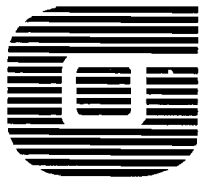


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August 25, 2000



O'BRIEN & GERE
ENGINEERS, INC.



FINAL WORK PLAN

Remedial Design Work Plan

*General Electric Company
381 Upper Broadway
Fort Edward, New York*



A handwritten signature in black ink, appearing to read "J.R. Heckathorne", written over a horizontal line. The signature is fluid and cursive.

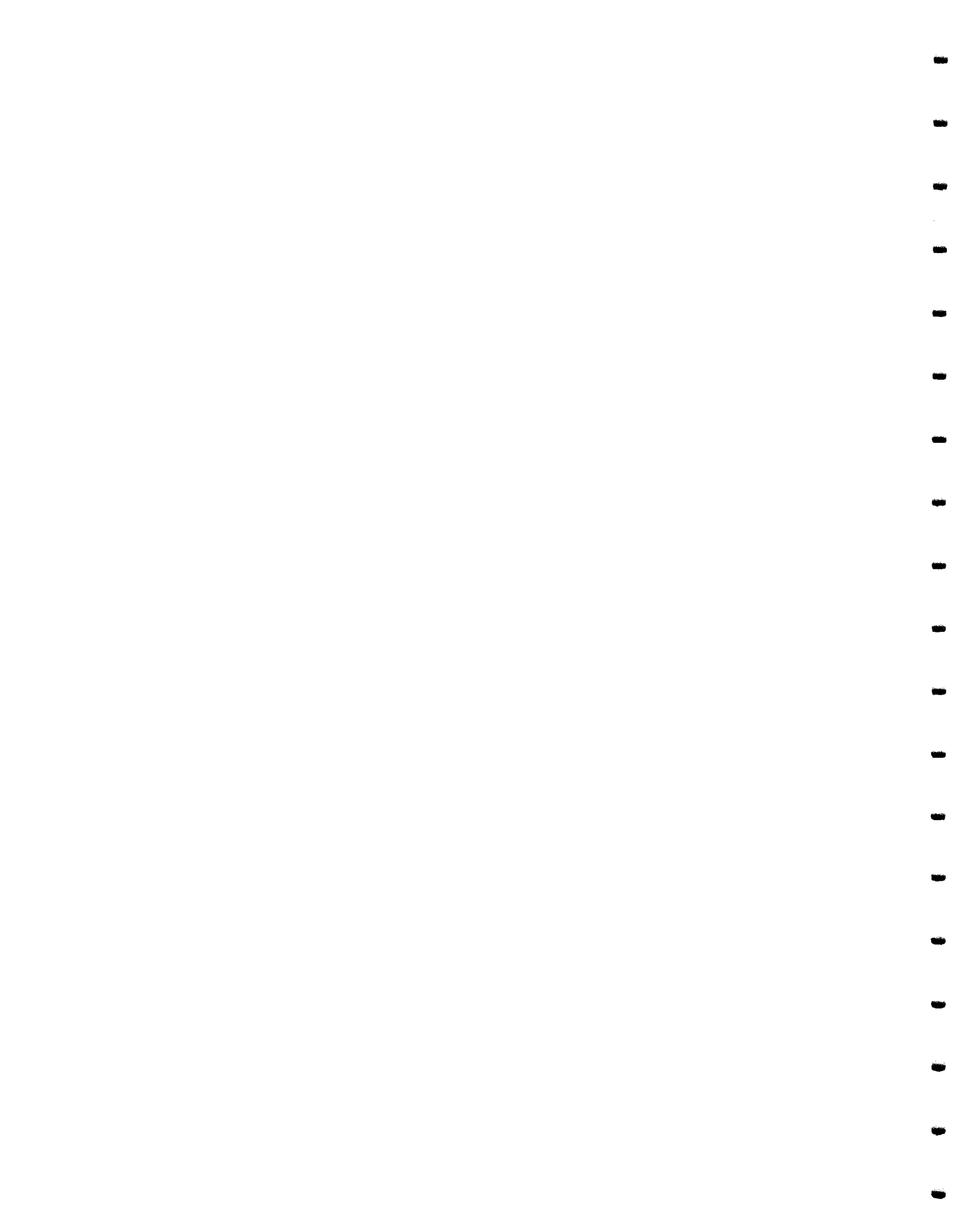
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Vice President

August 25, 2000



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1. Introduction

This Remedial Design Work Plan (RDWP) has been prepared to serve as a guide in implementing activities associated with the Remedial Design (RD) for the GE Fort Edward facility located in Fort Edward, New York. The site location plan is shown on Figure 1-1. The purpose of this RDWP is to specify the elements of work to be performed and the timing and sequence of these elements.

1.1. Site background

The GE Fort Edward facility is located approximately 800 feet east of the Hudson River between the Villages of Hudson Falls to the north, and Fort Edward to the south. The facility is approximately 32 acres and is bounded on the east by Broadway, on the south by Park Avenue, and on the west by the Delaware & Hudson Railroad/Allen Street as shown on Figure 1-2. As shown on Figure 1-2, an approximately 200 foot wide parcel located between Allen Street and the Hudson River is also owned by GE.

The Fort Edward plant has been in operation since 1942. Between 1942 and 1946 selsyn motors were manufactured for the U.S. Department of Defense; since 1946 the plant has produced small industrial capacitors. Operations related to capacitor production have included aluminum rolling, tin plating, capacitor recovery and salvage operations, polypropylene film manufacture, refining and blending of dielectric fluids, and quality control operations. Various cleaning operations to remove residues resulting from fabrication have also been conducted at the site. Among the products used in various operations were polychlorinated biphenyls (PCBs) (chlorinated and non-chlorinated), organic solvents, and kerosene. PCB use as a dielectric fluid at the site was discontinued in 1977. The plant has eliminated its use of organic solvents in recent years by modifying processes, installing new state-of-the-art processes, and implementing waste minimization programs.

Present facilities on the Fort Edward plant site consist of several buildings, a 1.8 million gallon concrete equalization basin located on the southwest corner of the property, and parking areas. The main manufacturing building, the largest building at the Fort Edward plant site, is comprised of several joined structures which were constructed over a span of 25 years. The second building, the former aluminum rolling mill (Bldg. 40), has also been expanded several times since its

original construction in 1960. Smaller buildings on the site include a pump house, maintenance building, and the waste water treatment facility. Rolling mill operations were terminated in 1995 and assembly and testing operations from the Hudson Falls facility were moved to Building 40.

1.2. Previous remedial activities

Since 1976, numerous improvements and remedial actions (RAs) have been undertaken by GE at the Fort Edward facility to reduce the potential impact of the site on the surrounding community and the Hudson River. These actions include, but are not limited to, the following:

- PCBs abatement program was conducted pursuant to a 1976 Agreement with the State of New York.
- In accordance with New York State Department of Health (NYSDOH) Recommendations, GE paid for and caused installation of water mains and piping for households on Park Avenue, Stevens Lane, Ethan Allen Street and Putnam Avenue.
- NYSDEC-approved on-site and off-site remedial plans were implemented pursuant to Order on Consent #T032785.
- In 1988, shallow bedrock ground water recovery and treatment was initiated in wells GM-8DR and GM-11D. A plan to upgrade the bedrock ground water recovery system was approved by NYSDEC and implemented in 1990.
- Since 1984, dense non-aqueous phase (DNAPL) PCB oil has been recovered from the southeastern portion of facility. Approximately 1,300 gallons of PCB/water mixture was collected from well GM-27 between 1984 and 1990. Between 1990 and 1999, approximately 91 and 1010 additional gallons of PCB DNAPL has been collected from oil recovery wells ORW-1 and ORW-2, respectively.
- Since 1992, several upgrades to the Fort Edward plant waste water treatment facility have been implemented to reduce effluent loading to the Hudson River.
- With the approval of NYSDEC and NYSDOH, GE undertook a voluntary residential well sampling and public water supply connection program in the areas south, east and west of the Fort Edward facility in 1994. To date, 31 homes and businesses in the Town of Fort Edward have agreed to be connected to public water at no charge to the owners.

In addition to the improvements and RAs that have been undertaken by GE at the Fort Edward facility, the following interim remedial measures (IRMs) have also been conducted at the Fort Edward plant site:

- Installation of RW-1. As a means of mitigating the volatile organic compound (VOC) plume identified in 1983, a shallow ground water recovery well, RW-1, was installed in August 1983 as part of a NYSDEC-approved IRM. The well was located along Park Avenue in the southeast portion of the facility and the ground water was pumped to an on-site water treatment facility (air stripper). In December 1988, recovery well RW-1A was installed as a replacement for recovery well RW-1.
- Sealing of production wells. In 1995, former production wells PW-1 and PW-2 were permanently decommissioned by sealing the entire length of each borehole with a combination of cement-bentonite grout and bentonite chips.
- Outfall 004 diversion. Between 1994 and 1996, a temporary outfall diversion and ultimately a permanent outfall diversion was completed. The permanent 6-inch diameter outfall was relocated approximately 200 feet upstream of the original outfall 004, and involved installing new underground piping from the tie-in to the existing outfall pipeline to a new concrete headwall erected near the edge of the river (just above the high water level). Other activities performed during the outfall diversion project include the removal of the 30-inch diameter CMP outfall from the steep bank back to the elbow near the concrete headwall, and removal of the remaining pipe between the top of the bank and manhole MH-1. The results of the associated outfall investigations and IRMs are contained in a report entitled "Outfall 004 Investigation Report" (Dames & Moore 1994b).
- Former Outfall 004 Pipeline IRM (1996). In accordance with a NYSDEC-approved IRM work plan and the 1995 Consent Order, over 600 feet of the former Outfall 004 pipeline and pipe bedding was removed from the area west of Manhole #4 to the top of the steep bank above the Hudson River. Between January and May 1996, more than 4,100 tons of PCB contaminated material was removed and transported to the Toxic Substance Control Act (TSCA)-permitted landfill operated by Chemical Waste Management in Model City, New York. Details of the IRM are contained in the summary report and engineering certification submitted to the NYSDEC in July 1996 (O'Brien & Gere 1996b).

1.2.1. RCRA corrective action

The Fort Edward facility currently holds a 6 NYCRR Part 373 permit for storage of hazardous waste. The effective date of the permit is November 15, 1995. Module III of the permit outlines the corrective action requirements for solid waste management units (SWMUs) and

areas of concern. As outlined in Module III, Order on Consent Index #A5-0316-94-06 provides for a Remedial Investigation and Feasibility Study of the site. Compliance with the Order on Consent fulfills GE's obligations to undertake RCRA corrective action under the Part 373 permit.

A total of 20 SWMUs and four other areas of concern were identified in the Remedial Investigation/Feasibility Study (RI/FS) work plan prepared by GE and approved by NYSDEC pursuant to Order on Consent #A5-0316-94-06. Subsequently, two additional areas of concern (Building 23 Former Carousel Vault and Building 30 Vault) were identified. This section provides a brief summary of the status of each SWMU and other areas of concern (AOCs) at the plant.

The following SWMUs have been identified as not requiring further investigation or corrective action:

- SWMU #2 - Bay Storage Area (CS-2)
- SWMU #3 - Bldg. 31 Hazardous Waste Storage (CS-3)
- SWMU #4 - Oil House Storage Area (CS-4)
- SWMU #7 - TCE Still (WRU-1)
- SWMU #8 - 1,1,1-TCA Still (WRU-2)
- SWMU #9 - Waste TCE Storage Tank (ST-1)
- SWMU #17 - Waste Kerosene Tank (ST-6)
- SWMU #18 - Waste Kerosene Tank
- SWMU #19 - New Waste Kerosene Storage Area (ST-8)

The corrective action requirements for the following SWMUs were addressed through closure of the units, as described in the Closure Plan submitted on April 1, 1991 and approved by NYSDEC on January 7, 1992, and no additional action is required:

- SWMU #11 - PCB Railroad Storage Tank (ST-3)
- SWMU #13 - PCB Railroad Storage Tank (ST-5)

The following SWMUs and AOCs were addressed by the remediation conducted pursuant to Order on Consent Index T032785. These SWMUs continue to be addressed by the on-going remedial measures conducted at the facility. Remedial operation and maintenance activities related to the following SWMUs and AOCs will continue:

- SWMU #1 - Past Drum Storage Area
- SWMU #5 - Pyranol Unload Area (TS-1)
- SWMU #10 - PCB Railroad Storage Tank (ST-2)
- SWMU #12 - PCB Railroad Storage Tank (ST-4)
- SWMU #14 - Sanitary Leach Field (LF-1)
- Ground Water Contamination Area
- PCB Contaminated DNAPL Pools

In 1990, soils from beneath the following SWMUs were excavated and disposed off-site:

- SWMU #5 - Closed Pyranol Unload Area (TS-1)
- SWMU #10 - Former PCB Railroad Storage Tank (ST-2)
- SWMU #12 - Former PCB Railroad Storage Tank (ST-4)

Soil beneath the capacitor manufacturing building which is immediately adjacent to the above SWMUs was not characterized due to the inaccessibility of the soil. This includes the areas of the Building 30 Vault and the Building 23 Former Carousel Vault. However, the areas underneath the capacitor manufacturing building and Building 30 were investigated as part of the comprehensive site Remedial Investigation.

The following SWMUs and AOCs were also addressed pursuant to the comprehensive site RI/FS.

- Building 30 Vault and Building 23 Former Carousel Vault Areas
- SWMU #16 - Soil Disposal Area
- SWMU #20 - Industry Sewers
- Foil Mill Area
- Former Mineral Oil Tank Area

As outlined in Module III, integrity assessments of SWMU #6 (i.e., EQ Basin) and SWMU #15 (i.e., sanitary plant) were to be performed following the removal of residual sludges or settled solids from the units. A Wastewater Treatment Unit Structural Integrity Assessment Work Plan was submitted to NYSDEC on March 24, 1999 and was approved by NYSDEC in a letter dated June 1, 1999.

Integrity inspections of the wastewater treatment units were performed between June 4 and August 10, 1999 in accordance with the NYSDEC-approved work plan. Following completion of the integrity assessment of the wastewater treatment units, an Engineering Certification Report dated October 25, 1999 (O'Brien & Gere, 1999c) was submitted to NYSDEC on October 28, 1999.

NYSDEC notified GE via correspondence dated July 25, 2000 that no further immediate action is required for the wastewater treatment units (SWMU's #6 and #15).

1.3. Remedial investigation summary

Between July 1995 and January 1997, a Remedial Investigation (RI) was conducted at the GE Fort Edward facility pursuant to Order on Consent #A5-0316-94-06 between the NYSDEC and GE. Following completion of the Remedial Investigation scope of work, a Remedial Investigation Report was submitted to NYSDEC on January 20, 1997. A Feasibility Study (FS) was subsequently submitted to NYSDEC on January 31,

1997. The RI/FS was successful in meeting the objectives outlined in the RI/FS Work Plan. Based on the results of the RI/FS, the NYSDEC issued its Proposed Remedial Action Plan (PRAP) for the Fort Edward facility on February 22, 1999 and the Record of Decision (ROD) for the Fort Edward facility was issued by NYSDEC on January 28, 2000.

1.4. Remedial design objectives

On January 28, 2000, NYSDEC issued a ROD presenting the remediation goals and a selected remedy for operable units 3 and 4 at the site (NYSDEC, 2000). The remediation goals and selected remedy discussed in the remainder of this work plan are specific to Operable Unit 3 (OU-3), the main portion of the plant site as defined in NYSDEC's ROD. As presented in the ROD, the remediation goals for OU-3 are:

- Eliminate, to the extent practicable, ingestion of ground water affected by the site that does not attain NYSDEC Class GA Ambient Water Quality Criteria (AWQC)
- Eliminate, to the extent practicable, off-site migration of ground water that does not attain NYSDEC Class GA AWQC
- Eliminate, to the extent practicable, migration of light and dense NAPL through removal and hydraulic management.

The NYSDEC's ROD has selected hydraulic control with pre-treatment as the remedy for OU-3. According to the ROD, the major elements of the remedy for OU-3 are shown on Figure 1-2, and include the following:

- Continued operation of the ongoing remedial programs for Operable Units 1 and 2, and completion of any other ongoing RAs
- Perform an evaluation of the capacity of the existing wastewater treatment plant to handle the expected flows and meet discharge limits
- Expand existing ground water collection system by the addition of ground water recovery wells in the transition zone along the southeastern perimeter of the site
- Ground water collection and pretreatment from a ground water recovery trench near the Foil Mill
- Ground water recovery from the abandoned sewer
- DNAPL recovery from the southeastern portion of the plant site

- Removal and off-site disposal of all contaminated soils excavated during construction activities.

The ROD also requires institutional controls including future use restrictions and long-term monitoring to evaluate the effectiveness of the remedy. In addition, the ROD requires that the remedial program be reviewed every five years to ensure that the remedy continues to provide protection of human health and the environment.

This RDWP performs the following functions:

- Establishes how elements of the project are organized to meet the overall project objectives
- Demonstrates appropriate links between work tasks associated with pre-design activities, RD and subsequent RA
- Demonstrates that individual components have been properly scoped, scheduled, and integrated in a manner consistent with the Order on Consent
- Documents that data will provide sufficient information to allow implementation of the RD and RA.

The following sections discuss the pre-design activities, components of the RD, and project schedule.

2. Pre-design activities

It is necessary to perform several pre-design investigation (PDI) activities to further characterize the site for purposes of completing the detailed remedial design (RD) and construction. The scope of the PDI has been identified and consists of Subtasks 2.1 through 2.6, as described below. For convenience in reviewing this work plan, individual pre-design subtasks have been summarized in table format and are described in detail in the write-ups that follow.

Table 2-1. Summary of Pre-Design Investigations

Subtask		Scope of Work	Subtask Output/Purpose
2.1	Ground Water Quality/Treatability Evaluation	<ul style="list-style-type: none">• Review existing ground water quality data generated during RI and subsequent annual sampling events.• Obtain additional water quality data under dynamic (i.e., pumping) conditions more representative of those that would be expected to be encountered during implementation of the remedy.	<ul style="list-style-type: none">• Ground water quality evaluation to assess pre-treatment/treatment requirements and to evaluate impacts on treatment system.
2.2	Soil Boring Program	<ul style="list-style-type: none">• Delineate current extent of DNAPL by installing additional DNAPL observation wells and completing soil borings both within and around the perimeter of the DNAPL zone.• Install a line of borings along alignment of collection trench near the Foil Mill.	<ul style="list-style-type: none">• Subsurface information for design and construction of collection systems.
2.3	Transition Zone Pump Test	<ul style="list-style-type: none">• Design and install test recovery well.• Install additional observation wells.• Conduct pump test.• Collect and analyze ground water samples.• Interpret pump test data	<ul style="list-style-type: none">• Estimate drawdown and pumping rates needed to achieve hydraulic control on the southeast side of the plant.• Evaluate hydraulic and contaminant loadings on the treatment system.
2.4	Manhole 27/Abandoned Sewer Pump Test	<ul style="list-style-type: none">• Pump sewer to temporary holding tank (i.e., sanitary sewer plant).• Collect and analyze ground water samples.	<ul style="list-style-type: none">• Estimate of long term yield• Assess pre-treatment/treatment requirements.

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2.5	Utilities Survey	<ul style="list-style-type: none">• Review existing mapping• Contact local utilities• Coordinate with plant engineer	<ul style="list-style-type: none">• Location of buried utilities• Availability of utilities
2.6	Site Survey	<ul style="list-style-type: none">• Locate soil borings and wells installed under Subtask 2.2 and 2.3 and locate utilities identified under Subtask 2.5.	<ul style="list-style-type: none">• Updated base map

Field activities associated with the PDI will be performed in accordance with the NYSDEC-approved Sampling and Analysis Plan (SAP) and/or the RI/FS Work Plan and related documents [i.e., Health and Safety Plan, Field Sampling Plan (FSP), and Quality Assurance Project Plan (QAPP)] developed for use during the RI.

2.1. Ground water quality/treatability evaluation

As part of the PDI, existing ground water quality data generated during the RI and subsequent annual sampling events will be reviewed to evaluate anticipated ground water influent characteristics. In addition, ground water samples will be collected from the vicinity of each of the proposed ground water collection points (transition zone recovery wells, ground water collection trench, and Manhole 27) to further evaluate anticipated ground water influent characteristics. The samples will be analyzed in the laboratory for the parameters listed below. The rationale for the parameters identified is also discussed below.

Table 2-2. Ground Water Quality/Treatability Parameters and Rationale

Parameter	Rationale
Volatile organic compounds (VOCs)	Establish design maximum influent concentration for each ground water collection point. Utilize results of VOCs analyses, with the design maximum flow rates established during the flow tests, to prepare VOCs loading balance. The VOCs loading balance will be used to size the low profile air stripper, evaluate the requirement (if any) for off-gas control, and evaluate impacts on existing treatment system.
Polychlorinated biphenyls (PCBs)	Establish design maximum influent concentration for each ground water collection point. Utilize results of PCB analyses, with the design maximum flow rates established during the flow tests, to prepare PCB loading balance. The PCB loading balance will be used to evaluate impacts on existing treatment system.
Oil and grease	Establish design maximum influent concentration of oil and grease present in the ground water. The presence of either would cause less efficient VOC removal by air stripping
Methyl blue alkaline substances (MBAS)	Establish design maximum influent concentration of surfactants (if any) present in the ground water. The presence of surfactants would cause less efficient VOC removal by air stripping, and would cause greater emulsification of oils and grease, also resulting in less efficient VOC removal by air stripping.

TAL metals (filtered and unfiltered)	Establish design maximum influent concentration for each ground water collection point. Utilize results of metals analyses, with the design maximum flow rates established during the flow tests, to prepare metals loading balance. The metals loading balance will be used to evaluate if the potential exists for fouling by metals downstream of the air stripper due to the likely rise in pH, and the potential impacts to the existing treatment system.
Microbiological examination	Perform a microscopic examination of the collected ground water to identify naturally occurring bacteria that may be present in the ground water and present a potential for fouling the ground water conveyance and treatment systems.
Hardness (as CaCO ₃)	Establish background water chemistry to evaluate if the potential exists for fouling by metals precipitation in pumps, piping, and on GAC filters due to the likely rise in pH through the air stripper.
Alkalinity (as CaCO ₃)	
Phenolphthalein alkalinity (as CaCO ₃)	
Nitrate and Nitrite	
Phosphate	
Sulfate and Sulfide	
Magnesium	
Manganese	
Calcium	
Chloride	
Total dissolved solids (TDS)	
Total suspended solids (TSS)	
pH (tested in lab and field)	

In addition to the tests indicated above, measurements of dissolved oxygen, temperature, pH, and turbidity will be recorded in the field. As discussed previously, sampling activities will be coordinated with routine monitoring events currently performed by GE. Laboratory analyses will be performed by Adirondack Environmental Services, Inc. under direct contract with GE.

Sample collection locations, frequencies and the analyses to be performed are summarized below:

Ground Water Collection Trench

In conjunction with the routine annual sampling event performed in accordance with the NYSDEC-approved SAP, ground water samples were collected from three monitoring wells located in the vicinity of the Foil Mill to evaluate anticipated ground water influent characteristics to the ground water collection trench and pre-treatment system proposed for the Foil Mill. The samples were collected from wells OBG-50, FM-6 and FM-11 on June 1 and 2, 2000. The samples were analyzed in the laboratory for each of the parameters listed above.

Transition Zone Recovery Wells

Ground water samples will be collected during the transition zone pump test (described in Subtask 2.3) from the end of the discharge pipe to further evaluate anticipated ground water influent characteristics to the existing treatment system. Ground water samples will be obtained for

VOC and PCB analyses at both the start and end of the pump test. Additional samples will be obtained at the end of the pump test for laboratory analyses for the additional parameters listed above.

Manhole 27/Abandoned Sewer Pump Test

Ground water samples will be collected during the Manhole 27/abandoned sewer pump test (described in Subtask 2.4) from the end of the discharge pipe to evaluate the anticipated ground water influent characteristics to the existing treatment system and to evaluate the potential need for pre-treatment. Ground water samples will be obtained for VOC and PCB analyses at both the start and end of the pump test. Additional samples will be obtained at the end of the pump test for laboratory analyses for the additional parameters listed above.

Existing Unconsolidated Unit Ground Water Collection System

To establish a baseline of the current ground water influent characteristics to the existing treatment system and to evaluate the impact on the influent characteristics that will result from mixing of ground water from multiple source areas, ground water samples were collected from the influent to the air stripper on June 7, 2000 for laboratory analyses for the parameters listed on Table 2. This sampling was coordinated with the routine quarterly SPDES sampling event so that VOC and PCB concentrations in the influent and effluent of the air stripper and each of the individual recovery wells can be compared.

2.2. Soil boring and DNAPL observation well installation program

To evaluate the current extent of DNAPLs in the southeast portion of the facility, additional soil borings and observation wells are proposed within and around the DNAPL zone in the eastern portion of the parking lot.

2.2.1. Soil Boring Program

As shown on Figure 2-1, soil borings are proposed at locations both around the perimeter and within the DNAPL pool to confirm the extent of DNAPL and, to develop a profile of the top of the low permeability glaciolacustrine clay layer along the conceptual alignment of the horizontal DNAPL extraction wells.

Three additional soil borings were also advanced along the alignment of the collection trench near the southern portion of the Foil Mill. The Foil Mill soil borings were completed on July 31, 2000 in accordance with this Work Plan. The rationale for these borings is to develop a profile along the collection trench, to show the depth of installation and materials likely to be encountered during excavation.

Soil borings will be advanced to the top of the low permeability glaciolacustrine clay or till layer utilizing geotechnical and/or direct push

drilling techniques. Soil samples will be field screened using a photoionization detector and an unaided visual inspection of the samples for the presence of DNAPL will be performed. Subsequently, examination of the fluorescence of the sample will be performed in a dark area [e.g., an Ultraviolet light (UV) box, inside of a building, etc.] by scanning the sample with a UV light. The sample will be left in the acetate liner or split-barrel sampler during the examination so that the sample interval of detected DNAPL, if any, can be determined.

2.2.2. Installation of additional observation wells

Following the completion of the soil borings at locations OW-3, OW-4, OW-5 and OW-6, new observation wells will be installed within the DNAPL zone to confirm the current extent and thickness of mobile DNAPL. These wells will also serve as effectiveness monitoring locations during active DNAPL recovery activities.

Following the completion of the soil borings at locations TZOW-3, TZOW-4 and TZOW-5, the borings will be converted to transition zone observation wells. Transition zone observation wells TZOW-3, TZOW-4 and TZOW-5 will be installed south and east of the DNAPL zone to confirm the extent of mobile DNAPL and to provide sentinel wells to evaluate potential continuing DNAPL migration. These wells will also provide hydraulic monitoring points for the transition zone pump test discussed in Section 2.3 of this work plan.

In addition, two transition zone observation wells (TZOW-1 and TZOW-2) will be located within the approximate cone of depression produced by the recovery well during the pump test. Based on an evaluation of the potential drawdown with distance that is anticipated to occur during the transition zone pumping test, the two new observation wells will be located approximately 7.5 and 20 feet away from the new test recovery well. Well installation will be performed using fluid rotary or drive and wash drilling techniques. Well construction, development, and handling of investigation derived materials will be performed in accordance with the RI FSP. Installation of the new observation wells will be performed in conjunction with the soil boring program described in Section 2.2.1.

Each of the new observation wells will be constructed of 2-inch polyvinyl chloride (PVC) well materials. Well installation, construction, development, and handling of investigation derived materials will be performed in accordance with the RI FSP. However, the transition zone observation wells will be installed using fluid rotary or drive and wash drilling techniques. Each of the new observation wells will be also be installed with a three foot long sump grouted into the top of the low permeability silt and clay unit. The well screen/sump will be installed such that the bottom of the slotted portion of the well screen will be located as close to sand or transition zone/silt and clay unit interface as practicable.

2.3. Transition zone pump test

To obtain an estimate of drawdown and pumping rates required to achieve hydraulic control within the transition zone on the southeast side of the plant, a constant-head pumping test is proposed. A constant-head pumping test will be used because it best simulates actual remedial conditions. The activities associated with the transition zone pump test include the following:

- Design and installation of test recovery well in the southeastern portion of the parking lot
- Installation of additional observation wells
- Development of the new test recovery well
- Performance of constant-head pumping test in the new test recovery well and observation of water levels in selected monitoring wells during the test
- Decontamination procedures
- Interpretation of pump test data
- Handling of investigation-derived materials.

2.3.1. Design and installation of test recovery well

To perform the constant-head pumping tests, a new test recovery well (designated TZRW-1) is proposed to be installed in the southeast parking lot. The transition zone pump test will be conducted at a location within the known DNAPL zone to minimize the potential for enhancing mobile DNAPL migration further towards the property boundary.

As shown on Figure 2-1, transition zone recovery well TZRW-1 will be installed entirely within the transition zone at a location southeast of oil recovery well ORW-2. TZRW-1 will be constructed of 6-inch inside diameter (ID) PVC or stainless steel riser pipe with approximately 10 feet of PVC or stainless steel well screen. The final length and slot size of the well screen will be determined based on the results of the soil borings performed during the soil boring/transition zone observation well installation program. Recovery well design data which will be obtained during the soil boring program includes determining the depth and thickness of the transition zone and collection of representative soil samples from the proposed screened interval for evaluation and grain size analysis, if determined necessary.

Installation of the test recovery well will be performed by advancing a 10-inch diameter borehole through the glaciodeltaic sand and gravel unit and the transition zone to the top of the underlying low permeability

glaciolacustrine clay unit. Drilling will be performed utilizing fluid rotary drilling techniques. After setting the well, sand will be introduced gradually inside the casing, and will fill the 2-inch annular space between the screen and the borehole adjacent to the screen. The sand pack will extend from the bottom of the boring to approximately two feet above the top of the screen. The sand pack will consist of clean, graded, silica sand with grain size distribution based on the slot size of the screen and/or the grain size analysis performed on the soil samples obtained during the transition zone test recovery well pilot boring.

A bentonite pellet seal will be placed above the sand pack to form a seal at least 2 feet thick. A thick cement-bentonite grout will extend from the top of the bentonite pellet seal to the ground surface. The grout material will consist of Type I Portland cement mixed with either a powdered or granular bentonite. The grout mixture will be prepared in accordance with ASTM D 5092-90, such that approximately 3 to 5 pounds of bentonite is mixed with 6 to 7 gallons of water per 94-pound sack of cement. The grout will be introduced via a tremie pipe lowered to just above the top of the bentonite pellet seal. As the grout is pumped into the borehole, the tremie pipe will be removed in sections so that the grout is pumped into the borehole at a level below the top of the grout seal as it is emplaced.

Following completion of the recovery well installation, the well will have a locking cap placed over the top of the outer casing

2.3.2. Test recovery well development

The new test recovery well will be developed to remove fine-grained materials which may have settled in the borehole during drilling, to reduce the turbidity of the ground water, and to increase the yield of the well. Development will be completed as soon as possible after the test recovery well installation activities have been completed but not less than 24-hours after the grout has been placed. Ground water and sediments resulting from the well development will be managed as described in Section 2.3.7 below.

The new test recovery well will be developed utilizing the following procedure:

- 1) Following installation of the test recovery well, a one-hour pumping test will be performed to establish the wells' pre-development specific capacity. This value will serve as a benchmark from which comparisons can later be made. All water removed during this step and subsequent development steps will be handled as discussed below in subtask 2.3.7.

- 2) Following the specific capacity test, a dispersant polymer (NW-220 manufactured by U.S. Filter) will be introduced to the well bore by tremie methods. The well will then be surged for one hour so that the solution comes in contact with the entire length of screen, the sand pack, and the natural formation.

3) The next day, the well will be surged for four hours, followed by surging and air lifting to remove fine-grained materials from the well. The development will include each portion of the well screen. At the end of the second day, the well will be pumped for one hour and the depth to water monitored. From this test, the well's specific capacity will be calculated again. Additional NW-220 will then be tremied into the well and the well surged for one hour to force the solution into the sand pack and surrounding formation.

4) On day three, the same procedures described in step 3 will be performed.

At the completion of step 4, well development observations and the results of the specific capacity testing will be evaluated to determine if additional development is necessary. Well development will continue until the specific capacity of the well has stabilized and the development fluid is relatively sand and clay-free as determined by the on-site geologist.

2.3.3. Constant-head pumping test

The constant-head pumping tests will be performed in transition zone test recovery well TZW-1. During the pumping test, TZW-1 will be equipped with a Hammerhead™ pump, manufactured by QED Environmental Systems Inc., which will be used to maintain a "constant" head while evacuating ground water from the well. This pumping test will continue for a minimum duration of fourteen days. However, the pumping test may be extended until steady state conditions are achieved, up to a period not to exceed one month.

Climatic data (i.e., temperature, precipitation and barometric pressure) will be obtained from the Glens Falls FAA Airport for the time period over which the pumping test is conducted. These data will be used to evaluate water level fluctuations potentially related to recharge or variations in barometric pressure. In addition, water level measurements will be collected from existing monitoring wells GM-19 and OBG-80 to evaluate background water level fluctuations.

Prior to starting the pumping test, the existing shallow unconsolidated unit recovery well system will be evaluated to determine if operation of these ground water recovery wells would result in ground water level fluctuations in the transition zone observation wells as a result of the pump cycling. This evaluation will be performed by cycling the well pumps in recovery wells RW-5 and RW-6, while observing water levels in the adjacent transition zone monitoring wells (i.e., OBG-82 and OBG-63). Pressure transducers equipped with data loggers will be installed in each of the monitoring and recovery wells for an approximate two hour period and then recovery wells RW-5 and RW-6 will be turned off and allowed to recover for approximately 12 hours (or overnight). The following morning the recovery well pumps will be placed back into

operation and the water level within the recovery well and transition zone monitoring well will be observed for approximately 12 hours.

Table 2-3 identifies the monitoring wells that will be monitored prior to, during, and immediately following the pump test. Well locations are shown in Figures 1-2 and 2-1.

Table 2-3. Constant Head Pump Test Summary

Well ID	Formation Screened
TZRW-1	Transition Zone
TZOW-1	Transition Zone
TZOW-2	Transition Zone
TZOW-3	Transition Zone
TZOW-4	Transition Zone
TZOW-5	Transition Zone
OBG-63	Transition Zone
OBG-64	Transition Zone
OBG-65	Transition Zone
OBG-66	Transition Zone
OBG-80	Transition Zone
OBG-81	Transition Zone
OBG-82	Transition Zone
GM-19	Glaciodeltaic S&G
GM-35	Glaciodeltaic S&G
ORW-2	Glaciodeltaic S&G/ Transition Zone

1. During the start of the pump test and during the recovery phase of the test, ground water measurements will be obtained from TZRW-1 using a data logger and submersible pressure sensor as follows:

0 to 1 hour	every 5 minutes
1 to 24 hours	every 15 minutes
24 hours to end of test	every 30 minutes

During the constant-head pumping test, water level elevations and the pumping rate will be monitored in TZRW-1. Ground water elevations will be monitored using a submersible datalogger with a pressure sensor. The pumping rate will be monitored using an in-line flow meter rated for the volume of ground water anticipated to be produced by the well. Initially, flow will be monitored at 5-minute intervals for the first 30 minutes of the test. Flow rate monitoring will then continue at reduced frequencies as shown below:

0 to 30 minutes	every 5 minutes
30-60 minutes	every 15 minutes
1 to 8 hours	every 30 minutes
8 hours to end of test	approximately every 4 hours

Additionally, the total volume of extracted ground water will be monitored at the same frequency as the flow rate monitoring using the totalizer on the in-line flow meter.

As discussed in Subtask 2.1, to evaluate the chemical characteristics of extracted ground water, samples will be collected from the end of the discharge pipe during the pump test for laboratory analyses. Details regarding the sample collection program are provided in Subtask 2.1.

Upon completing the pump test, the recovery phase will be monitored. During this phase, water level measurements will be collected from the pumping well and from the wells monitored during the pumping test at the same frequencies as used during the pumping phase of the test (see Table 2-3). To the extent practicable, the recovery phase will be monitored until the water level in the pumping well recovers to at least 90 percent of the observed drawdown. In the event measurable drawdown is not observed at any given monitoring well during the pumping phase of the pump test, that well may be dropped from the monitoring program during the recovery phase of the test. The final wells to be monitored during the recovery phase of the test will be confirmed at the completion of the pumping phase of the test.

The pumping and recovery phase of the pump test will have a total duration of one month. During that period, GE personnel will obtain one round of water levels per day and both rounds on the weekends during the pumping and recovery phase of the project.

2.3.4. Decontamination procedures

Decontamination of non-disposable equipment used during the drilling activities and while completing the other PDI activities will be performed so that potential contaminants are not introduced into the borehole or transferred across the site. Decontamination procedures will be performed in accordance with the NYSDEC-approved RI FSP.

2.3.5. Interpretation of pumping test data

The data obtained during the pump test will be interpreted to evaluate the hydraulic characteristics of the transition zone for subsequent use during the RD. Recovery well discharge rates, drawdown with distance data, and ground water recharge rates will be evaluated to estimate aquifer storage coefficients and the transmissivity of the transition zone. In addition, estimates of the bulk hydraulic conductivity of the transition zone will be obtained. The results of the pump test will be used to select the final number of recovery wells, the spacing of the wells, and the anticipated yield of the transition zone recovery well network.

2.3.6. 2-phase numerical model simulations

The NYSDEC's ROD has indicated that the remedial objective for the DNAPL pool is to remove mobile DNAPL so that the potential for further mobilization is reduced. The conceptual design for the DNAPL collection system utilizes two horizontal extraction wells to collect

DNAPL. Under this scenario, either passive or active water flooding techniques could be utilized for DNAPL recovery.

Using the information developed during the RI/FS and the results of the PDI activities, a 2-phase flow numerical model will be utilized to design the final DNAPL recovery well system. Design considerations that will be evaluated using the 2-phase flow numerical model include:

- determining the final number of wells,
- establishing the configuration and spacing of the wells,
- verifying the effectiveness of using horizontal vs. vertical wells to recover mobile DNAPL from the leading edge of the mobile DNAPL pool,
- estimating DNAPL recovery rates,
- calculating ground water flow rates if active water flooding techniques are used, and
- evaluating the feasibility of using vertical transition zone recovery wells within the DNAPL zone to both collect DNAPL and to provide for hydraulic control of ground water within the transition zone.

To design the DNAPL collection system and to perform the numerical modeling will require an evaluation of the variability of the chemical and physical characteristics of the DNAPL at the site, and an evaluation of the layering (i.e., K_h/K_v ratio) of the transition zone relative to DNAPL recovery using horizontal vs. vertical wells.

To evaluate the variability and to confirm previous measurements of chemical and physical characteristics of the DNAPL, five DNAPL samples will be collected during the PDI and analyzed for chemical properties [VOCs and some semi-volatile organic compounds (SVOCs)] and physical characteristics (i.e., density, viscosity and interfacial tension).

To evaluate K_h/K_v ratio of the transition zone, shelly tube samples of transition zone materials will be collected during the soil boring program and submitted to a laboratory for vertical permeability testing. The shelly tube samples will be collected from a soil boring advanced outside of the DNAPL zone.

In addition, estimates of bulk hydraulic conductivity will be obtained by conducting slug/bail tests in the new transition zone wells and through the evaluation of the transition zone pump test data. Hydraulic conductivity testing will be performed in accordance with the RI FSP.

2.3.7. Handling of investigation-derived materials

The PDI activities will produce investigation-derived materials (IDM), which will require appropriate management. This IDM includes the following:

- Drill cuttings
- Ground water resulting from drilling and development of the new pumping well
- Ground water resulting from the constant-head pump test
- Sediments which settle out of ground water produced during the above activities
- Decontamination fluids and sediments which may settle out of such fluids
- Personnel protective equipment (PPE) and associated debris resulting from the execution of field activities.

These materials will be managed in accordance with the procedures described in the RI FSP. However, due to the extended duration of the pump test, the larger quantities of water likely to be generated, and concerns related to chemical loadings to the existing waste water treatment facility, the pump test ground water will be discharged into the well bore of recovery well RW-6 for subsequent collection and discharge to the on-site air stripper for pretreatment and then to the wastewater treatment plant using the existing recovery well pump. Alternatively, pump test ground water will be discharged to a nearby storm water catch basin for subsequent discharge to the equalization basin. In addition, the sump of the transition zone observation and recovery wells will be monitored for DNAPL during the PDI phase of the project. If DNAPL is observed, it will be collected and managed for disposal by GE in the same manner as the DNAPL collected from oil recovery well ORW-2.

2.4. Manhole 27/abandoned sewer pump test

To obtain an estimate of the long-term yield from the abandoned sewers and to assess potential pre-treatment/treatment requirements, a pump test will be conducted. The pump test will be initiated by pumping the standing ground water and any additional ground water which infiltrates into the abandoned storm sewers to either a temporary holding tank or the equalization basin utilizing a diaphragm pump which will be temporarily installed in Manhole 27 via temporary plumbing connections. The digester/aeration basin of the sanitary plant, which is not currently being used, will act as the temporary holding tank.

The pumping test will continue for a minimum duration of 14 days. However, the pumping test may be extended if the volume of ground water recovered after the initial 14-day period is not sufficient to evaluate a representative long-term yield. In addition, the duration of the test may be reduced if water levels in the manhole and adjacent monitoring wells reach equilibrium prior to the end of the 14 days.

During the pump test, the pumping rate from the abandoned storm sewer will be monitored using an in-line flow meter rated for the volume of ground water anticipated to be produced. Initially, flow will be monitored at 1-hour intervals for the first 4 hours of the test. Flow rate monitoring will then continue at a reduced frequency, but not less than one reading every 4 hours. Additionally, the total volume of extracted ground water will be monitored using the totalizer on the in-line flow meter.

In addition to monitoring flow rate and total volume of ground water recovered, water level measurements will be collected from adjacent monitoring wells to determine the effect, if any, on overburden ground water levels in the vicinity of the abandoned storm sewers. Monitoring wells GM-22, OBG-8B, and F-2 will be monitored using pressure transducers and associated data loggers. In addition, one background monitoring well will also be monitored throughout the duration of the test. Monitoring will be initiated a minimum of 12 hours prior to the start of the pump test and will continue through the recovery phase of the test.

As discussed in Subtask 2.1, to evaluate the chemical characteristics of extracted ground water, samples will be collected from the end of the discharge pipe during the pump test for laboratory analyses. Details regarding the sample collection program are provided in Subtask 2.1.

Upon completing the pump test, the recovery phase will be monitored. During this phase, water level measurements will be collected from the wells monitored during the pumping test at the same frequencies as used during the pumping phase of the test. To the extent practicable, the recovery phase will be monitored until the water level in the storm sewer recovers to at least 90 percent of the observed drawdown.

2.5. Utilities survey

The proposed remedy includes excavation to construct the ground water collection trench. To evaluate the presence of buried utilities, O'Brien & Gere will review available plant mapping and incorporate the buried utilities shown on the available mapping into the design drawings. As appropriate, the plant mapping will be reviewed with the plant engineer. O'Brien & Gere will also contact local utility companies via telephone and describe the project. The utilities personnel will be questioned regarding the availability of mapping showing the location of buried utilities. If buried utilities are identified and mapping is available, O'Brien & Gere will obtain this mapping for use in completion of the final design.

The selected remedy will require power to operate pumps and other equipment associated with the ground water recovery and pretreatment

systems. Telephone service may also be necessary to operate auto dialers associated with the ground water recovery and pretreatment system. GE and the utility companies will be contacted regarding the availability of these services. The information provided by GE and the utility companies will be used during the design phase to specify equipment compatible with available site utilities.

2.6. Site survey

In conjunction with preparation of the RI, a detailed site survey was performed to delineate the location of monitoring wells, recovery wells, pertinent site features, and man-made structures. This map was updated during the course of the RI.

Following completion of PDI activities, O'Brien & Gere will survey the locations of additional soil borings, observation wells and recovery wells installed during the pre-design phase, and site utilities identified during Subtask 2.5. The base map will be updated and serve as the existing site plan and base map for the RD.

3. Remedial design

The major design components of the selected remedy include the following:

- Perform an evaluation of the capacity of the existing wastewater treatment plant to handle the expected flows and meet discharge limits.
- Control the migration of contaminated groundwater and non-aqueous phase liquids (NAPLs) through expansion of the existing collection and treatment system.
- Remove and dispose of, off-site, all contaminated soils excavated during construction activities.
- Maintain and monitor the site.
- Review the remedial program every five years to ensure that the remedy continues to provide protection of human health and the environment.

The selected remedy will control migration of ground water and NAPL through expansion of the existing ground water and DNAPL collection system. This expansion will result in collection of ground water from most of the existing recovery wells and will add ground water collection from the southeast corner of the facility, from areas west and south of the Foil Mill, and from the southwest corner of the facility, as described below. The water from the Foil Mill area will be pretreated prior to being pumped to the existing water treatment facility (WTF).

The conceptual plan presented in the ROD will be evaluated with respect to the ability to meet the remedial objectives based on the results of PDIs and subsequent engineering assessments. The deliverables resulting from RD activities include a RD Report documenting the design basis and supporting data, and a set of Contract Documents for construction. The Contract Documents will include requirements for bidding, general contract provisions, special provisions, and technical specifications detailing the conditions under which the work is to be conducted, the equipment to be incorporated into the work, and standards for acceptance of the work. The RD will be completed in two phases, Preliminary (30%) Design and the Final Design.

3.1. Manhole 27/abandoned sewer ground water collection system design

Based on the results of prior investigations, it is suspected that overburden ground water containing PCBs/VOCs may be entering the bedrock along the route of the abandoned 30-inch sewer in this area. Therefore, PCB/VOC concentrations in bedrock ground water may be reduced by collecting overburden ground water in the vicinity of this sewer.

It is proposed that the sewer be used as a ground water collection system. Former Manhole (MH) 27 will be utilized as a sump, and ground water entering the sewer will be pumped to the existing water treatment facility. Collection of bedrock ground water from GM-11D will be discontinued on a trial basis and monitored through quarterly ground water quality sampling for VOCs and PCBs to evaluate the effect of collection of overburden ground water on bedrock ground water quality at that location. A flow rate of 14 gpm has been estimated based on observations made by O'Brien & Gere personnel during dye testing activities (O'Brien & Gere, 1997). Final design flow estimates will be based on the PDI test results from the Manhole 27/abandoned sewer.

3.2. Foil Mill ground water cutoff trench design

Ground water and LNAPL will be collected along the western and southern perimeter of the Foil Mill by installing an interception trench. Conceptually, this trench will be approximately 850 ft long and have an average depth of approximately 7 ft. The trench will be excavated down to a low permeability layer or within 2 to 3 ft of bedrock. A perforated pipe will be placed near the bottom of the trench and routed to a collection sump. The trench will be backfilled with permeable material, such as crushed stone.

The sump will be equipped with a skimmer capable of removing LNAPL (kerosene) which may accumulate. Water from the sump will be directed to an air stripper for pretreatment in order to reduce its VOC loading prior to entering the WTF. The effluent from the air stripper will be discharged to MH 4, and subsequently treated in the existing WTF.

Initially, water will be pumped from the interception trench at a rate that the existing WTF can accept (estimated 10 to 15 gpm after inclusion of water from the transition zone wells and from the sewer in the southwest corner of the facility). The existing WTF may be capable of handling higher hydraulic loading when the VOC loading is reduced by the air stripper. It may also be possible to achieve hydraulic control in the vicinity of the Foil Mill at a flow rate which is less than the 35 gpm estimated in the FS. Ground water level monitoring will be performed during system operation to identify the actual flow rate required to achieve hydraulic control in the Foil Mill area.

Based on these results and the performance of the WTF, additional action may be warranted. Pre-treatment system design will be based on the ground water characteristics previously identified from samples obtained from wells in vicinity of foil mill.

3.3. Transition Zone ground water recovery system design

The existing ground water collection system will continue to operate in the southeast portion of the facility at its present capacity. Additional transition zone wells will be installed in the southeast parking lot to provide hydraulic control of transition zone ground water in that portion of the site. The transition zone recovery wells will be screened entirely within the transition zone. Ground water will be pumped from these wells to the existing air stripper and treatment facility. Estimated flow from these wells will be determined based on the results of the constant-head pumping test performed during the PDI. A more accurate estimate of the number of wells, the drawdown, and pumping rates that will be required to achieve hydraulic control within the transition zone on the southeast side of the plant will be determined during the 2-phase numerical model simulations.

3.4. DNAPL collection system design

The NYSDEC's ROD has indicated that the remedial objective for the DNAPL pool is to remove mobile DNAPL so that the potential for further mobilization is reduced. The conceptual design for the DNAPL collection system utilizes two horizontal extraction wells to collect DNAPL. Under this scenario, either passive or active water flooding techniques could be utilized for DNAPL recovery.

As discussed in Section 2.3.6, a 2-phase flow numerical model will be utilized to design the final DNAPL recovery well system.

The current conceptual design shows that one horizontal well will be located along the downgradient edge of the DNAPL to intercept migrating product. The other horizontal well will be located parallel to the direction of DNAPL migration, along the approximate centerline of the plume. The horizontal wells will act as an underdrain system. An oil recovery system similar to the QED system currently in use in ORW-2 will be installed in each well.

3.5. Preliminary remedial design

The preliminary design will include a Preliminary Design Report and Preliminary Design Drawings.

Preliminary Design Report. A Preliminary Design Report will be prepared to document the basis of design. The report will present a discussion of the manner in which the proposed RA will address the requirements of the ROD along with a discussion of the results of pre-design studies to establish a frame work to support the proposed RD. The proposed system along with ground water modeling, data utilized, and calculations performed to establish the design parameters will be presented. In addition, hydraulic calculations regarding the ground water collection systems will be presented to establish size requirements for the associated storage and/or treatment systems.

The Preliminary Design Report will also present drafts of the following documents:

- Health and Safety Plan (HASP);
- Construction Quality Control/ Quality Assurance Plan (CQC/QAP);
- Site Operation and Maintenance Plan (O&M Plan);
- Site Management Plan

HASP. The minimum requirements for a HASP to be developed by the contractor for persons working at the site will be identified in the Preliminary Design Report. The contractor will be required to prepare and implement a HASP in accordance with at least these minimum requirements, the General Regulations found under 29 CFR 1910.120 for Hazardous Waste Operations and Emergency Response, and the citations adopted by reference.

Community Monitoring Requirements. The minimum requirements for protecting and monitoring the health and safety of persons residing in the vicinity of the site will also be discussed in the Preliminary Design Report. The HASP will be required to include administrative and engineering controls to minimize potential exposure to hazardous substances for persons living in the vicinity of the site.

CQC/QAP. A CQC/QAP will be prepared as part of the Preliminary Design Report. Quality control and quality assurance procedures and protocols to be implemented during construction will be outlined in this section, recognizing that detailed procedures and requirements will be presented in the technical specifications. The CQC/QAP section of the report will present the following.

- Responsibility and Authority – The responsibility and authority of organizations and key personnel involved in regulating, designing, and constructing the remedial system will be presented. Appropriate lines of communication between involved parties will be delineated.
- Construction Quality Assurance (CQA) Personnel Qualifications – The qualifications of the CQA officer and supporting CQA personnel will be presented in the CQA in terms of required training and experience. The CQA officer will be required to operate independently of the contractor.
- On-site Observation – The observations and tests that will be used to document that the construction meets the design criteria, plans and specifications will be detailed.
- Sampling and Testing Methods – Sampling and testing methods, frequencies, acceptance and rejection criteria, and corrective measures will be outlined, recognizing that detailed information will be presented in the technical specifications.
- Documentation – Reporting requirements for CQA activities will be described. These will include daily summary reports, data sheets, meeting minutes, photographs, record drawings, problem identification and corrective measure reports, and final documentation.

Site Operation, Maintenance and Monitoring Plan (OM&M Plan). A separate section of the report will be prepared which presents a conceptual description of operation, maintenance and monitoring activities to be undertaken after the NYSDEC has approved construction of the RD. This section will discuss operation and maintenance of site facilities, including the following:

- Physical site security
- Ground water collection system
- DNAPL collection system
- Ground water cutoff trench
- Ground water monitoring systems
- Site access.

A discussion of post-construction record keeping will also be included in this section of the report. This section of the report will be prepared in a general format, recognizing that a site specific OM&M Plan will be required following the completion of construction to reflect the as built conditions.

Site Management Plan (SMP). The SMP section of the report will describe the procedures that will be utilized during the RA to address institutional issues, including:

- Site access, including properties affected by the RA
- Site security
- Management and communication responsibilities
- Emergency and notification procedures
- Work zone definition
- Construction water management
- Waste management.

Preliminary Design Drawings and Technical Specifications. Preliminary design drawings will be developed to show existing site conditions, the location and profile of the ground water cutoff trench, the horizontal and vertical well system, and the location and profile of the ground water collection system. It is anticipated that the preliminary design drawings will include the following:

- Title Sheet
- Existing Site Plan
- Plans showing the ground water cutoff trench, and the ground water collection systems
- Ground water cutoff trench profile
- Ground water collection system profile
- Ground water collection system piping and instrumentation
- DNAPL collection system piping and instrumentation
- Pre-treatment system piping and instrumentation
- Maintenance and protection of traffic plan.

The drawings will be sufficiently detailed to convey the intent of the RD.

A list of technical specifications to be utilized in implementing the RD will also be prepared to include in the Preliminary Design Report.

Response to NYSDEC Comments. Copies of the preliminary design documents will be provided to the NYSDEC. It is assumed that a single consolidated round of comments will be received from the NYSDEC and that a single comment response letter to NYSDEC will be required prior

finalization of the Preliminary RD. The response will be in the form a letter that lists each NYSDEC comment, followed by a discussion of how the comment will be addressed and incorporated, if appropriate, in the final design. The response will include an explanation of the reasons for proposing to exclude any comments from the final design.

3.6. Final design

Documents prepared during Final Design will bring the design to a 100% level of completion.

Final Remedial Design Report. The Preliminary Design Report will be updated to incorporate revisions to the design based on comments received from the NYSDEC and refinements made in progressing to a level commensurate with the completed design. The Final RD Report will present a detailed basis of design for site remedial systems.

Final Design Drawings and Technical Specifications. The Preliminary Design Drawings will be updated to a level commensurate with 100% completion based on comments received from NYSDEC and progress of the design from a 30% to 100% level of design.

Technical specifications will be prepared based on the list of specifications developed during preliminary design. The specifications will describe the requirements for the work to be constructed, the material and equipment to be incorporated into the work, and the standards for accepting the components of construction.

The specifications will also include provisions for overall site operations to deal with such issues as construction sequencing, preparation of a health and safety plan, equipment decontamination, and site security.

Response to NYSDEC Comments. The final design documents will be submitted to NYSDEC for review prior to finalization.

After obtaining a consolidated round of comments from the NYSDEC, and following resolution of these comments, agreed to changes will be incorporated into the final design documents. The documents will then be signed by a professional engineer licensed to practice in New York State.

3.7. Contract documents

GE, subject to NYSDEC approval, may elect to implement the RA as a series of sequential construction contracts. This approach has the advantage of allowing the sequence of construction to be optimized, taking advantage of the expertise of specialty contractors, and minimizing construction impacts to production operations at the Fort

Edward Plant. Contract documents for the construction contracts will be developed utilizing the drawings and technical specifications from the NYSDEC-approved final design. Where appropriate, bidding provisions and forms, and general and special contract provisions will be incorporated to allow solicitation of competitive bids for construction.

4. Project schedule

The following schedule is presented to fulfill the following requirements of the remedial design for the GE Fort Edward facility.

- Submission of the RDWP to be incorporated into a new Order on Consent to be negotiated between NYSDEC and GE.
- Submission of a Final RD within 180 days after the effective date of the new Order on Consent between NYSDEC and GE.

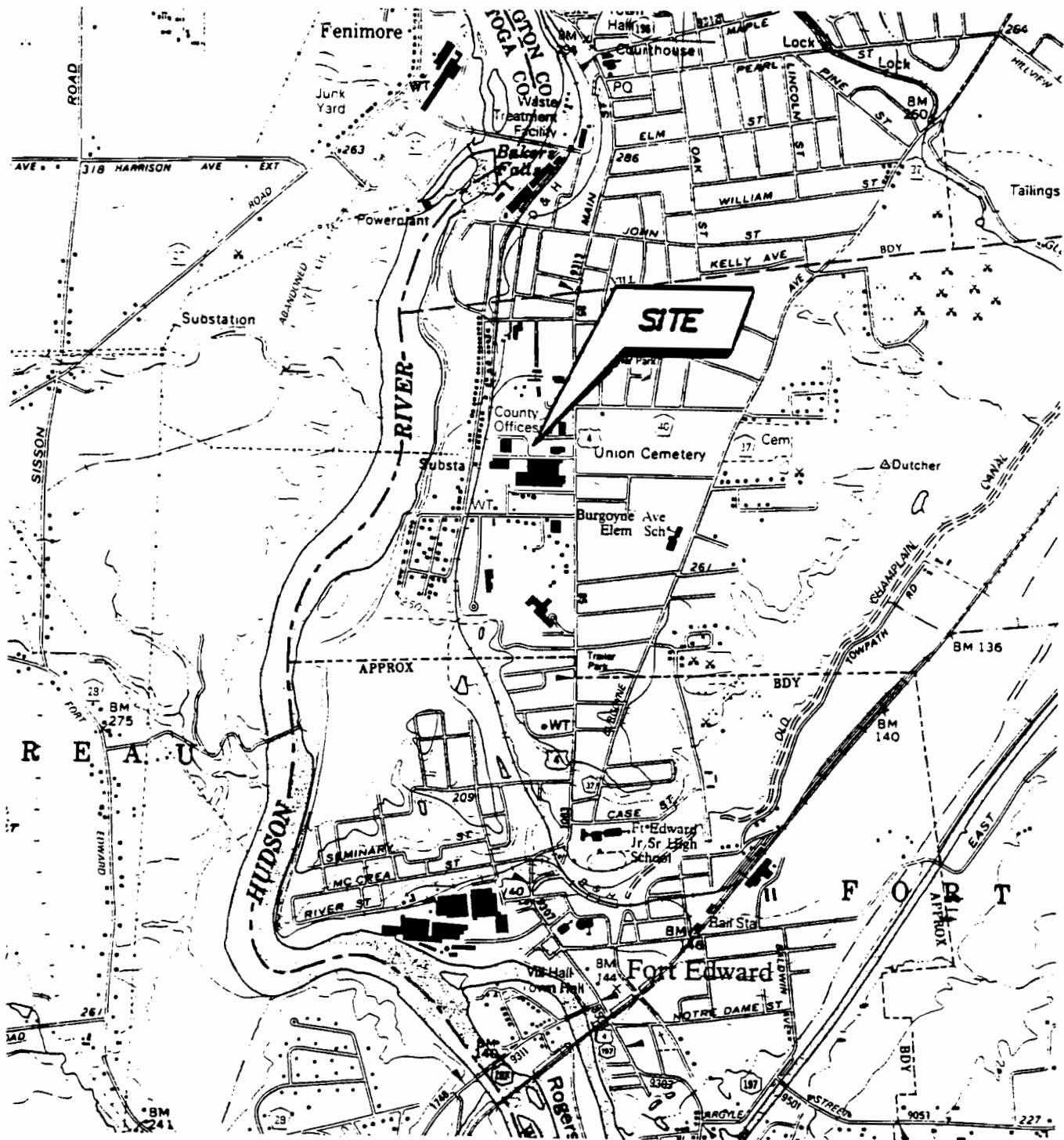
The submission of this RDWP accomplishes the first schedule requirement. The schedule included as Figure 4-1 demonstrates how the submission of the Final RD within 180 days of the effective date of the Order on Consent will be accomplished.

In preparing this schedule it has been assumed that the effective date of the Order on Consent is October 2, 2000. It has also been assumed that PDI activities will be mostly complete prior to the effective date of the Order on Consent. Figure 4-1 shows that approximately 6 additional weeks will be required to complete the PDI. Approximately two weeks of this time will be spent in the field. The remaining time will be required to analyze collected ground water and soil samples and to evaluate the pump test data and to perform the numerical modeling.

The schedule shows initiation of the preliminary design occurring after completion of the field investigation activities. It is estimated that it will require approximately 13 weeks to complete the preliminary design. At that time, a meeting will be held with the NYSDEC to review the preliminary design. Following the resolution of issues resulting from that meeting, the design will be finalized and submitted for NYSDEC review and approval. One month has been allowed for NYSDEC review and approval of the final design.

Concurrent with NYSDEC review of the final design, bid documents will be prepared.

FIGURE 1-1



GENERAL ELECTRIC COMPANY FORT EDWARD, NEW YORK

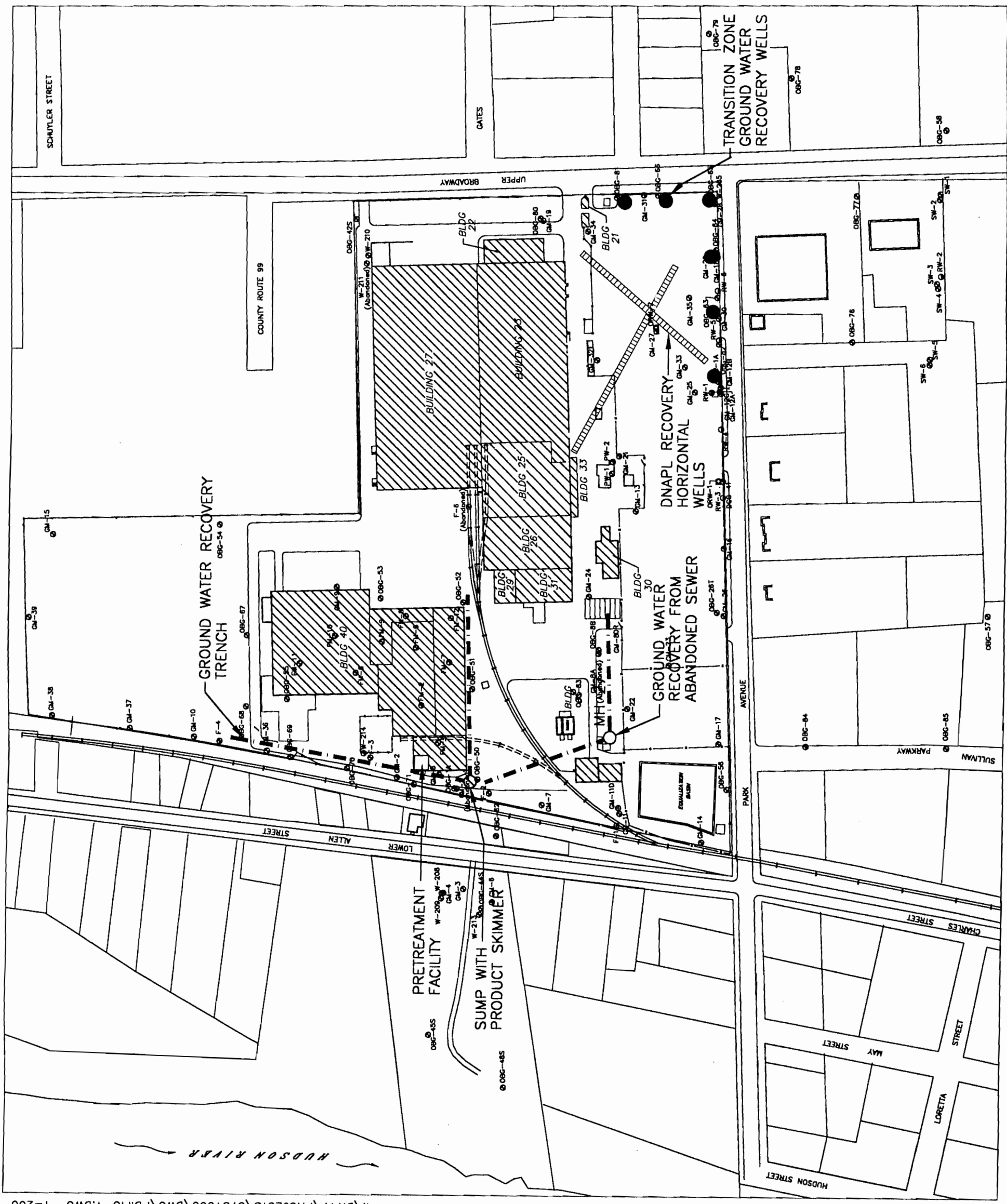
SITE LOCATION MAP

STATE LOCATION MAP

FILE NO. 23009.007

MARCH 1999

FIGURE 1-2

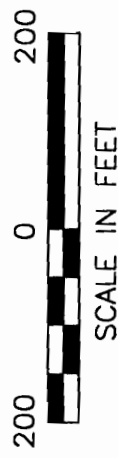


LEGEND

- EXISTING FENCE
- EXISTING BUILDING
- PROPOSED GROUND WATER RECOVERY FROM ABANDONED SEWER
- DNAPL RECOVERY HORIZONTAL WELL
- PROPOSED TRANSITION ZONE RECOVERY WELL
- PROPOSED GROUND WATER RECOVERY TRENCH

GENERAL ELECTRIC COMPANY
FORT EDWARD, NEW YORK
FEASIBILITY STUDY

SITE PLAN



FILE NO. 26695



GENERAL ELECTRIC CO.
FT. EDWARD FACILITY



FILE NO. 26695



Figure 4-1
Project Schedule

