Remedial Investigation

Supplemental Data Collection

Work Plan

Minmilt Realty

540 Smith Street, E. Farmingdale, NY

NYSDEC 1-52-147

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July 2000

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1.0 INTRODUCTION

The following work plan was prepared to describe the procedures and techniques of additional work required to complete the Remedial Investigation - Feasibility Study (RI/FS) for the Minmilt Realty site located at 540 Smith Street, East Farmingdale. This work plan was prepared as an addendum to the Investigation Work Plan (PWGC 9/94) and the Off-Site Work Plan (12/98) previously implemented at this location.

The field work described in this plan will be implemented in accordance with the Health and Safety Plan (PWGC - 3/94, Addendum 1- 7/96, Addendum 2 - 3/97) and the Quality Assurance Project Plan (PWGC - 3/94, Addendum 1- 3/97) previously prepared for this site.

1.1 Objectives

The objectives of the additional investigatory work detailed in this plan will be to collect the data necessary to:

- Determine the vertical distribution of residual contamination above and below the water table within the source area.
- Evaluate the remaining level of impacted soil in the vadose zone.
- Evaluate the hydraulic conductivity of the Glacial and Magothy aquifers at the site.
- Determine the vertical distribution of dissolved constituents at a distance of approximately 1,300 feet downgradient of the source area.
- Establish plume biotransformation type behavior and evaluate potential for reductive dechlorinization.
- Evaluate exposure pathways with respect to off-site human and environmental receptors.
- Predict the arrival time of the leading edge (250 ug/l) of the PCE plume at a hypothetical compliance point.

2.0 DATA COLLECTION

2.1 Vertical Profile Soil Boring & Sample Collection

A vertical profile soil boring will be advanced within the dry well located on the east side of the building (Figure 1), and previously established as the point source of the chlorinated solvents at the site. The purpose of the soil boring is to identify the distribution and concentration of residual contamination both above and below the water table. This information will be useful in identifying if potential modifications to the operation of the SVE and groundwater extraction systems could enhance performance and recovery. The vertical position of the remaining contaminant mass will also be used in evaluating if alternative or supplemental technologies would be of benefit in reducing the operational time needed to complete remediation of the site.

The boring will be advanced within the identified drywell using rotary drilling equipment and 3-inch (ID) hollow stem augers. Soil samples will be collected at five foot intervals from the base of the dry well to the extent of contamination using a 2-inch by 2 foot split (spoon) core barrel sampling device. The sampling method will consist of first drilling a borehole to a specified depth with the hollow stem augers, and then driving the sampler through the lead auger into the undisturbed sediments with a 140 pound free fall hammer. Upon collection, each sample will be logged by a PWGC geologist for lithology and physical evidence of contamination such as staining, odor or a visible sheen, screened for VOCs with a photoionization detector and temporarily stored in labeled re-sealable plastic bags. The samples which display the greatest evidence of contamination (PID readings and physical observation) from above and below (1 each) the water table will be placed in laboratory supplied glassware and retained for analysis. Contaminated soil returned on the auger flights will be left within the drywell. To prevent cross-contamination between sampling intervals the core barrel sampler will be decontaminated according to the following procedure:

- Wash with an Alconox detergent solution
- Rinse with distilled water
- Air dry

2.2 Vadose Soil Borings & Sample Collection

To determine the degree of sorbed contamination remaining within influence of the SVE system, four soil borings will be advanced in the vicinity of each SVE extraction point (SVE1, SVE2) as shown in Figure 1. Soil samples will be collected every five feet from 5 feet below surface to five feet below the water table using push-probe sampling equipment such as a Geoprobe or it's equivalent.

The Geoprobe system utilizes a hydraulically powered percussion hammer mounted on a light truck or ATV to drive a hollow stainless steel sampler to a predetermined depth. At the predetermined depth, the sampler is opened to allow an undisturbed soil sample to enter as the rods are driven down. The sampler extracts a 2-foot long, 1½-inch diameter soil-core and is lined with an acetate liner to preserve sample integrity and prevent cross contamination. Collected samples will be screened for total volatiles with a photoionization detector, logged and stored in labeled re-sealable plastic bags by an on-site PWGC geologist. From each boring the two samples, considered to represent the greatest concentration of contamination (PID readings and physical observation), will be retained along with the sample just above the water table and submitted to an ELAP-certified laboratory for analysis of volatile organic compounds according to EPA method 8260 with class B deliverables.

To prevent cross-contamination between sampling intervals and borehole locations, a new acetate liner will be used between intervals and the sampler will be decontaminated according to the following procedure:

- Wash with an Alconox detergent solution
- Rinse with distilled water
- Air dry

2.3 Multi-Level Well Installation

A single multi-level well will be installed on Central Avenue, approximately 1,100 feet downgradient of the site as located in Figure 2. The well will be installed to provide a "permanent" three-dimensional sampling location to monitor the vertical distribution of chorinated VOCs and geochemical parameters within the Glacial and upper Magothy Aquifers.

The well will be installed to a total depth of 150 feet using a truck mounted rotary drill rig equipped with 6¼ inch hollow stem augers. The well will consist of 12 individual sampling points covering the saturated interval from 40 to 150 feet below surface in ten foot increments. Sample points are constructed of ½-inch diameter schedule 40 PVC riser with a 6 inch 0.010 inch screened section. Installation is achieved by attaching the samplers in ten-foot intervals to a 2-inch diameter PVC centralizer pipe with nylon cable ties (Figure 3). The formation is then allowed to collapse in around the bundled samplers and centralizer during withdrawal of the augers. After the augers are removed, a 1 foot hydrated bentonite seal is installed and the borehole is backfilled to grade and finished with a 12 inch flush mount manhole. Upon completion, the samplers are fitted with a dedicated polyethylene tube and special cap to facilitate sampling. Excess soil generated during the well installation process will be drummed and stored within the Minmilt yard until profiling of the soil is completed and disposal arrangements can be made.

2.3.1 Multi-Level Well Sampling

The multi-level well will be sampled following a minimum two week period of quiescence following installation to minimize the dilution effects of water introduced during the drilling process. Sampling will be scheduled to coincide with a quarterly groundwater sampling event so that the vertical data at this location can be directly correlated to that of samples from the monitoring network.

Prior to sampling, the 2 inch central pipe will be gauged with an electronic tape to determine the height of the water column and corresponding volume of standing water in the well. The samplers will then be purged approximately 3-5 times the volume of standing water in the sampler using a peristaltic pump and stainless steel check valve attached to the bottom of the dedicated sample tubing. Purge water will be retained in a container and processed through the air stripping tower on the Minmilt property. After purging, the dedicated tube will be detached from the peristaltic pump, and the sample collected directly from the tube by oscillating the tube vertically to manually pump water into the laboratory supplied glassware. This procedure avoids having the sample water come into direct contact with the peristaltic pump reducing the need for decontamination of the pump.

Decontamination of the pump will be accomplished according to the following procedure:

- Purge with a Alconox detergent solution: ½ - ¾ gallons
- Purge with de-ionized water: ¾ - 1 gallon

2.4 Aquifer Response Testing

Aquifer response testing will be conducted to provide estimates of hydraulic conductivity for both the Glacial and Magothy Aquifers. Site specific values of hydraulic conductivity will provide better transport predictions, pump well capture zones and remediation time estimates. The method employed will be to perform rising head (slug) tests on three monitoring wells screened in the Glacial aquifer (MW1, MW4 and SP6) and two wells screened in the upper Magothy (MW9, ML1). Two to three rising head tests will be performed at each well and analyzed using the Bouwer-Rice method to obtain an average hydraulic conductivity value at each location. The test will be performed by rapidly withdrawing a displacement tube and recording pressure head over time using a pressure transducer/data logger combination.

3.0 LABORATORY ANALYSIS

3.1 Soil Sample Handling and Analysis

Samples retained for analysis will be transferred into laboratory supplied glassware, packaged for shipment and placed on ice in a cooler. Samples will be delivered to H_2M Laboratories of Plainview, New York for analysis. Chain-of-custody documentation will be maintained for all samples between the supervising geologist and the laboratory's representative.

Samples will be analyzed for volatile organic compounds, target compound list (TCL) by EPA Method 8260 using analytical sampling protocol with category B deliverables (ASP-B).

3.2 Groundwater Sample Handling and Analysis

As discussed in section *2.2.1,* sampling of the multi-level well will be scheduled to coincide with a regular quarterly sampling event. Collected samples will be placed into laboratory supplied glassware, and placed on ice in a cooler for delivery to EcoTest laboratories, of North Babylon, New York,. within 48 hours of collection by PWGC sampling personnel. Chain-of-custody documentation will be maintained for all samples between the field personnel and the laboratory's representative.

3.2.1 VOC Analysis

All samples collected during this event will be analyzed for volatile organic compounds, target compound list (TCL) by EPA Method 8260 with results-only deliverables.

3.2.2 Geochemical Analysis

As part of the screening process to evaluate the potential for reductive dechlorinization at this site, geochemical indicators will be included in the analysis of samples from the multi-level well and selected monitoring point locations. Parameters in the analysis will include: DO, Nitrate, Iron II, Sulfate, Sulfide, Redox, DOC, Temp, CO_2, Alkalinity and Chloride. Indicators such as DO, Redox and Temp may be measured in the field with electronic probes. Samples for the remaining parameters will be submitted to EcoTest for analysis. Geochemical parameters will be included in the analysis of samples from MW3, MW6, SP4 and all intervals from the multi-level well.

3.3 QA/QC

Quality assurance/quality control procedures to be implemented during this phase will include analysis of Field blank and Trip blank samples. A trip blank, prepared in the laboratory, will travel with the glassware and samples at a frequency of one per day/per cooler. Trip blanks are used to identify cross-contamination introduced during the storage and shipping of glassware and samples to and from the analytical laboratory. Field blanks will be prepared by pouring laboratory supplied deionized water over the decontaminated soil sampler into a container where the water can be collected and submitted for analysis. Field blanks are used to check the thoroughness of the decontamination procedure and to identify possible cross-contamination between collected samples. Field blanks will be collected at a frequency of one per day per sampler type.

Analysis of all blank samples will include volatile organic compounds, target compound list (TCL) by EPA Method 8260 with results-only deliverables

3.4 Data Validation

Independent, third party data validation will be conducted on the VOC results to define data quality with respect to project goals as stated in the QAPP. Data validation will be provided by Data Validation Services of North Creek, NY, in accordance with the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review and the USEPA SOPs HW-2 and HW-6.

4.0 RISK ASSESSMENT

The risk assessment submitted to the NYSDEC in July 1996 identified and evaluated the risks to a construction worker, involved in the installation of the remediation system, as the only potential exposure pathway. Due to the on-site focus of the risk assessment, the NYSDEC and NYSDOH approved the risk assessment for on-site purposes only. This document will be appended to include the systematic identification of all current and future potential exposure scenarios and a detailed analysis of all potential completed pathways. The revised risk assessment will then be re-submitted to the NYSDEC and the NYSDOH to establish target clean-up goals for the site.

5.0 GROUNDWATER TRANSPORT MODELING

A 2-dimensional analytical model (BIOSCREEN) will be used to evaluate the present extent of the Minmilt plume, and the predicted arrival time and maximum PCE concentration at the nearest wellfield (Gordon Ave.), under the following three transport scenarios: Upper glacial-only transport, Magothy-only transport and combined transport.

To predict when the leading edge of the plume reaches the wellfield, it will be necessary to define the concentration which will be considered the "leading edge"and the point (compliance point, receptor) where the prediction will be made. There are three factors which will reduce the PCE concentration of the plume

at the receptor (wellhead): hydrodynamic dispersion, reductive dechlorinization and dilution. In the BIOSCREEN model dispersion is calculated based on plume length in the longitudinal direction using the Xu & Eckstein formula (1995), and in the transverse direction using the formula from Gelhar and others (1992). Vertical dispersivity is expected to be insignificant for plume lengths greater then or equal to the aquifer thickness, and is not considered in the BIOSCREEN model. Based on the lack of transformation products in the on-site and near on-site monitoring wells, degradation is not expected to play a significant role in reducing contaminants and will not be evaluated with the model. Sampling for geochemical indicators will provide a better understanding regarding the potential for natural attenuation, if any. Dilution at the wellhead can be calculated from the volumetric flow rate through the source area and the pumping rate of the supply well as follows:

Supply well pump rate: 900 gpm (173,262 ft^3/d)
Source area thickness: 100 ft
Source are width: 200 ft
Porosity: 0.30
Groundwater flow rate 0.5 ft/d

173,262 ÷ 100 x 200 x 0.5 x 0.3 = 57 .75

A dilution ratio of 57 to 1 indicates a concentration of 250 ug/l at the receptor to meet the MSL of 5 ug/l at the wellhead. Since the flow field will change, increasing the groundwater velocity near the supply well, the leading edge of the plume will be evaluated at an imaginary compliance point located 1,000 feet upgradient of the well field. Use of a compliance point in this manner will be conservative in that the travel times will be considerably less than that of the arrival time at the receptor, due to the reduced transport distance and the effects of dispersion.

To comply with requests made by the SCDHS, the model will also be used to evaluate the arrival time of the PCE plume at the receptor at a concentration of 5 ug/l. As per SCDHS, increased flow velocities within the pumping well capture zone will not be included in the evaluation.

6.0 SCHEDULE

The proposed schedule for completion of the activities described in this work plan and the submission of a revised RI/FS is as follows.

① Mobilize for installation of the Multi-level well and the deep soil boring within two weeks of receiving DEC's approval of the work plan.

② Conduct a 2nd quarter groundwater sampling round which includes both the monitoring well network and the multi-level well. Sampling to be performed a minimum of 2 weeks after the installation of the multi-level well.

③ Perform aquifer response testing within one week following the 2nd quarter sampling round.

④ Perform additional vadose zone soil sampling within 2 weeks of receiving the laboratory results of the deep boring samples.

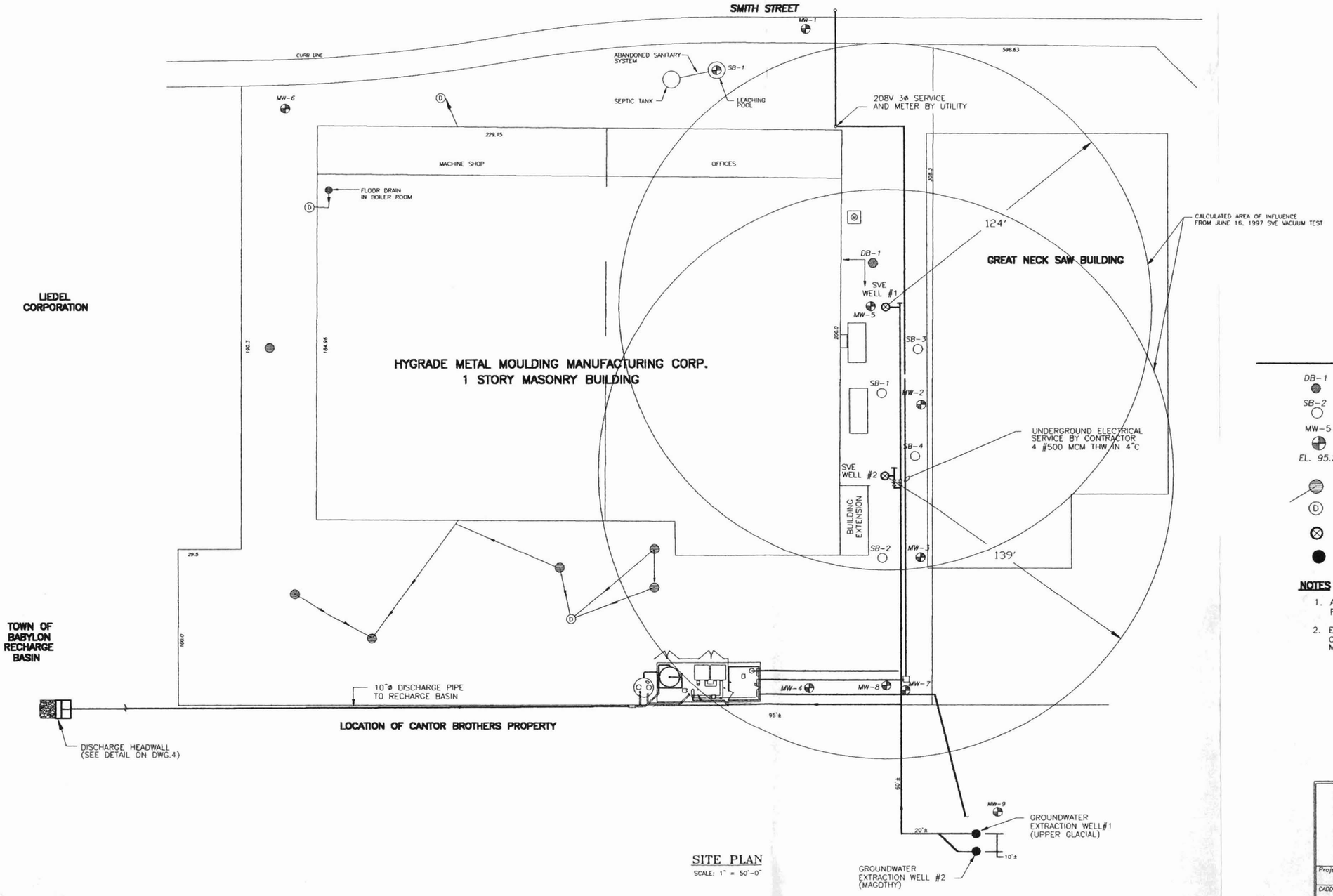
⑤ Complete the revised RI/FS and re-submit to DEC within three weeks of receiving the remaining laboratory reports from soil/and or groundwater sampling.

The anticipated completion date of this work, up to and including submission of the revised RI/FS, is September 30, 2000.

7.0 REPORTING

After the completion of field activities, as detailed in this workplan, the collected data and supplemental information will be summarized and incorporated into a revised version of the RI/FS report.

FIGURES



SITE PLAN
SCALE: 1" = 50'-0"

N

KEY

- DB-1 — DEEP SOIL BORING
- SB-2 — SHALLOW SOIL BORING
- MW-5, EL. 95.23 — EXISTING MONITORING WELL OR BORING WITH ELEVATION
- EXISTING DRYWELL (OPEN GRATE)
- (D) — EXISTING DRYWELL (COVERED)
- SVE SYSTEM
- GROUNDWATER EXTRACTION WELL

NOTES

1. ANY STRUCTURES NOT YET VERIFIED IN FIELD ARE TAKEN FROM PLANS FROM JOHN A. GRAMMAS, P.E. (MINEOLA, N.Y.)
2. ELEVATIONS OF MONITORING WELLS TAKEN ON NORTH SIDE OF PVC WELL CASING AND MEASURED RELATIVE TO MEAN SEA LEVEL (MSL).

PROPOSED SOIL BORING LOCATIONS

540 Smith Street
East Farmingdale, N.Y.

P.W. GROSSER CONSULTING ENGINEER & HYDROGEOLOGIST, P.C.
630 Johnson Ave. Suite 7
Bohemia, N.Y. 11716-2618
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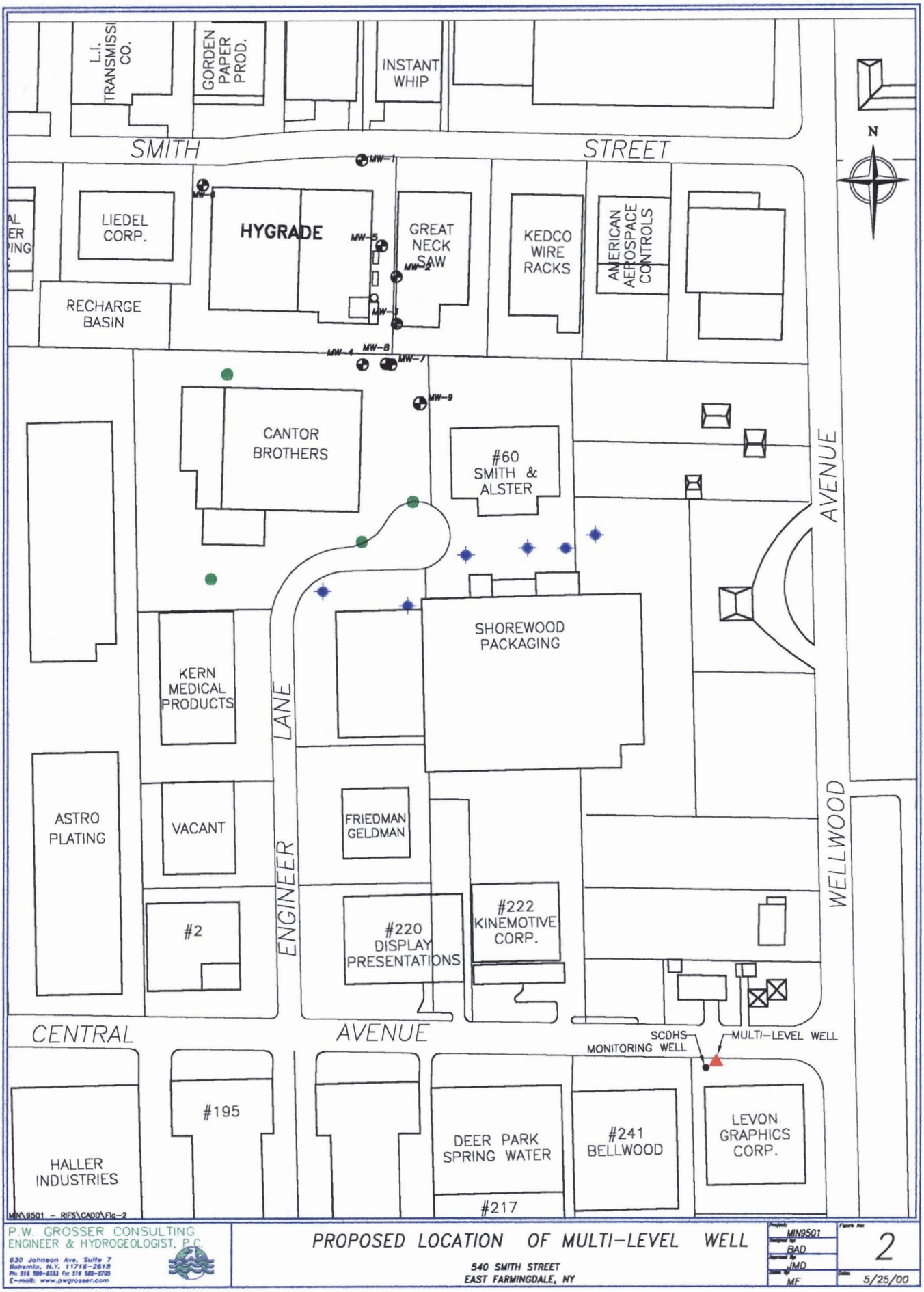
E-mail: www.pwgrosser.com

Project: MIN9603	Designed By: JPR	Figure No: 1
CADD Operator: MF	Approved By: PWG	Date: 5/25/00



MIN\9501 - RIFS\CADD\Fig-2

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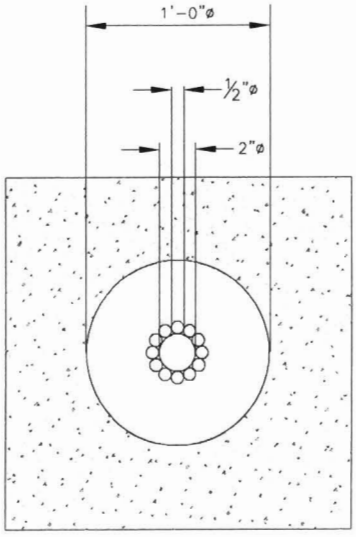
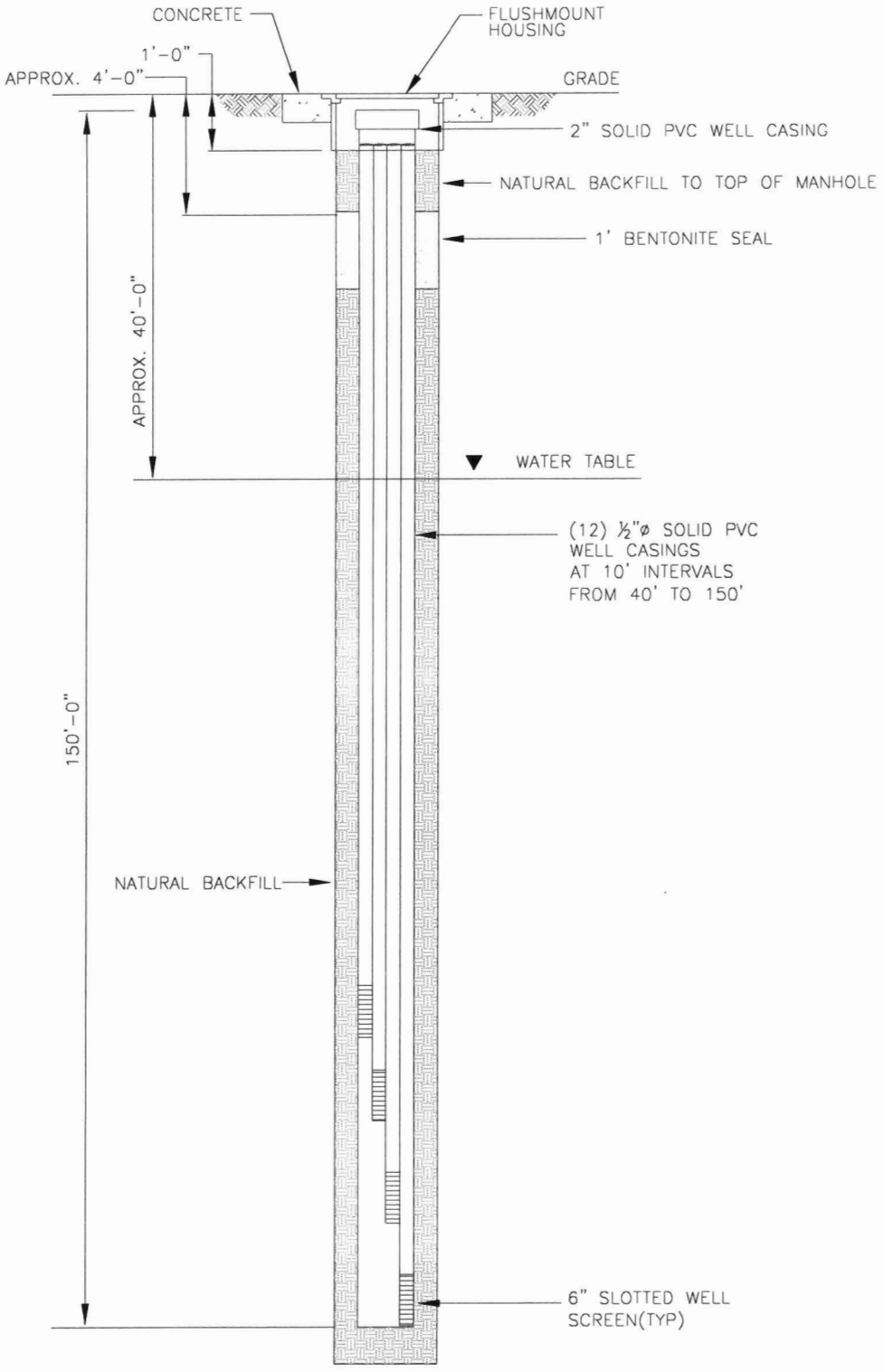
PROPOSED LOCATION OF MULTI-LEVEL WELL

540 SMITH STREET
EAST FARMINGDALE, NY

Project	MIN9501
Designed by	RAD
Approved by	JMD
Drawn by	MF
Figure No.	2
Date	5/25/00



PLAN VIEW
N.T.S.



CROSS-SECTION
N.T.S.

\MIN\9501 - RIFS\CADD\FIG-3

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MULTI-LEVEL WELL DETAIL

Project:	MIN9501
Designed by:	MBM
Approved By:	CBS
Drawn By:	MF
Figure No:	3
Date:	7/19/00

ATTACHMENT A

NYSDEC 7/18/00 Correspondence
PWGC 7/19/00 Response

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Eastern Remedial Action, Room 242
50 Wolf Road, Albany, New York 12233-7010
Phone: (518) 457-4349 FAX: (518) 457-4198

John P. Cahill
Commissioner

July 18, 2000

Charles Sosik
Project Engineer
P.W. Grosser Consulting Engineer & Hydrogeologist, P.C.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716-2618

RE: Minmilt Realty Site, Suffolk County
NYSDEC Site ID No 1-52-147.

Dear Mr. Sosik:

P.W Grosser, on behalf of Minmilt Realty, has submitted the revised work plan via e-mail entitled "Remedial Investigation, Supplemental Data Collection Work Plan, Minmilt Realty (Work Plan)." The New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation (DER) Bureau of Eastern Remedial Action and the New York State Department of Health (NYSDOH) have reviewed this plan, submitted in response to The April 25, 2000 NYSDEC comment letter on the Initial Remedial Measure (IRM) and draft Offsite Remedial Investigation and Feasibility Study Report (RI/FS) and the June 26, 2000 comment letter on the Work Plan.

The Work Plan, except for Section 7, can be approved by attaching this letter so that items 1 and 2 below can be addressed and work on sectons 5 and 6 can progress.

1. Page 1, Section 1.1, Last Bullet and Section 5, Groundwater Modeling: In addition to running a groundwater model using dilution factors, the NYSDOH wants the model to predict the time it would take for a plumeconcentration of 5ug/l of PCE to reach the wellhead, with no pumping effects.

2. The soil analytical results need to meet the NYSDEC Technical Assistance and Guidance Memorandum (TAGM) 4046 Soil Cleanup Objectives for SVE system closure. The Suffolk County Department of Health Services (SCDHS) Soil Gas Standards for Industrial/Commercial properties, based on Occupational Safety and Health Administration (OSHA) standards for action levels, can be compared to the SVE system effluent for compliance.

Comments on Section 7: Offsite Feasibility Study Report

What is the status of the outstanding comments from the April 25, 2000 letter on the Offsite

FS Report not discussed in this Work Plan? Specifically, this are comments 4 and 6 of this April 25 NYSDEC to P.W.A. Grosser correspondence. These changes can be covered by a letter from P.W.A. Grosser with respect to the Offsite FS. This letter must also detail how the Offsite RI/FS Report will be revised to accommodate the outstanding FS issues discussed during our June 2000 teleconference call.

If you have any questions, please contact me at (518) 457-3395.

Sincerely,

Steven M. Scharf, P.E.
Bureau of Eastern Remedial Action
Division of Environmental Remediation
(Offsiterifs.wpd)

cc: R. Cole, Minmilt Realty
F. Castellano, P.W. Grosser
J. Rhodes, P.W. Grosser
S. Robbins, SCDHS
W. Kuehner, NYSDOH

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July 19, 2000

Steven M. Scharf
Bureau of Eastern Remedial Action
Room 242
50 Wolf Road
Albany, NY 12233-7010

Re: Minmilt Realty Site, Farmingdale, NY.
NYSDEC ID No. 1-52-147

Dear Mr. Scharf:

The following discussion is presented to provide clarification and additional information on some of the issues raised in your April 25, 2000 letter. The items are addressed in the order in which they appeared in the letter.

SVE System

It appears that the SVE system may be approaching asymptotic levels. To evaluate the possibility of terminating the operation of this system, we will begin by advancing a soil boring within the dry well located on the east side of the building. Split spoon samples will be collected every ten feet at this location to the extent of contamination and screened in the field with a PID. The sample with the highest reading above the water table and the sample with the highest reading below the water table will be submitted for analysis of VOCs (EPA8260 ASP "B"). Collecting this data will provide a complete vertical profile of residual contamination within the source area, and will allow us to evaluate and enhance both the SVE and P&T system. If the "bulk" of the contamination is shallow, excavation of the drywell and impacted soil may be considered.

Once the vertical distribution of sorbed contamination is known, we can determine if continued operation of the SVE system is warranted in it's present configuration. If significant contamination is present just below the surface of the present water table (1-5 ft.), it may be beneficial to temporarily suspend operation of the system until the water level drops in response to seasonal conditions (Fall-winter).

If necessary, additional vadose-only borings will be advanced at key locations to further establish completion of the vadose clean-up at a later date.

P&T System

Initial discussions with the owners of the Cantor Brothers Building should make it unnecessary to relocate the recovery wells in the near future. The discussion resulted in an understanding whereby accommodations will be arranged to continue access to the wells in the event that the building is expanded over their current location.

New pumps have been ordered for both recovery wells (Magothy, Glacial) and will be installed shortly. Flow rates in the Glacial well were reduced from 200 to 80 gpm since October 1999 due to an undetermined problem with the pump. Flow rates have essentially been unchanged in the Magothy well.

PWGC has investigated the increasing trend in PCE at SP4 from 280 ug/l during the October 1999 sampling round to 3,700 ug/l in December 1999 and 6,400 ug/l in March 2000. Due to the proximity of the extraction well to the source area, and the narrow width of the point source, it is extremely unlikely that the edges of the PCE plume have somehow migrated around the extraction well. Even with the reduced flow rate of 80 gpm, the projected width of the capture zone would span a distance of 350 ft. The most probable explanation for the increase at SP4 is the retreat of the downgradient "stagnation point" from 170 to 60 feet from the extraction well, as the flow rate was reduced from 200 to 80 gpm. This would occur as remnants of the original PCE plume, caught in the area between opposing flow directions (GW Divide), was suddenly released to continue migrating south with the groundwater.

After the vertical position and nature of the residual contamination is established with the source area soil boring, supplemental or enhanced recovery options will be evaluated. As requested, a table will be included in the next status report which identifies the screened interval of all monitoring wells.

Risk Assessment

As discussed, the risk assessment submitted to the NYSDEC in July 1996 identified and evaluated the risks to a construction worker, involved in the installation of the remediation system, as the only potential exposure pathway. Due to the on-site focus of the risk assessment, the NYSDEC and NYSDOH approved the risk assessment for on-site purposes only. This document will be appended to include the systematic identification of all current and future potential exposure scenarios and a detailed analysis of all potential completed pathways. The revised risk assessment will then be re-submitted to the NYSDEC and the NYSDOH to establish target clean-up goals for the site.

RI/FS

Executive Summary - remove recommended option:

The statement regarding the recommended course of action in the executive summary will be removed, but will be identified in a separate section of the RI/FS.

Fate & Transport - State time frame for leading edge of plume to reach Gordon Avenue Wellfield:

The model results reported the time for the peak concentration to reach the wellfield. This is equivalent to the advective contaminant velocity (less than the groundwater velocity due to retardation). The effects of hydrodynamic dispersion, which cause the plume to spread at something beyond advective velocity, will cause the edge of the plume to reach the receptor sooner. Hydraulic gradients will also steepen within the well's area of influence increasing the flow velocity to the well.

To predict when the leading edge of the plume reaches the wellfield, it will be necessary to define the concentration which will be considered the "leading edge"and the point where the prediction will be made. There are three factors which will reduce the PCE concentration of the plume at the receptor (wellhead): hydrodynamic dispersion, reductive dechlorinization and dilution. In the BIOSCREEN model dispersion is calculated based on plume length in the longitudinal direction using the Xu & Eckstein formula (1995), and in the transverse direction using the formula from Gelhar and others (1992). Vertical dispersivity is expected to be insignificant for plume lengths greater then or equal to the aquifer thickness, and is not considered in the BIOSCREEN model. Based on the lack of transformation products in the on-site and near on-site monitoring wells, degradation is not expected to play a significant role in reducing contaminants and will

not be evaluated with the model. Sampling for geochemical indicators will provide a better understanding regarding the potential for natural attenuation, if any. Dilution at the wellhead can be calculated from the volumetric flow rate through the source area and the pumping rate of the supply well as follows:

Supply well pump rate: 900 gpm (173,262 ft^3/d)
Source area thickness: 100 ft
Source are width: 200 ft
Porosity: 0.30
Groundwater flow rate 0.5 ft/d

173,262 ÷ 100 x 200 x 0.5 x 0.3 = 57 .75

A dilution ratio of 57 to 1 indicates a concentration of 250 ug/l at the receptor to meet the MSL of 5 ug/l at the wellhead. Since the flow field will change, increasing the groundwater velocity near the supply well, the leading edge of the plume will be evaluated at an imaginary compliance point located 1,000 feet upgradient of the well field. Use of a compliance point in this manner will be conservative in that the travel times will be considerably less than that of the arrival time at the receptor, due to the reduced transport distance and the effects of dispersion.

To comply with requests made by the SCDHS, the model will also be used to evaluate the arrival time of the PCE plume at the receptor at a concentration of 5 ug/l. As per SCDHS, increased flow velocities within the pumping well capture zone will not be included in the evaluation.

Remedial Alternative Costs:
Remedial alternative costs were provided under section 5.1 and included capital costs, one year O & M and estimated total 10 year costs for each alternative. A further breakdown for each item will be provided.

Monitored Natural Attenuation:
In the report, the discussion on MNA describes the Minmilt plume as exhibiting a USEPA class 3 behavior. Class 3 plumes do not appreciably degrade. As such attenuation mechanisms evaluated by the model were based exclusively on hydrodynamic dispersion. To monitor the plume and water quality downgradient of the site, a multi-level sampling well will be installed on Central Avenue. The well will include 12, one-inch diameter samplers set at ten foot intervals from 150 feet to the water table. After the well is installed, it will be sampled for VOCs and Geochemical parameters. Sampling will coincide with a regularly scheduled quarterly sampling event. Geochemical parameters will also be included in the analysis of samples from selected monitoring wells during this event.

Cost of Full Plume Containment:
A discussion was provided which described the unknowns associated with preparing cost for this alternative, and the assumptions that were made to arrive at the figure presented. A detailed breakdown of the costs associated with this and the other alternatives will be provided.

Wellhead Treatment Contingencies:
The letter states that since the time frame for PCE impact to the municipal well exceeds 30 years, a cost for wellhead treatment is not required. Section 5.1.5 discusses the wellhead treatment alternative and concludes that the travel distance, migration times and presence of multiple sources make this approach impractical. As such, a cost for the alternative was not provided.

The alternative will be evaluated along with the other alternatives in accordance with the methodology described in " Selection of Remedial Actions At Inactive Hazardous Waste Sites" NYSDEC TAGM, HWR-90-4030.

Evaluation of Alternatives:
A section will be inserted between 5.1 and 5.2 which evaluates the alternatives as per the above referenced NYSDEC guidance document.

The remaining items discussed in your letter require minor additions and/or corrections which will be modified as requested. It appears that we are very close to finalizing the RI/FS and completing a ROD for this project. The additional work discussed in this letter will be detailed in a workplan which will be submitted to you shortly. We will suspend revising the RI/FS until this work is completed so that the results can be incorporated into this document. Please feel free to contact me with any questions or comments.

Very truly yours,

Charles Sosik
Senior Hydrogeologist

cc: R. Cole, Minmilt
F. Castellano, PWGC