MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND PROPOSAL FOR RCRA FACILITY INVESTIGATION OF UNKAMET BROOK AREA/USEPA AREA 1

General Electric Company

Pittsfield, Massachusetts

January 1995

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND PROPOSAL FOR RCRA FACILITY INVESTIGATION OF UNKAMET BROOK AREA/USEPA AREA 1

SUBMITTED TO THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

JANUARY 1995

BLASLAND, BOUCK & LEE, INC.
6723 TOWPATH ROAD, PO BOX 66
SYRACUSE, NEW YORK 13214

MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND PROPOSAL FOR RCRA FACILITY INVESTIGATION OF UNKAMET BROOK AREA/USEPA AREA 1

TABLE OF CONTENTS

MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND PROPOSAL FOR RCRA FACILITY INVESTIGATION OF UNKAMET BROOK AREA/USEPA AREA 1

TABLE OF CONTENTS

MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND
PROPOSAL FOR RCRA FACILITY INVESTIGATION OF
UNKAMET BROOK AREA/USEPA AREA 1

TABLE OF CONTENTS

SECTION 1 - INTRODUCTION

1.1 General

This report has been prepared on behalf of the General Electric Company (GE) by Blasland, Bouck & Lee, Inc., (BB&L) to meet two sets of requirements applicable to the GE facility in Pittsfield, Massachusetts. First, this report provides a Supplemental Phase II Scope of Work (SOW) for the Unkamet Brook Area Site, as required by the Massachusetts Department of Environmental Protection (MDEP), pursuant to the Massachusetts Contingency Plan (MCP), and a Consent Order executed by GE and the MDEP in July 1990. This site is designated by the MDEP as the Unkamet Brook Area Site (ID No. 1-0148) and has been classified by the MDEP as a priority site within Phase II - Comprehensive Site Assessment of the MCP process. This report proposes a plan to fill existing data gaps associated with an MCP Phase II Comprehensive Site Assessment of this site.

Second, this document constitutes a proposal for an investigation of the site pursuant to the requirements of a Permit issued to GE by the United States Environmental Protection Agency (USEPA) under corrective-action provisions of the federal Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA). Specifically, this document constitutes a proposal for a RCRA Facility Investigation (RFI) for the area designated by the USEPA as Area 1, which is co-extensive with the MDEP-designated Unkamet Brook Area Site. [Note: In April 1994, the boundaries of the MDEP-designated Unkamet Brook Area Site were expanded to include the entire GE facility east of Plastics Avenue and the area surrounding Buildings OP-1 and OP-2, which was previously included in the MDEP-designated Remainder of GE Facility Site (ID No. I-0563). This expansion was made so the Unkamet

Brook Area would be co-extensive with USEPA Area 1, to facilitate coordination between the MDEP and USEPA.]

The current site boundaries are consistent with the boundaries that have been used for previous studies including the MCP Phase II investigation. These boundaries include all property owned by GE, the impacted area of the Unkamet Brook floodplain containing constituents attributable to the GE facility, and the area where such constituents have been monitored in groundwater. The boundaries are also consistent with the site description contained in the Permit.

In the context of this report, the MDEP-designated Unkamet Brook Area Site and the USEPA-designated Area 1 will be jointly referred to as the Unkamet Brook Area/USEPA Area 1 Site (or the "site"). Figure 1-1 shows the general location of the site, while Figure 1-2 depicts the current boundaries of the site. As discussed further in Section 2.1 below, GE is proposing two slight modifications to the site boundaries, which include adding a small area north of Building OP-3 and south of Merrill Road, and deleting a small portion of the site south of Merrill Road, just west of Unkamet Brook. The proposed revised site boundaries are shown on Figure 1-3.

1.2 Background Information

Pursuant to a Consent Order executed by GE and the MDEP in July 1990, GE initiated activities at the Unkamet Brook Area in accordance with the requirements of the MCP. In August 1990, GE submitted an SOW for the Phase II Comprehensive Site Assessment of the Unkamet Brook Area (Blasland & Bouck, August 1990a). That SOW, which incorporated the MDEP's comments on a prior draft, evaluated previously collected information, compared the extent of these activities with the MCP requirements for a Comprehensive Site Assessment, and proposed additional activities to fill several data needs. The document was accompanied by an Unkamet Brook Area Supplemental Data Summary, which

summarized the results of investigations that had been previously performed at the site (Blasland & Bouck, August 1990b). The revised SOW was conditionally approved by the MDEP by letter dated November 7, 1990. The field investigations called for in the revised MCP Phase II SOW began in November 1990, and have been completed.

The USEPA issued a RCRA Corrective-Action Permit to GE in February 1991. The Permit required the investigation of and corrective action (if needed) for releases from Solid Waste Management Units (SWMUs) at the GE Pittsfield facility. The Permit divided the GE facility and other affected properties into several areas, one of which (Area 1) included the Unkamet Brook Area. In addition to submitting a proposal for an RFI for the various areas, the Permit required that GE must first submit a Current Assessment Summary (CAS) describing all available data pertaining to site characteristics and nature and the extent of polychlorinated biphenyl (PCB) and other contamination.

In April 1992, GE submitted a report to the MDEP and the USEPA entitled "Interim Phase II Report for Unkamet Brook Area and Current Assessment Summary for USEPA Area 1" (Blasland & Bouck, April 1992). That report was prepared as both an MCP Interim Phase II Report and a CAS in anticipation of joint agency review pending resolution of an appeal by GE and others of the original USEPA Corrective-Active Permit issued in February 1991.

After the Interim Phase II Report/CAS was submitted, a resolution of the appeal was reached, and the USEPA issued final Permit modifications on December 1, 1993. The modified Permit became effective on January 3, 1994.

The MDEP and the USEPA executed a Memorandum of Understanding (MOU) that provides for coordination between them in reviewing GE's submittals. As part of the MOU, certain submittals prepared by or on behalf of GE pursuant to the Permit and the July 1990 Consent Order are to be prepared jointly to facilitate coordinated agency review.

The Interim Phase II Report/CAS submitted to the MDEP and the USEPA in April 1992 was prepared to serve as a document for joint agency review. However, due to the performance of certain activities since that time, the Interim Phase II Report/CAS has been revised to reflect updated information for this site and is being submitted concurrently with this document under separate cover.

This MCP Supplemental Phase II SOW/RFI Proposal presents GE's proposed plan for additional investigations at this site. In addition, a Preliminary Health and Environmental Assessment Proposal (PHEAP) for this site is being submitted under separate cover.

1.3 Format of Document

This document is divided into several sections and provides pertinent site characterization information, and a proposal of activities to fill data needs for the MCP and RFI requirements. To assist in the review of this Supplemental Phase II SOW/RFI Proposal, Table 1-1 lists Permit requirements and the section(s) of the document where the requirements are addressed. Section 2 provides a brief overview of the site, a description of its environmental setting, a history of associated investigations, and an assessment of data needs related to the MCP and RFI requirements. Section 3 presents the proposed activities and a plan for the reporting of investigation results. Table 3-1 summarizes the proposed activities and the underlying rationale for the proposed activities. Section 4 presents a preliminary investigation of corrective measures for this site, while Section 5 presents a schedule of proposed activities.

ChemRisk, GE's risk assessment consultant for the site, has reviewed a draft of this proposal and made suggestions for additional sampling and analysis where appropriate. ChemRisk has indicated that the results of the investigations proposed herein, together with the existing data on the concentration and extent of PCBs and other constituents in the study area, will provide sufficient sampling

and analysis data to allow the performance of a Risk Characterization/Health and Environmental Assessment (HEA) for the Unkamet Brook Area/USEPA Area 1 Site. Potential data needs related to ecological risk assessment are not addressed in this document and will, to the extent necessary, be addressed in a future submittal.

SECTION 2 - SITE DESCRIPTION, SOURCE CHARACTERIZATION AND BACKGROUND

2.1 Site Description/SWMU Identification

The Unkamet Brook Area/USEPA Area 1 Site is composed of industrial, commercial, and lowland areas. The site includes the GE property east of Plastics Avenue and south of Dalton Avenue, portions of a small commercial area located between Merrill Road and the railroad tracks, and portions of a lowland area between the railroad tracks and the east branch of the Housatonic River. In addition, the site includes Buildings OP-1, OP-2, OP-3, and their adjacent areas as illustrated on Figure 1-2.

All three of the manufacturing divisions located at the GE Pittsfield facility (Transformer, Ordnance, and Plastics) have at one time operated, or are currently operating, in the Unkamet Brook Area (sometimes known as the East Plant Area). Activities in this area (beginning in or around 1932) have involved a wide range of research and development activities and the manufacture of power transformer-related products, ordnance-related products, monomers, polymers, and industrial resins.

The Ordnance-related operations at the Pittsfield facility, which take place in Buildings OP-1, OP-2, and OP-3, were sold to the Martin Marietta Corporation in 1993. GE continues to own the property at OP-1 and OP-2, and the U.S. Navy owns the property at OP-3. While Martin Marietta operates these facilities, the environmental investigations associated with this proposal will be performed under GE's direction.

The area of the GE facility north of Merrill Road and west of Unkamet Brook, and the area surrounding Building OP-3 is surrounded by fencing with locked gates (as shown on Figure 1-2). Access to this area is restricted

through active surveillance and security measures to GE, Martin Marietta, and Government personnel, and to authorized outside contractors.

The USEPA Corrective-Action Permit divides the facility and other affected properties into various areas to facilitate the investigation of releases from SWMUs at the GE facility. The Permit identifies 23 SWMUs as potential sources of releases within the Unkamet Brook/USEPA Area 1 Site. These SWMUs are as follows:

SWMU No.	SWMU Name
G-11	Interior Landfill
G-12	Former Waste Stabilization Basin
G-17	Building 119W Oil/Water Separator
O-B	Building 51 Underground Drainage Pipe
O-8	Building 51 Elementary Neutralization Unit
O-41	Building OP-3 Metal Treat Area
O-45	Building OP-3 Abandoned Storage Tank
O-2	Building OP-1 Abandoned Anodize Tank
O-A	Underground Fuel Storage Tanks
T-EEE, T-FFF (two tanks)	Transformer Division Inactive Underground Storage Tanks
P-D through P-L (nine tanks)	Plastics Division Inactive Underground Storage Tanks
P-4	Building 109 Wastewater Tank Farm
O-M	Ordnance Division Leaking Active Underground Storage Tank
[no number assigned]	Underground Pipes and Tunnels

The approximate locations of these SWMUs are shown on Figure 2-1. The SWMUs located within the Unkamet Brook Area/USEPA Area 1 Site are described in detail in Section 3 of the Interim Phase II Report/CAS. Procedures for the identification of additional SWMUs are described in Section 3.11 of this document.

As described in Section 8.11 of the Interim Phase II Report/CAS for this site, an area west of Building OP-3 was found in June 1994 to contain buried drums. At that time, all drums present in this area were removed and disposed of properly. In November 1994, an additional Ground Penetrating Radar (GPR) survey was performed in this and other areas of the site. Preliminary results of this survey indicate that additional drums may be buried in this area. As discussed in Section 3.2.7, GE plans to excavate these drums and dispose of them and any contaminated soil in accordance with applicable regulations. For purposes of future activities, this area will be labeled as SWMU O-46 (shown on Figure 2-1).

As part of this Supplemental Phase II SOW/RFI Proposal, GE proposes two slight modifications to the site boundaries. Specifically, GE proposes to add the small area located between Building OP-3 and Merrill Road, and to eliminate a portion of the area south of the railroad tracks, west of Unkamet Brook. The reason for adding the small area located between Building OP-3 and Merrill Road is that this area is part of the Building OP-3 facility owned by GE until 1993, and thus, should have been originally considered as part of the site. The basis for the proposal to eliminate the area south of the railroad tracks and west of Unkamet Brook is that this area is not (and never has been) owned by GE, and there has been no evidence that any oil or hazardous material released from the GE facility is present in the area (based on sampling conducted over the last 10 years). The PCB levels detected at this proposed boundary during MCP Phase II activities were approximately 1 ppm, and the proposed revised boundary is along the edge of a steep, heavily-vegetated bank. The proposed revised site boundaries are shown on Figure 1-3.

2.2 Environmental Setting

The portion of the Unkamet Brook Area/USEPA Area 1 Site owned by GE has been used for manufacturing operations for many years. As a result of these operations, the area north of Merrill Road and west of Unkamet Brook is predominantly covered by buildings and pavement. To the east of Unkamet Brook, the area is predominantly undeveloped with a portion of the former Interior Landfill as the only defined feature. Existing surface waters in this portion of the site are Unkamet Brook and the decorative pond. Unkamet Brook originates north of the site and flows across this portion of the site in a north to south direction. The decorative pond is a man-made feature constructed in 1985, as part of the construction of the GE Plastics Group World Headquarters.

A small commercial area exists between Merrill Road and the railroad tracks. Five structures in this area contribute to approximately half of the area being covered by buildings or pavement, with the remainder of the area covered by grass, trees, gravel, or unvegetated areas. Unkamet Brook flows through this area, although about 600 feet of its course are within a buried conduit.

Building OP-3 is located below the railroad tracks, in the central eastern portion of the site. This area is predominantly paved or covered by buildings, with some small grassy areas near Building OP-3.

South of the railroad tracks, Unkamet Brook re-emerges from the conduit and flows approximately 1,300 feet before it discharges into the east branch of the Housatonic River. The Unkamet Brook floodplain is predominantly covered by wetland grasses and trees. To the west of Unkamet Brook is a steep bank that has several dirt/gravel roadways at the top associated with non-GE railroad activities. To the east of Unkamet Brook, the area is a lowland floodplain. The east branch of the Housatonic River, which is located along the entire southern boundary of the site, is being addressed in separate submittals to the USEPA and MDEP as a distinct site.

A more complete discussion of the history of the site, as well as a description of its geographic location, physical characteristics, geology and hydrogeology, and current land use, are provided in the Interim Phase II Report/CAS.

2.3 History of Investigations

Numerous investigations have been conducted at the Unkamet Brook Area/USEPA Area 1 Site. A brief chronological summary of the activities performed at the site is presented below, and a more detailed discussion is contained in the Interim Phase II Report/CAS.

As a result of various manufacturing operations conducted by GE, various materials were inadvertently released to the environment over the years at the site. These releases have resulted in, among other things, the occurrence of a volatile organic compound (VOC) plume in the vicinity of the former waste stabilization basin, the presence of subsurface oil in a relatively small area in the vicinity of Buildings 51, 59, and 119, and various constituents in the soils and groundwater.

For a number of years, process wastewater and non-contact cooling waters from the Plastics Division facility were discharged into an on-site, earthen waste stabilization basin. The basin, formed by constructing earthen embankments to enclose a portion of an existing bog area, provided clarification and equalization of process wastewater from the East Plant Area. The waste stabilization basin has been closed and remediated. Phase I of the basin's closure consisted primarily of the construction of the Building 119W oil/water separator in 1971 and the installation of process modifications. Phase II of the closure involved the construction of a wastewater source control plant (Building 120W) that began operations in February 1979 to handle all contact waste flows. The actual basin

remediation activities, which included the removal of the basin contents and replacement with clean fill, were performed between August 1980 and June 1981.

North of the former waste stabilization basin is a former landfill area referred to as the former Interior Landfill. Study of this area was initiated in 1979 by the concern that some materials placed within this area may be a source of groundwater concern.

From 1979 to 1981, GE studied the effects of manufacturing activities on groundwater quality in the portion of the Unkamet Brook Area east of Plastics Avenue. The purpose of the investigation was to describe the nature and extent of groundwater concerns resulting from general operations within this area, and specifically related to the Interior Landfill and the waste stabilization basin.

In 1981, GE entered into a Consent Order with the MDEP (then known as the Department of Environmental Quality Engineering). In May 1983, pursuant to that Consent Order, the USEPA, the MDEP, and GE agreed to a monitoring program for stream sediment, surface water, and groundwater in the Unkamet Brook Area. The monitoring program consisted of sediment and surface water sampling, and mapping groundwater flow patterns at the site. The program also included describing lateral and vertical groundwater quality using the chemical data obtained from surface water and groundwater analysis. The areas included in the program were located along the perimeter of the Interior Landfill, in the vicinity of the plume emanating from the former waste stabilization basin, along the length of the brook itself, and at a number of locations in the marshy area adjacent to the brook.

During the summer of 1983, ambient air PCB monitoring was conducted in and around the Unkamet Brook and Interior Landfill in response to the 1981 Consent Order. Additional VOC air monitoring was performed in 1988 within the basement of a building located above the VOC plume area (located in the commercial area south of Merrill Road).

In 1987, hydrogeologic investigations were conducted to assess the relationship (if any) between a small oil plume floating on the water table near Buildings 51, 59, and 119, and the storm water drainage system in these areas. In 1989, a drainline was plugged and replaced with a new drainline above the water table. Between 1988 and 1992, GE monitored the thickness of free-phase oil on the water table in this area and conducted oil recovery activities.

Between August 1990 and April 1992, GE conducted an extensive site investigation pursuant to the July 1990 Consent Order executed by GE and the MDEP. These activities focused on obtaining information on the potential presence and distribution of constituents in Unkamet Brook surface water, sediment, floodplain soil, and fish. Additional information was collected on constituents present in groundwater, subsurface soils, and air.

The locations of all groundwater monitoring wells currently existing at the site are depicted on Figure 2-2.

The Interim Phase II Report/CAS provides detailed additional information regarding the source and characterization of SWMUs (Section 3), hydrogeologic investigations (Section 4), surface water investigations (Section 5), sediment investigations (Section 6), soils investigations (Section 7), miscellaneous investigations (Section 8), air monitoring (Section 9), Buildings 51/59 oil plume investigations (Section 10), and MCP fish investigations (Section 11).

2.4 Identification of Data Needs

Prior investigations and activities at the site have generated the information necessary to fulfill many of the MCP Phase II requirements, as described in the Interim Phase II Report/CAS. The information documented in that report also fulfills several requirements for an RFI of the site pursuant to the Permit.

Several data needs have been identified based on the comparison of existing site information and the MCP Phase II and RFI requirements. As

presented in Section 14 of the Interim Phase II Report/CAS, these data needs include:

- Additional soil sampling and analysis to determine the presence of constituents related to specific SWMUs and to provide a characterization of soils in areas not previously characterized;
- Additional soil sampling and analysis near Buildings OP-1 and OP-2 in areas where previous data do not exist (this and other related sampling have been requested by the U.S Navy as discussed in Attachment A);
- The collection and analysis of supplemental surficial soil samples to provide information on the potential presence of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) on a congener-specific basis in select areas of the site (Note: prior PCDD/PCDF data do not provide congener-specific results and are thus not adequate for current risk assessment purposes);
- Additional soil sampling and analysis along Merrill Road to provide information to assess potential exposures during road and utility maintenance activities;
- Surficial soil sampling and analysis to obtain information on the potential presence of constituents in exposed soil or grassy areas of the site;
- Additional sampling of floodplain soils to the west of transect UFP2 to better define the extent of PCBs and semi-volatile organic compounds (SVOCs) in this area;
- Additional groundwater monitoring to complete the assessment of groundwater quality on an area-wide basis, including potential releases from SWMUs subject to such monitoring;

- Additional information on groundwater elevation, groundwater flow patterns and rates, and seasonal variations in groundwater elevation and flow patterns;
- Additional groundwater and surface water data to track the attenuation of the VOC plume and to quantitatively evaluate the effects of the VOC plume, if any, upon Unkamet Brook and/or the Housatonic River and a program to monitor that plume on a semi-annual basis;
- Additional groundwater monitoring to define the western and southern boundaries of the small oil plume near Buildings 51 and 59, and a program to monitor that plume on a semi-annual basis;
- Estimation of volumes of materials affected by various hazardous constituents;
- Additional rounds of well point elevation monitoring along the sanitary sewer pipeline to determine if the pipeline is acting as a preferential pathway, and assessment of whether any other underground pipes and/or tunnels at the site are acting as preferential pathways for the transport of hazardous constituents;
- Additional air sampling to supplement existing data related to concentrations of PCBs in ambient air at the site, particularly in the vicinity of the former Interior Landfill; and
- Assessment of potential risks to human health and the environment associated with constituents present at the site.

These data needs will be addressed through the activities proposed in Section 3.

SECTION 3 - PROPOSED SUPPLEMENTAL MCP PHASE II/RFI ACTIVITIES

3.1 General

This section describes the proposed Supplemental Phase II/RFI activities to address the data needs listed in Section 2.4. Information obtained as part of the Supplemental Phase II/RFI activities will be presented in a Supplemental Phase II/RFI Report.

The methods to be used for these activities are those documented in GE's Sampling and Analysis Plan/Data Collection and Analysis Quality Assurance Plan (SAP/DCAQAP) and Data Management Plan (Blasland & Bouck, May 1994a, 1994b), as approved by the MDEP and USEPA.

A description of the proposed activities is presented below, along with a discussion of several ancillary assessment activities. Table 3-1 provides an overall summary of proposed activities.

3.2 Soil Sample Collection and Analysis from GE Facility and Commercial Areas

Numerous soil samples have been collected from the Unkamet Brook Area/ USEPA Area 1 Site and analyzed as part of various investigative activities. These analytical results have been useful in determining the presence of hazardous constituents (particularly PCBs) at portions of the site. However, the Permit requires soil sampling at or near certain SWMUs at the site to assess potential releases from those SWMUs. Limited additional soil sampling is also needed to provide a characterization of the soils in some areas where the existing data are inadequate and to provide information for use in the HEA. These soil characterization activities will be performed through the installation and sampling of soil borings or the collection and analysis of surficial soil samples.

This section describes the proposed soil boring and soil sampling activities at the GE facility and commercial areas of the site. (Proposed soil sampling in the lowland area is described in Section 3.3.) A total of eight soil borings will be installed at the GE facility to fill certain data needs, as described below. Several borings will be installed at, or downgradient of, individual SWMUs to obtain information on the presence of hazardous constituents, if any, attributable to potential releases from each SWMU and to gain a better understanding of the lithology at these location(s). Four of the eight boreholes will also be used to install monitoring wells, as discussed in Section 3.4.2. In addition, a total of nine surficial soil samples will be collected in these areas. These samples will be collected at certain SWMUs to obtain information on the presence of hazardous constituents, if any, attributable to releases from each SWMU. Samples will also be collected to provide information for the HEA, as well as for areas where previous data do not exist.

3.2.1. Former Waste Stabilization Basin

The GE Plastics Division, located within the Unkamet Brook Area/USEPA Area 1 Site, is involved in manufacturing, research, and development activities pertaining to monomers, polymers, and industrial resins. Previous activities in this area included the manufacturing of power transformers. For more than 40 years, process wastewater effluent, non-contact cooling water, and stormwater from these operations were discharged into the former waste stabilization basin and then to Unkamet Brook through outfall 010. The location of the former waste stabilization basin is shown on Figure 2-2. Past studies have determined that 98 percent of the waters discharged into the waste stabilization basin were non-contact cooling waters, and the remaining two percent were process wastewater and stormwater (O'Brien & Gere, July 1980).

In December 1979, in accordance with an agreement between GE and the MDEP, the discharge of process wastewater to the waste stabilization basin was stopped. Investigatory efforts, including the characterization of basin sediments, were initiated in June 1979. Further sampling and analysis was conducted from October 1979 through March 1980. The results of these investigatory efforts were described in a summary report (O'Brien & Gere, August 1981) and are summarized in the Interim Phase II Report/CAS.

The waste stabilization basin was remediated in 1981. The closure process initially involved removing the associated standing liquids and sludge layer. This was done by first placing synthetic fabric over the standing liquids to control any potential vapor emissions. A layer of cement/bentonite materials was then placed over the sludge layer (standing liquids still in place). The standing liquids were then pumped from the basin and discharged to the publicly owned treatment works (POTW) following pretreatment. Subsequently, the sludge layer and cement/bentonite cap were removed to an off-site secure landfill. The physical limits of the basin were easily identifiable based on visual observations (depicting the sludge layer and natural soil interface) and laboratory analysis. The basin was then backfilled with gravel, capped with soil, and seeded.

As described above, considerable pre-closure data exist for the former waste stabilization basin (see Section 3.2.2 and Tables 3-1 and 3-2 of the Interim Phase II Report/CAS). To collect additional information on the potential presence of constituents in soil associated with the former waste stabilization basin, one soil boring (UB-SB-3) will be installed to a depth of several feet below the water table at the location illustrated on Figure 3-1.

A truck-mounted hollow-stem auger rig (or equivalent method) will be used to install the boring. Split-spoon samples will be collected continuously at 2-foot increments from the land surface to the bottom of the boring in accordance with the protocols described in the SAP/DCAQAP. The split-spoon sampler will be driven ahead of the boring into undisturbed soil using a standard 140-pound hammer with a 30-inch fall.

A geologist or hydrogeologist will observe the drilling and log each split-spoon sample in detail for lithology and any signs of contamination (staining, texture, color, etc.). The geologist or hydrogeologist will then screen the sample by conducting a headspace analysis using a portable PID following the protocols described in the SAP/DCAQAP. To avoid cross-contamination, all sampling and drilling equipment will be decontaminated as described in the SAP/DCAQAP.

Soil samples will be collected continuously to the water table in 2-foot increments and analyzed for PCBs. One soil sample from o to 6 inches will be analyzed for those constituents listed in Appendix IX of 40 CFR Part 264 (excluding herbicides and pesticides) plus three additional constituents (benzidine, 2-chloroethyl vinyl ether, and 1,2-diphenylhydrazine) (Appendix IX+3) and total organic carbon (TOC). A second sample collected at depth will also be analyzed for Appendix IX+3 constituents. That sample will be selected following the protocols described in the SAP/DCAQAP for selection of a soil sample for Appendix IX+3 analysis. An additional soil sample will be collected from below the water table and analyzed for TOC to assist in the VOC plume assessment as described in Section 3.4.8.

Although significant post-remediation groundwater VOC plume monitoring data exist, it is proposed that additional groundwater monitoring be conducted as part of the groundwater sampling efforts (see Section 3.4.3).

3.2.2 Building 109 Wastewater Tank Farm

The Building 109 Wastewater Tank Farm (SWMU P-4) is located west of Building 109 as shown on Figure 2-1. This unit began operation in or around 1943 and has been used since for the storage of liquid raw materials, process wastes (including waste waters), process intermediates, and finished product. The vessels used to store these materials have included both above and below ground tanks. Over the years, storage tanks have been added and removed as business needs changed. Above ground tanks, of which there have been numerous, ranged in size from 600 gallons to 10,000 gallons. Below ground tanks, of which there have been four known, had storage capacities of 1,000, 2,400, and two of 5,000 gallons. According to historical records, above ground tanks were used to store allyl chloride, formaldehyde, isopropyl alcohol, methanol, methylene chloride, phenol, toluene, acids and caustics, while below ground were used to store methanol and toluene only.

Currently, the tank farm consists of 11 above ground storage tanks and no below ground storage tanks. Materials stored included raw materials, process intermediates, and waste water. These materials contain the chemical constituents toluene, methanol, and sodium hydroxide.

All below ground tanks have been removed from the ground. The 1,000 gallon and 2,400 gallon tanks were removed between 1971 and 1979. The two 5,000 gallons tanks were removed in 1988 in accordance with UST regulations following a tightness test performed on June 17, 1988 which determined the tanks to be leaking. Following excavation of the tanks, approximately 35 cubic yards of soil were removed and transported off-site for disposal.

Due to the large number of underground pipes and conduits located in this area as part of on-going manufacturing activities in the Plastics

Division, it may be difficult to find a safe, suitable location for soil borings. If such a location can be found, soil boring UB-SB-1 will be installed in the vicinity of former underground storage tanks (Figure 3-1). The proposed boring will extend to the water table (to a depth of approximately 12 feet) and will be sampled in 2-foot increments for PCBs with one sample also analyzed for Appendix IX+3 constituents (excluding herbicides and pesticides)

3.2.3 Former Interior Landfill

North of the former waste stabilization basin is a former Interior Landfill that is approximately 14 acres in size and was operated by GE until the late 1970s (Figure 2-1). An investigation was conducted by GE in the early 1980s in an attempt to define the areal extent of the fill area as well as groundwater flow and quality.

The extent of the former Interior Landfill has been defined through visual field inspections of the area, analysis of aerial photographs, and a magnetometer survey conducted by Weston Geophysical Corporation, Westboro, Massachusetts (O'Brien & Gere, 1981). The results of the magnetic survey indicated that two distinct zones are present within the fill area. Zone A, located on the western portion of the landfill, is characterized as exhibiting a highly irregular magnetic field indicative of buried metallic objects near the surface. Zone B, located on the eastern portion of the landfill, is characterized as exhibiting a relatively smooth magnetic field indicative of natural deposits or the absence of buried metal objects.

The extent of the former Interior Landfill has been further confirmed by various data including the PCB data recently collected during pre-excavation sampling for the installation of a fence in this area, which is discussed in Section 8.14 of the Interim Phase II Report/CAS, and

floodplain sampling conducted during MCP Phase II activities as described below.

Soil samples from the former Interior Landfill were previously collected in 1991 during Phase II activities as part of a floodplain transect (UFP3) that crossed the landfill. Soil samples at that time were analyzed for PCBs and, depending on PID results, VOCs and SVOCs. PCB concentrations varied from non-detectable to 650 ppm, while detected VOCs and SVOCs were generally less than 1 ppm. One sample, UFP3-R4, contained 1,1,1,-trichloroethane at a concentration of 76 ppm.

Numerous groundwater samples have been collected from wells either in or downgradient of the former Interior Landfill and analyzed for VOCs, phenols, and/or full Appendix IX+3 constituents (excluding herbicides and pesticides). The results of this MCP groundwater sampling are described in Section 4.2.2.4 of the Interim Phase II Report/CAS and indicate the presence of several VOCs and SVOCs, and PCBs generally well below 1 ppm. The available groundwater data are sufficient to evaluate potential transport from the former Interior Landfill via groundwater. Available surface water and sediment data collected in Unkamet Brook indicate limited migration of constituents. Soil information at depth is not necessary as any excavation related activities in this area would be infrequent, and performed under controlled conditions in accordance with the site health and safety plan, as well as applicable regulations issued by the Occupational Safety and Health Administration (OSHA) and the Massachusetts Department of Labor and Industries. These requirements include provisions for wearing personal protective equipment (PPE) when appropriate.

To assist in determining the potential presence of constituents in surficial soil, an additional soil sample will be collected from, 0 to 6 inches at the location previously found to contain the highest PCB concentration

in this area (UFP3-R1), as shown on Figure 3-1. This sample will be analyzed for total organic carbon (TOC), PCDDs/PCDFs on a congener-specific basis, and inorganics, as soil from this location was previously analyzed for PCBs, VOCs, and SVOCs.

3.2.4 Area Around Buildings OP-1 and OP-2

To provide soil data in areas of the site near Buildings OP-1 and OP-2 where soils have not been characterized, four additional soil borings (UB-MW-5 through UB-MW-8) will be installed at the locations shown on Figure 3-1. (This and other related sampling has been requested by the U.S. Navy, as discussed in Attachment A.) Each of these soil borings will be installed to a depth of approximately 10 feet below the water table. Soil samples will be collected from each boring and analyzed in 2-foot increments to the water table for PCBs. One soil sample from each boring will be analyzed for Appendix IX+3 constituents (excluding herbicides and pesticides). The results will be used to assess the potential presence of hazardous constituents associated with these areas. All four of these soil borings will be converted to monitoring wells as described in Section 3.4.2.

In addition to the four new borings described above, additional soil information is needed in the vicinity of Buildings OP-1 and OP-2 to assess the potential presence of constituents in the surficial soil in this area. Therefore, five surficial soil samples (UB-SS-1 through UB-SS-5, as illustrated on Figure 3-1) will be collected and analyzed for Appendix IX+3 constituents (excluding pesticides and herbicides) and TOC in accordance with the SAP/DCAQAP.

3.2.5 Sampling and Analysis of Soil Borings Along Merrill Road

To further assess the potential presence of hazardous constituents in soil adjacent to Merrill Road for use in the HEA, three additional soil borings (UB-SB-2 through UB-SB-4) will be installed at the locations shown

on Figure 3-1. These particular locations were selected to provide additional information related to potential exposure during road and utility maintenance activities. As discussed in Section 3.2.1, soil boring UB-SB-3 will also provide information with respect to the former waste stabilization basin. Each of these borings will be installed to a depth of several feet below the water table. Soil samples from the 0- to 6-inch increment of each boring will be collected and analyzed for Appendix IX+3 constituents (excluding herbicides and pesticides) and TOC. Soil samples will be collected continuously to the water table and analyzed for PCBs with one sample below the 0- to 2-foot increment also analyzed for Appendix IX+3 constituents (excluding herbicides and pesticides) based on protocols described in the SAP/DCAQAP. One sample below the water table will be collected and analyzed for TOC to provide information for use in the VOC plume assessment, as described in Section 3.4.8.

3.2.6 Other HEA-Related Sampling

Four surficial soil samples (UB-SS-6 through UB-SS-9) will be collected to provide additional information concerning potential human exposures at exposed soil or grass-covered areas of the site where previous surficial soil data are not available (Figure 3-1). Samples will be analyzed for Appendix IX+3 constituents (excluding pesticides and herbicides) in accordance with the SAP/DCAQAP.

3.2.7 Soil Sampling at SWMU 0-46

As described in Section 2-1, SWMU 0-46 represents the area west of Building OP-3 that was found to contain buried drums in June 1994. At that time, all drums present in this area were removed and disposed of properly. Based on the results of a GPR survey conducted in November 1994, additional drums may be present in this area. GE plans to excavate these drums and dispose of them, and any contaminated soil, in

accordance with applicable regulations and GE's Protocols for Management of Excavation Activities. A description of the removal activities and the related soil sampling data will be presented in the Supplemental Phase II/RFI Report.

3.2.8 Background Soil Data

Finally, limited available data on background levels of constituents in surficial soils in the general area of the GE facility could be used as background data for surficial soils at the Unkamet Brook Area/USEPA Area 1 Site and at other facility sites. To complete Phase II of the MCP process and an RFI for these sites, it would be desirable to collect additional background soil data. Because this data need affects several GE sites, however, a separate proposal describing a plan to obtain background soil data applicable to all the GE Pittsfield Sites will be provided to the MDEP and the USEPA for review and approval.

3.3 Floodplain Soil Sample Collection and Analysis from Lowland Area

As discussed in Section 14 of the Interim Phase II Report/CAS, there are three specific data needs related to floodplain soils in the lowland area located south of the railroad tracks. These data needs are: 1) to further define the extent and concentration of PCBs and SVOCs to the west of existing transect UFP-2; 2) to collect congener-specific information on the concentrations of PCDDs and PCDFs to the east and south of Building OP-3; and 3) to collect data on the presence and concentration of various Appendix IX+3 constituents along the Unkamet Brook floodplain. These investigations are described below.

3.3.1 Additional Sampling at Transect UFP-2

During Phase II activities, surficial soils at the Unkamet Brook Area were sampled and analyzed for PCBs and in some cases, based on PID screening, for VOCs and SVOCs, at three transects and at 20 locations

south of Building OP-3. (Two samples from near Building OP-3 were analyzed for Appendix IX+3 constituents as described below.) PCBs were detected at several locations generally in close proximity to the brook. Low levels of PCBs and a number of SVOCs were detected along the western side of transect UFP2 (Figure 3-1). To better define the extent of the SVOCs and PCBs in this area, a total of six floodplain soil samples from three locations will be collected to the west of transect UFP-2. Specific sample locations will be selected in the field, with samples collected from 0 to 6 inches and 6 to 12 inches, and submitted for analysis of PCBs and SVOCs.

3.3.2 Floodplain Soil Sampling Near Building OP-3

Twenty floodplain soil samples were collected to the south and east of Building OP-3 during Phase II activities. These soil samples were analyzed for PCBs and in some cases, based on PID screening, for VOCs and SVOCs. Two samples, UOP3-S15 and UOP3-S20, were analyzed for Appendix IX+3 constituents. Various PCDD and PCDF homologs were detected in the soil at these two locations. To provide congener-specific PCDD and PCDF data at these locations for use in the HEA, another 0- to 12-inch soil sample (which is the same depth increment previously sampled) will be collected from each of these locations (as shown on Figure 3-1) and submitted for analysis of TOC and PCDDs/PCDFs on a congener-specific basis.

3.3.3 Floodplain Sampling and Analysis for Appendix IX+3 Constituents

To collect additional information on the potential presence of various Appendix IX+3 constituents in the lowland area south of the railroad tracks, two floodplain soil samples will be collected. Specifically, soil samples will be collected at one location on transect UFP-1 and at one location on transect UFP-2 at the location that previously exhibited the highest PCB

result on each transect (UFP1-R1 and UFP2-L3 as illustrated on Figure 3-1). Soil samples previously collected from these two locations during Phase II activities were analyzed for PCBs, VOCs, and SVOCs. Therefore, the new soil samples will be analyzed for TOC, PCDDs/PCDFs on a congener-specific basis, and inorganics.

3.4 Hydrogeologic Investigations

3.4.1 Groundwater Monitoring - General

The Permit requires the performance of groundwater monitoring for certain SWMUs within the Unkamet Brook Area/USEPA Area 1 Site. To address this requirement, an "area-wide" approach to groundwater monitoring will be conducted. This area-wide approach entails the performance of sufficient groundwater monitoring to account for releases from each SWMU subject to such monitoring, to evaluate potential migration of hazardous constituents to the site boundaries, and to allow, to the extent feasible, the identification of likely sources of hazardous constituents (if any) found in groundwater. The USEPA agreed to this area-wide concept for groundwater monitoring in a letter from Mr. Merrill Hohman (USEPA) to Mr. Ronald Desgroseilliers (GE) dated April 9, 1992, and on page 27 of the Fact Sheet accompanying the draft Corrective-Action Permit, dated May 10, 1990. This area-wide approach has been used to develop the proposed activities described below.

As described in the Interim Phase II Report/CAS, groundwater samples have been collected and analyzed from numerous monitoring wells at the Unkamet Brook Area/USEPA Area 1 Site during previous investigations (see Figure 2-2). While data collected at a variety of monitoring wells have yielded information on the extent of hazardous constituents in groundwater, additional groundwater sampling would be appropriate to obtain more

information on the potential presence and nature of hazardous constituents in site groundwater on an area-wide basis. Such additional sampling will be carried out at select wells (existing and new) as described in the following sections.

3.4.2 Monitoring Well Installation

As described in Section 3.2.4, soil borings UB-MW-5 through UB-MW-8 will be completed as monitoring wells to better characterize groundwater associated with the area near Buildings OP-1 and OP-2, as requested by the U.S. Navy (Attachment A). The wells will be constructed of 1½- to 2-inch diameter Schedule 40 polyvinyl chloride (PVC) riser with 10 feet of 0.010-inch slotted screen. The screen will be installed to bridge the water table surface such that approximately 5 feet of screen will be above the water table. The installation of the monitoring wells will follow the procedures detailed in the SAP/DCAQAP.

Each well will be developed with a surge block and centrifugal pump. Development will continue until there is a good hydraulic connection between the aquifer and well and relatively sediment-free water is obtained from the pump discharge.

Upon completion, all new monitoring wells will be surveyed to an existing benchmark located on-site and accurately located on a base map. All development water will be containerized, properly labeled, and disposed of in accordance with applicable regulations.

3.4.3 Groundwater Sampling and Analysis

No sooner than one week after the newly installed wells have been developed, groundwater samples will be collected for laboratory analysis. A total of 29 monitoring wells will be sampled -- new wells UB-MW-5 through UB-MW-8, and existing wells 60B, RF-14, RF-15, 16ABCE, 39ABDE,

75B, 78B, 87B, 89ABD, 95ABC, 114ABC, and 115AB -- as illustrated on Figure 3-1.

3.4.3.1 Rationale for Selection of Wells for Sampling

The purpose of this groundwater sampling program is to collect additional information for the area-wide groundwater monitoring approach (including data for areas downgradient of SWMUs that require groundwater monitoring and where prior data do not exist).

Wells UB-MW-5 through UB-MW-8, RF-14, RF-15, and 60B have been selected for sampling to provide additional groundwater quality data in areas of the site where limited prior data exist. These samples will be analyzed for Appendix IX+3 constituents (excluding herbicides and pesticides).

Wells 39ABDE, 75B, 78B, and 87B have been selected for sampling to complete the area-wide groundwater monitoring effort downgradient of SWMUs subject to such monitoring (i.e., the former Interior Landfill and the former waste stabilization basin). Groundwater samples from these wells will be analyzed for VOCs as previous full Appendix IX+3 groundwater results in this area did not indicate other constituents to be at concentrations that warranted additional sampling, as described in Section 4.6.1 of the Interim Phase II Report/CAS.

Wells 39ABDE, 16ABCE, 89ABD, 95ABC, 114ABC, and 115AB have been selected for sampling because these wells are located along the axis of the VOC plume between the former waste stabilization basin and the Housatonic River. These wells will be sampled on a semi-annual basis (in the fall when the water table is seasonably low and in the spring when the water table is seasonably high) and analyzed for VOCs. Data from these wells will be used to monitor the horizontal and vertical extent of the VOC plume and to provide

information for use in a quantitative assessment of the VOC plume as described in Section 3.4.8.

The semi-annual monitoring will continue after submission of the Supplemental Phase II/RFI Report. A report will be submitted each year to the MDEP and the USEPA that summarizes the data collected that year and compares those data to historical groundwater quality data. The report will include maps and cross-sections depicting the VOC plume, and potentiometric surface maps depicting hydraulic gradient and groundwater flow direction. This program will be conducted until such time that GE proposes, and the MDEP and USEPA agree, to discontinue groundwater monitoring of the VOC plume.

The Permit also requires groundwater sampling and analysis at, or downgradient of, several SWMUs at the site including SWMU P-4 (Building 109 Wastewater Tank Farm). Groundwater sampling was conducted downgradient of SWMU P-4 at wells 35AB, 37AB, 38AB, and 39BDE, during Phase II activities in 1991. Sample were collected and analyzed for Appendix IX+3 constituents (some samples excluding herbicides and pesticides). Based on the available data, no additional groundwater sampling activities related to this SWMU are proposed at this time.

3.4.3.2 Sampling and Analysis Procedures

Prior to the collection of groundwater samples, each well will be evacuated or purged, thus ensuring the collection of representative groundwater samples. All purge water will be containerized and disposed of properly. Well purging will be achieved in accordance with the field procedures given in the SAP/DCAQAP. When the well cap is first removed, the headspace in the well will be monitored with

a photoionization detector (PID) and the value recorded in the field notebook.

Field measurements of specific conductivity, pH, and temperature will be recorded from each well immediately after sampling is completed. Sampling, analysis, and decontamination activities will follow the protocols set forth in the SAP/DCAQAP.

The analytical results will be presented in the Supplemental Phase II/RFI Report. That report will also include an evaluation of and proposal for future groundwater quality monitoring at the site, including the wells to be monitored, the constituents for analysis, and the frequency of monitoring.

3.4.4 Water Level Measurements

As discussed in Section 4.5 of the MCP Interim Phase II Report/CAS, groundwater potentiometric surface elevation monitoring has been conducted at the site during numerous measurement events since 1980. These data, along with data collected during groundwater sampling conducted as part of the Supplemental Phase II/RFI activities, will be used to assess seasonal variations in groundwater elevation at the site.

The groundwater elevation data will be evaluated for seasonal and temporal groundwater elevation fluctuations as described in Section 3.4.5.

3.4.5 Evaluation of Groundwater Flow Patterns

3.4.5.1 General Observations

Water table elevation contours will be depicted on maps and interpreted to graphically illustrate groundwater flow. The flow maps, which will include an assessment of seasonal variations in groundwater flow patterns (if any) at the site, will be used to determine the distribution of heads, apparent discharge areas, areas of high (or low) velocities, and the general flow patterns. These figures will be

developed from elevations of the water table as described in Section 3.4.4, and will depict water level contours and groundwater flow direction. Density corrections will be made for the thickness of light non-aqueous phase liquid (LNAPL), if any is present.

Existing geologic cross-sections (Figure 4-5 in the Interim Phase II Report/CAS) will be revised, if necessary, to include lithological information collected from the newly installed borings and monitoring wells.

3.4.5.2 Assessment of Vertical Gradients

In addition to the vertical gradient assessment in Section 4.5.1 of the Interim Phase II Report/CAS, which indicated upward vertical gradients adjacent to the Housatonic River, water level elevation data obtained from monitoring well clusters 16ABCE, 39ABDE, 89ABD, 95ABC, 114ABC, and 115AB during semi-annual groundwater sampling events will be used to further assess vertical hydraulic gradients. The water level elevation data will also be used to assess any seasonal or temporal changes in gradients. This data, along with the other water level elevation data from monitoring wells and surface water at the site, will allow groundwater flow dynamics to be characterized at the downgradient river perimeter.

3.4.5.3 Assessment of Seasonal and Temporal Variation

Along with Housatonic River stage data, data collected during the semi-annual groundwater sampling events from monitoring well clusters 16ABCE, 39ABDE, 89ABD, 95ABC, 114ABC, and 115AB will be used to assess seasonal and temporal variations in water table elevations and groundwater flow.

This assessment will include a characterization of the hydraulic relationship between the Housatonic River, Unkamet Brook, and site

groundwater flow. Apparent groundwater flow reversals observed from these data, if any, will be assessed and reported.

3.4.6 In-Situ Hydraulic Conductivity Testing

As described in Section 4.5.2 of the Interim Phase II Report/CAS, numerous in-situ hydraulic conductivity tests ("slug tests") have been performed as part of prior investigations. The purpose of such tests is to characterize the hydraulic conductivity of the overburden material throughout the Unkamet Brook Area. The existing information will be supplemented by the performance of slug tests at the four monitoring wells to be installed during Supplemental Phase II/RFI activities (Wells UB-MW-5 through UB-MW-8 - see Figure 3-1). These slug tests will be performed promptly after the development of the new wells and will be conducted in accordance with the protocols described in the SAP/DCAQAP.

3.4.7 Groundwater Flow Rate Estimates

The site-wide groundwater flow rate will be calculated using Darcy's Law and estimates of effective porosity. The flow rate (seepage velocity or average linear velocity) is directly proportional to the hydraulic gradient, which will be determined by the use of the groundwater elevation data as described in Section 3.4.4. Estimates of effective porosity will be obtained from published literature for the saturated lithology. The direction of groundwater flow is expected to be perpendicular to the lines of hydraulic head (e.g., isotropic condition). The estimated rate of movement of groundwater or average linear velocity (also called seepage velocity) can be derived from Darcy's law divided by the effective porosity (Fetter, 1988), as follows:

$$V_x = -Kdh/ndl$$

where, V_x is the average linear velocity, K is the hydraulic conductivity, dh/dl is the hydraulic gradient, and n is the effective porosity.

The seasonal or temporal variations in estimated groundwater flow rates will be characterized through the use of the groundwater elevation data described in Section 3.4.4.

The chemical constituents of interest detected in groundwater at the site are expected to travel at considerably slower rates than groundwater due to dispersion and retardation factors. The rate of solute transport movement can be determined by the retardation equation (Fetter, 1988):

$$V_c = V_x / [1 + (P_b/\theta)(K_d)]$$

where, V_c is the velocity of the chemical constituent of interest, V_x is the average linear groundwater velocity, P_b is the dry bulk density of the soil, θ is the porosity, and K_d is the sorption-based distribution coefficient for the chemical constituent of interest.

Available retardation factors for chemical constituents of interest from the published literature will be presented in the Supplemental Phase II/RFI Report. Estimates of chemical constituent flow velocity will be prepared using existing and new site data, and values will be published in the report.

3.4.8 Quantitative Assessment of VOC Plume Discharge

As discussed in Section 14 of the Interim Phase II Report/CAS, additional information is needed to quantitatively evaluate the volume (mass flux) of dissolved constituents potentially entering the Housatonic River and to assess the relative contribution from Unkamet Brook. MCP Phase II groundwater and surface water sampling indicated that the VOC plume was discharging to the lower section of Unkamet Brook, and possibly into the Housatonic River. Additional VOCs were found to be present in the upstream reach of Unkamet Brook (albeit at much lower concentrations).

Surface water samples and stream/river flow-rate data will be collected

within a single field day and analyzed for VOCs, at the following locations (Figure 3-1):

- Housatonic River upstream of, and proximal to, the confluence with Unkamet Brook (LOC-4);
- Housatonic River downstream of, and proximal to, the confluence with Unkamet Brook (LOC-5);
- Unkamet Brook near the confluence with the Housatonic River (USW-10); and
- Further upstream on Unkamet Brook (USW-4).

As described in more detail in Section 3.7.2, a surface water sample will be also collected just upstream of Dalton Avenue and analyzed for SVOCs and inorganics.

Based on the flow rates and concentration of constituents of concern, the mass flux of constituents in surface water at each of the above locations will be calculated.

In addition, to provide supplemental information regarding the groundwater flow rate and loading of the constituents of concern to the brook, the following data will be collected on the same day that the above sampling is performed (as well as during a second semi-annual event):

- As described in Section 3.4.3.1, groundwater samples from select monitoring wells (i.e., monitoring wells 16ABCE, 39ABDE, 89ABD, 95ABC, 114ABC, and 115AB) located in the vicinity of Unkamet Brook, to be analyzed for Appendix IX VOCs; and
- Measurement of groundwater elevations in the monitoring wells described above.

The data collected as part of the quantitative assessment of the VOC plume discharge will be evaluated to assess such variables as relative contribution of VOCs from groundwater to Unkamet Brook, plume attenuation

characteristics, relative impact of VOCs on the Housatonic River, and groundwater discharge rates. The results of this evaluation will be presented in the Supplemental Phase II/RFI Report.

3.4.9 Building 51/59 Oil Plume Investigation

As discussed in Section 10 of the Interim Phase II Report/CAS, the occurrence of free-phase oil in the vicinity of Buildings 51 and 59 was investigated in 1986 and 1987. Between February 1988 and 1992, GE has periodically monitored the thickness of oil in 15 to 18 monitoring wells and manually bailed wells that exhibited a significant accumulation of oil.

Results of the MCP oil investigation indicate that the extent of free-phase oil in the ground in this area has been well defined to the northeast and east. However, the pocket of oil between Buildings 51 and 59, which has been monitored at wells 59-1, 59-3, and 59-7, is not well defined along the western border. Therefore, to address this data need, piezometer UB-PZ-1 will be installed along Plastics Avenue to determine if oil is present in this area. The proposed location for the piezometer is illustrated on Figure 3-2.

In addition, two piezometers will be installed along the northern edge of Merrill Road to confirm that the southern boundary of the oil plume has not extended into this area. Although wells 34B, 35B, 37B, and 38B were monitored for oil on a monthly basis from 1988-1992 and determined to be oil free, it is possible under certain circumstances that the well screens at these locations are below the water table. Therefore, the installation of two additional piezometers (UB-PZ-2 and UB-PZ-3) in this area would be appropriate to address this data need. The proposed well point locations are illustrated on Figure 3-2.

The piezometers will be installed in accordance with the SAP/DCAQAP. Upon completion, the piezometers will be developed to ensure a good hydraulic connection between the screen zone and the water formation.

Following installation and development of the new piezometers, wells and piezometers UB-PZ-1 through UB-PZ-3, 51-3, 51-5 through 51-9, 51-11 through 51-20, 59-1, 59-3, and 59-7 will be monitored semi-annually for oil presence and thickness. Similar to oil monitoring performed in East Street Area 2/USEPA Area 4 and East Street Area 1/USEPA Area 3, monitoring will be performed in October when the groundwater table is typically low and in April, when the groundwater table is typically high.

To assist in gathering accurate potentiometric data, the top of casing at wells 51-9, 59-1, and 59-3 will be re-measured. The new top of casing elevation data will be used in future evaluations of groundwater flow in this area.

Results of the existing and proposed semi-annual monitoring efforts will be used to assess seasonal variations in free-phase oil thickness, location, and groundwater flow patterns. This information will then be utilized to determine the future necessity of oil recovery in this area (if any).

3.5 Integrity Testing and Inspection

As part of the investigation of individual SWMUs within the Unkamet Brook Area/USEPA Area 1 Site, the Permit requires that GE determine, through mechanical and/or visual means, the integrity of several underground storage tanks (USTs), an underground drainage pipe, a metal treat area, and an oil/water separator. A total of 18 SWMUs within the Unkamet Brook Area/USEPA Area 1 Site are subject to this requirement. However, as discussed below, integrity testing of most of these SWMUs is either infeasible or unnecessary because the SWMUs have been previously removed from the ground or filled in place.

In accordance with the Permit, when integrity testing is performed (following a 14-day notice to the USEPA), all calculations, measurements, results, copies of inspection notebooks, raw data, photographs, and any other information collected during the performance of these visual inspections will be compiled and summarized. This information will be provided to the MDEP and USEPA within 30 days of the performance of the integrity testing activities, as required by the Permit.

3.5.1 Building 51 Underground Drainage Pipe (SWMU O-B)

This SWMU was a section of underground drainage pipe located east of Building 51 as illustrated on Figure 2-1. The pipe was constructed of clay tile and installed in 1922. This pipe connected to the Building 119W Oil/Water Separator (SWMU G-17) following its construction in 1970. The pipe received stormwater, boiler blowdown, and washwater from boiler cleaning operations in Building 51. Operation of the Building 51 powerhouse ceased in 1990 with the commencement of operations of the Altresco Cogeneration Facility.

Due to the observed presence of oil in the Building 119W Oil/Water Separator that was entering from the Building 51 Underground Drainage Pipe, Geraghty & Miller, on GE's behalf, began an investigation of this area (Geraghty & Miller, 1987). The investigation determined that oil present in the Building 51/59 oil plume was able, under seasonably high groundwater table conditions, to rise with the water table and enter a specific leaking section of the pipe. Following additional activities, including a video reconnaissance of the leaking pipe, the clay tile pipe was crushed and left in place and replaced with a new stormwater drainage pipe installed above the high water table elevation. Since the replacement of the pipe, there has been no indication of oil from the Building 51/59 oil plume entering the pipeline. Therefore, no further integrity testing is necessary at this SWMU.

3.5.2 Building 51 Elementary Neutralization Unit (SWMU O-8)

The Building 51 Elementary Neutralization Unit was located in Building 51 (Figure 2-1) and consisted of a wastewater treatment system, which included tanks, sand filters, cartridge filters, and a spill collection pit. The unit was used to process incoming city water and wastewater associated with the manufacture of printed wiring board, and was designed to treat up to 30,000 gallons per day (gpd) on a batch-operated basis.

The Building 51 Elementary Neutralization Unit was approximately 80-feet long and 40-feet wide, and was fabricated of stainless steel, concrete, PVC, polypropylene, and polyester materials, with an underlying concrete base. The unit was operated from 1983 to November 1987.

Building 51 is no longer used for manufacturing. The Elementary Neutralization Unit was removed from a non-cracked concrete floor. Because the unit was removed from a non-cracked concrete floor, analytical data were not collected during removal activities. Because this unit has been removed, it cannot be tested for integrity.

3.5.3 Building OP-3 Metal Treat Area (SWMU 0-41)

The Building OP-3 Metal Treat Area is located inside Building OP-3 along the southern wall of the building as illustrated on Figure 2-1. The unit incorporates a full-scale metal cleaning and treating system, which includes wastewater treatment. The unit originally operated as a paint area in 1952, and was upgraded to include anodizing in 1962. The existing tanks were installed in 1982.

The Metal Treat Area is underlain by concrete and occupies an overall area 34-feet by 14-feet, and holds a total of 26 tanks ranging from 2- to 3-feet long and 2- to 3-feet wide, and having a maximum depth of 4 feet. The tanks are constructed of stainless steel, lead, polypropylene, and

fiberglass reinforced polyester. The unit is designed to treat up to 3,000 gpd.

Following a thorough cleaning of this area (if necessary), a visual inspection of the concrete floor on the bottom of the Metal Treat Area will be conducted to identify any cracks, deterioration, or other signs of questionable integrity.

3.5.4. Building 119W Oil/Water Separator (SWMU G-17)

The Building 119W Oil/Water Separator is located adjacent to the former waste stabilization basin, as illustrated on Figure 2-1. The unit consists of a gravity separator used to skim oil from the surface of wastewater originating from Buildings OP-1, OP-2, 51, and 59 (Plastics and Ordnance Divisions) and from stormwater runoff from facility parking lots. Collected oil is placed in containers and transferred to the Building 121 Drum Storage Area (SWMU P-8) for off-site disposal. Treated water is discharged to Unkamet Brook through NPDES Outfall No. 009.

The Building 119W Oil/Water Separator is 60-feet long, 20-feet wide, and 3-feet deep. The unit is constructed of concrete, and is underlain by soil. The Building 119W Oil/Water Separator was installed in 1978 and is currently in use.

Discharge flow from SWMU G-17 is indirectly associated with NPDES-permitted Outfall 09A, and as such, is regulated by specific discharge and monitoring requirements. In addition to establishing discharge-related requirements, the NPDES permit required GE to develop and implement a Stormwater Management Plan (Blasland & Bouck, July 1990, as subsequently amended). One element of that plan is the performance of a monthly inspection of each stormwater management facility (including SWMU G-17). Included in this inspection are general observations regarding the overall condition of this facility. As part of the integrity testing requirements for

the SWMU G-17, the monthly inspections will continue, and will include a greater emphasis on the structural integrity and condition of the visible portions of this unit.

In addition, GE periodically performs maintenance activities that consist of draining this unit of accumulated sediment. The effort involves the use of a licensed hazardous waste contractor, implementation of confined-space entry procedures for any personnel entering the unit, and specialized removal and dewatering equipment for the recovered materials. GE performs this removal activity on a periodic basis that is anticipated to continue. GE will perform visual inspections of the submerged portions of this SWMU in conjunction with these on-going periodic maintenance acitivites. This is a more practical and cost-effective means of achieving the Permit objective than would be an independent effort to remove sediments and inspect the submerged portions of this SWMU apart from these periodic maintenance activities.

3.5.5 Building OP-3 Abandoned Storage Tank (SWMU O-45)

This storage tank was formerly located outside the south wall of Building OP-3, as illustrated on Figure 2-1. This unit consisted of an underground tank which had been out of service since 1967. The tank, which is also known as Tank OP-3-A1, was removed in 1992. The details regarding the removal of this SWMU are presented in Appendix B of the Interim Phase II Report/CAS. Because this SWMU was removed, integrity testing cannot be conducted.

3.5.6 Building OP-1 Abandoned Anodize Tank (SWMU O-2)

The Building OP-1 anodize tank was located below the Drum Storage Area No. 224 (SWMU O-6) immediately outside the west wall of Building OP-1 (Figure 2-1). The tank, which is also known as tank OP1-A1, was situated underground, constructed of steel, and underlain by soil. Tank

dimensions are not available although it formerly held 1,000 gallons of wastewater.

The unit was operated from 1942 to 1970. In 1981, under supervision of the Massachusetts Department of Environmental Quality Engineering (DEQE), a "Close-in-Place" plan was implemented in which the unit was emptied and filled with sand. In 1991, this tank was removed and disposed of in accordance with all applicable local, state, and federal regulations. The details regarding the removal of this SWMU are presented in Appendix B of the Interim Phase II Report/CAS. Because this SWMU was removed, integrity testing cannot be conducted.

3.5.7 Underground Fuel Storage Tanks (SWMU O-A)

This unit consisted of two underground tanks, formerly located adjacent to the east wall of Building OP-2 (Figure 2-1). The tanks, also known as Tank OP2-01 and Tank OP2-02, were in operation from 1944 to 1959 and were constructed of steel, each having a storage capacity of 550 gallons. The tanks reportedly contained gasoline. These tanks were removed in 1991 and disposed of in accordance with all applicable local, state, and federal regulations. The details regarding the removal of this SWMU are presented in Appendix B of the Interim Phase II Report/CAS. Because this SWMU was removed, integrity testing cannot be conducted.

3.5.8 Transformer Division Inactive USTs (SWMUs T-EEE and T-FFF)

SWMUs T-EEE and T-FFF (also known as tanks 51-01 and 51-05, respectively) were part of group of six underground storage tanks located just east of Building 51 (Figure 2-1). They were constructed of steel, SWMU T-EEE in 1937 and SWMU T-FFF before 1944. They previously contained fuel oil and had a capacity of 20,000 gallons each. SWMU T-EEE was emptied and filled with sand in 1978, while SWMU T-FFF was emptied and filled with sand in 1958. These tanks were removed in 1991,

in accordance with all applicable local, state and federal regulations. Removal activities associated with these tanks are described in Section 8.5 of the Interim Phase II Report/CAS. Because these SWMUs were removed, integrity testing cannot be conducted.

3.5.9 Plastics Division Inactive USTs (SWMUs P-D through P-L)

SWMUs P-D through P-L consist of nine inactive underground storage tanks associated with the Plastics Division. Tanks P-D through P-K appear on old plant drawings and were located adjacent to Buildings 114, 115, and 119A as illustrated on Figure 3-1.

Three of these tanks (SWMUs P-D through P-F) had a capacity of 30,000 gallons each. Two of these tanks contained benzene and the other contained phenol. These three tanks were removed between 1949 and 1952. Three other tanks (SWMUs P-G through P-I) had a capacity of 15,000 gallons each. All of these tanks contained benzene, were removed from service by 1952, and pulled from the ground in 1982. Two tanks (SWMUs P-J and P-K) had capacities of 15,000 gallons and 10,000 gallons, respectively, and both contained No. 2 fuel oil. The date of removal of these tanks is currently unknown.

SWMU P-L was not identified on old plant drawings; however, two additional USTs were identified. Both of these tanks had a capacity of 800 gallons and both were located adjacent to the southeast corner of Building 59. One of these tanks contained toluene and the other contained allyl chloride. Both tanks were removed between 1949 and 1952.

GPR was used in August of 1993 to verify the removal of SWMUs P-D, P-E, and P-F. The GPR study was conducted by Blasland & Bouck in and around the area of these USTs, and the results showed no reflections characteristic of USTs. The results of this study are provided in Appendix E of the Interim Phase II/CAS.

GPR was used in November 1993 to verify the removal of SWMUs P-J, and P-K, and the two additional USTs. The GPR study was conducted by Blasland & Bouck in and around the area of these USTs, and the results showed no reflections characteristic of USTs. The results of this study are also provided in Appendix E of the Interim Phase II Report/CAS. Because these SWMUs appear to have been removed, integrity testing cannot be performed.

3.6 Subsurface Gas Sampling

As discussed in Section 4 of the Interim Phase II Report/CAS, various hydrogeological investigative activities have been completed at the site. As part of these subsurface investigations, headspace analyses of split-spoon soil samples have been performed with a photoionization detector (PID). Additional PID readings have been collected as part of various miscellaneous investigations as discussed in Section 8 of the Interim Phase II Report/CAS. A number of these readings are in the area of the former Interior Landfill (SWMU G-11) and the former waste stabilization basin (SWMW G-12). PID headspace readings give a qualitative estimate of the concentration of volatile constituents present in subsurface soil gas. The PID headspace readings from the borings at the site are presented in Table 4-13 of the Interim Phase II Report/CAS.

As noted in Section 4.3.2 of the Interim Phase II Report/CAS, the existing PID data from most borings show background PID readings (less than 1 PID unit) near the ground surface (0-2 foot interval), while higher PID readings are principally found at depth as expected based on the location of the VOC plume. These data indicate that while volatile constituents may be present at the site in subsurface materials, there is no appreciable vertical migration of constituents in subsurface gas to the ground surface in the majority of the site.

As noted further in Section 4.3.2 of the Interim Phase II Report/CAS, a total of eight subsurface gas samples were collected from soil gas vapor probes parallel to Merrill Road and analyzed for VOCs. Several VOCs, notably benzene and cholorobenzene, were detected in the vicinity of the former waste stabilization basin (SWMU G-12). These results are consistent with groundwater sampling results from this area in that several VOCs are present in subsurface materials. In addition, this Supplemental Phase II SOW/RFI Proposal proposes, for other purposes, the installation of eight soil borings (four to be completed as monitoring wells). During the installation of these borings/wells, PID screening will be performed on each 2-foot interval split-spoon sample in accordance with the protocols specified in the SAP/DCAQAP. PID measurements will also be collected as part of groundwater sampling activities (i.e., when the well is first opened, a PID measurement will be taken). The existing database of PID readings together with the PID screening associated with the proposed activities should be sufficient to meet the objectives of a subsurface gas investigation at this site.

3.7 Investigation of Surface Water and Sediment

The Permit sets forth three requirements related to surface water and sediment sampling of the Unkamet Brook Area/USEPA Area 1 Site. It requires: 1) a surface runoff characterization plan for the former Interior Landfill (SWMU G-11) and the former waste stabilization basin (SWMU G-12); 2) a surface water sampling plan to characterize releases from these two SWMUs; and 3) a sediment sampling plan to characterize releases from these two SWMUs. Each of these requirements is discussed below.

3.7.1. Surface Runoff Characterization

The Permit states that surface water runoff from the former Interior Landfill (SWMU G-11) and the former waste stabilization basin (SWMU G-12)

should be characterized. For both of these SWMUs, the likely recipient of any surface water runoff is Unkamet Brook which runs through the former Interior Landfill and adjacent to the former waste stabilization basin.

Surface runoff typically occurs during periods of rainfall when the rate of rainfall exceeds the infiltration capacity of the soils. Therefore, in order to characterize surface runoff to Unkamet Brook from the former Interior Landfill and the former waste stabilization basin, surface water sampling would be conducted during a period of relatively high rainfall.

As described in Section 5.3 of the Interim Phase II Report/CAS, surface water sampling was conducted in Unkamet Brook during both high-flow and low-flow conditions. The timing of the high-flow sampling was approved by the MDEP and corresponded to a period of prolonged rainfall. Samples were collected from five locations in Unkamet Brook and analyzed for Appendix IX VOCs, SVOCs, PCBs, and inorganics. The five locations are illustrated on Figure 5-2 of the Interim Phase II Report/CAS.

Location ID	Location Description
USW-1	Upstream of the former Interior Landfill;
USW-2	Downstream of the former Interior Landfill, but upstream of the former waste stabilization basin;
USW-4	Below the former waste stabilization basin, just below the railroad crossing;
USW-8	Downstream of the railroad crossing; and
USW-10	Just upstream of the Housatonic River confluence.

The results of the Unkamet Brook high-flow sampling, as presented in Table 5-4 of the Interim Phase II Report/CAS, indicate the following:

- No VOCs, SVOCs, or PCBs were detected upstream of the former Interior Landfill at location USW-1;

- Chlorobenzene at a concentration of 5 ppb and benzene at an estimated concentration of 2 ppb were detected downstream of the former Interior Landfill. PCBs were detected in an unfiltered sample at 0.064 ppb at this location;
- Benzene and chloroform were detected at estimated concentrations of 2 ppb at USW-4 below the former waste stabilization basin, along with PCBs in an unfiltered sample at a concentration of 0.086 ppb. Chlorobenzene was not detected at this location under high-flow conditions

Based on the availability of high-flow surface water sampling results at locations upstream and downstream of the former Interior Landfill and the former waste stabilization basin, additional sampling to characterize surface runoff from these SWMUs is not necessary at this time.

3.7.2 Unkamet Brook Surface Water

As noted above, the Permit requires surface water sampling for areas that may contain constituents released from SWMUs on the GE facility. A number of surface water sampling programs have been conducted in Unkamet Brook:

- A total of 10 locations were sampled in 1981 for VOCs and PCBs;
- Samples were collected from two locations during five sampling rounds between 1982 and 1985 and analyzed for VOCs and PCBs;
- Samples were collected from four locations annually in 1987, 1988, and 1989 and analyzed for VOCs and PCBs; and

- Samples were collected from five locations during both high-flow and low-flow conditions during MCP Phase II activities and analyzed for VOCs, SVOCs, PCBs, and inorganics.

Details on these sampling activities are provided in Sections 5.2 and 5.3 of the Interim Phase II Report/CAS.

Additional surface water sampling will be conducted as part of this Supplemental Phase II/RFI investigation. As described in Section 3.4.8, Unkamet Brook surface water samples will be collected as part of the VOC plume assessment. In addition, a sample (UB-SW-UP) and flow rate measurements will be collected in Unkamet Brook just upstream of Dalton Avenue as illustrated on Figure 3-1. The water sample will be analyzed for SVOCs and inorganics, and will provide additional information to be compared to existing data.

3.7.3 Unkamet Brook Sediment

As noted above, the Permit requires a sediment sampling plan for areas that may contain constituents released from SWMUs on the GE facility. A number of sediment sampling activities have also been conducted in Unkamet Brook:

- In 1981, sediment samples were collected at 15 locations and analyzed for PCBs;
- In 1982, sediment samples were collected from 18 locations from just upstream of Dalton Avenue to the Housatonic River and analyzed for PCBs and chlorobenzene;
- Between 1983 and 1985, sediment samples were collected from three locations on a semi-annual basis and analyzed for PCBs;
- During Phase II activities, sediment samples were collected at five locations and analyzed for VOCs, SVOCs, total

phenols, PCBs, and inorganics and from two locations within the former Interior Landfill for Appendix IX+3 analyses.

Details on these sampling activities are provided in Sections 6.2 and 6.3 of the Interim Phase II Report/CAS.

An additional sediment sample (UB-SED-UP) will be collected in Unkamet Brook just upstream of Dalton Avenue as illustrated on Figure 3-1, and analyzed for SVOCs and inorganics. This additional sample will provide background information to be used for comparative purposes.

3.7.4 Housatonic River Surface Water and Sediment

An MCP Interim Phase II Report/Current Assessment Summary for the Housatonic River and Silver Lake was submitted to the MDEP and USEPA in December 1991 (Blasland & Bouck, December 1991), and an addendum to that report was submitted in August 1992 (Blasland & Bouck, August 1992). An MCP Supplemental Phase II Scope of Work and RFI Proposal for the Housatonic River and Silver Lake was submitted for MDEP and USEPA review in April 1993 and was revised in accordance with comments from MDEP and USEPA and resubmitted in June 1994 (Blasland, Bouck & Lee, Inc., June 1994). The proposal was approved in September 1994, and further assessment of the sediment and surface water of the Housatonic River and Silver Lake adjacent to the site are underway as part of the overall MCP/RCRA investigation of the Housatonic River and Silver Lake.

3.8 Preferential Pathway Analysis of Underground Pipes and Tunnels

3.8.1 Supplemental Preferential Pathway Analysis of Previously Assessed Pipelines

As discussed in Section 4.7 of the Interim Phase II Report/CAS, the results of the preferential pathway analysis performed in the previous MCP Phase II investigations illustrate that the sanitary sewer pipeline and the

Building 119W oil/water separator effluent pipe and storm drain are not acting as preferential pathways. However, well point data associated with one sampling round (out of three) at one location along the sanitary sewer pipeline did potentially show preferential migration. To better assess this phenomenon, additional rounds of well point elevations along the pipeline will be collected at WP-1A, -1B, and -1C; WP-2A, -2B, and -2C; and WP-3A, -3B, and -3C as illustrated on Figure 3-3. Groundwater elevations will be collected twice, once during a period with a relatively high groundwater table and once with a period of relatively low water table. Results of this sampling will be evaluated, together with existing data, to determine if and under what conditions the sanitary sewer line may be acting as a preferential pathway.

3.8.2 Preferential Pathway Analysis of Other Underground Pipes and Tunnels

This section presents a proposal for a preferential pathway analysis of underground pipes and tunnels that were not assessed during prior MCP Phase II activities. This analysis is pursuant to Special Condition II.A.1.e.6 of the Permit, which states that:

> "The RFI Proposal shall include procedures for incorporating the contribution of preferential pathways, including but not limited to underground pipes, tunnels and storage tanks, to releases of hazardous waste and/or hazardous constituents to the subsurface environment."

In general, the preferential pathway analysis described below utilizes a phased approach. The first phase will involve the compilation of information (to the extent currently available) related to the locations of underground pipes/tunnels. The second phase will involve evaluating the locations of potential preferential pathways and the potential for migration of hazardous constituents off-site via these pathways. If preferential pathways are identified in phase two, the third phase will involve an

assessment of the contributions of migration of hazardous materials due to the identified preferential pathways. Each of the above phases is discussed in further detail below. It should be noted that USTs are not being addressed in this section since they are being addressed on a SWMU-specific basis in other sections of this document and in the Interim Phase II Report/CAS.

3.8.2.1 Evaluation of Currently Available Information

The Interim Phase II Report/CAS presents currently available information related to underground piping, including municipal water supply pipes, sanitary sewer pipes, fire protection water supply pipes, stormwater drainage pipes, electrical lines, and natural gas supply lines. This information includes the locations and routing of these piping systems, dimensions, and, in some cases, materials of construction. However, this information is not sufficient to perform an evaluation of preferential pathways at this time because the information is not completely current and is somewhat incomplete. As a result, additional activities to verify the accuracy and completeness of the currently available information will be conducted. This verification will include both desk-top evaluations and field verification.

The desk-top evaluation will include further review of file information related to underground piping systems to determine if additional, more up-to-date information is available. The desk-top evaluation will be followed by limited field verification, such as visual inspection, surveying of invert elevations, etc. to assess the accuracy of the available information.

The intent of these additional activities is to develop engineering figures that illustrate the most current information related to underground piping and tunnels, including, to the extent possible,

locations, routing, materials of construction, age, dimensions, types of materials conveyed (past and current), and information regarding past or current leaks or breaks. These figures will be presented in a report that will be submitted to both the USEPA and the MDEP as part of the second evaluation phase of the preferential pathway analysis as discussed below.

3.8.2.2 Identification of Pipes and Tunnels with Migration Potential

The second phase of the preferential pathway analysis will be an evaluation to identify specific pipelines or tunnels for which an increased potential exists for these structures to act as preferential pathways for the migration of hazardous constituents.

Table 3-2 presents a matrix of conditions that has been developed to assist in achieving this objective. This table compares potential methods of migration to various categories of underground pipes and tunnels. The goal of this comparison is to narrow the scope of the evaluation phase such that only preferential pathways that have a potential to contribute to the migration of hazardous materials will be evaluated in more detail.

Table 3-2 identifies five categories of underground pipes or tunnels and a "potentially yes" or "no" decision is made related to three mechanisms of migration. A "potentially yes" decision indicates that a potential exists for migration of hazardous constituents from the identified pipe/tunnel via the identified migration mechanism. The justification for retaining or eliminating a preferential pathway for further evaluation is described in more detail below.

The five categories of underground pipes/tunnels identified in Table 3-2 include:

- Process;

- Utility;
- Stormwater;
- Sanitary Sewer; and
- Tunnels.

As further discussed below, each pipe/tunnel category may contain several different types of piping systems.

Process

This category would include all pipelines related to process flows either in the past or currently in service. Examples of process piping previously in service would primarily include transfer lines (i.e., for oil, solvent, etc.). These piping systems would typically be relatively shallow (less than 10 feet below ground surface) and may be either pressurized or gravity flow systems. Several of these piping systems may have been abandoned in-place (by the draining of the pipes and sealing the ends) following removal of a particular UST. The piping systems could be constructed from a variety of materials although ductile iron pipe would be most probable.

Utility

This category would include all pipelines related to utilities. Examples include electrical, natural gas, potable water, or fire protection lines. These piping systems would typically be relatively shallow (less than 10 feet below ground surface) and would be pressurized systems, sealed liquid-tight, or encased in concrete in the case of electrical lines. The piping systems could be constructed from a variety of materials including ductile iron, steel, copper, or PVC. These piping systems would not transport hazardous constituents related to GE, except possibly by infiltration into the pipes from groundwater.

Stormwater

This category would include all pipelines related to stormwater flows. In certain cases this would include combined process (i.e., non-contact cooling water or treated process water) and stormwater flows. GE's Final Stormwater Management Plan (Blasland & Bouck, July 1990, as subsequently amended) provides a summary of stormwater discharges related to the GE facility. With the exception of some miscellaneous yard drains and sewer relief overflows, these discharges are monitored under GE's National Pollution Discharge Elimination System (NPDES) Permit. These piping systems would typically be relatively shallow (less than 10 feet below ground surface) and would be gravity flow systems. The piping system could be constructed from a variety of materials, including ductile iron, reinforced concrete, or vitreous clay.

Sanitary Sewer

This category would include all pipelines related to sanitary sewer flows, including sanitary sewer lines that are owned and maintained by the City of Pittsfield, as well as GE-owned sanitary sewer systems. These piping systems would typically be at moderate depths (less than 15 feet below ground surface) and would be gravity flow systems. The piping could be constructed from a variety of materials including ductile iron, reinforced concrete, or vitreous clay. These piping systems would not transport hazardous constituents related to GE except possibly by infiltration into the pipes from groundwater.

Tunnels

This category would include any underground tunnels and the piping systems conveyed in them, such as steam tunnels. Tunnels would typically be at shallow depths (less than 10 feet below ground

surface) and would contain pressurized piping systems. The tunnels would likely be constructed of reinforced concrete and piping within them would likely be ductile iron or steel.

Other

While this category is not included in Table 3-2, it is reserved for any piping systems identified during the initial data acquisition phase that do not fit into one of the categories described above.

Each of the categories of piping described above has been evaluated based on three general mechanisms of migration as identified in Table 3-2. The first identified mechanism of migration is the potential for the pipeline or tunnel to release hazardous constituents to the subsurface soil or groundwater. Under this scenario, the pipe/tunnel would transport hazardous constituents and a breach in the integrity of the pipe/tunnel would allow hazardous constituents to be released to the surrounding soil or groundwater.

The second identified mechanism of migration is the potential for the migration of hazardous constituents via infiltration of groundwater into the pipe or tunnel. In this case, a breach in the integrity of the pipe/tunnel would allow groundwater containing hazardous constituents to enter the pipe/tunnel and be transported to another area.

The third identified mechanism of migration is the potential for the migration of hazardous constituents via infiltration of groundwater into the pipe trench. Pipe trenches are included in the preferential pathway assessment because backfill materials used for pipe trenches are likely to have a higher hydraulic conductivity than the native material and could create a preferential migration pathway. In this case, groundwater containing hazardous constituents could enter the potentially higher-

conductivity trench materials and migrate along the axis of the trench to another area.

The mechanism of migration related to a specific pipe category is largely dependent on the location of the pipe with respect to the water table. For the purpose of this evaluation, the water table is taken to mean the maximum measured water table elevation, including the presence of oil (if any). Table 3-2 presents the results of an analysis that evaluates the potential for each identified pipe category to act as a preferential pathway based on its location with respect to the water table. The following observations are made related to this evaluation:

Release of Hazardous Materials to Subgrade

Process piping, stormwater piping, and tunnels located above the water table will be evaluated further under this mechanism of migration because they have the potential to contain hazardous constituents and to release constituents to the subsurface via leakage from a breach in the integrity of the pipe. Process piping, stormwater piping, and tunnels located below the water table will also be evaluated further under this mechanism because they likewise have the potential to contain hazardous constituents and to release them to the environment via a breach in the integrity of the pipe/tunnel. Release mechanisms for pressurized pipes would be via direct leakage, and those for other pipes or tunnels would be via advection/dispersion. Utility or sanitary sewer lines located either above or below the water table will not be evaluated further under this mechanism of migration because these lines do not transport hazardous materials related to GE; therefore, a "release" of such materials is not a possible method of migration.

Infiltration of Groundwater into Pipeline

All categories of pipes/tunnels located above the water table will be eliminated from further evaluation under this mechanism of migration because groundwater does not have the potential to enter the pipe/tunnel. All categories of pipes/tunnels, with the exception of utility lines and pressurized process lines, located below the water table will be further evaluated under this mechanism of migration because groundwater has the potential to enter the pipe/tunnel. Utility lines and pressurized process lines are excluded because the pressure differential would prevent groundwater from entering the pipe.

Infiltration of Groundwater into Trench

All categories of pipes/tunnels located above the water table will be eliminated from further analysis under this mechanism of migration because groundwater does not have the potential to enter the pipe/tunnel trench. All categories of pipes/tunnels located below the water table will be further evaluated under this mechanism of migration because groundwater has the potential to enter the pipe/tunnel trench.

Following elimination of various pipe/tunnel categories from further evaluation based on the analysis described above, the remaining pipe categories that have a potential to act as a preferential pathway will be reviewed further. For such categories, all available information presented in the Interim Phase II Report/CAS and any other information obtained will be reviewed to determine if any of the conditions identified in Table 3-2 exist. For example, information will be reviewed to determine if there are any utility trenches that are located below the water table. If an identified condition exists, an assessment of the migration of hazardous materials related to the identified condition will be made. All identified pipes or

areas will be described in a separate report to the USEPA and the MDEP. This report will include a proposal for further assessment (if necessary) as described below.

3.8.2.3 Assessment of Potential Migration

The results of the evaluation described above will be an identification of specific conditions for which an increased potential exists for a pipe/trench to act as a preferential pathway for migration of hazardous constituents. These specific conditions will be further assessed as proposed in the evaluation report (subject to USEPA/MDEP approval). The method of assessment will be dependent on a number of factors and will be determined based on the specific evaluation condition (i.e., a visual inspection would only apply to exposed piping such as would be present in tunnels). Potential assessment methods could include:

- Visual inspection of exposed piping (e.g., tunnels or abandoned pipelines that have been exposed for the purpose of inspection) for obvious leaks or signs of migration of hazardous constituents;
- Integrity testing to determine if a piping system is intact;
- Testing and disposal of residual material (if any) in abandoned piping systems;
- Installation of soil borings, well points, or monitoring wells and associated sampling activities; and/or
- Mass balance analysis (e.g., intermediate and end-of-pipe monitoring of hazardous constituents in stormwater/sanitary pipelines to determine if the pipe is transporting hazardous constituents).

The results of any further assessment activities will be presented in the Supplemental Phase II/RFI Report. Any additional assessment activities that result from the initial assessment will be proposed in that report.

3.9 Estimation of Volumes

Activities performed to date in the Unkamet Brook Area/USEPA Area 1 Site have provided a substantial amount of information related to the presence and extent of hazardous constituents in site soil and groundwater. The investigative activities described in this document will provide additional information on this subject as well as fulfill data gaps. This information will be evaluated and, to the extent practical, volume estimates related to various affected materials will be developed and presented in the Supplemental Phase II/RFI Report.

3.10 Air Monitoring

As summarized in Section 9 of the Interim Phase II Report/CAS, three separate air monitoring efforts have been conducted in the Unkamet Brook Area. The air monitoring programs included: Pre-MCP air monitoring for PCBs at five sampling stations in and around the Unkamet Brook Area and former Interior Landfill; air monitoring for benzene and chlorobenzene at six locations within the basement of a commercial building on Merrill Road; and a one-year MCP air monitoring program for PCBs that included one air monitor location just south of Building OP-3.

As discussed in Section 9.2.2 of the Interim Phase II Report/CAS, the ambient air sampling conducted in 1983 for PCBs did not use current USEPA-recommended sampling methodology for the collection of PCB samples and would not meet current USEPA QA/QC criteria for comparability, representativeness, precision, and accuracy. The current USEPA-recommended

method for ambient air sampling of PCBs, which was used in the 1991-1992 MCP air monitoring program, employs a high-volume sampler to collect a relatively large volume sample (360m^3) on a polyurethane foam media. The method used in 1983 employed a low-volume pump to collect a relatively small sample (~12 m^3) on a florisil adsorbent. The two methods do not produce results that are directly comparable. In addition, the three 8-hour samples collected in 1983 at each station represented a total volume sampled of 36 m^3 and only one 24-hour period. The concentration of PCBs in ambient air above the former Interior Landfill cannot be appropriately characterized by such a small sample volume over one 24-hour period.

Other QA/QC controls that allow a determination of precision (repeatability) or accuracy (bias) also were not part of the 1983 sampling program. These include a lack of documentation of the following: co-located sampling locations; travel or trip blanks; analytical method blanks; sampling equipment calibration; and zero checks of sampling equipment.

In order to provide data that are valid and representative of current PCB concentrations in the ambient air at and around the former Interior Landfill, additional ambient air sampling is proposed. The details of this proposed ambient air monitoring program are contained in Attachment B.

3.11 Risk Assessment

The data generated by Supplemental Phase II/RFI activities and previous site investigations will be evaluated to determine the potential risks to human health and the environment, given the current and reasonably foreseeable uses of the Unkamet Brook Area/USEPA Area 1 Site and surrounding environment. A discussion of this evaluation is provided in a separately bound document entitled "Preliminary Health and Environmental Assessment Proposal for the Unkamet

Brook Area/USEPA Area 1 Site," prepared by ChemRisk and submitted concurrently with this document.

3.12 Procedures for Identification of Additional SWMUs

If additional SWMUs are identified during MCP Supplemental Phase II/RFI activities, both the MDEP and the USEPA will be notified by letter within 30 days. To the extent available, the following information will be provided:

- description of SWMU and/or media and location;
- period that the SWMU was operating;
- description of materials managed in the SWMU and/or media;
- release controls for the SWMU;
- history of releases from the SWMU and/or media; and
- a summary of any environmental data collected for each SWMU and/or media.

In addition to the information presented above, the notification letter will propose appropriate activities, if needed, to address the SWMU and/or media.

3.13 Reporting of Investigation Results

Following MDEP/USEPA approval of this Supplemental Phase II SOW/RFI Proposal, the proposed field activities will be performed. After the performance of these activities, all data will be compiled, presented, and interpreted in an MCP Supplemental Phase II/RFI Report, which will be submitted for MDEP/USEPA review and approval. At the same time, a Risk Assessment SOW/Supplemental HEA Proposal (which will be more detailed than the Preliminary HEA Proposal submitted concurrently with this document) will be submitted for MDEP/USEPA review and approval. If, upon review of the Supplemental Phase II/RFI Report, it should be determined that additional investigations are necessary, those investigations will be proposed and (after approval) carried out. In that event,

an Addendum to the Supplemental Phase II/RFI Report will be submitted for review prior to the performance of the risk assessment. After performance of the risk assessment activities, an MCP Final Phase II Report (including the risk assessment) and HEA Report will be submitted, together with a Media Protection Standards Proposal for the site.

SECTION 4 - PRELIMINARY INVESTIGATION OF CORRECTIVE MEASURES

4.1 General

This section presents a preliminary investigation of corrective measures (PICM) for the Unkamet Brook Area/USEPA Area 1 Site pursuant to Special Condition II.A.1.a of the Permit, which requires the following:

> "The RFI Proposal shall identify the potential corrective measure technologies that may be used on-site and/or off-site to contain, treat, remedy and/or dispose of the contamination resulting from the release of hazardous waste and/or hazardous constituents from SWMUs and other sources in Area 1. This Preliminary Investigation shall summarize all prior investigations performed by or available to the Permittee and identify all existing data gaps and field data that need to be collected during implementation of the RFI to facilitate the technical evaluation and selection of the corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.)."

Section 4.2 identifies potential corrective measures for the site based on a review of the existing site information presented in the Interim Phase II Report/CAS, which summarizes the prior investigations. Section 4.3 addresses the issue of additional data needs relating to such corrective measures.

4.2 Potential Corrective Measures

For purposes of considering current and reasonably foreseeable uses of the Unkamet Brook/USEPA Area 1 Site, the site can be divided into three areas.

First, a large portion of the site consists of an access-restricted industrial facility, which includes a large part of the northern portion of the site, located north of Merrill Road and west of Unkamet Brook, and the eastern central portion of the site that includes Building OP-3 and associated grounds. These areas are both surrounded by chain-link fence and locked gates, and access is restricted to authorized personnel. Because the Ordnance operations at the GE

facility were sold to the Martin Marietta Corporation in 1993, the Ordnance facilities in Buildings OP-1, OP-2, and OP-3 are currently operated and maintained by Martin Marietta. The land underlying Buildings OP-1 and OP-2, however, is still owned and maintained by GE, while the land underlying Building OP-3 is owned and maintained by the U.S. Department of the Navy. Both of these portions of the site are likely to remain access-restricted industrial facilities for the foreseeable future.

Second, a small commercial area is located between Merrill Road and the railroad tracks. This area is zoned for commercial use only.

Finally, there are two undeveloped areas at the site. The northern portion of the site east of Unkamet Brook consists of a fairly large undeveloped marsh area, which is owned by GE. The ground in this area is very wet and covered with heavy brush. The portion of the site between the railroad tracks and the Housatonic River is an undeveloped lowland area. This area is meadow-like, with both wet and dry areas, and some wooded portions. Any future development in these areas is unlikely due to limitations on the development of wetland/floodplain areas.

Given the current and reasonably foreseeable uses of this site area, the following potential corrective measures have been preliminarily identified:

- Additional Institutional Controls;
- Supplemental Surface Covers;
- Surface Water Diversion;
- Oil Recovery and/or Groundwater Extraction and Treatment;
- Subsurface Cut-off Walls;
- In-Situ Bioremediation of oil;
- In-Situ Stabilization or Treatment;
- Removal and Treatment/Disposal of Affected Materials;

- Decontamination of Surfaces;
- Management of USTs; and
- Management of Preferential Pathways.

Each of the potential corrective measures presented above is described in further detail in the following sections.

4.2.1. Additional Institutional Controls

Institutional controls are used to restrict access to or use of a designated property to prevent or minimize contact with hazardous constituents. As noted previously, the GE-owned portion of this site north of Merrill Road is, for the most part, surrounded by a high fence and monitored gates. GE also owns other property associated with this site, which is currently unfenced. The commercial area and lowland area are also both accessible. Potential corrective measures for this site, therefore, include additional access restrictions and/or other institutional controls for select areas within the site (if determined to pose a significant risk). Specifically, these supplemental institutional controls could include the placement of additional fencing and/or warning signs to prevent access into portions of the site. Further institutional controls, such as deed restrictions or other activity and use limitations, also offer potential long-term corrective measures for this site.

4.2.2. Supplemental Surface Covers

The placement of a surface cover is a technique commonly used to isolate a subsurface or surface area from its surrounding environment. This isolation is intended to serve as a means of containing constituents of concern within the affected area. A surface cover can provide such isolation by diverting surface water and preventing infiltration through the

affected media. By eliminating infiltration, the rate of migration of the constituents of concern is reduced, if not eliminated.

The types of surface cover most commonly employed include an asphalt cap, soil cap, multi-media cap, and/or an armoring system. An asphalt cap involves the placement of asphalt as a means of diverting surface water. The same effect can also be achieved by a soil cap, which involves the placement of a low permeability soil layer (usually clay) over the affected area. Multi-media caps include layers of various soils and/or synthetic materials which form drainage layers to divert rainfall and impermeable layers to prevent infiltration. Armoring systems, which are used for the in-place containment of sediments, involve the placement of materials such as geotextile, sand, and stone (i.e., rip-rap) to act as a barrier from surface water contact with the constituents of concern.

A substantial portion of the site is covered with buildings or paved with asphalt or concrete. Continuation or expansion of that surface cover is thus a potential corrective measure for consideration for portions of the site. Implementation of a surface cover or armoring system is also a potential corrective measure for Unkamet Brook or its banks. Since portions of the site lie within the floodplain of either Unkamet Brook or the Housatonic River, implementation of a surface cover or armoring system in such areas would most likely require approval by the Pittsfield Conservation Commission, which could require the provision of compensatory floodplain storage to offset any loss of flood storage capacity due to the placement of the cover.

4.2.3 Surface Water Diversion

Surface water diversion is used to isolate sediments and prevent or minimize contact with constituents of concern. Surface water diversion

measures can be either temporary or permanent. Temporary surface water diversion may be considered if sediments containing constituents of concern were to be removed (e.g., mechanical excavation, dredging, etc.) from an area or if sediments were to be armored in-place and the existing channel restored. Permanent surface water diversion may be considered if sediments containing constituents of concern were to be managed in-situ (e.g., stabilization, treatment, or armoring system).

Methods of surface water diversion include pumping techniques, trenches, and piping. As part of surface water diversion measures a relocated channel could be constructed with a semi-permeable or impermeable liner system which would act as a barrier from contact with the underlying soils.

4.2.4 Oil Recovery and/or Groundwater Extraction and Treatment

This corrective measure refers to the extraction of oil and/or groundwater from the subsurface and subsequent separation and treatment of the extracted groundwater, if appropriate. Extraction of groundwater is typically accomplished through the use of recovery wells or trenches that are installed at specified locations and depths to optimize groundwater and/or oil recovery. The locations and depths of wells or trenches are dependent upon soil permeability, hydrogeologic setting, and the presence of hazardous constituents and/or oils. Technologies employed for the treatment of extracted groundwater are dependent upon the various constituents present, but could typically include air stripping, activated carbon adsorption, metals precipitation, and/or biological degradation. Treatment could also be accomplished in-situ by recirculating groundwater while providing biological degradation enhancements (e.g., nutrients, oxygen,

etc.). Another treatment option could include direct discharge to a publicly-owned treatment works (POTW).

Oil and groundwater recovery with groundwater treatment has been implemented at the various GE Pittsfield sites for over 10 years. The use of an oil recovery system and/or a groundwater extraction and treatment system might also be an effective means of removal of oil and/or groundwater and treatment of groundwater at portions of the Unkamet Brook Area/USEPA Area 1 Site, if such a system is shown to be warranted.

4.2.5 Subsurface Cut-off Wall

Similar to a surface cover, a subsurface cut-off wall is a means of isolating an affected area and containing the constituents of concern. A subsurface cut-off wall is a relatively impermeable vertical barrier typically installed around the affected area. This vertical barrier diverts the horizontal flow of groundwater around the contained area and isolates the area within the cut-off wall. By minimizing the horizontal flow of groundwater, the potential for migration of the constituents is also reduced, if not eliminated.

Subsurface cut-off walls may take the form of a slurry wall (e.g., soil-bentonite wall or cement-bentonite wall), a grout curtain, or sheet-piling. In the saturated zone, these barriers are typically tied into an impermeable layer at the base of the aquifer. Used in conjunction with a surface cap, these controls can effectively deter both infiltration and horizontal groundwater migration through a site.

Subsurface cut-off walls could also include permeable treatment "panels" whereby groundwater containing constituents of concern is allowed to pass through select portions of the cut-off wall. In this type of

installation, the treatment "panels" are designed such that the constituents of concern are reduced or destroyed by contact with the "panel" materials.

4.2.6 In-Situ Bioremediation of Oil

Various types of in-situ remedial techniques could be considered for potential application at this site. One potential alternative is the in-situ bioremediation of oils floating on the groundwater at the site. GE's Corporate Research and Development (CRD) facility has generated promising results for this technology when applied to the oil present in groundwater in certain areas of the nearby East Street Area 2/USEPA Area 4 Site (GE, April 1994). These results, based on a preliminary laboratory study of this technology, indicated that:

- the oils are appreciably biodegradable;
- the soils contain active oil-degrading bacterial populations;
- initial biodegradation rates are encouraging; and
- the subsurface of the site is sufficiently permeable for in-situ remediation.

Additional laboratory experiments are underway to further evaluate the effectiveness of bioremediation of oils.

4.2.7 In-Situ Stabilization or Treatment

In-situ stabilization and/or solidification is a remedial technique used to physically or chemically isolate waste constituents in place by the mixing of stabilization or solidification reagents with the waste materials. Most likely, the Pittsfield Conservation Commission would have to approve the implementation of any such in-situ stabilization and/or solidification in areas within the Unkamet Brook or Housatonic River floodplains because of floodplain compensation issues caused by an expansion of the volume of material due to the remedial technique. Another in-situ technique, referred

to as soil washing, involves the physical or chemical "washing" of waste constituents from the in-place soil materials.

Alternatively, in-situ biodegradation or bioremediation of the chemicals in soils or sediments involves the treatment of organic contaminants in the soils/sediments with aerobic or anaerobic organisms to promote or enhance the degradation of those contaminants to less toxic or less mobile products. Although this technique may be promising, more research is needed before it could be applied to this site.

4.2.8 Removal and Treatment/Disposal of Affected Materials

This corrective measure refers to the removal and either on-site or off-site treatment and/or disposal of affected materials. This corrective measure could apply to relatively small volumes of surface soils/sediments, high-concentration "hot-spot" materials, or other impacted materials at the site, including areas within Unkamet Brook and/or other areas at the site. Various removal techniques (e.g., mechanical excavation, dredging, etc.) and treatment/disposal techniques would need to be considered depending on the hazardous constituents present, their concentrations, and the volume of the affected materials.

4.2.9 Decontamination of Surfaces

This corrective measure refers to the select cleaning/decontamination of surfaces, if needed. This corrective measure would apply to surfaces amenable to decontamination, such as concrete surfaces, tanks, pits, sumps, etc. For porous surfaces such as concrete, where testing indicates that hazardous constituents have only penetrated the top layers, scarification may be used, with removed materials taken off-site for appropriate disposal. Similarly, in-place sealing procedures may be appropriate if hazardous constituents have penetrated the porous materials involved. For other non-

porous surfaces such as steel, cleaning methods such as solvent washing/wiping and pressure/steam cleaning may be used. In this case, all solvent/wash water would be collected for appropriate treatment and disposal. Typically, following cleaning, core samples (for concrete) or wipe samples (for non-porous surfaces) are obtained to verify decontamination. GE operates an equipment cleaning facility within Building 12-Y where various equipment components are cleaned via a high-pressure detergent wash. All wash water is treated on-site and recycled. Accumulated solids are containerized for off-site disposal.

4.2.10 Management of USTs

This corrective measure refers to the removal or in-place closure (by filling with sand or concrete slurry) of USTs. These activities have been performed by GE for a number of USTs throughout the GE Pittsfield facility, particularly in the late 1980s under the Underground Storage Tank Management Plan (Blasland & Bouck, December 1986). The Interim Phase II Report/CAS provides additional information on the status of USTs throughout this site. Removal and/or in-place closure of remaining USTs (including active USTs taken out of service and inactive USTs discovered in the future) are potential corrective measures for this site.

4.2.11 Management of Preferential Pathways

The management of preferential pathways refers to a variety of corrective measures that could be implemented should an underground pipe, tunnel, or other underground structure be identified as a preferential pathway for migration of hazardous constituents. Section 3.7 presents GE's proposal for the evaluation and assessment of underground pipes and tunnels as preferential pathways. If specific pipes or tunnels are identified as preferential pathways as a result of the proposed evaluation and

assessment, several corrective measures could be implemented. The selected corrective measure would depend on several factors including, but not limited to, method of migration (i.e., release, infiltration into a pipe, or infiltration of groundwater into a pipe trench), location of the structure with respect to the water table, materials of construction, and current use. Potential corrective measures include:

- Rehabilitation such as by slip-lining or grouting;
- Replacement of select pipe sections;
- Removal;
- In-place abandonment including removal of any materials in the pipe and sealing of the ends; and
- Installation of anti-seepage collars on piping to limit migration of groundwater along the axis of the pipe trench.

GE has performed each of the above corrective measures as part of various efforts in the past. For example, several pipe sections at the GE facility were slip-lined in the early 1980s as part of a PCB abatement program performed by GE; several pipe sections have been removed or abandoned in-place as part of the UST management activities; and GE has installed anti-seepage collars on piping at locations in the facility to limit migration of groundwater along the pipe trench axis.

4.3 Additional Data Needs

This subsection details the potential data needs that pertain to the specific corrective measures identified in Section 4.2. A discussion of such potential additional data needs is presented below.

4.3.1 Additional Institutional Controls

The existing site information should be sufficient to evaluate the need for and type of additional access and use restrictions or other institutional controls that may be appropriate at this site. Hence, no additional data needs are apparent relating to this potential corrective measure.

4.3.2 Supplemental Surface Covers

If this remedial measure is selected, supplemental soil or sediment sampling may be needed to determine the lateral extent of the surface cover(s). Future evaluation may also be required to determine the components (i.e., type, size, thickness, etc.) of the surface cover(s), and if the cover is to be placed in Unkamet Brook, to determine the feasibility, effectiveness, reliability, implementability, and environmental impacts of installing such a cover. In addition, the need for compensatory floodplain storage would require investigation. However, it would be premature to conduct such sampling and investigations at this time, before any in-depth evaluation of potential corrective measures has been conducted.

4.3.3 Surface Water Diversion

In the event temporary or permanent surface water diversion is required as part of corrective measures, the following data needs may have to be addressed:

- Anticipated surface water flowrates (including seasonal variations); and
- Location, type, and size of the surface water diversion.

If this remedial measure is selected, installation of stream gages and stream gage monitoring may be required to determine the data needs. In addition, the potential flood impacts and the need for compensatory floodplain storage could require investigation. However, it would be

premature to conduct such investigations at this time, before any in-depth evaluation of potential corrective measures has been conducted.

4.3.4 Oil Recovery and/or Groundwater Extraction and Treatment

If this remedial measure is selected, the following data needs may have to be addressed prior to implementation of a recovery/treatment system:

- The proper number, locations, and depths for recovery trenches and/or wells;
- Appropriate well screen depths and drawdown depths for recovery;
- Pump rates for the recovery wells; and
- An assessment of the capabilities/requirements for a groundwater treatment facility to treat the flows and specific constituents of concern.

Information pertinent to assessing the need for a recovery/treatment system, as well as potential locations of recovery wells and/or trenches and groundwater pumping rates, should be obtained through the hydrogeologic investigations proposed in this document, together with review of existing data. Any remaining data needs pertaining to construction of groundwater recovery and treatment system(s) would be considered "contingent" data needs and would only need to be addressed should groundwater recovery/treatment become a future response requirement.

4.3.5 Subsurface Cut-off Wall

Prior investigations should provide sufficient data to assess the potential need for and appropriateness of installing subsurface cut-off wall(s) at this site, as well as the appropriate location for such cut-off wall(s), if needed. A potential data need relating to this corrective measure would involve an assessment of the compatibility of potential cut-off wall

materials and subsurface constituents. It is not proposed that this assessment be performed at this time. Such a compatibility assessment can be performed at a later date using readily available site materials and information.

4.3.6 In-Situ Bioremediation of Oil

As noted in Section 4.2.6, additional laboratory experiments are being conducted by GE-CRD to evaluate potential in-situ bioremediation of oil floating on groundwater at the nearby East Street Area 2/USEPA Area 4 Site. If, after completion of these studies, the potential for in-situ biodegradation of the subsurface oils is determined to be favorable, a field pilot study may be conducted. The details of such a field pilot study would be described to the MDEP and the USEPA prior to initiation.

4.3.7 In-Situ Stabilization or Treatment

The site characterization investigations previously described will define the characteristics and (to the extent feasible) volume of potentially affected materials at the site. This information, along with other site information previously defined, should be sufficient to assess potential in-situ techniques in a general way. To fully evaluate the appropriateness of a particular in-situ remedial technique for the site, additional information or research may be required relating to that particular technology. However, it would be premature to attempt to fill these possible needs until a more detailed analysis of alternatives refines the scope of the study. To the extent that the required information relates to this specific site, it should be possible to collect supplemental samples of site materials, as necessary, since the characterization data should be sufficient to allow for identification of the general locations of various affected materials. To the extent that the required information is more general (e.g., effectiveness of

bioremediation on soils or sediments containing the types of constituents found here), this data need goes far beyond this specific site. In these circumstances, no specific data needs relating to in-situ techniques have been identified for investigation during the Phase II/RFI activities at this site.

4.3.8 Removal and Treatment/Disposal of Affected Materials

The site characterization investigations previously described will assist in defining the characteristics and (to the extent feasible) volume of potentially affected materials at the site. However, to fully evaluate removal technologies for this site, supplemental information may be needed to delineate the extent of materials that might be removed, to physically characterize those materials (such as particle grain size distribution), to evaluate the appropriate removal equipment, and to assess appropriate disposal locations. To the extent that such evaluations would require supplemental samples of site materials, it should be possible to collect such samples expeditiously, since the site characterization data should be sufficient to allow the identification of the general locations of various affected materials. In addition, if a removal technology is to be applied to Unkamet Brook, other investigations (e.g., to access the feasibility and environmental impacts of such dredging) would be necessary. However, for all these additional data needs, it would be premature to conduct the investigations at this time, since they would involve a more in-depth evaluation of potential corrective measures than is warranted at this stage of the MCP/Corrective-Action process.

4.3.9 Decontamination of Surfaces

The only data need that would be associated with the decontamination of surfaces would be pre-cleaning testing to identify surfaces that require

decontamination. GE has extensive experience in the performance of decontamination activities including pre- and post-cleaning sampling through the operation of its equipment cleaning facility in Building 12-Y. Therefore, it is not proposed to perform additional assessments related to decontamination of surfaces at this time as the activities can be addressed on an as-needed basis.

4.3.10 Management of USTs

The existing information and any additional data gathered related to USTs should be sufficient to evaluate the need for and type of UST management that may be appropriate. If it is determined that more detailed information is needed to accurately determine the location, volume, or contents of a particular UST prior to removal or in-place closure, this information can be collected as necessary.

4.3.11 Management of Preferential Pathways

Data needs associated with the management of preferential pathways are being addressed by the evaluation and assessment activities proposed in Section 3.7.

SECTION 5 - SCHEDULE OF ACTIVITIES

Following the approval of this MCP Supplemental Phase II Scope of Work/RFI Proposal by the MDEP and the USEPA, GE will initiate the proposed Supplemental Phase II/RFI activities discussed in Section 3 of this document. A proposed schedule for these activities is presented on Figure 5-1. It is important to note that certain proposed activities are seasonal in nature while others depend on receiving property access.

General Condition 26 of the USEPA Permit requires a description of the state and local permits and approvals needed to implement the activities proposed in this document, and an estimate of the timeframe anticipated for receiving those approvals. The only such approval that would appear to be necessary for the activities proposed herein is the MDEP's approval, which is expected to be provided concurrent with that of the USEPA.

The proposed schedule assumes that no additional field investigations will be necessary after submission of the Supplemental Phase II/RFI Report. If it should be determined, upon review of that report, that additional field investigations are necessary, those investigations will be proposed and (upon MDEP/USEPA approval) implemented. In that event, an Addendum to the Supplemental Phase II/RFI Report will be prepared and submitted to report the results of those investigations, and the schedule for the remaining activities will be extended as appropriate.

In addition, as noted in the PHEAP, a future submittal of an ecological risk assessment plan could require additional activities, which may modify the schedule presented on Figure 5-1.

REFERENCES

Blasland & Bouck Engineers, P.C., Underground Storage Tank Management Plan, (Syracuse, NY: December 1986).

Blasland & Bouck Engineers, P.C., Unkamet Brook Area MCP Phase II Supplemental Data Summary Report, (Syracuse, NY: August 1990a).

Blasland & Bouck Engineers, P.C., Unkamet Brook Area MCP Phase II Supplemental Data Summary Report, (Syracuse, NY: August 1990b).

Blasland & Bouck Engineers, P.C., MCP Interim Phase II Report/Current Assessment Summary for Housatonic River, Volumes I through IV, (Syracuse, NY: December 1991).

Blasland & Bouck Engineers, P.C., Addendum to MCP Interim Phase II Report/ Current Assessment Summary for Housatonic River, (Syracuse, NY: August 1992).

Blasland & Bouck Engineers, P.C., Sampling and Analysis Plan/Date Collection and Analysis Quality Assurance Plan, (Syracuse, NY: May 1994).

Blasland, Bouck & Lee, Inc., MCP Supplemental Phase II Scope of Work and Proposal for RCRA Facility Investigation of Housatonic River and Silver Lake, (Syracuse, NY: June 1994).

Fetter, C.W., Applied Hydrogeology, 2nd Ed. (Columbus, OH: Merrill Publishing Company, 1988).

General Electric Company, In-Situ Bioremediation of Oil-PCB Mixtures in Groundwater, (Schenectady, NY: April 1994).

Groundwater Technology, Inc., Summary of 1991 Activities, Building 51 and 59 Areas, (West Springfield, MA: January 1992).

O'Brien and Gere, Inc., Waste Stabilization Pond Closure, (Syracuse, NY: July 1980).

O'Brien & Gere, Inc., Report on Past Hazardous Waste Monitoring and Remedial Actions - East Plant Area (Volumes I and II) (Unkamet Brook), (Syracuse, NY: August 1981).

Tables

TABLE 1-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND RFI PROPOSAL
FOR UNKAMET BROOK AREA/USEPA AREA 1

OVERVIEW OF PERMIT REQUIREMENTS AND ASSOCIATED SECTION REFERENCES

I. GENERAL PERMIT REQUIREMENTS	
Description of Permit Requirement (Permit Section Reference)	Applicable Section
1. Preliminary Investigation of Corrective Measures (II.A.1.a)	4
2. Identification of Additional SWMUs and/or Media of Concern in Area 1, (II.A.1.b)	3.12
3. Environmental Setting (II.A.1.c)	2.2
4. Source Characterization (II.A.1.d)	3 (plus Section 3 of CAS)
5. Investigation of Individual SWMUs (II.A.1.e)	See Part II Below
6. Underground Pipes and Tunnels	3.8
7. Groundwater Contamination Investigation in Area 1 (II.A.1.f)	3.4

II. INDIVIDUAL SWMU PERMIT REQUIREMENTS							
SWMU No.	SWMU Description	Permit Requirements and Associated Section					
		Soil Sampling	Groundwater Sampling	Integrity Testing	Subsurface Gas	Surface Runoff	Surface Water Sampling
G-11	Former Interior Landfill	3.2.3	Existing data and additional monitoring (see Section 3.4.3.1)	NA	3.6	Existing data (see Section 3.7.1)	Existing data (see Section 3.7.2)
G-12	Former Waste Stabilization Basin	3.2.1	Existing data and additional monitoring (see Sections 3.4.3.1 & 3.4.8)	NA	3.6	Existing data (see Section 3.7.1)	Existing data (see Section 3.7.2)

TABLE 1-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND RFI PROPOSAL
FOR UNKAMET BROOK AREA/USEPA AREA 1

OVERVIEW OF PERMIT REQUIREMENTS AND ASSOCIATED SECTION REFERENCES
(cont'd)

II. INDIVIDUAL SWMU PERMIT REQUIREMENTS

SWMU No.	SWMU Description	Permit Requirements and Associated Section					
		Soil Sampling	Groundwater Sampling	Integrity Testing	Subsurface Gas	Surface Runoff	Surface Water Sampling
O-B	Bldg. 51 Underground Drainage Pipe	NA	NA	3.5.1	NA	NA	NA
O-8	Bldg. 51 Elementary Neutralization Unit	NA	NA	3.5.2	NA	NA	NA
O-41	Bldg. OP-3 Metal Treat Area	NA	NA	3.5.3	NA	NA	NA
G-17	Bldg. 119W Oil/Water Separator	NA	NA	3.5.4	NA	NA	NA
O-45	Bldg. OP-3 Abandoned Storage Tank	NA	NA	3.5.5	NA	NA	NA
O-2	Bldg. OP-1 Abandoned Anodize Tank	NA	NA	3.5.6	NA	NA	NA
O-A	Underground Fuel Tanks	NA	NA	3.5.7	NA	NA	NA
T-EEE and T-FFF	Transformer Division Inactive USTs	NA	NA	3.5.8	NA	NA	NA
P-D through P-L	Plastics Division Inactive USTs	NA	NA	3.5.9	NA	NA	NA
P-4	Bldg. 109 Wastewater Tank Farm	3.2.2	Existing data (see Section 3.4)	NA	NA	NA	NA
O-M	Ordnance Division Leaking UST	NA	3.4	NA	NA	NA	NA

TABLE 3-1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP SUPPLEMENTAL PHASE II SCOPE OF WORK
AND RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

SUMMARY OF PROPOSED ACTIVITIES

Activity	Sample Media	Quantity	Type of Analysis	Rationale
1. Soil Boring and Analysis	Soil	8	- Appendix IX+3 (excluding herbicides and pesticides) and PCBs per Section 3.2 - PID screening. - TOC in select soil increments	- Three soil borings adjacent to Merrill Road to assess potential exposure during road and utility maintenance activities (analyzed in 0-6 inch and in 2-foot increments). One of these borings is adjacent to former Waste Stabilization Basin as well. - One soil boring in vicinity of former Tanks 14 and 15 in the Building 109 Wastewater Tank Farm (analyzed in 2-foot *increments*). - Four soil borings in areas of site where soils not previously characterized.
2. Surficial Soil Sampling in Facility Area	Soil	9	- Appendix IX+3 (excluding herbicides and pesticides) per Sections 3.2.4 and 3.2.6.	- Surficial soil sampling to obtain information concerning potential exposures at grass-covered areas of site, where surficial soil data do not exist.
		1	- TOC, PCDDs/PCDFs, and inorganics per Section 3.2.3.	- Surficial soil sampling at location UFP3-R1 within the *former Interior Landfill*.
3. Floodplain Sampling in Lowland Area	Soil	6	- PCBs and SVOCs per Section 3.3.1.	- To assess floodplain soil at three locations along western side of transect UFP2.
		2	- TOC and PCDDs/PCDFs per Section 3.3.2.	- To assess floodplain soil in the vicinity of Building OP-3.
		2	- TOC, PCDDs/PCDFs, and inorganics per Section 3.3.3.	- To assess floodplain soil at transects UFP-1 and UFP-2.

(See Notes on Page 5)

TABLE 3-1
(Cont'd)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP SUPPLEMENTAL PHASE II SCOPE OF WORK
AND RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

SUMMARY OF PROPOSED ACTIVITIES

Activity	Sample Media	Quantity	Type of Analysis	Rationale
4. Monitoring Well Installation	--	4	- Conversion of soil borings to monitoring wells.	- To facilitate the collection of groundwater samples in the vicinity of Buildings OP-1 and OP-2.
5. Monitoring Well Sampling	Groundwater	7 (4 new and 3 existing wells)	- Appendix IX+3 constituents (excluding herbicides and pesticides) per Section 3.4.3.1.	- To provide groundwater quality data in the vicinity of Buildings OP-1 and OP-2.
		19 existing wells	- Appendix IX+3 VOCs, semi-annually per Section 3.4.3.1.	- To monitor the extent of the VOC plume and to provide data to be used in a quantitative assessment of the VOC plume.
		7 existing wells	- Appendix IX+3 VOCs per Section 3.4.3.1.	- To complete area-wide groundwater monitoring effort.
6. Well Point (piezometer) Installation and Monitoring	--	3	- Presence of oil on a semi-annual basis in area of Buildings 51/59 per Section 3.4.9.	- To better assess the boundaries of the Building 51/59 oil plume.
7. Semi-Annual Monitoring of Building 51/59 Oil Plume	--	18 existing wells and piezometers and 3 new piezometers	- Depth to water and oil thicKness, if any.	- To monitor presence of oil and to collect data to assist in evaluating recovery alternatives
8. Groundwater Elevation Monitoring	Groundwater	29 wells	- Groundwater Elevation per Section 3.4.4.	- To obtain a groundwater flow map of the entire site.
9. Groundwater Flow Estimates	--	--	- Per Section 3.4.7.	- To provide an estimate of the groundwater flow rate.

(See Notes on Page 5)

TABLE 3-1
(Cont'd)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP SUPPLEMENTAL PHASE II SCOPE OF WORK
AND RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

SUMMARY OF PROPOSED ACTIVITIES

Activity	Sample Media	Quantity	Type of Analysis	Rationale
10. Surface Water Sampling	Water	4	- Appendix IX+3 VOCs, and flow rate per Section 3.4.8.	- To characterize flow rate and hazardous constituents which may be present in the Housatonic River and Unkamet Brook for use in the quantitative VOC plume assessment.
	Water	1	- Appendix IX+3 SVOCs, inorganics, and flow rate per Section 3.4.8.	- To characterize flow rate and hazardous constituents just upstream of the site.
11. Sediment Sampling	Sediment	1	- SVOCs and inorganics per Section 3.4.8.	- To characterize sediment just upstream of the site.
12. Air Sampling	Air	3 each from 2 locations	- PCBs per Section 3.10.	- To obtain additional information on concentrations of PCBs in ambient air at the GE facility for use in the HEA.
13. Integrity Testing and Inspection of SWMUs	--	2	- Visual inspection.	- To verify integrity of the Building OP-3 Metal Treat Area (SWMU 0-41) and the Building 119W Oil/Water Separator (SWMU G-17) per Section 3.5.
14. Drum Removal Near Building OP-3 and Nearby Soil Sampling	Soil	To Be Determined	- Per Excavation Protocols	- Removal of buried drums at SWMU 0-46 near Building OP-3.
15. Subsurface Gas Evaluation	Subsurface Gas	8 borings	- PID Measurements at 2 foot intervals.	- To obtain additional information for subsurface gas evaluation.

(See Notes on Page 5)

TABLE 3-1
(Cont'd)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP SUPPLEMENTAL PHASE II SCOPE OF WORK
AND RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

SUMMARY OF PROPOSED ACTIVITIES

Activity	Sample Media	Quantity	Type of Analysis	Rationale
16. Preferential Pathway Analysis Along Sewer Pipeline	--	9	- Measurement of groundwater elevation at piezometers along sewer pipeline.	- To further evaluate the potential of the sewer pipeline to act as a preferential pathway.
17. Preferential Pathway Analysis of other Underground Pipes/Tunnels	--	--	- Per Section 3.8.	- To evaluate the potential contribution of hazardous constituents from underground pipes/tunnels.
18. Estimation of Volumes	--	--	- Per Section 3.9.	- To develop estimates of volumes of affected material.
19. Characterization of Risk of Harm to Human Health, Safety, Public Welfare, and the Environment	--	--	- Per Preliminary HEA Proposal (concurrently submitted).	- To assess risk of harm to human health, safety, public welfare, and the environment as required by the Corrective-Action Permit and the MCP.
20. Preliminary Investigation of Corrective Measures	--	--	- Per Section 4.	- To identify potential corrective measure technologies and assess the need for additional data to facilitate the technical evaluation and selection of corrective measures.

(See Notes on Page 5)

TABLE 3-1
(Cont'd)

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP SUPPLEMENTAL PHASE II SCOPE OF WORK
AND RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

SUMMARY OF PROPOSED ACTIVITIES

Notes:

- PID = Photoionization detector
- PCBs = Polychlorinated biphenyls
- Appendix IX+3 = Those constituents listed in Appendix IX of 40 CFR part 264 plus three additional constituents (benzidine, 1, 2-diphenylhydrazine, and 2 chloroethyl vinyl ether)
- TOC = Total Organic Carbon
- UST = Underground Storage Tank
- HEA = Health and Environmental Assessment
- MCP = Massachusetts Contingency Plan
- VOC = Volatile Organic Constituents
- SVOCs = Semivolatile Organic Constituents
- SWMU = Solid Waste Management Unit
- PCDDs/PCDFs = Polychlorinated dibenzo-p-dioxins/Polychlorinated dibenzofurans (performed on a congener-specific basis)

TABLE 3-2

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
MCP SUPPLEMENTAL PHASE II SCOPE OF WORK
AND RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

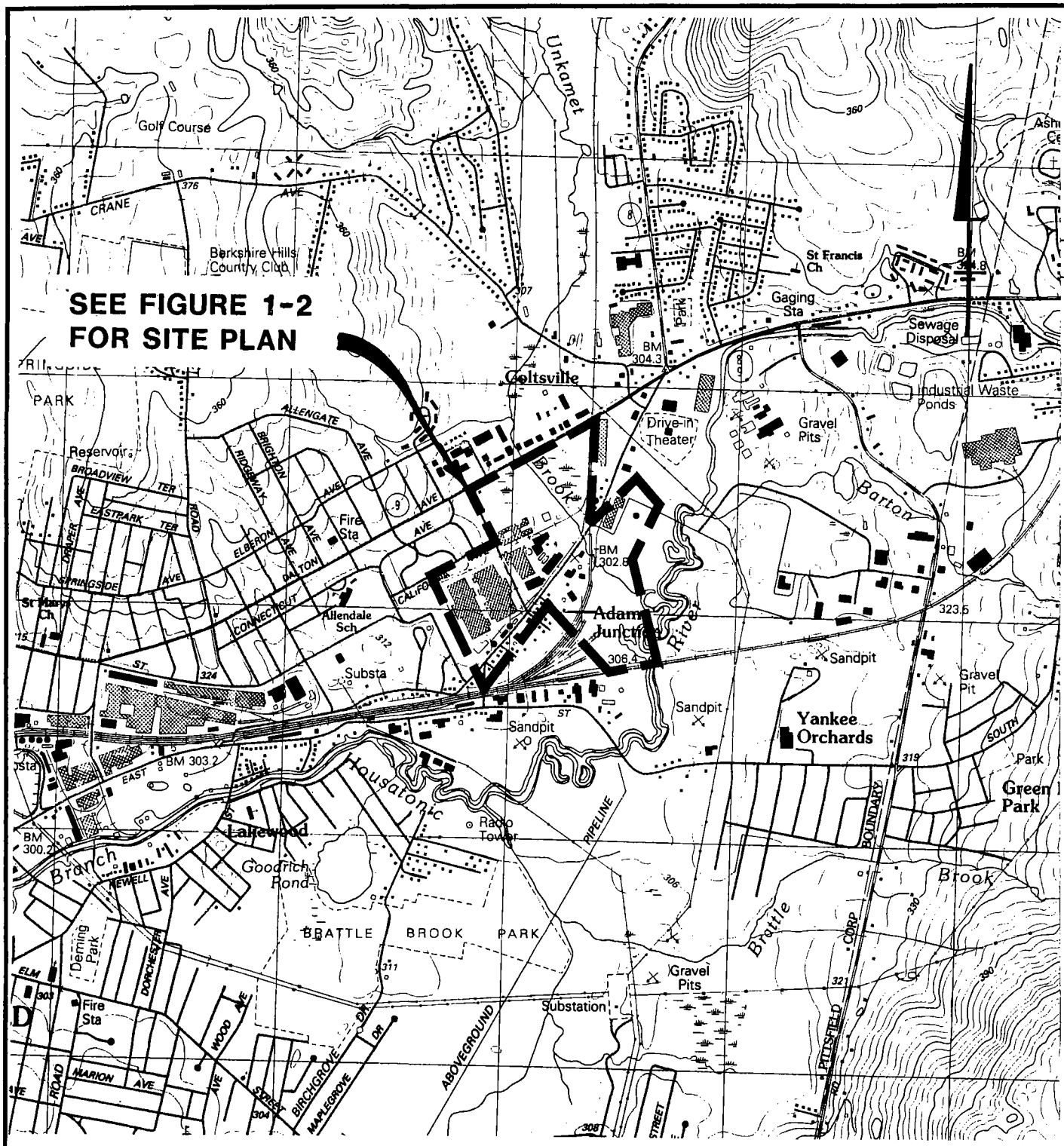
ANALYSIS OF POTENTIAL PREFERENTIAL PATHWAYS

Method of Migration	Process		Utility		Stormwater		Sanitary		Tunnels	
	Located Above the Water Table	Located Below the Water Table	Located Above the Water Table	Located Below the Water Table	Located Above the Water Table	Located Below the Water Table	Located Above the Water Table	Located Below the Water Table	Located Above the Water Table	Located Below the Water Table
1. Release of Hazardous Materials to Subgrade	Potentially Yes	Potentially Yes	No	No	Potentially Yes	Potentially Yes	No	No	Potentially Yes	Potentially Yes
2. Infiltration of Groundwater Into Pipe/Tunnel	No	Potentially yes, for non-pressurized pipes only	No	No	No	Potentially Yes	No	Potentially Yes	No	Potentially Yes
3. Infiltration of Groundwater Into Trench	No	Potentially Yes	No	Potentially Yes	No	Potentially Yes	No	Potentially Yes	No	Potentially Yes

Notes:

Potentially Yes = Potential for migration exists for this condition.
No = Potential for migration does not exist for this condition.
See Section 3.3.2 for further explanation of this table.

Figures



REFERENCE: PITTSFIELD, EAST USGS QUAD. 1988

2000' 0 2000'

APPROX. SCALE: 1" = 2000'

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

GENERAL ELECTRIC COMPANY • PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II
SOW / RFI PROPOSAL FOR
UNKAMET BROOK AREA / USEPA AREA 1

LOCATION MAP

FIGURE 1-1

11/94 D54-JVM
1019503/10195N02.CDR

X: 10195X02,10195X04,10195X05
L: ON=*,OFF=*REF*
1/95 54--PMC DMW
10195030/10195G25.DWG

LEGEND:

- APPROXIMATE SITE BOUNDARY
- SITE PROPERTY CURRENTLY OWNED BY GENERAL ELECTRIC CO.
- 988 ELEVATION CONTOUR
- FENCING

NOTES:

1. MAPPING IS BASED ON PHOTOGRAPHIC MAPPING BY LOCKWOOD MAPPING, INC.–FLOWN IN APRIL 1990 AND DATA PROVIDED BY GENERAL ELECTRIC COMPANY.
2. NOT ALL PHYSICAL FEATURES SHOWN.

400' 0 400' 800'

APPROXIMATE SCALE: 1" = 400'

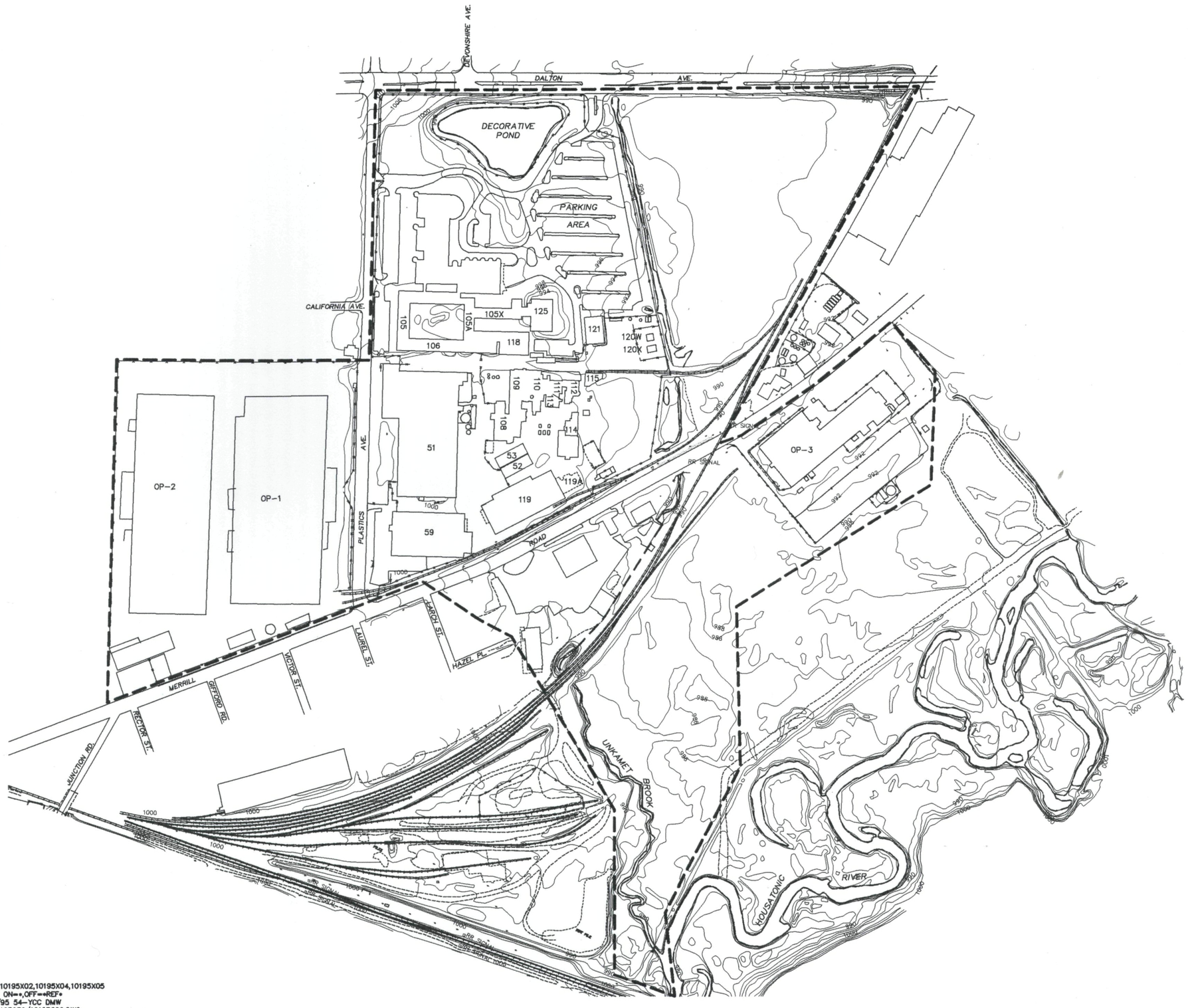
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SOW/RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

SITE PLAN

FIGURE **1-2**



LEGEND:

- PROPOSED SITE BOUNDARY
- 988 ELEVATION CONTOUR
- FENCING

NOTES:

1. MAPPING IS BASED ON PHOTOGRAPHIC MAPPING BY LOCKWOOD MAPPING, INC.–FLOWN IN APRIL 1990 AND DATA PROVIDED BY GENERAL ELECTRIC COMPANY.
2. NOT ALL PHYSICAL FEATURES SHOWN.

400' 0 400' 800'

APPROXIMATE SCALE: 1" = 400'

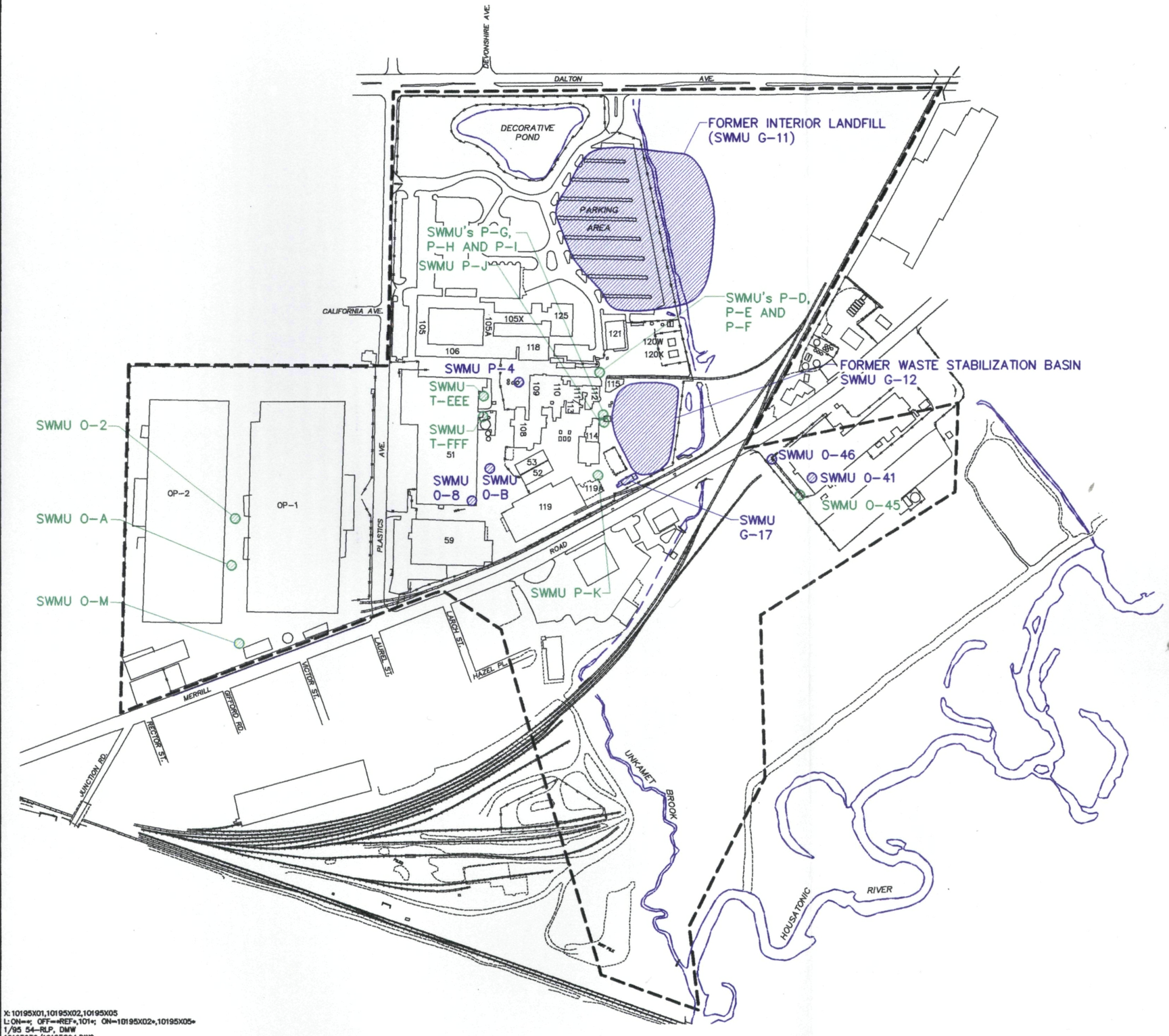
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SOW/RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

PROPOSED SITE BOUNDARY FIGURE **1-3**

X: 10195X02,10195X04,10195X05
L: ON=*,OFF=*REF*
1/95 54–YCC DMW
10195030/10195G28.DWG



LEGEND:

- APPROXIMATE SITE BOUNDARY
- FENCING
- APPROXIMATE LOCATION OF UST SWMU
- APPROXIMATE LOCATION OF OTHER (NON-UST) SWMU

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC.–FLOWN IN APRIL 1990 AND DATA PROVIDED BY GENERAL ELECTRIC COMPANY.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. LOCATION OF SWMU P-L IS CURRENTLY UNKNOWN.

400' 0 400' 800'

SCALE: 1" = 400'

X: 10195X01,10195X02,10195X05
L: ON=*; OFF=*REF*,101*; ON=10195X02*,10195X05*
1/95 54-RLP, DMW
10195030/10195G04.DWG

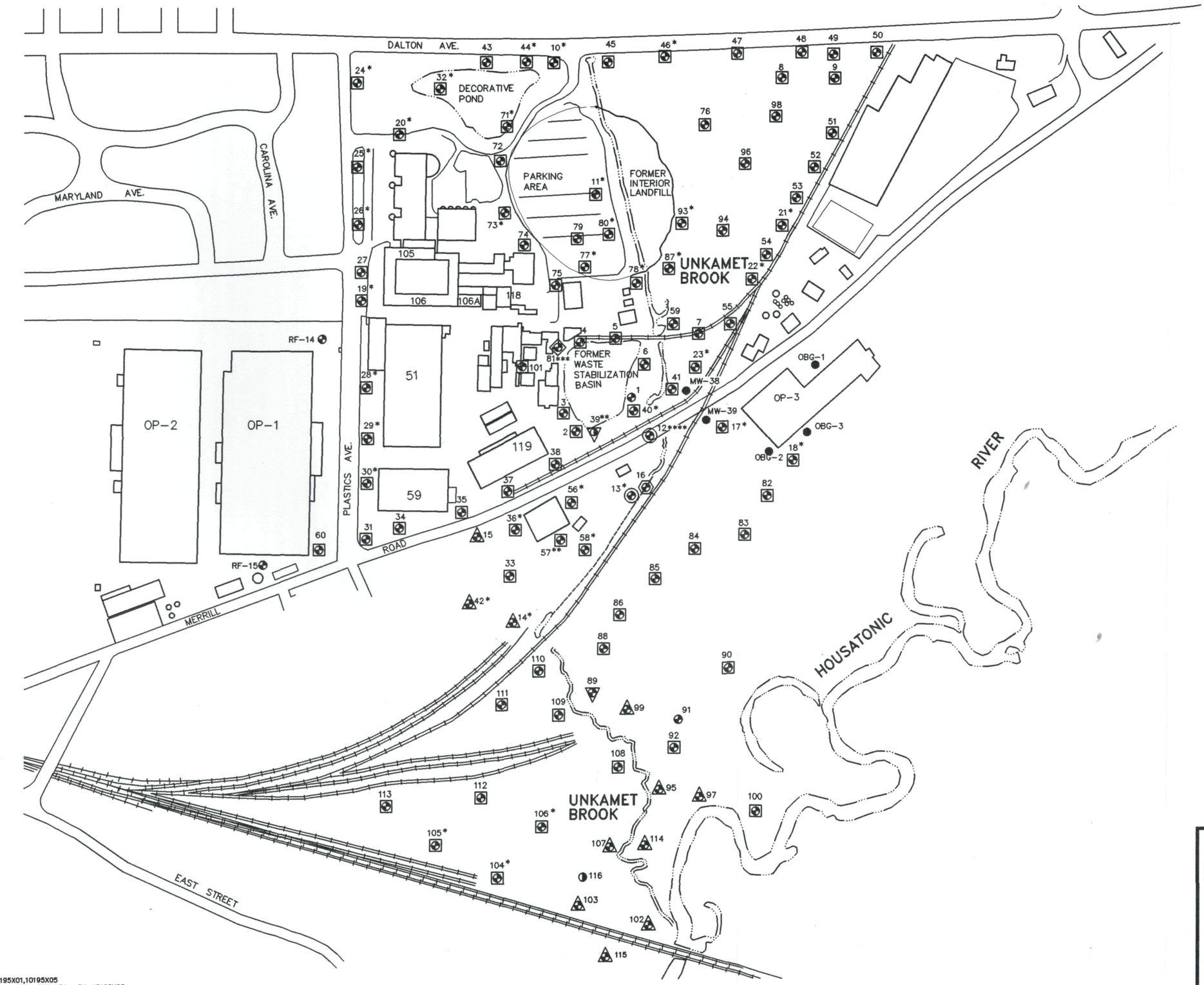
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SOW/RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

USEPA AREA 1 SWMU LOCATIONS

FIGURE **2-1**



LEGEND:

- ● MONITORING WELL (SHALLOW)
- MONITORING WELL (B SERIES WELL)
- MONITORING WELL (E SERIES WELL)
- MONITORING WELL CLUSTER (A & B SERIES WELLS)
- MONITORING WELL CLUSTER (A, B, & C SERIES WELLS)
- MONITORING WELL CLUSTER (A, B, C, & D SERIES WELLS)
- MONITORING WELL CLUSTER (A, B, C, & E SERIES WELLS)
- MONITORING WELL CLUSTER (A, B, & D SERIES WELLS)
- MONITORING WELL CLUSTER (A, B, D, & E SERIES WELLS)
- MONITORING WELL CLUSTER (A, B, 81* & F SERIES WELLS)
- * WELL CLUSTER DESTROYED OR NOT LOCATED
- ** A SERIES WELL DESTROYED OR NOT LOCATED
- *** A AND B SERIES WELLS DESTROYED
- **** A,C, AND D SERIES WELLS NOT LOCATED

NOTES:

1. PORTIONS OF BASE MAP WERE GENERATED BASED ON AERIAL PHOTOGRAPHS TAKEN APRIL 23, 1990.
2. WELL LOCATIONS ARE APPROXIMATE.
3. THE PRESENCE OR ABSENCE OF SPECIFIC WELLS AS DESIGNATED ON THIS FIGURE IS BASED ON A WELL INVENTORY CONDUCTED BY GERAGHTY & MILLER IN 1990.

400' 0 400'

1" = 400'

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

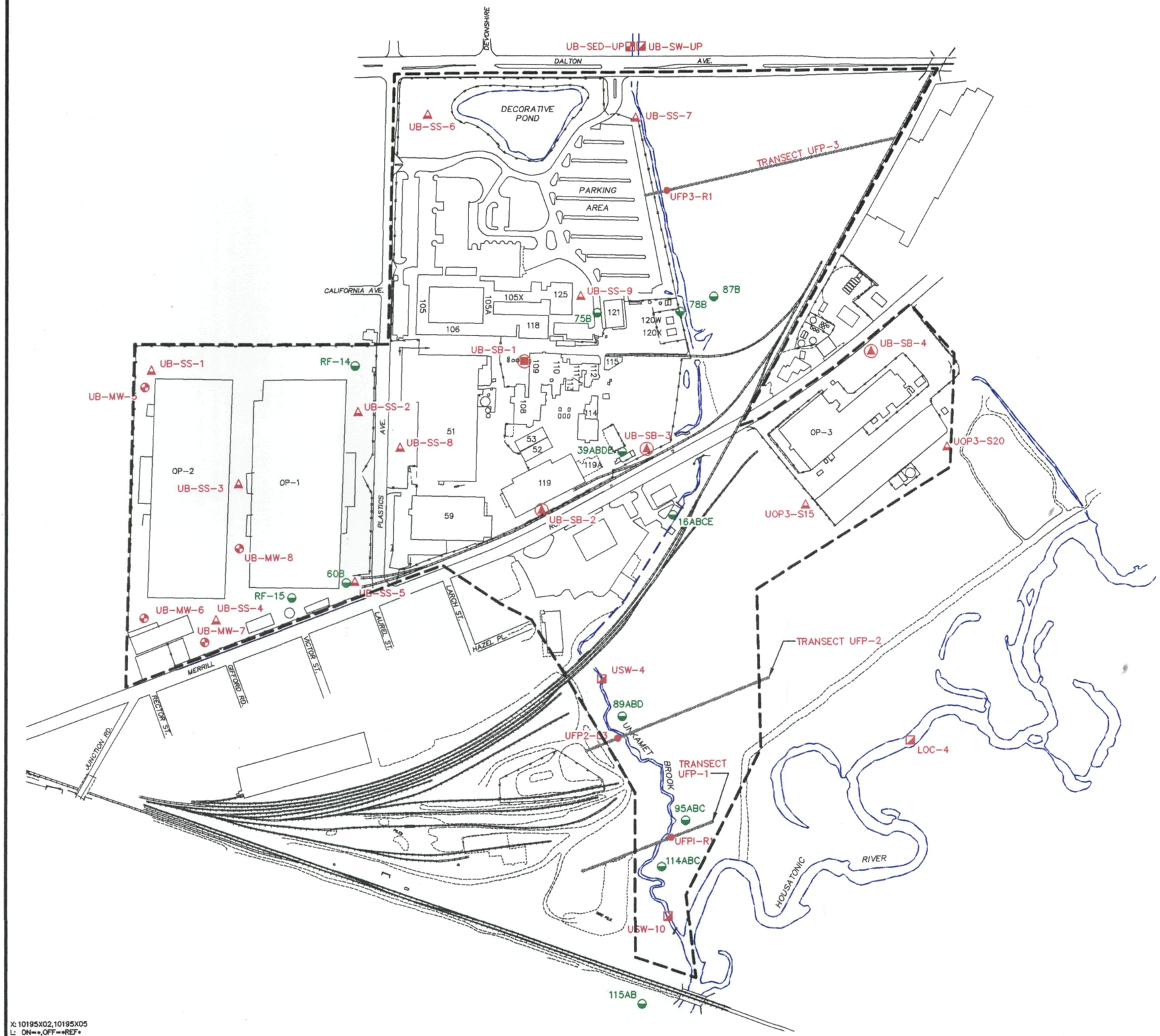
GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SOW/RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

MONITORING WELL LOCATION PLAN

FIGURE **2-2**

X: 10195X01,10195X05
L:ON=*; OFF=*REF*,101*; ON=10195X05*
1/95 54-YCC DMW
10195030/10195G18.DWG



LEGEND:

- PROPOSED SITE BOUNDARY
- FENCING
- EXISTING MONITORING WELL PROPOSED FOR SAMPLING
- PROPOSED SURFACE WATER SAMPLING LOCATION
- PROPOSED SEDIMENT SAMPLING LOCATION
- PROPOSED SOIL BORING AND MONITORING WELL LOCATION
- PROPOSED SOIL BORING LOCATION SAMPLED IN 2-FOOT INCREMENTS
- PROPOSED SOIL BORING SAMPLED AT 0 TO 6 INCHES AND IN 2-FOOT INCREMENTS
- PROPOSED SURFICIAL SOIL SAMPLING LOCATION
- FLOODPLAIN TRANSECT AND PROPOSED SAMPLING LOCATION

NOTES:

1. MAPPING IS BASED ON PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC.-FLOWN IN APRIL 1990 AND DATA PROVIDED BY GENERAL ELECTRIC COMPANY.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. HOUSATONIC RIVER SURFACE WATER MONITORING LOCATION (LOC-5) JUST BELOW THE UNKAMET BROOK CONFLUENCE IS NOT ILLUSTRATED.
4. EXISTING SAMPLING LOCATIONS ARE APPROXIMATE.
5. ADDITIONAL SAMPLING LOCATIONS ARE ILLUSTRATED ON FIGURES 3-2 AND 3-3.

400' 0 400' 800'

APPROXIMATE SCALE: 1" = 400'

BLASLAND, BOUCK & LEE, INC.

ENGINEERS & SCIENTISTS

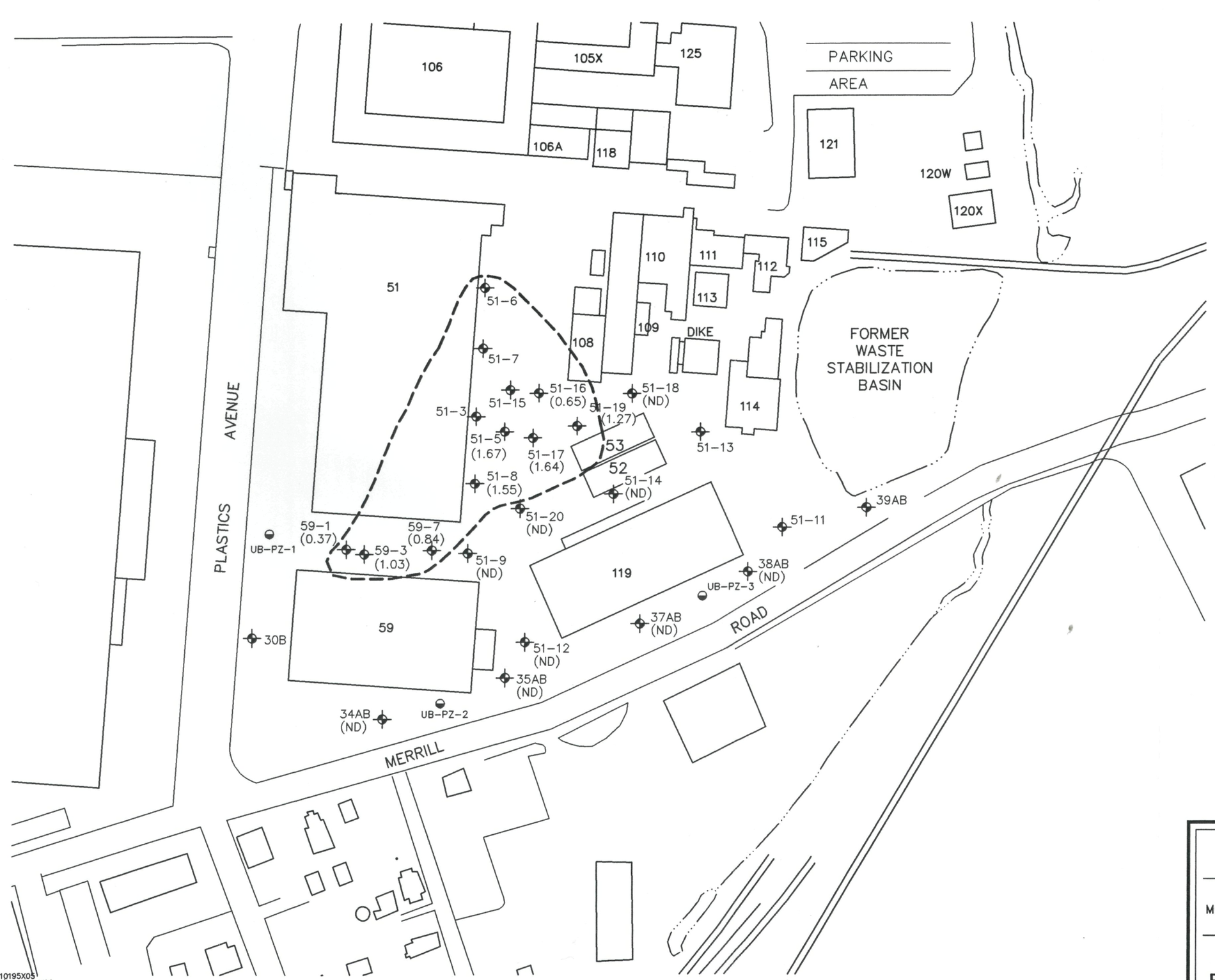
GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SOW/RFI PROPOSAL FOR UNKAMET BROOK AREA/USEPA AREA 1

PROPOSED SAMPLING LOCATION MAP

FIGURE **3-1**

X: 10195X02,10195X05
L: ON=*,OFF=*REF*
1/27/95 54-DMW
10195030/10195G27.DWG



X:10195X05
12/94 54-YCC
\10195030\10195G30.DWG

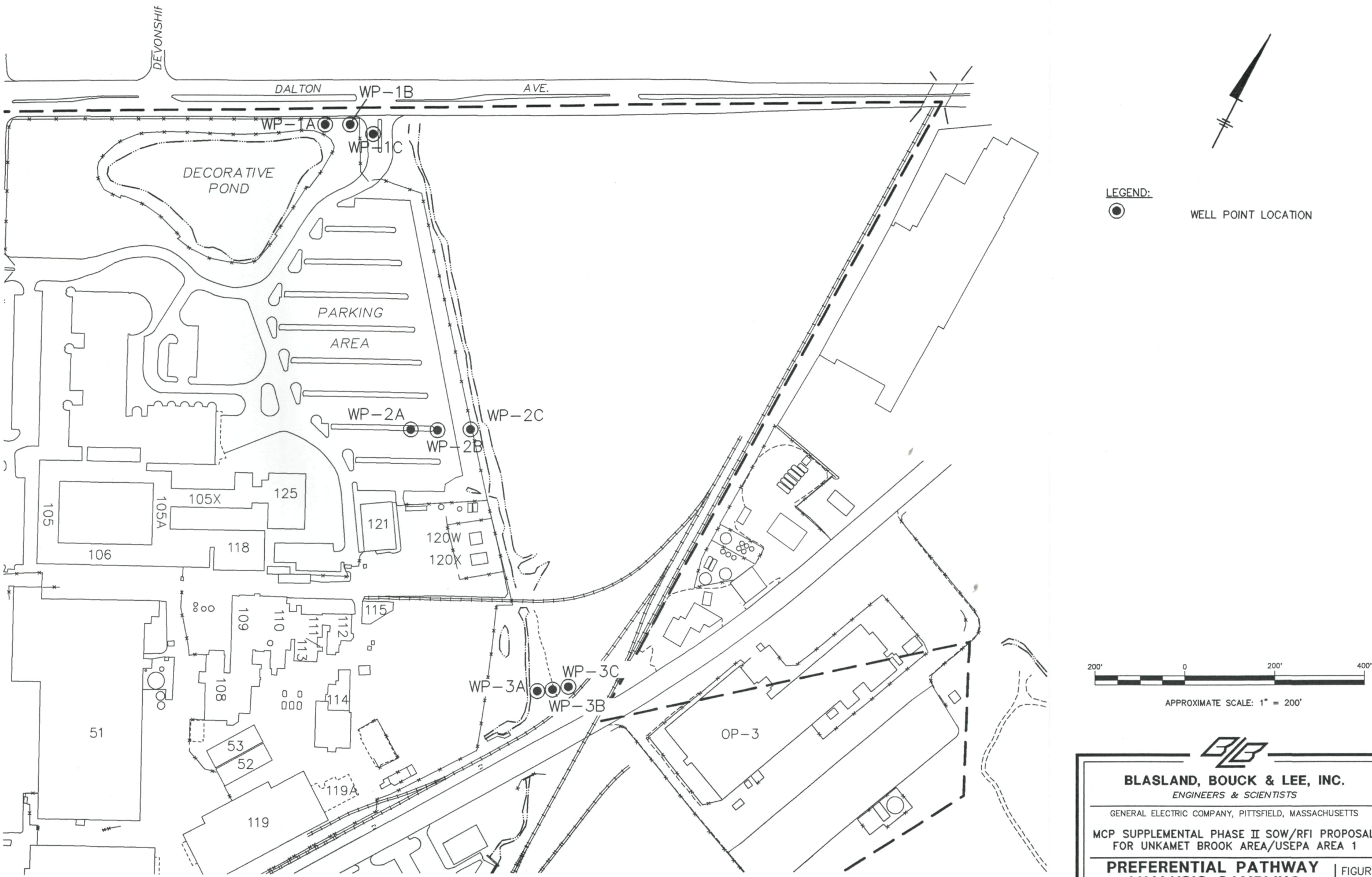
BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SOW/RFI PROPOSAL
FOR UNKAMET BROOK AREA/USEPA AREA 1

BUILDING 51/59 AREA DISTRIBUTION OF FREE-PHASE OIL DECEMBER 1991

FIGURE **3-2**



X: 10195X02,10195X05
L: ON=*;OFF=*REF*
1/95 54-YCC DMW
10195030/10195G31.DWG

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS

MCP SUPPLEMENTAL PHASE II SOW/RFI PROPOSAL
FOR UNKAMET BROOK AREA/USEPA AREA 1

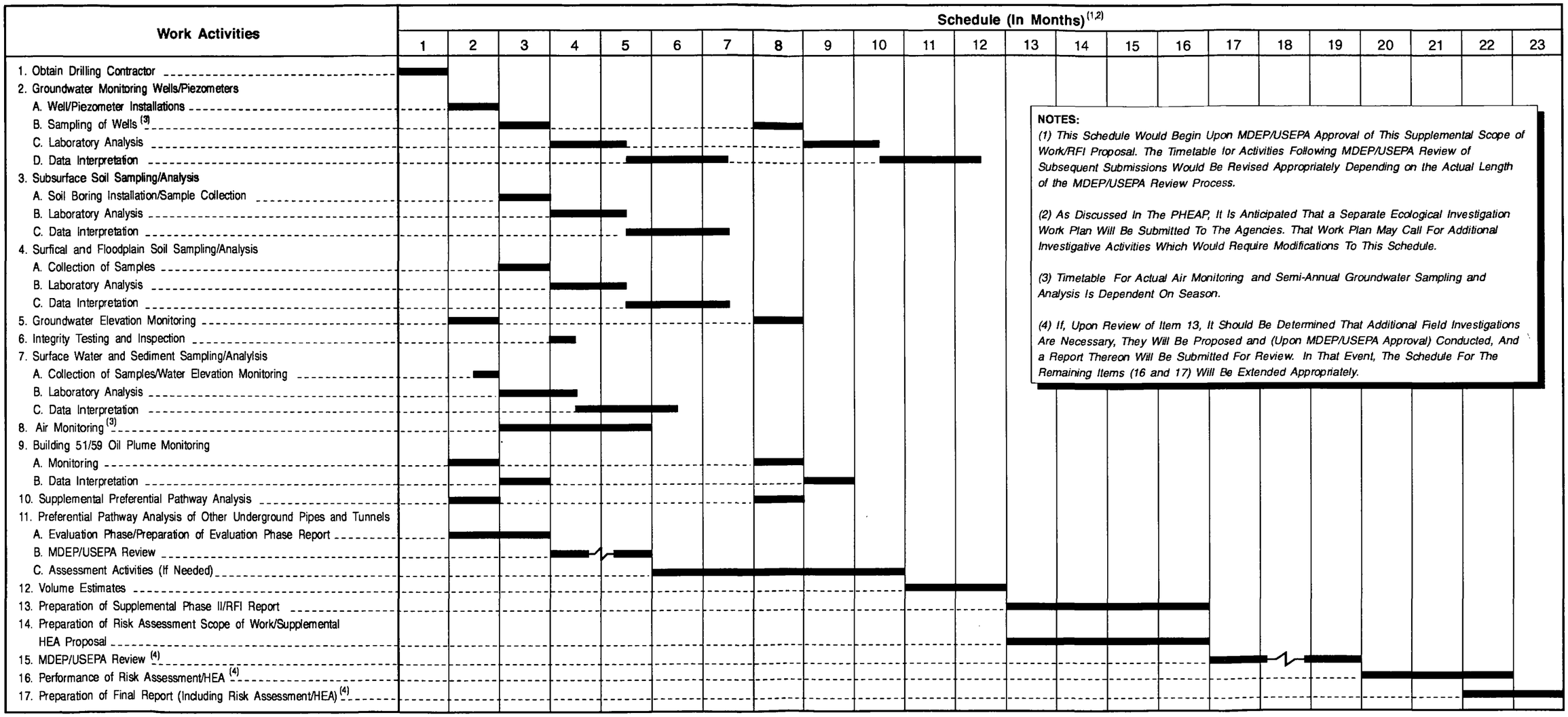
PREFERENTIAL PATHWAY ANALYSIS SAMPLING LOCATIONS

FIGURE **3-3**

FIGURE 5-1

GENERAL ELECTRIC COMPANY, PITTSFIELD, MASSACHUSETTS
MCP SUPPLEMENTAL PHASE II SCOPE OF WORK AND
PROPOSAL FOR RCRA FACILITY INVESTIGATION OF UNKAMET BROOK AREA /USEPA AREA 1

PROJECT SCHEDULE



NOTES:

(1) This Schedule Would Begin Upon MDEP/USEPA Approval of This Supplemental Scope of Work/RFI Proposal. The Timetable for Activities Following MDEP/USEPA Review of Subsequent Submissions Would Be Revised Appropriately Depending on the Actual Length of the MDEP/USEPA Review Process.

(2) As Discussed In The PHEAP, It Is Anticipated That a Separate Ecological Investigation Work Plan Will Be Submitted To The Agencies. That Work Plan May Call For Additional Investigative Activities Which Would Require Modifications To This Schedule.

(3) Timetable For Actual Air Monitoring and Semi-Annual Groundwater Sampling and Analysis Is Dependent On Season.

(4) If, Upon Review of Item 13, It Should Be Determined That Additional Field Investigations Are Necessary, They Will Be Proposed and (Upon MDEP/USEPA Approval) Conducted, And a Report Thereon Will Be Submitted For Review. In That Event, The Schedule For The Remaining Items (16 and 17) Will Be Extended Appropriately.

01/95 DJH D54
10195001/10195J01.cdr

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

Attachments

ATTACHMENT A

UNITED STATES DEPARTMENT OF THE NAVY CORRESPONDENCES

DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP #82
LESTER PA 19113-2090

IN REPLY REFER TO

11011
Code 241LP

28 JUN 1994

From: Commanding Officer, Northern Division, Naval Facilities Engineering Command
To: Commanding Officer, Naval Sea Systems Command, 2531 Jefferson Davis Highway, Arlington, VA 22242-5160

Subj: POTENTIAL PURCHASE OF UNDERLYING LAND AT OP1 AND OP2 AT NIROP, PITTSFIELD, MA

Ref: (a) NAVSEA ltr, OPR 0713, Ser 071/113, dtd 1 Dec 93

Encl: (1) Memo dtd 16 Jun 94, Subj: EBS For Purchase of GE Property at NIROP Pittsfield, 6 pages

1. Reference (a) requested our assistance with the purchase of the underlying land at OP1 & OP2 at the NIROP Facility located at Pittsfield, Massachusetts.

2. Enclosure (1) is the result of a field trip conducted on June 8th and 9th by members of the Northern Division Environmental Branch of the area.

3. Our environmentalists recommend, and this office agrees with their suggestion to wait until the results of the RFI and Health and Environmental Assessments are available prior to a final decision on the purchase of this property. Please be advised that in addition to the above results, we further request that a response to items under Recommendation, 2. a., through 2.e. be provided to this office.

4. If there are any further questions regarding this matter, please contact the undersigned at (610) 595-0764.

Lucy V. Peebles

LUCY V. PEEBLES
By direction

Copy to:
Mr. Hank Malafronte, Martin Marietta
Mr. K. Morrow, NAVSEA TECH REP
Mr. Ron Desgrossilliers, GE, EFO

MEMORANDUM

June 16, 1994

From: Code 1812/LHN & 1822/ML

To: Code 24/09TC/LP, 09C/09TA/RL, 09C/09TC/KH, 09C/GP

Via: Code 1812 & 1822

Subj: ENVIRONMENTAL BASELINE SURVEY (EBS) FOR PURCHASE OF GE PROPERTY AT NIROP PITTSFIELD

Encl: (1) Phonecon on Jun 16, 94 with MADEP
(2) Phonecon on Jun 20, 94 with EPA Region I
(3) Map of proposed monitoring well locations

Objectives:

1. A review of Martin Marietta's Environmental Baseline Survey (EBS) was done on June 8-10, 1994 to assess the property beneath OP-1 and OP-2 at the GE facility.

2. After visiting the site and reviewing available data be able to make recommendations to NAVSEA on purchasing the property.

FINDINGS:

A. According to Martin Marietta, all USTs have been properly removed. Photographs, records and certifications of removals were reviewed by NORTHDIV to confirm the proper removals of these USTs.

B. All PCB Transformers were located inside Buildings OP-1 and OP-2. According to Martin Marietta, these PCB transformers did not leak and were removed by GE as part of the GE Capitol Maintenance Program. Site visit showed that only a few non-PCB transformers remain at this site.

C. Hazardous materials are stored in a locked, fenced storage area. Martin Marietta has a good Pollution Prevention program in place to eliminate the following: excess storage of hazardous materials in work areas, open purchases, usage of highly toxic hazardous materials, etc..

D. There are approximately 47 and 19 Satellite Accumulation areas in OP-1 and OP-2 and one less than 90 day storage area. The hazardous waste containers are properly labeled and in good conditions. The less than 90 day storage area has secondary containment and a floor drain at the entrance to contain spills and leaks.

E. GE has established an impressive monitoring well network to the east of OP-1 and OP-2. They placed two wells in the area west of Plastics Ave., one upgradient (RF-14) and one downgradient (RF-15). Only one round of sampling occurred at wells RF-14 and RF-15. On a site map, well #60 was also identified to be a downgradient well and was analyzed for two rounds of sampling. All the above wells were analyzed for Appendix IX+3 parameters.

F. In wells RF-14 and RF-15, tetrachlorodibenzofurans, pentachlorodibenzofurans and hexachlorodibenzofurans were found at concentrations of 1.3, 0.96 and 2.1 (ng/L) respectively. Split sampling took place at RF-14. IT Analytical Services reported the above results, where Compu Chem Laboratories produced no detectable furans concentrations. This discrepancy is raising a "red flag" for these results.

DISCUSSION:

As part of a RCRA Corrective Action Permit, GE is required to submit a RCRA Facilities Investigation (RFI) Work Plan and a Preliminary Health & Environmental assessment by November 29, 1994. This work plan should include an investigation in the vicinity of OP-1 and OP-2. Based on telephone conversations with MADEP and EPA, enclosures (1) and (2), NORTHDIV can not recommend purchasing the property underlying OP-1 and OP-2 without the results of the above investigations. If the decision is to purchase the property, the Navy will automatically become a Potentially Responsible Party (PRP).

RECOMMENDATIONS:

1. It is NORTHDIV's recommendation that NAVSEA wait until the results of the RFI and Health & Environmental Assessment are available before deciding on purchasing the property. NORTHDIV will review the reports at that time and make recommendations.

2. NORTHDIV would like to see the following items included in the investigations in order to better characterize the site:

   a. Install three to five wells around OP-1 and OP-2 west of Plastics Avenue.

b. Sample new and existing wells (#60, RF-14, RF-15) for Appendix IX+3 parameters.

c. Collect 4 to 5 composite samples, each consisting of 4 to 5 locations. Analyze each sample for Appendix IX+3 parameters, and also include PCBs and furans/dioxins. Samples should be taken from 0-6 inches.

d. Evaluate groundwater flow direction and possible source of contamination, if any?

e. Evaluate surficial (0-6") soil data to determine if there is a PCB/furan problem.

3. Any questions concerning this matter can be directed to Ms. L. Nguyen at (610) 595-0567 ext 141 or Mr. M. Leipert at (610) 595-0567 ext 146.

TELEPHONE CONVERSATION RECORD

DATE: 16 Jun 94
TIME: 16:15

ORIGINATOR (NAME)	(TITLE)	(LOCATION)
Lien Nguyen	Envr.Eng.	NORDIV

PERSON CALLED (NAME)	(TITLE)	(LOCATION)
Lynna Cutler (413) 784-1100 ext 316		Mass. DEP

SUBJECT: GE PROPERTY AT NIROP PITTSFIELD

SUMMARY OF CONVERSATION:

I called Lynn Cutler to ask her about GE property to see if the property that we are interested in buying is clean or not. She informed me that there is no clean and at GE site. She also said that GE has until November 29, 94 to submit the followings:

1. A Current Assessment Summary of the MCP
2. RFI Proposal and
3. Preliminary Health & Environmental Assessment Proposal.

Ms. Cutler also said that we should wait to see the above items before making any decision. I told her that if we decide to purchase, we would like to take some surficial samples and install atleast 3-5 additional monitoring wells around OP-1 and OP-2. She then said that no work can be done on GE property without a Scope of Work and an approval from Mass. DEP. She also said that if we purchase this property we would become another PRP.

ROUTING			COMMENTS
CODE	ACTION	INFO	INITIAL
1822/ML		X	
1812		X	

COPIES TO:
Code 24/09TC/LP
Code 09C/GP

SIGNATURE
Lien Nguyen

TELEPHONE CONVERSATION RECORD

DATE: 20 JUNE 94
TIME: 09:00

ORIGINATOR (NAME)	(TITLE)	(LOCATION)
MARK LEIPERT	GEOLOGIST	NORDIV

PERSON CALLED (NAME)	(TITLE)	(LOCATION)
BRIAN OLSON	PROJECT MANAGER	EPA Region I

SUBJECT: PITTSFIELD, MA AREA 1 (Ordnance and Plastics Divisions, East and West of Plastics Avenue.

SUMMARY OF CONVERSATION: I spoke with Mr. Olson regarding the MCP Interim Phase II Report For Unkamet Brook Area and Current Assessment Summary For USEPA Area I. I asked him if he had a chance to review the report dated April 1992. He said that EPA had focussed it's efforts on the Housatonic River, since the public had seen a potential human health risk associated with the PCBs and river sediments.

Mr. Olson also informed me that several drums were unearthed as a result of installing a streamline at OP-3. There were no records of these drums ever being buried. He stated that as a result of this finding the way in which sites were being looked at would change, this would include OP-1 and OP-2. He hinted at the use of geophysical techniques.

Mr. Olson said that by November 29, 1994, GE had to submit a Current Assessment Summary, a RFI Proposal/SOW and a Preliminary Health and Environmental Assessment Proposal. He stated that EPA would accept comments from the public as well as the Navy on the RFI work plan. EPA feels that additional field work is necessary to determine whether or not the property is contaminated.

Mr. Olson's recommendation to the Navy is to wait until <u>at least</u> November 29, 1994 before deciding on purchasing the property. The Navy should contact EPA Region I around mid-November to see if GE's submittal would be on time. The Navy should get a copy of the RFI work on Area I and provide comments to EPA Region I.

ROUTING			COMMENTS
CODE	ACTION	INFO	INITIAL
1822		X	
1812 /LHN		X	

COPIES TO:
Code 24/09TC/LP
Code 09C/GP

SIGNATURE
Mark Leipert

ATTACHMENT B

ZOREX AIR MONITORING ANALYSIS

ATTACHMENT B TO SOW

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

PROPOSED PCB AMBIENT AIR MONITORING
UNKAMET BROOK AREA/USEPA AREA 1 SITE

To supplement the existing ambient air monitoring data on PCBs in the Unkamet Brook Area/USEPA Area 1 site, GE proposes to conduct additional ambient air monitoring for PCBs. The objective of the additional sampling will be to obtain valid and representative concentrations of PCBs in the ambient air at and around the old Interior Landfill. The monitoring program will use sampling and analytical methods to provide data that are consistent with data collected during the year-long PCB air monitoring program conducted in 1991-92.

Sampling and Analytical Methodology

GE is proposing to establish two monitoring stations in the Unkamet Brook Area/USEPA Area 1 Site. One station will be located near the center of the former Interior Landfill just east of the current GE Plastics parking lot (see Fig. B-1) and west of Unkamet Brook. A second station will be located west of the former Interior Landfill on the south side of the decorative pond (see Fig. B-1). Data from the second station will be used to compare levels of ambient PCBs found in the surrounding area with those measured directly over the former Interior Landfill.

Three rounds of ambient air sampling will be conducted at each station during mid-summer. Previous studies have shown that PCB concentrations in the ambient air increase with average ambient temperature. Sampling, therefore, will be conducted from early July through mid-August when average daily temperatures are expected to be highest. The sampling events will be spaced

at 15 days apart. Samples will be collected for 24 hours from 7 a.m. to 7 a.m. during each event.

The sampling method for PCBs will be USEPA Compendium Method TO-4, Method for the Determination of Organochlorine Pesticides and Polychlorinated Biphenyls in Ambient Air. This method employs a modified high volume sampler consisting of a glass fiber filter with a polyurethane foam (PUF) backup absorbent cartridge to sample ambient air at a rate of 200-280 L/minute (0.20 - 0.28 m^3/min). A General Metal Works Model PS-1 Sampler equivalent will be used.

Method TO-4 cites the U.S. EPA Reference Method for the Determination of Suspended Particulates (TSP) in the Atmosphere (High Volume Method) contained in 40 CFR 50, Appendix B, for procedures on equipment calibration. The TSP reference method is also used as a QA guideline for sampling procedures, calculation and data reporting, maintenance, and the assessment of data for accuracy and precision.

The samplers will be monitored at six-hour intervals over each 24-hour sampling period. During these six-hour checks, barometric pressure, temperature, flow, and magnehelic pressure readings will be taken. When necessary, the air flow will be adjusted to the target flow rate. At the end of the sampling period, the PUF cartridges will be removed from the sampling train. Each PUF cartridge (inside a glass holder) will be wrapped in hexane rinsed aluminum foil. The PUF samples will be labeled, wrapped, packaged in blue ice and sent under chain-of-custody to the contract laboratory for analysis.

The PCB sampling probe height for all high volume monitors will be approximately 2.0 meters above the ground. This height is adequate to represent the breathing zone and be above the influence of ground activity around the monitor. The location of the samplers will be in conformance, to the extent practical, with the siting requirements for ambient monitors in Ambient

Monitoring Guidelines for Prevention of Significant Deterioration (PSD), U.S. EPA. May, 1987.

Analytical

The PCBs will be recovered by Soxhlet extraction. The extracts will be reduced in volume using Kuderna-Danish (K-D) concentration techniques and subjected to column chromatographic cleanup. The extracts will be analyzed for PCB Aroclors using gas chromatography with electron capture detection (GC-ECD) as described in EPA Method 608. To confirm the analytical results of Method 608, one sample from each event will be analyzed by high resolution GC/Mass Spectrometry (GC-MS).

The detection limit (DL) for PCB analysis of the high volume samples in this study will be 0.0005 ug/m^3, in consideration of the following:

Sampling Rate	0.25 - 0.26 m^3/min.
Avg Sample Volume	370 m^3/PUF
Analytical DL	0.20 ug/PUF
Project DL	0.0005 ug/m^3

Quality Assurance and Quality Control Procedures

Quality assurance and quality control (QA/QC) procedures for the air sampling program will generally follow those described in the Quality Assurance Project Plan (QAPP) prepared by Zorex for the two previous MCP Phase II ambient air sampling projects. Applicable sections of the QAPP associated with high-volume sampling are contained in Appendix L-2 of GE's Sampling and Analysis Plan/Data Collection and Analysis Quality Assurance Plan (Blasland, Bouck & Lee, May 1994). The QAPP was developed in accordance with the OTS Guidance Document for the Preparation of Quality Assurance Project Plans, U.S.

EPA, 1984, and the Quality Assurance Handbook for Air Pollution Measurement Systems, U.S. EPA, 1976. Prior to the initiation of sampling, applicable sections of the QAPP will be revised to reflect the specific activities of this sampling. Data Quality Objectives (DQO) in terms of validity, comparability, completeness, precision, accuracy, and representativeness will also be identified. The revised QAPP will be forwarded to DEP and EPA for review.

The objective of the QAPP is to ensure that the data collected on ambient levels of PCB are adequate to meet the objective of the monitoring program and the intended uses of the data. The following objectives will be used as guidelines to assuring quality in the design and implementation of the monitoring program.

- The sampling and analytical procedures will be conducted in accordance with EPA Compendium Method TO-4 and other EPA recommended guidelines, as applicable.

- All phases of the sampling program will be adequately documented. Documentation will be maintained to evidence the validity of calibrations, sample collection, flow calculations, sample custody, analytical performance, data reduction and audit procedures. A record book will be maintained to identify and reconstruct sampling events, calibration procedures, maintenance and repair activity, and other related information.

- The GE Project Manager will be kept informed of sampling activity with update memoranda.

- Sampling and analytical data quality will be measured and reported, where applicable, in terms of completeness, precision, accuracy (bias), representativeness, and comparability.

Calibrations for all sampling equipment will be conducted in accordance with the schedules and procedures specified in EPA Method TO-4. All data and calculations for the calibrations will be maintained in a calibration log file.

The following internal quality control checks will be performed on each sampler:

- A one-point audit of the calibrated flow rate versus sampler magnehelic pressure indication will be performed on each high-volume sampler before and after each sampling event;

- A zero check on the samplers' pressure gauges or flow meters will be verified before and after each sampling event;

- A leak check will be performed on each sampler before and after each sampling event;

- A recording and adjustment of the sampler pressure or flow indicator will be undertaken to maintain a constant rate flow at six-hour intervals during the sampling event; and

- One co-located high-volume sampler will be installed at each sampling site as a sampling precision check on the field samplers. The ambient PCB data from the co-located samples will be used to verify the precision of the primary samplers.

The following quality control measures will also be performed to insure the integrity of the high volume ambient air samples:

- All PUFs and filters will be extracted by the contract laboratory before use. One PUF adsorbent from each batch of 21 extracted PUFs will be analyzed, before shipment of the batch to the field, as a method blank check for PCBs. The blank control limit will be the detection limit. Each set of PUFs used in sampling will be verified with this method.

- One PUF field blank will be transported with the samples to and from the field without being unwrapped or having air drawn through it. The PUF will be shipped along with the samples to the laboratory for analysis.

- All samples will be labeled and transported under chain of custody by Federal Express to the contract laboratory. The samples will be recorded and handled according to strict chain-of-custody.

All sampling data recorded in the field and flow calculations based on the field data will be verified by the Project Manager, Maura J. Hawkins of Zorex Environmental Engineers, Inc., before final recording. Calibration charts for flow calculations will be validated by the QA Engineer, Amy T. Austin of Zorex Environmental Engineers, Inc.

The contract laboratory has documented procedures for data validation of analytical results. These procedures comply at a minimum with the requirements in Method TO-4 and associated references, as applicable. Analytical results and laboratory validation procedures will be reviewed by the Project Manager.

Sample Documentation, Handling and Shipment

Each filter holder and PUF cartridge holder will be pre-marked with a permanent identification number. As each sample is collected, it will be recorded on a field data form and a Chain-of-Custody form, along with the date, time, and location of collection.

All samples will be securely wrapped for shipment. PCB samples will be preserved at 4°C and shipped on blue ice. Samples will be shipped under chain-of-custody by commercial overnight carrier to the analytical laboratory.

Meteorological Monitoring

Concurrent with the PCB sampling, a Climatronics Electronic Weather Station (EWS) will be operated at the GE facility in Pittsfield, Massachusetts. This EWS has been operating continuously since 1991 at GE East Street Area 2/USEPA Area 4 Site providing data to support other GE activities under the MCP. The EWS measures and records wind speed, wind direction, precipitation, temperature, relative humidity and integrated solar radiation. Barometric pressure will be measured and recorded manually on each sampling day. The sitting of the meteorological station was established with the approval of DEP. The station was installed and continues to operate in accordance with EPA On-site Meteorological Program Guidance for Regulatory Modeling Applications and a Site-Specific Meteorological Monitoring Quality Assurance Project Plan. The operation of the EWS has been successfully audited by DEP.

Documentation and Reporting

All field and laboratory data recorded during ambient monitoring will be documented. A written report summarizing the results and providing the following information will be provided at the conclusion of the sampling program:

Date and Time of Sampling
Sampling Locations
Calibration and Maintenance Activities
Pollutants Monitored
Number of Samples Collected
Analytical Results
Quality Assurance Assessment
Meteorological Data Summary
Discussion of Problems or Disruptions
Signature of Individual Responsible For Monitoring Program