Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Citizens Development Company
Operable Unit 1
Inactive Hazardous Waste Site
University Gardens, Nassau County
Site Number 1-30-070

March 1998

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* John P. Cahill, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Citizens Development Company Inactive Hazardous Waste Site
OPERABLE UNIT 1
University Gardens, Nassau County, New York
Site No. 1-30-070

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Operable Unit 1 for (OU-1) the Citizens Development Company inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Citizens Development Company Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from Operable Unit 1 of the Citizens Development Company Site have been addressed by implementing the interim response actions identified in this ROD. Therefore, this Operable Unit no longer represents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Citizens Development Company, remediation of the site under previously completed Interim Remedial Measures and the criteria identified for evaluation of alternatives, the NYSDEC has selected no further action with continued groundwater monitoring for Operable Unit 1. This remedy will include:

- Monitoring and evaluating groundwater quality and flow direction at 12 existing groundwater monitoring wells annually for a period of at least three years.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

3/30/98

Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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RECORD OF DECISION

CITIZENS DEVELOPMENT COMPANY

Site No. 1-30-070
Operable Unit No. 1
University Gardens (V), North Hempstead (T), New York
March, 1998

SECTION 1: SITE LOCATION AND DESCRIPTION

Citizens Development Company Site #1-30-070 is located at 47 Northern Boulevard in the City of Great Neck, Town of North Hempstead, Nassau County, New York. A site location map is presented in Figure No.1. The Site consists of a one acre parcel of land containing a 3000 square foot, one story concrete building, situated in the center of the property. The building contains a basement. Adjacent to the Site are light industrial and commercial properties to the east, west and south. To the north is a residential apartment complex.

Two inactive hazardous waste disposal sites are located within one mile of the Site. They are:
* Stanton Cleaners (1-30-072), 0.5 miles north
* Mayflower Cleaners (1-30-068), 0.2 miles east

A public water supply wellfield is located approximately 2500 feet north of the Site. The wellfield is operated by the Water Authority of Great Neck North. The wellfield has been impacted by chlorinated solvents. Wellhead treatment is currently in place to remove contaminants and render the water potable.

Operable Unit 1, which is the subject of this PRAP, addresses the completed remediation of the on-site source area, previous groundwater treatment, and documents groundwater quality in the shallow aquifer. Soil and groundwater quality have been evaluated via subsurface investigation and laboratory analysis.

An Operable Unit represents a portion of the site remedy which for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. The remaining operable unit for this site is described in Section 2.2 below.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

Cleanland Drive-In Cleaners occupied the facility from approximately 1960 to 1976. Intermittently during this time, the dry cleaners stored (PCE) saturated filter media on an unpaved portion of the site immediately north of the facility (rear yard). This practice was confirmed by a former employee of Cleanland Drive-In Cleaners.

1960-1976: Facility occupied by Cleanland Drive-In Cleaners.

1976: Facility burned down.

1982-1984: Facility rebuilt and occupied by Flower Fashion, a commercial florist.

1984-present: Various commercial tenants, none of which were associated with the use or discharge of hazardous wastes.

2.2: Remedial History

The following is a chronological listing of investigations and remedial measures performed at site.

November 7, 1983: Nassau County Department of Health (NCDH) acquired a surface soil sample from the site in the rear yard. Analysis revealed 3.5 ppm of PCE (see Figure 2).

January 3, 1984: NCDH acquired a surface soil sample from the site in the rear yard. Analysis revealed 17 ppm of PCE (see Figure 2).

1984-1985: In April 1984, under NCDH oversight, the Potentially Responsible Party (PRP) installed an on-site groundwater observation well (OW) and advanced four soil borings in the rear yard. The groundwater monitoring well was screened at the water table. Soil borings B-1, and B-3 were advanced to a final vertical depth of 22 feet below land surface (bls). Soil borings B-2 and B-4 were advanced to a final vertical depth of 27 feet bls. Soil samples were acquired and analyzed for volatile organic compounds (VOCs) every five feet. PCE concentrations were observed to generally decrease with depth within the vertical soil profile (from 1300 ppm to less than 1 ppm). Two groundwater samples acquired from the on-site monitoring well revealed 4700 and 4900 ppb of PCE (see Figure 2).

December 1984: Approximately 75 cubic yards of soil were excavated and removed from the site. The excavation was conducted in the rear yard and encompassed an area of approximately 150 square feet and extended vertically approximately 15 - 17 feet. This soil was removed from the site by a licensed waste hauler to an approved Treatment, Storage and Disposal Facility (TSDF). Also, during this time, three additional groundwater monitoring wells were installed on the site (MW-2, MW-3, MW-4). These monitoring wells were screened at the water table. Groundwater samples were acquired from MW-2, MW-3, and MW-4 in January 1985. PCE concentrations were detected at 970 ppb, 3335 ppb, and 3503 ppb, respectively. The observation well was also sampled in January 1985 at which time 3463 ppb of PCE were detected (see Figure 3).

January 1985: Monitoring wells #5 - #10 were to have been installed off-site. However, it appears from the file search that monitoring well #9 was not installed. These monitoring wells were screened at the water table (see Figure 3).

January 1986- May 1990: In January 1986, a groundwater pump and treat system was installed on-site. The observation well installed in April 1984 was removed and replaced with a 12 inch recovery well. The recovery well was advanced to a depth of approximately 75 feet bls. Depth to groundwater on-site is approximately 43 feet bls. A submersible pump delivered groundwater to a granular activated carbon treatment system (see Figure 3). Treated effluent was regulated under a State Pollution Discharge Elimination System (SPDES) permit (NY 0206351) as overseen by the Division of Water (DOW). The treated effluent was discharged to a storm sewer catch basin. The groundwater remediation operated until May 1990, at which time mechanical failure caused the system to be shut down. Groundwater samples were acquired in August 1989 from monitoring wells MW-2, MW-3, MW-4 and the recovery well. Comparison of groundwater data collected in 1985 with groundwater data generated in 1989 reveals decreasing concentrations of PCE in MW-2, MW-3, MW-4, and the recovery well (see Table A).

December 1990: An upgradient groundwater monitoring well was installed (MW-1a). Groundwater levels were taken to confirm the site specific groundwater flow direction and monitoring wells MW-1a, MW-2 and MW-4 were sampled. Site specific groundwater flow direction was determined to be nearly due north (see Figure 3).

February 1991 - July 1991: Groundwater sampling and analysis of selected on-site (MW-1a, MW-2, MW-3, MW-4) and off-site (MW-8, MW-10) groundwater monitoring wells (see Figure 3) . This sampling effort revealed low level VOCs upgradient of the Site and elevated levels of VOCs downgradient of the Site (see Table B). Petroleum hydrocarbons were also detected during this round of groundwater sampling, however, these contaminants are not attributable to past practices at the site.

February 1993: 17 soil borings were advanced on-site. Twelve of these soil borings were advanced in the front of the facility, upgradient of the identified source area. The remaining five soil borings were advanced in the rear of the facility in the area previously identified as the source area. Soil samples were acquired from borings B-1 through B-16 for VOC analysis at vertical depth intervals of 10 and 15 feet bls. There were no detections of VOCs in any of the soils analyzed from borings B-1 through B-13 and B-15. Soil boring B-17 was sampled at five foot intervals beginning at five feet bls to an ultimate vertical depth of 40 feet bls. Analytical results revealed residual, low level PCE contamination existed in soils from borings B-14, B-16 and B-17. Only the soil sample acquired at the ten foot interval from boring B-17 exceeded NYSDEC Technical Administrative Guidance Memorandum (TAGM) #4046 soil cleanup guidelines for the protection of human health and groundwater (see Figure 4).

Two of the soil borings, B-3 and B-4, were advanced during this February 1993 investigation to the water table and monitoring wells were constructed. These became upgradient monitoring wells MW-1c and MW-1d, respectively. Also constructed was upgradient water table monitoring well, MW-1b (see Figure 4). In February and March 1993, monitoring wells MW-1a,b,c,d, MW-2 - MW4 and the recovery well were sampled for VOCs. Analytical results from this sampling effort revealed PCE in upgradient and downgradient monitoring wells (see Table A).

There are two exterior dry wells (DW-1 and DW-2) located on-site. Both dry wells were sampled during the period February 1993. Soil samples were acquired from the bottom sediments of each dry well and a second soil sample was collected five feet beneath the bottom of each dry well. The bottom sediments of DW-1

revealed the following levels of VOCs: Vinyl chloride at 10 ppb, 1,2-dichloroethene at 170 ppb, trichloroethylene at 52 ppb, and PCE at 42 ppb. These levels are below NYSDEC TAGM #4046 guidance levels, and so the sediments can be left in place. Analysis of the soil sample acquired five feet below the bottom of the dry well revealed no detections of VOCs. Laboratory analysis of the sediments and soil from dry well DW-2 revealed no detections of VOCs (see Figure 4).

April 12, 1993: Site is listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 site.

April 1993: During an inspection of the interior of the facility a floor sump was discovered in the basement of the facility. The sump was approximately two to three feet wide and approximately one foot deep. Samples were taken of the liquid within the sump, sediments from the side of the sump and sediments from the bottom of the sump. Additional soil samples were taken at depth, vertically through the bottom of the sump. These samples were analyzed for VOCs. Laboratory analysis of the liquid and soil within the floor sump revealed the highest levels of VOCs extended to a depth of approximately 22 inches (see Figure 4). Under the approved Interim Remedial Measure (IRM), liquid and sediment was removed from the floor sump to a depth of four feet.

Operable Unit 2 (OU-2) will further define off-site, downgradient groundwater quality at depth and further identify those receptors which may be impacted. To this end, some OU-2 work has already begun with the installation and sampling of off-site, downgradient groundwater monitoring wells. Additional groundwater sampling at depth will confirm whether or not PCE has migrated vertically within the aquifer.

SECTION 3: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and the environment, the Citizens Development Company has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any remaining groundwater contamination resulting from previous activities at the site. Soil contamination was remediated during several IRMs which are discussed in detail in Section 3.2.

The RI was conducted in one phase. Field implementation of the RI took place during June through September 1997. A report entitled Remedial Investigation Report dated November 1997 has been prepared describing the field activities and findings of the RI in detail.

The RI included the following activities:

- *Background information review.*
- *Utilizing 15 groundwater monitoring wells, seven of which were located on-site and eight located off-site, groundwater elevations were acquired in June, July and September 1997 to determine if groundwater flow direction*

has fluctuated from flow direction previously observed. All the monitoring wells utilized in this survey are screened at the water table. Groundwater flow direction was found to be nearly due north as was previously observed in December 1990. (see Figure 5).

- *The collection of groundwater samples from the same 15 monitoring wells. Groundwater samples were acquired by both the Responsible Party and NYSDEC in July 1997 and submitted to a NYSDOH ELAP certified laboratory for VOC analysis (see Table A).*

To determine groundwater contamination levels of concern, the RI analytical data were compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, SCGs identified for the Citizens Development Company site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. Soil quality data was compared to NYSDEC TAGM #4046.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, certain areas and media of the site require further monitoring. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb), parts per million (ppm), For comparison purposes, SCGs are given for groundwater.

3.1.1 Nature of Contamination:

As described in the RI Report, groundwater samples were collected at the Site to characterize the nature and extent of contamination.

Groundwater Quality:

- A total of 15 monitoring wells, located both on and off the site were sampled and analyzed during the RI (see Figure 5). Previous investigations have utilized all of these monitoring well at some point for groundwater sampling and analysis (see Table A).

- Based upon past environmental investigations, and groundwater sampling and analysis for the RI, PCE is the contaminant associated with past disposal practices. Beside PCE, trichloroethylene and 1,2 dichloroethylene have been observed in groundwater samples both on and off -site. Benzene, toluene, ethyl-benzene and xylene have been discovered in sidegradient monitoring wells FN-4 and FN-14; however, those contaminants are associated with a nearby petroleum spill currently being remediated by the Division of Environmental Remediation (Spill #82-00157).

3.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in groundwater and compares the data with the proposed remedial action levels (SCGs) for the Site. The following are the media which were investigated and a summary of the findings of the investigation.

Groundwater

The primary VOC of concern was PCE (2 to 180 ppb) which was detected in some monitoring wells above NYS groundwater standard. Other VOCs which were detected in groundwater included methylene chloride (2 to 24 ppb), trichloroethene (1 to 30 ppb), toluene (540 to 2400 ppb), ethylbenzene (310 to 900 ppb), xylene (5 to 3700 ppb), benzene (150 to 380 ppb), 1,2-dichloroethene (1 to 38 ppb) and acetone (4 ppb), (see Table 1). The groundwater standard for all of these compounds, except benzene and acetone, is 5 ppb. The groundwater standard for benzene is 0.7 ppb. The groundwater standard for acetone is 50 ppb.

3.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

January 24, 1995: NYSDEC approved an Interim Remedial Measure (IRM) work plan to remove contaminated soil from the interior floor sump and utilize soil vapor extraction (SVE) for the remediation of the remaining soil contamination on the site.

May 1995: Field implementation of the approved IRM work plan began by utilizing a truck mounted vacuum system to excavate an area approximately five feet in diameter and four feet deep from the interior floor sump. Post excavation confirmatory soil sampling revealed non detections of VOCs in two sidewall samples and 9.8 ppm of PCE and 0.1 ppm of trichloroethene in the bottom soil. Approximately four cubic yards of excavated soil material was containerized on site and vacuumed using the SVE system to remove the PCE. A perforated pipe was placed within the excavation and connected to the SVE system, to remove the residual PCE that existed after the excavation. The excavation was backfilled, and the concrete slab was patched.
Five soil vacuum extraction wells were installed outside the facility, to remove the residual PCE contamination observed in soil borings B-14, B-16 and B-17. The SVE system operated for approximately 10 months whereupon steady state emissions were observed and five confirmatory soil samples acquired to verify the success of the remedial effort (see Figure 6).

February 28, 1996: NYSDEC approved an IRM Closure Report. Confirmatory soil samples taken from five to ten below grade in the rear yard revealed residual contaminant concentrations below NYSDEC TAGM #4046.

Confirmatory soil sampling of the containerized soil/sediments revealed residual contaminant levels below TAGM #4046. The soil was spread in an unpaved portion of the site.

Contaminants identified in sediments within the two on-site drywells were below TAGM #4046 soil cleanup guidance levels.

3.3 Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 5.0 of the RI Report.

An exposure pathway is how an individual may come into contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

The exposure assessment evaluated the potential current and future risks to potentially exposed individuals. Potential pathways for exposures include ingestion, dermal contact, and/or inhalation.

Identified Exposure Pathways and Receptors

Current Use:

The site at present is unsecured. Entrance to the facility building is limited to its employees or customers. All potable water used at the site is obtained from a public water source. Although contaminants have been detected in the soil, sediment and groundwater under the current land use scenario exposure pathways are limited to site workers.

Review of public water supply well locations and populations indicate that everyone within a 1-1/2 mile radius of the site is connected to a public water supply system.

Future Use:

Although the use of the site in the future is likely to remain commercial, a future residential use is assumed for purposes of the risk assessment.

If residences are constructed on the site in the future, child and adult residents would be considered potential receptors. If the site remains a commercial property, on-site workers and patrons would be considered potential receptors. Potential future exposure points are soil, soil vapor and groundwater. Potential exposure pathways are, for the most part, identical for both current use (commercial) receptors such as workers or patrons and for possible future use (residential) receptors:

- Incidental ingestion of soils and sediments.
- Dermal contact with soils and sediments.
- Inhalation of contaminated air.

There are presently no potable or production wells on-site utilizing groundwater. However, if under a future residential use scenario, an on-site water supply well was used an additional exposure pathway would be:

- Ingestion of groundwater.

Exposure to contaminated sediments or soils via incidental ingestion or direct contact is not likely at present because the site is paved. Additionally, residual levels of PCE in soils are below levels identified in TAGM #4046.

The potential exists for elevated concentrations of residual PCE in indoor air. This exposure pathway will be evaluated through indoor air sampling at the site during Operable Unit 2. Air monitoring with field instrumentation has not indicated elevated concentrations of VOCs in ambient (outdoor) air.

Alternative 2: Groundwater Pump and Treatment

This remedial system would utilize the existing recovery well at the site. This well is adjacent to both the historical source area and the monitoring well (MW-4) currently demonstrating the highest residual concentration of PCE.
The groundwater pump and treatment system as proposed in the RI/FS would utilize a precipitation process to remove elevated mineral levels in the groundwater. Thereafter, groundwater would be treated by the carbon sorption process to remove hydrocarbons and prevent hydrocarbon fouling from a nearby gasoline spill. Treated groundwater would then be subjected to an air stripping process before being discharged to the storm sewer on Northern Boulevard. Remedial effectiveness would be evaluated through a groundwater monitoring program.

Present Worth:	600,000
Capital Cost:	300,000
Annual O&M:	100,000
Time to Implement:	Three months

Alternative 3: Groundwater Air Sparging System

A groundwater air sparging system would be installed in the area previously identified as the source area. The system would include three air sparge wells spaced approximately 20 feet apart and extending 25 feet into the groundwater. Four soil vapor extraction wells would be installed between the sparge points. The vapor extraction wells would be screened above the water table and would collect the VOC vapors resulting from the sparging operation. VOC vapors may require polishing through activated granular carbon before being exhausted into the atmosphere. Remedial effectiveness would be evaluated through a groundwater monitoring program.

Present Worth:	100,000
Capital Cost:	55,000
Annual O&M:	15,000
Time to Implement:	Two months

6.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the RI/FS report.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

Alternative 1 would not immediately meet the SCGs for groundwater quality standards. However, natural attenuation would restore the aquifer to the groundwater quality standards over a period of time. The existing public water supply regulations are in effect to ensure that the drinking water standards are met within the public water supply distribution system. This would be the same regardless of the alternative selected. The existing wellhead treatment at the Watermill Lane wellfield ensures compliance with the NYS drinking water standards. Alternative 1, while not immediately meeting SCGs, would be an acceptable alternative given the relatively low concentrations of PCE recently observed in monitoring wells downgradient of the site.

Groundwater Alternatives 2 and 3 would also result in groundwater eventually complying with applicable SCGs.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

All groundwater remedial alternatives would be protective of human health and the environment. These alternatives rely upon the NYSDOH Part 5 drinking water requirements which must be met by community water suppliers. The public water supply wells located at Watermill Lane are equipped with wellhead treatment to meet these requirements. There are no potable or production wells on-site utilizing groundwater.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Worker exposure to contaminated groundwater or soil during implementation of Alternatives 2 or 3 would be controlled through a site specific health and safety plan.
It is estimated that both Alternatives 2 and 3 would have to operate for a minimum of three years before complying with SCGs.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Under Alternative 2, treated groundwater would have to meet Groundwater Effluent Standards prior to being discharged to the municipal storm sewer system. A groundwater monitoring program would evaluate groundwater quality and the effectiveness of the remedial alternative.

Under Alternative 3, VOCs would be extracted from the groundwater via air sparging and vacuum extraction. Air emissions generated during the application of this alternative might have to be treated to comply with SCGs. A groundwater monitoring program would evaluate the effectiveness of the remedial alternative.

Alternatives 2 and 3 provide for long term effectiveness and permanence.

The Citizens Development Company site and surrounding community are utilizing public water for potable uses. The public water supply wells located at Watermill Lane are equipped with wellhead treatment to treat contaminated groundwater.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.
Neither Alternatives 1, 2 or 3 would reduce the toxicity of the groundwater contaminants at the Site.
Alternative 2 would reduce the volume of contaminants at the
Site and would also reduce the mobility due to containment around the recovery well.
Alternative 3 would reduce the volume of contaminants at the Site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction and the ability to monitor the effectiveness of the remedy. For administrative feasibility, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc..

All alternatives are implementable. However, Alternative 2 would be complicated by high mineral content within the groundwater (iron fouling) and the possibility of capturing hydrocarbons associated with a nearby gasoline spill.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised.

SECTION 7: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC is proposing Alternative 1 as the remedy for this site.

While Alternative 1 does not immediately meet SCGs, its selection is based upon the fact that three remedial actions previously undertaken at the site have been successful in remediating the soil and groundwater. Those remedial actions were:

1. Soil Excavation: Under the oversight of the NCDH, approximately 75 cubic yards of VOC contaminated soil was excavated and removed from the site in December 1984. Removal of this grossly contaminated soil greatly reduced the threat of continued contamination of on-site groundwater.

2. Groundwater Pump and Treatment: Under the supervision of the Department, a groundwater extraction and treatment system removed VOCs from on-site groundwater. The system operated from January 1986 through May 1990. PCE concentrations in the on-site recovery well diminished from 3463 ppb in January 1985 to 860 ppb in August 1989.

3. Soil Vapor Extraction (SVE) System: Under the supervision of the Division of Environmental Remediation a SVE system removed residual VOC contamination from on-site soil. The system operated from May 1995 through February 1996. Confirmatory soil sampling verified that the on-site source area and the interior floor sump had been remediated to levels below NYSDEC TAGM #4046.

Groundwater quality data generated prior to and during the RI has demonstrated that remediation of the source area and previous groundwater treatment have resulted in significantly reducing the concentrations of PCE in on-site and off-site groundwater. For example, PCE concentrations in downgradient MW-4 diminished from 3,503 ppb in January 1985 to 180 ppb in July 1997.

Groundwater quality data generated during the RI from downgradient monitoring wells, off - site has demonstrated that natural attenuation continues to reduce concentrations of PCE to nearly the SCGs.

The estimated present worth cost to implement the remedy is $30,000. The estimated average annual operation and maintenance cost for three years is $10,000.

The elements of the selected remedy are as follows:

1. Since the remedy results in untreated groundwater remaining at the site, a long term groundwater monitoring program will be instituted. This program will allow the effectiveness of past remedial actions to be monitored and would be a component of the operation and maintenance for the site.

2. The RI confirmed the site specific groundwater flow direction. Based upon these results, monitoring wells MW-1a, 1b, 1c, 1d, MW-2 through MW-8 and MW-10 will be utilized in a groundwater monitoring program. Under this program, groundwater samples will be acquired annually for VOC analysis. The results will be evaluated by NYSDEC and NYSDOH. Water levels will also be taken from this suite of monitoring wells to observe any changes in groundwater flow direction. At the end of the three year monitoring program, groundwater quality will be evaluated and a determination made as to whether to continue the monitoring program or not.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established.

- A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
- A RI/FS Fact Sheet was disseminated to the public in December, 1996.
- A public meeting was held on February 23, 1998 to present the Proposed Remedial Action Plan.
- In March, 1998 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the Proposed Remedial Action Plan.

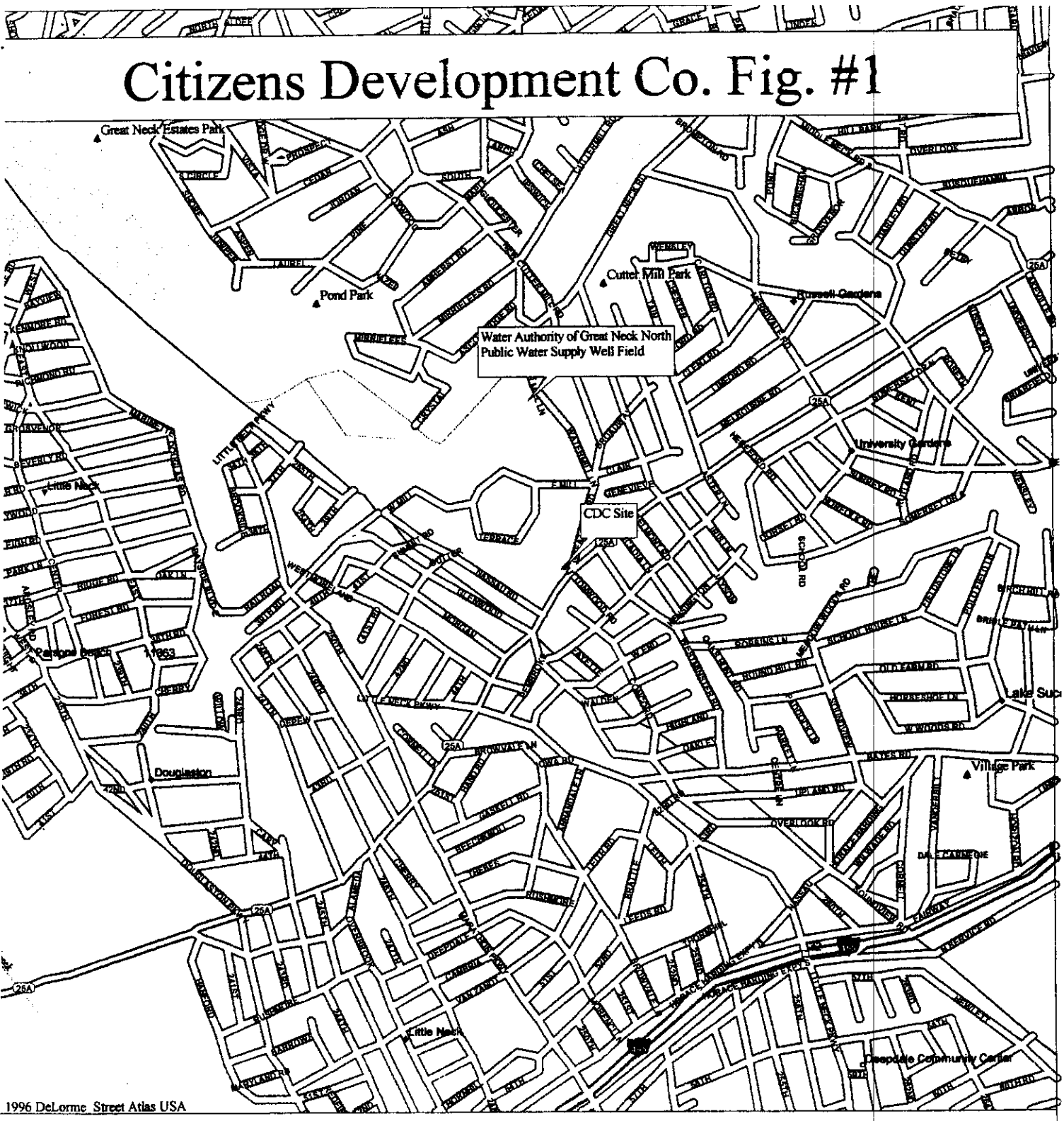
Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of EXCEEEDING SCGs	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	Methylene Chloride	2 to 24	4	5
		1,2-Dichloroethene	ND to 38	3	5
		Trichloroethene	ND to 30	2	5
		Tetrachloroethene	2 to 180	10	5
		Benzene	ND to 380	2	0.7
		Toluene	ND to 2400	3	5
		Ethylbenzene	ND to 900	3	5
		Xylene	ND to 3700	3	5
		Acetone	ND to 4	0	50

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
No Further Action - Monitor Only	$0	$10,000	$30,000
Groundwater Pump & Treat System	$300,000	$100,000	$600,000
Groundwater Air Sparging System	$55,000	$15,000	$100,000

Citizens Development Co. Fig. #1



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Local Road	Locale
Primary State Route	Exit
Interstate/Limited Access	County Boundary
Railroad	Population Center
Point of Interest	Lake
Small Town	Land
Geographic Feature	Water
Park/Reservation	River/Canal

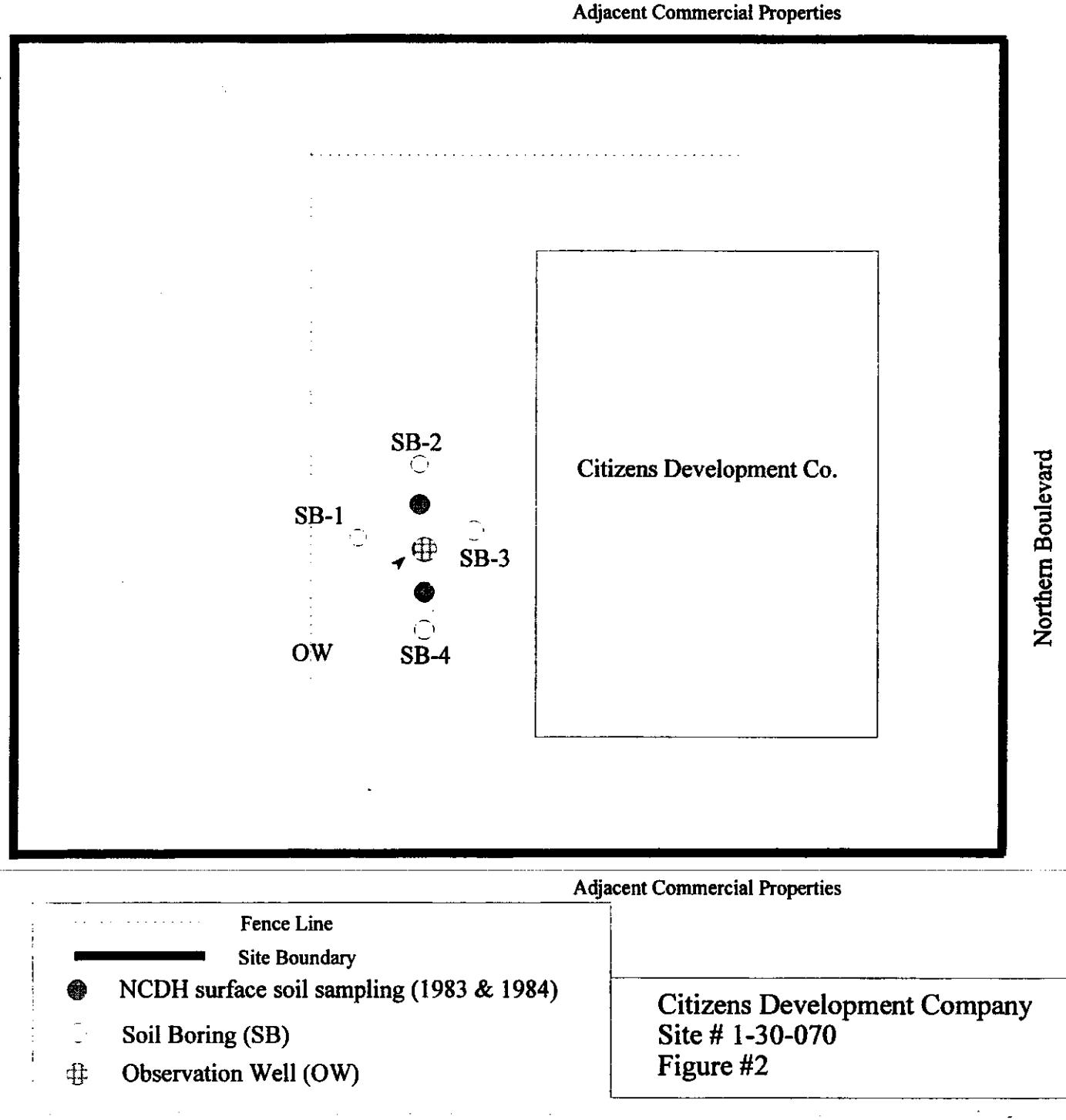
PCE in soil (ppm) -April 1984

Sample Depth	OW	SB1	SB2	SB3	SB4
5 - 7	1300	0.13	0.01	ND	470
10 - 12	550	0.01	ND	ND	6.5
15 - 17	NS	ND	0.01	0.02	0.14
20 - 22	0.01	ND	NS	ND	NS
25 - 27	NS	NS	ND	NS	ND
30 - 32	ND	NS	NS	NS	NS
40 - 42	0.01	NS	NS	NS	NS
50 - 52	0.34	NS	NS	NS	NS

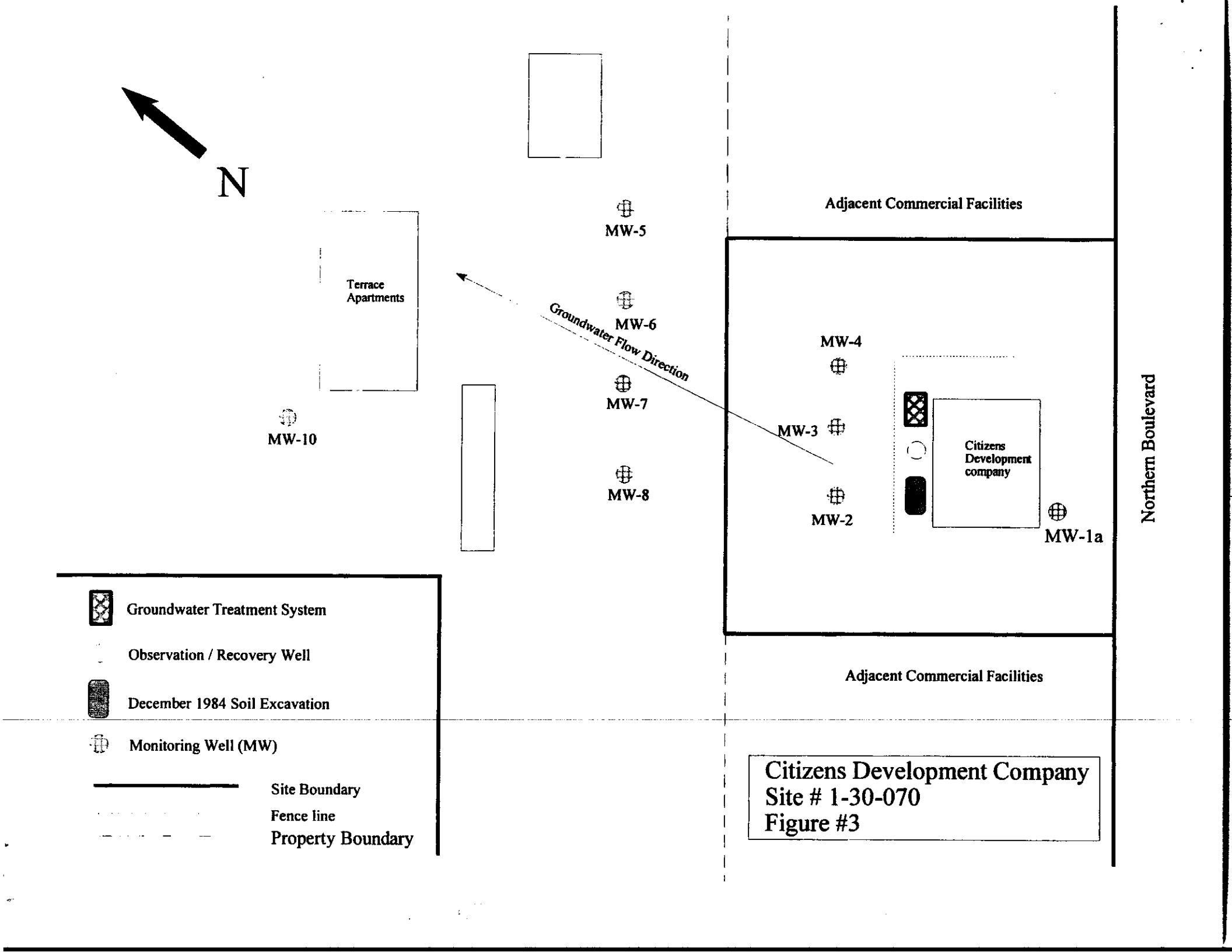
NS - Not Sampled

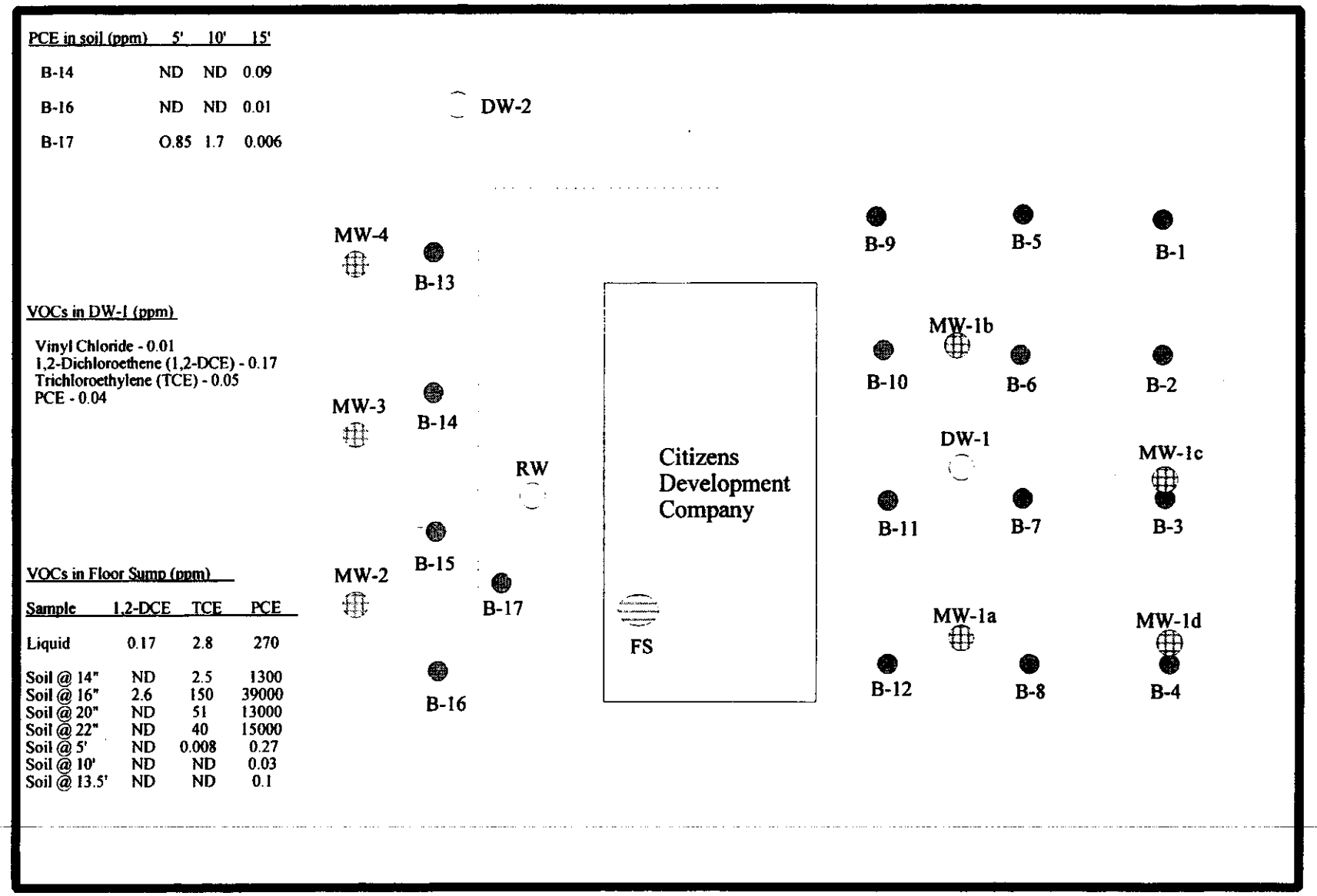
ND - Non Detect

All sample depths in feet below grade



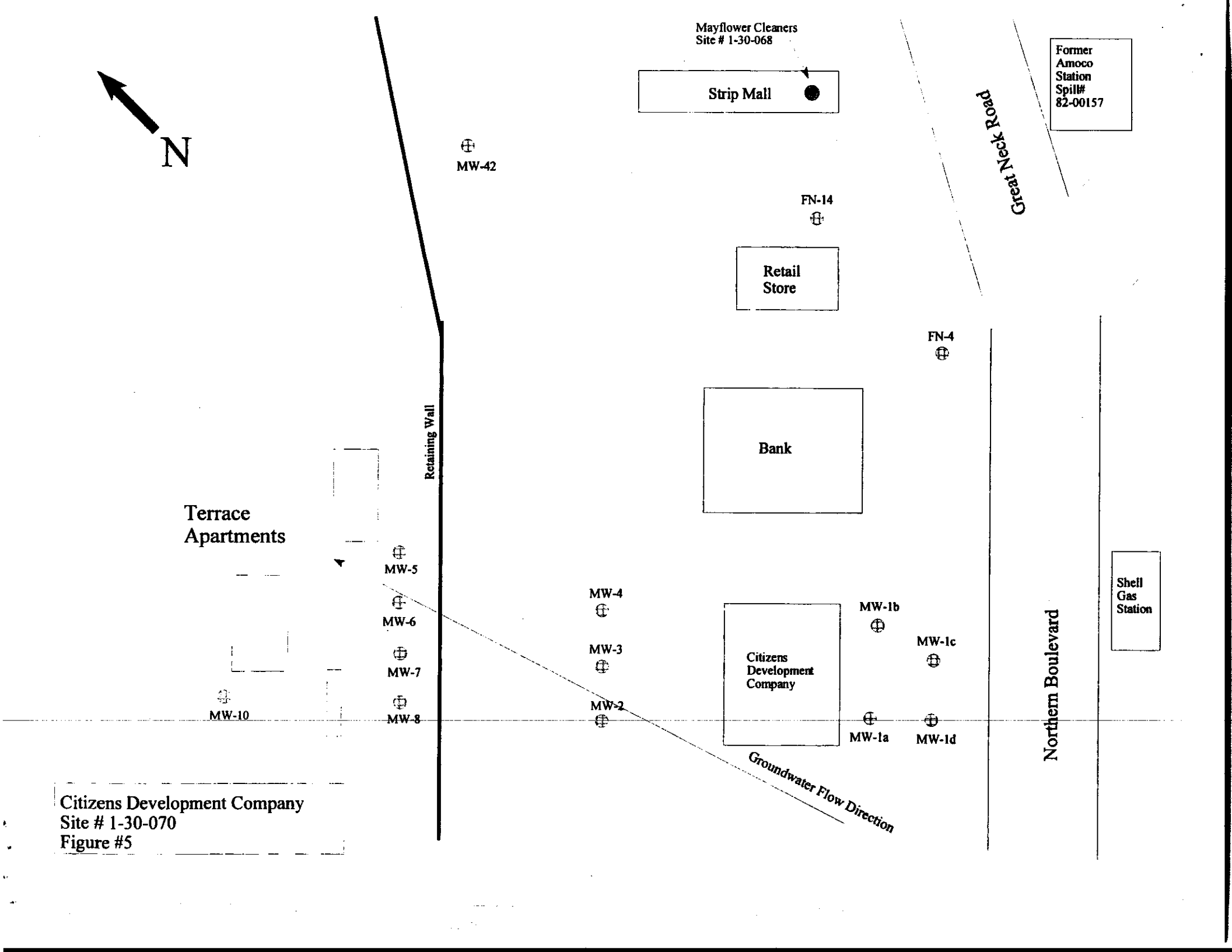
Citizens Development Company
Site # 1-30-070
Figure #2


N
Adjacent Commercial Facilities
MW-5
Terrace Apartments
MW-6
Groundwater Flow Direction
MW-4
MW-7
MW-3
MW-10
Citizens Development company
MW-8
MW-2
MW-1a
Northern Boulevard
Adjacent Commercial Facilities
Groundwater Treatment System
Observation / Recovery Well
December 1984 Soil Excavation
Monitoring Well (MW)
Site Boundary
Fence line
Property Boundary
Citizens Development Company
Site # 1-30-070
Figure #3

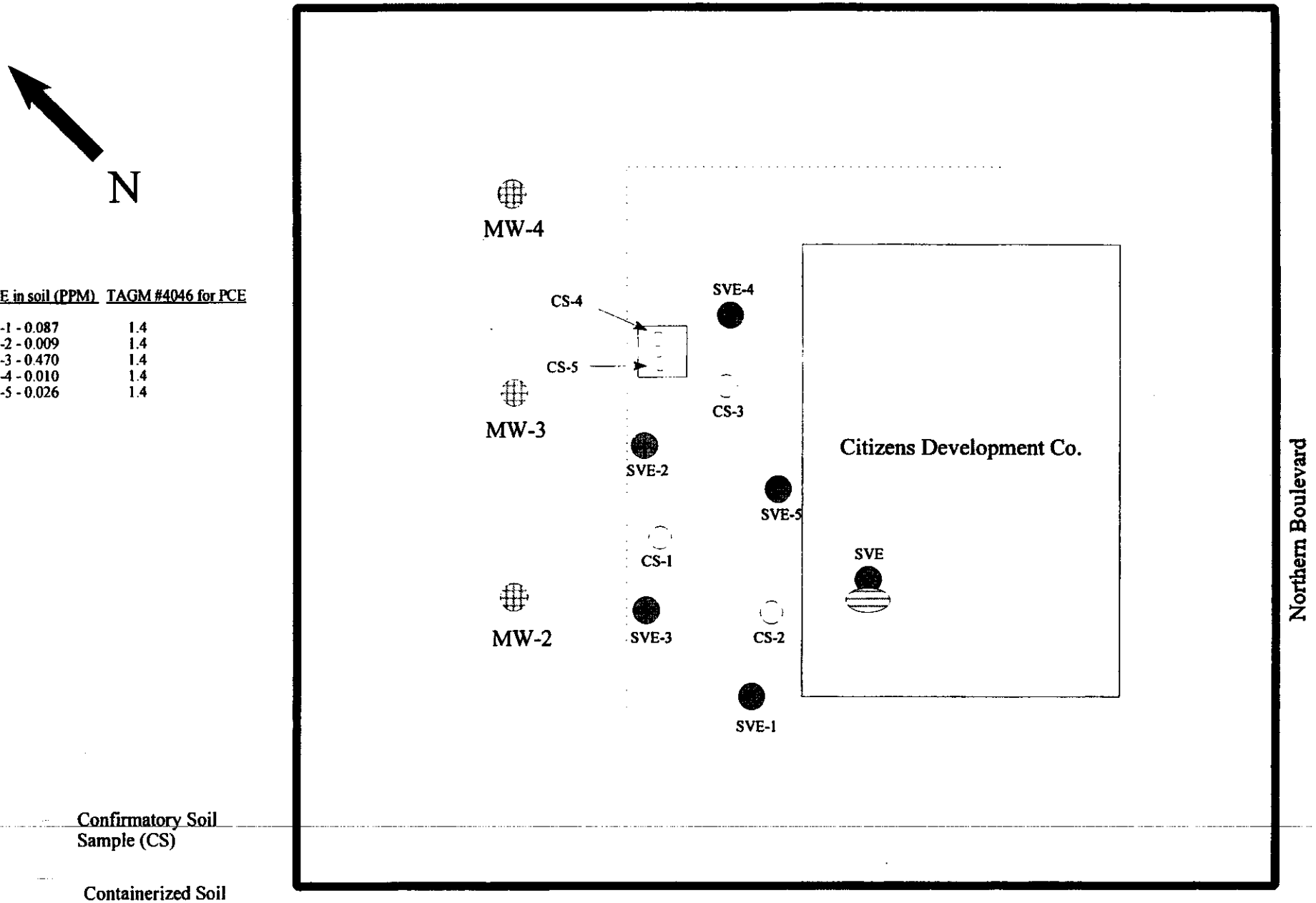


Soil Boring location
Monitoring Well (MW)
Recovery Well (RW)
Drywell (DW)
ND - Non Detect
Floor Sump (FS)

Citizens Development Company
Site # 1-30-070
Figure #4



Citizens Development Company
Site # 1-30-070
Figure #5



PCE in soil (PPM)	TAGM #4046 for PCE
CS-1 - 0.087	1.4
CS-2 - 0.009	1.4
CS-3 - 0.470	1.4
CS-4 - 0.010	1.4
CS-5 - 0.026	1.4

Confirmatory Soil Sample (CS)

Containerized Soil

Site Boundary

Floor Sump (FS)

Monitoring Well (MW)

Fence

Soil Vapor Extraction point (SVE)

Citizens Development Company
Site # 1-30-070
Figure #6

Table A: PCE in Groundwater (ppb) April 1984 - July 1997

	April 1984	January 1985	NCDH 1985	NCDH 1986	August 1989	December 1990	July 1991	February 1993	March 1993	July 1997
MW-1a						63	31	46	48	7
MW-1b								150	120	4
MW-1c								45	54	12
MW-1d								9	18	3
OW/RW	4900	3463			860				38	
MW-2		970	1100	68	29	701	772	860	8	69
MW-3		3335	3000	620	140		229	50	25	52
MW-4		3503	2000		26	1033	1780	1800	850	180
MW-5			6							3
MW-6			56							25
MW-7			340							6
MW-8			190				58			2
MW-10							104			4
FN-4										17
FN-14										36
MW-42										7

Table B: VOCs in Groundwater (ppb) February 1991 - July 1991

Monitoring Well No.	Date	PCE	Trichloroethylene	Benzene	Toluene	Ethyl-benzene	Xylene
MW-1a	February	20	3				
	March	29					
	April	37					
	May	30					
	June	38	3				
	July	31					
MW-2	February	333	42			6	12
	March	342	50				
	April	557	81		13	29	92
	May	405	49		19	32	88
	June	633	74		8	23	41
	July	772	92			25	13
MW-3	February	37	30	4			
	March	446	34				10
	April	221	12				5
	May	99					
	June	150	15				
	July	229	20				
MW-4	February	327	11				
	March	1732	55				
	April	1441	46				
	May	1367	43				
	June	1479	44				
	July	1780	54				
MW-8	February	57	5				
	July	58	8				
MW-10	February	46	19	3			
	July	104	21	135		1	2

APPENDIX A

Citizens Development Company
Site #1-30-070
March 23, 1998

RESPONSIVENESS SUMMARY

This document summarizes the comments and questions received by the New York State Department of Environmental Conservation (NYSDEC) regarding the Proposed Remedial Action Plan (PRAP) for the Citizens Development Company Site. The Department provided a comment period from February 17, 1998 to March 20,1998 to receive comments from the public on the PRAP. The Department held a public meeting on February 23,1998 at the Lakeville Elementary School to discuss the PRAP and the preferred alternative.

Part 1: The following questions were raised during the public meeting of February 23, 1998:

1. **Can the Public Comment Period be extended?**

   The Public Comment Period will end on March 20, 1998 rather than March 18, 1998.

2. **Has the areal extent of the groundwater plume been defined?**

   The horizontal extent of groundwater contamination has been defined. The vertical extent of groundwater contamination will be determined during Operable Unit 2 (OU-2). During OU-2 groundwater samples will be acquired at discrete depth intervals to ascertain groundwater quality within the aquifer.

3. **Has the NYSDEC ever chosen a remedy other than the Preferred Remedy specified in the Proposed Remedial Action Plan?**

   Yes, in some instances the NYSDEC has chosen an alternative remedy rather than implementing the Preferred Remedy originally described in the Proposed Remedial Action Plan.

4. **Does the pumping of the public water supply wells located on Watermill Lane have any influence on water table elevations at the Citizens Development Company Site?**

   There has been no observed influence on water table elevations attributable to the public water supply wellfield.

5. **Was there notification of the Public Meeting in any local newspapers?**

   The Public Meeting was announced in the Great Neck News, the Great Neck Record, Newsday's Government Watch and by a Meeting Invitation Fact Sheet prepared by the NYSDEC.

Part 2: The following questions/comments were raised by Ms. Shirley Siegal of the League of Women Voters of Great Neck in a letter dated February 25, 1998.

1. **Since the No Further Action Alternative results in untreated groundwater remaining at the site, it remains a threat to human health and the environment and is therefore unacceptable.**

   The No Further Action Alternative was chosen to recognize the effectiveness of past remedial activities conducted at the site. The residual concentrations of tetrachloroethylene (PCE), as observed in the downgradient groundwater monitoring wells, are not expected to pose a threat to human health or the environment. A program of groundwater monitoring - an integral part of this Alternative - will be implemented to verify this. Additionally, under Operable Unit 2, further investigation will be conducted to assess the significance of residual concentrations with respect to deeper portions of the aquifer.
   Recent observations of benzene, toluene and xylene in an upgradient on-site groundwater monitoring well suggests an upgradient source of these contaminants which will be further investigated for appropriate action.

2. **If private wells are used for watering lawns, there is a danger that the contaminated groundwater could be ingested. Blowing contaminated soil spread in the rear, and interior volatile organic compounds (VOCs) still must be addressed.**

   There are no known private wells immediately downgradient of the site. Local water supply is provided by the Water Authority of Great Neck North. The most contaminated soil was excavated from the interior floor sump and the remaining soil was subjected to soil vapor extraction. Prior to emplacement at the rear of the site, remediated soil was analyzed and found to be well below soil cleanup guidelines. Indoor air monitoring will be performed within the basement of the facility as part of OU-2.

3. **Additional monitoring wells must be installed in all three aquifers on-site and off-site to the north to determine the levels of VOCs which are flowing towards the wellfield at Watermill Lane. The monitoring wells should be tested quarterly and the data shared with the Water Authority of Great Neck North (WAGNN) and the Nassau County Department of Health. A limit of three years for this remediation is not protective of the health and welfare of the residents of area.**

   As part of OU-2, groundwater samples will be acquired at discrete vertical depths to ascertain groundwater quality at depth within the aquifer. The Groundwater Monitoring Program will utilize 12 monitoring wells located on-site and off-site, upgradient and downgradient of the site. The contaminant concentrations in groundwater samples taken during the remedial investigation have continued to show a downward trend since the source removal. As a result, groundwater samples and water levels will be acquired annually for a period of three years. This data will be shared with the local water authority and the Health Department and will be evaluated with regard for the need for further remedial action. The Groundwater Monitoring Program can be extended if warranted.

4. **Why was soil removed to a depth of four feet in the interior floor sump?**

The highest levels of soil contamination observed within the floor sump extended to a depth of 22 inches. Soil quality at a depth of five feet was found to be below soil cleanup guidelines. Excavation of soil/sludge material extended to a depth of four feet, whereupon excavation was discontinued due to physical constraints. The remaining soil was subjected to soil vapor extraction to remove residual VOCs.

5. **The soil which was removed from the floor sump was containerized and then subjected to soil vapor extraction. When remediation was complete, the soil was spread about in the unpaved alley on the west side of the facility. This soil should be removed from the site. The soil which remains in the floor sump should be retested.**

The containerized soil was analyzed after remediation and found to be below the soil cleanup guidelines. The soil cleanup guidelines are protective of human health and the environment, therefore, the soil can remain on-site.

Post excavation sampling of the floor sump revealed contaminant levels at nearly the soil cleanup guidelines. Due to the presence of residual contamination, the floor sump was subjected to soil vapor extraction to remove the remaining VOCs.

6. **The customers of the Water Authority of Great Neck North are asked to pay for the remediation of any contamination which may arrive at the wellfield from the Citizens Development Company Site. This is another reason why the No Further Action alternative is unacceptable.**

OU-2 will be conducted to determine if there is any off-site impact to the groundwater from the Citizens Development Company Site. The residual levels of tetrachloroethylene observed in the groundwater monitoring wells downgradient of the site, are not expected to pose a threat to the Watermill Lane wellfield. However, in recognition of the impacts caused to the WAGNN Watermill Lane wellfield by at least one other site, the NYSDEC will be funding the upgrade of the air stripper used by the Water Authority to treat groundwater.

7. **Tetrachloroethylene (PCE) levels have decreased over time, but where have they gone?**

PCE levels have reduced over time due to a variety of reasons. On-site source remediation, pumping and treating of contaminated groundwater, and natural attenuation have all played a part in reducing the concentration of PCE in groundwater.

8. **The No Further Action Alternative does not meet the following goals: "At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by hazardous waste disposed at the site through the proper application of scientific and engineering principles".**

On-site source remediation has been successful. The residual concentrations of PCE observed in the downgradient monitoring wells do not pose a significant threat to the public health or the environment.

9. **What do the letters U, J, B and E in Appendix A and B of the Remedial Investigation/ Feasibility Study (RI/FS) mean?**

These letters are used by the analytical laboratory to qualify analytical results. The individual definitions of these letters is described in Appendix B of the RI/FS.

10. **If the No Further Action Alternative is chosen how will benzene, toluene and xylene be removed from the groundwater?**

These contaminants have been observed coming onto the site from an upgradient source. The NYSDEC will identify and investigate the source of the observed hydrocarbon contamination and then undertake the necessary remedial effort.

11. **Please explain laboratory data sheet 1E - Tentatively Identified Compounds.**

The compounds noted on this lab sheet are hydrocarbon based, their origin is most likely due to the presence of gasoline in the groundwater.

12. **In Appendix A, what is MDL?**

MDL stands for Method Detection Limit.

13. **Finding 1300 ppm of PCE in the soil in the rear yard may indicate more was being dumped than just filters.**

The areal extent of the soil contamination in the rear yard was delineated and the source area remediated.

14. **What was the pumping rate of the groundwater pump and treatment system?**

The pumping rate was approximately 50 gallons per minute.

15. **Why was no data produced in sampling the effluent from the pump and treatment system for 1986, 1987 and 1988?**

The Division of Water was responsible for regulatory oversight of the discharge of treated groundwater from the site. A search of DOW files has revealed data gaps during 1986 and 1987.

16. **Table A states that the PCE level for mw-4 on 7/91 was 180 ppb. Appendix A states that on 7/91 the PCE level was 1780 ppb. Why the difference?**

Table A of the Proposed Remedial Action Plan correctly represents the analytical data for mw-4. In 7/91 the concentration of PCE in mw-4 was 1780 ppb. In 7/97 the concentration of PCE in mw-4 was 180 ppb.