# Interim Remedial Measures Work Plan
Utility Manufacturing Company
700 Main Street
Westbury, New York

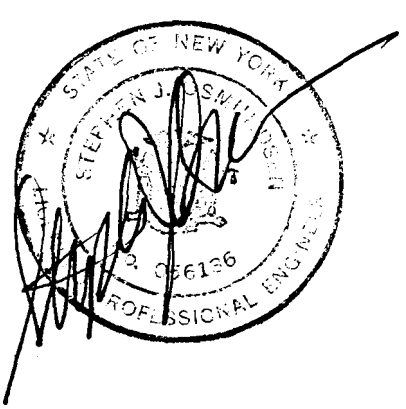
August 2001

Prepared for:

Utility Manufacturing Company
700 Main Street
Westbury, New York 11590

Prepared by:

CA RICH CONSULTANTS, INC.
17 Dupont Street
Plainview, New York 11803



**CA RICH CONSULTANTS, INC.**
CERTIFIED GROUND-WATER AND
ENVIRONMENTAL SPECIALISTS

August 7, 2001

**NYSDEC**
50 Wolf Road
Albany, New York 12233-7010

Attention: Jeffrey Dyber, P.E.

Re: **Interim Remedial Measures Work Plan**
**Utility Manufacturing Company**
**700 Main Street**
**Westbury, New York**

Dear Mr. Dyber:

Attached is a copy of our Interim Remedial Measures Work Plan for the above referenced site.

If there are any questions regarding this Work Plan, please do not hesitate to call our office.

Sincerely,

**CA RICH CONSULTANTS, INC.**

Eric A. Weinstock
Associate

Stephen J. Osmundsen, P.E.
Project Engineer

cc: Audie Kranz
Miriam Villani, Esq.
Chittibabu Vasudevan, P.E.
Alali Tamuno, Esq.
Jacqueline Nealson

Attachments

17 DUPONT STREET, PLAINVIEW, NEW YORK 11803 • TEL 516/576-8844 • FAX 516/576-0093

**New York State Department of Environmental Conservation**
**Division of Environmental Remediation**
**Bureau of Eastern Remedial Action, 11th Floor**
625 Broadway, Albany, New York 12233-7015
**Phone:** (518) 402-9621 • **FAX:** (518) 402-9627
**Website:** www.dec.state.ny.us

Erin M. Crotty
Commissioner

**HAND DELIVERED**

August 3, 2001

Eric A. Weinstock
CA Rich Consultants, Inc.
17 Dupont Street
Plainview, New York 11803

Dear Mr. Weinstock:

Re: Utility Manufacturing Site (1-30-043H)
Town of North Hempstead, Nassau County
Proposed IRM Operable Unit 02 On-site Groundwater

The Department has approved the Interim Remedial Measures (IRM) Work Plan dated July 5, 2001. Please deliver nine (9) copies of the final IRM Work Plan to me by August 9, 2001. Construction of the SVE system shall begin no later than October 2, 2001, as indicated in the IRM Work Plan. Should you have any questions, please contact me at (518) 402-9621.

Sincerely yours,

Jeffrey L. Dyber, P.E.
Project Manager
Remedial Section A
Bureau of Eastern Remedial Action
Division of Environmental Remediation

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## FIGURES

**Interim Remedial Measures Work Plan**
**Utility Manufacturing Company**
**700 Main Street**
**Westbury, New York**
**Site Number: 130043H**

## 1.0 INTRODUCTION

The following Interim Remedial Measures (IRM) Work Plan was prepared by CA RICH Consultants, Inc. (CA RICH) on behalf of the Utility Manufacturing Company (Utility). The IRM Work Plan was prepared in accordance with an Order on Consent, Index Number W1-0795-97-06. For the purposes of this IRM Work Plan, the contaminants of concern are perchloroethene (a.k.a. PCE or tetrachloroethene); trichloroethene (TCE); 1,1,1-trichloroethane (TCA) and their degradation products.

The Work Plan addresses the remediation of an area of the Upper Glacial Aquifer located in the southwest portion of the property. The estimated thickness of the Upper Glacial Formation at this location is 100 feet and the depth to the water table is approximately 55 feet.

A series of previous investigations were performed at this site by both the NYSDEC and Utility. A detailed summary of these previous investigations is described in the Remedial Investigation prepared for this site. The following is a partial list of these previous investigations.

| Investigation | Date |
|---|---|
| NYS Superfund Contract, Site Investigation Report New Cassel Industrial Area (Ref. 1) | February 1995 |
| NYS Superfund Contract, Multisite PSA Report New Cassel Industrial Area (Ref. 2) | March 1996 |
| NYS Superfund Contract, Multisite PSA Report New Cassel Industrial Area (Ref. 3) | March 1997 |
| Focused Remedial Investigation, Utility Manufacturing/ Wonder King, Anson Environmental, Ltd. (Ref. 4) | January 1999 |
| On-Site Groundwater Investigation, Utility Manufacturing/ Wonder King, Anson Environmental, Ltd. (Ref. 5) | December 2000 |

## 2.0 PHYSICAL SITE CHARACTERISTICS

### 2.1 Site History

The Utility Manufacturing / Wonder King site consists of a parcel approximately one acre in size. The property contains one building that was constructed in 1967. The ground surface around three sides of the building is improved with pavement. A narrow unpaved area exists on the west side of the building. A Site Plan is included as Figure 1.

Utility is a chemical blending and packaging plant that has operated at this facility since 1976. The company manufactures a variety of cleaning and lubricating products for commercial and industrial customers. The building is constructed with a concrete slab on grade and there are no known floor drains within the structure. Raw materials are stored in above ground tanks within the facility that are registered and inspected periodically. There are also two 4,000 gallon underground storage tanks below the rear of the property that store tetrahydrafuran and acetone.

The services of Safety Kleen are used to provide mineral spirits for use in cleaning silk screens in the plant. Safety Kleen disposes of the used mineral spirits and provides the plant with new product on a contract basis. This is the only chemical waste generated at this Facility.

### 2.2 Geologic Setting

Utility is situated upon the glacial outwash soil deposits of Long Island at an elevation of approximately 120 feet above mean sea level. The Upper Glacial Formation at this site includes a layer of clay that occurs at a depth of approximately 38 to 40 feet below grade in the rear of the parking lot. The configuration of this "40-foot" clay layer based on references 4 and 5 is included as Figure 2. Based upon field measurements from the five wells installed during the Remedial Investigation (Ref. 4), the regional direction of shallow groundwater flow is to the southwest. The depth of the water table occurring within the underlying Upper Glacial Formation is approximately 55 feet below land surface.

The Upper Glacial Formation is underlain at a depth of approximately 100 feet by the Magothy Formation, the principal water supply aquifer for most of Nassau County. The Magothy Formation is, in turn, underlain by the Raritan Formation. The Raritan Formation is composed of the upper Raritan Clay, a regional confining layer, followed by the more permeable Lloyd Sand. The Lloyd Sand sits directly upon crystalline bedrock.

### 2.3 Evaluation of Previous Groundwater Sample Analyses

Based on the Remedial Investigation, site wells MW- 1, 2 and 3 are located along the upgradient property boundary of the facility and monitor the quality of the groundwater entering the property. Well MW-4 is installed to monitor perched groundwater that collects on the surface of the "40-foot" clay layer discussed earlier. Well MW-5 is a water table well that monitors the area with the highest levels of VOCs identified at the site. The location of these wells are illustrated on Figure 1. A summary of the May, 1998 R.I. results for PCE, TCE and TCA are tabulated below:

| Compound (in ppb) | Well Numbers MW-1 | MW-2 | MW-3 | MW-4 | MW-5 |
|---|---|---|---|---|---|
| PCE | 12.2 | 148 | 142 | 118 | 876 |
| TCE | ND | ND | 11.4 | 52.1 | 69.6 |
| TCA | ND | ND | ND | ND | 24.4 |

## 3.0 Interim Remedial Measures Design

The IRM design proposed for this facility consists of two systems. A Soil Vapor Extraction (SVE) system is proposed to collect and treat the remaining PCE, TCE, TCA and their degradation products from the vadose zone below the parking lot. Vacuum monitoring probes will be installed to measure the effectiveness of this system.

Concurrent with the SVE system, an Air Sparging (AS) system is proposed to strip PCE, TCE, TCA and their degradation products from the ground water in the Upper Glacial Formation beneath the property. The effectiveness of the AS equipment will be monitored using a multi-depth monitoring well installed at the downgradient corner of the property.

### 3.1 Soil Vapor Extraction Well Design

The SVE system for this site will include SVE wells in two locations in the rear parking lot. The location of each of these SVE wells is presented on Figure 3 of this Work Plan and are subject to change based on utility clearances and site conditions. The placement of these two SVE wells incorporates a radius of influence (ROI) of approximately 75 feet. We believe this ROI will be adequate for the site conditions at this Facility.

The SVE wells will consist of combined shallow and deep screened sections and will be installed using a hollow stem auger drill rig in one common borehole. One air sparge point will also be installed in each borehole. A section of 2-inch diameter, Schedule 40 PVC, 0.020-inch slotted (20 slot) PVC well screen will be installed from a depth of 45 to 50 feet below grade and below the "40-foot" clay layer discussed in section 2.2 of this Plan. This will be followed by PVC pipe to the ground surface. Morie number 2 sand will be placed around the well screens followed by a bentonite seal around the PVC pipe in the area of the clay layer. Native sand and gravel from the borehole will be used as backfill above the seal.

A shallow SVE well constructed of 0.020-inch slotted (20 slot) PVC well screens will then be installed above the clay layer at a depth of 15 to 25 feet below grade. This will be followed by a separate PVC pipe to the ground surface. A schematic profile of a typical AS point/SVE well is presented on Figure 4. Details of the AS point design are included in Section 3.4 below.

### 3.2 Soil Vapor Extraction System Design

Each of the SVE wells will be completed at grade with a regulating valve arranged such that each SVE screened section can be operated independently. The wells will then be connected to a 2-inch diameter PVC header line that will be trenched over to a storage trailer as shown on Figure 4.

A 2.5 horsepower regenerative blower capable of developing 145 cfm with 10 inches of water vacuum is proposed for this project. The blower, moisture knock-out drum and associated equipment will be placed in the storage trailer. Two 85-gallon carbon drums will be placed downstream of the blower to treat the extracted soil vapor as required in NYSDEC's Air Guide-1 (Ref. 6). Allowing for mixing and dispersion, these values will be multiplied by 100 and used as a guidance concentration in monitoring the discharge from the SVE unit.

At the near by Tishcon Corporation site (Site Number: 130043E), a total of 58 feet of SVE screens were installed and connected to a 185 cfm blower. This resulted in a ratio of 3.2 cfm per foot of SVE screen. Using this design, a vacuum radius of influence on the order of 100 feet was measured. Our design includes the installation of 30 feet of SVE screens and 145 cfm blower.

This results in a ratio of 4.8 cfm per foot of screen. Based on our measurements at the Tishcon site, the vacuum radius of influence produced by this blower should be adequate for the Utility project.

A 4-inch PVC discharge stack will be attached to the side of the container with the discharge point at a height of 6 feet above the existing container elevation. An electrical connection will be made directly from the blower to a utility panel inside the building.

### 3.3 Installation of Vacuum Monitoring Probes

Three borings will be installed and completed as Vacuum Monitoring Probes (VMPs) at the locations shown on Figure 4. The purpose of these probes will be to measure the area of influence (i.e. vacuum) created in the subsurface by the operation of the SVE system.

A two foot length of 0.020-inch slotted (20 slot), one-inch diameter PVC screen followed by 10 feet of one-inch diameter solid PVC pipe along with native sand and gravel will be placed in each of these boreholes. They will, in turn, be finished at grade with one-inch slip caps and flush-mounted covers. A typical vacuum monitoring probe profile is included as Figure 4.

### 3.4 Air Sparging Point Design

A total of 2 air sparging points will be installed using a hollow stem auger rig at the locations illustrated on Figure 3 using the same boreholes as the SVE wells. Each of the sparge points will be constructed of 2-inch diameter x 2-foot long 0.020-inch slotted (20 slot) PVC well screens connected to 2-inch diameter PVC pipe. The sparge points will be placed from 103 to 105 feet below grade or to the top of the Magothy Formation, which ever is encountered first. Each sparge point will be surrounded with a Morie No. 1 sand pack followed by a 5 foot thick bentonite seal. A schematic profile of a typical AS point/SVE well is presented on Figure 4.

The locations of each of these air sparge points are presented on Figure 3 of this Report and are subject to change based on utility clearances and site conditions. The placement of these two sparge points incorporates a radius of influence (ROI) of approximately 25 feet depending on the final location of the wells. We believe this ROI will be adequate for the site conditions at this Facility.

### 3.5 Air Sparging System Design

Air sparging will be achieved through the use of an on-site air compressor. The two air sparging points will be connected to an air compressor capable of developing a minimum of 15 cfm with 100 pounds per square inch (psi) of pressure reduced by a pressure regulating valve to an operating pressure of approximately 20 to 25 psi. The basis for this design is the pressure required to displace the column of water in the sparge point and the head loss across the screened section of the point. Based on our measurements at the nearby Tishcon site (Site Number: 130043E), the sparging radius of influence produced by this compressor should be adequate for the Utility project.

The air compressor will be placed in a storage trailer located in the parking lot along with the SVE blower. An electrical connection will be made directly from the air compressor to a utility panel inside the building.

Each of the air sparging points will be connected to the air blower using 1/2-inch diameter nylon tubing placed in conduit extending from the sparge points and connected to the storage trailer as shown on Figure 4. A regulating valve will be installed to allow for adjustment of the operating pressure of the system.

### 3.6 Installation of On-Site Multi-Depth Monitoring Wells

One multi-depth well cluster, to be designated as MW-7S, 7I and 7D, will be installed at the downgradient corner of the property as shown on Figure 1. The purpose of this well cluster is to confirm the depth to the top of the Magothy Formation, delineate the vertical extent of volatile organic compounds in the groundwater, and to monitor the effectiveness of the air sparging system once it is placed into operation. A hollow stem auger drill rig will be mobilized to the site. Using 4-inch diameter hollow stem augers, a boring will be drilled. Split barrel core samples will be collected at 10 foot intervals to determine soil characteristics for the SVE wells and AS points. Samples will be collected at 5 foot intervals at the 35 foot depth to obtain a sample of the "40-foot" clay and at 95 feet to obtain a sample of the top of the Magothy Formation. The contact with the Magothy Formation will be determined by the Geologist supervising the drilling operation by the presence of clay and mica in the core sample.

Once the depth to the top of the Magothy Formation is determined, the 4-inch diameter augers will be removed from the ground and 6-inch diameter hollow stem augers equipped with a bottom plug will be advanced. A cluster of three, 2-inch diameter wells will be installed in the 6-inch augers. The lowest screen will be set with the bottom of the screen resting at the contact with the Magothy Formation. The shallowest well screen will be installed to intersect the encountered water table. The intermediate screen will be installed at the midpoint between the shallow and deep screens.

These two-inch diameter PVC wells will be installed using 0.020-inch slotted (20 slot) pipe and No. 1 sand as provided by the Jesse Morie Company. The deep and intermediate wells will have 10 foot long screens and the shallow well will have a 15 foot long screen set 10 feet into the encountered water table. The seals between the screens will be placed by pumping a thick bentonite slurry into the bottom of the augers using a side-discharging tremie line. The bentonite seals will be placed after the sand packs have been set into place. The wells will be completed with drill cuttings placed above the upper bentonite seal. The well will be furnished with locking caps and a bolting, flush-mounted cover.

## 4.0 Remediation System Monitoring and Equipment Termination Criteria

The following monitoring schedule has been developed for the operation of the SVE unit and the AS system. Evaluation of historical plots of the data generated during the operation of this equipment will be used to determine when it is appropriate to shut off the remediation equipment.

### 4.1 SVE Unit Monitoring and Termination Criteria

Once the SVE equipment has been installed and is ready to be placed into operation, an initial "base line" soil vapor sample will be collected of the untreated vapor stream between the exhaust side of the blower and the inlet side of the carbon canisters using absorbent tubes. The sample tubes will be sent to a ELAP-approved laboratory for analysis of halogenated volatile organics including PCE, TCE & TCA and their degradation products using GC methodologies. In addition, an 10.2ev HNU™ or another appropriate PID will also be used to screen the amount of VOCs in the untreated vapor stream.

Prior to the initial start up of the SVE system, a round of static vacuum measurements will be measured at each of the 3 Vapor Monitoring Probes (VMPs) using a magnehelic. The blower will then be started and each of the two clustered SVE wells will be tested separately. While this first SVE cluster wells is under vacuum, the vacuum in the 3 VMPs and in the second SVE cluster wells will be measured until stabilized vacuum readings are recorded. The test will be repeated by placing a vacuum on the second cluster well and measuring the vacuum in the 3 VMPs and the first cluster well. A final test will then be run with both SVE wells under vacuum. These readings will be plotted on a base map and provided to the NYSDEC as an attachment to the monthly progress report. A guideline of 0.10 inches of $H_2O$ vacuum as measured in the field on a magnehelic will be used to determine the radius of influence of the SVE wells.

Total VOC measurements using a Photo Ionization Detector (PID) will be collected on a frequency of at least once per week during the first month the system is in full operation. After the first month, PID readings will be collected either monthly or as needed to evaluate the progress of the cleanup. In addition to the PID readings, absorbent tube samples will be collected on a quarterly basis.

As the operation of the SVE unit progresses, the PID and absorbent tube data will be plotted versus time of operation on graphs. Once the levels of total VOCs in the SVE wells decreases to a near constant or asymptotic concentration, operation of the system will be suspended. Graphs of the concentration of total VOCs versus time will be compiled after each round of quarterly monitoring.

The SVE also serves to capture off-gassing contaminants from the AS system. Therefore, regardless of the criteria described above, the SVE system will remain in operation as long as the AS system described in the next section is in operation.

### 4.2 AS System Monitoring and Termination Criteria

The on-site multi-depth well cluster (MW-7s, i & d), well MW-4 and well MW-5 will serve as compliance points for the operation of this remediation system. Wells MW-1, 2 & 3 will serve as up-gradient monitoring points. Prior to start up of the AS system, "base line" samples will be collected from these compliance wells.

Prior to start up of the air sparge system, a pilot test will be performed. The depth to water in wells MW-7s, i & d, MW-3, 4 & 5 will be recorded. The two air sparge points will then be turned on and readings will be measured from the wells mentioned above. Measurements will continue until the readings stabilize or for a maximum of 4 hours. The results from the air sparging pilot test will be forwarded to the NYSDEC as an attachment to the following month's progress report.

The samples from well MW-1, 2 & 3 will serve as upgradient monitoring wells to determine the quality of ground water entering the property from upgradient areas. Once placed in full operation, the compliance wells will be sampled on a quarterly basis and analyzed for halogenated volatile organics using EPA method 8010, 8021 or a similar, approved method. Graphs of the concentration of total VOCs versus time will be compiled after each round of quarterly monitoring. The system will be kept in operation until the concentration of PCE, TCE, TCA and their degradation products meets the criteria established in this Plan.

The AS/SVE system will remain in operation until the groundwater samples from the compliance wells indicate that: 1) they meet the Standards, Criteria and Guidance (SCGs) for PCE, TCE, TCA and their degradation products; 2) the data shows that PCE, TCE, TCA and their degradation products have reached an asymptotic condition and the system is no longer effectively removing the contaminants of concern; or, 3) the concentration of PCE, TCE, TCA and their degradation in the compliance wells is equal to or less than the concentrations in the up-gradient monitoring wells.

## 5.0 Remedial Action Schedule

The following schedule has been developed for this project.

**Plans**

| | |
|---|---|
| Submission of IRM Work Plan | July 2001 |
| NYSDEC approval of Work Plan | |

**Field Activities**

| | |
|---|---|
| Ordering and procurement of equipment | 30 days after DEC approval |
| Installation of SVE wells and Air Sparging points | 60 days after DEC approval |
| Installation of equipment shed, blower & air compressor | 120 days after DEC approval |
| System start up | 180 days after DEC approval |

## 6.0 REFERENCES

1. NYSDEC (February 1995), NYS Superfund Contract, Site Investigation Report, New Cassel Industrial Area.

2. NYSDEC, (March 1996), NYS Superfund Contract, Multisite PSA Report, New Cassel Industrial Area.

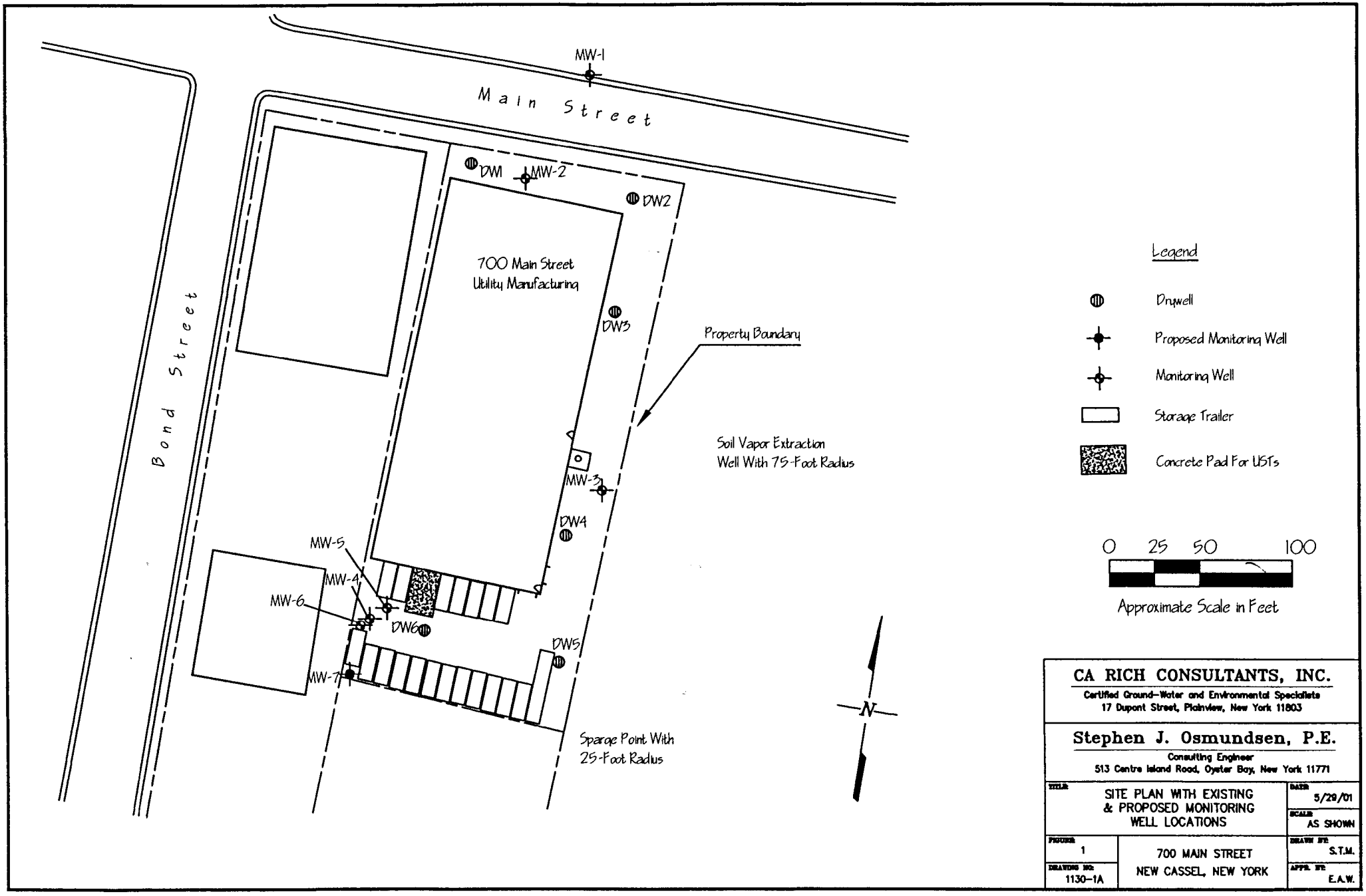
3. NYSDEC, (March 1997), NYS Superfund Contract, Multisite PSA Report, New Cassel Industrial Area.

4. Anson Environmental, Ltd., (January 1999), Focused Remedial Investigation, Utility Manufacturing/Wonder King,

5. Anson Environmental, Ltd , (December 2000), On-Site Groundwater Investigation, Utility Manufacturing/Wonder King.

6. NYSDEC, (1991), Draft New York State Air Guide – 1, Guidelines for the Control of Toxic Ambient Air Contaminants.

# FIGURES

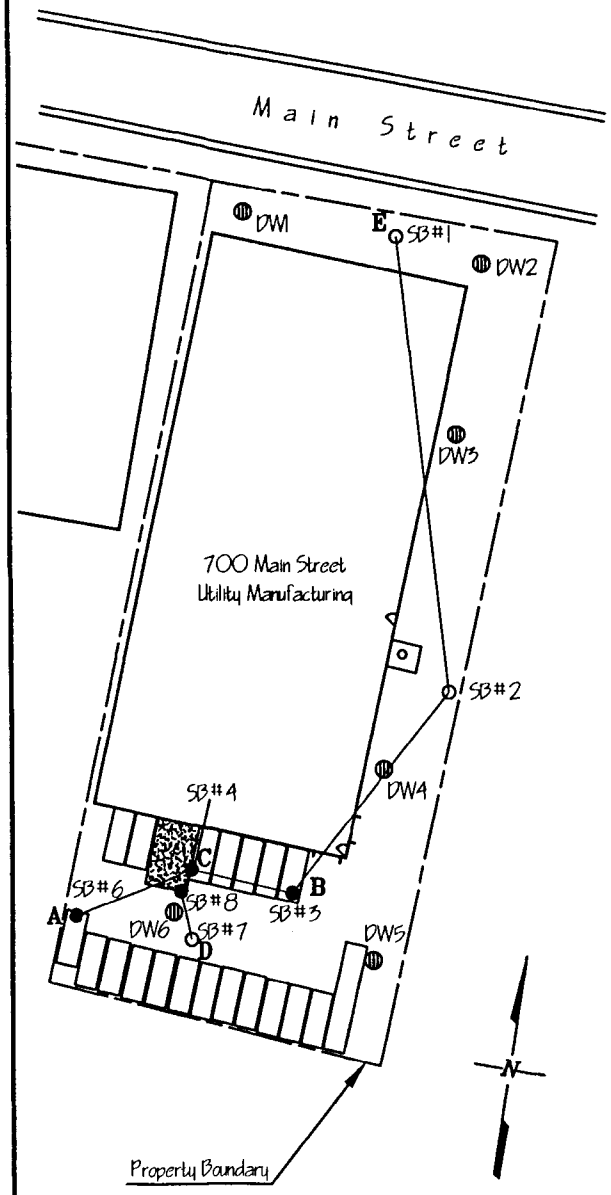


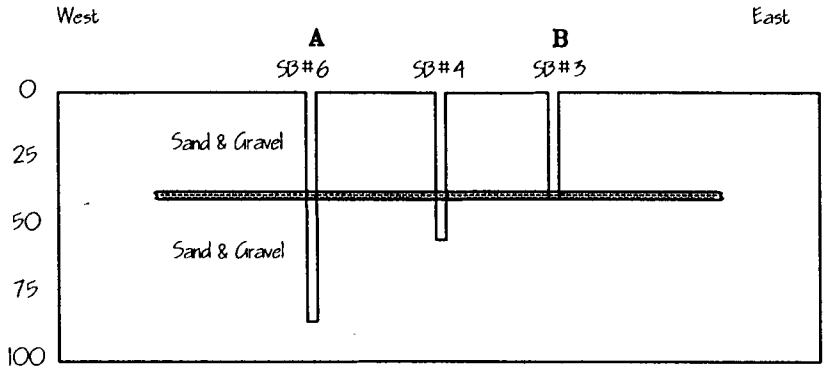


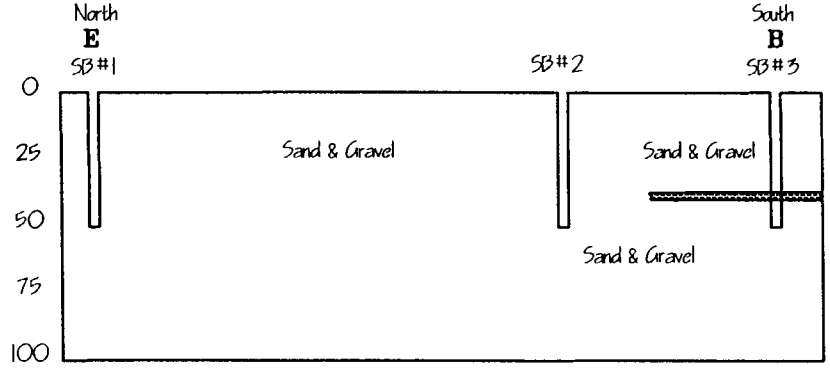
**CA RICH CONSULTANTS, INC.**
Certified Ground-Water and Environmental Specialists
17 Dupont Street, Plainview, New York 11803

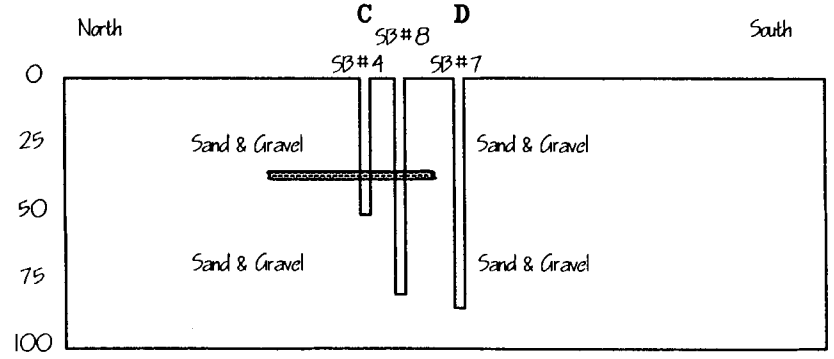
**Stephen J. Osmundsen, P.E.**
Consulting Engineer
513 Centre Island Road, Oyster Bay, New York 11771


| | | |
|---|---|---|
| TITLE: SITE PLAN WITH EXISTING & PROPOSED MONITORING WELL LOCATIONS | | DATE: 5/29/01 |
| | | SCALE: AS SHOWN |
| FIGURE: 1 | 700 MAIN STREET NEW CASSEL, NEW YORK | DRAWN BY: S.T.M. |
| DRAWING NO: 1130-1A | | APPR. BY: E.A.W. |

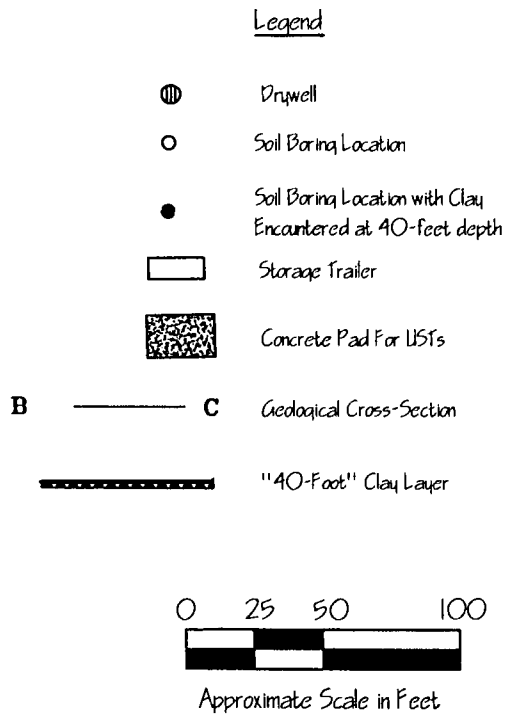



**Geological Cross-Sections**





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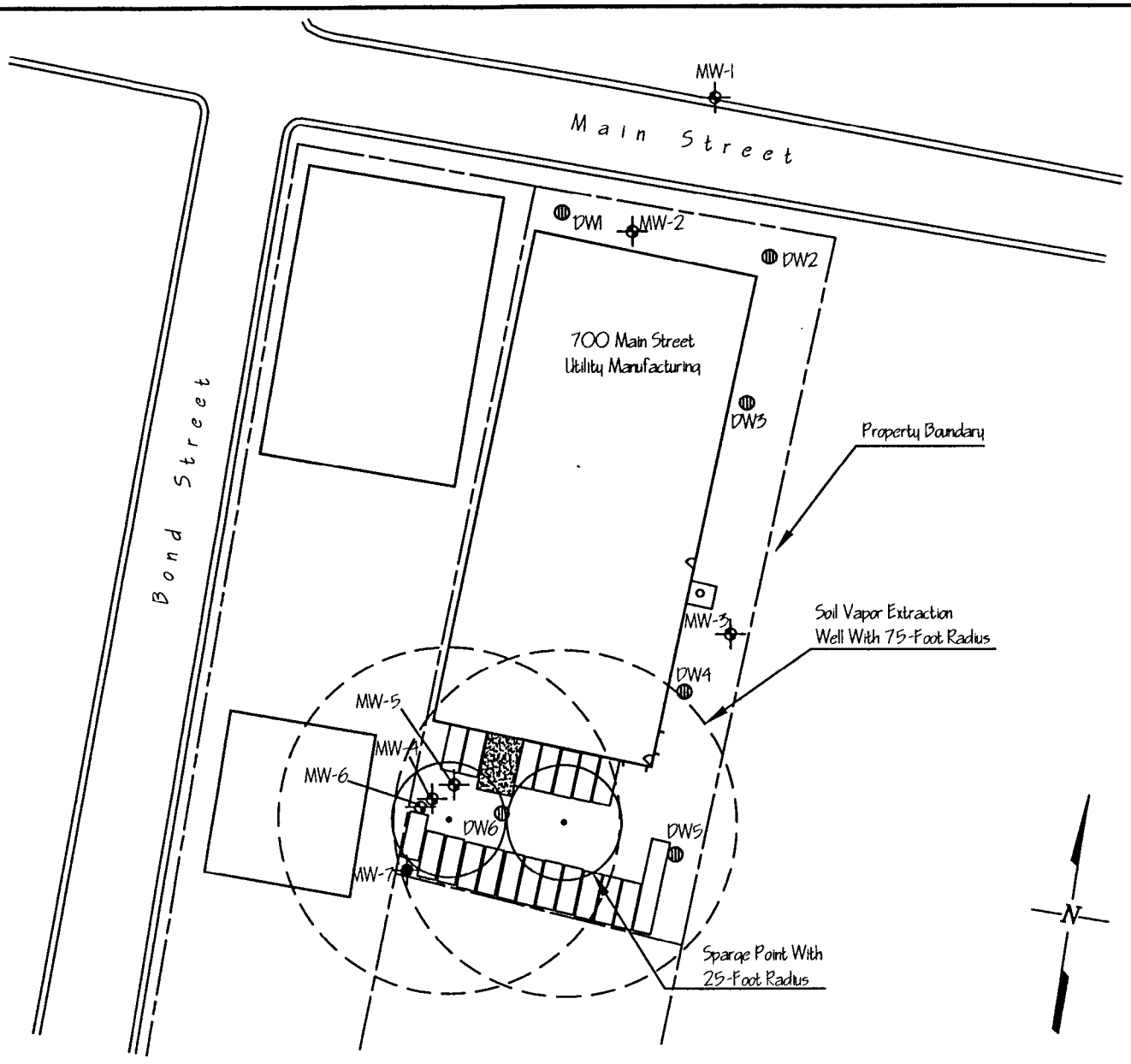
17 Dupont Street, Plainview, New York 11803

**Stephen J. Osmundsen, P.E.**
Consulting Engineer
513 Centre Island Road, Oyster Bay, New York 11771


| | | |
|---|---|---|
| TITLE: SOIL BORING LOCATION MAP WITH GEOLOGICAL CROSS-SECTIONS | | DATE: 5/31/01 |
| | | SCALE: AS SHOWN |
| FIGURE: 2 | 700 MAIN STREET NEW CASSEL, NEW YORK | DRAWN BY: S.T.M. |
| DRAWING NO: 1130-1C | | APPR. BY: E.A.W. |




Legend

- Drywell
- Proposed Monitoring Well
- Monitoring Well
- Storage Trailer
- Concrete Pad For USTs

0 25 50 100

Approximate Scale in Feet


**CA RICH CONSULTANTS, INC.**
Certified Ground-Water and Environmental Specialists
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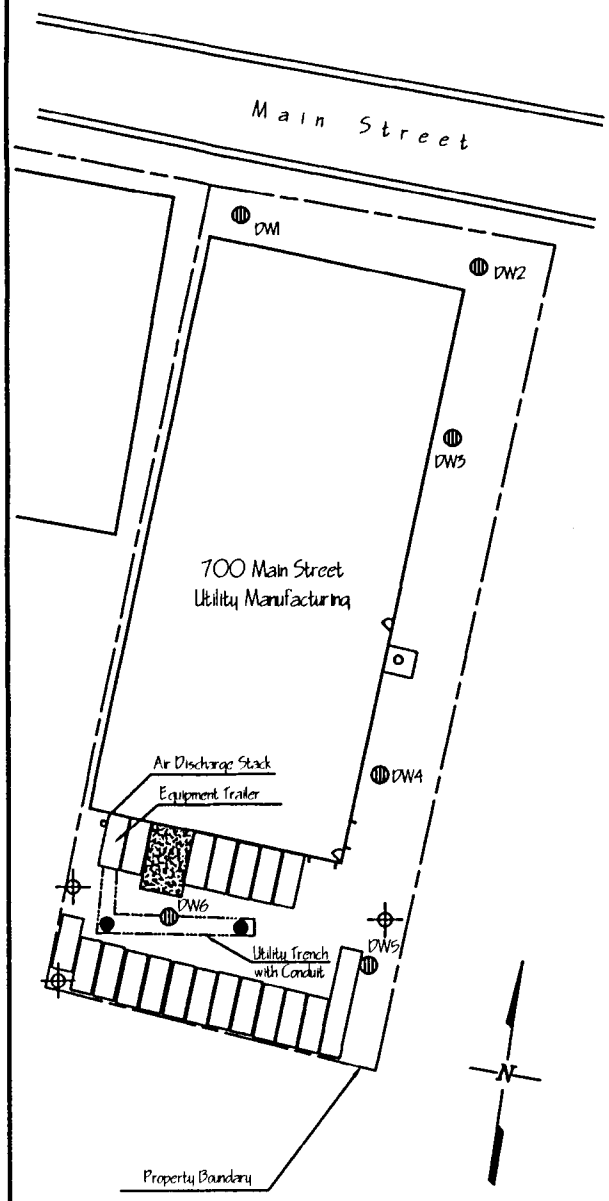
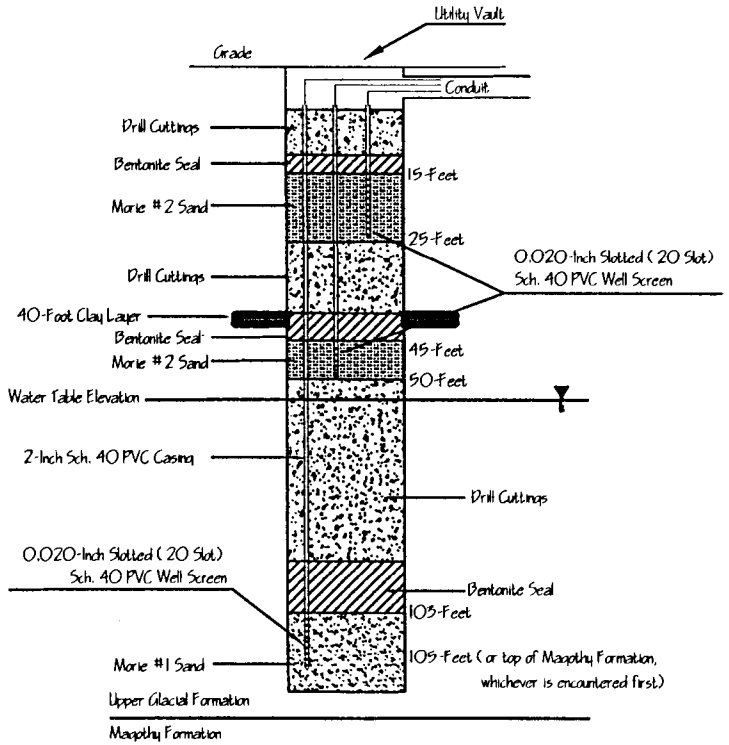
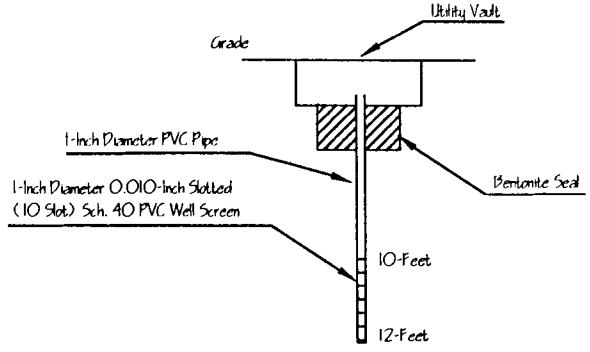
| | | |
|---|---|---|
| TITLE: PROPOSED SOIL VAPOR EXTRACTION & AIR SPARGE POINT LAYOUT | | DATE: 5/30/01 |
| | | SCALE: AS SHOWN |
| FIGURE: 3 | 700 MAIN STREET NEW CASSEL, NEW YORK | DRAWN BY: S.T.M. |
| DRAWING NO: 1130-1B | | APPR. BY: S.J.O. |




AIR SPARGE POINT / SOIL VAPOR EXTRACTION WELL

(Not to Scale)




TYPICAL VACUUM MONITORING POINT

(Not to Scale)

## Legend

- Drywell
- Air Sparge Point / Soil Vapor Extraction Point
- Vacuum Monitoring Point
- Storage Trailer
- Concrete Pad For USTs

0 25 50 100

Approximate Scale in Feet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Certified Ground-Water and Environmental Specialists
17 Dupont Street, Plainview, New York 11803

**Stephen J. Osmundsen, P.E.**

Consulting Engineer
513 Centre Island Road, Oyster Bay, New York 11771


| | | |
|---|---|---|
| TITLE: SITE PLAN WITH PROPOSED SOIL VAPOR EXTRACTION WELL, AIR SPARGE POINT AND VACUUM MONITORING POINT DETAILS | | DATE: 8/1/01 |
| | | SCALE: AS SHOWN |
| FIGURE: 4 | 700 MAIN STREET NEW CASSEL, NEW YORK | DRAWN BY: S.T.M. |
| DRAWING NO: 1130-1D | | APPR. BY: S.J.O. |