20th★★★★ Anniversary

RADIAN CORPORATION
13595 Dulles Technology Dr.
Herndon, VA 22071
215-004-2620 (703)834-1500

May 30, 1989

New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
50 Wolf Road - Room 212
Albany, New York 12233

Attention: Michael J. O'Toole, P.E., Acting Director

Re: Revised Work Plan
Stage 2 Remedial Investigation
Emerson Power Transmission, Ithaca, New York

Dear Mr. O'Toole:

This letter and the enclosed Revised Work Plan for the Stage 2 Remedial Investigation at the Emerson Power Transmission (EPT) facility in Ithaca, New York, are submitted in response to the requirements of the Consent Order issued to EPT on July 13, 1988. The letter and Work Plan also provide our responses to your department's and the Department of Health's comments on the planned Stage 2 investigation. The responses are keyed to the comments provided to us by Ms. Susan D. McCormick of your office in her letter of May 1, 1989 and comments made during the conference call between NYSDEC and Radian on May 30, 1989. In her letter, Ms. McCormick detailed four comments on the Stage 2 work plan. These, along with the comments from the conference call, are addressed both in the enclosed revised work plan and in the summary provided below.

1. When a dilution is necessary to bring a sample within the linear range of the analytical method, the detection limits for all analytes covered by the method are raised by the dilution factor. Using a more sensitive method would not allow detection of additional compounds, but, in fact, would require an even higher dilution factor.

   The analysis of all ground water samples for volatile organics will be done by applying the 600-series of analytical procedures. Samples that do not exhibit any constituents above the detection limit when analyzed by the method 600-series for volatiles will be analyzed by the 500-series analytical methods, as well, to obtain a lower detection limit in an attempt to achieve the appropriate ARAR concentrations.

   For samples from the MW-6 series of wells, downgradient from the PCB-containing soil, an attempt will be made to reach the ground water ARARs detection limit by modifying the analysis for PCBs through the selection of an alternative analytical method. Samples for PCBs found to contain interferences will be subject to one of the analytical

RADIAN CORPORATION

cleanup procedures described in SW-846, or may be re-extracted an effort to achieve the contract-required quantitation limits. The laboratory will demonstrate good laboratory practice. No samples will be diluted by more than a factor of five.

Analytical results for methods 8010/8020 will include a Reporting and Deliverables package, in accordance with SW-846.

2. In a conversation with Ms. McCormick, it was agreed upon that five Stage 2 wells will be installed, but that some of the locations would change. Well MW-10-40 will be moved from the proposed location to Spencer Street, in a east-northeasterly direction from wells MW-1, MW-2, and MW-3 and along the orientation of the fracture traces.

3. The MW-9 well cluster will be moved from the proposed location to a position at the intersection of the plant access road and Cayuga Street. The wells will be located on the southeastern corner of this intersection, which will place them in the northeasterly downgradient direction from the MW-3 cluster.

4. Seep F was added to the seep sampling program. Its omission was an oversight.

We are confident that these responses and the information contained in the enclosed Revised Work Plan serve to address all comments that NYSDEC and NYSDOH had regarding the planned Stage 2 investigation. A separate Revised Work Plan describing the planned Residential Soil Gas and Indoor Air Monitoring program is being sent under separate cover. Please contact me or Ms. Sheila Harvey of Shaw, Pittman, Potts & Trowbridge if you have any questions.

Sincerely yours,

Barbara M. Wong
Project Director

Enclosures

cc: G. Bowitch/NYSDEC
W. Krichbaum/NYSDEC
K. Makeig/Radian
R. Tramontano/NYSDOH
R. Hubbert/EPT
S. Harvey/SPPT
J. Anderssen/Thompkins Co.
H. Hedges/Emerson

REVISED WORK PLAN FOR STAGE 2 REMEDIAL INVESTIGATION EMERSON POWER TRANSMISSION ITHACA, NEW YORK

Prepared for:
Shaw, Pittman, Potts & Trowbridge
2300 N Street, N.W.
Washington, D.C. 20037

Prepared by:
Radian Corporation
13595 Dulles Technology Drive
Suite 200
Herndon, Virginia 22071

May 30, 1989

1.0 INTRODUCTION

1.1 PURPOSE

Stage 2 of the Remedial Investigation of the Emerson Power Transmission (EPT) facility in Ithaca, New York is being performed in conformance with a Consent Order issued by the State of New York Department of Environmental Conservation (NYSDEC) to EPT on July 13, 1988. The purpose of the Stage 2 investigation is to augment the information collected regarding the site during Stage 1 of the Remedial Investigation, in order to more completely describe the lateral and vertical distribution of contamination, to characterize the transport and fate of contaminants, to evaluate applicable environmental standards and criteria, and to identify potential receptors. The information generated from this study and previous studies will form the basis for a Feasibility Study that will evaluate remedial alternatives.

This Revised Work Plan presents the specific objectives of the Stage 2 investigation, the data to be collected and the methods for doing so, the methods of analysis to be used in their interpretation, and the procedures to be used to ensure the quality and consistency required for the performance of the proposed work. Detailed plans, including a Work Plan, Sampling and Analysis Plan, Data Management Plan, and Health and Safety Plan, were prepared for the Stage 1 investigation. Since the Stage 2 investigation is a continuation of that effort, these plans will not be duplicated, and reference will be made to the earlier plans for the purposes of defining any additional or altered protocols to be used during the Stage 2 effort, wherever appropriate.

1.2 TECHNICAL SCOPE OF WORK

The primary objective of the Stage 2 investigation is to complete the characterization of the site and associated contamination. The scope of work described in this plan consists of the following components:

- To evaluate which state and federal standards, criteria, advisories, and guidance are applicable or relevant and appropriate to the site;
- To perform a more focused and in-depth examination of plant chemical handling and housekeeping practices to clarify possible sources of contaminants detected in environmental media on and around the site;

- To install additional monitoring wells to provide better definition of the lateral and vertical extent of contaminants in ground water;

- To conduct additional monitoring of the fire reservoir, and additional sampling and analysis of ground water, seeps and pipes, surface water, water supply, and bedrock;

- To conduct limited additional sampling and analysis of soils for total petroleum hydrocarbons and PCB's from the scrap conveyor/loading area; and

- To evaluate instances where contaminant concentrations exceed the applicable, relevant or appropriate federal and state standards, and analyze the extent to which these standards are to be considered in developing remedies, where appropriate.

The technical scope of work for this investigation is organized into the five tasks listed below:

Task 1: Evaluation of Applicable Standards and Criteria
Task 2: Review of Plant Procedures
Task 3: Installation of Monitoring Wells
Task 4: Sampling and Analysis
Task 5: Data Evaluation and Reporting

The details of these five tasks are presented in Sections 2.0 through 6.0 of this revised work plan.

1.3 BACKGROUND

Emerson Power Transmission (EPT) is located in Ithaca, New York (Figure 1). The facility manufactures industrial power transmission products, primarily steel roller chain. Reconstruction of past operations at the site indicates that trichloroethylene (TCE) was used and distilled on-site. In early 1987, TCE was detected in the water of the underground fire reservoir (Figure 2). As required by law, on February 9, 1987, EPT notified the New York State Department of Environmental Conservation (NYSDEC) about the presence of solvents in the reservoir and the potential for releases from the reservoir. The reservoir was subsequently emptied in accordance with applicable laws and regulations. On July 13, 1988, NYSDEC issued a Consent Order to EPT which governs the investigation and cleanup of the EPT facility.

To date, EPT has undertaken and completed a preliminary

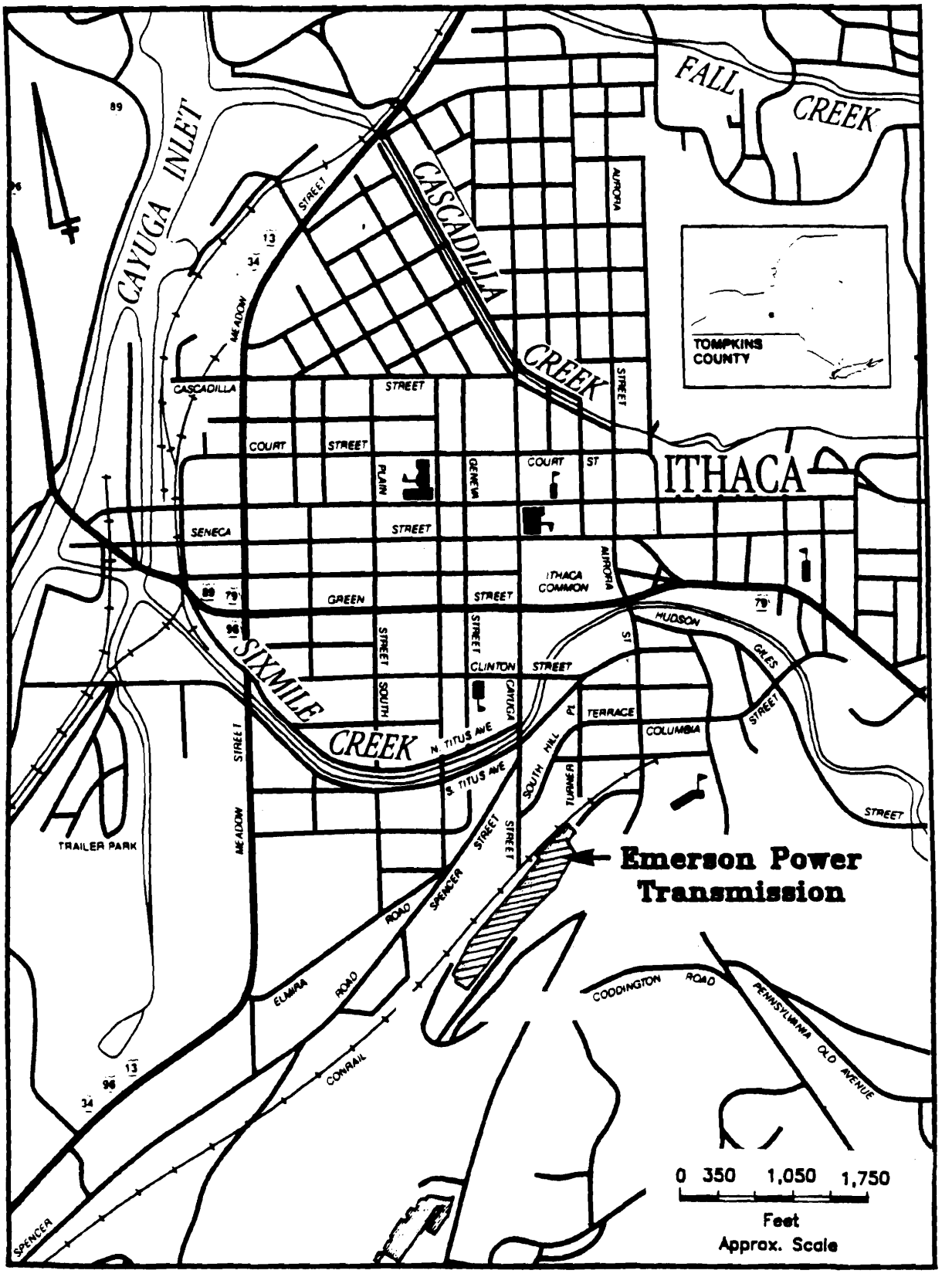


Figure 1. Site Location Map, Emerson Power Transmission
Ithaca, New York

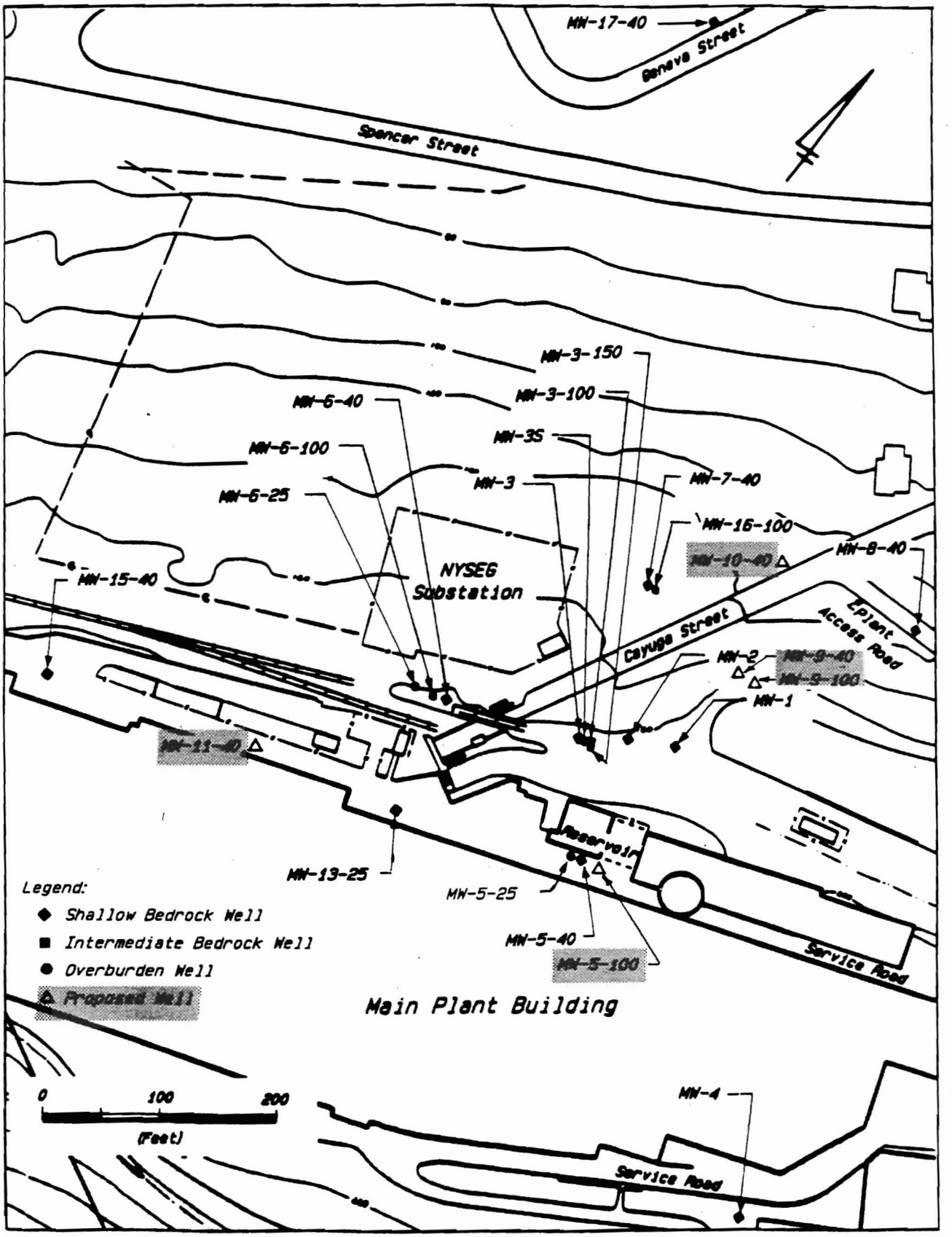


Figure 2. Locations of Existing and Proposed Monitoring Wells at Emerson Power Transmission Ithaca, New York

RADIAN CORPORATION

environmental assessment and a Stage 1 Remedial Investigation of the facility. These activities and associated analytical results, findings, and conclusions are detailed in the Radian Corporation reports entitled Preliminary Environmental Assessment of the Fire Reservoir, Morse Industrial Corporation, Ithaca, New York, dated July 13, 1987, and Final Report, Stage 1 Remedial Investigation, Emerson Power Transmission (EPT), Ithaca, New York, dated February 1989, respectively. A brief summary of these activities and the primary conclusions of the studies are presented below.

A preliminary assessment was conducted from February 1987 to July 1987. Tasks performed during the assessment included sampling and analysis of water and sludge from the reservoir, cleanup of the reservoir, installation of five monitoring wells, sampling and analysis of ground water, seeps, surface water and sediments, and investigation of pipes and manmade seeps in the vicinity of the reservoir. The data generated by these activities indicated that volatile organic compounds were present in the water and sludge in the reservoir, as well as in the soils, surface water, sediments, and ground water from the vicinity of the reservoir. It was also concluded that the reservoir was one source of contamination at the site, and it was likely that there was hydraulic connection between the reservoir and the underlying ground water regime. Further investigation of this area was recommended to verify the source of the contaminants at the facility.

The Stage 1 Remedial Investigation was conducted from August 1987 to December 1988. Tasks performed during the Stage 1 investigation included soil gas surveys on- and off-site, geologic mapping, borehole geophysical logging, installation of 13 monitoring wells, field permeability testing, and sampling and analysis of soils, ground water, surface water, sediments, seeps, and storm and sanitary sewers. Data generated by this study indicated that ground water flow regimes in the unconsolidated soils and the bedrock underlying the facility are likely connected, and that flow in the bedrock is controlled by and is consistent with fracturing. It was further concluded that TCE and associated compounds were found to be primarily concentrated in ground water near the top of bedrock both directly north and south of the fire reservoir. Evaluation of the site hydrogeology and chemistry indicate that these contaminants migrate predominantly in the downward direction, with some migration laterally downslope and off-site. Vertical migration may be limited in depth due to decreasing permeability with depth in the bedrock. Sampling of other media on- and off-site indicate the presence of generally low, isolated concentrations of contaminants in other areas of the site. Results of soil gas surveys also indicate the possibility of migration of vapors along the sewer lines that run

parallel to the streets, away from the plant. In addition, petroleum hydrocarbons and PCB's were found to be present in soils from the scrap conveyor/loading area on-site.

The Stage 1 study identified additional data needed to fully evaluate the site. These data will be collected during the Stage 2 investigation, as described below.

2.0 TASK 1: EVALUATION OF APPLICABLE STANDARDS AND CRITERIA

In order to provide a meaningful basis for evaluating the concentrations of contaminants detected in environmental samples, and to evaluate the levels which must be addressed by any site remediation, the extent to which specific state and federal environmental and public health standards are applicable or relevant and appropriate to the site will be examined. State and federal standards exist for some of the compounds of interest in ground water; however, such requirements are not currently available for these compounds in soils or soil gas and air.

Radian has obtained copies of some of the New York State ground water and health standards, criteria, and guidance that may be relevant to this site, and has requested that NYSDEC and NYSDOH provide copies of any additional guidance that may be applicable to the site. In addition, Radian is familiar with and will review federal ground water standards, criteria, and guidance for their applicability to the site. During the performance of this task, Radian will summarize those criteria that are potentially applicable to ground water at the site and obtain concurrence from NYSDEC as to their appropriateness for judging ground water quality and establishing remediation criteria, if necessary.

Since there are currently no state of federal standards available for the compounds of interest in soils or soil gas and air, Radian will review the requirements used for other sites with similar attributes, if available, and work with the NYSDEC to evaluate and determine appropriate requirements for the EPT site.

3.0 TASK 2: REVIEW OF PLANT PRACTICES

Sampling and analysis of ground water from well MW-15-40 (Figure 2) during the Stage 1 investigation indicated that 1,1,1-

TCA, a solvent used in current plant operations, may be present at this location. As discussed in Section 5.0, this well will be sampled during the Stage 2 investigation and the sample will be analyzed for volatile organic compounds to confirm the presence of 1,1,1-TCA. No source of 1,1,1-TCA is known to be present at this location. If the second round of sampling and analysis confirms that this compound is present in well MW-15-40, a detailed review of plant chemical handling procedures and practices in this area will be undertaken in an attempt to identify the source of this compound. The review will include interviews with plant employees knowledgeable in this area, as well as a reevaluation of plant files that will focus on the use and handling of 1,1,1-TCA in this area of the plant.

During Stage 1, sampling and analysis of ground water from well MW-5-40 located upgradient of the fire reservoir (Figure 2) indicated high concentrations of TCE and its degradation products were present, comparable to the concentrations found directly downgradient of the fire reservoir. It is suspected that previously-elevated water levels in the reservoir resulted in mounding on the water table beneath the reservoir, which subsequently resulted in the movement of TCE towards the south side of the reservoir. However, in order to rule out additional sources upgradient of the reservoir, a focused review of plant procedures and practices for handling TCE in the area of the plant directly upgradient of the fire reservoir will be conducted. This review will take the form of more detailed employee interviews and additional evaluation of plant files, where appropriate.

In addition, low level and/or isolated concentrations of volatile organic compounds were detected in the surface drainages and storm sewers sampled during the Stage 1 study. No known sources of these compounds have been identified in these areas. Again, plant chemical handling procedures and practices will be reviewed for areas that may be related to these drainages, to see if a source can be determined for the compounds that were detected.

In the event that any additional sources of chemicals are identified during this task, field investigation of these sources will be incorporated into the Stage 2 study and undertaken, if appropriate and necessary.

4.0 TASK 3: MONITORING WELL INSTALLATION

4.1 WELL INSTALLATION

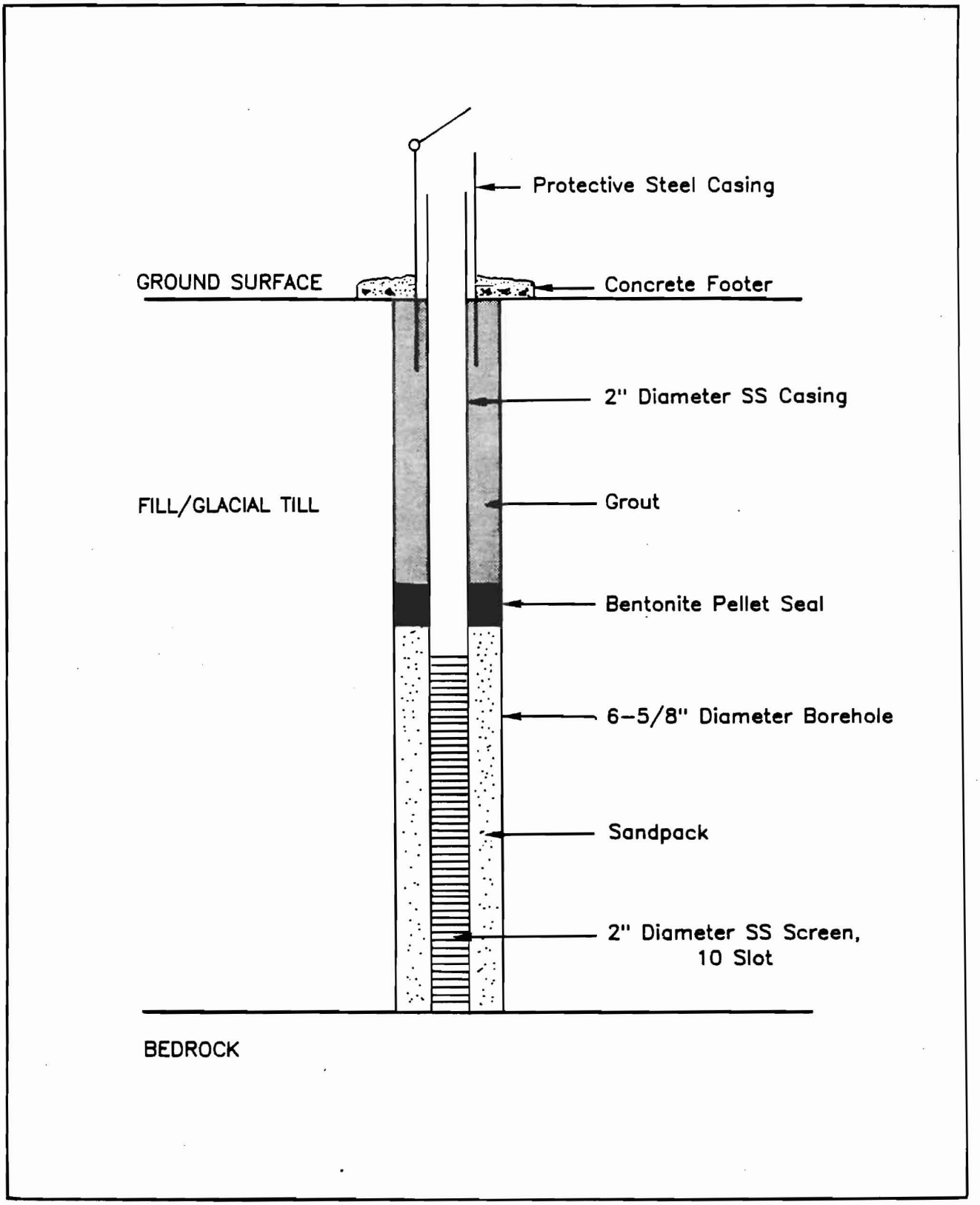
To date, a total of 18 monitoring wells have been installed on and near the EPT property during the previous studies of the site (Figure 2). As detailed in the Stage 1 Final Report, these wells were designed to monitor three different depth zones in the subsurface at and around the site, and as a result, were installed using one of three construction techniques appropriate to the depth of interest for that well. Figures 3 through 5 indicate the type of well construction used for each depth zone and summarize the details of the well designs. A more detailed description of the drilling and installation of these three well types is provided in the Stage 1 Final Report, as well as in the Revised Work Plan for Stage 1, Remedial Investigation Program, Morse Industrial Corporation, Ithaca, New York, dated May 1988.

Installation of five additional wells is proposed for the Stage 2 investigation. The proposed locations of the Stage 2 wells are shown on Figure 2. All locations indicated are proposed and may need to be adjusted in the field depending on the conditions encountered. If changes to the planned locations are necessary, concurrence will be obtained from the designated NYSDEC representative prior to use of an alternate location.

The proposed design of the monitoring wells is summarized in Table 1. In order to continue the monitoring of discrete depth zones within the subsurface regime and to maintain comparability of the data collected during Stage 2 with that of previous studies, wells will be installed using one of the three methods previously employed on-site, based on the depth zone of interest. All appropriate protocols for decontamination, drilling, sampling, logging, installation, and development, as described in the Stage 1 Work Plan, will be used during the Stage 2 work. Any changes to the well locations necessitated by conditions encountered in the field will receive the concurrence of NYSDEC prior to implementation.

All new wells will be surveyed for location and elevation in a manner consistent with the survey conducted for Stage 1, so that data obtained from new wells may be integrated with that obtained from the existing wells. All new wells will be equipped with dedicated Well Wizard (TM) bladder pumps, similar to the ones already installed in existing wells.

Proposed wells MW-9-40 and MW-9-100 will be located northeast of well MW-1, on the southeast corner of the intersection of Cayuga Street and the EPT access driveway downhill from the



RADIAN CORPORATION

Figure 3. Typical Well Construction for Overburden Wells at EPT

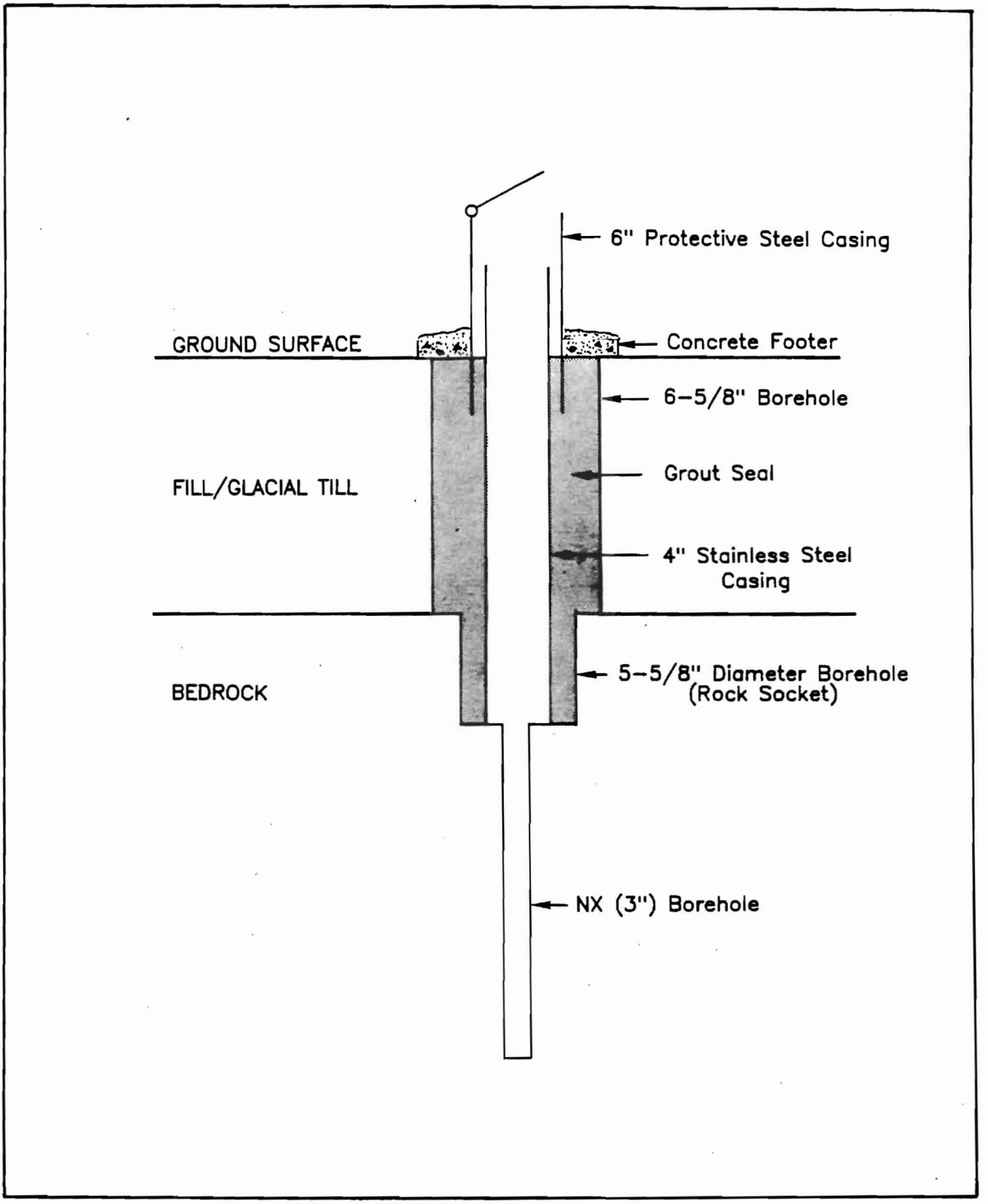
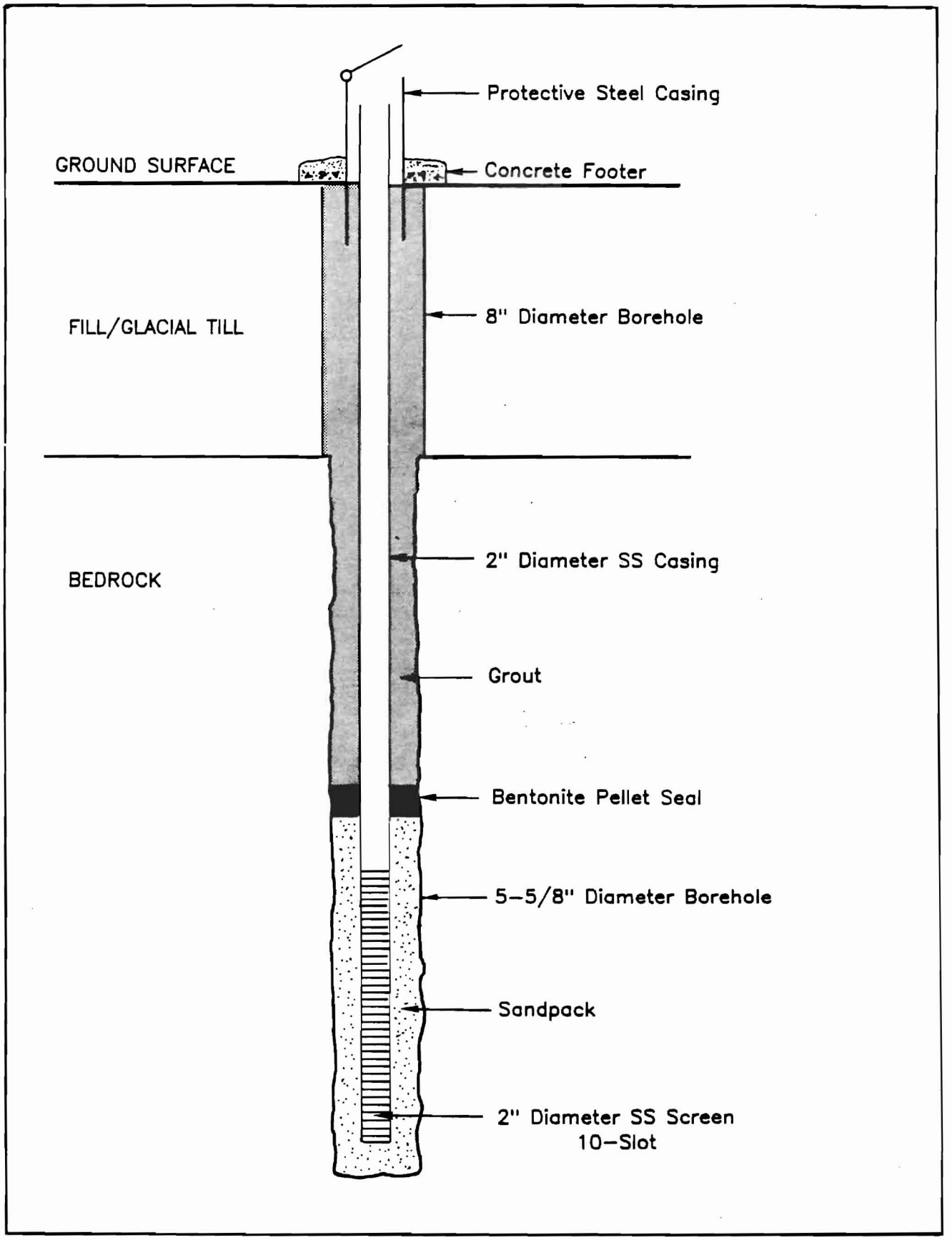


Figure 4. Typical Well Construction for Shallow Bedrock Wells at EPT



RADIAN CORPORATION

Figure 5. Typical Well Construction for Intermediate Depth Bedrock Wells at EPT

TABLE 1: SUMMARY OF PROPOSED STAGE 2 WELL DESIGNS
STAGE 2 REMEDIAL INVESTIGATION
EMERSON POWER TRANSMISSION, ITHACA, NY

WELL NO.	APPROX. FINAL DEPTH (ft)	SCREEN TYPE	FIGURE NUMBER REFERENCE*
MW-5-100	100	2" stainless steel	5
MW-9-40	40	open corehole	4
MW-9-100	100	2" stainless steel	5
MW-10-40	40	open corehole	4
MW-11-40	40	open corehole	4

* refers to figure number in the Stage 2 Work Plan

plant. Sixty (60) ppb of TCE and 700 ppb of cis-1,2-DCE were detected in the sample from MW-1, which is 39.2 feet deep. To provide additional information on the furthest lateral extent of TCE and associated compounds in this area, MW-9-40 will be installed at a comparable depth of approximately 40 feet. To provide information on the potential for vertical migration and the furthest lateral extent at depth, if any, MW-9-100 will be installed at this location to a depth of approximately 100 feet.

Proposed well MW-10-40 will be located along Spencer Street, east-northeast of the MW-3 and MW-2 wells and along the orientation of the fractures in the bedrock. To provide additional information on the furthest lateral extent of TCE and associated compounds in this area, well MW-10-40 will be located downgradient of the reservoir and the property line, and installed to a depth of approximately 40 feet.

Proposed well MW-11-40 will be located west of well MW-13-25, between well MW-13-25 and well MW-15-40. Both TCE (30 ppb) and cis-1,2-DCE (80 ppb) were detected in well MW-13-25, whereas these compounds were not detected in well MW-15-40, approximately 300 feet to the west. Well MW-11-40 will be placed between these two locations in order to provide better definition of the lateral extent of contaminant distribution in this area.

Proposed well MW-5-100 will be located at the existing MW-5 well cluster. Concentrations of 220,000 ppb of TCE were detected in well MW-5-40 at this location. Installation of well MW-5-100 down to a depth of approximately 100 feet will provide additional information on the vertical extent of these compounds in this area.

TCE and associated compounds were not detected in samples from any of the wells in the MW-6 cluster. Therefore, no further investigation of this area is warranted, as the MW-6 location provides information on the limit of the lateral distribution in this direction.

Additional wells deeper than 150 feet were not proposed due to their potentially limited usefulness. Based on logging of rock cores and borehole geophysical data from the site, bedrock at depths greater than 150 feet below ground surface demonstrates a significant decrease in fracture frequency, permeability, secondary porosity, and ground water yield. It is likely that vertical migration of ground water and associated compounds may be limited due to the decreased permeability of the formation. Ground water flow velocities at depths below 150 feet are expected to be extremely slow. In addition, wells installed and screened at depths below 150 feet are not likely to yield sufficient water to allow adequate purging prior to sampling. This

situation could preclude the collection of representative ground water samples from such depths.

4.2 WATER LEVEL MEASUREMENTS

To provide additional data for the evaluation of the ground water gradient and rate of flow at the site, water level measurements will be made periodically in all existing wells, in all completed new wells, and in the fire reservoir during the period when field work for the Stage 2 investigation is being performed. At least one complete round of measurements will be made in all wells and the fire reservoir when all the new wells have been completed and developed. The procedures to be used for these measurements are described in the Stage 1 Work Plan and in the Stage 1 Final Report.

4.3 FIELD PERMEABILITY TESTING

After the new monitoring wells are completed and developed, they will be used to conduct field permeability tests in the form of slug tests. Any existing monitoring wells previously not tested will be tested at this time. The procedures to be used for these tests are described in the Stage 1 Work Plan and in the Stage 1 Final Report.

5.0 TASK 4: SAMPLING AND ANALYSIS

During the previous investigations, samples of ground water from monitoring wells and seeps, water from the fire reservoir, surface water and sediments from surface drainages, water from storm and sanitary sewers, and soils from the scrap conveyor/loading area were collected and analyzed. During the Stage 2 investigation, some of these locations will be resampled in order to confirm the results previously obtained during the Stage 1 study. In addition, samples will be collected from new monitoring wells and at other selected locations (Figure 6). Table 2 summarizes the planned sampling locations and the analyses to be requested for each sample. Additional details of the proposed sampling and analysis program are discussed below. Most of the protocols for sampling and analysis previously presented in the Revised Appendix A - Sampling and Analysis Plan, Morse Industrial, Ithaca, New York, dated November 1987, are still valid and will be used during the Stage 2 work. Protocols that have been added or altered since the preparation of that document are highlighted in the discussion below.

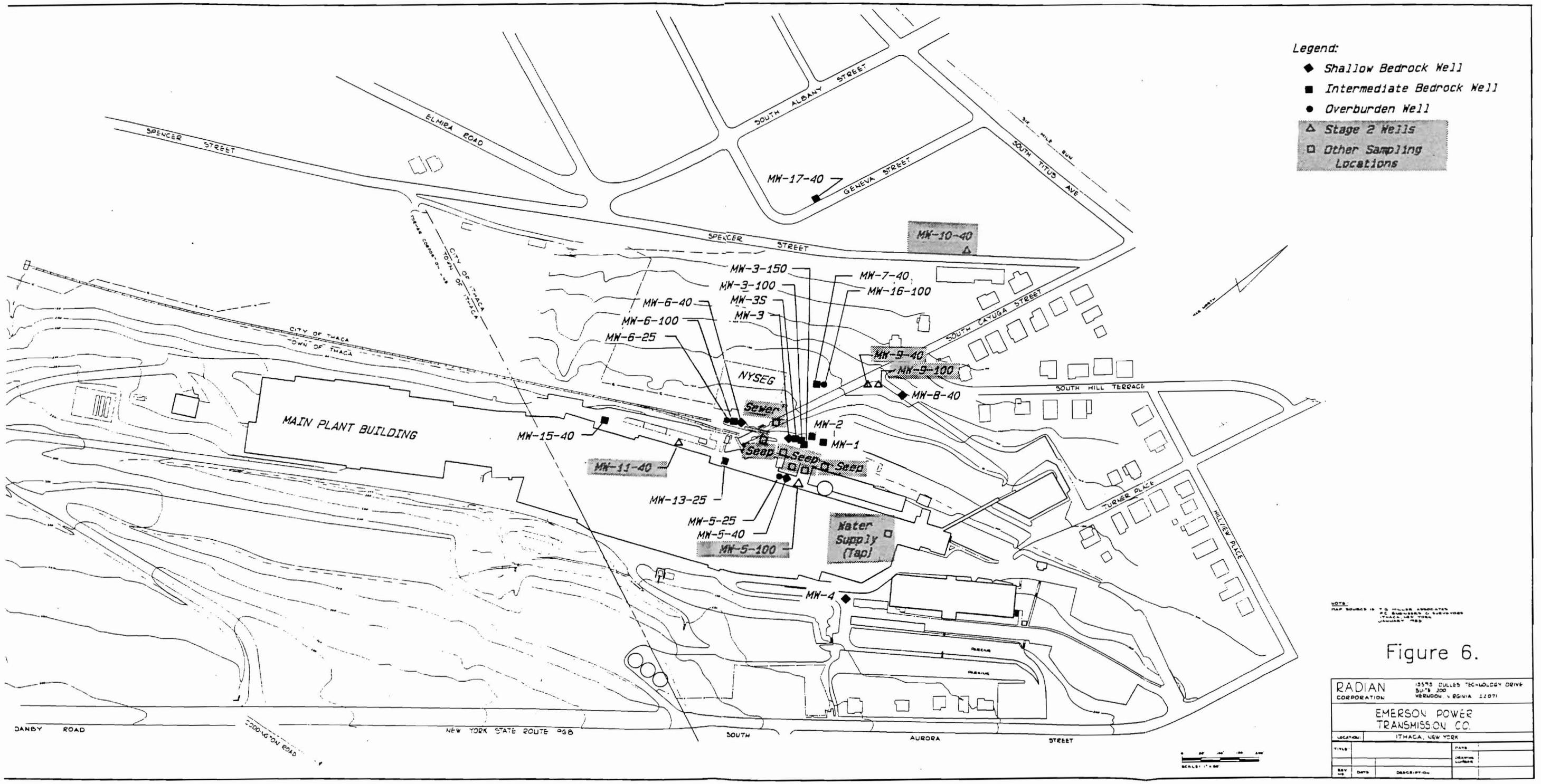


Figure 6.

Figure 6. Proposed Sampling Locations at
Emerson Power Transmission, Ithaca, New York

TABLE 2: SUMMARY OF SAMPLING AND ANALYSIS PROGRAM
STAGE 2 REMEDIAL INVESTIGATION
EMERSON POWER TRANSMISSION, ITHACA, NY

SAMPLE TYPE	SAMPLE ID	ANALYSIS REQUIRED* VOCs	HSL METALS	TPHs	PCBs
BEDROCK	ROCK1		x		
	ROCK2		x		
GW	MW-1	x			
	MW-2	x			
	MW-3	x	x		
	MW-3s	x	x		
	MW-3-100	x	x		
	MW-3-150	x			
	MW-4	x	x		
	MW-5-25	x	x		
	MW-5-40	x	x		
	MW-5-100	x			
	MW-6-25	x	x		x
	MW-6-40	x			x
	MW-6-100	x	x		x
	MW-7-40	x			
	MW-8-40	x	x		
	MW-9-40	x			
	MW-9-100	x	x		
	MW-10-40	x			
	MW-11-40	x			
	MW-13-25**	x			
	MW-15-40	x	x		
	MW-16-100	x	x		
	MW-17-40	x			
	Duplicate	x	x		
	Duplicate	x			x
SEEPS	SEEP A	x		x	
	SEEP B	x		x	
	SEEP C	x		x	
	SEEP D	x		x	
	SEEP E	x		x	
	SEEP F	x		x	
	Duplicate	x		x	
PIPES	PIPE 1	x		x	
	PIPE 2	x		x	
	PIPE 3	x		x	

2

TABLE 8: SUMMARY OF SAMPLING AND ANALYSIS PROGRAM
STAGE 2 REMEDIAL INVESTIGATION
EMERSON POWER TRANSMISSION, ITHACA, NY

SAMPLE TYPE	SAMPLE ID	ANALYSIS REQUIRED* VOCs	HSL METALS	TPHs	PCBs
	PIPE 4	x		x	
	PIPE 5	x		x	
CREEK	SW 1	x		x	
	SW 2	x		x	
	SW 3	x		x	
	Duplicate	x		x	
RESERVOIR	FR1	x		x	
	FR2	x		x	
SEWER	STORM 1	x		x	
	STORM 2	x		x	
	SANITARY 1	x		x	
	SANITARY 2	x		x	
	Duplicate	x		x	
WATER SUPPLY	SUPPLY 1	x			
	Duplicate	x			
SOILS	B-13A	x		x	x
	B-13B	x		x	x
	B-14A	x		x	x
	B-14B	x		x	x
	B-15A	x		x	x
	B-15B	x		x	x
	Duplicate	x		x	x
	Equipt Blank	x			

NOTES:

* Analytical methods used will be:
VOCs by USEPA Method 8010/8020 (SW-846)
HSL Metals by CLP protocol (USEPA CLP Statement of Work for Inorganics)
TPHs by USEPA Method 418.1 (USEPA Methods for Chemical Analysis of Water and Wastes)
PCBs by CLP protocol (USEPA CLP State of Work for Organics)

** Well numbers MW-12 and MW-14 not used during the Remedial Investigation.

*** Field Blanks will be collected every other day of sampling activities and analyzed for VOCs

5.1 MONITORING WELL SAMPLING AND ANALYSIS

During the Stage 2 investigation, following the completion, development, and equipping of all newly-installed wells, all 23 monitoring wells will be measured for water levels, and purged and sampled using the dedicated Well Wizard (TM) bladder pumps installed in each well. The protocols that will be used with these pumps is fully described in the November 1987 Sampling and Analysis Plan.

All ground water samples collected from monitoring wells will be analyzed for volatile organic compounds using the 600-series (8010/8020) of analytical procedures. These data will provide confirmation for concentrations previously detected in existing wells, and will add data from the new well locations. For those wells where volatile organics were not detected in the monitoring wells using the 600-series (8010/8020), the samples will be analyzed using the 500-series analytical methods. In those cases where the 600-series of analysis is able to achieve the detection limits imposed by the NYS ground water ARARs, the 500-series analysis will not be performed. In those cases where neither the 600- nor 500- series methods would yield detection limits comparable to the ARARs (ie. samples that are highly contaminated), the samples will be analyzed only using the 600-series methods. Table 23 summarizes the NYS standards, guidance values, and the method detection limits for the parameters under investigation.

As shown in Table 2, 12 well samples have been selected for analysis of HSL metals. These include a sample from MW-4, the upgradient background well, as well as all four wells that were previously examined for HSL metals. Additional wells selected include those at deeper depths and several wells downgradient of the MW-3 well cluster. These additional data will allow evaluation of lateral and vertical distribution of metals in ground water over an expanded area. Samples from wells in the MW-6 cluster will also be analyzed for PCB's to monitor for possible migration from the scrap conveyor/loading area. Analysis for total petroleum hydrocarbons will be omitted from the Stage 2 analytical program because previous analysis of ground water from wells for TPH's did not result in any detections.

5.2 ANALYSIS OF BEDROCK MATERIALS FOR HSL METALS

Elevated concentrations of metals were detected in three of the four wells selected for HSL metals analysis during the Stage 1 study. One suspected source of these metals concentrations in ground water is the bedrock material itself. The presence of high concentrations of solvents, such as TCE, in the subsurface

may result in the formation of organic acids that may be causing naturally-occurring metals to leach from bedrock materials into ground water. To examine this possibility, two samples of rock core will be analyzed for metals content.

One bedrock sample will be selected from the rock core retrieved during the Stage 1 study, to be representative of fractured rock from a location not influenced by the facility. This rock presumably has not been in contact with contaminants in ground water; therefore, its metals content has not been affected by leaching by organic acids. The second bedrock sample will be selected from the rock core retrieved from a borehole that eventually showed high concentrations of TCE and associated compounds. This sample will be selected to be representative of fractured rock that shows indications of ground water flow and therefore has potentially been in contact with contaminated ground water that may have had an effect on the metals content.

The rock cores currently in storage at EPT will be reviewed to select the two samples most representative of the criteria specified above. Portions of the selected rock core will be removed from storage and placed in clean glass containers for transfer to the laboratory for metals analysis. These results will be compared with each other and with those for ground water in order to determine the possible source of elevated metals concentrations, if any.

5.3 SEEPS AND PIPES SAMPLING AND ANALYSIS

One of the Stage 1 objectives was to collect samples from any flowing ground water seeps and pipes found at the base of the hillside below the plant. Conditions were extremely dry during the Stage 1 sample collection program. As a result, only three ground water seeps were flowing and available for sampling. All other seeps and pipes were dry.

During the Stage 2 investigation, another attempt will be made to find additional flowing ground water seeps and pipes below the plant in order to collect samples. Samples will be collected from a maximum of eleven flowing ground water seeps and pipes, using the procedures described in the Sampling and Analysis Plan and in the Stage 1 Final Report.

In addition, to evaluate possible ground water discharge to Six Mile Creek and the potential for water quality impacts, an attempt will be made to find seeps which are flowing from the creek bank, or within the creek bed, if surface water flow is low. Samples will be collected from a maximum of three seeps in the segment of Six Mile Creek that is directly downgradient of

Table 3. Summary of New York Standards and Guidance Values (ug/L)

Compound	NYS GA Std or Guidance	8010/8020 Method Detection Limit
Bromodichloromethane	50	0.1
Bromoform	50	0.2
Bromomethane		
Carbon tetrachloride	5	0.12
Chloroacetaldehyde		
Chlorobenzene	20	0.2
Chloroethane		0.52
Chloroform	100	0.05
Chloromethane		0.08
Dibromochloromethane	50	0.09
1,2-Dichlorobenzene	4.7 (sum)	0.15
1,3-Dichlorobenzene		0.32
1,4-Dichlorobenzene		0.24
Dichlorodifluoromethane		
1,1-Dichloroethane	50	0.07
1,2-Dichloroethane	0.8	0.03
1,1-Dichloroethylene	0.07	0.13
trans-1,2-Dichloroethylene	50	0.10
Dichloromethane		
1,2-Dichloropropane	50 (sum)	0.04
trans-1,3-Dichloropropylene		0.34
1,1,2,2-Tetrachloroethane	0.2	0.03
Tetrachloroethylene	0.7	0.03
1,1,1-Trichloroethane	50	0.03
1,1,2-Trichloroethane	0.6	0.02
Trichlorofluoromethane	50	
Vinyl Chloride	5.0	.18
Benzene	ND	0.2
Ethyl Benzene	50	0.4
Toluene	50	0.2
Xylenes	50	0.2

the EPT facility. In the event that no flowing seeps are located, samples of surface water from three locations along this segment of Six Mile Creek will be collected instead. Surface water collected during a low flow period, when no flowing seeps are found, represents base flow which derives primarily from ground water recharge. Therefore, these samples will likely reflect the quality of ground water being discharged to Six Mile Creek. The procedures to be used for sample collection are the same as those cited above and are described in the Sampling and Analysis Plan, and in the Stage 1 Final Report.

All samples from flowing seeps and pipes will be analyzed for volatile organic compounds and for total petroleum hydrocarbons. These analyses will facilitate confirmation of previous results and will provide additional data for defining the distribution of the volatile compounds of interest at the site.

5.4 FIRE RESERVOIR SAMPLING AND ANALYSIS

Previous sampling and analysis of water from the fire reservoir during Stage 1 has confirmed the effectiveness of the earlier fire reservoir cleanup effort. Concentrations of contaminants in water have declined significantly since the cleanup. However, continued monitoring of reservoir water levels and water quality is desired since the reservoir shows a hydraulic connection with the surrounding shallow ground water regime, and ground water is in fact seeping into the reservoir at times.

Another round of water level measurements will be made and another set of water samples will be collected from the two fire reservoir compartments during the Stage 2 investigation. The protocols for this effort are specified in the Sampling and Analysis Plan and in the Stage 1 Final Report. These samples will be analyzed for volatile organic compounds, metals, and total petroleum hydrocarbons to provide additional data on the movement of these compounds in the vicinity of the reservoir.

5.5 STORM AND SANITARY SEWER SAMPLING AND ANALYSIS

Samples of water from both the storm sewers and plant discharge to the sanitary sewer were collected and analyzed during the Stage 1 study. The storm sewer samples indicated the presence of primarily 1,1,1-TCA and TCE, as well as some trihalomethane compounds. The sanitary sewer discharge samples also indicated the presence of 1,1,1-TCA and TCE, as well as some oil and grease.

To provide confirmation of the concentrations previously

determined for these compounds, these locations will be sampled again during the Stage 2 study, using the protocols detailed in the Sampling and Analysis Plan and in the Stage 1 Final Report. These samples will be analyzed for volatile organic compounds and total petroleum hydrocarbons.

5.6 PLANT WATER SUPPLY SAMPLING AND ANALYSIS

As summarized in the Stage 1 Final Report, a number of the analyses indicated the presence of chloroform and other trihalomethane compounds. No known source of chloroform has been identified at the facility. One suspected source of these compounds is their presence in the chlorinated municipal water supply that serves the facility. NYSDOH has provided data that indicates these compounds are present in the City of Ithaca water supply.

To confirm that the water supply is contributing trihalomethane compounds to the environment in the vicinity of the plant, a sample and duplicate will be taken of the water supply at the plant during the Stage 2 investigation. The samples will be analyzed for volatile organic compounds. The sample and its duplicate will be taken by selecting a supply tap at the facility, as close to the connection with the water main as possible, prior to any type of water treatment. The tap will be opened and allowed to run for a minimum of ten minutes in order to purge any stagnant water in the pipes. Using a slow, steady stream, four 40-ml VOA vials will be filled directly from the tap and capped as quickly as possible. The vials will be checked for air bubbles and handled according to the protocol for other VOA samples, as described in the Sampling and Analysis Plan.

5.7 SCRAP CONVEYOR/LOADING AREA SOIL SAMPLING AND ANALYSIS

A total of 12 soil borings were drilled in the scrap conveyor/loading area during the Stage 1 study. Soils from eight of these borings were collected and submitted for analysis of TPH's and PCB's. Soils from two of the eight borings were also analyzed for the presence of VOC's. The analysis detected TPH's and Aroclor 1254 in the majority of the samples. A limited number of VOC's were also detected. Although these results provide a good representation of the location and range of concentrations of TPH's and PCB's in this area, the limits of the contaminated soil have not been fully described.

During the Stage 2 investigation, additional soil samples will be collected from three locations on the fringes of the area previously investigated (Figure 7) and will be analyzed for

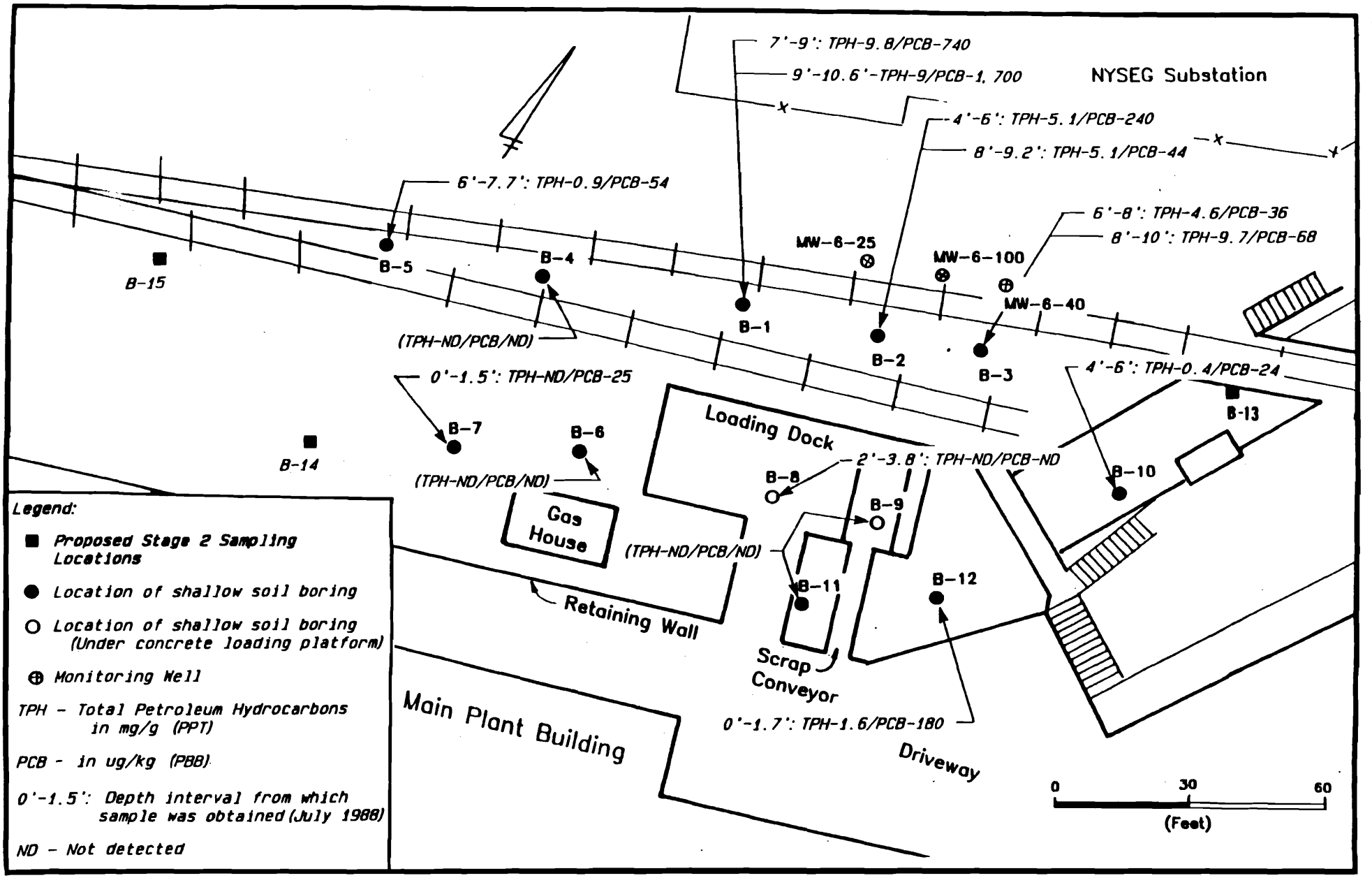


Figure 7. Map Showing Locations of Stage 2 Soil Samples and Previous Sampling Results from the Scrap Conveyor/Loading Area, Emerson Power Transmission, Ithaca, New York

TPH's, PCB's and VOC's. Two samples will be collected from each location, one at a shallow depth and one near the final depth of the boring, using the procedures previously employed to collect samples in this area, as described in the Sampling and Analysis Plan and in the Stage 1 Final Report. All samples extracted from the borings will also be examined for visual evidence of contamination. Data generated by this effort will allow a clearer definition of the limits of contaminated soil in this area.

5.8 FIELD AND LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL

Sample handling, and all field and laboratory quality control measures specified in the Sampling and Analysis Plan, will be implemented as part of the Stage 2 sampling and analysis effort.

The laboratory analytical methods to be used are specified in the Sampling and Analysis Plan and on Table 2.

6.0 TASK 5: DATA EVALUATION AND REPORT PREPARATION

6.1 DATA EVALUATION

The first step in data evaluation will be to see if all QA/QC procedures and other specified protocols have been adhered to during the study. Any deviations will be noted, along with their effects on the quality of the data generated.

In evaluating conditions at the EPT site and vicinity, the data generated by the Stage 2 study will be integrated with the results previously obtained from the Stage 1 study . Additional data generated by borehole drilling and coring, field permeability testing, and other field observations will be used to refine the understanding of the site geology and hydrogeology, including any physical factors that may exert control over the transport and fate of the compounds of interest. Information obtained during the review of plant practices will be used along with other data obtained on contaminant concentrations to identify other contaminant sources, if any are found to be present at the facility, in addition to the fire reservoir. Additional data generated by the analysis of the samples collected during the Stage 2 investigation will be used in conjunction with defined source location(s) to refine the delineation of the lateral and vertical distribution of the compounds of interest in on- and off-site areas.

The analytical results will be compared with any applicable and relevant state and federal standards, criteria, and guidance values, and any exceedances will be noted. Applicable standards, criteria, and exceedances, if any, will be evaluated in light of any potential need for remedial actions at the site. Physical parameters, such as aquifer permeability, will also be evaluated in light of any potential need for remedial actions. Results of the residential soil gas and indoor air monitoring study will provide additional data on potential receptors in the vicinity of the plant and the potential for health-related impacts, if any.

6.2 REPORT PREPARATION

A final report will be prepared for the Remedial Investigation which incorporates the results of both the Stage 1 and Stage 2 studies of the EPT facility. To the degree possible, the final report will use as a base the report prepared at the conclusion of the Stage 1 investigation, and will build on it to integrate the additional data generated by the Stage 2 effort. The final report will provide complete documentation of both stages, including:

- A description of all site activities;
- The results of all sample analyses, including the analytical laboratory reports;
- A characterization of the site geology and hydrogeology, including the rate of ground water flow;
- An identification of contaminant sources, where known;
- An evaluation of the lateral and vertical extent of the compounds of interest on- and off-site, if appropriate;
- A comparison of contaminant concentrations with the applicable and relevant state and federal standards, criteria, and guidance; and
- A description of and the results of the residential soil gas and indoor air monitoring being conducted as a separate study.

The report text will be supplemented by maps, contour plots, and cross-sectional drawings of the site, where appropriate, in order to clearly present the results and conclusions of the Remedial Investigation. The data and results presented in this final report will be used as a basis for formulating the Feasibility

Study, if required.

7.0 TASK 6: PROJECT SCHEDULE

PROJECT: EPT STAGE 2 REMEDIAL INVESTIGATION

PROPOSED SCHEDULE FOR STAGE 2 REMEDIAL INVESTIGATION AT EPT, ITHACA, NY