AFP59 01007

INSTALLATION RESTORATION PROGRAM
PHASE II PRESURVEY REPORT FOR
U.S. AIR FORCE PLANT NO. 59
JOHNSON CITY, NEW YORK

Prepared by:

Fred C. Hart Associates, Inc.
530 Fifth Avenue
New York, New York 10036

Prepared for:

Department of the Air Force
Occupational and Environmental Health Laboratory
Brooks Air Force Base, Texas 78235

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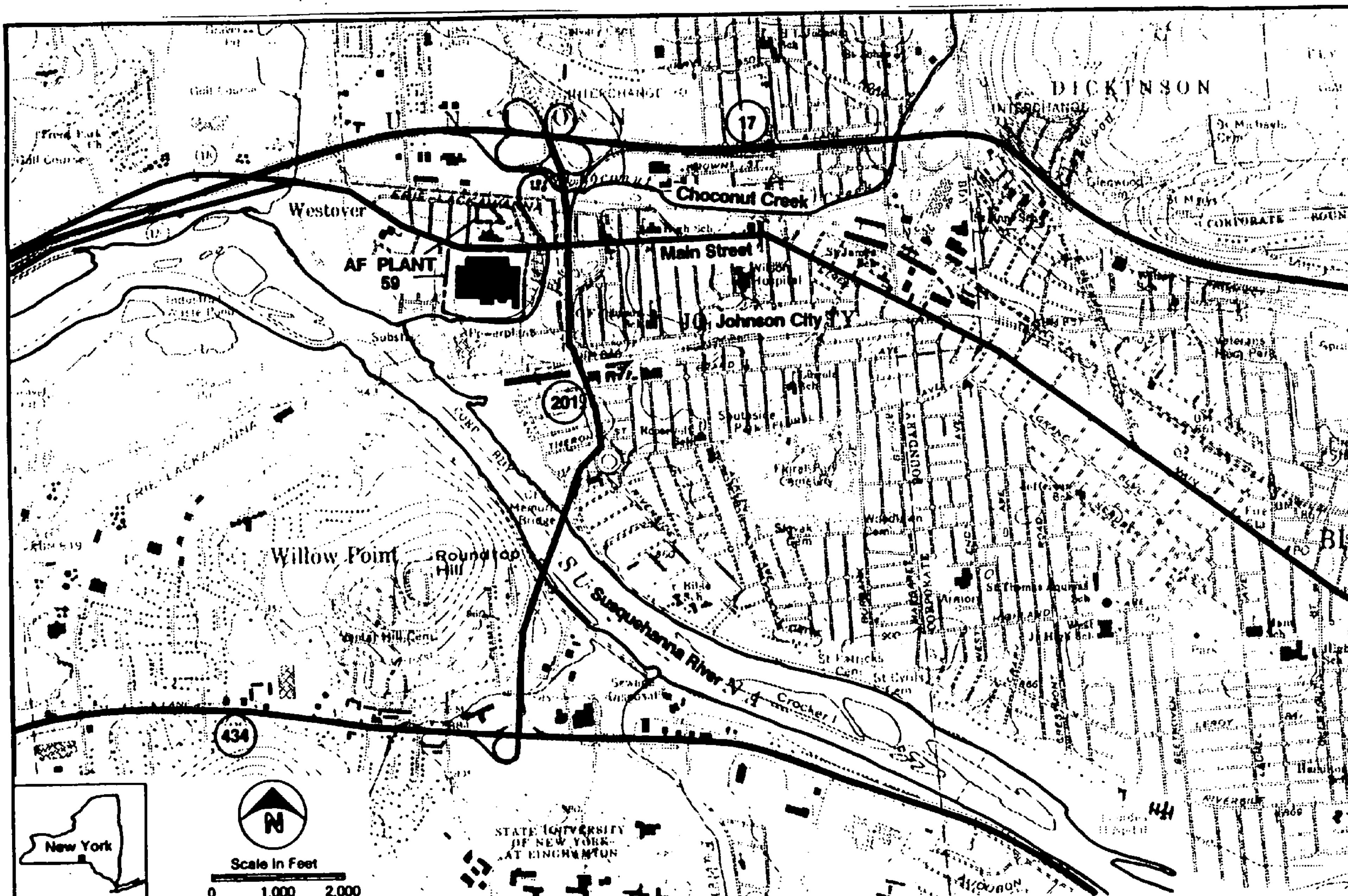
A. INTRODUCTION

As requested by the U.S. Air Force Occupational and Environmental Laboratory (OEHL), Fred C. Hart Associates has prepared the following Pre-survey Report for Phase II confirmation work at the Air Force Plant 59 (AFP), in Johnson City, New York. The recommended work is based upon review of several documents; Phase I - Records Search (October 1984), and assorted data provided by the U.S. Air Force (USAF) and General Electric Company (GE) at the AFP, personnel and included data gathered at a site visit conducted on October 31, 1985. The level of effort, types of investigations and specific components of certain tasks are modifications of those contained in the above documents. This specific approach was taken with the intent to fulfill the requirements of the USAF Phase II investigation philosophy.

This scope of work begins with a review of the background information on the facility including: History of Plant Operations, Hazardous Materials Handling, Potential Sources of Environmental Contamination, and the Environmental Setting. The Recommended Scope of Work outlines the proposed tasks and they are described individually in the Detailed Scope of Work. This scope of work is to be used in conjunction with Technical Operations Plan to define all field operations.

B. BACKGROUND

The AFP is located in Broome County, New York, in the Village of Johnson City, about 3 miles west-northwest of the center of the City of Binghamton, and about 4 miles east of the center of the Village of Endicott. Other nearby towns (within 5 miles) include Maine, Chenango, Dickinson, Union, Binghamton, and Vestal. A location and vicinity map of AFP is shown in Figure 1, and a site map is shown in Figure 2.



From CH2M HILL, 1984

FIGURE 1
Location and Vicinity Map of Air Force Plant 59

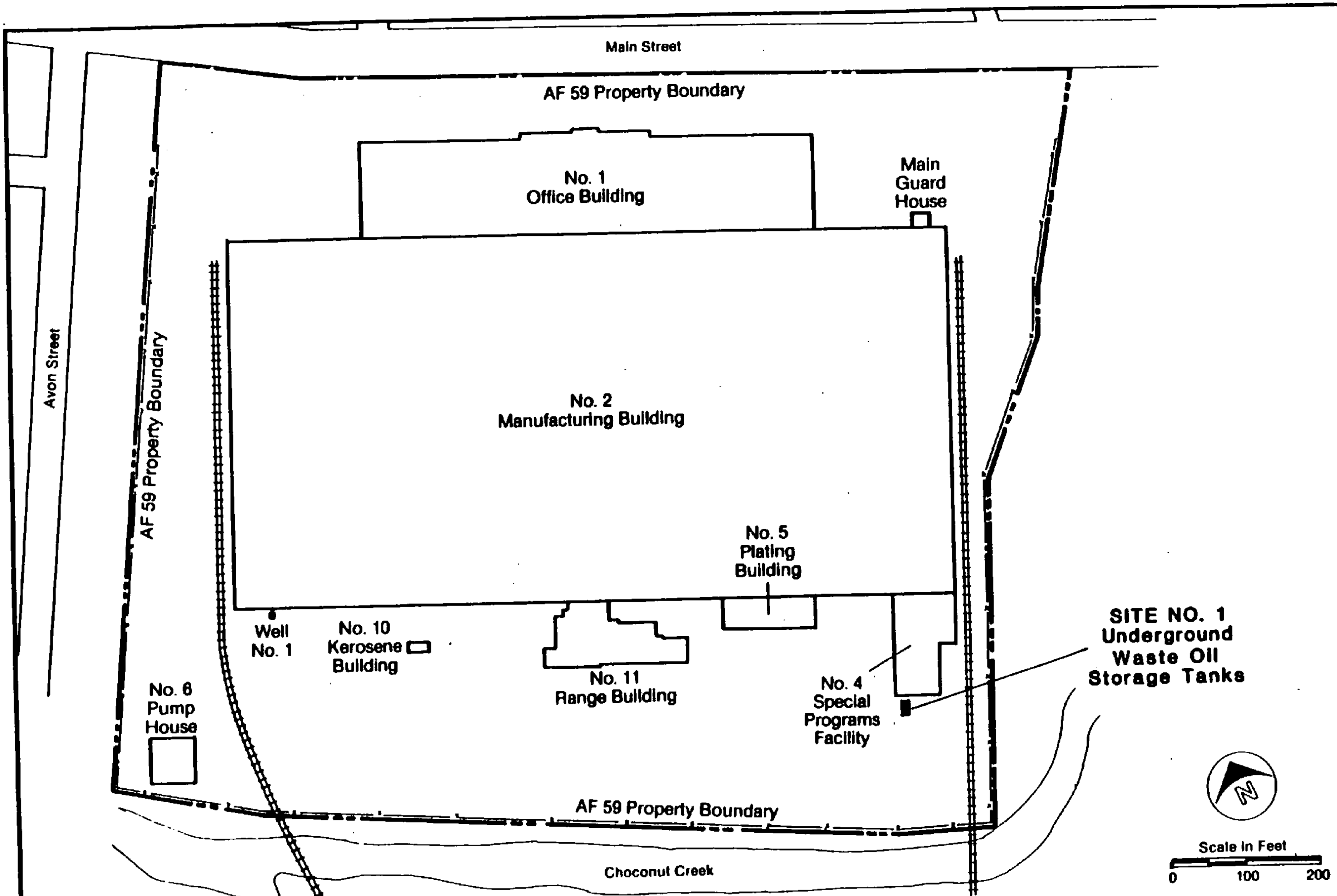


FIGURE 2

Site Map, Indicating Area of Potential Contamination

From CH2M HILL, 1984

The total land area of AFP is 29.6 acres. The main entrance of AFP is at 600 Main Street (New York State Route 17C), which is the northern boundary of the installation. The AFP is located on a bend of Little Choconut Creek which runs just to the east and south of the installation. The confluence of Little Choconut Creek and the Susquehanna River is about 1,000 feet west of the southwest corner of the plant. A 0.6-acre parking lot which is part of AFP property, but not contiguous with the main plant-site, is located north of Main Street.

The AFP is an Air Force-owned electro-mechanical systems production facility operated under contract by the General Electric Company. Aircraft electronic equipment is manufactured for both military and commercial clients. Authority to use Government-owned facilities for non-government work is obtained on a continuing basis from the Defense Logistics Agency.

The mission of AFP is the manufacture and assembly of electronic and electro-mechanical equipment. General Electric Company is currently producing flight control systems, weapons control systems, laser systems, internal navigation and guidance systems, and aerospace ground support equipment.

B-1 History of Plant Operations

The AFP was designed and built by PLANCOR, the Defense Plant Corporation, a subsidiary of the Reconstruction Finance Corporation in 1942. The original building contained 621,500 square feet of floor space and has remained essentially unchanged.

The original contractor at the plant was Remington Rand, Incorporated. Remington Rand manufactured aluminum aircraft propellers for the Second World War effort from 1942 to 1945, and then closed.

In April 1949, AFP was reopened as an aircraft controls manufacturing facility with General Electric Company as the sole contractor. The major manufacturing process at that time was parts machining for electro-mechanical control systems. Machine shop activity peaked in 1967 at the height of the Vietnam War effort.

Activity at the plant dropped off markedly in the 1970s. Parts machinery activities were further curtailed as a result of technological advances that have made control systems more strictly electrical in nature. Currently, 2,300 employees work at AFP on three shifts.

Several improvements have been made to the outdoor facilities at AFP over the years. In 1959, the gravel and dirt parking lots surrounding the manufacturing building were paved. New York State built an earthen containment dike along the banks of the Little Choconut Creek as part of a mid-1960s flood control project. A water supply well was drilled immediately south of the manufacturing building to reduce the plant's usage of municipal water in 1974. A water recharge well for non-contact cooling water was also drilled at this time but its use was quickly discontinued due to subsurface subsidence. General Electric Company discontinued its use of the railroad spur in the early 1950s, the spur was paved over, and the trestle over Little Choconut Creek was eventually removed in 1980.

General Electric Company currently manufactures flight control, laser systems, weapons control, internal navigation, and guidance systems at AFP. These systems are used in various military aircraft including the F-18, F-15, F-111, and B-1. In addition, a small amount of work is done for Boeing 757 and 767 commercial jets.

B-2 Hazardous Materials Handling

Industrial operations at AFP were performed by Remington Rand from 1942 to 1945, and by GE from 1949 to the present. The plant was idle during the intervening 4 years. Remington Rand manufactured airplane propellers; GE manufactures aerospace control and electrical systems.

Manufacture of these aircraft-associated parts resulted in generation of varying quantities of the same waste products. Wastes generated are (a) waste oils, including cutting oils, lubricating oils, and coolants; (b) spent solvents, including degreasers; (c) spent process chemicals, including plating acids, caustics, chromium and cyanide solutions; and (d) paint residues. The total quantity of these wastes currently generated is about 50,000 gallons per year. Waste quantities are dependent on contractor workload and have varied over time.

In general, the standard procedures for past and present industrial waste disposal practices have been as follows: (1) concentrated plating baths have been neutralized in an aboveground holding tank and removed by a contractor (1952 to present); (2) plating rinsewater was treated in a settling tank for metal precipitation prior to discharge to Outfall 001 (1952 to 1969); plating rinsewater was treated in a settling tank for chromium reduction and metal precipitation prior to discharge to Outfall 001 (1969 to July 1984); plating rinsewater is treated by an anion and cation exchange column and reused (July 1984 to present); (3) waste oils were primarily recovered, with some waste oils being discharged to an oil/water separator upstream of Outfall 002 (1942 to 1953); waste oils are discharged to two underground waste oil storage tanks and removed by a contractor (1953 to present); and (4) kerosene-based degreasing solvents were disposed of with the waste oils (1942 to 1969); spent solvents are drummed and removed by a contractor (1969 to present).

B-3 Potential Sources of Environmental Contamination

The main area of potential environmental contamination is the Underground Waste Oil Storage Tanks area (Site No. 1) (Figure 2). Waste oils including synthetic hydraulic oils, cutting oils, and coolants are collected from the various machining areas of the plant by a "Spencer Vac" system, which consists of a small mobile collection tank and vacuum system. Prior to 1969, some non-chlorinated kerosene-based degreasers were also placed in the storage tanks. Once collected, the waste oils are then pumped from the "Spencer Vacs" by an air pump located inside the main building to the two underground waste oils tanks located outside of

Building No. 4. The waste oils are then temporarily stored for subsequent vacuum truck pickup and disposal by a private contractor.

The waste oil tanks are inspected daily to prevent overtopping of the tanks. However, waste oil spills have occurred during the contractor removal of the tank contents, which is conducted on a monthly basis. Interviewees reported that the spills were the result of the release of the residual volume of the vacuum truck suction hose. The area surrounding the tanks had been backfilled with gravel during their installation. The gravel area surrounding both tanks was heavily stained. In the past, the stained gravel had been removed and replaced with fresh gravel for aesthetic reasons.

Area No. 1 has been identified as a potential threat due to the close proximity of wells and the fact that the population within 3 miles of the site is served by groundwater. The waste oils are identified are hazardous and persistent.

B-4 Environmental Setting

The environmental data review for this investigation indicated the following major points that are relevant to the evaluation of past hazardous waste management practices at the AFP.

° The average annual temperature for nearby Binghamton is 46°F. Monthly mean temperature vary from 20°F in January to 69°F in July.

° Mean annual precipitation recorded in the vicinity of AFP is about 37 inches per year. The wettest month is June and the driest is February. On the average, precipitation is evenly distributed throughout the year.

° Mean annual lake evaporation, commonly used to estimate the mean annual evapotranspiration rate, is estimated to be 28 inches per year. Evapotranspiration over land areas may be greater or less than lake evaporation depending on vegetative cover type and moisture availability.

Mean annual net precipitation (mean annual precipitation minus mean annual evapotranspiration) is approximately 9 inches per year.

° The AFP is situated on valley fill sediments deposited by Pleistocene glaciers during the last ice age. This "fill" material is located in the trough-shaped valleys cut into the bedrock by glacial action. In general the valleys that have been filled in by glacial deposits are now occupied by a post-glacial river flood plain. The AFP is located in the flood plain of the post-glacial Susquehanna River. (A flood levee has been installed along Little Choconut Creek to eliminate the potential for flooding of the plant site and surrounding area.)

° The bedrock material that underlies the glacial deposits throughout southern New York consists of Devonian shales, siltstones, and sandstones. The glacial sediments that are commonly found as valley fill include fine lake sediments, sand, and gravel.

° The site specific lithology can be described as being a series of gravels intermixed with clay and sand. The upper 27 feet of material is a series of sand and gravel apparently free of large amounts of silt and clay. Beneath the sandy gravel, a 37-foot thick zone of clay and gravel is present. Beneath the clay and gravel, another sand and gravel zone occurs, extending to the bedrock at 94 feet.

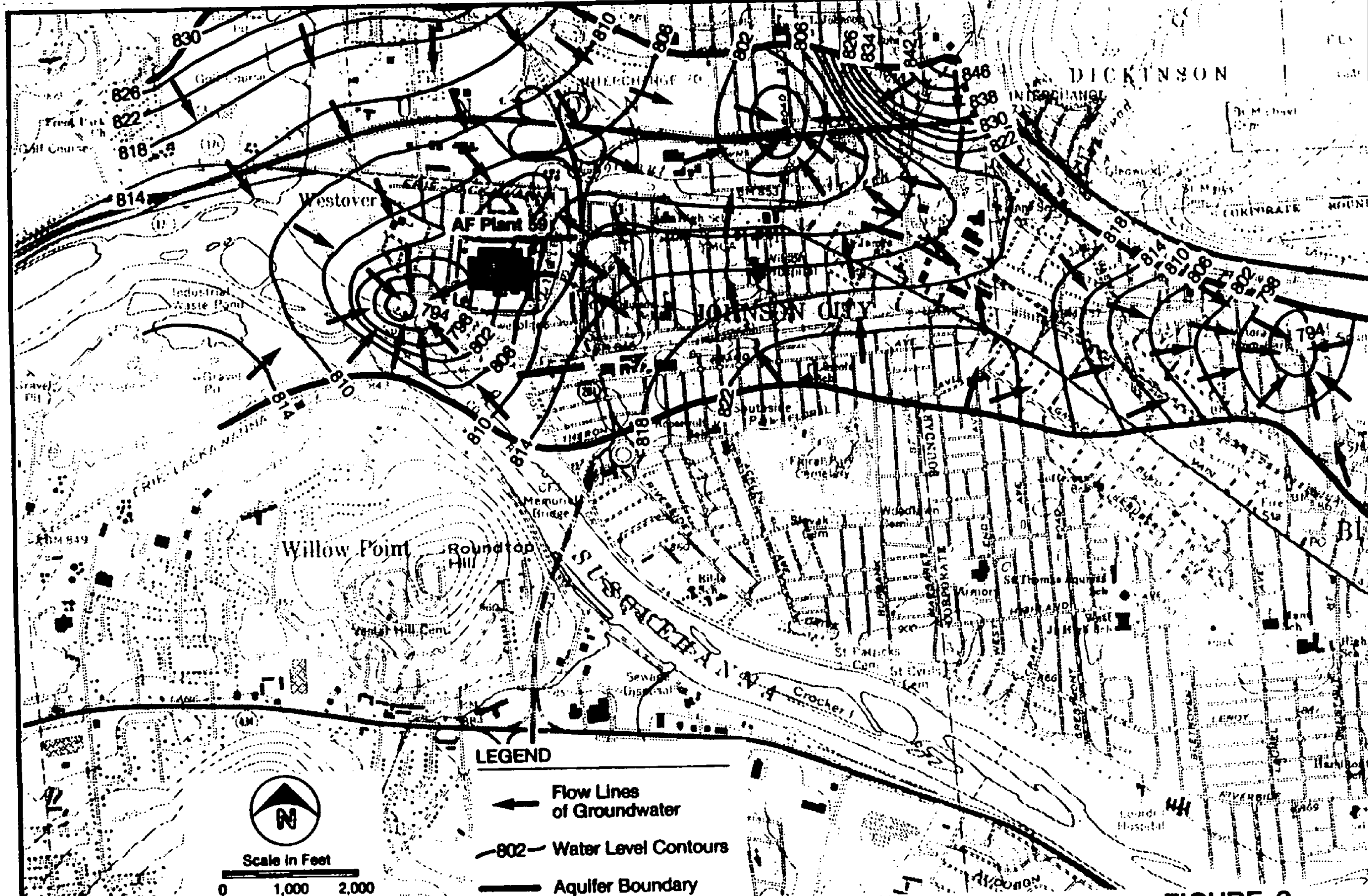
° Storm-water runoff from a large part of the southern area of the plant discharges to Little Choconut Creet at Outfall 002 via the oil/water separator located behind the plating building. Storm-water runoff from the remaining areas is generally directed off site in an unchannelized system.

° The AFP overlies a major glacial aquifer that provides water for Johnson City municipal supply. This aquifer, named the Clinton Street-Ballpart Aquifer is generally confined to the pre-Susquehanna River channel that was filled with highly permeable sands and gravels by glacial meltwaters. The depth of the glacial material is about 90 feet at AFP Well No. 1, with the main sand and gravel aquifer occupying the bottom 30 feet of the sequence.

° Hydraulic connection between the Clinton Street-Ballpark Aquifer and the Susquehanna River is well documented and a case of coliform bacteria contamination of a municipal well by ground-water movement from the river has been recorded in nearby Endicott. The aquifer is also connected to smaller feeder streams to the Susquehanna. This is evidenced by studies that have shown the water loss of Little Choconut Creek as the Stream flows across the aquifer.

° The ground-water contours in the Clinton Street-Ballpark Aquifer in October 1967 are shown in Figure 3. These contours are believed to generally reflect present day levels. The AFP lies within the cone of depression of the municipal well field for Johnson City. The Johnson City well field consists of four wells pumping 3.3 mgd (2,290 gpm). The pumping effects of this well field create a general ground-water gradient of 2 ft/450 ft (.0044) across the southern end of the AFP when AFP Well No. 1 is not pumping. Ground-water flow direction is toward the Johnson City well cluster to the southwest of the plant. During operating hours, Well No. 1 probably creates a cone of depression that induces groundwater flow within the plant boundaries towards the well. When Well No. 1 is shut down, the ground-water contours tend to revert to those shown in Figure 3 with flow underneath the plantsite being redirected towards the Johnson City Well Field to the southwest.

° The potential for ground-water contaminant migration at AFP is moderately high due to the presence of a heavily used aquifer underlying the plant, and a stream that recharges the aquifer flowing past the plant. Any contaminant entering the surficial sands and gravels would first have to migrate down about 15 feet to the water table. About 30 feet of relatively low permeability clay and gravel separate the upper part of the sediments from the heavily used lower aquifer. These low-permeability sediments would slow and attenuate contaminant movement to the aquifer. However, if contaminants reach the Clinton StreetBallpark Aquifer. These low-permeability sediments would slow and at tenuate contaminant movement to the aquifer. However, if contaminants reach the Clinton Street-Ballpark Aquifer, travel time to Well No. 1 or the Johnson City municipal supply wells would be relatively short.



Source: New York State Dept. of Environmental Conservation Bulletin 73

From CH2M HILL, 1984

FIGURE 3

Water Level Contours and Flow Lines in the Clinton Street—Ballpark Aquifer, October 1967

° No natural plant or annual communities are present on the AFP site. There are no state or federal endangered or threatened terrestrial wildlife or plant species are known to occur in the vicinity of AFP.

° Lab analyses from the existing well (sample #27795 2/7/85) on the site indicate no parameters that exceed federal established limits and organic parameters were below the detection level of the lab. A water sample collected on 2/12/85 from the well site (sample #30861) indicated the presence of several organic analytes in small concentrations. The highest concentration was 63 ppb t-1,2-Dichloroethane.

° A sample taken from the production well by HART on 10/31/85 indicated Oil and Grease, and Total Organic Carbon below detection limits. A normal pH (7.35) and Specific Conductance (730 mmho) along with a minor amount of Total Organic flalogen (13 ug/l) was found.

C. RECOMMENDED SCOPE OF WORK

Several tasks have been identified as components of this study. Generally, the study will consist of two phases, a field investigation phase consisting of drilling, well installation and sampling and a report preparation phase which evaluates and synthesizes the data and reaches conclusions as to the presence or absence of contamination and potential risks.

Briefly, the tasks are as follows:

Task 1 Coordination with Air Force Personnel

Task 2 Groundwater Sampling of Production Well

Task 3 Groundwater Monitoring Well Installation

Task 4 Groundwater Sampling Program

Task 5 Surveying of Groundwater Monitoring Wells

Task 6 Water Level Measurements

Task 7 Training of USAF Personnel to perform on-going portions of the work

Task 8 First Draft Report

Task 9 Second Draft Report

Task 10 Final Report

Task 11 Meeting with USAF Personnel

The investigation has been subdivided into these tasks for ease of discussion and mutual understanding and to assure adequate definition of the services to be provided. While they are roughly laid out in the order they will be performed, many can be accomplished simultaneously, particularly during the field portion of the investigation.

D. DETAILED SCOPE OF WORK

This section provides a description of the work to be performed under the various tasks/subtasks mentioned above and a rationale for the approach.

D.1 Task 1 - Coordination with USAF Personnel

Approach: This is an on-going task that involves continually updating Air Force personnel as to the progress of the investigation. It also entails informing USAF personnel of locations of investigative activities and notifying USAF personnel three (3) days in advance of any sample collection dates for the purpose of splitting samples.

Rationale: Close coordination with all interested parties is necessary for the smooth flow of events and timely completion of the field work.

D.2 Task 2 Groundwater Sampling of Production Well

Approach: A new groundwater production well will soon be installed at the AFP (not part of this plan). This well will be sampled, and the samples split with OEHL according to the Technical Operations Plans. The well will be tested in the field for Specific Conductance, Temperature and pH. The laboratory analyses include Volatile Organics, RCRA Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag), and Oil and Grease.

Rationale: This task will constitute a separate trip to the AFP as soon as the Task Order is received. This will provide a good record of baseline conditions in the new production well.

D.3 Task 3 Groundwater Monitoring Well Installation

Approach: Three shallow boreholes (35 feet) SW-1, SW-2, SW-3, will be drilled (two downgradient, one upgradient) and be completed as groundwater monitoring wells. Locations of the wells is shown on Figure 4. The boreholes will all be continuously sampled, with a split spoon sampler. Wells will be constructed of 2 inch Schedule 40 PVC flush joint cashing with machine slotted 10 slot (.01 inch) screen that are 10 feet in length (Figure 5).

Each well will receive a filter pack, bentonite seal, have the annular space grouted to the surface, and a protective casing with locking cap will be installed. Each soil sample obtained will be described and screened with an Organic Vapor Analyzer (OVA) to determine the presence and degree of hydrocarbon contamination. Wells will be installed through a 6 inch O.D. hollow stem auger. The augers will be cleaned with a steam cleaner between each borehole.

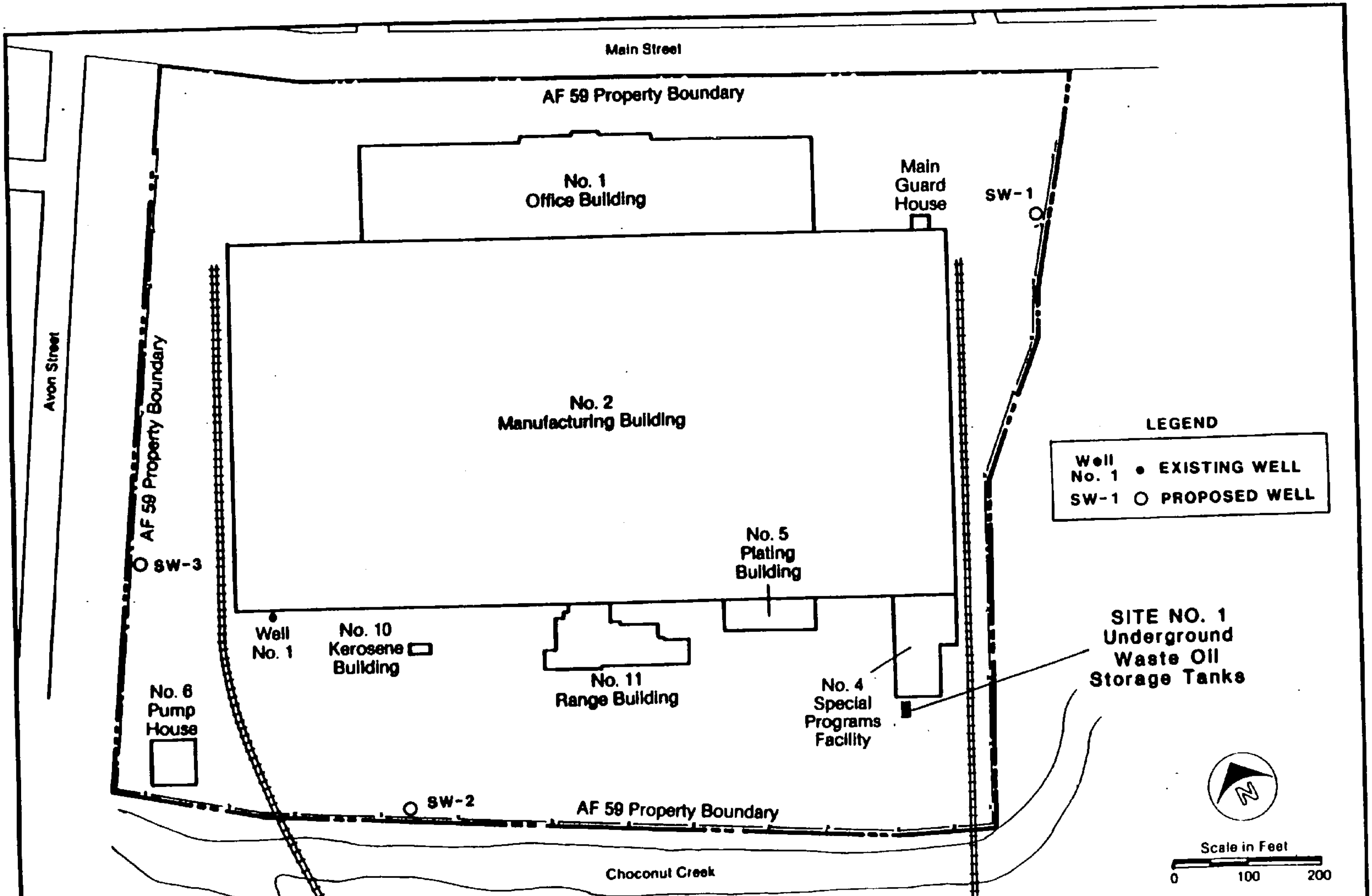
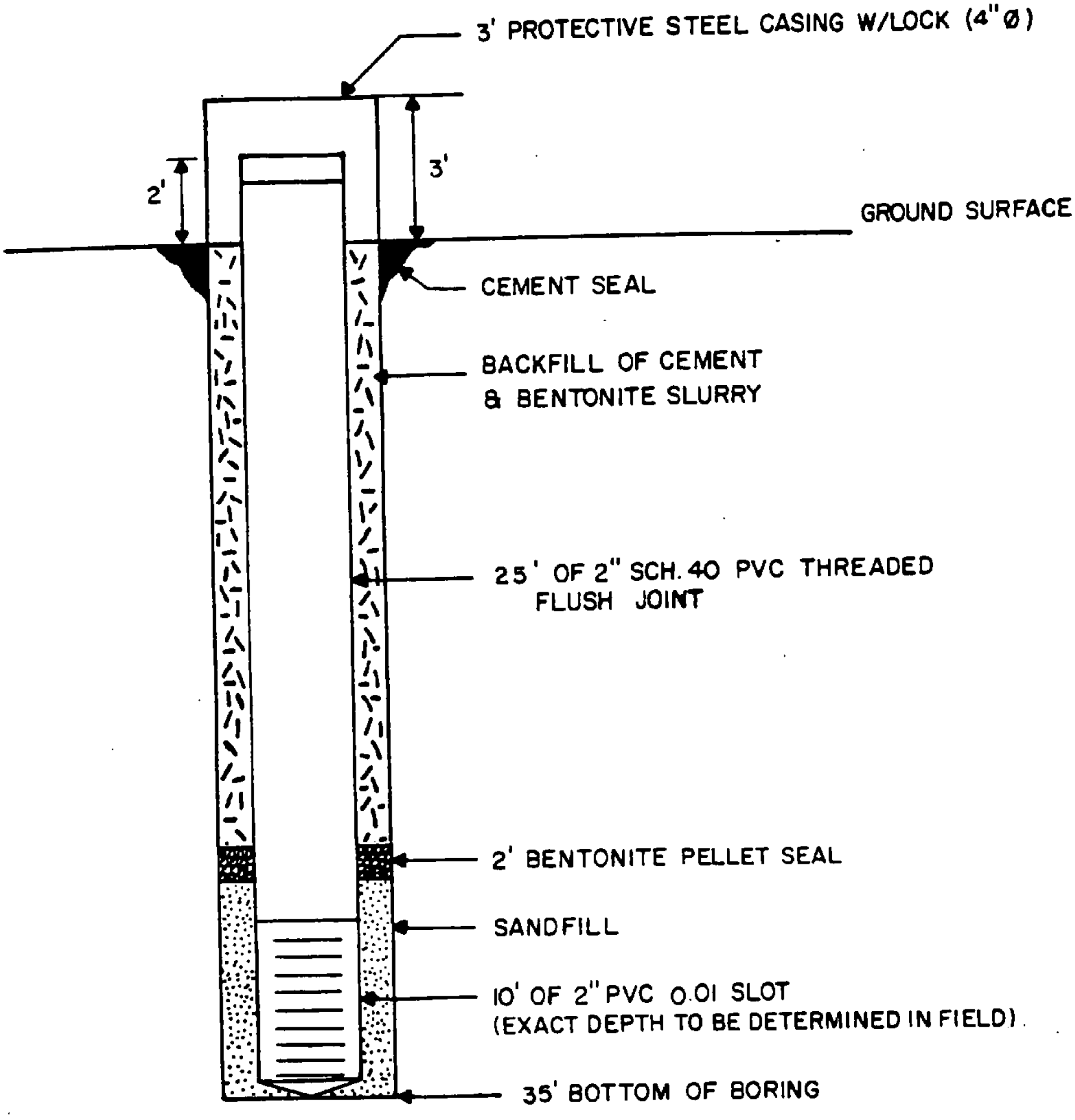


FIGURE 4

Location of Groundwater Monitoring Wells

From CH2M HILL, 1984



NOT TO SCALE

FIGURE 5

GENERALIZED WELL CONSTRUCTION DIAGRAM

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Geochemical analysis will be performed on three soil samples, one from each well. The samples will be taken from the soil-water interface and laboratory analyses will be performed for Volatile Organics, Oil and Grease.

Geotechnical analyses will be performed on soil samples to determine permeability, and grain size distribution. Three shelby tube samples (one from each well) will be obtained for falling head permeability testing. The sample depth will be chosen in the field. Additionally, two soil samples from each of the three deep wells will be analyzed for grain size distribution (sieve and hydrometer analysis). If possible, one sample from each borehole will be unsaturated and the other saturated.

Note, all soil samples will be split with the Air Force, and cuttings from the boreholes will be drummed and left on the site for eventual testing by HART for EP Toxicity Metals and Ignitability and disposal by the Air Force.

Rationale: Groundwater monitoring wells surrounding the facility will help determine if there is any contamination emanating from the site.

D.4 Task 4 Groundwater Sampling Program

Approach: A total of 4 wells will be sampled (Figure 4). This includes the 3 wells installed for this study and the existing production well. Prior to sampling all wells will be properly flushed to provide representative samples. Bailers will be decontaminated between wells. Samples will be placed in properly prepared bottles, and placed in a cooler at 4°c. Coolers will be sealed and shipped overnight to

Princeton Testing Laboratories. Samples will be split and a set of samples will be sent to OEHL in Texas. Proper chain-of-custody procedures will be followed which are defined in the Technical Operations Plan.

The wells will be tested in the field for Specific Conductance, Temperature and pH. The laboratory analyses include Volatile Organics, RCRA metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag), and Oil and Grease. One duplicate sample, trip blank and field blank will also be taken.

QA/QC procedures for Princeton Testing Laboratories are contained in the Technical Operations Plan.

Rationale: Wells will be sampled all at once rather than individually because it is more convenient to perform one round of sampling rather than sample individual wells as they are completed. Also samples cannot be stored for any length of time, requiring samples to be shipped within a few days of their collection.

D.5 Task 5 - Surveying of Wells

Approach: A professional surveyor will survey the horizontal and vertical locations of the wells.

Rationale: It is necessary to establish the elevation of well casings for calculation of groundwater elevations.

D.6 Task 6 - Water Level Measurements

Approach: Measurements will be made of all the water levels in all groundwater monitoring wells at the AFP. This will be completed in one day.

Rationale: Measurements will provide the basis for a potentiometric surface maps to be made in future studies.

D.7 Task 7 - Training of USAF Personnel to Perform Certain On-Going Portions of the Work

Approach: Hart Associates will train USAF personnel to take groundwater levels in the monitor wells that will be installed during this investigation.

Rationale: Groundwater levels must be periodically monitored in order to determine groundwater flow directions over time. It is not cost-effective for HART personnel to travel to the site for the limited time period required to take these measure ments. USAF personnel will be trained to provide monthly groundwater level measurements in the wells.

D.8 Task 8 - First Draft Report (Including Risk Assessment)

Approach: Hart Associates will prepare a draft report of the findings of this investigation. The report will describe field methods such as well installation techniques, sampling procedures, soil gas investigations, etc. It will also provide well construction diagrams, test boring logs, sample results and OVA readings. The geology and hydrogeology will be evaluated with respect to the site as a whole and individual storage areas. A risk assessment will be developed that will evaluate the level of contamination at the site, the potential for migration, the migration pathways and possible receptors.

Rationale: The draft report will be submitted to the Air Force for review. It will describe the field investigation and present the results of sampling, drilling and geotechnical tests. It will also discuss the risk posed by each site and the plant as a whole.

D.9 Task 9 - Second Draft Report

Approach: Hart Associates will respond to the Air Force's comments and resubmit a second draft report.

Rationale This second draft will be reviewed by the Air Force and submitted to interested parties for comment.

D.10 Task 10 - Final Report

Approach: Based upon comments received, a final report will be prepared.

Rationale: It is necessary to produce a report that considers the views of all interested parties.

D.11 Task 11 - Meeting with USAF Personnel

Approach: If requested, representatives from Hart Associates will attend meetings to discuss the investigation, present findings and defend conclusions. Assume five meetings.

E. STAFFING

Personnel used on this investigation will include several hydrogeologists, field technicians, field sampling specialists and drafts people. The project leader will be a hydrogeologist and at least one hydrogeologist will monitor the test borings and installation of all wells.

F. SCHEDULE

A proposed schedule for this scope of work is contained in Figure 6. This schedule begins upon issuance of the Task Order.

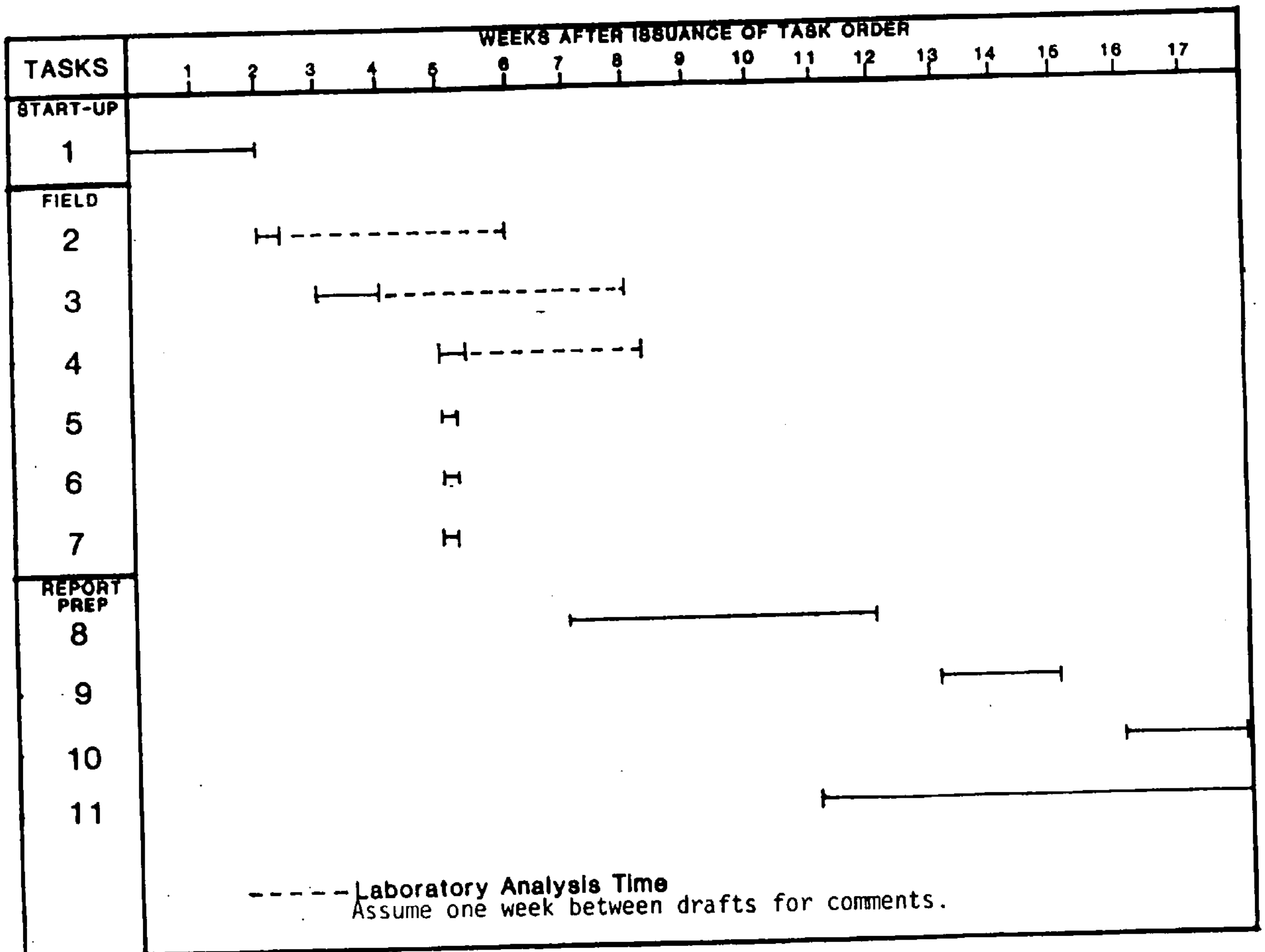

FIGURE 6

PROPOSED SCHEDULE

HART

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