel and subsequent site inspections resulted in the identification of two sites at the Base potentially contaminated with HM/HW. Figure 9 illustrates the locations of the identified sites.

The two identified sites were assigned a HAS according to HARM (Appendix C). A summary of the HAS for each scored site is given in Table 3. Copies of the completed Hazardous Assessment Rating Forms are found in Appendix D. The objective of this assessment is to provide a relative ranking of sites suspected of contamination from hazardous substances. The final rating score reflects specific components of the hazard posed by a specific site: possible receptors of the contamination (e.g., population within a specified distance of the site and/or critical environments within a 1-mile radius of

Table 2. Hazardous Material/Hazardous Waste Disposal Summary: 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.

Shop Name and Location	Hazardous Waste/ Used Hazardous Material	Current Estimated Quantities (Gallons/Year)	Method of Treatment/Storage/Disposal 1950 1960 1970 1980 1988
Aircraft Maintenance (Bldg. No. 2)	PD-680 Solvent (Type II)	300	1950–1980: CONTR; 1980–1988: DRMO
	AVGAS	1,000	1950–1956: FTA1
	JP-4 Jet Fuel	unknown	1956–1961: FTA2; 1961–1984: CONTR/FTA2; 1984–1988: FTA3 / DRMO
	Hydraulic Oil	144	1950–1980: CONTR; 1980–1988: DRMO
	Engine Oil	30	1950–1980: CONTR; 1980–1988: DRMO
Aerospace Ground Equipment (AGE) Maintenance (Bldg. No. 13)	Engine Oil	160	1950–1980: CONTR; 1980–1988: DRMO
	JP-4 Jet Fuel	22	1956–1961: FTA1; 1961–1984: CONTR/FTA2; 1984–1988: FTA3 / DRMO
	Turbine Oil	55	1950–1980: CONTR; 1980–1988: DRMO
	PD-680 Solvent (Type II)	unknown	1950–1988: CONTR
Vehicle Maintenance (Bldg. No. 4)	Engine Oil	90	1950–1980: CONTR; 1980–1988: DRMO
	PD-680 Solvent (Type II)	30	1950–1980: CONTR; 1980–1985: DRMO; 1985–1988: RCY
	Lubricating Oil	6	1950–1980: CONTR; 1980–1988: DRMO
	Hydraulic Oil	200	1950–1980: CONTR; 1980–1988: DRMO

KEY:

CONTR - Disposed of through a contractor.
DRMO - Disposed of through the Defense Reutilization and Marketing Office.
FTA1 - Burned at Fire Training Area #1 (Site No. 1).
FTA2 - Burned at Fire Training Area #2 (off Base property - see Other Pertinent Information, page IV-8).
FTA3 - Burned at Fire Training Area #3 (in Town of Colonie, New York).
RCY - Recycled by a contractor.
SAN - Disposed of in drains leading to the sanitary sewer.
SIL REC - Sent to silver recovery.

Table 2. Hazardous Material/Hazardous Waste Disposal Summary: 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York (Continued).

Shop Name and Location	Hazardous Waste/ Used Hazardous Material	Current Estimated Quantities (Gallons/Year)	Method of Treatment/Storage/Disposal 1950 1960 1970 1980 1988
Vehicle Maintenance (Bldg. 4) (Continued)	Transmission Fluid	165	|----CONTR----|--DRMO--|
	Paint Thinner	16	|----CONTR----|--DRMO--|
	Brake Fluid	6	|----CONTR----|--DRMO--|
	Bearing Grease	6	|----CONTR----|--DRMO--|
Fuels Management (Bldg. Nos. 8 and 9)	JP-4 Jet Fuel	180	|-FTA1-|----CONTR/FTA2----|FTA3 -DRMO-|
Nondestructive Inspection (NDI) (Bldg. No. 19)	Penetrant	60	|--------SAN--------|
	Emulsifier	55	|--------SAN--------|
	Developer	55	|--------SAN--------|
	Fixer	20	|--------SIL REC--------|
	PD-680 Solvent (Type II)	5	|----CONTR----|--DRMO--|

KEY:

CONTR - Disposed of through a contractor.
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FTA1 - Burned at Fire Training Area #1 (Site No. 1).
FTA2 - Burned at Fire Training Area #2 (off Base property - see Other Pertinent Information, page IV-8).
FTA3 - Burned at Fire Training Area #3 (in Town of Colonie, New York).
RCY - Recycled by a contractor.
SAN - Disposed of in drains leading to the sanitary sewer.
SIL REC - Sent to silver recovery.

Table 2. Hazardous Material/Hazardous Waste Disposal Summary: 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York (Continued).

Shop Name and Location	Hazardous Waste/ Used Hazardous Material	Current Estimated Quantities (Gallons/Year)	Method of Treatment/Storage/Disposal 1950 – 1960 – 1970 – 1980 – 1988
Corrosion Control (Bldg. No. 19)	Paint Strippers	4	|------CONTR------|--DRMO--|
Photo Lab (Bldg. No. 1)	Developer	37	|------SAN------|
	Fixer	30	|------SIL REC------|
	NH-5 Hypoconcentrate	6	|------SIL REC------|
	Chromium Intensifier	2	|------CONTR------|--DRMO--|
	Reversal Bath Process E-6	2	|------CONTR------|--DRMO--|

KEY:

CONTR - Disposed of through a contractor.
DRMO - Disposed of through the Defense Reutilization and Marketing Office.
FTA1 - Burned at Fire Training Area #1 (Site No. 1).
FTA3 - Burned at Fire Training Area #3 (in Town of Colonie, New York).
FTA2 - Burned at Fire Training Area #2 (off Base property - see Other Pertinent Information, page IV-8).
RCY - Recycled by a contractor.
SAN - Disposed of in drains leading to the sanitary sewer.
SIL REC - Sent to silver recovery.

HMTC Source: Base Master Plan (1985)

Figure 9. Location of Sites at the 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.

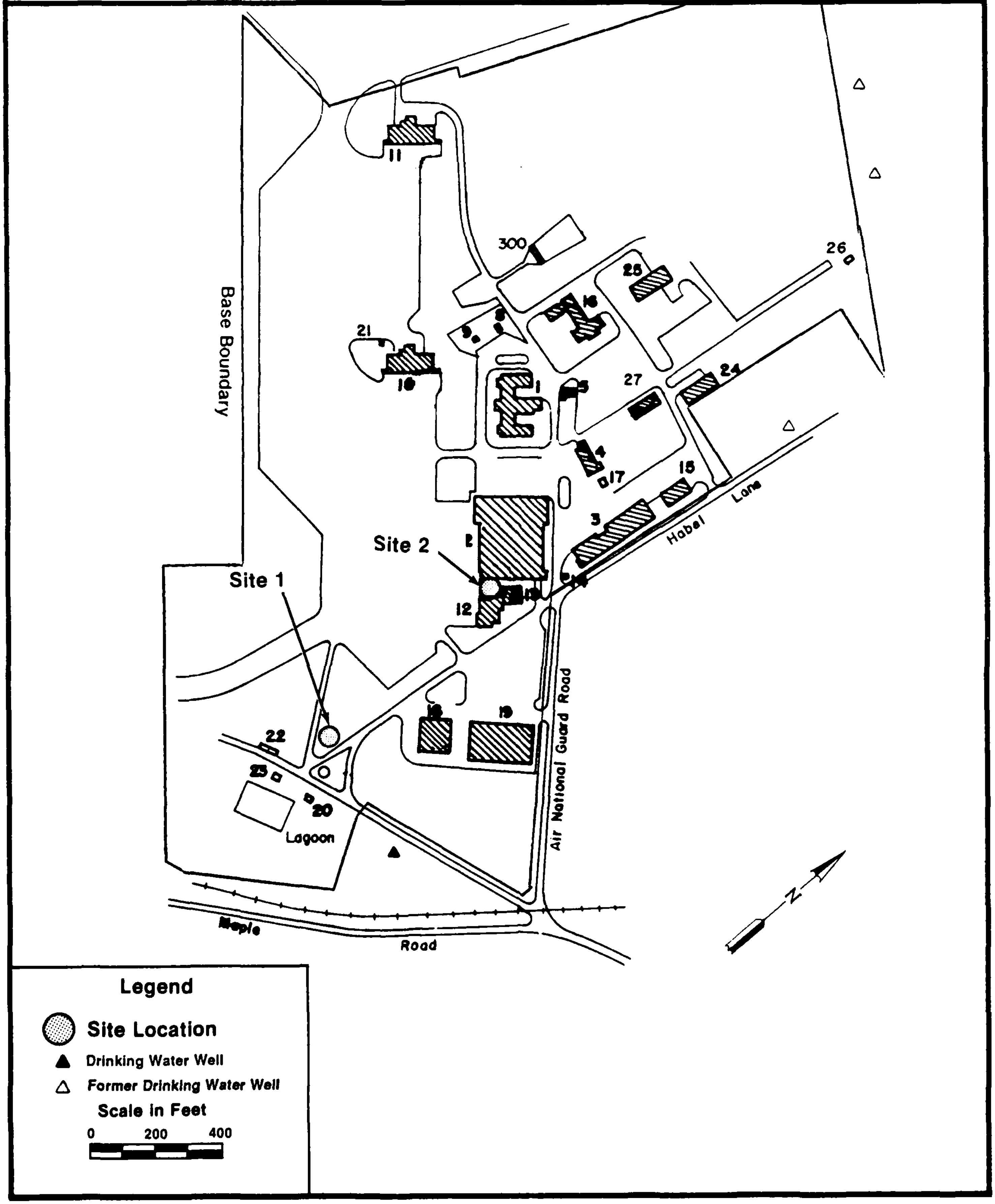

Table 3. Site Hazard Assessment Scores (as derived from HARM): 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.

Site Priority	Site No.	Site Description	Receptors	Waste Characteristics	Pathway	Waste Mgmt. Practices	Overall Score
1	1	Fire Training Area	55	64	67	1.0	62
2	2	Drum Storage Area	55	32	67	1.0	51

the site); the waste and its characteristics; and the potential pathways for contaminant migration (e.g., surface water, groundwater, flooding). Descriptions of all the sites follow.

Site No. 1 - Fire Training Area (HAS-62)

A former fire training area (FTA) is located approximately 300 feet west of Building No. 18. An average of 11 training exercises were held at this location each year from about 1951 to 1960. The FTA consisted of an unlined circular area with an earthen berm. The FTA was abandoned in 1960 because of its small size and its proximity to the Base and private residences. An estimated 100 to 200 gallons of aviation gasoline or JP-4 jet fuel were used for each fire training exercise. In addition to aviation gasoline and JP-4, flammable liquids from the Base shops, such as waste oil, PD-680 solvent, and paint thinners, were also burned at the FTA. The fuel was not floated on water prior to burning. Over the years the FTA was operational, between 9,000 and 18,000 gallons of flammable liquids were burned at the FTA. Assuming 70 percent of the fuel burned, between 2,700 and 5,400 gallons may have remained to soak into the soils at this site. These estimates, however, do not take into account any subsequent biodegradation or evaporation.

At the time of the site visit, no visible signs of contamination were observed at the FTA site. This site was scored on the basis of a "moderate" quantity release (between 1,000 and 5,000 gallons) of aviation gasoline and JP-4 jet fuel; these fuels are both ignitable (flashpoint less than 80°F) and toxic (Sax's level 3).

Site No. 2 - Drum Storage Area (HAS-51)

The area between Building Nos. 12 and 13 was identified as a storage area where drums of both new and waste PS-661 and PD-680 solvent were stored in the 1950s and 1960s. Drums of waste oil were also stored in this area. The area was originally bare soil, but was paved in 1958. Small spills resulting from day-to-day operations were reported to have occurred in this area before it was paved. This site was scored on the "small" quantity release of PD-680 solvent, which is both toxic (Sax's level 3) and ignitable (flash point between 100°F and 140°F).

C. Other Pertinent Information

- There are 33 underground storage tanks (USTs) on the Base. The locations and characteristics of these USTs are summarized in Appendix F. Each of these USTs was recently pressure tested and all leaking pipe fittings were replaced under the supervision of the New York Department of Environmental Conservation. All fuel USTs (17) were tested in 1988 and passed New York State tank tightness testing procedures.

- The Base conducted fire training exercises from 1960 until 1986 at an area northeast of the airport on land belonging to Schenectady County. The Base conducted remediaton of the site in 1986 and 1987 and received approval from the New York State Department of Environmental Conservation that cleanup of the site was complete.

- There are no landfills, radioactive burial sites, or sludge burial sites on Base property.

- The Base has an onsite sanitary sewage treatment facility which discharges to an unnamed creek, which is tributary to the Mohawk River. Runoff from the aircraft parking apron also goes to this creek. The Base constructed a permanent in-stream oil separation structure in 1979 upstream of the unnamed creek for spill control and countermeasures. The sewage treatment facility discharges 27,000 gallons per day of wastewater that has had secondary treatment plus sand filtration. The Base has a National Pollutant Discharge Elimination System (NPDES) permit to discharge its wastewater.

- All of the Base oil/water separators are connected to the Base sanitary sewer system, except for the oil/water separators at Building Nos. 8 and 9, which are connected to the Base storm sewer system.

- At the time of the site visit, two empty 55-gallon drums and an empty 250-gallon container were observed in a ravine near the new POL construction site. The ravine is directly northwest of Building No. 25. The drums and container are so weathered that the former contents are unknown. Miscellaneous construction rubble is also in the ravine. No vegetative stress or other signs of contamination were observed in the ravine or in its immediate vicinity.

- South of the Base sewage treatment facility is a polyethylene-lined, bermed drying pit for aeration of contaminated spill cleanup material. The pit is 4 years old and has been approved by the New York State Department of Environmental Conservation.

V. CONCLUSIONS

Information obtained through interviews with 28 past and present Base personnel, review of Base records, and field observations has resulted in the identification of two potentially contaminated disposal and/or spill sites on Base property. These sites consist of the following:

Site No. 1 - Fire Training Area (HAS-62)
Site No. 2 - Drum Storage Area (HAS-51)

Each of these sites is potentially contaminated with HM/HW and each exhibit the potential for contaminant migration to groundwater and surface water. Therefore, each site was assigned as HAS according to HARM.

VI. RECOMMENDATIONS

In accordance with applicable regulations, further IRP investigations are recommended for each of the identified sites.

GLOSSARY OF TERMS

ALLUVIAL - Pertaining to or composed of alluvium, or deposited by a stream or running water; e.g., an "alluvial clay" or an "alluvial divide."

ALLUVIAL DEPOSIT - A general term for clay, silt, sand, gravel, or similar unconsolidated material deposited during comparatively recent geologic time by a stream or running water.

ALLUVIUM - A general term for clay, silt, sand, gravel, or similar unconsolidated material deposited during comparatively recent geologic time by a stream or running water.

ANNUAL PRECIPITATION - The total amount of rainfall and snowfall for the year.

AQUIFER - A geologic formation, or group of formations, that contains sufficient saturated permeable material to conduct groundwater and to yield economically significant quantities of groundwater to wells and springs.

BED - The smallest formal unit in the hierarchy of lithostratigraphic units. In a stratified sequence of rocks it is distinguishable from layers above and below. A bed commonly ranges in thickness from a centimeter to a few meters.

BEDLOAD - The part of the total stream load that is moved on or immediately above the stream bed, such as the larger or heavier particles (boulders, pebbles, gravel).

BEDROCK - A general term for the rock, usually solid, that underlies soil or other unconsolidated, superficial material.

BOULDER - A detached rock mass larger than a cobble, having a diameter greater than 256 mm, being somewhat rounded or otherwise distinctly shaped by abrasion in the course of transport.

CALCAREOUS - Said of a substance that contains calcium carbonate.

CHANNEL - The bed where a natural body of surface water flows or may flow.

CHANNERY - Thin, flat, coarse fragments of limestone, sandstone, or schist, having diameters as large as 150 mm.

CHERT - A hard, extremely dense or compact sedimentary rock.

CLAY [geol] - A rock or mineral fragment or a detrital particle of any composition smaller than a fine silt grain, having a diameter less than 0.004 m.

CLAY [min] - One of a complex and loosely defined group of finely crystalline, metacolloidal, or amorphous hydrous silicates, essentially of aluminum (and sometimes of magnesium and iron); they have a monoclinic crystal lattice of the two-or three-layer type, in which silicon and aluminum ions have tetrahedral coordination with respect to oxygen and in which aluminum, ferrous and ferric iron, magnesium, chromium, lithium, manganese, and other ions have octahedral coordination with respect to oxygen or hydroxyl. There may be exchangeable cations (usually calcium and sodium, sometimes potassium, magnesium, hydrogen, and aluminum) on the surfaces of the silicate layers, in amounts determined by the excess negative charge within the layer. Clay minerals are formed chiefly by alteration or weathering of primary silicate minerals such as feldspars, pyroxenes, and amphiboles, and are found in clay deposits, soils, shales, alteration zones of ore deposits, and other rocks, in flakelike particles or in dense, feathery aggregates of varying types. They are characterized by small particle size and ability to adsorb substantial amounts of water and ions on the surfaces of the particles. The most common clay minerals belong to the kaolin, montmorillonite, and illite groups.

CLAY [soil] - A rock or mineral particle in the soil having a diameter less than 0.002 mm.

COARSE-GRAINED - Said of a soil or sediment in which gravel and/or sand predominates.

COBBLE - A rock fragment larger than a pebble and smaller than a boulder, having a diameter in the range of 64 to 256 mm being somewhat rounded by abrasion in the course of transport.

CONTAMINANT - As defined by Section 101(f)(33) of Superfund Amendments and Reauthorization Act of 1986 (SARA) shall include, but not be limited to any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction), or physical deformation in such organisms or their offspring; except that the term "contaminant" shall not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under:

(a) any substance designated pursuant to Section 311(b)(2)(A) of the Federal Water Pollution Control Act,

(b) any element, compound, mixture, solution, or substance designated pursuant to Section 102 of this Act,

(c) any hazardous waste having the characteristics identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act (but not including any waste the regulation of which under the Solid Waste Disposal Act has been suspended by Act of Congress),

(d) any toxic pollutant listed under Section 307(a) of the Federal Water Pollution Control Act,

(e) any hazardous air pollutant listed under Section 112 of the Clean Air Act, and

(f) any imminently hazardous chemical substance or mixture with respect to which the administrator has taken action pursuant to Section 7 of the Toxic Substance Control Act; and shall not include natural gas, liquefied natural gas, or synthetic gas of pipeline quality (or mixtures of natural gas and such synthetic gas).

CONTINENTAL CLIMATE - The climate of the interior of a continent, characterized seasonal temperature extremes and by the occurrence of maximum and minimum temperature soon after summer and winter solstice, respectively.

CRITICAL HABITAT - The specific areas within the geographical area occupied by the species on which are found those physical or biological features essential to the conservation of the species and which may require special management consideration or protection.

CROSS-BEDDED - Arrangement of strata inclined at an angle to the main stratification.

CUESTA - A hill or ridge with a gentle slope on one side and a steep slope on the other; specifically an asymmetric ridge.

DEPOSIT - Earth material of any type, either consolidated or unconsolidated, that has accumulated by some natural process or agent.

DEVONIAN - A period of the Paleozoic era (after the Silurian and before the Mississippian), thought to have covered the span of time between 400 and 345 million years ago.

DISCONTINUOUS - No continuous; characterized by interruptions or breaks.

DOLOMITE - A carbonate sedimentary rock of which more than 50% by weight or by areal percentages under the microscope consists of the mineral dolomite, or a variety of limestone or marble rich in magnesium carbonate.

DRAINAGE CLASS - Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained - Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained - Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained - Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons.

Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained - Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained - Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained - Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough periods during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained - Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

DRAINAGE SYSTEM - The configuration or arrangement of the natural stream courses in an area; it is related to local geologic and geomorphologic features and history.

DRAINAGEWAY - A channel or course along which water moves in draining an area.

DRIFT - A general term applied to all rock material (clay, silt, sand, gravel, boulders) transported by a glacier and deposited directly by or from the ice, or by running water emanating from a glacier. Drift includes unstratified material (till) and stratified deposits.

EFFLUENT - An outflow, as of water from a lake, industrial sewage, etc.

ENDANGERED SPECIES - Any species which is in danger of extinction throughout all or a significant portion of its range, other than a species of the Class Insecta determined by the secretary to constitute a pest whose protection would present an overwhelming and overriding risk to man.

EROSION - The general process or the group of processes whereby the materials of the Earth's crust are loosened, dissolved, or worn away, and simultaneously moved from one place to another by natural agencies, but usually exclude mass wasting.

ESCARPMENT - A long, more or less continuous cliff or relatively steep slope facing in one general direction, produced by erosion or by faulting.

FAULT - A fracture or zone of fractures along which there has been displacement of the sides relative to one another.

FINE-GRAINED - Said of a soil or sediment in which silt and/or clay predominate.

FLASH POINT - The lowest temperature at which the vapors of combustible liquids, especially fuels, will ignite.

FLOOD PLAIN - The surface or strip of relatively smooth land adjacent to a river channel, constructed by the present river in its existing regimen and covered with water when the river overflows its banks.

FORMATION - A lithologically distinctive, mappable body of rock.

GLACIAL - (a) Of or relating to the presence and activities of ice or glaciers, (b) Pertaining to distinctive features and materials produced or derived from glaciers and ice sheets.

GLACIAL DRIFT - See DRIFT.

GLACIAL TILL - See TILL.

GLACIER - A large mass of ice formed by the compaction and recrystallization of snow, moving slowly downslope by creep.

GRAVEL - An unconsolidated, natural accumulation of rounded rock fragments resulting from erosion, consisting predominantly of particles larger than sand, such as boulders, cobbles, pebbles, granules or any combination of these fragments.

GRAYWACKE - A dark gray, firmly indurated, coarse-grained sandstone that consists of poorly sorted angular to subangular grains of quartz, feldspar, and a variety of dark minerals.

GROUNDWATER - Refers to the subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated.

HARM - Hazard Assessment Rating Methodology - A system adopted and used by the United States Air Force to develop and maintain a priority listing of potentially contaminated sites on installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts. (Reference: DEQPPM 81-5, 11 December 1981.)

HAS - Hazard Assessment Score - The score developed by using the Hazardous Assessment Rating Methodology (HARM).

HAZARDOUS MATERIAL - Any substance or mixture of substances having properties capable of producing adverse effects on the health and safety of the human being. Specific regulatory definitions also found in OSHA and DOT rules.

HAZARDOUS WASTE - A solid or liquid waste that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to, an increase in mortality or an increase in serious or incapacitating reversible illness, or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

HILL - A natural elevation of the land surface, rising rather prominently above the surrounding land, usually of limited extent and having a well defined outline (rounded) and generally considered to be less than 1,000 feet from base to summit.

HUMID - Containing vapor or water; moist; damp.

HYDRAULIC CONDUCTIVITY - The rate at which water can move through a permeable medium.

IGNEOUS ROCK - Rock or mineral that has solidified from molten or partially molten material, i.e. from a magma.

IGNITABILITY - The ability of a substance to burn or catch fire.

INFILTRATION - The flow of a fluid into a solid substance through pores or small openings, specifically the movement of water into soil or porous rock.

INTERBEDDED - Beds lying between or alternating with others of different character; espescially rock material laid down in sequence between other beds.

KAME - A low mound, knob, hummock, or ridge composed of stratified sand and gravel deposited by a glacial stream.

LAKE - Any inland body of standing water, generally of appreciable size.

LENS - A geologic deposit bounded by converging surfaces (at least one of which is curved), thick in the middle and thinning out toward the edges, resembling a convex lens. A lens may be double-convex or plano-convex.

LIMESTONE - A sedimentary rock consisting primarily of calcium carbonate, primarily in the form of the mineral calcite.

LOAM - A rich, permeable soil composed of a friable mixture of relatively equal proportions of sand, silt, and clay particles, and usually containing organic matter.

LOWLAND - A general term for low-lying land or an extensive region of low land, especially near the coast and including the extended plains or country lying not far above tide level.

MEAN ANNUAL LAKE EVAPORATION - The total evaporation amount for a particular area in a year; this amount is based on precipitation and climate (humidity).

MEDIUM-GRAINED - Said of a sediment or sedimentary rock, and of its texture, in which the individual particles have an average diameter between 0.06 mm and 2 mm.

MELTWATER - Water derived from the melting of snow or ice.

METAMORPHIC ROCK - Any rock derived from pre-existing rocks by minerological, chemical, and/or structural changes, essentially in solid state, in response to marked changes in temperature, pressure, shearing stress, and chemical environment, generally at depth in the Earth's crust.

MICACEOUS - Consisting of or containing mica.

MIGRATION (Contaminant) - The movement of contaminants through pathways (groundwater, surface water, soil, and air).

MOUNTAIN - Any part of the Earth's surface that projects at least 300 m above the surrounding land.

MUDSTONE - An indurated mud having the texture and composition of shale, but lacking its fine fissility.

NET PRECIPITATION - Precipitation minus evaporation.

ORDOVICIAN - The second earliest period of the Paleozoic era (after the Cambrian and before the Silurian), thought to have covered the span of time between 500 and 440 million years ago.

ORGANIC - Pertaining to a compound containing carbon.

OUTCROP - That part of a geologic formation or structure that appears at the surface of the Earth; also, bedrock that is covered only by surficial deposits such as alluvium.

OUTWASH - A stratified detritus (chiefly sand and gravel) removed or "washed out" from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of an active glacier.

OVERBANK DEPOSIT - Fine-grained sediment deposited from suspension on a flood plain by floodwaters.

PD-680 - A cleaning solvent composed predominately of mineral spirits; Stoddard solvent.

PERMEABILITY - The capacity of a porous rock, sediment, or soil for transmitting a fluid without impairment of the structure of the medium; it is a measure of the relative ease of fluid flow under unequal pressure.

PHYSIOGRAPHIC PROVINCE - Region of similar structure and climate that has had a unified geomorphic history.

PLEISTOCENE - The first epoch of the Quaternary period; the Pleistocene began two to three million years ago and lasted until the start of the Holocene period some 8,000 years ago.

PREGLACIAL - Pertaining to the time preceding a period of glaciation, specifically that immediately before the Pleistocene epoch.

RECENT - An epoch of the Quaternary period which covers the span of time from the end of the Pleistocene epoch, approximately 8 thousand years ago, to the present. Also called the Holocene epoch.

RIDGE - A general term for a long, narrow elevation of the Earth's surface, usually sharp-crested with steep sides, occurring either independently or as part of a larger mountain or hill.

RIVER - A general term for a natural freshwater surface stream of considerable volume and a permanent or seasonal flow, moving in a definite channel toward a sea, lake, or another river.

SAND - A rock or mineral particle in the soil, having a diameter in the range 0.52 - 2 mm.

SANDSTONE - A medium-grained fragmented sedimentary rock composed of abundant round or angular fragments of sand, size set in a fine-grained matrix (silt or clay) and more or less firmly united by a cementing material (commonly silica, iron oxide, or calcium carbonate).

SANDY LOAM - A soil containing 43 - 85% sand, 0 - 50% silt, and 0 - 20% clay, or containing at least 52% sand and no more than 20% clay and having the percentage of silt plus twice the percentage of clay exceeding 30, or containing 43 - 52% sand, less than 50% silt, and less than 7% clay.

SCHIST - A medium or coarse-grained, strongly foliated, crystalline rock; formed by dynamic metamorphism.

SEDIMENT - Solid fragmental material that originates from weathering of rocks and is transported or deposited by air, water, or ice, or that accumulates by other natural agents, such as chemical precipitation from solution or secretion by organisms, and that forms in layers on the Earth's surface at ordinary temperatures in a loose, unconsolidated form; (b) strictly solid material that has settled down from a state of suspension in a liquid.

SEDIMENTARY ROCK - A rock resulting in the consolidation of loose sediment that has accumulated in layers; e.g., a clastic rock (such as conglomerate or tillite) consisting of mechanically formed fragments of older rock transported from its source and deposited in water or from air or ice; or a chemical rock (such as rock salt or gypsum) formed by precipitation from solution; or an organic rock (such as certain limestones) consisting of the remains or secretions of plants and animals.

SHALE - A fine-grained detrital sedimentary rock, formed by the consolidation (especially by compression) of clay, silt, or mud.

SILURIAN - A period of the Paleozoic era, thought to have covered the span of time between 440 and 400 million years ago; also the corresponding system of rocks.

SILT [geol] - A rock fragment or detrital particle smaller than a very fine sand grain and larger than coarse clay, having a diameter in the range of 0.004 to 0.063 mm.

SILT [soil] - (a) A rock or mineral particle in the soil, having a diameter in the range 0.002-0.005 mm; (b) A soil containing more than 80% silt-size particles, less than 12% clay, and less than 20%.

SILT LOAM - A soil containing 50 - 88% silt, 0 - 27% clay and 0 - 50% sand.

SILTSTONE - A rock whose composition is intermediate between those of sandstone and shale and of which at least two-thirds is material of silt size.

SILTY CLAY LOAM - A soil containing 27-40% clay, 60-73% silt and less than 20% sand.

SLATE - A compact, fine-grained metamorphic rock that possesses slaty cleavage and hence can be split into slabs and thin plates. Most slate was formed from shale.

SOIL PERMEABILITY - The characteristic of the soil that enables water to move downward through the profile. Permeability is measured as to the number of inches per hour that water moves downward through the saturated soil.

Terms describing permeability are:

Very Slow	- less than 0.06 inches per hour (less than 4.24×10^{-5} cm/sec)
Slow	- 0.06 to 0.20 inches per hour (4.24×10^{-5} to 1.41×10^{-4} cm/sec)
Moderately Slow	- 0.20 to 0.63 inches per hour (1.41×10^{-4} to 4.45×10^{-4} cm/sec)
Moderate	- 0.63 to 2.00 inches per hour (4.45×10^{-4} to 1.41×10^{-3} cm/sec)
Moderately Rapid	- 2.00 to 6.00 inches per hour (1.41×10^{-3} to 4.24×10^{-3} cm/sec)
Rapid	- 6.00 to 20.00 inches per hour (4.24×10^{-3} to 1.41×10^{-2} cm/sec)

Very Rapid - more than 20.00 inches per hour (more than 1.41×10^{-2} cm/sec)

(Reference: U.S.D.A. Soil Conservation Service)

SOIL REACTION - The degree of acidity of alkalinity of a soil, expressed in pH values. A soil that tests of pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity of alkalinity is expressed as:

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

SOIL STRUCTURE - The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are -- platty (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. *Structureless soils* are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

SOLVENT - A substance, generally a liquid, capable of dissolving other substances.

STRATA - Distinguishable horizontal rock layers separated vertically from other layers.

STRATIFIED - Formed, arranged, or laid down in layers or strata; especially said of any layered sedimentary rock or deposit.

SURFACE WATER - All water exposed at the ground surface, including streams, rivers, ponds, and lakes.

THREATENED SPECIES - Any species which is likely to become an endangered species within the foreseeable future throughout all or significant portion of its range.

TILL - Dominantly unsorted and unstratified drift, generally unconsolidated, deposited directly by and underneath a glacier without subsequent reworking by meltwater, and consisting of a heterogenous mixture of clay, silt, sand and gravel and boulders ranging widely in size and shape

TOPOGRAPHY - The general conformation of a land surface, including its relief and the position of its natural and manmade features.

TOXICITY - The degree of intensity of a poison; toxicity can be evaluated using the rating scheme of Sax (1984):

0 = no toxicity (None)

Substances that cause no harm under any conditions or substances that cause toxic effects under the most unusual conditions or by overwhelming doses.

1 = slight toxicity (Low)

Substances that produce changes in the human body which are readily reversible and which will disappear following termination of exposure.

2 = moderate toxicity (Moderate)

Substances that may produce irreversible as well as reversible changes in the human body. These changes are not of such severity as to threaten life or to produce serious physical impairment.

3 = severe toxicity (High)

Substances that produce irreversible changes in the human body. These changes are of such severity to threaten human life or cause death.

TRIBUTARY - A stream feeding, joining, or flowing into a larger stream or into a lake.

UNCONSOLIDATED MATERIAL - A sediment that is loosely arranged or whose particles are not cemented together, occurring either at the surface or at depth.

UPLAND - A general term for highland or an extensive region of high land, especially in the interior of a country.

VALLEY - Any low-lying land bordered by higher ground, especially an elongate, relatively large, gently sloping depression of the earth's surface, commonly situated between two mountains or between ranges of hills and mountains, and often containing a stream or river with an outlet. It is usually developed by stream or river erosion, but can be formed by faulting.

VALLEY FILL - The unconsolidated sediment deposited by any agent so as to fill or partially fill a valley.

WATER TABLE - The surface between the zone of saturation and the zone of aeration; that surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere.

YIELD - The amount of water than can be taken continuously from a well.

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National Oil and Hazardous Substances Contingency Plan, 47 Federal Register 31224-31235, 16 July 1982.

Roedemann, R. Geology of the Capital District (Albany, Cohoes, Troy, and Schenectady Quadrangles) with a Chapter on Glacial Geology. New York State Education Department, Bulletin No. 285, 1930.

Sax, N.I. Dangerous Properties of Industrial Materials. 6th Edition. Van Nostrand Reinhold, New York, New York, 1984.

Winslow, J.D., Stewart, H.G., Jr., Johnston, R.H., and Crain, L.J. Groundwater Resources of Eastern Schenectady County, New York, with Emphasis on Infiltration from the Mohawk River. New York State Conservation Department, Bulletin 57, 1965.

APPENDIX A

Resumes of HMTC Preliminary Assessment Team

JANET SALYER EMRY

EDUCATION

M.S., geology, Old Dominion University, 1987
B.S. (cum laude), geology, James Madison University, 1983

EXPERIENCE

Three years' technical experience in the fields of hydrogeology and environmental science, including drilling and placement of wells, well monitoring, aquifer testing, determination of hydraulic properties, computer modeling of aquifer systems, and field and laboratory soils analysis.

EMPLOYMENT

Dynamac Corporation (1987-present): Staff Scientist/Hydrogeologist

Responsibilities include Preliminary Assessments, Site Investigations, Remedial Investigations, Feasibility Studies, and Emergency Responses to include providing geological and hydrological assessments of hazardous waste disposal/spill sites, determination of rates and extents of contaminant migration, and computer modeling of groundwater flow and contaminant transport. Projects are for the U.S. Air Force and Air National Guard Installation Restoration Program.

Froehling and Robertson, Inc. (1986-1987): Geologist/Engineering Technician

Performed both field and laboratory engineering soils tests.

The Nature Conservancy (1985-1986): Hydrogeologist

Investigated groundwater geology of the Nature Conservancy's Nags Head Woods Ecological Preserve in Dare County, North Carolina. Study included installing wells, monitoring water table levels, determination of hydraulic parameters through a pumping test, stratigraphic test borings, and computer modeling.

Old Dominion University (1983-1985): Teaching Assistant, Department of Geological Sciences

Taught laboratory classes in Earth Science and Historical Geology.

PROFESSIONAL AFFILIATIONS

Geological Society of America
National Water Well Association/Association of Ground Water Scientists and Engineers

PUBLICATION

Impact of Municipal Pumpage Upon a Barrier Island Water Table, Nags Head and Kill Devil Hills, North Carolina. In: Abstracts with Programs, Geological Society of America, Vol. 19, No. 2, February 1987.

MARK B. PAPE

EDUCATION

M.S., civil engineering (specializing in water resources systems analysis), Massachusetts Institute of Technology, 1981
B.S., civil engineering, MIT, 1978
B.A., psychology, Lafayette College, 1974

EXPERIENCE

Six years of experience in civil engineering, specializing in the applications of systems analysis to the engineering, environmental, and economic analyses of water, transportation, and energy sectors. Two years' experience in state and federal government providing engineering support to regulatory agencies on environmental issues. Four years in international development both implementing and providing technical support to water quality projects in East and Southern Africa, and conducting engineering analyses to monitor boundary water quality between the United States and Canada. Expertise includes a working knowledge of microcomputer systems.

EMPLOYMENT

Dynamac Corporation (1986-present): Senior Engineer

Provides cost management support to the Air Force Installation Restoration Program. Analyzes the detailed and aggregated cost histories to date for remedial action sites in the program. Provides cost projections and schedules for the program based on statistical analyses of the above data.

Prepared the current (June 1986) version of *The Air Force Installation Restoration Pricing Guide.*

Louis Berger International, Inc. (1981-1986): Systems Analyst/Water Resources Engineer

Responsible for engineering, environmental, and economic analysis of interdisciplinary systems (primarily water supply, transportation, and energy systems). Provided technical analyses to field teams in Africa, including the selection and operation of the firm's local computer systems and the design of monitoring and evaluation programs for rural development projects. Assignments included:

- Provided transportation systems analysis for projects in Kenya, Nigeria, the Southern Africa Development Coordinating Committee, and Lesotho.

- Provided water systems cost and environmental analyses in U.S.A., Kenya and Somalia. In addition, established overall water development program for project in Kenya, and designed and installed water planning units for projects in Kenya and Somalia.

- o Performed energy systems analysis in Kenya and Somalia. Provided analytical support to renewable energy project in Egypt.

- o Configured, installed and oversaw training and operation of microcomputer systems in company's Washington office and at projects in Mali, Kenya (2), Somalia, Egypt and Zimbabwe.

International Joint Commission of U.S.-Canada (1980-1981): Engineer Advisor

Conducted all engineering analyses performed by the U.S. section of this Commission which is entrusted with regulating and monitoring boundary water flows, quality, and usage in accordance with international treaties. Work involved review and analysis of all engineering materials, the maintenance of contacts and information exchange between the sections of the Commission and its Engineering and Advisory Boards and other sources.

Energy Facility Siting Council of the Commonwealth of Massachusetts (1980): Engineer Advisor

Developed procedures for appraising and approving hydropower development projects in Massachusetts. Conducted detailed research, made revisions of permitting procedures followed by local, state, and federal agencies and developed a framework to better fit these to the specific engineering and environmental characteristics of hydropower projects.

Massachusetts Institute of Technology (1977-1980): Research/Teaching Assistant, School of Engineering

Designed an analytical framework for determining and comparing the cost-effectiveness of various dam safety related projects. The framework is oriented to the analysis of overtopping failure potential of embankment dams, but it can be generalized to incorporate other modes of failure and dam types.

Was teaching assistant for a course on mathematical optimization techniques.

Compiled and edited two series of technical reports on issues of Massachusetts water policy concerning water quality in the Charles River and the need for the expansion of the existing water supply system of Metropolitan Boston.

Implemented flow models and assisted in hydraulic analysis of water structures to determine their impact on engineered facilities and on the environment.

Peace Corps, Upper Volta (1974-1976): Volunteer

Conducted surveys and interviews of rural households to obtain health, social, and demographic information for public health control activities.

Ran a shallow wells program, constructing approximately 30 wells in remote rural areas of northeastern Upper Volta.

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
National Water Resources Association
American Geophysical Union

HARDWARE/SOFTWARE

Primary expertise on microcomputer systems. Hardware experience includes IBM PC, PC-XT, PC-AT, PC-Compatibles (Compaq, Kaypro and Wang-PCs), HP-86, Osborne 1 and DEC. Software experience includes Lotus 1-2-3, Symphony, Supercalc, Visicalc, Multiplan, SPSS-PC, dBase III, RBase 5000, HP-86 database management, FORTRAN, BASIC and various word processing, graphics and communications packages.

Mainframe experience on IBM, Honeywell and DEC systems primarily in FORTRAN language programming.

BETSY A. BRIGGS

EDUCATION

B.S., Biology and Chemistry, State University College of New York at Cortland, 1979

Completed several courses in M.B.A. program, University of Phoenix, Denver, Colorado Division, 1984

SPECIALIZED TRAINING

Hazardous Waste Management course, Air Force Institute of Technology, 1986

CERTIFICATION

Certified Hazardous Materials Manager, Institute of Hazardous Materials Management, 1985

SECURITY CLEARANCE

Secret/DOE

EXPERIENCE

Nine years of experience including three years in hazardous waste management, two years as an environmental engineer, two years as an ecologist, and two years in laboratory research. Has conducted ambient air quality monitoring programs, critical pathways projects to study movement of radioactive materials in the environment, metallurgic laboratory analyses, and independent studies in biology and chemistry. Currently provides managerial oversight and technical support to a hazardous waste program for the Air Force.

EMPLOYMENT

Dynamac Corporation (1985-present): Program Manager/Hazardous Waste Specialist

Primary responsibility as program manager is to oversee and manage up to 44 field personnel involved in RCRA and CERCLA work in support of the U.S. Air Force. Other duties include performing preliminary assessments/site surveys for the Air National Guard, marketing and proposal preparation, and preparing and providing training in preparation for the Certified Hazardous Materials Manager examination.

As hazardous waste specialist the primary responsibility was to manage the hazardous waste program at Myrtle Beach Air Force Base. Duties included:

- o Reviewing the design and specifications of various base construction projects and overseeing such projects to ensure compliance with all applicable state and federal hazardous waste regulations. Projects under design included a corrosion control facility, TSD facility, two accumulation points, and a parts cleaning vat system. Construction project oversight included the final inspection of the entomology building to ensure that the facility was equipped for proper storage, usage and disposal of pesticides; removal of materials contaminated with pesticides, PCBs, petroleum products, and solvents from six sites; asbestos removal and disposal from a former hangar site; and the removal of two underground storage tanks, one of which was leaking.
- o Conducting surveys of hazardous waste generating activities.
- o Advising on need for and methods of minimizing hazardous waste generation.
- o Writing and maintaining hazardous waste management plan.
- o Preparing hazardous waste management reports and documents required by state and federal law.
- o Maintaining liaison with federal and state regulatory agencies on matters involving criteria, standards, performance specifications, and monitoring.
- o Providing information and technical consultation to Air Force installation staff regarding hazardous materials and hazardous waste operations.
- o Serving as ad hoc advisor to environmental contingency response teams.

Rockwell International (1982-1984): Environmental Engineer

Primary responsibility was collection, evaluation, and reporting of ambient air monitoring data. Other responsibilities included technical assistance for monitoring total suspended solids in ambient air. Also performed data collection and reduction of air effluent emission control activities.

Environmental monitoring and control programs are to ensure that all Department of Energy and other governmental effluent regulations are met, and that plant effluents are consistent with the As Low As Reasonably Achievable (ALARA) Principle. Monthly and Annual Reports summarize the effluent and environmental monitoring programs.

Rockwell International (1980-1982): Ecologist

Responsible for planning, organizing, and leading critical pathways projects designed to study the movement of radioactive materials throughout the environment. Projects were: (1) general critical pathway evaluation to identify sampling points possibly not considered in present monitoring program; (2) plant uptake versus plant uptake plus foliar deposition measurement study; (3) deer tissue analysis program; and (4) food stuff monitoring program. Progress and results were published in semiannual reports.

Colorado School of Mines Research Institute, Texas Gulf Research Laboratory (1979-1980): Senior Laboratory Technician

Work involved quantitative analysis of platinum, palladium, and silver in soil samples. Analysis included sample preparation, fire assays, calorimetric procedures, and smelt tests.

State University College of New York at Cortland (1978-1979): Undergraduate Independent Study

Project involved the isolation of trail pheromone from spun silk of *Hyphantria* (fall webworm). Included organic and inorganic extraction procedures and performing bioassays. Also worked on production of synthetic diet comparable to fresh leaf diet for *Malacosomo* (eastern tent caterpillar).

PUBLICATIONS

Hazardous Waste Management Survey for Myrtle Beach Air Force Base, Hazardous Materials Technical Center, Rockville, Maryland, 1986 and 1988.

Hazardous Waste Management Plan for Myrtle Beach Air Force Base, Hazardous Materials Technical Center, Rockville, Maryland, 1987 and 1988.

Waste Minimization Guidance for Myrtle Beach Air Force Base, Hazardous Materials Technical Center, Rockville, Maryland, 1988.

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TECHNICAL PRESENTATIONS

PCB Management, Myrtle Beach Air Force Base, 1987.

Underground Storage Tank Regulations/History, Myrtle Beach Air Force Base, 1986.

Overview of the Hazardous Waste Training Program, Myrtle Beach Air Force Base, 1985.

Overview of the Environmental Studies Group, Nevada Test Site and Rockwell International at Hanford, Washington, 1981.

KATHRYN A. GLADDEN

EDUCATION

B.S., chemical engineering (minor in biological sciences), University of Washington, 1978

SECURITY CLEARANCE

Secret DOD clearance

EXPERIENCE

Seven years of experience in hazardous waste consulting and plant process engineering. Experience includes development of engineering alternatives for reduction of in-plant effluents and preparation of RCRA background listing documents for the plastics industry.

EMPLOYMENT

Dynamac Corporation (1985-present): Staff Engineer

Performs studies on the feasibility of solvent recycling, including the evaluation of several alternatives. Studies to date have included 15 sites. For each site, prepared reports describing present practice for solvent use and disposal, and conducted economic analyses of options.

Conducted preliminary site investigations and ranking of hazardous waste sites for the U.S. Federal Bureau of Prisons. Prepared reports detailing site investigation findings and recommendations for Phase II monitoring and sampling.

Preparing statement of work for a Phase IV-A remedial action plan for the Air Force's Installation Restoration Program.

Conducted analysis of public comments on Advanced Notice of Public Rulemaking to establish National Primary Drinking Water Regulations for radionuclide contaminants.

Peer Consultants (1984-1985): Staff Engineer

Developed background documents for listing of RCRA hazardous wastes.

Engineering Science (1983-1984): Staff Engineer

Conducted regulatory policy review and technology assessment of transportation and decontamination procedures for acutely hazardous wastes. Project engineer for development of a cost analysis methodology for the U.S. Army Toxic and Hazardous Materials Agency Installation Restoration Program.

Weyerhaeuser Company (1978-1983): Chemical Engineer

Conducted plant environmental audits to develop in-plant effluent load balances; developed capital alternatives and improved operating procedures for in-plant effluent reduction; developed and implemented recommendations for plant energy conservation and process optimization programs; investigated industrial hygiene impacts of wood pyrolysis air emissions, and performed pilot trials for wood gasification and pyrolysis technology development.

PROFESSIONAL AFFILIATIONS

Tau Beta Pi Engineering Honorary
Society of Women Engineers

RAYMOND G. CLARK, JR.

EDUCATION

Completed graduate engineering courses, George Washington University, 1957
B.S., Mechanical Engineering, University of Maryland, 1949

SPECIALIZED TRAINING

Grad. European Command Military Assistance School, Stuttgart, 1969
Grad. Army Psychological Warfare School, Fort Bragg, 1963
Grad. Sanz School of Languages, D.C., 1963
Grad. DOD Military Assistance Institute, Arlington, 1963
Grad. Defense Procurement Management Course, Fort Lee, 1960
Grad. Engineer Officer's Advanced Course, Fort Belvoir, 1958

CERTIFICATIONS

Registered Professional Engineer: Kentucky (#4341); Virginia (#8303); Florida (#36228)

EXPERIENCE

Thirty-one years of experience in engineering design, planning and management including construction and construction management, environmental, operations and maintenance, repair and utilities, research and development, electrical, mechanical, master planning and city management. Over six years' logistical experience including planning and programming of military assistance materiel and training for foreign countries, serving as liaison with American private industry, and directing materiel storage activities in an overseas area. Over two years' experience as an engineering instructor. Extensive experience in personnel management, cost reduction programs, and systems improvement.

EMPLOYMENT

Dynamac Corporation (1986-present): Program Manager/Department Manager

Responsible for activities relating to Preliminary Analysis, Site Investigations, Remedial Investigations, Feasibility Studies, and Remedial Action for the Installation Restoration Program for the U.S. Air Force, Air National Guard, Bureau of Prisons, and the U.S. Coast Guard, including records search, review and evaluation of previous studies; preparation of statements of work, feasibility studies; preparation of remedial action plans, designs and specifications; review of said studies/plans to ensure that they are in conformance with requirements; review of environmental studies and reports; preparation of Air Force Installation Restoration Program Management Guidance; and preparation of Part B permits.

<u>Howard Needles Tammen & Bergendoff (HNTB) (1981-1986)</u>: Manager

Responsible, as Project Manager, for: design of a new concourse complex at Miami International Airport to include terminal building, roadway system, aircraft apron, drainage channel relocation, satellite building with underground pedestrian tunnel, and associated underground utility corridors, to include subsurface aircraft fueling systems, with an estimated construction cost of $163 million; a cargo vehicle tunnel under the crosswind runway with an estimated construction cost of $15 million; design and construction of two large corporate jet aircraft hangars; and for the hydrocarbon recovery program to include investigation, analysis, design of recovery systems, monitoring of recovery systems, and planning and design of residual recovery systems utilizing biodegradation. Participated, as sub-consultant, in Air Force IRP seminar.

<u>HNTB (1979-1981)</u>: Airport Engineer

Responsibilities included development of master plan for Iowa Air National Guard base; project initiation assistance for a new regional airport in Florida; engineering assistance for new facilities design and construction for Maryland Air National Guard; master plan for city maintenance facilities, Orlando, Florida; in-country master plan and preliminary engineering project management for Madrid, Spain, International Airport; and project management of master plan for Whiting Naval Air Station and outlying fields in Florida.

<u>HNTB (1974-1979)</u>: Design Engineer

Responsibilities included development of feasibility and site selection studies for reliever airports in Cleveland and Atlanta; site selection and facilities requirements for the Office of Aeronautical Charting and Cartography, NOAA; and onsite mechanical and electrical engineering design for terminal improvements at Baltimore-Washington International Airport, Maryland.

<u>HNTB (1972-1974)</u>: Airport Engineer

Responsible for development of portions of the master plan and preliminary engineering for a new international airport for Lisbon, Portugal, estimated to cost $250 million.

<u>Self-employed (1971-1972)</u>: Private Consultant

Responsible for engineering planning and installation of a production line for multimillion-dollar contract in Madrid, Spain, to fabricate transmissions and differentials for U.S. Army vehicles.

<u>U.S. Army, Corps of Engineers (1969-1971)</u>: Chief, Materiel & Programs

Directed materiel planning and military training programs of military assistance to the Spanish Army. Controlled arrival and acceptance of materiel by host government. Served as liaison/advisor to American industry interested in conducting business with Spanish government. Was Engineer Advisor to Spanish Army Construction, Armament and Combat Engineers, also the Engineer Academy and Engineer School of Application.

Corps of Engineers (1968-1969): Chief, R&D Branch, OCE

Directed office responsible to Chief of Engineers for research and development. Developed research studies in new concepts of bridging, new explosives, family of construction equipment, night vision equipment, expedient airfield surfacing, expedient aircraft fueling systems, water purification equipment and policies, prefabricated buildings, etc. Achieved Department of Army acceptance for development and testing of new floating bridge. Participated in high-level Department Committee charged with development of a Tactical Gap Crossing Capability Model.

Corps of Engineers (1967-1968): Division Engineer

Facilities engineer in Korea. Was fully responsible for management and maintenance of 96 compounds within 245 square miles including 6,000+ buildings, 1 million linear feet of electrical distribution lines, 18 water purification and distribution systems, sanitary sewage disposal systems, roads, bridges, and fire protection facilities with real property value of more than $256 million. Planned and developed the first five-year master plan for this area. Administered $12 million budget and $2 million engineer supply operation. Was in responsible charge of over 500 persons. Developed and obtained approval for additional projects worth $9 million for essential maintenance and repair. Directed cost reduction programs that produced more than $500,000 savings to the United States in the first year.

Corps of Engineers (1963-1967): Engineer Advisor

Engineer and aviation advisor to the Spanish Army. Developed major modernization program for Spanish Army Engineers, including programming of modern engineer and mobile maintenance equipment. Directed U.S. portion of construction, testing and acceptance of six powder plants, one shell loading facility, an Engineer School of Application, and depot rebuild facilities for engineer, artillery, and armor equipment. Planned and developed organization of a helicopter battalion for the Spanish Army. Responsible for sales, delivery, assembly and testing of 12 new helicopters in country. Provided U.S. assistance to unit until self-sufficiency was achieved. Was U.S. advisor to Engineer Academy, School of Application and Polytechnic Institute.

Corps of Engineers (1960-1963): Deputy District Engineer

Responsible for planning and development of extensive construction projects in the Ohio River Basin for flood control and canalization, including dam, lock, bridge, and building construction, highway relocation, watershed studies, real estate acquisitions and dispositions. Was contracting officer for more than $75 million of projects per year. Supervised approximately 1,300 personnel, including 300 engineers. Planned and directed cost reduction programs amounting to more than $200,000 per year. Programmed and controlled development of a modern radio and control net in a four-state area.

Corps of Engineers (1959-1960): Area Engineer

Directed construction of a large airfield in Ohio as Contracting Officer's representative. Assured that all construction (runway, steam power plant, fuel transfer and loading facilities, utilities, buildings, etc.) complied with terms of plans and specifications. Was onsite liaison between Air Force and contractors.

Corps of Engineers (1958-1959): Chief, Supply Branch

Managed engineer supply yard containing over $21 million construction supplies and engineer equipment. Directed in-storage maintenance, processing and deprocessing of equipment. Achieved complete survey of items on hand, a new locator system and complete rewarehousing, resulting in approximately $159,000 savings in the first year.

Corps of Engineers (1957-1958): Student

U.S. Army Engineer School, Engineer Officer's Advanced Course.

Corps of Engineers (1954-1957): Engineer Manager

Managed engineer construction projects and was assigned to staff and faculty of the Engineer School. Was in charge of instruction on engineer equipment utilization, management and maintenance. Directed Electronic Section of the school. Coordinated preparation of five-year master plan for the Department of Mechanical and Technical Equipment.

Corps of Engineers (1949-1954): Engineer Commander

Positions of minor but increasing importance and responsibility in engineering management, communications, demolitions, construction administration and logistics.

PROFESSIONAL AFFILIATIONS

Member, National Society of Professional Engineers
Fellow, Society of American Military Engineers
Member, American Society of Civil Engineers
Member, Virginia Engineering Society
Member, Project Management Institute

HARDWARE

IBM PC

SOFTWARE

Lotus 1-2-3, D Base III Plus, Framework, Project Scheduler 5000, Harvard Project Manager, Volkswriter, Microsoft Project

MARK D. JOHNSON

EDUCATION

B.S., Geology, James Madison University, 1980

EXPERIENCE

Eight years' technical and management experience including geologic mapping, subsurface investigations, foundation inspections, groundwater monitoring, pumping and observation well installation, geotechnical instrumentation, groundwater assessment, preparation of Air Force Installation Restoration Program Guidance, preparation of statements of work for environmental field monitoring and feasibility studies for the Air Force and the Air National Guard, development of environmental field monitoring programs, and preparation of Preliminary Assessments for the Air National Guard.

EMPLOYMENT

Dynamac Corporation (1984-present): Senior Staff Scientist/Geologist

Primarily responsible for developing and managing technical support programs relevant to CERCLA related activities for the Air Force, Air National Guard, Department of Justice and Coast Guard. These activities include Statements of Work for Site Investigations (SI), Remedial Investigations (RI), and Feasibility Studies (FS); assessing groundwater at hazardous waste disposal/spill sites for the purpose of determining rates and extents of contaminant migration and for developing SI and RI programs and identifying remedial actions; reviewing SI, RI and FS contractor work plans for various government clients, developing technical and contractual requirements for SI, RI and FS projects, managing the development and preparation of Preliminary Assessments, and assisting clients in the development of their environmental management programs, which included preparation of the Air Force's Installation Restoration Program Management Guidance document.

Bechtel Associates Professional Corporation (1981-1984): Geologist

Performed the following duties in conjunction with major civil engineering projects including subways, nuclear power plants and buildings: prepared geologic maps of surface and subsurface facilities in rock and soil including tunnels, foundations and vaults; assessed groundwater conditions in connection with construction activities and groundwater control systems; monitored the installation of permanent and temporary dewatering systems and observation wells; monitored surface and subsurface settlement of tunnels; and participated in subsurface investigations.

Schnabel Engineering Associates (1981): Geologist

Inspected foundations and backfill placement.

PROFESSIONAL CREDENTIALS

Registered Professional Geologist, South Carolina, #116, 1987

PROFESSIONAL AFFILIATIONS

Association of Engineering Geologists
National Water Well Association/Association of Ground Water Scientists and Engineers

APPENDIX B

Outside Agency Contact List

OUTSIDE AGENCY CONTACT LIST

1. Glenville Water District Office
   818 Glenridge Drive
   Glenville, New York
   (518) 384-3501

2. National Oceanic and Atmospheric Adminstration
   6001 Executive Boulevard
   Rockville, Maryland 20853
   (301) 443-8243

3. New York State Department of Environmental Conservation
   2176 Guilderland Avenue
   Schenectady, New York 12306
   (518) 382-0680

4. New York State Department of Environmental Conservation
   Bureau of Wildlife
   50 Wolf Road
   Albany, New York 12233-4754
   (518) 457-4480

5. New York Geological Survey
   Albany, New York
   (518) 474-5816

6. Schenectady County Soil and Water Conservation District
   530 Franklin Street
   Schenectady, New York 12305
   (518) 374-0245

7. U.S. Geological Survey
   12201 Sunrise Valley Drive
   Reston, Virginia 22092
   (703) 648-4000

APPENDIX C

USAF Hazard Assessment Rating Methodology (HARM) and HARM Guidelines

USAF HAZARD ASSESSMENT RATING METHODOLOGY

The Department of Defense (DoD) has established a comprehensive program to identify, evaluate, and control problems associated with past disposal practices at DoD facilities. One of the actions required under this program is to:

> develop and maintain a priority listing of contaminated installations and facilities for remedial action based on potential hazard to public health, welfare, and environmental impacts (Reference: DEQPPM 81-5, 11 December 1981).

Accordingly, the United States Air Force (USAF) has sought to establish a system to set priorities for taking further actions at sites based upon information gathered during the Preliminary Assessment phase of its Installation Restoration Program (IRP).

PURPOSE

The purpose of the site rating model is to provide a relative ranking of sites of suspected contamination from hazardous substances. This model will assist the Air National Guard in setting priorities for follow-on site investigations.

This rating system is used only after it has been determined that (1) potential for contamination exists (hazardous wastes present in sufficient quantity), and (2) potential for migration exists. A site can be deleted from consideration for rating on either basis.

DESCRIPTION OF MODEL

Like the other hazardous waste site ranking models, the U.S. Air Force's site rating model uses a scoring system to rank sites for priority attention. However, in developing this model, the designers incorporated some special features to meet specific DoD program needs.

The model uses data readily obtained during the Preliminary Assessment portion of the IRP. Scoring judgment and computations are easily made. In assessing the hazards at a given site, the model develops a score based on the most likely routes of contamination and the worst hazards at the site. Sites are given low scores only if there are clearly no hazards. This approach meshes well with the policy for evaluating and setting restrictions on excess DoD properties.

Site scores are developed using the appropriate ranking factors according to the method presented in the flow chart (Figure 1 of this report). The site rating form and the rating factor guideline are provided at the end of this appendix.

As with the previous model, this model considers four aspects of the hazard posed by a specific site: possible receptors of the contamination, the waste and its characteristics, the potential pathways for contaminant migration, and any efforts that were made to contain the wastes resulting from a spill.

The receptors category rating is based on four rating factors: the potential for human exposure to the site, the potential for human ingestion of contaminants should underlying aquifers be polluted, the current and anticipated uses of the surrounding area, and the potential for adverse effects upon important biological resources and fragile natural settings. The potential for human exposure is evaluated on the basis of the total population within 1,000 feet of the site, and the distance between the site the the base boundary. The potential for human ingestion of contaminants is based on the distance between the site and the nearest well, the groundwater use of the uppermost aquifer, and population served by the groundwater supply within 3 miles of the site. The uses of the surrounding area are determined by the zoning within a 1-mile radius. Determination of whether or not critical environments exist within a 1-mile radius of the site predicts the potential for adverse effects from the site upon important biological resources and fragile natural settings. Each rating factor is numerically evaluated (0-3) and increased by a multiplier. The maximum possible score is also computed. The factor score and maximum possible scores are totaled, and the receptors subscore computed as follows: receptors subscore = (100 x factor score subtotal/maximum score subtotal).

The waste characteristics category is scored in three stages. First, a point rating is assigned based on an assessment of the waste quantity and the hazard (worst case) associated with the site. The level of confidence in the information is also factored into the assessment. Next, the score is multiplied by a waste persistence factor, which acts to reduce the score if the waste is not very persistent. Finally, the score is further modified by the physical state of the waste. Liquid wastes receive the maximum score, while scores for sludges and solids are reduced.

The pathways category rating is based on evidence of contaminant migration or an evaluation of the highest potential (worst case) for contaminant migration along one of three pathways: surface-water migration, flooding, and groundwater migration. If evidence of contaminant migration exists, the category is given a subscore of 80 to 100 points. For indirect evidence, 80 points are assigned, and for direct evidence, 100 points are assigned. If no evidence is found, the highest score among the three possible routes is used. The three pathways are evaluated and the highest score among all four of the potential scores is used.

The scores for each of the three categories are added together and normalized to a maximum possible score of 100. Then the waste management practice category is scored. Scores for sites with no containment can be reduced by 5 percent. If a site is contained and well managed, its score can be reduced by 90 percent. The final site score is calculated by applying the waste management practices category factor to the sum of the scores for the other three categories.

I. RECEPTORS CATEGORY

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
A. Population within 1,000 feet (includes on-base facilities)	0	1-25	26-100	Greater than 100	4
B. Distance to nearest water well	Greater than 3 miles	1 to 3 miles	3,001 feet to 1 mile	0 to 3,000 feet	10
C. Land Use/Zoning (within 1-mile radius)	Completely remote (zoning not applicable)	Agricultural	Commercial or Industrial	Residential	3
D. Distance to installation boundary	Greater than 2 miles	1 to 2 miles	1,001 feet to 1 mile	0 to 1,000 feet	6
E. Critical environments (within 1-mile radius)	Not a critical environment	Natural areas	Pristine natural areas; minor wetlands; preserved areas; presence or economically important natural resources susceptible to contamination	Major habitat of an endangered or threatened species; presence of recharge area major wetlands	10
F. Water quality/use designation of nearest surface water body	Agricultural or industrial use	Recreation, propagation and management of fish and wildlife	Shellfish propagation and harvesting	Fotable water supplies	6
G. Ground-water use of uppermost aquifer	Not used, other sources readily available	Commercial, industrial, or irrigstion, very limited other water sources	Drinking water, municipal water available	Drinking water, no municipal water available; commercial, industrial, or irrigation, no other water source available	9
H. Population served by surface water supplies within 3 miles downstream of site	0	1-50	51-1,000	Greater than 1,000	6
I. Population served by aquifer supplies within 3 miles of site	0	1-50	51-1,000	Greater than 1,000	6

II. WASTE CHARACTERISTICS

A-1 Hazardous Waste Quantity

S = Small quantity (5 tons or 20 drums of liquid)
M = Moderate quantity (5 to 20 tons or 21 to 85 drums of liquid)
L = Large quantity (20 tons or 85 drums of liquid)

A-2 Confidence Level of Information

C = Confirmed confidence level (minimum criteria below)

o Verbal reports from interviewer (at least 2) or written information from the records

o Knowledge of types and quantities of wastes generated by shops and other areas on base

S = Suspected confidence level

o No verbal reports or conflicting verbal reports and no written information from the records

Logic based on the knowledge of the types and quantities of hazardous wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at a site

A-3 Hazard Rating

Rating Factors	Rating Scale Levels 0	1	2	3
Toxicity	Sax's Level 0	Sax's Level 1	Sax's Level 2	Sax's Level 3
Ignitability	Flash point greater than 200° F	Flash point at 140° F to 200° F	Flash point at 80° F to 140° F	Flash point less than 80° F
Radioactivity	At or below background levels	1 to 3 times background levels	3 to 5 times background levels	Over 5 times background levels

Use the highest individual rating based on toxicity, ignitability and radioactivity and determine the hazard rating.

Hazard Rating	Points
High (H)	3
Medium (M)	2
Low (L)	1

II. **WASTE CHARACTERISTICS**--Continued

Waste Characteristics Matrix

Point Rating	Hazardous Waste Quantity	Confidence Level of Information	Hazard Rating
100	L	C	H
	L	C	M
80	M	C	H
70	L	S	H
60	S	C	H
	M	C	M
	L	S	M
50	L	C	L
	M	S	H
	S	C	M
	S	S	H
40	M	S	M
	M	C	L
	L	S	L
	S	C	L
30	M	S	L
	S	S	M
70	S	S	L

Notes:

For a site with more than one hazardous waste, the waste quantities may be added using the following rules:

Confidence Level

- o Confirmed confidence levels (C) can be added.
- o Suspected confidence levels (S) can be added.
- o Confirmed confidence levels cannot be added with suspected confidence levels.

Waste Hazard Rating

- o Wastes with the same hazard rating can be added.
- o Wastes with different hazard ratings can only be added in a downgrade mode, e.g., MCM + SCH = LCM if the total quantity is greater than 20 tons.

Example: Several wastes may be present at a site, each having an MCM designation (60 points). By adding the quantities of each waste, the designation may change to LCM (80 points). In this case, the correct point rating for the waste is 80.

B. **Persistence Multiplier for Point Rating**

Persistence Criteria	Multiply Point Rating From Part A by the Following
Metals, polycyclic compounds, and halogenated hydrocarbons	1.0
Substituted and other ring compounds	0.9
Straight chain hydrocarbons	0.8
Easily biodegradable compounds	0.4

C. **Physical State Multiplier**

Physical State	Multiply Point Total From Parts A and B by the Following
Liquid	1.0
Sludge	0.75
Solid	0.50

III. PATHWAYS CATEGORY

A. Evidence of Contamination

Direct evidence is obtained from laboratory analyses of hazardous contaminants present above natural background levels in surface water, ground water, or air. Evidence should confirm that the source of contamination is the site being evaluated.

Indirect evidence might be from visual observation (i.e., leachate), vegetation stress, sludge deposits, presence of taste and odors in drinking water, or reported discharges that cannot be confirmed as resulting from the site, but the site is greatly suspected of being a source of contamination.

B-1 Potential for Surface Water Contamination

Rating Factors	Rating Scale Levels: 0	1	2	3	Multiplier
Distance to nearest surface water (including drainage ditches and storm sewers)	Greater than 1 mile	2,001 feet to 1 mile	501 feet to 2,000 feet	0 to 500 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to +20 inches	Greater than +20 inches	6
Surface erosion	None	Slight	Moderate	Severe	8
Surface permeability	0% to 15% clay ($>10^{-2}$ cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	Greater than 50% clay ($<10^{-6}$ cm/sec)	6
Rainfall intensity based on 1-year 24-hour rainfall (Number of thunderstorms)	<1.0 inch (0-5)	1.0 to 2.0 inches (6-35)	2.1 to 3.0 inches (36-49)	>3.0 inches (>50)	8

B-2 Potential for Flooding

Rating Factors	0	1	2	3	Multiplier
Floodplain	Beyond 100-year floodplain	In 100-year floodplain	In 10-year floodplain	Floods annually	1

B-3 Potential for Ground Water Contamination

Rating Factors	0	1	2	3	Multiplier
Depth to groundwater	Greater than 500 feet	50 to 500 feet	11 to 50 feet	0 to 10 feet	8
Net precipitation	Less than -10 inches	-10 to +5 inches	+5 to +20 inches	Greater than +20 inches	8
Soil permeability	Greater than 50% clay ($<10^{-6}$ cm/sec)	30% to 50% clay (10^{-4} to 10^{-6} cm/sec)	15% to 30% clay (10^{-2} to 10^{-4} cm/sec)	0% to 15% clay ($>10^{-2}$ cm/sec)	8
Subsurface flows	Bottom of site greater than 5 feet above high ground-water level	Bottom of site occasionally submerged	Bottom of site frequently submerged	Bottom of site located below mean ground water level	8

B 3 Potential for Ground Water Contamination Continued

Rating Factors	Rating Scale Levels 0	1	2	3	Multiplier
Direct access to groundwater (through faults, fractures, faulty well casings, subsidence, fissures, etc.)	No evidence of risk	Low risk	Moderate risk	High risk	8

IV. WASTE MANAGEMENT PRACTICES CATEGORY

A. This category adjusts the total risk as determined from the receptors, pathways, and waste characteristics categories for waste management practices and engineering controls designed to reduce this risk. The total risk is determined by first averaging the receptors, pathways, and waste characteristics subscores.

B. Waste Management Practices Factor

The following multipliers are then applied to the total risk points (from A):

Waste Management Practice	Multiplier
No containment	1.0
Limited containment	0.95
Fully contained and in full compliance	0.10

Guidelines for fully contained:

Landfills:

- o Clay cap or other impermeable cover
- o Leachate collection system
- o Liners in good condition
- o Adequate monitoring wells

Spills:

- o Quick spill cleanup action taken
- o Contaminated soil removed
- o Soil and/or water samples confirm total cleanup of the spill

Surface Impoundments:

- o Liners in good condition
- o Sound dikes and adequate freeboard
- o Adequate monitoring wells

Fire Protection Training Areas:

- o Concrete surface and berms
- o Oil/water separator for pretreatment of runoff
- o Effluent from oil/water separator to treatment plant

General Note: If data are not available or known to be complete the factor ratings under items I-A through I, III-B-1, or III 6-3, then leave blank for calculation of factor score and maximum possible score.

APPENDIX D

Site Factor Rating Criteria and Hazardous Assessment Rating Forms

109th Tactical Airlift Group
New York Air National Guard
Schenectady County Airport
Scotia, New York

USAF Hazard Assessment Rating Methodology
Factor Rating Criteria

1. RECEPTORS CATEGORY	RATING SCALE LEVELS	NUMERICAL VALUE
Population within 1,000 feet of site:		
Site No. 1	Approximately 200	3
Site No. 2	Approximately 200	3
Distance to nearest well:		
Site No. 1	Less than 600 feet	3
Site No. 2	Approximately 850 feet	3
Land use/zoning within 1-mile radius:	Residential	3
Distance to Base boundary:		
Site No. 1	Less than 1,000 feet	3
Site No. 2	Less than 1,000 feet	3
Critical environments within 1-mile radius:	None	0
Water quality of nearest surface water body:	Recreation	1
Groundwater use of upper-most aquifer:	Drinking water; municipal water available	2
Population served by aquifer supply within 3 miles downstream of site:	1 to 50	1
Population served by aquifer supply within 3 miles of site:	1 to 50	3

109th Tactical Airlift Group
New York Air National Guard
Schenectady County Airport
Scotia, New York

USAF Hazard Assessment Rating Methodology
Factor Rating Criteria

2. WASTE CHARACTERISTICS	RATING SCALE LEVELS	NUMERICAL VALUE
Quantity:		
Site No. 1	Moderate	M
Site No. 2	Small	S
Confidence Level:		
Site No. 1	Confirmed	C
Site No. 2	Suspected	S
Hazard Rating:		
Toxicity		
Site No. 1	Sax's Level 3	3
Site No. 2	Sax's Level 3	3
Ignitability		
Site No. 1	Flash point < 80°F	3
Site No. 2	Flash point 80°F to 140°F	2
Radioactivity		
Site No. 1	At or below background levels	0
Site No. 2	At or below background levels	0
Persistance Multiplier:		
Site No. 1	Straight chain hydrocarbons	0.8
Site No. 2	Straight chain hydrocarbons	0.8

109th Tactical Airlift Group
New York Air National Guard
Schenectady County Airport
Scotia, New York

USAF Hazard Assessment Rating Methodology
Factor Rating Criteria

2. WASTE CHARACTERISTICS (Cont'd)	RATING SCALE LEVELS	NUMERICAL VALUE
Physical State Multiplier:		
Site No. 1	Liquid	1.0
Site No. 2	Liquid	1.0

3. PATHWAYS CATEGORY

Surface Water Migration:		
Distance to nearest surface water		
Site No. 1	300 feet from storm drain	3
Site No. 2	Immediately adjacent to storm drain	3
Net precipitation	9.2 inches	2
Surface erosion	Slight	1
Surface permeability	10^{-4} to 10^{-6} cm/sec	2
Rainfall intensity	2.25 inches	2
Flooding:	Beyond 100-year floodplain	0
Groundwater Migration:		
Depth to groundwater	0 to 10 feet	3
Net precipitation	9.2 inches	2
Soil permeability	10^{-4} to 10^{-6} cm/sec	1

109th Tactical Fighter Group
New York Air National Guard
Schenectady County Airport
Scotia, New York

USAF Hazard Assessment Rating Methodology
Factor Rating Criteria

3. PATHWAYS CATEGORY (Cont'd)	RATING SCALE LEVEL	NUMERICAL VALUE
Groundwater Migration (Cont'd)		
Subsurface flow	Bottom of site occasionally submerged	1
Direct access to groundwater	No evidence of risk	0

4. **WASTE MANAGEMENT PRACTICES CATEGORY**

Practice:

Site No. 1	No containment	1.0
Site No. 2	No containment	1.0

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE: FIRE TRAINING AREA (SITE 1)
LOCATION: NEW YORK AIR NATIONAL GUARD, SCHENECTADY
DATE OF OPERATION/OCCURRENCE: 1951 TO 1960
OWNER/OPERATOR: 109TH TAG
COMMENTS/DESCRIPTION
RATED BY: HMTC

I. RECEPTORS

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
A. POPULATION WITHIN 1000 FEET OF SITE	:	3	4	12	12
B. DISTANCE TO NEAREST WELL	:	3	10	30	30
C. LAND USE/ZONING WITHIN 1 MILE RADIUS	:	3	3	9	9
D. DISTANCE TO INSTALLATION BOUNDARY	:	3	6	18	18
E. CRITICAL ENVIRONMENTS WITHIN 1 MILE RADIUS OF SITE	:	0	10	0	30
F. WATER QUALITY OF NEAREST SURFACE WATER	:	1	6	6	18
G. GROUND WATER USE OF UPPERMOST AQUIFER	:	2	9	18	27
H. POPULATION (WITHIN 3 MILES) SERVED BY					
DOWN STREAM SURFACE WATER	:	0	6	0	18
GROUND WATER	:	1	6	6	18
		SUBTOTALS		99	180

RECEPTORS SUBSCORE (100 x FACTOR SCORE SUBTOTAL/MAXIMUM SCORE SUBTOTAL) 55

II. WASTE CHARACTERISTICS

A. SELECT THE FACTOR SCORE BASED ON THE ESTIMATED QUANTITY, THE DEGREE OF HAZARD, AND THE CONFIDENCE LEVEL OF THE INFORMATION.

1. WASTE QUANTITY (S=SMALL, M=MEDIUM, L=LARGE) (M)
2. CONFIDENCE LEVEL (S=SUSPECT, C=CONFIRM) (C)
3. HAZARD RATING (L=LOW, M=MEDIUM, H=HIGH) (H)

FACTOR SUBSCORE A (80)
(FROM 20 TO 100 BASED ON FACTOR SCORE MATRIX)

B. APPLY PERSISTENCE FACTOR

FACTOR SUBSCORE A x PERSISTENCE FACTOR = SUBSCORE B
(80)(0.8) = (64)

C. APPLY PHYSICAL STATE MULTIPLIER

SUBSCORE B x PHYSICAL STATE MULTIPLIER = WASTE CHARACTERISTICS SUBSCORE
(64)(1) = (64)

III. PATHWAY

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE

A. IF THERE IS EVIDENCE OF MIGRATION OF HAZARDOUS CONTAMINANTS, ASSIGN MAXIMUM FACTOR SUBSCORE OF <100 POINTS FOR DIRECT EVIDENCE> OR <80 POINTS FOR INDIRECT EVIDENCE>. IF DIRECT EVIDENCE <100> EXISTS THEN PROCEED TO C. IF NO EVIDENCE OR INDIRECT EVIDENCE <LESS THEN 80> EXISTS, PROCEED TO B.
(0)

B. RATE THE MIGRATION POTENTIAL FOR 3 POTENTIAL PATHWAYS: SURFACE WATER MIGRATION, FLOODING, AND GROUND-WATER MIGRATION. SELECT THE HIGHEST RATING, AND PROCEED TO C.

1. SURFACE WATER MIGRATION

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
DISTANCE TO NEAREST SURFACE WATER	:	3	8	24	24
NET PRECIPITATION	:	2	6	12	18
SURFACE EROSION	:	1	8	8	24
SURFACE PERMEABILITY	:	2	6	12	18
RAINFALL INTENSITY	:	2	8	16	24
SUBTOTALS				72	108
SUBSCORE (100 x FACTOR SCORE SUBTOTAL/MAXIMUM SCORE SUBTOTAL)					67

2. FLOODING

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
FLOODING		0	1	0	3
SUBSCORE (100 x FACTOR SCORE /3)	:				0

3. GROUND WATER MIGRATION

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
DEPTH TO GROUND WATER	:	3	8	24	24
NET PRECIPITATION	:	2	6	12	18
SOIL PERMEABILITY	:	1	8	8	24
SUBSURFACE FLOWS	:	1	8	8	24
DIRECT ACCESS TO GROUND WATER	:	0	8	0	24
SUBTOTALS				52	114
SUBSCORE (100 x FACTOR SCORE SUBTOTAL/MAXIMUM SCORE SUBTOTAL)					46

C. HIGHEST PATHWAY SUBSCORE

ENTER THE HIGHEST SUBSCORE VALUE FROM A, B-1, B-2 OR B-3 ABOVE.
(67)

IV. WASTE MANAGEMENT PRACTICES

A. AVERAGE THE THREE SUBSCORES FOR RECEPTORS, WASTE CHARACTERISTICS, AND PATHWAYS.

RECEPTORS	(55)
WASTE CHARACTERISTICS	(64)
PATHWAYS	(67)
TOTAL DIVIDED BY 3 = GROSS TOTAL SCORE	(62)

B. APPLY FACTOR FOR WASTE CONTAINMENT FROM WASTE MANAGEMENT PRACTICES

GROSS TOTAL SCORE x	WASTE MANAGEMENT PRACTICES FACTOR x		FINAL SCORE
(62)	(1)	=	62

HAZARDOUS ASSESSMENT RATING FORM

NAME OF SITE	DRUM STORAGE AREA (SITE 2)
LOCATION	NEW YORK AIR NATIONAL GUARD, SCHENECTADY
DATE OF OPERATION/OCCURRENCE	1950s TO 1960s
OWNER/OPERATOR	109TH TAG
COMMENTS/DESCRIPTION	
RATED BY	HMTC

I. RECEPTORS

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
A. POPULATION WITHIN 1000 FEET OF SITE	:	3	4	12	12
B. DISTANCE TO NEAREST WELL	:	3	10	30	30
C. LAND USE/ZONING WITHIN 1 MILE RADIUS	:	3	3	9	9
D. DISTANCE TO INSTALLATION BOUNDARY	:	3	6	18	18
E. CRITICAL ENVIRONMENTS WITHIN 1 MILE RADIUS OF SITE	:	0	10	0	30
F. WATER QUALITY OF NEAREST SURFACE WATER	:	1	6	6	18
G. GROUND WATER USE OF UPPERMOST AQUIFER	:	2	9	18	27
H. POPULATION (WITHIN 3 MILES) SERVED BY					
DOWN STREAM SURFACE WATER	:	0	6	0	18
GROUND WATER	:	1	6	6	18
		SUBTOTALS		99	180

RECEPTORS SUBSCORE (100 x FACTOR SCORE SUBTOTAL/MAXIMUM SCORE SUBTOTAL) 55

II. WASTE CHARACTERISTICS

A. SELECT THE FACTOR SCORE BASED ON THE ESTIMATED QUANTITY, THE DEGREE OF HAZARD, AND THE CONFIDENCE LEVEL OF THE INFORMATION.

1. WASTE QUANTITY (S=SMALL, M=MEDIUM, L=LARGE) (S)
2. CONFIDENCE LEVEL (S=SUSPECT, C=CONFIRM) (S)
3. HAZARD RATING (L=LOW, M=MEDIUM, H=HIGH) (H)

FACTOR SUBSCORE A (40)
<FROM 20 TO 100 BASED ON FACTOR SCORE MATRIX>

B. APPLY PERSISTENCE FACTOR

FACTOR SUBSCORE A x PERSISTENCE FACTOR = SUBSCORE B
(40)(0.8) = (32)

C. APPLY PHYSICAL STATE MULTIPLIER

SUBSCORE B x PHYSICAL STATE MULTIPLIER = WASTE CHARACTERISTICS SUBSCORE
(32)(1) = (32)

III. PATHWAY

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE

A. IF THERE IS EVIDENCE OF MIGRATION OF HAZARDOUS CONTAMINANTS, ASSIGN MAXIMUM FACTOR SUBSCORE OF <100 POINTS FOR DIRECT EVIDENCE> OR <80 POINTS FOR INDIRECT EVIDENCE>. IF DIRECT EVIDENCE <100> EXISTS THEN PROCEED TO C. IF NO EVIDENCE OR INDIRECT EVIDENCE <LESS THEN 80> EXISTS, PROCEED TO B.
(0)

B. RATE THE MIGRATION POTENTIAL FOR 3 POTENTIAL PATHWAYS: SURFACE WATER MIGRATION, FLOODING, AND GROUND-WATER MIGRATION. SELECT THE HIGHEST RATING, AND PROCEED TO C.

1. SURFACE WATER MIGRATION

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
DISTANCE TO NEAREST SURFACE WATER	:	3	8	24	24
NET PRECIPITATION	:	2	6	12	18
SURFACE EROSION	:	1	8	8	24
SURFACE PERMEABILITY	:	2	6	12	18
RAINFALL INTENSITY	:	2	8	16	24
SUBTOTALS				72	108
SUBSCORE (100 x FACTOR SCORE SUBTOTAL/MAXIMUM SCORE SUBTOTAL)					67

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
2. FLOODING		0	1	0	3
SUBSCORE (100 x FACTOR SCORE /3)	:				0

3. GROUND WATER MIGRATION

RATING FACTOR		FACTOR RATING	MULTIPLIER	FACTOR SCORE	MAXIMUM POSSIBLE SCORE
DEPTH TO GROUND WATER	:	3	8	24	24
NET PRECIPITATION	:	2	6	12	18
SOIL PERMEABILITY	:	1	8	8	24
SUBSURFACE FLOWS	:	1	8	8	24
DIRECT ACCESS TO GROUND WATER	:	0	8	0	24
SUBTOTALS				52	114
SUBSCORE (100 x FACTOR SCORE SUBTOTAL/MAXIMUM SCORE SUBTOTAL)					46

C. HIGHEST PATHWAY SUBSCORE

ENTER THE HIGHEST SUBSCORE VALUE FROM A, B-1, B-2 OR B-3 ABOVE.
(67)

IV. WASTE MANAGEMENT PRACTICES

A. AVERAGE THE THREE SUBSCORES FOR RECEPTORS, WASTE CHARACTERISTICS, AND PATHWAYS.

RECEPTORS	(55)
WASTE CHARACTERISTICS	(32)
PATHWAYS	(67)
TOTAL DIVIDED BY 3 = GROSS TOTAL SCORE	(51)

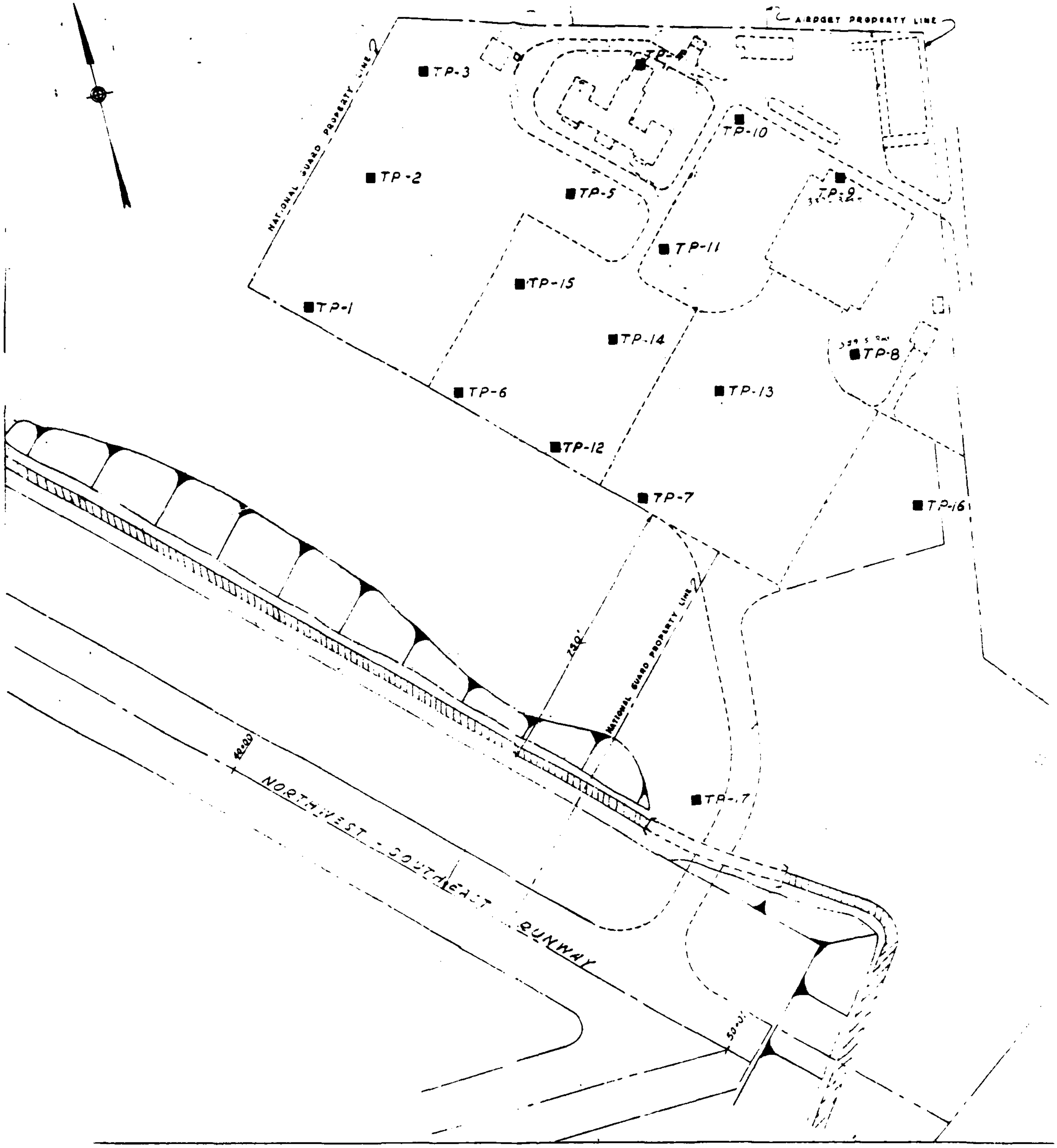
B. APPLY FACTOR FOR WASTE CONTAINMENT FROM WASTE MANAGEMENT PRACTICES

GROSS TOTAL SCORE x	WASTE MANAGEMENT PRACTICES FACTOR x		FINAL SCORE
(51)(	1)	=	51

=========

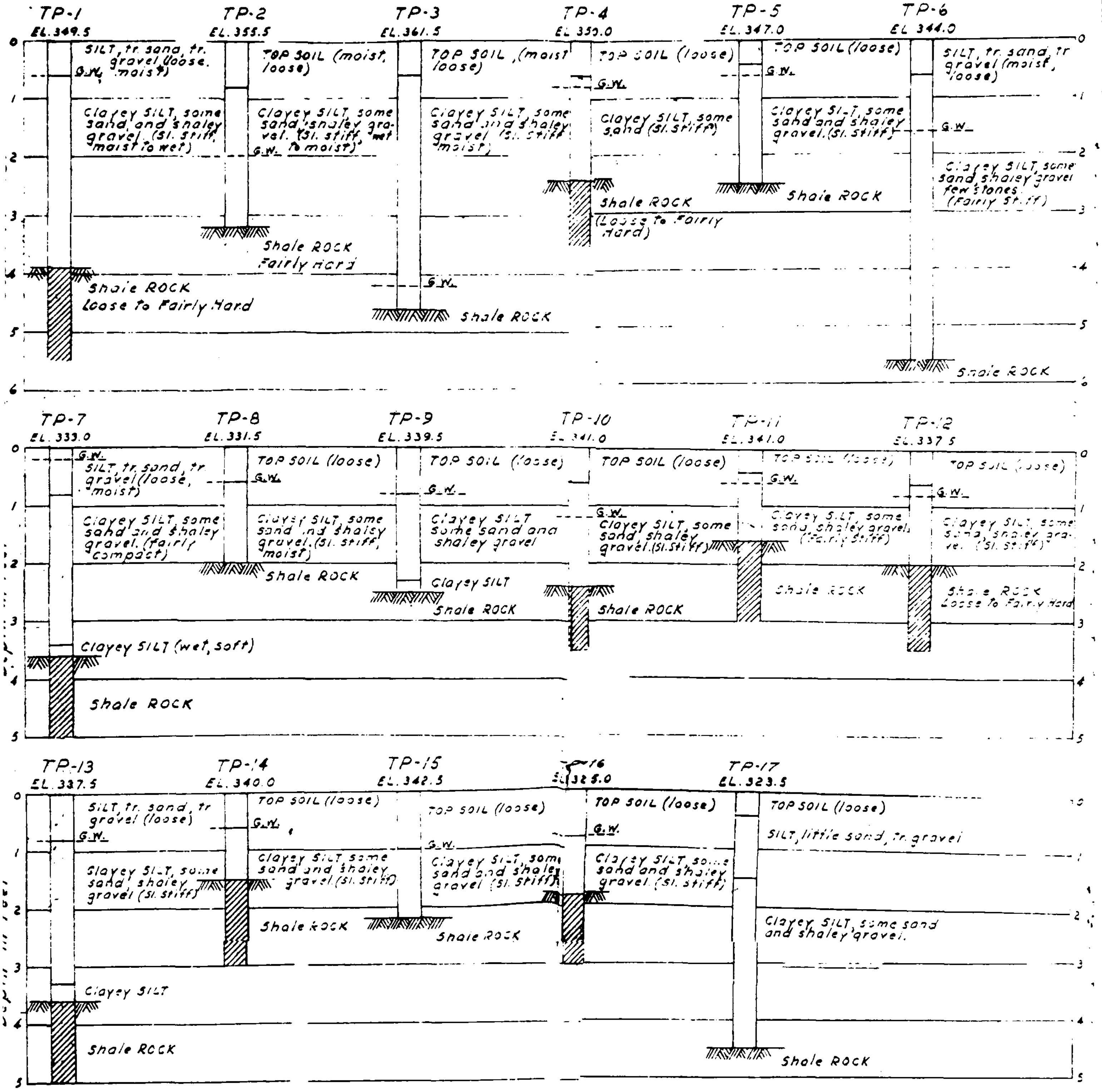
APPENDIX E

Soil Boring Logs



BORING LOCATION PLAN

SCALE IN FEET
100 0 100 200



LEGEND

T.P. Test Pit
G.W. Ground Water Surface
Top of Rock

SOIL CLASSIFICATION

Material	Size (mm)	Size (ins)
Stone small	200-60	8-2
Gravel	60-2.0	2-.08
Sand	2.0-0.06	
Silt	0.06-0.002	
Clay	Less than 0.002	

some - 20% to 40%
little - 10% to 20%
trace - 0% to 10%

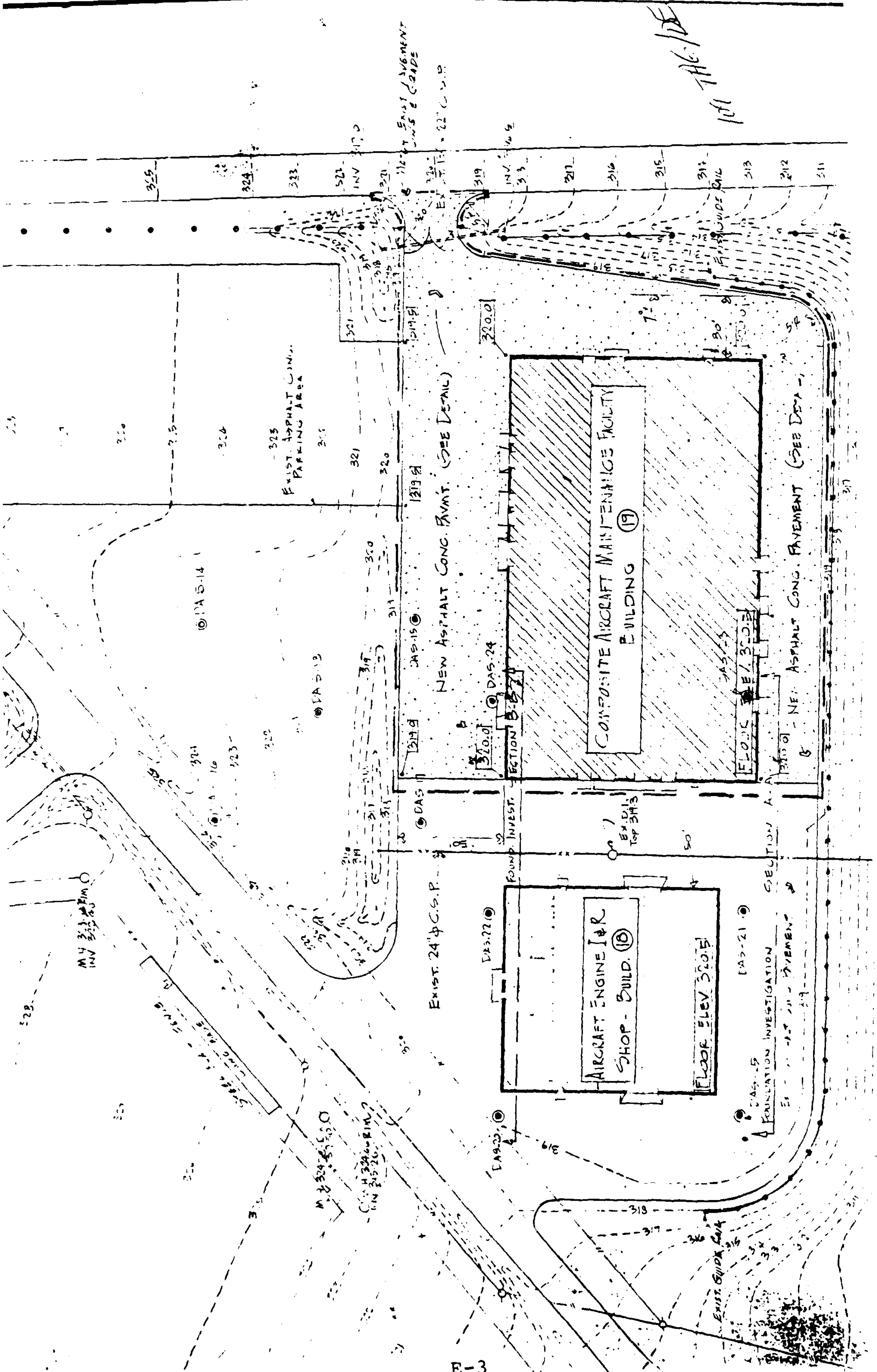
Predominant soil types indicated by Capital letters. Other soil types indicated by lower case letters.

REVISION	DATE	DESCRIPTION

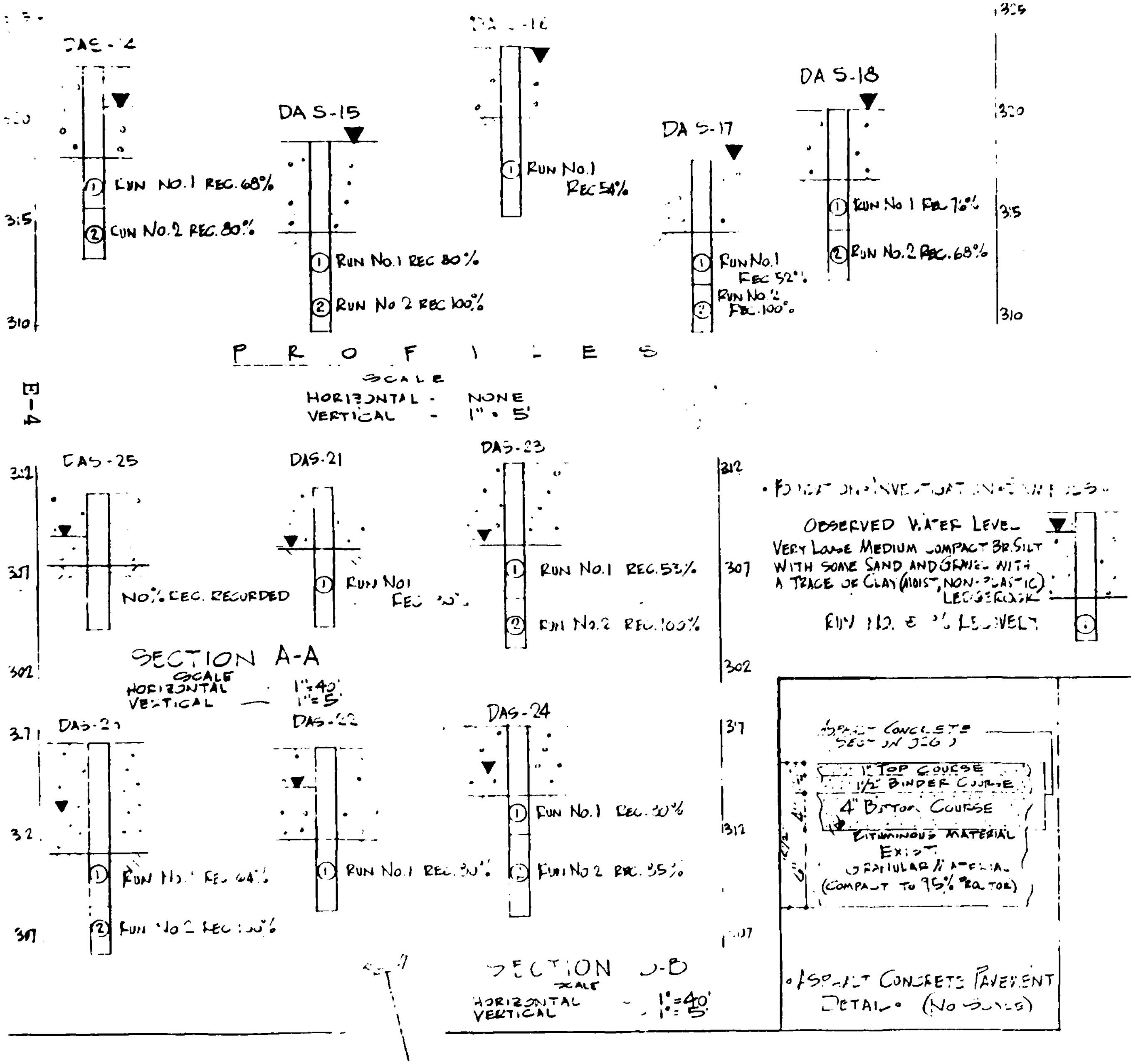
CORPS OF ENGINEERS, U.S. ARMY
OFFICE OF THE DISTRICT ENGINEER
NEW YORK DISTRICT
NEW YORK 5, NEW YORK

DRAWN BY: E.L.
CHECKED BY: E.L.
DESIGNED BY:
REVIEWED: CHIEF DESIGN BRANCH
SUBMITTED: CHIEF MILITARY PROJECTS PLANNING BR.
RECOMMENDED: CHIEF ENGINEERING DIVISION
APPROVED:

SCHENECTADY COUNTY AIRPORT
AIR NATIONAL GUARD FACILITIES
LOG OF BORINGS
SCHENECTADY NEW YORK
SCALE AS SHOWN


COMPOSITE AIRCRAFT MAINTENANCE FACILITY
BUILDING (19)
AIRCRAFT ENGINE I&R
SHOP - BUILD. (18)
FLOOR ELEV 320.5
NEW ASPHALT CONC. PAVMT. (SEE DETAIL)
NEW ASPHALT CONC. PAVEMENT (SEE DETAIL)
EXIST. ASPHALT CONC. PARKING AREA
EXIST. 24" ∅ C.S.P.
FOUND. INVEST.
SECTION A
PAVEMENT INVESTIGATION
EXIST. GUIDE RAIL

FOUNDATION INVESTIGATION



GENERAL NOTES

THE SUBSURFACE EXPLORATIONS SHOWN HEREON WERE MADE

BETWEEN 11-15-72 TO 1-27-72

THE SOIL DESCRIPTIONS SHOWN ON THE SOIL PROFILES ARE AS DETERMINED IN THE MAIN OFFICE OF THE BUREAU OF SOIL MECHANICS BY A VISUAL INSPECTION OF THE SOIL SAMPLES.

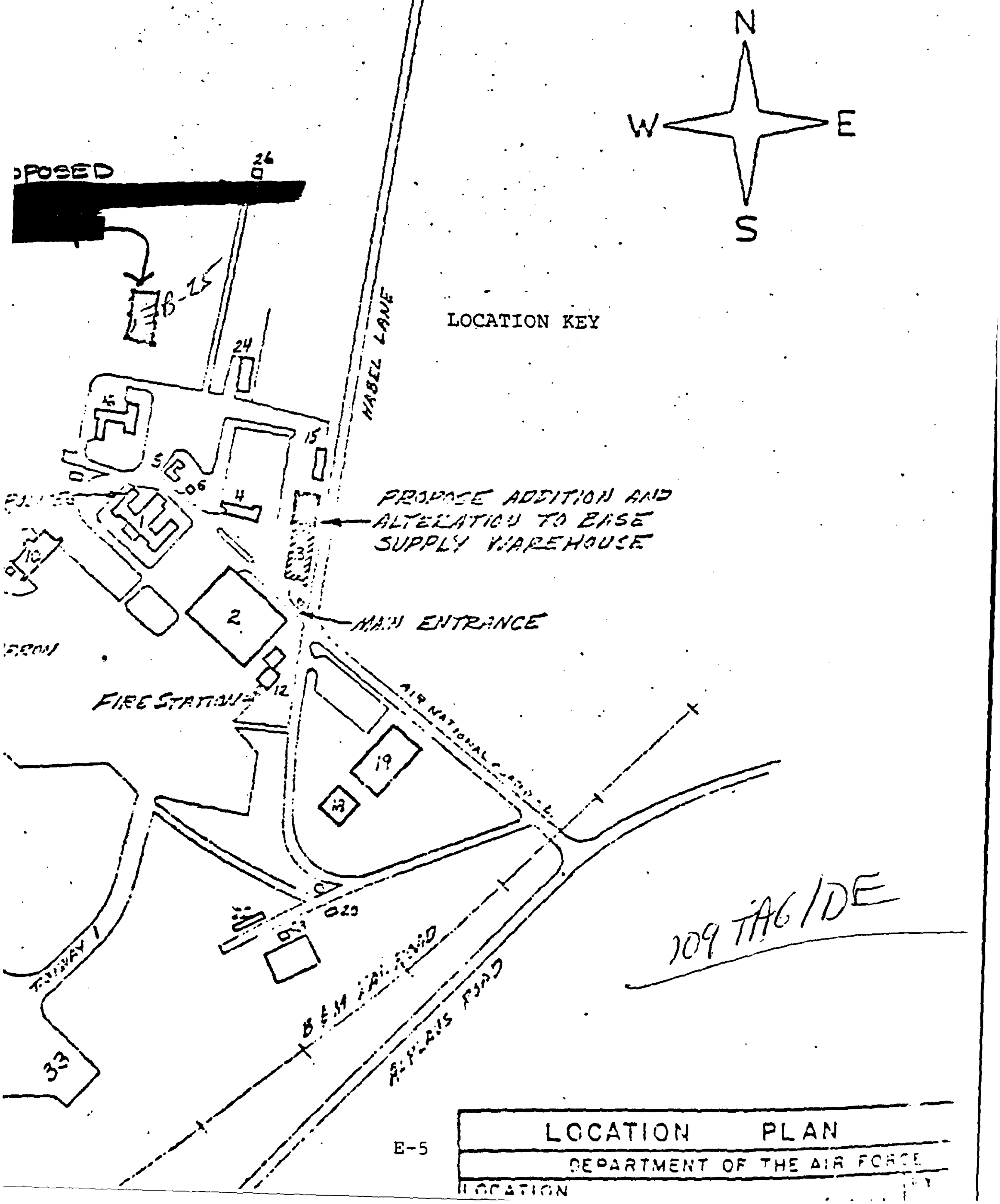
THE OBSERVED WATER LEVELS AND/OR CONDITIONS INDICATED ON THE SOIL PROFILES ARE AS RECORDED AT THE TIME OF DRILLING. THESE WATER LEVELS AND/OR CONDITIONS MAY VARY CONSIDERABLY, WITH TIME, ACCORDING TO THE PREVAILING CLIMATE RAINFALL AND OTHER FACTORS.

THE SUBSURFACE INFORMATION INDICATED ON THE SOIL PROFILES IS AS INTERPRETED BY THE MAIN OFFICE OF THE BUREAU OF SOIL MECHANICS FROM AN EXAMINATION OF THE BORING LOGS AND SOIL SAMPLES FROM THE VARIOUS EXPLORATIONS. REASONABLE CARE WAS TAKEN IN PERFORMING THIS WORK. THIS INFORMATION IS INTENDED FOR STATE DESIGN PURPOSES ONLY, AND IS MADE AVAILABLE TO BIDDERS ONLY THAT THEY MAY HAVE ACCESS TO IDENTICAL SUBSURFACE INFORMATION AVAILABLE TO THE STATE. IT IS PRESENTED IN GOOD FAITH, BUT IS NOT INTENDED AS A SUBSTITUTE FOR PERSONAL INVESTIGATIONS, INTERPRETATIONS OR JUDGMENT OF THE CONTRACTOR.

THE BORING LOGS AND SOIL SAMPLES, FROM WHICH THIS INFORMATION WAS DERIVED, ARE AVAILABLE FOR INSPECTION AT THE MAIN OFFICE OF THE BUREAU OF SOIL MECHANICS.

109 TAG/DE

Schenecatady County Airport
May 18, 1979
Appendix



GENERAL NOTES

DRILLING & SAMPLING SYMBOLS

SS : Split-Spoon – 1⅜" I.D., 2" O.D., except where noted
ST : Shelby Tube – 2" O.D., except where noted
PA : Power Auger Sample
DB : Diamond Bit – NX: BX: AX:
CB : Carboloy Bit – NX: BX: AX:
OS : Osterberg Sampler – 3" Shelby Tube
HS : Housel Sampler
WS : Wash Sample
FT : Fish Tail
RB : Rock Bit
WO : Wash Out

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch OD split spoon, except where noted.

WATER LEVEL MEASUREMENT SYMBOLS

WL : Water Level
WCI : Wet Cave In
DCI : Dry Cave In
WS : While Sampling
WD : While Drilling
BCR : Before Casing Removal
ACR : After Casing Removal
AB : After Boring

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils, the accurate determination of ground water elevations is not possible in even several days observation, and additional evidence on ground water elevations must be sought.

CLASSIFICATION

COHESIONLESS SOILS

"Trace"	:	1% to 10%	
"Trace to some"	:	10% to 20%	
"Some"	:	20% to 35%	
"And"	:	35% to 50%	
Loose	:	0 to 9 Blows	or equivalent
Medium Dense	:	10 to 29 Blows	or equivalent
Dense	:	30 to 59 Blows	or equivalent
Very Dense	:	≥ 60 Blows	or equivalent

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, then clay becomes the principle noun with the other major soil constituent as modifier; i.e., silty clay. Other minor soil constituents may be added according to classification breakdown for cohesionless soils: i.e., silty clay, trace to some sand, trace gravel.

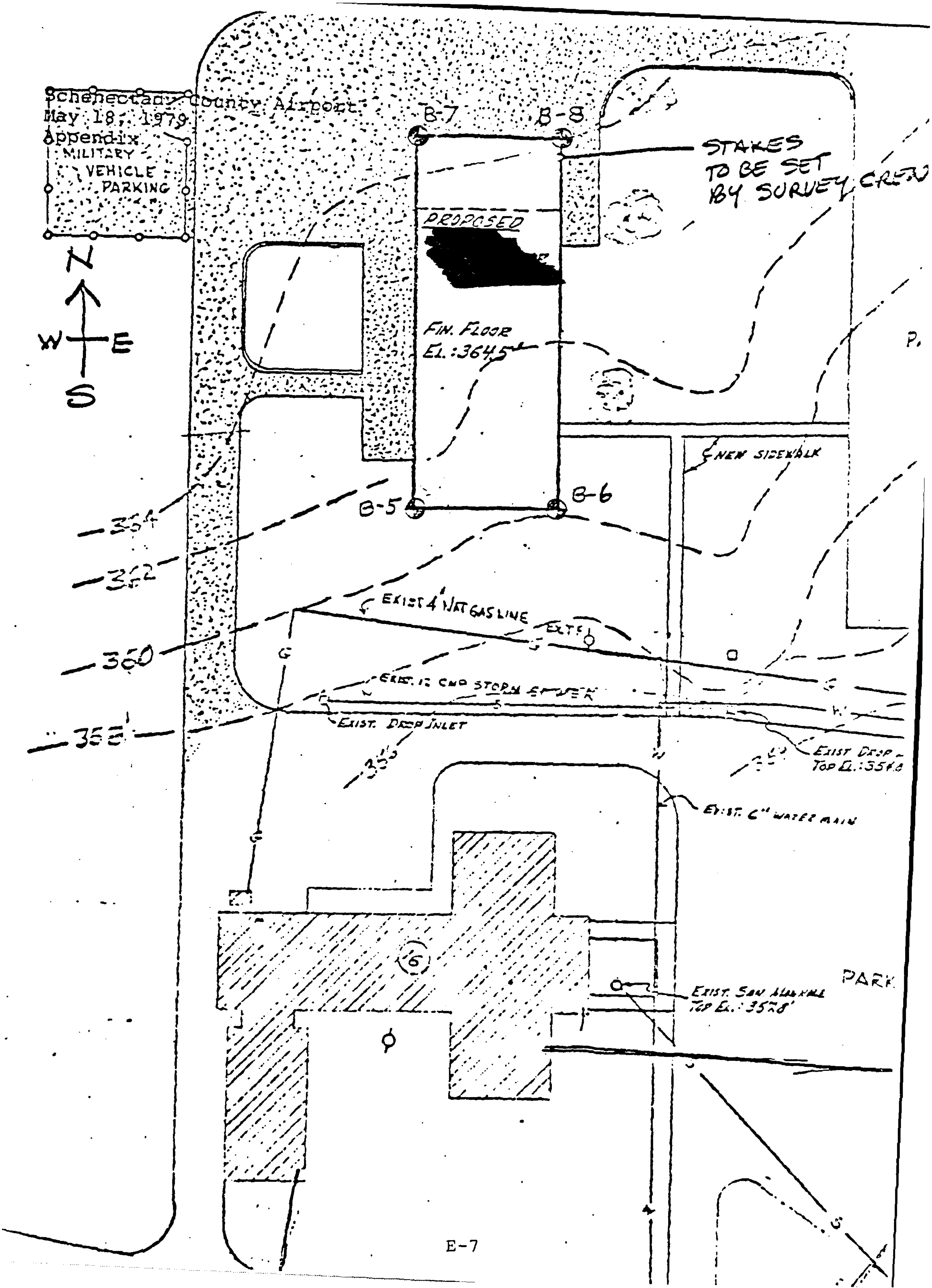
Soft	:	0.00 — 0.59 tons/ft²
Medium	:	0.60 — 0.99 tons/ft²
Stiff	:	1.00 — 1.99 tons/ft²
Very Stiff	:	2.00 — 3.99 tons/ft²
Hard	:	≥ 4.00 tons/ft²

GENERAL NOTES

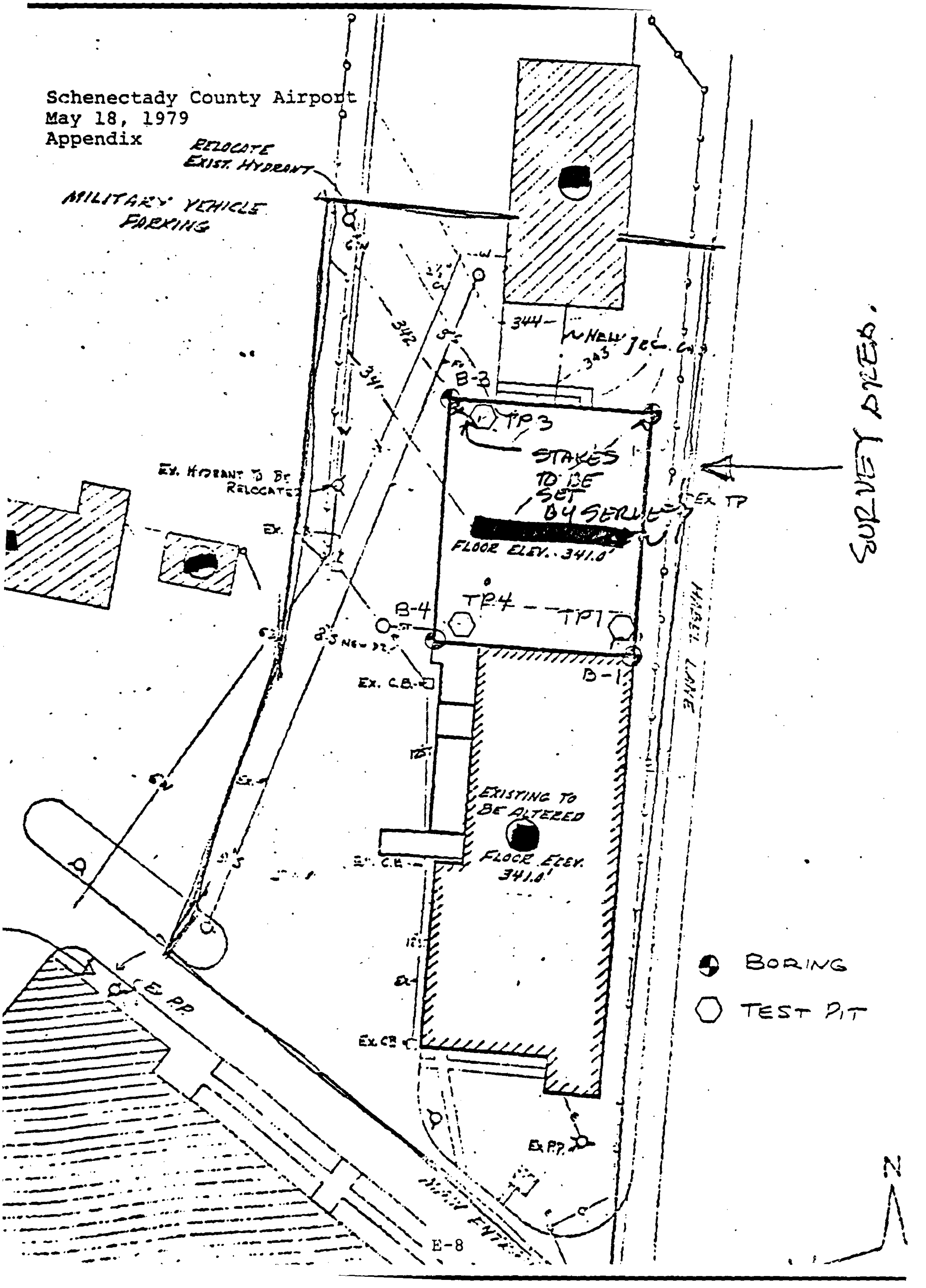
S·M·T

SOIL & MATERIAL TESTING, INC.
57 South Main Street
Castleton, N.Y. 12033

Schenectady County Airport
May 18, 1979
Appendix



Schenectady County Airport
May 18, 1979
Appendix



TEST PIT LOGS:

TP-1

0.0	- 4.0	Silty and clayey sand and gravel fill
4.0	- 5.0	Clayey topsoil with tree roots
5.0	- 5.5	Silty clay, dark gray to black
5.5	- 6.0	Silty fine to medium sand, wet

Water began flowing in from sand at bottom of test pit.

TP-3

0.0	- 3.0	Sand and gravel fill
3.0	- 5.0	Silty and clayey sand and gravel

No water

TP-4

0.0	- 2.0	Sand and gravel fill
2.0	- 4.0	Silty and clayey sand and gravel fill
4.0	- 5.5	Silty clay topsoil and tree roots
5.5	- 6.5	Silty clay, black to dark gray

No water

WNER	LOG OF BORING NUMBER
Schenectady County Airport	1
ROJECT NAME	ARCHITECT-ENGINEER
Warehouse Addition	Dodge, Chamberlin , Luzine

ITE LOCATION

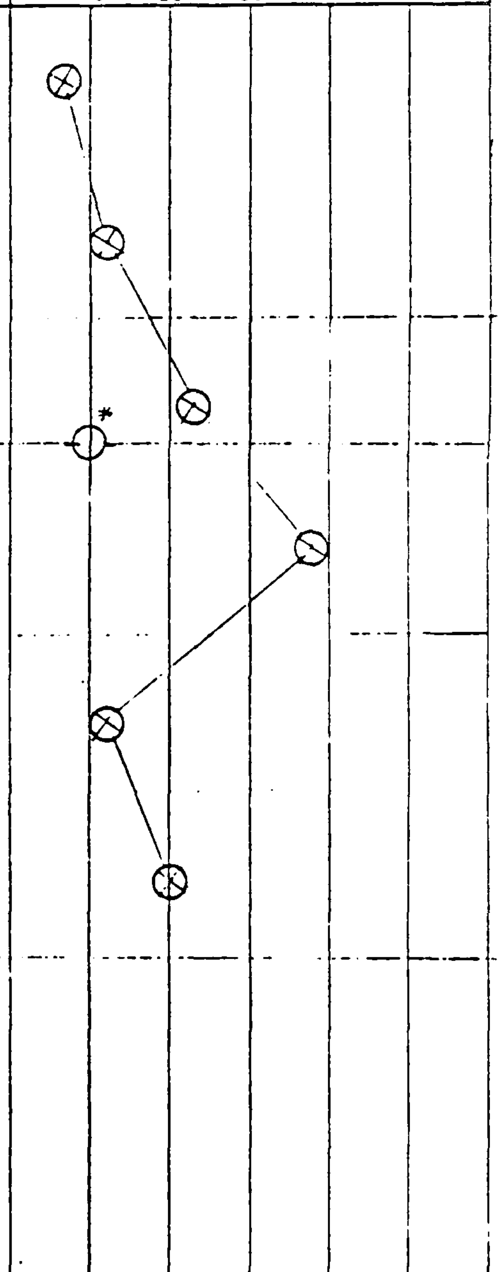
Schenectady, N.Y.

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT. 10 20 30 40 50

DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	1	SS			Layers of sand, clayey silt & gravel, trace organic, brown, (SM) and clayey silt, some sand, trace organic, brown, (ML-CL); moist, loose-medium dense, fill	
	2	SS				
5	3	SS			Fine sand, some silt, light grey, moist-wet, medium dense (SM) beneath layer of silty clay, black, stiff (CL-CH)	
	4	SS			Fine sand, some silt, brown, moist-wet, dense (SM)	
	5	SS			Sand, some silty clay & gravel, dark-grey, moist-wet, medium dense (SC)	
10	6	SS			Weathered shale, dark grey, wet, medium dense	
					End of boring 12.0'	
15						



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS or WD	BORING STARTED 5/1/79	SOIL & MATERIAL TESTING, INC.
WL	BCR ACR	BORING COMPLETED 5/1/79	57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033

OWNER	LOG OF BORING NUMBER
Schenectady County Airport	2
PROJECT NAME	**ARCHITECT-ENGINEER**
Warehouse Addition	Dodge, Chamberlin, Luzine

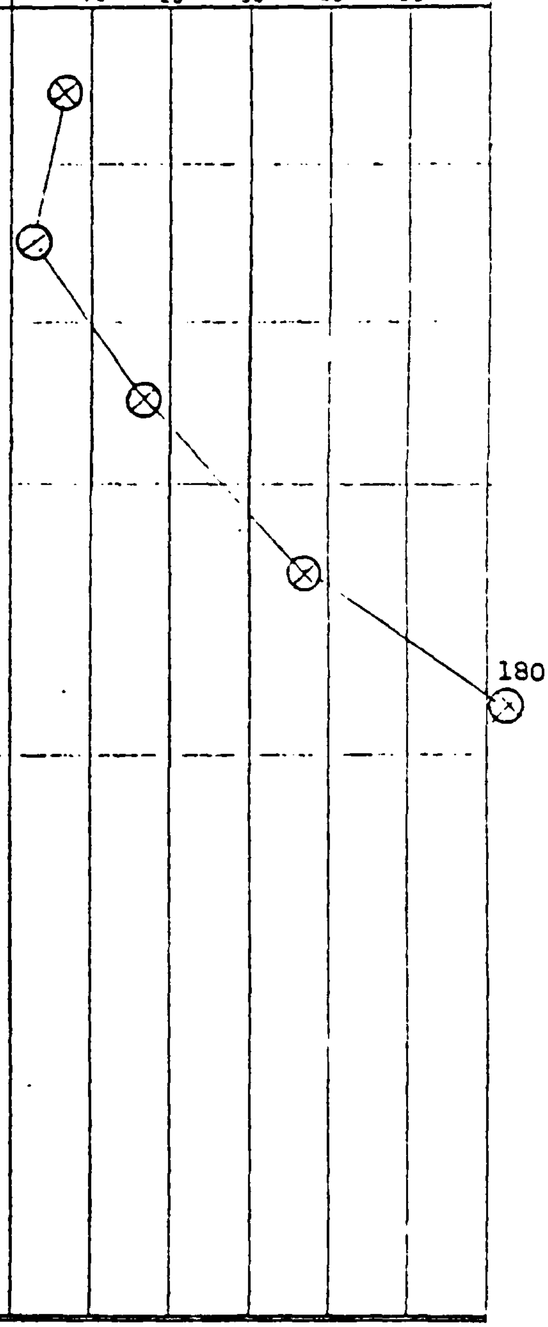
SITE LOCATION
Schenectady, N.Y.

—O— UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2}: 1 2 3 4 5

PLASTIC LIMIT % X - - - - WATER CONTENT % ● - - - - LIQUID LIMIT % △ : 10 20 30 40 50

⊗ STANDARD PENETRATION BLOWS/FT.: 10 20 30 40 50

ELEVATION	DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.^{3}
		1	SS			Sand & clayey silt, trace organic & roots, dark brown, moist, loose (SM-SC) topsoil & fill	
		2	SS			Fine-medium sand, trace silt, gravel & organic; brown, wet, saturated, loose (SP)	
	5	3	SS			Sand & gravel, some silty clay, grey, medium dense, moist, (SC-GC)	
		4	SS			Layers of fine -medium sand, trace silt, brown, moist, sand & gravel, some silty clay, & shale fragments, grey, dense-very dense (SP-SC)	
		5	SS				
	10					End of boring 9.5'	
	15						



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES; IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS or WD	BORING STARTED 5/1/79	SOIL & MATERIAL TESTING, INC. 57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033
WL BCR	ACR	BORING COMPLETED 5/1/79	
WL		RIG A-86 FOREMAN DW	APPROVED BY VCH SMT JOB NO. 71742

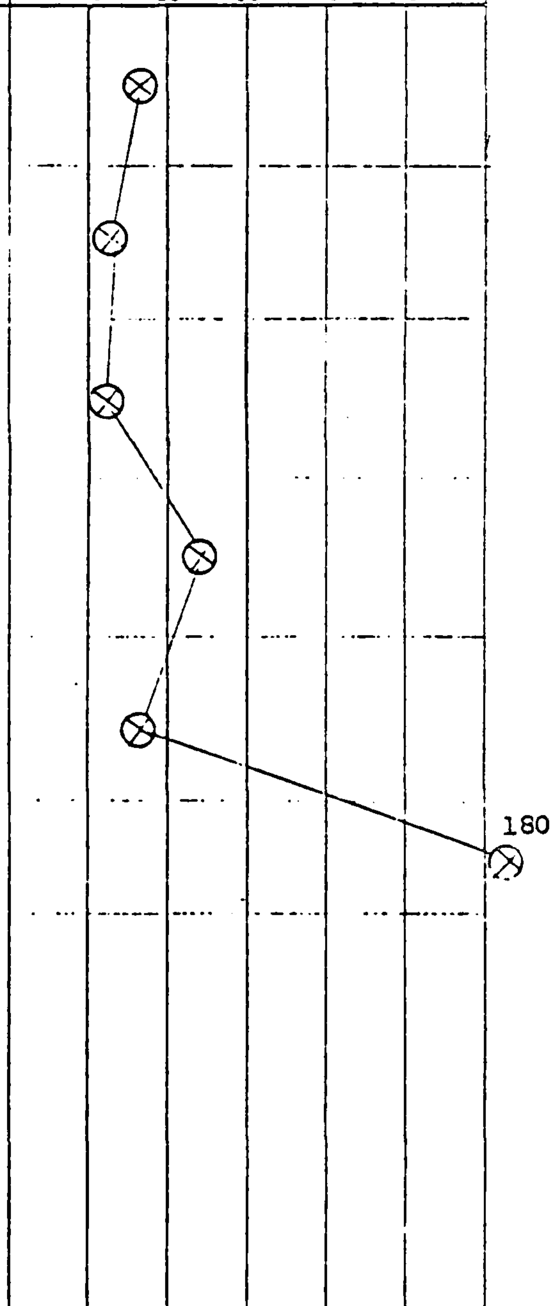
OWNER	LOG OF BORING NUMBER
Schenectady County Airport	3
PROJECT NAME	**ARCHITECT-ENGINEER**
Warehouse Addition	Dodge, Chamberlin, Luzine
SITE LOCATION	
Schenectady, N.Y.	

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT. 10 20 30 40 50

ELEVATION / DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	1	SS			Fine-coarse sand, trace-some silt & fine gravel, brown, moist, medium dense (SP) fill	
	2	SS			Sand & gravel, some silty clay, grey, medium dense, moist, (SC) fill	
5	3	SS			Sand, some clayey silt & gravel, grey, medium dense, moist (SC-SM)	
	4	SS			Layers of silty clay, grey brown, stiff (CL) & fine sand, some silt, grey, moist, medium dense (SM)	
	5	SS			Sand & gravel, some silty clay, grey, medium dense, moist (SC)	
10	6	SS			Grey & sand, trace silt, with clay lumps, trace roots, brown, moist, dense (GM-SM)	
15					End of boring 11.5' Refusal to SS	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL WS or WD	BORING STARTED 5/1/79	SOIL & MATERIAL TESTING, INC. 57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033
WL BCR ACR	BORING COMPLETED 5/1/79	
WL	RIG A86 FOREMAN DW	APPROVED BY [illegible] SMT JOB NO. [illegible]

E-12

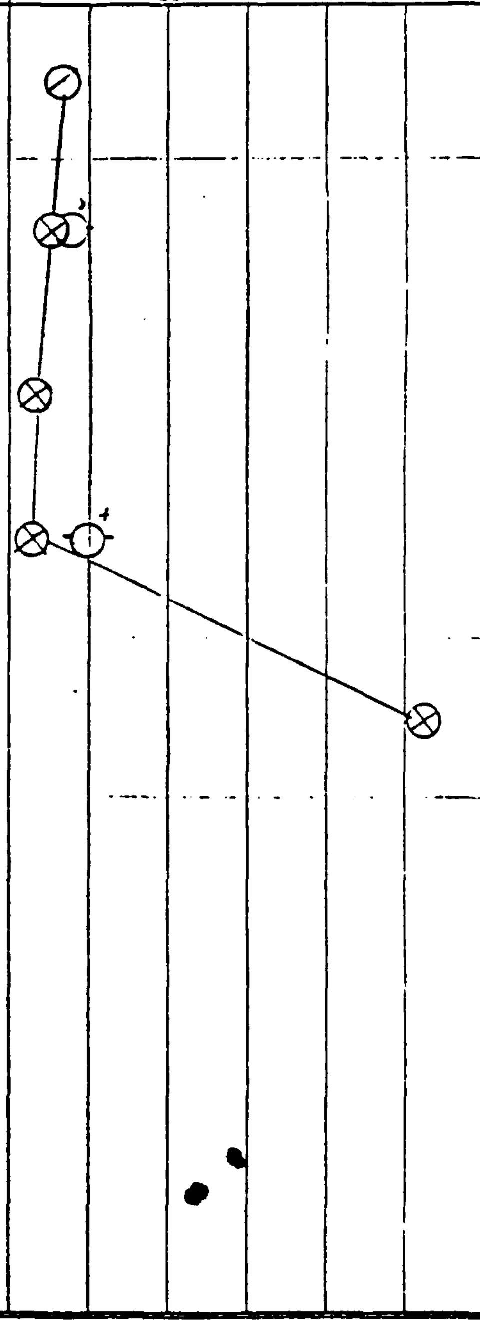
OWNER	LOG OF BORING NUMBER
Schenectady County Airport	4
PROJECT NAME	**ARCHITECT-ENGINEER**
Warehouse Addition	Dodge, Chamberlin, Luzine
SITE LOCATION	
Schenectady, N.Y.	

ELEVATION / DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	1	SS			Fine-coarse sand, trace-some gravel, trace silt, brown, moist, loose (SP-SM) fill	
	2	SS			Sand, some silt, grey, loose, moist, (SM) & layer of silty clay, dark grey, medium (CL-CH) *Fill*	
5	3	SS				
	4	SS			Fine-coarse sand, trace-some gravel, trace silt, grey, wet, loose (SM) with layers of silty clay, medium, dark grey, (CL-CH)	
	5	SS			Weathered shale, dense-very dense	
10					End of boring 10.0' Refusal to SS	
15						

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT. 10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS or WD	BORING STARTED	SOIL & MATERIAL TESTING, INC. 57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033
WL BCR	ACR	BORING COMPLETED	
WL		RIG FOREMAN	APPROVED BY / SMT JOB NO.

OWNER	LOG OF BORING NUMBER
Schenectady County Airport	5
PROJECT NAME	**ARCHITECT-ENGINEER**
Proposed Engineering Bldg.	Dodge, Chamberlin, Luzine

SITE LOCATION
Schenectady, N.Y.

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % (10 20 30 40 50)

STANDARD PENETRATION BLOWS/FT. (10 20 30 40 50)

ELEVATION / DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³	STANDARD PENETRATION BLOWS/FT.
	1	SS			Silty clay, some sand, trace gravel & root, brown, stiff, moist (CL) topsoil		
	2	SS			Sand & gravel, some silty clay, moist, gray, dense-very dense		171
5							
					End of boring 5.0' PA refusal SS refusal 3.0-3.5		

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS or WD	BORING STARTED 5/1/79	SOIL & MATERIAL TESTING, INC.
WL BCR	ACR	BORING COMPLETED 5/1/79	57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033

OWNER	LOG OF BORING NUMBER
Schenectady County Airport	6
PROJECT NAME	ARCHITECT-ENGINEER
Proposed Engineering Bldg	Dodge, Chamberlin, Luzine

SITE LOCATION
Schenectady, N.Y.

-O- UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT %
10 20 30 40 50

⊗ STANDARD PENETRATION BLOWS/FT.
10 20 30 40 50

ELEVATION / DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	1	SS			Silty clay & sand, trace organic, brown, moist, medium dense or very stiff (CL-SL)	
	2	SS				
					Weathered shale, very dense, grey, moist	
5						
					End of boring 5.0' PA Refusal SS Refusal at 3.0-3.5'	

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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS or WD	BORING STARTED 5/1/79	SOIL & MATERIAL TESTING, INC.
WL BCR	ACR	BORING COMPLETED 5/1/79	57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033
WL		RIG FOREMAN	APPROVED BY

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OWNER	LOG OF BORING NUMBER
Schenectady County Airport	7
PROJECT NAME	ARCHITECT-ENGINEER
Proposed Engineering Bldg.	Dodge, Chamberlin, Luzine

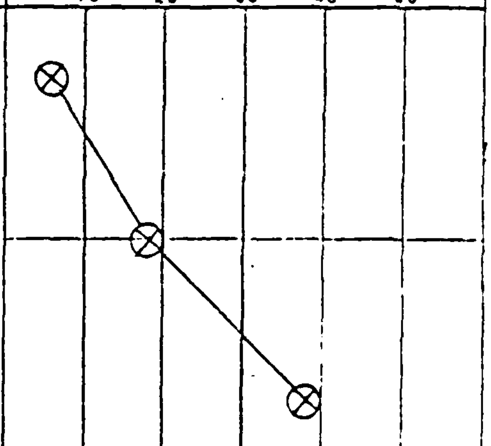
SITE LOCATION
Schenectady, N. Y.

ELEVATION	DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
		1	SS			Topsoil over clayey silt, some sand & gravel, trace organic, brown, moist, loose (ML-CL)	
		2	SS				
						Weathered shale, brown, moist, medium dense-very dense	
	5	3	SS				
						End of boring 6.0'	
	10						

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT. 10 20 30 40 50



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL WS or WD	BORING STARTED 5/7/79	SOIL & MATERIAL TESTING, INC. 57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033
WL BCR ACR	BORING COMPLETED 5/7/79	
WL	RIG FOREMAN	APPROVED BY	SMT JOB NO. 71 742

OWNER	LOG OF BORING NUMBER
Schenectady County Airport	8
PROJECT NAME	**ARCHITECT-ENGINEER**
Proposed Engineering Bldg.	Dodge, Chamberlin, Luzine

SITE LOCATION

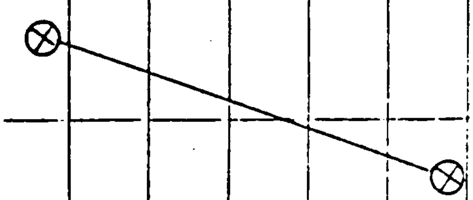
Schenectady, N.Y.

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² — 1 2 3 4 5

PLASTIC LIMIT % — WATER CONTENT % — LIQUID LIMIT % — 10 20 30 40 50

STANDARD PENETRATION BLOWS/FT. — 10 20 30 40 50

ELEVATION	DEPTH	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS./FT.³
	X						
		1	SS			Sand & silty clay, brown, moist-wet, loose-medium dense (ML-CL)	
		2	SS			Weathered shale, dark grey, medium dense,-very dense, moist	
						End of boring 3.5'	



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDRY LINES BETWEEN SOIL TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS or WD	BORING STARTED 5/7/79	SOIL & MATERIAL TESTING, INC. 57 SOUTH MAIN STREET CASTLETON-ON-HUDSON, N. Y. 12033
WL BCR	ACR	BORING COMPLETED 5/7/79	
WL @ surface AB		RIG Tripod FOREMAN rw	APPROVED BY VCH · SMT JOB NO. 71742

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APPENDIX F

Underground Storage Tank Inventory

Underground Storage Tank Inventory, 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.

TANK LOCATION IDENTIFICATION

Location	1-1	2-1	3-1	4-1	410-1	410-2	410-3	4-2
Capacity (gallons)	7,500	7,500	7,500	6,000	1,000	2,000	2,000	600
Contents	Fuel Oil	Fuel Oil	Fuel Oil	Fuel Oil	Gasoline	Diesel Fuel	Gasoline	Waste Oil
Year Installed	1974	1975	1981	1974	1951	1972	1972	1973
Material of Construction	Welded Steel	Welded Steel	Welded Steel	Welded Steel	Welded Steel	Welded Steel	Welded Steel	Concrete
Coatings A. Interior B. Exterior	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Uncoated
Cathodic Protection	None	None	None	None	None	None	None	None
Piping	Welded Steel	Welded Steel	Welded Steel	Welded Steel	Galvanized Steel	Galvanized Steel	Galvanized Steel	Unknown
Status of Tank (date abandoned)	In Use	In Use	In Use	In Use	In Use	In Use	In Use	In Use
Remarks	None	None	None	None	None	None	None	Oil/Water Separator

Underground Storage Tank Inventory, 109th TAG, New York Air National Guard, Schenectady County Airport, Scotia, New York.

TANK LOCATION IDENTIFICATION

Location	4-3	8-1	8-2	800-1	800-2	800-3	800-4	10-1
Capacity (gallons)	1,000	7,500	3,500	25,000	25,000	25,000	25,000	6,000
Contents	Waste Oil	Waste JP-4	Waste JP-4	JP-4	JP-4	JP-4	JP-4	Fuel Oil
Year Installed	1978	1977	1977	1951	1951	1951	1951	1973
Material of Construction	Concrete	Concrete	Concrete	Welded Steel	Welded Steel	Welded Steel	Welded Steel	Welded Steel
Coatings A. Interior B. Exterior	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt	A. Uncoated B. Asphalt
Cathodic Protection	None	None	None	None	None	None	None	None
Piping	Unknown	Unknown	Unknown	Asphalt-coated Steel	Alphalt-coated Steel	Asphalt-coated Steel	Asphalt-coated Steel	Welded Steel
Status of Tank (date abandoned)	In Use	In Use	In Use	In Use	In Use	In Use	In Use	In Use
Remarks	Oil/Water Separator	Oil/Water Separator	Oil/Water Separator	None	None	None	None	None

Underground Storage Tank Inventory, 109th TAG, New York Air National Guard,
Schenectady County Airport, Scotia, New York.

TANK LOCATION IDENTIFICATION

Location	10-2	10-3	11-1	11-2	11-3	2101	12-1	12-2	15-1
Capacity (gallons)	1,500	1,000	6,000	1,500	1,000	450	3,000	600	6,000
Contents	Waste Oil	Waste Oil	Fuel Oil	Waste Oil	Waste Oil	Water/Sewage	Fuel Oil	Waste Oil	Fuel Oil
Year Installed	1961	1973	1973	1961	1973	1975	1981	1978	1973
Material of Construction	Concrete	Concrete	Welded Steel	Concrete	Concrete	Concrete	Welded Steel	Concrete	Welded Steel
Coatings A. Interior B. Exterior	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Asphalt	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Asphalt	A. Uncoated B. Uncoated	A. Uncoated B. Asphalt
Cathodic Protection	None	None	None	None	None	None	None	None	None
Piping	Unknown	Unknown	Welded Steel	Unknown	Unknown	Unknown	Welded Steel	Welded Steel	Welded Steel
Status of Tank (date abandoned)	Abandoned (1973)	In Use	In Use	Abandoned (1973)	In Use	In Use	In Use	In Use	In Use
Remarks	Oil/Water Separator	Oil/Water Separator	None	Oil/Water Separator	Oil/Water Separator	Sewage Lift Station	None	Oil/Water Separator	None

Underground Storage Tank Inventory, 109th TAG, New York Air National Guard,
Schenectady County Airport, Scotia, New York.

TANK LOCATION IDENTIFICATION

Location	18-1	18-2	19-1	2000	2102	2400	19-2	21-1	2-2	2103
Capacity (gallons)	6,000	500	11,250	100,000	2,000	375,000	500	3,000	1,000	7,000
Contents	Fuel Oil	Waste Oil	Fuel Oil	Water	Water/Sewage	Sewage	Waste Oil	Waste Oil	Waste Oil	Water/ Sewage
Year Installed	1976	1976	1976	1951	1951	1975	1976	1961	1973	1985
Material of Construction	Welded	Concrete Steel	Welded	Concrete Steel	Concrete	Polyurethane	Concrete	Welded	Concrete Steel	Concrete
Coatings A. Interior B. Exterior	A. Uncoated B. Asphalt	A. Uncoated B. Uncoated	A. Uncoated B. Asphalt	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated	A. Uncoated B. Asphalt	A. Uncoated B. Uncoated	A. Uncoated B. Uncoated
Cathodic Protection	None	None	None	None	None	None	None	None	None	None
Piping	Welded Steel	Unknown	Welded Steel	Unknown	Unknown	Unknown	Unknown	Galvanized Steel	Unknown	PVC
Status of Tank (date abandoned)	In Use	In Use	In Use	Abandoned (1976)	In Use	In Use	In Use	In Use	In Use	In Use
Remarks	None	Oil/Water Separator	None	Water Storage	Sewage Pump Station	Sewage Lagoon with Polyurethane Liner	Oil/Water Separator	None	Oil/Water Separator	Bypass Line Settling Tank