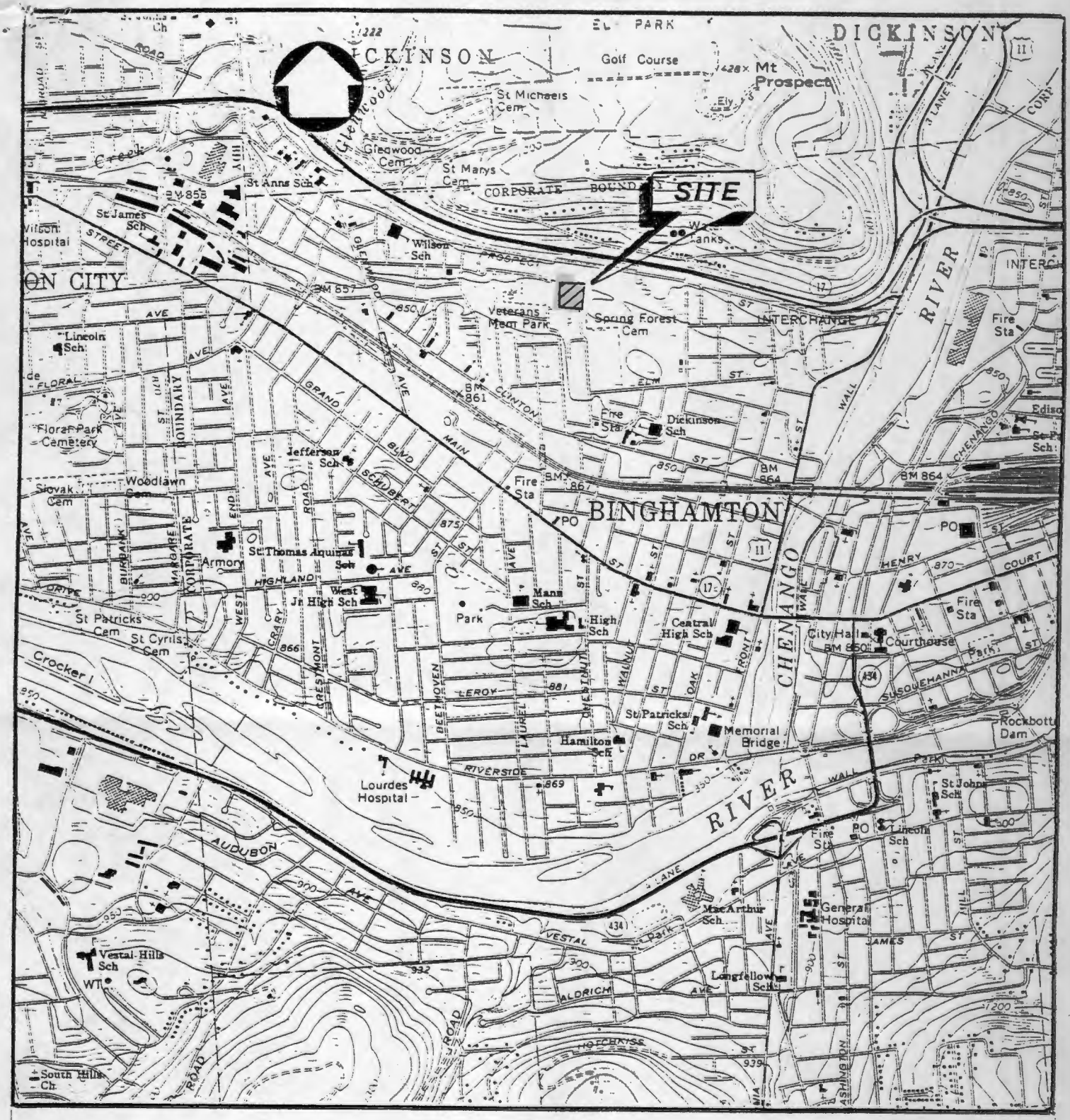


SCALE: 1"= 2000'

TOPOGRAPHY TAKEN FROM
1968
BINGHAMTON, N.Y
U.S.G.S. QUADRANGLE
7.5 MIN SERIES

MAP LOCATION

FIGURE 1

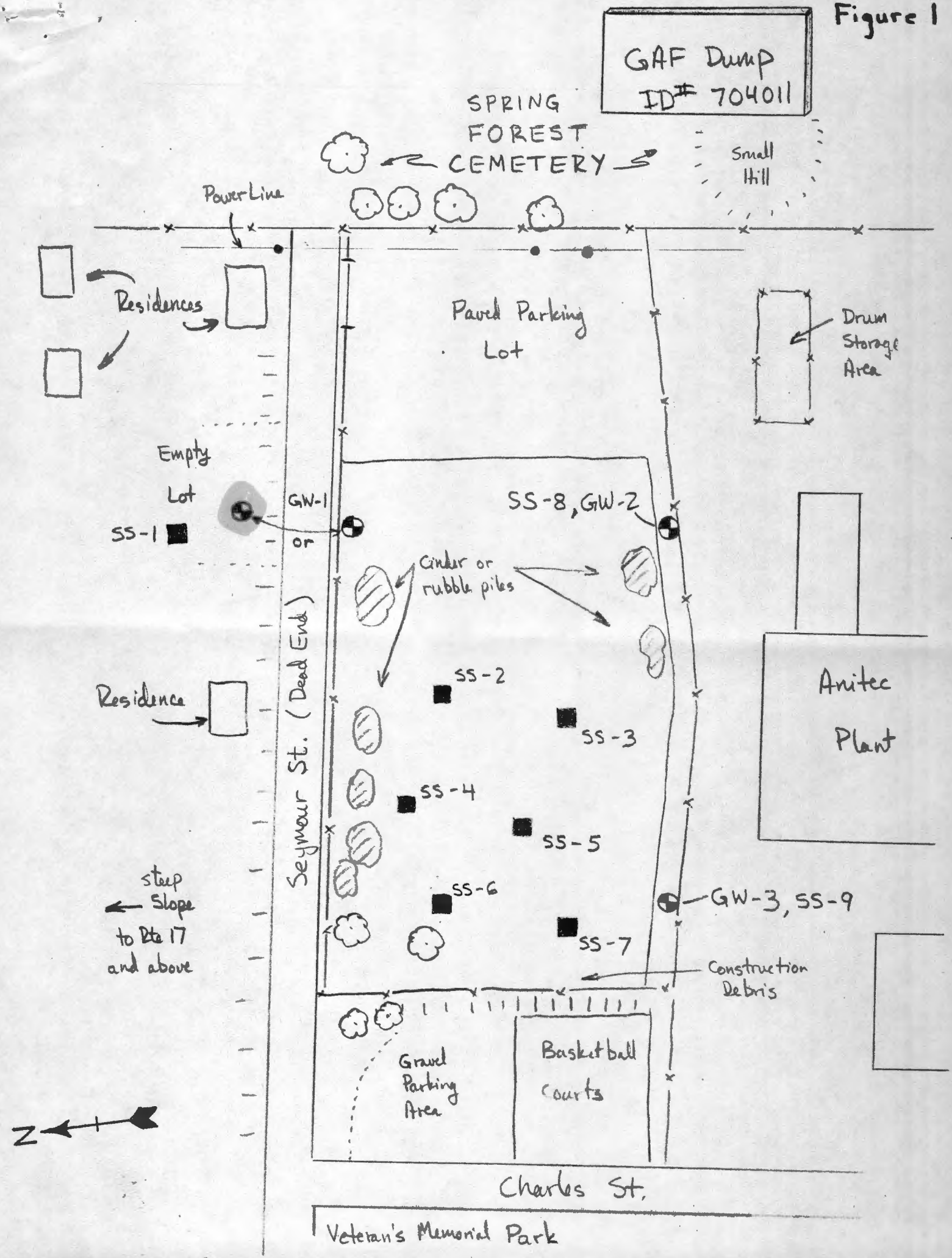
SITE LOCATION MAP

GAF DUMP SITE

LAT. 42°06'29"N LONG. 75°55'45"W

1/1/1987

Figure 1


GAF Dump
ID# 704011
SPRING
FOREST
CEMETERY
Small
Hill
Power Line
Residences
Paved Parking
Lot
Drum
Storage
Area
Empty
Lot
SS-1
GW-1
or
SS-8, GW-2
Cinder or
rubble piles
Residence
SS-2
SS-3
SS-4
SS-5
SS-6
SS-7
Seymour St. (Dead End)
Anitec
Plant
steep
Slope
to Rte 17
and above
GW-3, SS-9
Construction
Debris
Gravel
Parking
Area
Basketball
Courts
Charles St.
Veteran's Memorial Park
N

Phase II Work Plan

GAF Dump

City of Binghamton/Broome County

Site ID #704011

Based on this work plan, the consultant must develop a detailed cost estimate for each task identified on Table 1. The cost estimate and work plan will be incorporated into the cost plus fixed fee contract with a limiting upset figure. Unless it is otherwise stated, work shall conform to the concept of Schedule 4, Exhibits 1 (Generic Work Plan - State Superfund Program - Phase II Investigations) and 3 (Guidelines for Exploratory Boring, Monitoring Well Installation, and Documentation of these Activities) of the contract document.

A copy of this work plan and Exhibits 1 and 3 of the contract must be taken to the field by the consultant during Phase II field activities, since these documents are crucial to proper implementation of Departmental field protocols. Through his actions, the field representative will display familiarity with the provisions of the work plan and exhibits. Failure to provide any of the above documents at the New York State Department of Environmental Conservation (NYSDEC) representative's request, or for the consultant to show inadequate comprehension of their contents are sufficient grounds for NYSDEC to halt Phase II field work.

Introduction

The GAF Dump is a one-acre site located in the City of Binghamton behind the former GAF manufacturing plant, now owned by Anitec Corporation. GAF retained ownership of the dump area when their plant was sold to Anitec.

The site was used for dumping construction debris and there are piles of cinders scattered about. GAF allegedly used the site to dispose of waste liquids from the production of photographic material by dumping 55-gallon drums of liquid directly onto the ground. GAF denies this allegation.

Since the site is located in a populous neighborhood, and Johnson City, located west of the site, draws groundwater from the aquifer of concern, a Phase II investigation will be performed.

A Phase I investigation by Wehran Engineering was completed in April, 1986.

Objective

The objective of this Phase II investigation is to collect the information required to classify the site for further action and to develop a final HRS score. This includes collecting the field data necessary to identify the occurrence and characteristics of contamination and if a release of contaminants from the site has occurred. This information will be used to determine if any imminent and/or significant environmental or health hazard exists. Specifically, these objectives will be accomplished through the drilling of test borings, installation of groundwater monitoring wells, and sampling and analysis of groundwater, surface water, soil, wastes, and sediments (where any or all of these media are applicable).

For the purpose of report preparation, the consultant is to compile all pertinent file information and data obtainable from the NYSDEC and various other agencies.

Site Reconnaissance

Representatives of NYSDEC met with GAF's consultant on November 1, 1985 and inspected the GAF Dump site in order to familiarize staff with the site and to discuss locations for sampling and boring/monitoring well installation.

The site is located at the east corner of Charles and Seymour Streets and abuts Spring Forest Cemetery. Approximately one third of the site consists of a paved parking lot. Based on the topography of the cemetery, it appears that the paved area was probably never filled in. However, a slope from the west side of the site down to a gravel parking area and basketball courts indicates that at least a section of the site may have been filled at one time.

Access to the site will not be difficult since the terrain is flat and it is located adjacent to two roads. A chain link fence surrounds the site and entrance must be made through a gate at the north site of the paved area. GAF Corporation has the key to that gate.

Based on the site inspection, a sketch was prepared showing the proposed monitoring well and sampling locations (see Figure 1).

Field Investigation

This project has been divided into specific tasks, summarized in Table 1. Field efforts to complete this investigation are described in greater detail below.

Geophysics: The goals of the geophysical survey are to characterize the subsurface geology, locate contaminant plumes, define the boundaries of buried waste, and to determine groundwater flow direction. In addition, buried metal objects, such as drums, gas lines, water lines, and metal waste, may also be located.

For the GAF Dump a geophysical survey will be conducted using a grid to sufficiently characterize subsurface conditions of the site and site-related areas (e.g. background and downgradient). The starting point of the grid will be located from an established reference point so that the survey may be repeated if elected. The consultant must determine the best geophysical method to meet the goals of the investigation and submit a work plan for the Bureau's review.

In addition to the geophysical survey, a magnetometer survey will also be conducted on site to locate buried water mains, gas, electric, or telephone lines which may be present. The magnetometer survey will be used to supplement the geophysical data and to investigate proposed monitoring well locations for obstructions.

Since final placement of monitoring wells is contingent on the results of the geophysical investigation, reduced geophysical data and a written interpretation of it shall be present at the site in the field representative's possession, and fully understood by the representative, at the time of drilling and placement of monitoring wells.

Test Borings and Monitoring Wells: Monitoring wells will be installed to provide data pertinent to both water chemistry and characterization of the stratigraphy and groundwater regime at the site.

Well construction shall adhere strictly to the NYSDEC protocols enumerated in Exhibit 3 of the Phase II Generic Work Plan. (This exhibit is also included in the contract). These protocols govern not only well installation and development, but classification and physical testing of soil, containment of drill cuttings and fluids, recording blow counts, etc. They also govern the proper procedures regarding decontamination of drilling equipment, split spoon samplers, and all other downhole materials.

It is anticipated that 2-inch I.D. monitoring wells will be installed at the approximate locations shown in Figure 1, using hollow-stem augers large enough to facilitate placement of downhole materials with a tremie, as required in Schedule 4, Exhibit 3 of the consultant contract.

Finalized well locations will depend on the results of the geophysical study and local conditions. The consultant, in conjunction with NYSDEC representatives, shall determine the final well locations in the field, as necessary. The consultant will provide an experienced engineer, geologist, or other adequately experienced technical staff to be on site at all times during drilling activities and monitoring well construction.

Three test borings/monitoring wells will be installed on the GAF Dump site. Refer to Figure 1 for approximate well locations.

It is anticipated that groundwater will be encountered at approximately thirty to forty feet below ground surface. The site lies over the Clinton Street - Ballpark aquifer, a section of the Endicott-Johnson City valley-fill aquifer that is separated from the Susquehanna River by deposits of till. The site lies on the northern edge of the aquifer, where glacial outwash deposits thin out and the valley wall rises. As a result, the thickness of the aquifer beneath the GAF site is expected to be only 20 to 40 feet.

The area to the east of the Spring Forest Cemetery consists of a kettlehole filled by low permeability peat, muck, silt, and clay deposited over the mixed sand and gravel aquifer to a thickness of twenty feet or more. A tongue of this low permeability deposit reaches to the GAF Dump and ends in the vicinity of Veteran's Memorial Park, immediately to the west of the site. This can be seen in the 1935 topographic map where the area that is now the park was then a swamp.

Groundwater flow in the immediate vicinity of the site appears to flow south, toward Anitec's on-site wells (used for cooling water). Past groundwater pumpage has caused drawdown of the water table to a point that the gradient,

which originally flowed to the east toward the Chenango River, is reversed, causing induced recharge from the Chenango River. In particular, this recharge affects several industrial wells located southeast of the site, between the Chenango and Spring Forest Cemetery, but it may also affect Anitec wells located at the main plant, south of the site. Other sources of aquifer recharge are precipitation, local streams, and inflow from outlying areas. A cone of depression exists around Anitec's on-site wells.

One of Johnson City's drinking water wells draws from a major buried aquifer approximately one and a half miles to the northwest of the site. Though the buried aquifer is separated from the upper aquifer by low permeability deposits of lake silt and fine sand, the potentiometric surface around this well indicates local drawdown conditions. It is, however, unlikely that any potential contamination from the GAF Dump would make its way to this well due to the separation between the sites and the cone of depression caused by Anitec's industrial wells.

The single upgradient well will be located to the north of the site either along the south side of Seymour Street or perhaps across the street in an empty lot. A third option exists just north of the gravel parking lot at the corner of Charles and Seymour Streets.

Two downgradient wells will be located south of the site close to Anitec's plant. There may be some difficulty in well placement, since there is a paved road (approximately fifteen feet wide) along the southern fence line of the site. Since the parking lot is fenced in and no longer used, it may be possible to drill the wells through the pavement in order to take them as far away from the old disposal area as possible. Wells placed on Anitec's property would most likely interfere with plant operation, so this option is not being pursued.

The two downgradient wells will be placed to gain the best information on site stratigraphy and groundwater flow. If a contaminant plume is identified through the geophysical survey, at least one of the wells will be placed to sample from that plume.

If borings are not completed on the same day they are started, a mechanism to ensure their integrity will be devised. The consultant will provide NYSDEC with their plan for this contingency.

During drilling operations, the open hole and split spoon samples will be monitored with an HNU or OVA (or similar instrument). If the site is found or suspected of discharging gases near or above explosive limits, then drilling operations will be monitored with an explosimeter/oxygen meter.

Following construction of the monitoring wells, each well will be developed as soon as it has fully stabilized and as soon as practically possible before or during the drilling operation at the next well. Groundwater elevations will be taken in each well before and immediately following proper development. Each well will be developed to the point that the turbidity of the recovered well water is 50 Nephelometric Turbidity Units (NTU's) or less. A nephelometer shall be brought to the field for the purpose of making this measurement. A signed statement stating that the turbidity in each well was 50 NTU or less immediately after development will be provided to NYSDEC if a Department representative is not present when measurements are made.

Permeability testing of each monitoring well will be performed after well development. The slug test method is preferable, where a known volume of water is introduced to the well and the water level recovery is recorded.

Well locations and elevations for all on-site wells will be surveyed by a licensed surveyor to allow for accurate water level measurements and development of groundwater contour maps. Each well elevation will be determined relative to a USGS datum, if available within 200 feet of the site, or a permanent point set in the field. The top-of-casing measurement for each well will be accurate to the nearest 0.01 foot, and the ground surface adjacent to the well shall be measured to the nearest 0.1 foot. The distance between wells will be measured to a two-foot accuracy.

Prominent surface water levels will also be measured to the nearest 0.01 foot in order to augment groundwater measurements, particularly when the surface water is known or believed to represent an above-ground extension of the water table.

All well locations in Figure 1 are approximate. Final locations will be determined after the geophysical analysis has been performed and data has been reduced and interpreted. Completed well logs shall be prepared and submitted with the Phase II report.

Refer to the Generic Work Plan and Exhibits 3 and 4 for specific monitoring well construction and soil classification requirements.

Sampling and Analysis: Where required by NYSDEC, sampling and chemical analyses will be performed by the consultant. This includes split spoon samples for chemical analysis when it is suspected or confirmed by HNU or OVA that soils are contaminated. During all sampling episodes, the consultant will follow the QA/QC and chain-of-custody protocols as referred to in the Generic Work Plan and as described in the New York State Contract Laboratory Protocols document. NYSDEC's chosen sampling locations (which may be upgraded or modified by the consultant) are indicated in Figure 1, with sampling and chemical analyses summaries specified in Tables 2 and 3, respectively.

Where dilution of any Phase II sample is to be done by the chemical analytical laboratory prior to analysis, NYSDEC is to be advised immediately. The concern is that a component of low concentration, but of significant environmental impact, could become so diluted that is presence in the final extract will not be detected.

During this contract, the NYSDEC chemist will discuss alternatives with the laboratory's chemist on how best to conduct the analysis. NYSDEC chemist is Mr. John Rankin, telephone (518) 457-3252.

Although a method or extra work may be agreed upon by both chemists, clearance for any extra cost must be obtained by the consultant from the NYSDEC contract manager. Such cost will be paid from the contingency amount in the contract, and clearance must be confirmed by NYSDEC in writing.

At least one sample each from the three monitoring wells will be collected for laboratory analysis. Surface water does not exist, per se, at this site. A 66-inch storm sewer line runs underground beneath Anitec's plant to its discharge point at the Chenango River. It is known as the Trout Brook line, perhaps due to incorporation of a stream by the same name. The topographical map shows a small stream which disappears from the map in the vicinity of Wilson School, south of Prospect Street.

It would seem inappropriate to sample this flow as surface water, since any contamination found could not positively be attributed to the GAF Dump. Water from this line was sampled by the Broome County Health Department in 1971 and was found to seriously violate state pollution control laws. The water in the line was determined to represent industrial wastes, cooling water wastes, and storm water from the then GAF plant, plus a small amount of storm water from a portion of Prospect Street.

Since it is not known whether these conditions still exist, it will suffice to say that surface water sampling will not occur at the GAF Dump site.

The alleged waste disposal practice (i.e. dumping liquid on the ground surface) suggests that limited soil sampling should be done in lieu of surface water sampling. Samples shall be taken from various depths by using a hand auger. A total of six soil samples will be taken from a depth of three to four feet at locations spread around the site. In addition, soil samples from the two downgradient locations shall be taken at a depth of ten feet. One additional sample shall be taken from off-site for background information.

These nine soil samples will be analyzed for Hazardous Substance List (HSL) metals. GAF's representative indicated that GAF dumped silver smelting slag on-site in 1964, and sampling of Trout Brook detected silver and zinc. Other heavy metal wastes used by GAF Corp. may be detected in soil samples.

Where determined by NYSDEC or the consultant's field representative that additional chemical analyses are required for soil samples from well drilling activities, the consultant must be prepared to obtain such samples for shipment to a laboratory. Pricing for this activity must be included. For costing purposes, assume one sample per well for analysis.

Water samples will be analyzed for volatile organics (VOA's), pesticides/PCB's, base-neutral-acids (BNA's), and HSL metals. Refer to Table 3 for details on chemical analysis of samples. One trip blank (VOA only) and one field blank will be analyzed with the water samples.

Air monitoring, consisting of a site survey with a detection instrument such as an HNU or OVA, shall occur upon arrival at the site. This air monitoring is separate from monitoring that is part of the health and safety plan. If a source of air contamination is identified, the air will be sampled using appropriate equipment to determine the nature and concentration of the contaminant. Upwind air samples will also be analyzed at the same time. Wind direction must be continuously monitored and documented during any sampling and analysis of air samples.

Health and Safety Plan

The consultant will observe the provisions of the health and safety plan during drilling and sampling activities.

It is anticipated that Level D protection will be necessary on the site. If, during the investigation, it is determined that the level of protection should be upgraded, the consultant shall prepare a site-specific health and safety plan appropriate for the level of protection required.

Report

The report shall follow the format outlined in the Phase II Generic Work Plan, and shall be in accordance with Article 49 of the consultant contract.

Quality Assurance Plan

The Quality Assurance Plan will be submitted as a separate document.

Table 1

Phase II Work Plan - Task Description

GAF Dump

Tasks		Description of Task
II-A	Prepare and update work plan	Will be done by NYSDEC.
II-B	Conduct records search/data compilation	Review Phase I information and any additional information.
II-C	Site reconnaissance	Has been done by NYSDEC.
II-D	Conduct geophysical studies	Conduct geophysical survey. Based on the study, revise the location of monitoring wells, if needed, for approval by NYSDEC.
II-E	Install and develop monitoring wells	Install three wells. The borings will be drilled to a depth of approximately 50 feet.
	Soil samples during drilling	During drilling, soil samples collected at 5-ft. intervals, and at changes in lithologies. Perform grain size analysis and Atterberg limits. Rock core samples collected continuously.
II-F	Perform sampling and analysis	Refer to Tables 2, 3 and "Sampling and Analysis".
II-G	Conduct site assessment	A preliminary site contamination assessment will be conducted to complete the final HRS score and HRS documentation records.
II-H	Report preparation	Prepare final report containing significant Phase I information, additional field data, final HRS score, HRS documentation records, and site assessments.
II-I	Project management	Project coordination, administration and reporting.

Table 2

Phase II Work Plan - Sampling Summary

GAF Dump

Designation	Location	Aquifer Screened	Approx. Boring Depth (ft)	Length of Screen (ft)
Groundwater				
GW-1	Upgradient	Overburden	50	10
GW-2	Downgradient	Overburden	50	10
GW-3	Downgradient	Overburden	50	10
Surface Water				
None				
Sediment				
None				
Soil (refer to Figure 1 and text of work plan)				
SS-1 to SS-9				
Leachate				
None				

NOTE: Locations, aquifer screened, approximately boring depth, length of screen are based on existing data and are the basis of the cost estimate. These criteria may change based on the results of the geophysical surveys and/or field conditions.

TABLE 3
NYSDEC - RECOMMENDED CHEMICAL ANALYSES - GAF Dump

Type of Sample	Type of Analyses(1) HSL(2) Metals	HSL(3) Volatiles	HSL(4) Semi-Volatiles	HSL(5) Pesticides/ PCBs	Spike/Duplicate(6)
Groundwater(7)	4	4	4	4	1/1
Surface Water	---	---	---	---	---
Sediment	---	---	---	---	---
Soil	9	---	---	---	1/1
Blanks (Trip and Field)	1	2	1	1	---

(1) Complete identification per NYSDEC Generic Work Plan, Section 3(b)(ii)(B). Field pH, conductivity and temperature measurements will be conducted on all water samples. Also pH, specific conductance, Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) measurements will be made at the laboratory for all water samples.

(2) HSL Metals - Preparation and analysis of the 15 Task 1 and 9 Task 2 inorganic compounds using the specified CLP methods.

(3) HSL Volatiles - Preparation and analysis using the CLP specified GC/MS method for HSL purgeable organics plus a library search for and the quantification of any additional non-HSL compounds (the CLP requires the library search only for the 10 non-HSL compounds of largest apparent concentration).

(4) HSL Semi-Volatiles - Preparation and Analysis using the CLP specified GC/MS method for HSL Extractable Base/Neutral and Acid Organic compounds plus a library search for and the quantification of any additional non-HSL compounds (the CLP requires the library search only for the 20 non-HSL compounds of largest apparent concentration).

(5) HSL Pesticides/PCBs - Preparation and pre-extraction of the HSL organo-chloride pesticides and polychlorinated biphenyls using the CLP specified GC-ECD method

(6) Superfund and Contract Laboratory Protocol, January 1985, requires at least one spiked sample analysis and one duplicate sample analysis from each group of samples of a similar matrix type for each case of samples or for each 20 samples received, whichever is more frequent.

--- Designates that no samples are to be analyzed.

(7) The reason for one additional groundwater sample is that a duplicate sample must be obtained from a monitoring well chosen at random. That duplicate sample must not be identified as a duplicate to the laboratory, but must be assigned an identifier similar to other groundwater samples.

The Bureau requires the blind analysis of a duplicate sample for each site by the laboratory, to confirm the integrity of all sampling and analytical activities.