

RECORD OF DECISION

**Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Nassau County, New York**

**United States Environmental Protection Agency
Region 2
New York, New York
September 2007**

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Town of Hempstead, Nassau County, New York

Superfund Site Identification Number: NYSFN0204234

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's selection of a remedy for the Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. Section 9601, *et seq.*, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selection of the remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the planned remedy in accordance with CERCLA Section 121(f), 42 U.S.C. Section 9621(f), and it does not concur at this time with the Record of Decision pending review of the environmental easement requirements (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy includes the following components:

- **Pre-Design Investigation of the Contaminant Plume:** A pre-design investigation will be conducted to collect information for the remedial design. The pre-design investigation will include: installation of at least three multiport monitoring wells; a pumping test; and infiltration tests at the Nassau County recharge basin #124.

- **Groundwater Modeling:** The preliminary three-dimensional groundwater model will be updated for the remedial design. Up-to-date contaminant distribution data will be collected from the pre-design investigation, and used to update the contaminant plume maps. The lithology and Site-specific hydraulic conductivity obtained during literature review and the pumping test will be incorporated into the model.

The improved groundwater model with up-to-date contaminant data will be used to select the final location(s) of groundwater extraction well(s) and discharge options for treated groundwater for the remedial design.

- **Stage II Cultural Resource Survey:** If ground intrusion such as well drilling or pipe routing are planned in any areas specified as sensitive for archeological resources during the Stage 1A cultural resource survey, a Stage II survey will be conducted.
- **Groundwater Extraction Well:** To reduce the contaminant concentrations reaching the two supply wells GWP-10 and GWP-11, a groundwater extraction well(s) will be installed south of SVP/GWM-4. A new remedial extraction well SVP-4E will capture the contaminant plume upgradient of SVP/GWM-4, while ensuring that the pumping capacity of supply wells GWP-10 and GWP-11 is not affected. The final location and number of extraction wells required will be determined after the pre-design investigation is completed and the groundwater model is updated.
- **Ex-Situ Groundwater Treatment:** A low profile air stripper will remove the volatile organic compound (VOC) contaminants. During the remedial design, additional treatment technologies (including liquid phase carbon adsorption) may be considered if additional information suggests the need for treatment following air stripping. The treated water will meet groundwater and surface water discharge standards.
- **Discharge of Treated Groundwater:** The treated groundwater will be discharged to the local Nassau County recharge basin #124. During the remedial design, results of infiltration tests will be used to calculate the capacity of the recharge basin. Run-off from a representative rain event will also be calculated to verify the available capacity for treated groundwater discharge.
- **Evaluation and Upgrade of the Air Strippers at Supply Wells GWP-10 and GWP-11:** An evaluation of the conditions of the air strippers will be conducted. Any necessary upgrade or replacement of the air strippers will be evaluated. The upgrade or replacement costs of the air strippers will be estimated based on the condition of the existing treatment system.

- **Vapor Intrusion Sampling:** There is concern, based on previous sampling results, that Site-related vapor may migrate into the commercial buildings to the west of the mall. Vapor intrusion sampling will be conducted at six buildings during the winter heating season. Vapor mitigation systems will be installed, if further sampling indicates the need for such systems.
- **Institutional Controls:** Institutional controls will be relied upon to restrict the future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA will rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area will be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.
- **Site Management Plan:** A SMP will be developed and will provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction at or in the vicinity of the Site; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.
- **Long-term Monitoring:** The contaminant plume will be monitored through annual sampling and analysis of groundwater. The results of the long-term monitoring program will be used to evaluate changes in the contaminant plume over time and to ensure achievement of Maximum Contaminant Levels (MCL)s.
- **Contingency Plan:** In the event that public supply wells GWP-10 and GWP-11 are taken out of service permanently or are operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.
- **Five-Year Review:** Because MCLs will take longer than five years to achieve, it is EPA's policy to conduct a review of Site conditions no less often than once every five years.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. Section 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In keeping with the statutory preference for treatment that reduces toxicity, mobility, or volume of contaminated media as a principal element of the remedy, the contaminated groundwater will be treated.

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

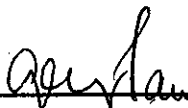
ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

- Contaminants of concern and their respective concentrations (see ROD, pages 7-11 and Appendix II, Tables 1-6);
- Baseline risk represented by the contaminants of concern (see ROD, pages 12-18);
- Cleanup levels established for contaminants of concern and the basis for these levels (see ROD, Appendix II, Table 1);
- Manner of addressing source materials constituting principal threats (see ROD, page 27);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see ROD, pages 12-18);
- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, page 32);

- Estimated capital, annual operation and maintenance, and present-worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (see ROD, page 31); and
- Key factors used in selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see ROD, pages 32-35).

AUTHORIZING SIGNATURE



George Pavlou, Director
Emergency and Remedial Response Division

9/28/07

Date

**RECORD OF DECISION FACT SHEET
EPA REGION 2**

Site

Site name: Old Roosevelt Field Contaminated Groundwater Area Site
Site location: Garden City, Nassau County, New York
HRS score: 100.00
Listed on the NPL: May 11, 2000

Record of Decision

Date signed: September 28, 2007
Selected remedy: Extraction of contaminated groundwater with ex-situ treatment and discharge of the treated water to a nearby recharge basin, installation of vapor mitigation systems at commercial buildings, if necessary, evaluation of the wellhead treatment at two Garden City supply wells, institutional controls, a site management plan, and long-term monitoring.
Capital cost: \$6,240,000
Annual operation and maintenance cost: \$850,000 for years 1 through 10, \$175,000 for years 10 through 25 and \$111,000 for years 26 through 35.
Present-worth cost: \$13,160,000

Lead

EPA

Primary Contact: Caroline Kwan, Remedial Project Manager, (212) 637-4275
Secondary Contact: Angela Carpenter, Chief, Eastern New York Remediation Section, (212) 637-4263

Main PRPs

None identified to date

Waste

Waste type: Chlorinated Volatile Organic Compounds in Groundwater

Waste origin:

On-Site spills/discharges

Contaminated media:

Groundwater, Air

DECISION SUMMARY

**Old Roosevelt Field Contaminated Groundwater Area Superfund Site
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**United States Environmental Protection Agency
Region 2
New York, New York
September 2007**

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SITE NAME, LOCATION, AND DESCRIPTION

The Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site) is an area of groundwater contamination within the Village of Garden City, Town of Hempstead, in central Nassau County, New York. Figures 1 and 2 provide a Site location and a Site map, respectively. The Site is located on the eastern side of Clinton Road, south of the intersection with Old Country Road, and includes the area of the former Roosevelt Field airfield. The former Roosevelt Field airfield area is currently developed as a large retail shopping mall with a number of restaurants, and a movie theater. Several office buildings (including Garden City Plaza) are on the western perimeter of the mall and share parking space with the mall. A thin strip of open space along Clinton Road (known as Hazelhurst Park) serves as designated parkland and a buffer between the residential community and the mall complex. Two recharge basins are directly east and south of the mall area. The eastern basin is known as Pembroke Basin and is on property owned by the mall. The basin situated to the south is Nassau County Recharge Basin number 124.

Two municipal supply well fields are located south (downgradient) of the former airfield. The Village of Garden City public supply wells (designated as Wells 10 and 11) are located just south of the airfield boundary, on the eastern side of Clinton Road. The Village of Hempstead Wellfield is located approximately 1 mile south of the Garden City supply wells.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

The Site was used for aviation activities from 1911 to 1951. The original airfield was known as the Hempstead Plains Aerodrome and encompassed 900 to 1,000 acres east of Clinton Road and south of Old Country Road. By the time the field opened in July 1912, there were 5 cement and 30 wooden hangars along Old Country Road, 4 grandstands along Clinton Road, and several flying schools. At least two aviators built aircraft at the field in 1912, including the first all-metal monoplane in America. During its first three years, activities at the airfield included civilian flight training, equipment testing, and aerial stunt shows.

The United States (U. S.) military began using the Hempstead Plains field prior to World War I. The New York National Guard First Aero Company began training at the airfield in 1915, and in 1916 the U.S. Army used the field to train Army and Navy officers. When the U. S. entered World War I in April 1917, the airfield was taken over as a training center for military pilots and renamed Hazelhurst Field. The Army removed the grandstands, built barracks along Clinton Road, and built larger hangars along Old Country Road. In 1918, the Army changed the name of the airfield to Roosevelt Field in honor of Quentin Roosevelt, a son of Theodore Roosevelt who had trained there and was killed during the war. Roosevelt Field was used throughout the war to train aviators.

After the war, the U. S. Air Service authorized aviation-related companies to operate from Roosevelt Field, but maintained control until July 1, 1920, at which time the Government sold its improvements on the airfield and relinquished control of the field. Subsequently, the property owners sold portions along the southern edge of the field and split the remainder of the property into two flying fields with an incline between them. The eastern half, with sod runways and only two hangars, continued as Roosevelt Field. The western half, which had many hangars, flying schools, and aviation maintenance shops, became known as Curtiss Field.

By 1929, the eastern field (Roosevelt) had served as the starting point or terminus of many notable flights, including Lindbergh's takeoff for his historic trans-Atlantic flight in May 1927. The western field (Curtiss) was used for flying circuses, a flying school, aircraft sales and service, and flight tests. Both fields were bought in 1929 by Roosevelt Field, Inc., and the property was once again called Roosevelt Field. Improvements were quickly made, including the installation of several large steel and concrete buildings for hangars, shops, and office space along Old Country Road. As of November 1929, numerous aviation-related businesses operated in the hangars and other buildings surrounding the western field. By 1932, paved runways and 50 buildings made Roosevelt Field the country's largest and busiest civil airfield. While the western field developed into the large aviation center that continued to operate throughout the 1930s, the eastern field remained unpaved, with few buildings, until it was leased in 1935 and became a racetrack.

Roosevelt Field was used by the Navy and Army during World War II. In July 1939, the Army Air Corps contracted Roosevelt Field, Inc. to provide airplane and engine mechanics training to Army personnel at their school. In early 1941, there were more than 200 Army students and approximately 600 other students at the Roosevelt Aviation School. At the beginning of 1942, after the U.S. had entered the war, civilian flying and private hangar rental had ceased at Roosevelt Field due to a ban on private flying in defense areas.

As of March 1942, there were 6 steel/concrete hangars, 14 wooden hangars, and several other buildings at Roosevelt Field. The Army training school was concentrated in buildings located along Clinton Road. In addition to the training activities, the Roosevelt Field facilities were used to receive, refuel, crate, and ship Army aircraft.

The Navy also used Roosevelt Field during World War II. In November 1942, the Navy Bureau of Aeronautics established a modification center at Roosevelt Field to install British equipment into U.S. aircraft for the British Royal Navy. The Navy leased five steel/concrete hangars along Old Country Road and built a barracks, mess hall, and sick bay and designated this installation as the U.S. Naval Air Facility (NAF) Roosevelt Field by February 1943. By September 1943, the Navy had built wooden buildings between four of the hangars, and in October 1943 leased six additional hangars. NAF Roosevelt Field was responsible for aircraft repair and maintenance, equipment installation, preparation and flight delivery of lend-lease aircraft, and metal work required for the installation of British modifications. The metal work constituted a substantial portion of the facility's work load. The facility also performed salvage work of crashed Royal Navy planes. The Navy vacated

all but six hangars shortly after the war ended, and removed their temporary buildings by the time their lease expired on June 30, 1946. Restoration of buildings and grounds was completed by August 1946, and Roosevelt Field operated as a commercial airport until it closed in May 1951.

Soon after the airfield closed, the large Roosevelt Field Shopping Center was constructed at the Site and opened in 1957. The old field is currently the Site of the shopping mall and office building complexes, the Meadowbrook Parkway and is surrounded by commercial areas and light industry. Three of the old Navy hangars remained standing until some time after June 1971, with various occupants, including a moving/storage firm, discotheque, amusement center, and bus garage.

It is likely that chlorinated solvents were used at Roosevelt Field during and after World War II. Chlorinated solvents such as tetrachloroethene (PCE) and trichloroethene (TCE) have been widely used for aircraft manufacturing, maintenance, and repair operations since about the 1930s. Beginning in the late 1930s, the U.S. military issued protocols for use of solvents such as TCE for cleaning airplane parts and for de-icing. The types of airplanes designated for solvent use were present at Roosevelt Field during World War II. The finish specifications for at least one type of plane that the Navy modified at Roosevelt (eight of which were on Site in April 1943) called for aluminum alloy to be cleaned with TCE. An aircraft engine overhaul manual issued in January 1945 specified TCE as a degreasing agent.

Wells 10 and 11 were installed by the Village of Garden City in 1952 and were put into service in 1953. Well 10 is screened from 377 to 417 feet below the ground surface (bgs) and well 11 is screened from 370 to 410 feet bgs. Both wells have shown the presence of PCE and TCE since they were first sampled in the late 1970s and early 1980s, and concentrations increased significantly until 1987, when an air-stripping treatment system was installed to treat the water from the wells. Sampling results of treated well water from May 1993, September 1995, and June/July 1999 indicated that breakthrough of the treatment system had occurred. The highest levels of volatile organic compound (VOC) contamination were noted during the mid-to late 1990s, and have steadily declined since then, although the levels remain above EPA and New York State (NYS) drinking water standards.

In addition to the Village of Garden City supply wells, seven cooling water wells in the mall area pumped contaminated groundwater from the Magothy aquifer for use in the air conditioning systems of the mall building and the office buildings west of the mall. Cooling water wells pumped variable amounts of water, with greater extraction rates during the hot summer months. These wells operated from approximately 1960 to 1985. After the contaminated groundwater was used in air conditioning systems, the untreated water was returned to the aquifer system via surface recharge, first to the Pembroke recharge basin and later to a drain field west of 100 Garden City Plaza and 200 Garden City Plaza.

The discharge of contaminated water into the recharge basin and drain field continued up to 1985 when the cooling water wells were taken out of service due to the presence of VOCs in the groundwater. Surface discharge of contaminated groundwater spread contamination through the Upper Glacial and Magothy aquifers. The recharge basin and drain field also created localized groundwater mounding, which may have spread contamination at the water table. However, the sandy nature of the recharge basin soils likely did not result in retention of VOCs within the soils. In addition, the zone below the recharge basin has been flushed with stormwater runoff for 20 years; residual contamination from Roosevelt Field is not likely to remain in the area. The Pembroke recharge basin currently only receives surficial stormwater runoff from parking lots surrounding the mall and the office buildings. The drain field/diffusion wells near 100 Garden City Plaza are under the paved parking lot west of 100 Garden City Plaza and 200 Garden City Plaza and are not currently identifiable in the field. Significant groundwater contamination is present at depth at SVP/GWM-4, which is located near the general area of the diffusion wells/drain field.

Enforcement Activities

EPA's search for potentially responsible parties (PRPs) is ongoing. EPA has not yet identified any financially viable parties that would be responsible under CERCLA for the Site. If PRPs are identified, EPA will seek to have them perform or pay the cost of EPA's investigation and cleanup.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA conducted an RI/FS at the Site from 2001-2007. The findings are presented in a remedial investigation (RI) report¹ and feasibility study (FS) report². EPA's preferred remedy and the basis for the preferred remedy was identified in a Proposed Plan. These documents were made available to the public in information repositories maintained at the following locations: (1) EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan; (2) at the Garden City Library located at 60 Seventh Street, Garden City, New York; and, (3) the Hempstead Library located at 115 Nichols Court, Hempstead, New York. A notice of the commencement of the public comment period, the public meeting date, a summary of the preferred remedy, EPA contact information, and the availability of the above-referenced documents was published in the *Garden City News* and *Garden City Life*

¹ *Final Remedial Investigation Report, Old Roosevelt Field Contaminated Groundwater Area Site, Remedial Investigation/Feasibility Study, Garden City, New York, Volumes I and II, CDM Federal Programs Corporation, July 24, 2007.*

² *Final Feasibility Study Report, Old Roosevelt Field Contaminated Groundwater Area Site, Remedial Investigation/Feasibility Study, Garden City, New York, Volumes I and II, CDM Federal Programs Corporation, August 20, 2007.*

on August 20, 2007 and in the *Garden City News* on August 24, 2007 and in *Garden City Life* on August 31, 2007. The public comment period ran from August 22, 2007 to September 20, 2007. EPA held a public meeting on September 11, 2007, at 7:00 P.M. at the Village of Garden City Village Hall to present the findings of the RI/FS and to answer questions from the public about the Site and the remedial alternatives under consideration. Approximately 25 people, including residents, local business people, and state and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected remedy. Public comments were related to remedy details, cost recovery by the Village of Garden City for past treatment of contaminated groundwater and a schedule for implementation of the remedy. Responses to written comments that were received during the public comment period and to comments received at the public meeting are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF THE OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing Site problems. A discrete portion of a remedial response eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. This response action applies a comprehensive approach to the Site; therefore, only one operable unit is required to remediate the Site.

The primary objectives of this action are to remediate the groundwater contamination at the Site, to reduce and minimize the potential for migration of contaminants, and to minimize any potential future health and environmental impacts.

SUMMARY OF SITE CHARACTERISTICS

RI-related field investigation activities included the collection of groundwater through multi-port monitoring wells installed during the RI, existing monitoring wells, municipal supply wells, and collection of soil gas, air/vapors, and soil samples. Associated activities included synoptic water level measurements, an ecological assessment, and a cultural resources survey. The results of the RI are summarized below.

The Site lies within the Atlantic Coastal Plain. The topography of the central portion of Nassau County is characterized by a gently southward-sloping glacial outwash plain. Two linear chains of hills, the remnants of two glacial terminal moraines, border the outwash plain to the north. The southern limit of the outwash plain is defined by the low-lying salt marshes, tidal inlets and creeks, and beach-barrier islands along the Atlantic coast of

southern Long Island. The southern chain of morainal hills, the Ronkonkoma moraine, extends from Queens eastward to form the South Fork of Long Island. The northern chain of hills, the Harbor Hill moraine, extends eastward to form the North Fork of Long Island. The moraines converge to the west of Nassau County. The Ronkonkoma moraine reaches elevations of up to 400 feet above mean sea level (msl).

The Site is flat to gently undulating. The Site slopes from approximately 100 feet above msl along Old Country Road down to approximately 70 feet above msl about 4,000 feet south-southwest of Roosevelt Field, along Clinton Road. The Roosevelt Field shopping center is located on a flat area originally called Hempstead Plains, which is at an elevation of approximately 90 feet above msl.

No naturally-occurring surface water bodies are present in the vicinity of the Site. The closest stream is East Meadow Brook, which is about 1.5 miles southeast of the Site and flows south towards Great South Bay and the Atlantic Ocean. The largest body of freshwater near the Site is Hempstead Lake, located at the head of Millbrook Creek, approximately four miles south of the Site. In general, the sandy nature of natural soils on Long Island promotes fast infiltration of precipitation (rainwater) from the ground surface. Almost the entire Site area is paved or is occupied by buildings; therefore, any surface rainwater runoff is routed into storm water collection systems and commonly is discharged directly to either dry wells or recharge/detention basins.

The Pembroke recharge basin and two Nassau County recharge basins are man-made water table recharge basins located at the Site. One of the Nassau County basins is located immediately south of the Pembroke Basin, approximately 1,500 feet southwest of the Roosevelt Field Shopping Center; the other county recharge basin is located about 1,000 feet southeast of the shopping center. The privately-owned Pembroke Basin receives surface water runoff during storm events. The Nassau County basins receive storm runoff from the municipal storm water collection system.

The Site is located within the Atlantic Coastal Plain Physiographic Province. The geology of Long Island is characterized by a southeastward-thickening wedge of unconsolidated sediments unconformably overlying a gently-dipping basement bedrock surface. The wedge ranges in thickness from zero feet beneath Long Island Sound to the north, on the submerged western margin of the Coastal Plain, to more than 2,000 feet under the southern shores of Long Island. In the vicinity of the Site the sedimentary units thicken from about 800 feet at the northern edge of the Town of Hempstead to approximately 1,500 feet thick beneath the barrier islands.

The geologic units consist of:

- Basement - Precambrian to Early Paleozoic igneous or metamorphic bedrock
- Raritan Formation - Cretaceous Lloyd Sand Member (sand and gravel) and the overlying Raritan Clay Member (clay and silt)

- Magothy Formation - Cretaceous fine to medium quartz sand, interbedded clayey sand with silt, clay, and gravel interbeds or lenses
- Pleistocene Deposits - the fluvial Jameco Gravel, the marine Gardiners Clay, and the Upper Glacial deposits

The Upper Glacial Pleistocene sediments and the Magothy Formation are the geologic units of interest for the Site.

The Upper Glacial and Magothy aquifers are unconfined and form a single aquifer unit, albeit with different properties. They are the most productive and heavily utilized groundwater resources on Long Island. The depth to the water table ranges from 25 to 50 feet bgs. Average transmissivities are 32,160 square feet per day (ft²/d) for the Magothy aquifer and 26,800 ft²/d in the Upper Glacial aquifer. Average hydraulic conductivities are 228 feet per day (ft/d) in the Upper Glacial and 174 in the Magothy.

Horizontal velocity in the Upper Glacial aquifer generally ranges from 1 to 2 feet per day (ft/d). Based on Site-specific values, the average horizontal flow rate for the Magothy is 1.8 ft/d, although literature values are estimated to be 0.3 ft/d. Based on measurements in the eight multi-port wells and the existing wells, groundwater flow is to the south/southwest. Pressure measurements in the ports indicate the vertical groundwater flow is downward. The five multi-port wells in the mall area have similar vertical gradients, with the differences between water levels in the shallow and deep ports within each well ranging from 1.8 to 2.9 feet. Further to the south, the vertical gradients become larger: 3.2 feet in SVP/GWM-7; 8.2 feet in SVP/GWM-8, and 9.7 in SVP/GWM-6. The higher vertical gradients in SVP/GWM-8 and SVP/GWM-6 are most likely caused by pumping at the Village of Hempstead public supply wells, about a block from multi-port wells SVP/GWM-6 and SVP/GWM-8.

SUMMARY OF REMEDIAL INVESTIGATION RESULTS

Chlorinated volatile organic compounds (VOCs) are the predominant contaminants in the groundwater at the Site. Although a number of organic compounds related to gasoline were detected in the Site groundwater, they could not be attributed to operations at the Site. The chemicals of concern (COCs) identified for the Site are TCE, PCE, 1,1-dichloroethene, cis-1,2-dichloroethene, and carbon tetrachloride.

The sample results for the various media are summarized below.

Groundwater

EPA and the New York State Department of Health have promulgated health-based protective Maximum Contaminant Levels (MCLs), which are enforceable standards for various drinking water contaminants. MCLs ensure that drinking water does not pose

either a short- or long-term health risk to the public. Table 1 summarizes the MCLs for the COCs.

Eight multi-port monitoring wells were drilled during the RI (see Figure 3). Four wells, each with ten ports, were installed in the Roosevelt Field mall area. One upgradient (background) well with ten ports is located on the north side of Old Country Road and three wells, each with six ports, are located in the downgradient area, south of two Village of Garden City supply wells. Two rounds of groundwater samples were collected from the eight multi-port wells (64 ports), ten existing monitoring wells and the two Garden City supply wells (see Figure 3). The concentrations for each of the COCs detected in the sampled wells are summarized in Tables 2 through 5.

The highest levels of PCE and TCE (350 and 280 micrograms per litre ($\mu\text{g/L}$), respectively) are concentrated at SVP/GWM-4 at approximately 250 to 310 feet deep. It should be noted that the SVP/GWM-4 location was selected for monitoring because of the well/drain field that was operated in the area during the 1980s, to dispose of cooling water contaminated with the Site-related VOCs. The next highest levels occur downgradient (to the south) of SVP/GWM-4 in existing well GWX-10019, at a slightly shallower depth at approximately 223 to 228 feet below ground surface (bgs), and at the two supply wells GWP-10 and GWP-11, at approximately 370 to 417 feet deep. Figures 4 and 5 show the TCE and PCE groundwater contamination in the mall area. Multi-port well SVP/GWM-7, located southwest of the supply wells, showed 20 $\mu\text{g/L}$ of TCE and 7.7 $\mu\text{g/L}$ of PCE at approximately 310 to 315 feet. Further downgradient, monitoring well SVP/GWM-8, installed during the RI, showed 34 $\mu\text{g/L}$ of PCE at approximately 100 to 105 feet and 57 $\mu\text{g/L}$ of PCE at the same depth from round 1 and round 2 sampling, respectively. TCE was detected at levels below the MCL in both rounds. Monitoring well SVP/GWM-6 showed a detection of 8.2 $\mu\text{g/L}$ of TCE at 245 to 250 feet in round 1 and 2.3 $\mu\text{g/L}$ in round 2 at the same depth. PCE was detected in several depths during both sampling rounds, but at levels below the MCL.

GWP-10 and GWP-11 each have a capacity to pump approximately one million gallons per day (mgd) of groundwater from the Magothy aquifer. Groundwater flow and contaminant movement is downward and south from the mall area to the Garden City supply wells. Contamination was observed south (downgradient) of the Garden City supply wells, as observed in the wells sampled.

Further downgradient of the supply wells, PCE and TCE contaminant levels in the most downgradient multi-port well (SVP/GWM-8) are seen at shallower depths than in the mall area. Other sources of VOC contamination in the area south of the Site may have contributed to the contamination of SVP/GWM-8 and therefore are not Site-related.

The Village of Hempstead Water Supply Wellfield, approximately one block south (downgradient) of multi-port monitoring wells SVP-6 and SVP-8, has been contaminated with VOCs since the 1980s. Two of the wells in the Village of Hempstead Wellfield showed detections of 11.8 $\mu\text{g/L}$ (well screened from 390-542 feet bgs) and 9.2 $\mu\text{g/L}$ (well screened

from 344 - 444 feet bgs) of TCE early this year through their routine monitoring. The source of this contamination is currently unknown since several potential sources are located in the vicinity of the Hempstead Wellfield.

Soil Gas

Two types of soil gas samples were collected: a screening survey on a 100-foot grid on the northern and western sides of the mall parking lot (see Figure 6) and laboratory samples collected around Garden City Plaza Buildings 100 and 200, 100 Ring Road, and in Hazelhurst Park (see Figure 7). A total of 34 samples were collected for laboratory analysis. EPA also collected soil samples at soil gas screening locations that exceeded 100 parts per billion per volume (ppbv) and at selected locations in Hazelhurst Park adjacent to Clinton Road (summarized below).

Soil gas screening criteria were selected from the EPA 2002 document titled "*Draft Document for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil*". This document provides potential screening criteria for VOCs based on risk levels and the depth of the sample. The Site-specific soil gas screening criteria shown on Table 6.

Soil Gas Screening Results: Soil gas screening samples were collected at the nodes of a 100-foot by 100-foot grid from 158 locations in a large portion of the paved and unpaved areas of the Site bordering Old Country Road and Clinton Road. Soil gas screening results from approximately 15 feet bgs and 35 feet bgs are summarized below and shown on Figures 8 and 9.

15 Feet bgs: Five of the samples collected at approximately 15 feet bgs had total VOC readings above 100 ppbv.

- Location A0 - This location is at the corner of Old Country Road and Clinton Road. The total VOC reading was 106 ppbv.
- Location A11 - This location borders Clinton Road in Hazelhurst Park. The total VOC reading was 136 ppbv.
- Location D17 - This location is just west of 100 Garden City Plaza. The total VOC reading was 531 ppbv.
- Location D19 - This location is west of 200 Garden City Plaza. The total VOC reading was 534 ppbv.
- Location F20 - This location is south of 200 Garden City Plaza. The total VOC reading was 163 ppbv.

Of the soil gas readings collected at approximately 15 feet bgs, 85 percent were at or below 10 ppbv; 8 percent were between 11 and 50 ppbv, and 4 percent were between 51 and 100 ppbv.

35 Feet bgs: Seven of the samples collected at approximately 35 feet bgs had total VOC readings above 100 ppbv, as described below.

- Locations A9, A10, and A11 - These locations border Clinton Road in Hazelhurst Park. The total VOC readings were 245 ppbv, 233 ppbv, and 148 ppbv, respectively.
- Location D17 - This location is just west of 100 Garden City Plaza. The total VOC reading was 494 ppbv.
- Location E14 - This location is north of the northeast corner of 100 Garden City Plaza. The total VOC reading was 211 ppbv.
- Location H1 - This location is southeast of the Citibank building, near the entrance road to the mall. The total VOC reading was 152 ppbv.
- Location K0 - This location is on the eastern side of the mall entrance road. The total VOC reading was 185 ppbv.

Of the soil gas readings collected at approximately 35 feet bgs, 83 percent were at or below 10 ppbv; 9 percent were between 11 and 50 ppbv, and 2.5 percent were between 51 and 100 ppbv.

Soil Gas Analytical Results: Soil gas samples were collected in Summa canisters for laboratory analysis at 15 feet bgs at 30 locations adjacent to 100 Garden City Plaza, 200 Garden City Plaza, and at 100 Ring Road. In addition, six canister samples (from four different locations) were collected from Hazelhurst Park (the grassy strip along Clinton Road) where the screening survey results were elevated. Detections of COC VOCs are shown on Figure 10 and are summarized below.

TCE detections exceeded the screening criterion for deep soil gas of 2.2 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) (see Table 6) in one sample near 200 Garden City Plaza (SGRF-25 at $23\mu\text{g}/\text{m}^3$). Three samples collected in Hazelhurst Park had TCE detections that exceeded the criterion (SGHP-2 at 3.9J, SGHP-3 at 12, and SGHP-4 at 3J $\mu\text{g}/\text{m}^3$). PCE did not exceed the screening criterion shown on Table 6.

Numerous other VOCs were detected at very low levels in the soil gas samples collected near the buildings and along Hazelhurst Park. None exceeded the screening criteria and most are associated with gasoline.

Vapor Intrusion

Based on the results of the soil gas screening, EPA is conducting an investigation of indoor air of structures within the area that could potentially be affected by intrusion of vapors from the groundwater contamination plume (summarized below). EPA would implement an appropriate remedy (such as subslab ventilation systems) based on the investigation results.

EPA collected two rounds of vapor samples in April and June 2007. The first round of sampling in April included subslab samples collected underneath the concrete slabs at four commercial buildings on the west side of the Roosevelt Field mall complex.

Based on the Round 1 results, in June 2007 EPA collected a second round of subslab and indoor air samples at six commercial buildings at the Site. No indoor samples were above levels of concern in any of the buildings. Also in June 2007, EPA collected subslab samples at seven homes located west of Clinton Road adjacent to the Roosevelt Field mall/office complex.

Additional evaluation of the residential and commercial buildings will take place to determine the extent of the vapor intrusion impacts.

Soils

A total of 41 subsurface soil samples were collected from 12 soil borings at locations with soil gas screening results above 100 ppbv and at 7 additional locations in Hazelhurst Park.³ Soil samples were generally collected at 2 depths, 15 and 40 feet bgs, although the actual depths of samples were adjusted slightly because the drilling rig occasionally encountered obstacles in the subsurface.

No VOCs exceeding the detection limit of 5 micrograms per kilogram ($\mu\text{g}/\text{kg}$) were detected in any of the soil samples collected. While it is believed that airfield activities were the source of the groundwater contamination identified in the RI, based on the results of the soil gas and soil borings, there do not appear to be any continuing sources in the soil in the areas that were sampled.

Contamination Fate and Transport

The persistence of contaminants is determined by the rate of degradation, velocity of the groundwater, the geochemical conditions in the aquifer, and the retardation coefficient (K_d) of the individual compounds. The K_d values for the COC VOCs show that they will have low adsorption to the materials in the aquifer. No residual sources in the unsaturated zone were identified.

The COCs are mobile and are expected to move with the groundwater, although at a slower rate. Natural attenuation via biodegradation appears to be limited, and due to the high oxygen levels found in the aquifer, is not likely to sufficiently reduce contaminant levels. Limited natural attenuation, however, is expected to occur through dilution and dispersion.

³Analytical Report prepared by Lockheed Martin, Inc. (Air Results), June 2007; Analytical Report prepared by Lockheed Martin, Inc. (Air Results), August 2007; Analytical Report prepared by Lockheed Martin, Inc., (Soil Results), August 2007.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Site includes a large shopping mall, numerous restaurants, a movie theater, and office buildings which ring the shopping mall. Most of the open space at the Site is asphalt parking areas for the shopping mall and office buildings. Other parts of the Site include the two Village of Garden City supply wells, two recharge basins and a small strip of open space known as Hazelhurst Park just east of Clinton Road. The use of the Site in the future is unlikely to change.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land uses. The baseline risk assessment includes a human health risk assessment and an ecological risk assessment. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessments for this Site.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* – uses the analytical data collected to identify the contaminants of potential concern at the Site for each medium, with consideration of a number of factors explained below; *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed; *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of Site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the NCP as an excess lifetime cancer risk greater than 1×10^{-4} - 1×10^{-6} or a Hazard Index (HI) greater than 1.0. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as COCs in the final remedial decision or Record of Decision. This section also includes a discussion of the uncertainties associated with these risks.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the Site in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of a number of constituents, such as PCE, TCE, carbon tetrachloride, chloroform and benzene in groundwater at concentrations of potential concern. Based on this information, the risk assessment focused on groundwater and the contaminants which may pose significant risk to human health. A comprehensive list of all COPCs can be found in the baseline human health risk assessment (BHHRA) in the administrative record. PCE and TCE, which are the COCs whose concentrations pose a significant risk or hazard at the Site, are listed in Table 7.

Exposure Assessment: Consistent with Superfund policy and guidance, the BHHRA is a baseline human health risk assessment and therefore assumes no remediation or institutional controls to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices are calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a site. For those contaminants for which the risk or hazard exceeds acceptable levels, the central tendency estimate (CTE), or the average exposure, was also evaluated.

Current Site land use is primarily commercial, including office buildings and a shopping mall. The neighboring properties are mixed-use (commercial and residential) in nature. Future land use is expected to remain the same, although the unlikely possibility that the mall and office buildings would be developed into a residential area was considered in the BHHRA. Although residents and businesses in the area are served by municipal water, groundwater is designated by the State as a potable water supply, meaning it could be used for drinking in the future. Therefore, potential exposure to groundwater was evaluated. The BHHRA evaluated potential risks to populations associated with both current and potential future land uses.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for the groundwater at the Site. Exposure pathways assessed in the BHHRA for the groundwater included ingestion of and dermal contact with tap water. Inhalation of volatile contaminants while showering and bathing was also evaluated for the hypothetical future resident. Based on current and anticipated future use of the Site, the BHHRA considered a variety of possible receptors: the current and future on-site worker and the potential future on-site resident (adult and child). A summary of the exposure pathways included in the baseline human health risk assessments can be found in Table 8.

Typically, exposures are evaluated using a statistical estimate of the exposure point concentration (EPC), which is usually an upperbound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in

groundwater can be found in Table 7, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the BHHRA.

Toxicity Assessment: Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to Site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or other sources that are identified as appropriate references for toxicity values consistent with EPA's directive on toxicity values. This information is presented in Table 9 (noncancer toxicity data summary) and Table 10 (cancer toxicity data summary).

Risk Characterization: Noncarcinogenic (systemic) risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses [RfDs], reference concentrations [RfCs]). RfDs and RfCs are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (e.g., the amount of a chemical in soil incidentally ingested) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impact a particular receptor population.

The HQs for oral and dermal exposures are calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC rather than the RfD.

$$\text{HQ} = \text{Intake}/\text{RfD}$$

Where: HQ = hazard quotient
 Intake = estimated intake for a chemical (mg/kg-day)
 RfD = reference dose (mg/kg-day)

The intake and the RfD represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of Site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1.0, separate HI values

are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1.0 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across several media. A summary of the noncarcinogenic risks associated with these chemicals for each exposure pathway is contained in Table 11.

As seen in Table 11, noncancer hazards for the on-site worker, adult on-site resident, and on-site child resident exceed EPA's HI threshold of 1, at 3, 10 and 35, respectively. Therefore, noncarcinogenic risks may occur from exposure routes evaluated in the risk assessment. The noncarcinogenic risks were attributable primarily to ingestion of TCE in groundwater.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

$$\text{Risk} = \text{LADD} \times \text{SF}$$

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as $[1/(\text{mg/kg-day})]$

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. As stated in the NCP, the acceptable risk range for Site-related exposure is 10^{-6} to 10^{-4} , with 10^{-6} being the goal of protection.

As shown in BHHRA and summarized in Table 12, in the unlikely event that untreated Site groundwater were to be used as drinking water, exposure to groundwater contaminated with PCE and TCE would be associated with combined excess lifetime cancer risks of 2×10^{-4} for the future on-site worker, 2×10^{-3} for the future on-site adult resident, and 6×10^{-3} for the future on-site child resident.

These cancer risks and noncancer health hazards indicate that there is significant potential risk from direct exposure to groundwater to potentially exposed populations. For these receptors, exposure to PCE and TCE in groundwater results in both an excess lifetime cancer risk that exceeds EPA's target risk range of 10^{-4} to 10^{-6} and an HI above the threshold of 1. Concentrations of PCE and TCE are also in excess of the Federal and State MCL of $5\mu\text{g/L}$ for these contaminants. 1,1-Dichloroethene and cis-1,2-dichloroethene are also site-related contaminants that exceeded the MCL of $5\mu\text{g/L}$ and are

therefore considered COCs. Carbon tetrachloride is considered a site-related contaminant, but concentrations did not exceed the MCL of 5 µg/L. However, a cleanup goal has been established (5µg/L) should future sampling indicate that carbon tetrachloride exceeds MCLs.

Based on the soil gas data collected, EPA conducted an investigation of indoor air/vapor intrusion into commercial structures within the area that could potentially be affected by the groundwater contamination plume. EPA is currently planning a further investigation of vapor intrusion into these structures. More information about the vapor intrusion investigation can be found in a separate report in the information repository for the Site. If the results of the investigations indicate that there is concern with Site-related vapors migrating into buildings, EPA would perform mitigation as necessary.

The response action selected in the Record of Decision is necessary to protect the public health or welfare of the environment from actual or threatened releases of contaminants into the environment.

Uncertainties: The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis;
- environmental parameter measurement;
- fate and transport modeling;
- exposure parameter estimation; and
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the BHHRA report.

Summary of Ecological Risks

The initial activities associated with a Screening Level Ecological Risk Assessment (SLERA) were completed for this investigation. The first step was to obtain information regarding the environmental setting and chemical contamination at the Site by compiling information from the Site history and other reports related to the Site. This was followed by collecting additional information related to the ecological resources at the Site regarding threatened and endangered species, as well as utilizing topographical maps and aerial photographs. Finally, a Site visit was performed to obtain detailed information relating to the habitat types present at the Site and to identify the flora and fauna at the Site.

An evaluation of the information and data that was collected was then performed, and the results of the evaluation indicated that a scientific/management decision point (SMDP) was reached. During the SLERA process, there are three possible outcomes that can be reached at the SMDP:

- (1) There is adequate information to conclude that ecological risks are negligible and therefore there is no need for remediation on the basis of ecological risk;
- (2) The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue;
- (3) The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted.

As described in preceding sections, VOCs in the groundwater are the primary contaminants, and groundwater is the primary medium of concern at the Site. Given that groundwater does not discharge to a surface water body or any surface features (i.e., the recharge basins) at the Site, which prevents exposure to any potential ecological receptor at the Site, a conclusion can be reached that there are no completed pathways present at the Site for ecological receptors. In addition, most of the land area is paved and there do not appear to be any continuing sources of contamination in the areas sampled, which prevents any potential exposure for ecological receptors. Based on this information, there is adequate information to conclude that ecological risks are negligible and therefore there is no need for remediation on the basis of ecological risk.

Summary of Human Health and Ecological Risks

The results of the risk assessment indicate that exposure of future receptors to untreated Site groundwater presents unacceptable increased cancer risks and noncancer hazards. In addition, groundwater COC concentrations exceed their respective MCLs, thereby

posing a potential human health risk.

EPA determined that ecological risks are negligible. VOCs in the groundwater are the primary contaminants and groundwater is the primary medium of concern for the Site. Groundwater does not discharge to a surface water body or surface feature (i.e., recharge basins) at the Site, which prevents exposure to any potential ecological receptors at the Site.

Basis for Action

Based upon the results of the RI and human health risk assessment, EPA has determined that the response action selected in this ROD is necessary to protect the public health or welfare of the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered guidance, and Site-specific risk-based levels.

The following remedial action objectives were established for the Site:

- Prevent or minimize potential, current, and future human exposures including inhalation, ingestion, and dermal contact with VOC-contaminated groundwater that exceeds MCLs;
- Minimize the potential for off-site migration of groundwater with VOC contaminant concentrations greater than MCLs;
- Restore groundwater to beneficial use levels within a reasonable time frame, as specified in the National Contingency Plan (NCP); and
- Mitigate, if necessary, Site-related vapor migrating into the commercial buildings.

Groundwater cleanup goals will be the more stringent of the New York State or federal MCLs, which are summarized on Table 1.

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. §9621(b)(1) mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource

recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. Section 121(d) of CERCLA, 42 U.S.C. §9621(d) further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to Section 121(d)(4) of CERCLA, 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. The FS report presents the three groundwater alternatives summarized below.

The duration time for each alternative reflects the estimated time required for the contaminant levels in the entire groundwater contaminant plume associated with the Site to be reduced below MCLs.

The remedial alternatives are:

Alternative 1: No Action

Capital Cost:	\$0
Annual Operation and Maintenance (O&M) Cost:	\$0
Present-Worth Cost:	\$0
Duration:	46 years

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative would not include any physical remedial measures to address the groundwater contamination at the Site. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 2: Monitoring and Institutional Controls

Capital Cost:	\$300,000
Annual O&M Cost ⁽⁴⁾ :	\$150,000/\$110,000 ⁽⁵⁾
Present-Worth Cost:	\$2,290,000
Duration:	46 years

(4) Includes long-term monitoring costs only

(5) The long-term monitoring program would be reduced after 25 years due to the reduction in the size of the plume.

Alternative 2 includes long-term monitoring of the contaminant plume through annual sampling and analysis of 7 existing multi-port wells and 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020).

The results of the long-term monitoring program would be used to evaluate the migration and changes in the contaminant plume over time to ensure attainment of the MCLs. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes. This alternative would also include future vapor intrusion sampling to determine if there is a concern with Site-related vapor migrating into the buildings.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.

A site management plan (SMP) would also be developed and would provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 3: Groundwater Extraction and Ex-situ Treatment (Pump and Treat)

Capital Cost:	\$6,240,000
Annual O&M Cost:	\$850,000/\$175,000/111,000 ⁽⁶⁾
Present-Worth Cost:	\$13,160,000
Duration:	35 years

(6) O&M and long-term monitoring for years 1-10/long-term monitoring for years 10-25/reduced long-term monitoring for years 25-35.

Alternative 3 includes a groundwater extraction well(s) which would be installed downgradient from monitoring well SVP/GWM-4 (see Figure 11), to capture the portion of the contaminant plume with high PCE and TCE concentrations without impacting the pumping capacity of supply wells GWP-10 and GWP-11, which have a pumping zone of influence radius of approximately 1,000 feet. The number of extraction wells needed would be determined after the completion of the pre-design investigation described below. Extracted groundwater would be treated via air strippers for approximately 10 years, with the treated water expected to be discharged to Nassau County recharge basin #124. Figure 12 shows the approximate location of the treatment facility. Based on the preliminary groundwater model, it is estimated that MCLs would be achieved in the zone of influence of the new pumping well in approximately 10 years, at which time the contamination in the extracted groundwater would have reached drinking water standards (MCLs). It is also noted that at the end of the same 10-year period, the supply wells GWP-10 and 11 would withdraw groundwater, before wellhead treatment, with contamination at or close to MCLs. It would take another 25 years for contaminant residuals in the aquifer to reach MCLs through natural attenuation processes. In summary, the preliminary model estimated that complete restoration of the aquifer to levels below the MCLs would require a total of 35 (10 + 25) years.

Alternative 3 includes a pre-design investigation which would include installation of at least 3 new multi-port wells: one well to the north of existing well GWX-9953 to confirm the northern boundary of the plume, a second well to the west of GWX-9953 to confirm the total depth of the plume, and a third well to the south of the Village of Garden City supply wells to better define the leading edge of the plume. Figure 13 shows the locations of the proposed multi-port wells.

Alternative 3 would also include evaluation and future upgrading, if necessary, of the wellhead treatment at the Garden City supply wells 10 and 11, which have been impacted by Site-related contamination. This wellhead treatment system would be needed until it has been determined that these public supply wells are no longer being impacted by the Site-related contaminants above MCLs.

In addition, if future vapor intrusion investigations indicate that there is a concern with Site-

related vapors migrating into the commercial buildings, EPA would perform mitigation, as necessary.

This alternative would also include institutional controls that restrict future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.

An SMP would also be developed and would provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Alternative 3 would also include long-term monitoring of the contaminant plume through annual sampling and analysis. For cost estimating purposes, 7 existing multi-port wells, 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020), and the new multi-port wells to be installed as part of the pre-design investigation would be monitored. The results of the long-term monitoring program would be used to evaluate changes in the contaminant plume over time and to ensure achievement of MCLs.

In the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

Because MCLs will take longer than five years to achieve, a review of Site conditions will be conducted no less often than once every five years.

Contingency Plan

Capital Cost:	\$5,660,000
Annual O&M Cost:	\$680,000

As a potential element of Alternatives 3, in the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considers the factors set out in Section 121 of CERCLA, 42 U.S.C. § 9261, by conducting a detailed analysis of the remedial alternatives pursuant to the NCP, 40 CFR §300.430(e)(9) and Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01. The detailed analysis consists of an assessment of the alternatives against each of nine evaluation criteria and comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are To-Be-Considered (TBCs). TBCs are not required by the NCP, but may be very useful in determining what is protective of a Site or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
4. Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. Cost includes estimated capital and O&M costs, and net present-worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was presented in the Proposed Plan:

8. State acceptance indicates whether, based on its review of the RI/FS reports and Proposed Plan, the State concurs with, opposes, or has no comments on the selected remedy.

9. Community acceptance refers to the public's general response to the alternatives described in the RI/FS reports and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

1. Overall Protection of Human Health and the Environment

The HHRA for the Site indicated the potential for risks associated with ingestion of contaminated groundwater by future on-site workers and future on-site adult and child residents. Alternative 1 would not include any monitoring or remedial measures, and as such, would not be protective of public health and the environment. Alternative 2 would only require long-term monitoring of the groundwater plume and institutional controls. As such, Alternative 2 would only be marginally more protective of human health and the environment than Alternative 1 because the groundwater plume would be monitored. Alternative 3 would provide overall protection of human health and the environment through implementation of a pump and treat system to extract and treat the groundwater contamination and natural attenuation processes. Alternatives 1 and 2 would rely solely upon natural processes to restore groundwater quality to drinking water standards. Although more costly than the other two alternatives, Alternative 3, which would include extraction and ex-situ treatment of contaminated groundwater, would result in the restoration of water quality in the aquifer approximately 11 years sooner than natural processes alone.

2. Compliance with ARARs

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR, Chapter 1), which are enforceable standards for various drinking water

contaminants. Alternatives 1 and 2 would not comply with chemical-specific ARARs because no groundwater treatment would be undertaken and the groundwater model predicts it would take 46 years for the contaminant levels to drop below MCLs. Alternative 3 would comply with chemical-specific ARARs through active removal and treatment of groundwater contamination. Alternative 3 would also comply with location- and action-specific ARARs that may be applicable to the treatment plant location, any necessary piping to the plant from the extraction well or from the plant to the recharge basin. All work would comply with health and safety ARARs.

3. Long-Term Effectiveness and Permanence

Alternatives 1, 2 and 3 would provide long-term effectiveness and permanence, but in different time frames. Alternatives 2 and 3 would require 46 years for the groundwater contaminant levels to be reduced to levels below the MCLs. Alternative 2 would provide slighter greater long-term effectiveness than Alternative 1 because institutional controls would be employed. Alternative 3 would achieve long-term effectiveness and permanence in 35 years by extracting contaminated groundwater from the aquifer and treating it to remove the contaminants. Alternatives 2 and 3 also would include vapor intrusion sampling and mitigation, if necessary, in six commercial buildings at the Site.

4. Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2 would not reduce toxicity, mobility, or volume through treatment since no treatment would be implemented. Alternative 3 would reduce the mobility and volume of the contaminant plume through groundwater extraction and reduce the toxicity through ex-situ treatment using air strippers. Alternative 3 would prevent the contaminant plume with concentrations above the MCLs from migrating downgradient. Alternatives 2 and 3 would also provide for mitigation due to vapor intrusion in the commercial buildings, if deemed necessary.

5. Short-Term Effectiveness

Alternative 1 would not have any short-term impact. Alternative 2 would have minimal short-term impact to the community and the environment due to the annual sampling of wells. Alternative 3 would have some additional impact to the community due to the drilling of wells and the construction of the groundwater extraction well(s) and treatment systems, but the duration would be short and the disturbance would be minimal.

6. Implementability

All three alternatives are implementable. Alternative 1 would be the easiest to implement, since it involves no action. Alternative 2 would be the next easiest to implement, since it only involves annual sampling of monitoring wells and would not have any ground intrusion activities. Alternative 3 would be also be easy to implement but more involved. Access for installation of extraction well(s) and construction of a treatment facility would be

required and various contractors would need to be procured. Construction activities could be readily conducted using standard equipment and procedures.

7. Cost

Alternative 1 would not involve any costs. Alternative 2 would have relatively low costs since it only includes annual sampling of monitoring wells and vapor intrusion investigation of the commercial buildings. The costs associated with Alternative 3 primarily reflect the installation and operation of a groundwater extraction and treatment system and vapor intrusion mitigation systems in the commercial buildings, if deemed necessary. Although more costly than the other two Alternatives, Alternative 3 would result in the restoration of water quality in the aquifer approximately 11 years sooner than the natural processes relied on in Alternatives 1 and 2 alone.

<u>Alternative</u>	<u>Capital Cost</u>	<u>Annual O&M</u>	<u>Total Present Worth</u>
1	\$0	\$0	\$0
2	\$300,000	\$150,000/\$110,000 ⁽⁷⁾	\$2,290,000
3*	\$6,240,000	\$850,000/175,000/110,000 ⁽⁸⁾	\$13,160,000

* If the Contingency Plan is necessary, the capital costs for these alternatives would increase by \$5,660,000 and the annual O & M costs would increase by \$680,000. The actual present worth value of the contingency plan cannot be calculated, however, if it were to be implemented, the contingency plan would only operate until the MCLs are achieved.

(7) Includes long-term monitoring costs only. The monitoring program would be reduced after 25 years.

(8) O&M and long-term monitoring for years 1-10/long-term monitoring for years 10-25/reduced long-term monitoring for years 25-35.

8. State Acceptance

NYSDEC does not concur with the Record of Decision at this time pending review of the environmental easement requirements (see Appendix IV).

9. Community Acceptance

Comments received during the public comment period indicate that the public generally supports the selected remedy. These comments are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

PRINCIPAL THREAT WASTE

No materials which meet the definition of "principal threat wastes" were identified during the RI/FS. Nevertheless, the EPA mandate (NCP Section 300.430 (a)(1)(iii)(F)) which requires that a contaminated sole-source drinking water aquifer be restored to beneficial use is met through treatment of the TCE and PCE groundwater contamination. No

evidence was found during the RI that dense nonaqueous phase liquids (DNAPLs) are present within the saturated zone of the aquifer. Soil sample results indicated no VOCs remain in the unsaturated zone in the areas of the former airfield that were sampled. Therefore, no principal threat wastes are present at the Site.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative 3 (groundwater extraction and ex-situ treatment) best satisfies the requirements of CERCLA Section 121, 42 U.S.C. Section 9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria listed at 40 CFR Section 300.430(e)(9).

Through groundwater extraction and ex-situ treatment, Alternative 3 will satisfy CERCLA's preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site.

Alternative 3, which includes extraction and ex-situ treatment of contaminated groundwater, will result in the restoration of water quality in the aquifer more quickly than natural processes alone and provide for vapor intrusion mitigation, if deemed necessary.

EPA believes that the preferred remedy will remove contaminated groundwater from the aquifer, be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions to the maximum extent practicable. The preferred remedy also will meet the statutory preference for the use of treatment as a principal element.

Description of the Selected Remedy

The selected remedy includes the following components:

Pre-Design Investigation of the Contaminant Plume: A pre-design investigation will be conducted to collect information for the remedial design. The pre-design investigation will include: installation of three multiport monitoring wells; a pumping test; a literature review; and infiltration tests at the Nassau County recharge basin #124.

The northern boundary and the vertical extent of the contaminant plume will be refined at well locations SVP/GWM-2 and SVP/GWM-4. A new well, SVP/GWM-9, will be installed to the north of well GWX-9953 to confirm the northern boundary of the plume. A new well, SVP/GWM-10, will be installed to the west of well GWX-10019 to confirm the total depth,

the contaminant levels, and the vertical distribution of the contaminant plume at this area. A new well, SVP/GWM-11, will be installed to the south of the two supply wells GWP-10 and GWP-11 to monitor whether contaminants are migrating downgradient from the area directly south of the supply wells (see map at Figure 13). The new multi-port monitoring wells will be installed 40 feet deeper than SVP/GWM-4. The installation of the three new wells will be similar to the multi-port monitoring well installation conducted during the RI. In addition, gamma logs will be run in all new wells to determine lithology.

A pumping test will be conducted to improve the accuracy of the groundwater model. A literature review will be conducted to obtain all available lithology logs of existing wells near the Site. The lithology data obtained from this review and the pre-design investigation gamma logs at the new multiport wells will be used to further refine the groundwater model's Site-specific conditions.

Infiltration tests will also be conducted at the Nassau County recharge basin #124 to obtain information on its current capacity in order to calibrate the groundwater model.

Groundwater Modeling: The preliminary three-dimensional groundwater model will be updated for the remedial design. Up-to-date contaminant distribution data will be collected from the pre-design investigation, and used to update the contaminant plume maps. The lithology and Site-specific hydraulic conductivity obtained during literature review and the pumping test will be incorporated into the model. During the remedial design, the most recent available pumping data and water level data will be used and the model will be re-calibrated accordingly.

The improved groundwater model with up-to-date contaminant data will be used to select the final location(s) of groundwater extraction well(s) and discharge options for treated groundwater for the remedial design.

Stage II Cultural Resource Survey: If ground intrusion such as well drilling or pipe routing are planned in any areas specified as sensitive for archeological resources during the Stage 1A cultural resource survey, a Stage II survey will be conducted.

Groundwater Extraction Well: To reduce the contaminant concentrations reaching the two supply wells GWP-10 and GWP-11, a groundwater extraction well(s) will be installed south of SVP/GWM-4 as shown in Figure 11. A new remedial extraction well SVP-4E will capture the contaminant plume upgradient of SVP/GWM-4, including the 200 µg/L contour of the PCE plume, while ensuring that the pumping capacity of supply wells GWP-10 and GWP-11 is not affected. The final location and number of extraction wells required will be determined after the pre-design investigation is completed and the groundwater model is updated.

The location, screen interval, and pumping rate of new SVP-4E were estimated using the preliminary groundwater model. The proposed pumping rate is 150 gpm with the screened interval from 175 to 275 below msl. The preliminary groundwater model indicated that after

10 years of pumping at SVP-4E, most of the contaminant plume upgradient of this extraction well will be removed. A very small portion of the contaminant plume near SVP-4E will still have concentrations above the MCLs. However, continuous operation of SVP-4E after 10 years was not recommended in the model, because it will not improve the overall cleanup time of the entire plume. As the preliminary groundwater model indicated, the drawdown caused by operation of both the new extraction well (SVP-4E) and the supply wells GWP-10 and GWP-11 may create a low flow zone between the two pumping areas. To the north of this low flow zone, groundwater flows toward SVP-4E; to the south of this low flow zone, groundwater flows toward the two supply wells. However, contaminants within the low flow zone may be held in place until extraction well SVP-4E is shut down. Once the extraction well SVP-4E is shut down, the low flow zone would disappear.

To minimize the low flow zone, several model simulations were conducted. Simulations included: a) one extraction well sequentially at different locations, b) three extraction wells running simultaneously at a lower flow rate and perpendicular to the groundwater flow, and c) three extraction wells running simultaneously at a lower flow rate and parallel to the groundwater flow. The results indicated that in order to capture the contaminant plume upgradient of new extraction wells, it is difficult to avoid creating a low flow zone.

Ex-Situ Groundwater Treatment: A low profile air stripper will remove the VOC contaminants. During the remedial design, additional treatment technologies (including liquid phase carbon adsorption) may be considered if additional information suggests the need for treatment following air stripping. The treated water will meet groundwater and surface water discharge standards.

Based on the maximum concentrations of PCE and TCE detected in SVP/GWM-4 during the RI, the maximum total VOCs (PCE and TCE) generated in the off-gas from the air stripper would be 1.5 pounds per day (lbs/day). According to the OSWER Directive 9355.0-28, *Control of Air Emissions from Superfund Air Strippers and Superfund Sites* (EPA 1989), off-gas treatment will not be necessary since the total VOC emissions are below 15 lbs/day. For New York State, according to air emission regulation 6NYCRR Part 212, the off-gas treatment required for VOC emission less than 1 pound per hour (lb/hr) is determined by the commissioner on a case by case basis. The emission rate at this Site is expected to be significantly below 1 lb/hr.

As stated above, the new extraction well SVP-4E will be operated for approximately 10 years, at which time it is estimated that contaminant levels in the majority of the zone of influence upgradient of the new pumping well would approach or achieve the MCLs, although the contamination in the groundwater near SVP-4E may be slightly above MCLs. It is also noted that at the end of the same 10-year period, the contamination in extracted groundwater in supply wells GWP-10 and 11 would, before wellhead treatment, be at or near the MCLs since the wells pump water from both contaminated and clean parts of the Magothy aquifer. The preliminary groundwater model indicated that after SVP-4E is shut down, it will take approximately another 25 years for the PCE and TCE contaminant

residuals in the aquifer to achieve MCLs through natural processes. The residual contamination is expected to remain within the capture zone of the two supply wells until levels are reduced to below the MCLs. The overall duration for this alternative is estimated to be 35 years.

The proposed location of the ex-situ treatment system is shown in Figure 12.

Discharge of Treated Groundwater: The treated groundwater will be discharged to the local Nassau County recharge basin #124. The basin was constructed in 1940 and was designed for an estimated tributary area of 162 acres. The estimated available capacity is approximately 1,124,960 cubic feet. This basin has a 36-inch overflow pipe located in the southeast corner. The overflow eventually leads to Hempstead Lake and ultimately to tidal waters. With a 150 gpm discharge rate from the new groundwater extraction well SVP-4E, the daily loading to the recharge basin will be 28,944 cubic feet, significantly lower than the basin's capacity. However, during a storm event, the run-off would reduce the available capacity of the basin for groundwater discharge. During the remedial design, results of infiltration tests will be used to calculate the capacity of the recharge basin. Run-off from a representative rain event will also be calculated to verify the available capacity for treated groundwater discharge.

Evaluation and Upgrade of the Air Strippers at supply wells GWP-10 and GWP-11: The two packed tower air strippers at the supply wells were installed in 1987, and have been in operation for approximately 20 years. During the years of operation, the Village has upgraded the stripper capacity several times. An evaluation of the conditions of the air strippers will be conducted. Any necessary upgrade or replacement of the air strippers will be evaluated. The upgrade or replacement costs of the air strippers will be estimated based on the condition of the existing treatment system.

Vapor Intrusion Sampling: There is concern, based on previous sampling results, that Site-related vapor may migrate into the commercial buildings to the west of the mall. Vapor intrusion sampling will be conducted at six buildings during the winter heating season. Vapor mitigation systems will be installed, if further sampling indicates the need for such systems.

Institutional Controls: Institutional controls will be relied upon to restrict the future use of groundwater at the Site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA will rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area will be necessary to support the land use change. Regulatory requirements under the State's Superfund program may result in NYSDEC seeking to obtain easements/covenants on various properties within the Site.

Site Management Plan: A SMP will be developed and will provide for the proper management of all Site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of Site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction at or in the vicinity of the Site; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Long-term Monitoring: The contaminant plume will be monitored through annual sampling and analysis of groundwater. The results of the long-term monitoring program will be used to evaluate changes in the contaminant plume over time and to ensure achievement of MCLs. Approximately 14 wells will be included in the long-term monitoring program, including seven multi-port wells installed during the RI (SVP/GWM-2 through SVP/GWM-8), three new multi-port wells, two single screen monitoring wells (GWX-10019 and GWX-10020), two supply wells, and annual groundwater sampling reports. Each new multi-port monitoring well was assumed to have 10 sampling ports.

Contingency Plan: In the event that public supply wells GWP-10 and GWP-11 are taken out of service permanently or area operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

Five Year Review: Because MCLs will take longer than five years to achieve, a review of Site conditions will be conducted no less often than once every five years.

Summary of the Estimated Remedy Costs

The estimated capital, annual O&M, and total present-worth cost for the selected groundwater remedy are \$6,240,000, \$850,000 (for O&M and long-term monitoring for the first 10 years), \$175,000 (long-term monitoring for years 10 through 25 and \$111,000 for years 26 through 35), and \$13,160,000, respectively. Table 13 provides the basis for the cost estimates for Alternative 3. As stated earlier, if the Contingency Plan is implemented, it would result in additional estimated costs of \$5,660,000 and \$680,000, for capital costs and O&M costs, respectively.

It should be noted that these cost estimates are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual project cost. These cost estimates are based on the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedy.

Expected Outcomes of the Selected Remedy

The results of the risk assessment indicate that there is an unacceptable future cancer risk from exposure to contaminated groundwater through ingestion, inhalation and dermal contact to future residents if the Site were ever developed as a residential area, and through ingestion to future on-site workers.

The selected remedy will allow for the following potential land and groundwater use.

Land Use

The land use at the Site is not expected to change in the future. The mall area is developed as commercial and office facilities and the residential areas are also fully developed, with very little vacant land available for development.

Groundwater Use

Under the selected remedy, contaminated groundwater will be treated and returned to productive use. The use of remediation well(s) will accelerate the cleanup of the groundwater and prevent the most highly contaminated groundwater from reaching the two Village of Garden City supply wells. EPA does not anticipate that groundwater usage at the two supply wells will change in the future, but a Contingency Plan will ensure that contaminated groundwater does not migrate downgradient should the two supply wells be shut down or their level of pumping be severely reduced.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site.

For the reasons discussed below, EPA has determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

Groundwater concentrations of several chlorinated VOCs in the aquifer exceed their respective MCLs, thereby posing a potential human health risk.

The selected remedy will be protective of human health and the environment through implementation of a remedial pump and treat system to extract and treat the groundwater

contamination. The remedy will restore the groundwater to levels below the MCLs more rapidly than relying on natural attenuation processes alone.

Compliance with ARARs and Other Environmental Criteria, Advisories or Guidance

A summary of the ARARs and other federal or state advisories, criteria, or guidance and To-Be-Considered (TBCs) is presented below. TBCs may be very useful in determining what is protective of a Site or how to carry out certain actions or requirements.

- National Primary Drinking Water Standards-Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) (40 CFR Part 141)
- OSWER Draft guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils
- New York Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 NYCRR Part 703)
- New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Technical and Operational Guidance Series 1.1.1)
- New York State Department of Health Drinking Water Standards (10 NYCRR Part 5)
- National Historic Preservation Act (40 CFR 6.301)
- RCRA Identification and Listing of Hazardous Wastes (40 CFR 261)
- RCRA Standards Applicable to Generators of Hazardous Wastes (40 CFR 262)
- RCRA—Standards for Owners/Operators of Permitted Hazardous Waste Facilities (40 CFR 264.10–164.18)
- RCRA—Preparedness and Prevention (40 CFR 264.30–264.31)
- RCRA—Contingency Plan and Emergency Procedures (40 CFR 264.50–264.56)
- New York Hazardous Waste Management System – General (6 NYCRR Part 370)
- New York Identification and Listing of Hazardous Waste (6 NYCRR Part 371)
- Department of Transportation (DOT) Rules for Transportation of hazardous materials (49 CFR Parts 107, 171, 172, 177 to 179)
- RCRA Standards Applicable to Transporters of Hazardous Waste (40 CFR 263)
- New York Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (6 NYCRR Part 372)
- New York Waste Transporter Permit Program (6 NYCRR Part 364)
- RCRA Land Disposal Restrictions (40 CFR 268)
- New York Standards for Universal Waste (6 NYCRR Part 374-3) and Land Disposal Restrictions (6 NYCRR Part 376)
- Clean Water Act (40 CFR 122, 125)
- Clean Water Act Water Quality Criteria (Federal Ambient Water Quality Criteria and Guidance Values [40 CFR 131.36])
- Safe Drinking Water Act - Underground Injection Control (40 CFR 144, 146)
- New York Regulations on State Pollution Discharge Elimination System (SPDES) (6 NYCRR Parts 750-757)

- New York Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 NYCRR Part 703)
- New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (Technical and Operational Guidance Series 1.1.1)
- New York State Regulations on Environmental Remediation 6 NYCRR part 375-1.8(a)(5)
- Clean Air Act, National Ambient Air Quality Standards (40 CFR 50)
- Federal Directive - Control of Air Emissions from Superfund Air Strippers (OSWER Directive 9355.0-28)
- New York State Air Regulations (6 NYCRR Part 200, et seq.)
- New York State Department of Environmental Conservation (6 NYCRR Part 602) Applications for Long Island Wells
- New York State Department of Health State Sanitary Code Appendix 5-B Standards for Water Wells

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to the remedy's overall effectiveness (NCP Section 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective in that it will achieve the remediation goals more rapidly than solely relying on natural processes within the aquifer.

Each of the alternatives has undergone a detailed cost analysis. In that analysis, capital and annual O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of an alternative using a 7% discount rate. The estimated present-worth cost of the selected groundwater remedy is \$13,160,000. EPA believes that the cost of the selected alternative is proportional to its overall effectiveness because it reduces the time required to achieve MCLs within the aquifer.⁹

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP Section 300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanent solutions and treatment technologies can be utilized for the groundwater at the Site. In addition, the selected remedy provides significant protection of human health and the environment, provides long-term effectiveness, is able to achieve the ARARs more quickly than the other alternatives, and is therefore cost-effective.

The selected groundwater remedy is considered a permanent remedy and will employ a treatment technology to reduce the toxicity, mobility, and volume of the contaminants in the groundwater.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected remedy in that contaminated groundwater will be treated and treatment will be used to reduce the toxicity, mobility, and volume of contamination and achieve cleanup levels.

Five-Year Review Requirements

Under EPA policy, since MCLs will take longer than five years to achieve, a review of Site conditions will be conducted no less often than once every five years.

⁹As stated earlier, the actual present worth value of the contingency plan cannot be calculated. However, if implemented, the contingency plan would only operate until MCLs are achieved. Even if the contingency plan were to be implemented, the selected remedy would still be cost-effective because it would ensure treatment of the contaminant plume in the area of GWP-10 and GWP-11.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan, released for public comment on August 22, 2007, identified Alternative 3 (groundwater extraction and treatment). Based upon its review of the written and oral comments submitted during the public comment period, EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate. However, a typographical error was noted in the Proposed Plan; O&M costs for the preferred alternative were reported as \$850,000 for the first 10 years and \$790,000 for the remaining 25 years. The correct O&M costs are \$850,000 (O&M and long-term monitoring for years 1-10), \$175,000 (long-term monitoring for years 10-25) and \$111,000 (reduced long-term monitoring for years 25-35). As there was no impact on the overall remedy cost this change is not considered significant.

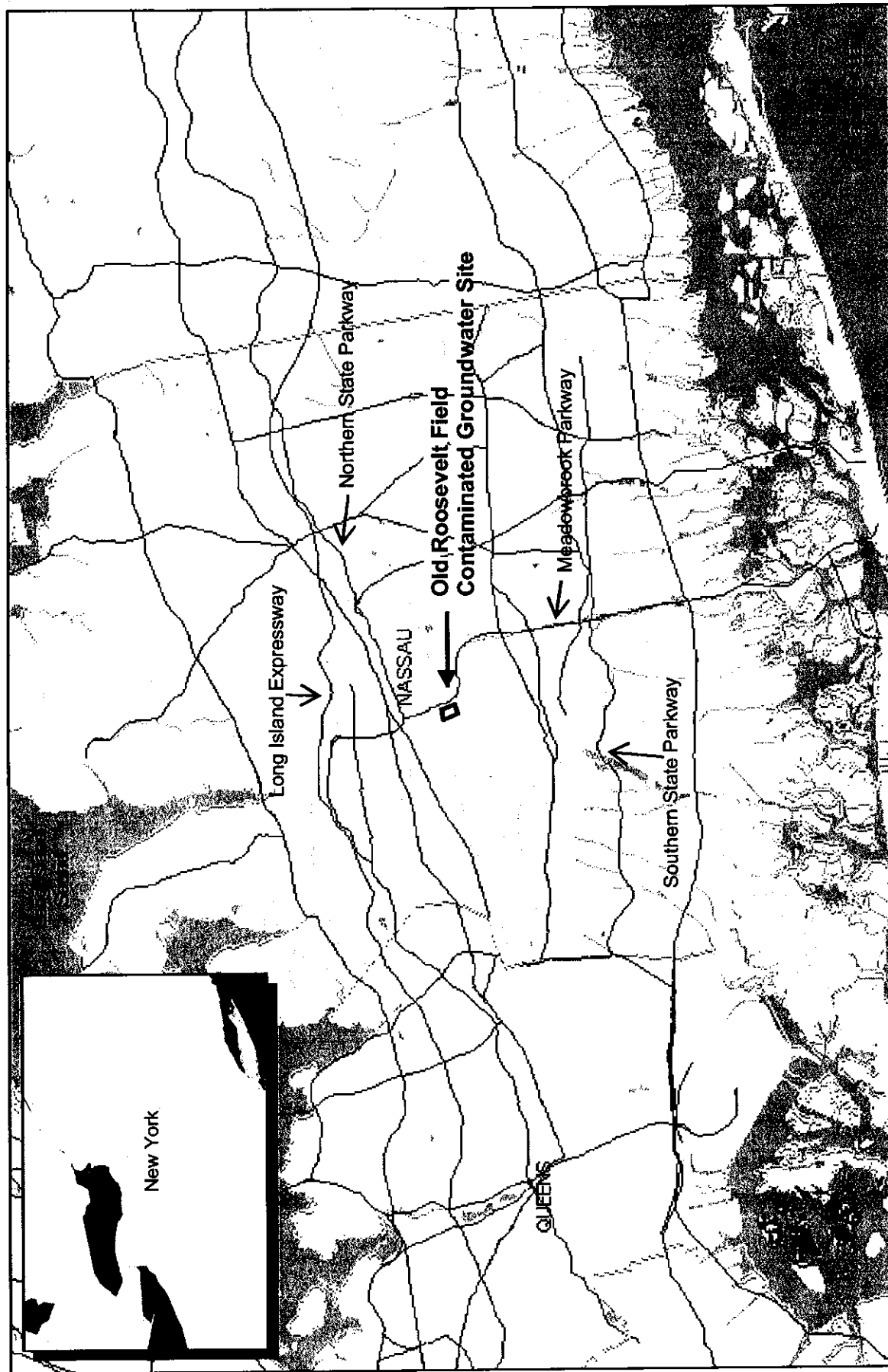
**OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
SUPERFUND SITE
RECORD OF DECISION**

APPENDIX I

FIGURES

SUMMARY OF FIGURES

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- Figure 7: Soil Gas Analytical Sample Locations
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- Figure 10: Soil Gas Analytical Results
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- Figure 12: Proposed Location for Treatment System Pump and Treat Alternative
- Figure 13: Proposed Locations for New Multi-port Wells



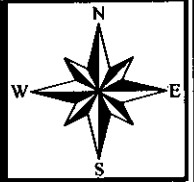
adapted from: NYSDEC Interactive Mapping Gateway: <http://www.nycis.state.ny.us/gateway/index.html>

Figure 1

Site Location Map

Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York





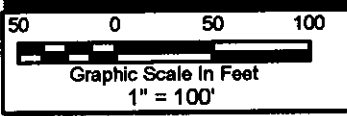
S01
 SS01
 SS02
 SS03
 SS04
 SS05
 SS06
 SS07
 GW01
 GW02
 MW01

S04
 SS15
 SS16
 SS17
 SS18
 SS19
 SS20
 SS21/SS22 (duplicate)
 GW05
 GW06
 MW03



S02/SS03 (duplicate)
 SS08
 SS09
 SS10
 SS11
 SS12
 SS13
 SS14
 GW03
 GW04
 MW02/MW06 (duplicate)

S05
 SS23
 SS24
 SS25
 SS26
 SS27
 SS28
 SS29
 GW07
 GW08
 MW04

S06
 SS30
 SS31
 SS32
 SS33
 GW09
 GW10/GW11 (duplicate)
 MW05



SOURCE:
 NYS Office of Cyber Security & Critical Infrastructure Coordination
 "Nassau County 6-inch Resolution Natural Color Orthoimagery Geospatial_
 Data_Presentation_Form:remote-sensing image" Spring 2004.

LEGEND:
 Site Boundary
 Proposed Sampling and Monitoring Well Location
 Note: All sample numbers are preceded by "ALC-"

TITLE:
 Proposed Sample Location Map
 Aluminum Louvre Corp.
 Old Bethpage
 Nassau County, NY

PROJECT:
 Aluminum Louvre Corp.

CLIENT NAME:
 EPA



DATE:
 May 2007

FIGURE #:
 2

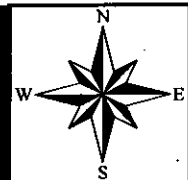


adapted from NY SDEC Interact two-Mapping Gateway: <http://www.nys.gov/interact/index.html>

Figure 2
Site Map
 Old Roosevelt Field Contaminated Groundwater Site
 Garden City, New York

0.25 0.125 0 0.25 Miles



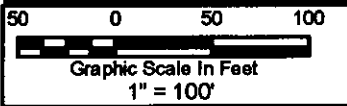


S01
SS01
SS02
SS03
SS04
SS05
SS06
SS07
GW01
GW02
MW01

S02/S03 (duplicate)
SS08
SS09
SS10
SS11
SS12
SS13
SS14
GW03
GW04
MW02/MW05 (duplicate)

S04
SS15
SS16
SS17
SS18
SS19
SS20
SS21/SS22 (duplicate)
GW05
GW06
MW03

S05
SS23
SS24
SS25
SS26
GW07
GW08/GW09 (duplicate)
MW04



SOURCE:
NYS Office of Cyber Security & Critical Infrastructure Coordination
"Nassau County 6-inch Resolution Natural Color Orthoimagery Geospatial_
Data_Presentation_Form:remote-sensing image" Spring 2004.

LEGEND:
 Site Boundary
 Proposed Sampling and Monitoring Well Location
Note: All sample numbers are preceded by "FILT-"

TITLE:
Proposed Sample Location Map
Filtron Corp
Old Bethpage
Nassau County, NY

PROJECT:
Filtron Corp

CLIENT NAME:
EPA



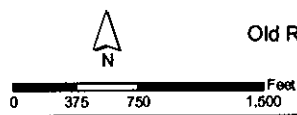
DATE:
May 2007

FIGURE #:
2



- Existing Monitoring Wells
- Multi-port Wells
- Village of Garden City Supply Wells
- N-8050 - A former cooling water well in which the highest concentrations were historically detected; the well is no longer active

Figure 3
Multi-port Well, Existing Monitoring Well, and Supply Well Locations



Old Roosevelt Field Contaminated Groundwater Site
 Garden City, New York

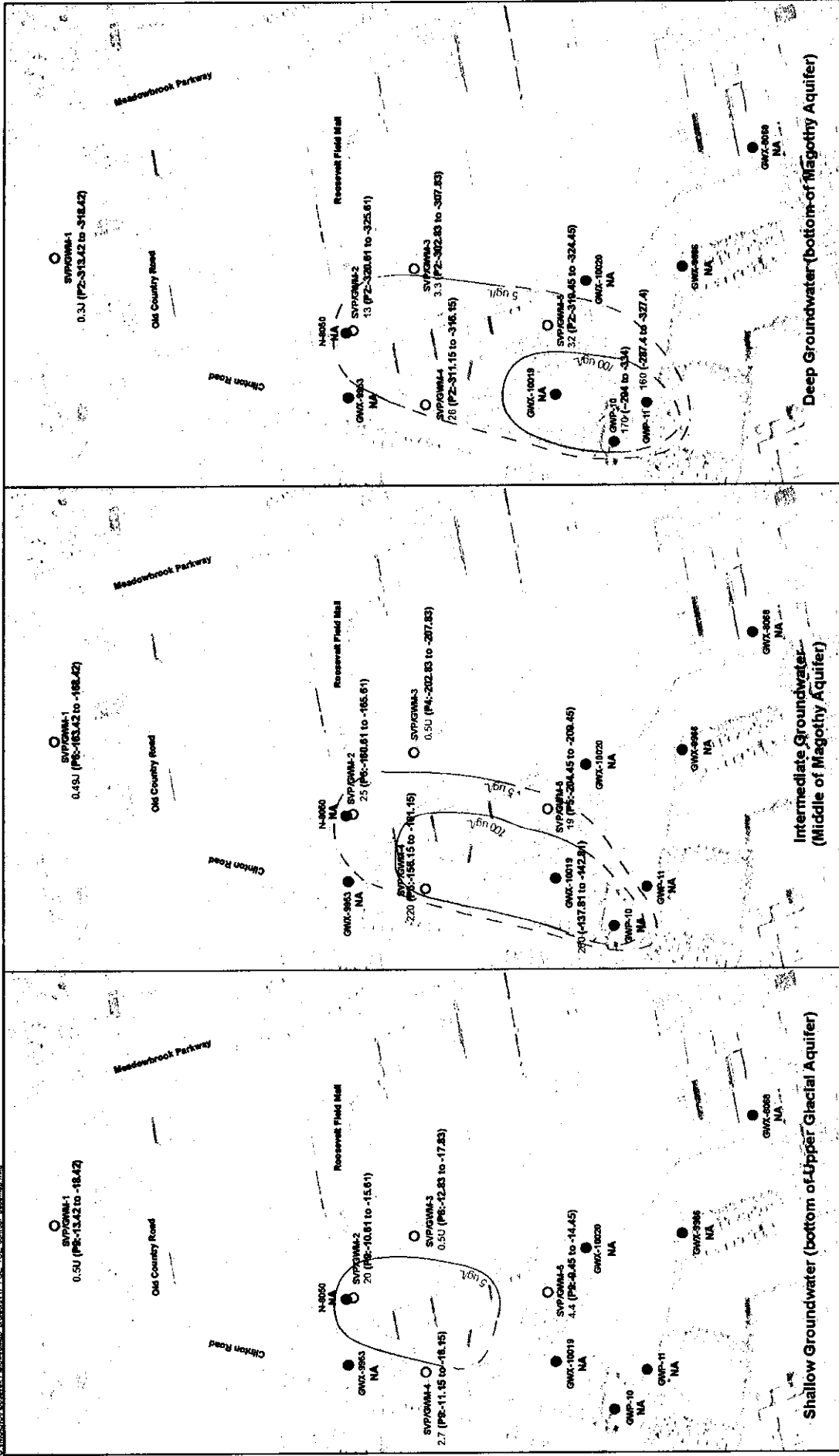


Figure 4
 March 2006 (Round 1) TCE Isocontours at Select Elevations
 Old Roosevelt Field Contaminated Groundwater Site
 Garden City, New York

Legend:

- Existing Wells
- Multiport Wells
- Supply Wells
- PCE Contour (µg/L), dashed where inferred.
- TCE value (font #: screen interval in feet AMSL)

Notes:

- All posted values are in micrograms per liter (µg/L)
- PCE = Tetrachloroethene
- NA = Not applicable - no data exists at elevation range
- MCL = 5 µg/L

Scale: 0, 500, 1,000, 2,000 Feet

CDM

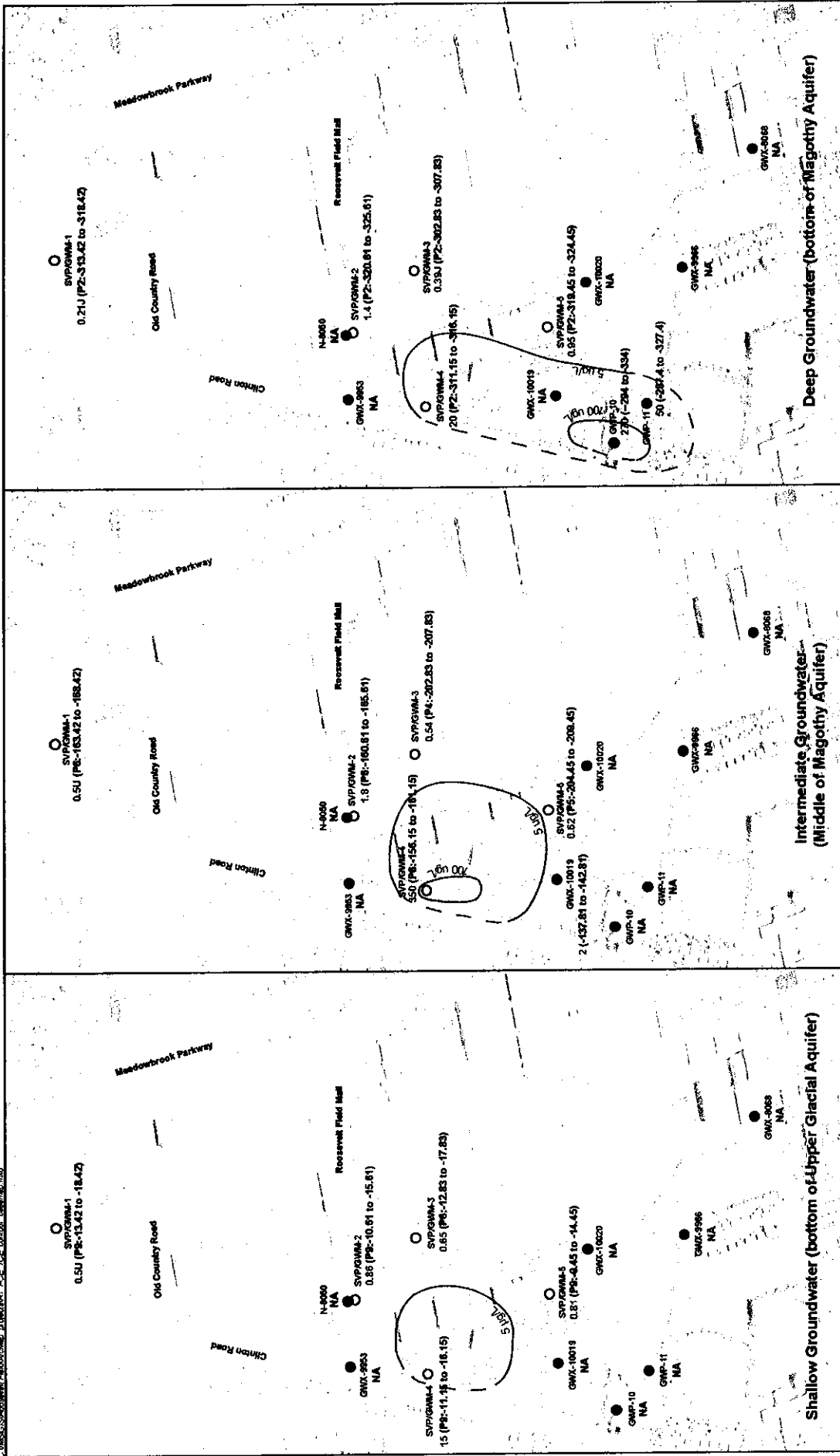


Figure 5
 March 2008 (Round 1) PCE Isocontours at Select Elevations
 Old Roosevelt Field Contaminated Groundwater Site
 Garden City, New York

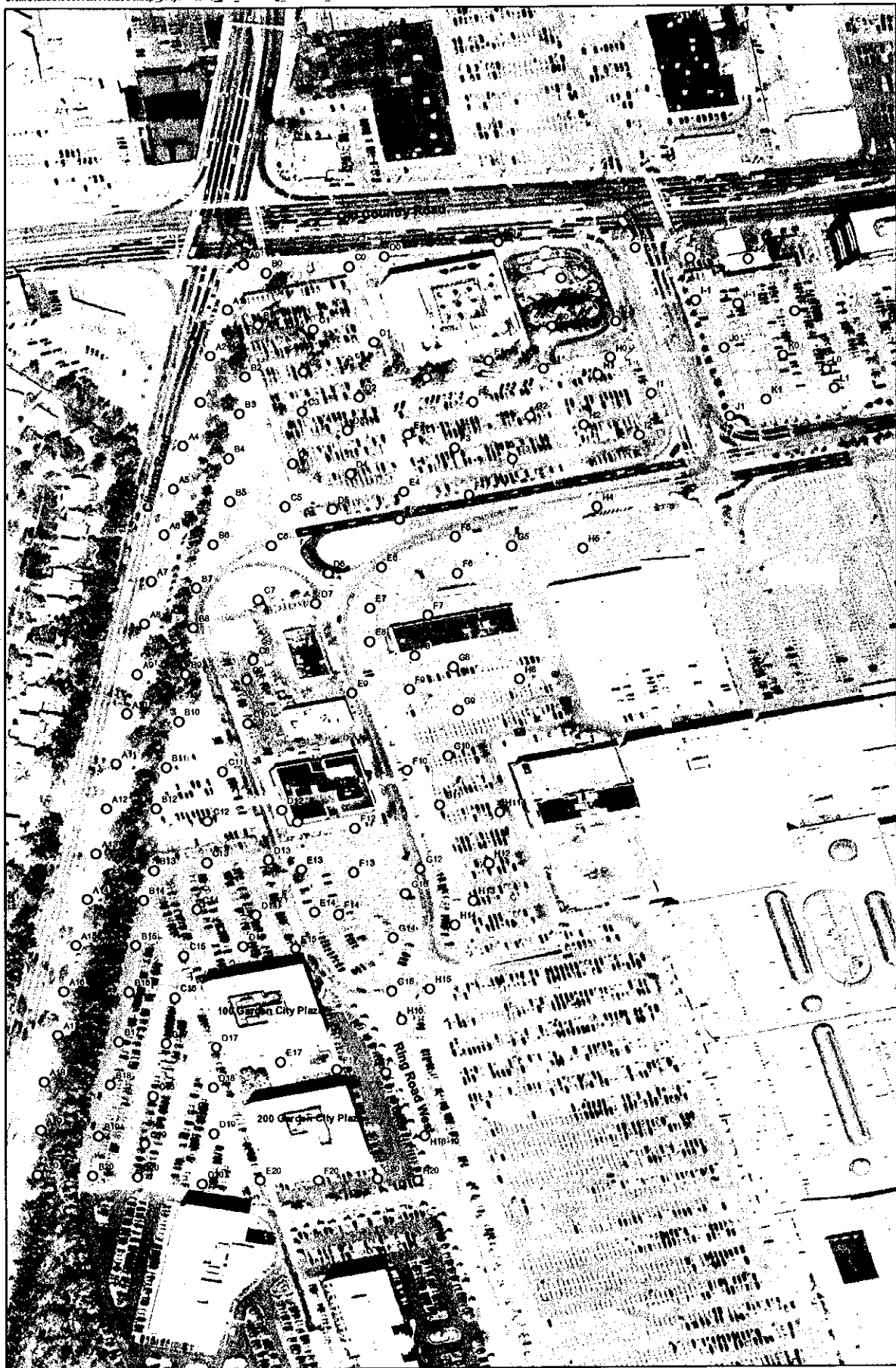
CDM

Shallow Groundwater (bottom of Upper Glacial Aquifer)
Intermediate Groundwater (Middle of Magoghy Aquifer)
Deep Groundwater (bottom of Magoghy Aquifer)

All posted values are in micrograms per liter (µg/L)
 PCE = Tetrachloroethene
 NA = Not applicable - no data exists at elevation range
 MCL = 5 µg/L

● Existing Wells
 ○ Multiport Wells
 ● Supply Wells
 --- PCE Contour (µg/L), dashed where inferred
 PCE value (Port #: screen interval in feet AMSL)

0 500 1,000 2,000 Feet



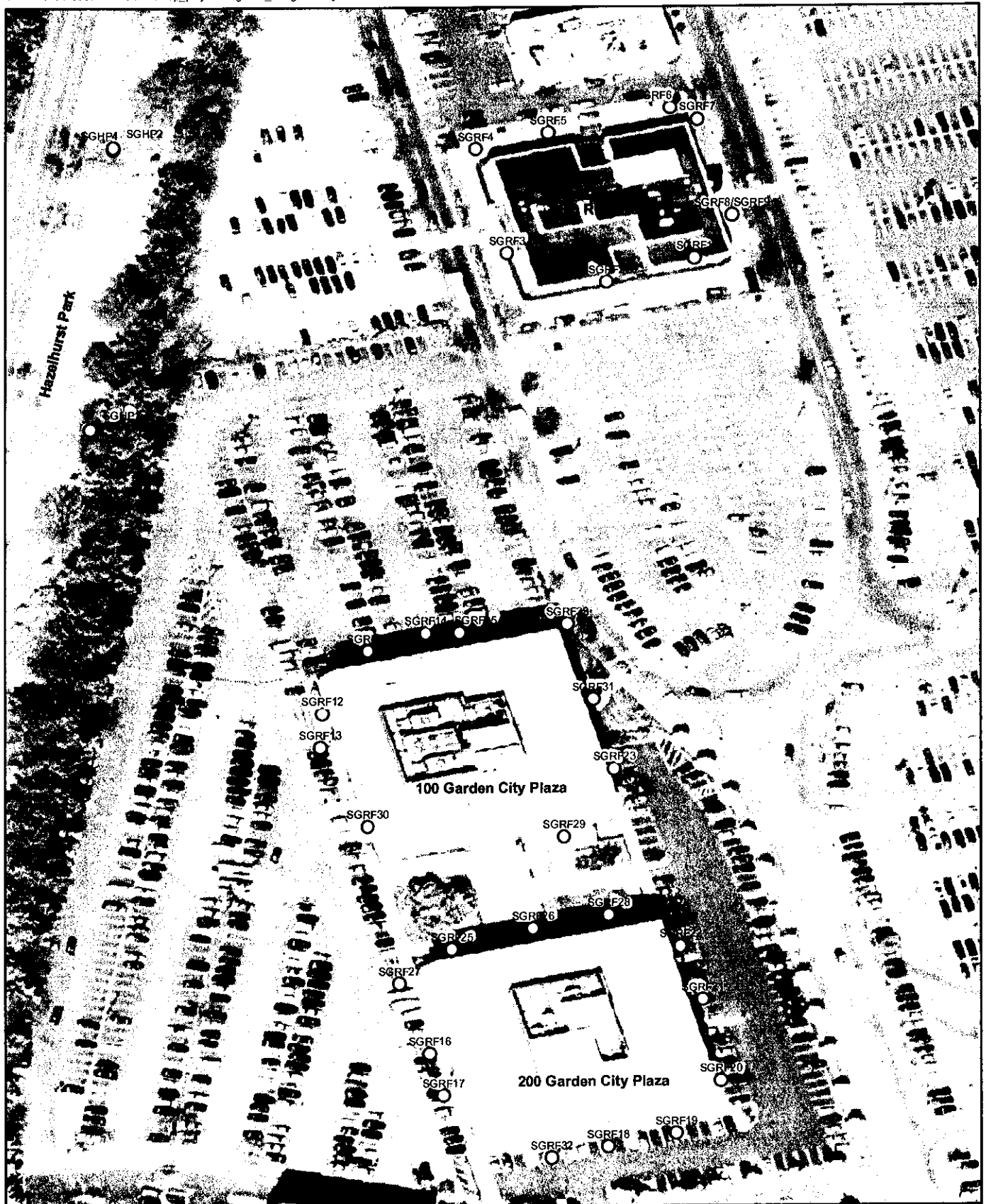
○ Soil Gas Screening Grid Point Location



0 100 200 400 Feet

Figure 6
Soil Gas Screening Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

CDM



○ Soil Gas Boring Location
for VOC Analysis via method TO-15

Note: SGRF10 and SGRF11 were not
collected due to underground utilities.

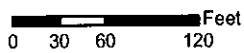


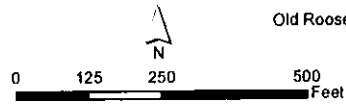
Figure 7
Soil Gas Analytical Sample Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York



- Soil gas screening point with grid point number and screening reading in parts per billion per volume (ppbv)
- Soil gas screening point with outdoor building boring location number
- Screening results at location exceed 10 ppbv
- Existing Wells and Multi-port Wells included for Spatial Reference

Notes: H19 and H18 were combined at location H-19
 bgs = below ground surface
 All soil gas measurements were made with a ppbRAE

Figure 8
Soil Gas Total VOC Screening Results - 15 feet bgs
 Old Roosevelt Field Contaminated Groundwater Site
 Garden City, New York

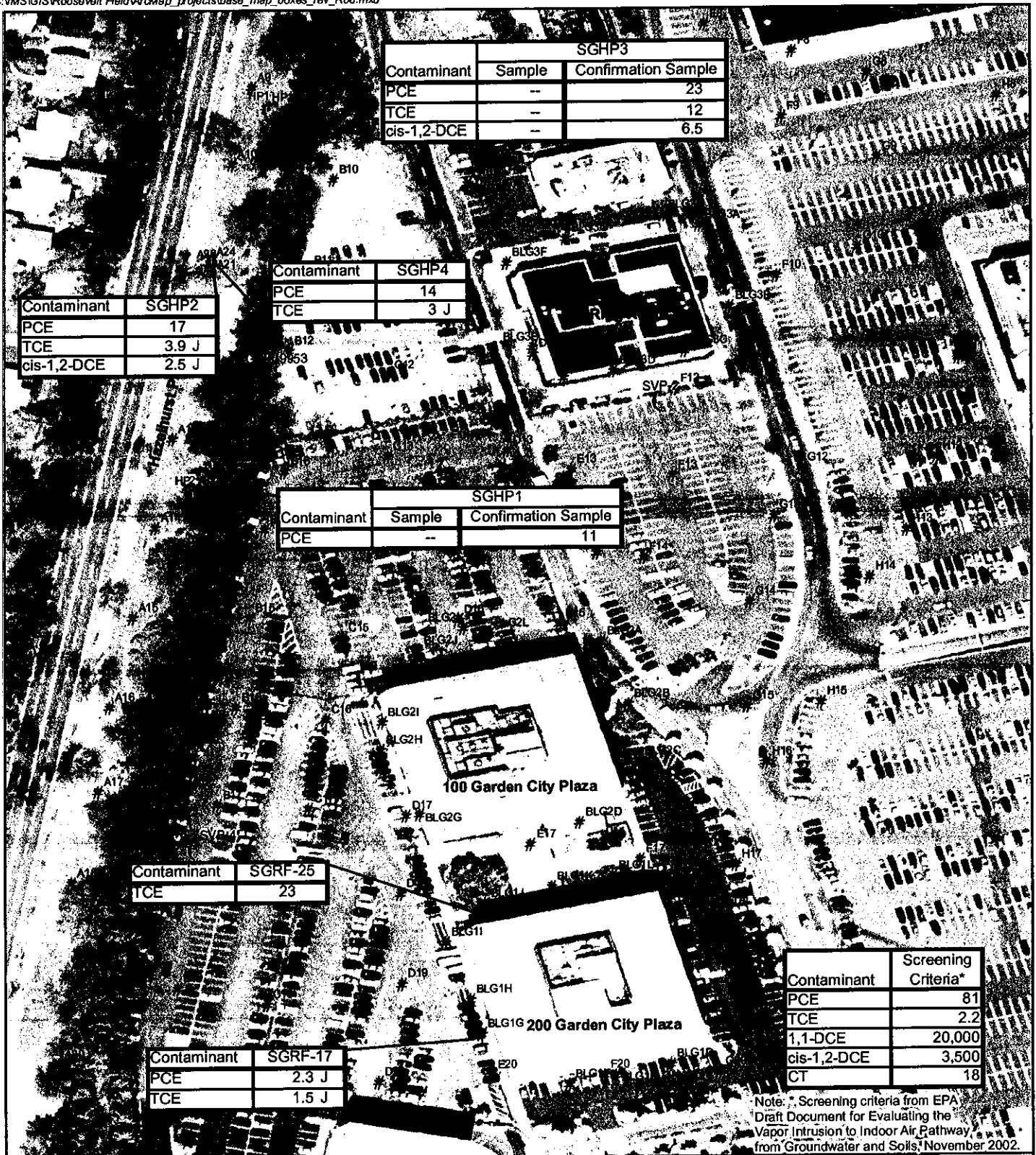




- Soil gas screening point with grid point number and screening reading in parts per billion per volume (ppbv)
 - Soil gas screening point with outdoor building boring location number
Screening results at location exceed 10 ppbv
 - Existing Wells and Multi-port Wells include for Spatial Reference
- Notes: H19 and H18 were combined at location H-19
 bgs = below ground surface
 All soil gas measurements were made with a ppbRAE

Figure 9
Soil Gas Total VOC Screening Results - 35 feet bgs
 Old Roosevelt Field Contaminated Groundwater Site
 Garden City, New York





- Soil Gas Boring Location, collected at 15 feet bgs, for VOC Analysis via method TO-15
- (Existing Monitoring Wells and Multi-port Wells Included for Spatial Reference
- # Soil gas screening locations provided for reference.

Notes

SGRF-10 and SGRF-11 were not collected due to underground utilities.

All values are in micrograms per cubic meter (µg/m³)

J = Estimated Value TCE = Trichloroethene
 U = Non Detect 1,1-DCE = 1,1 Dichloroethene
 CT = Carbon Tetrachloride cis-1,2-DCE = cis-1,2-Dichloroethene
 PCE = Tetrachloroethene

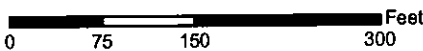


Figure 10
Soil Gas Analytical Results

Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

Simulated PCE Concentrations
after 8 Years of Operation

PCE (ppb)

- 5 - 50
- 50 - 100
- 100 - 250
- > 250

0 125 250 500
Feet

"Low Flow Zone" - Competing Flow
Between GWP-10/11 and Extraction Well

Recharge Basin

→ Groundwater Flow Vectors (scaled)

Head contours shown for model level 6, approx. 250 feet below msl

- Public Supply Well
- Multiport Well
- Existing Well
- ⊕ Extraction Well
- ⊗ Proposed Multiport Well
- Potentiometric Surface (ft, msl)

Figure 11
Alternative 3 Extraction Well Location
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York
CDM

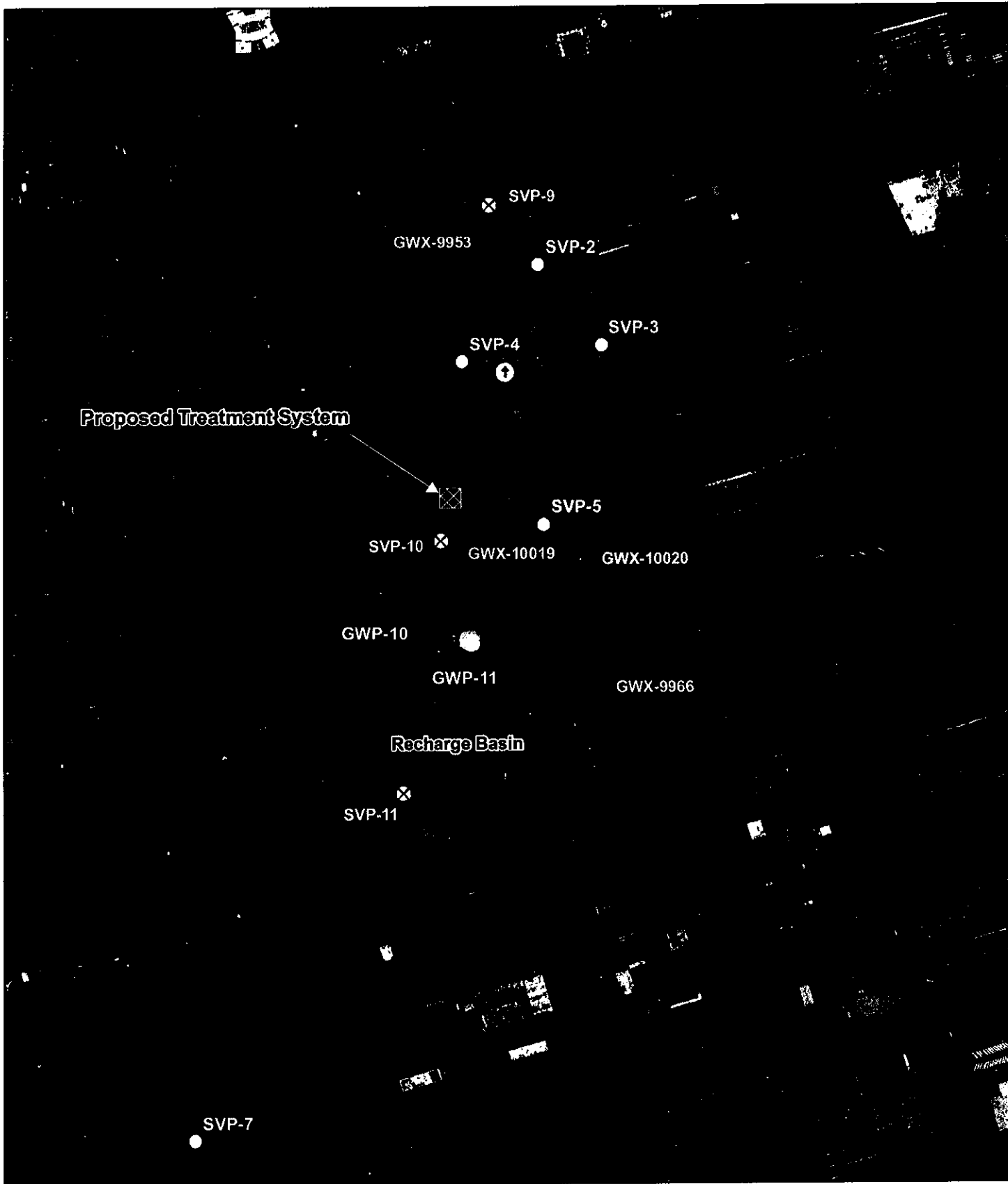
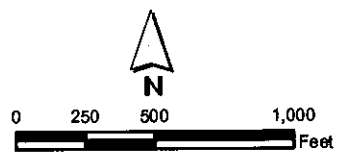
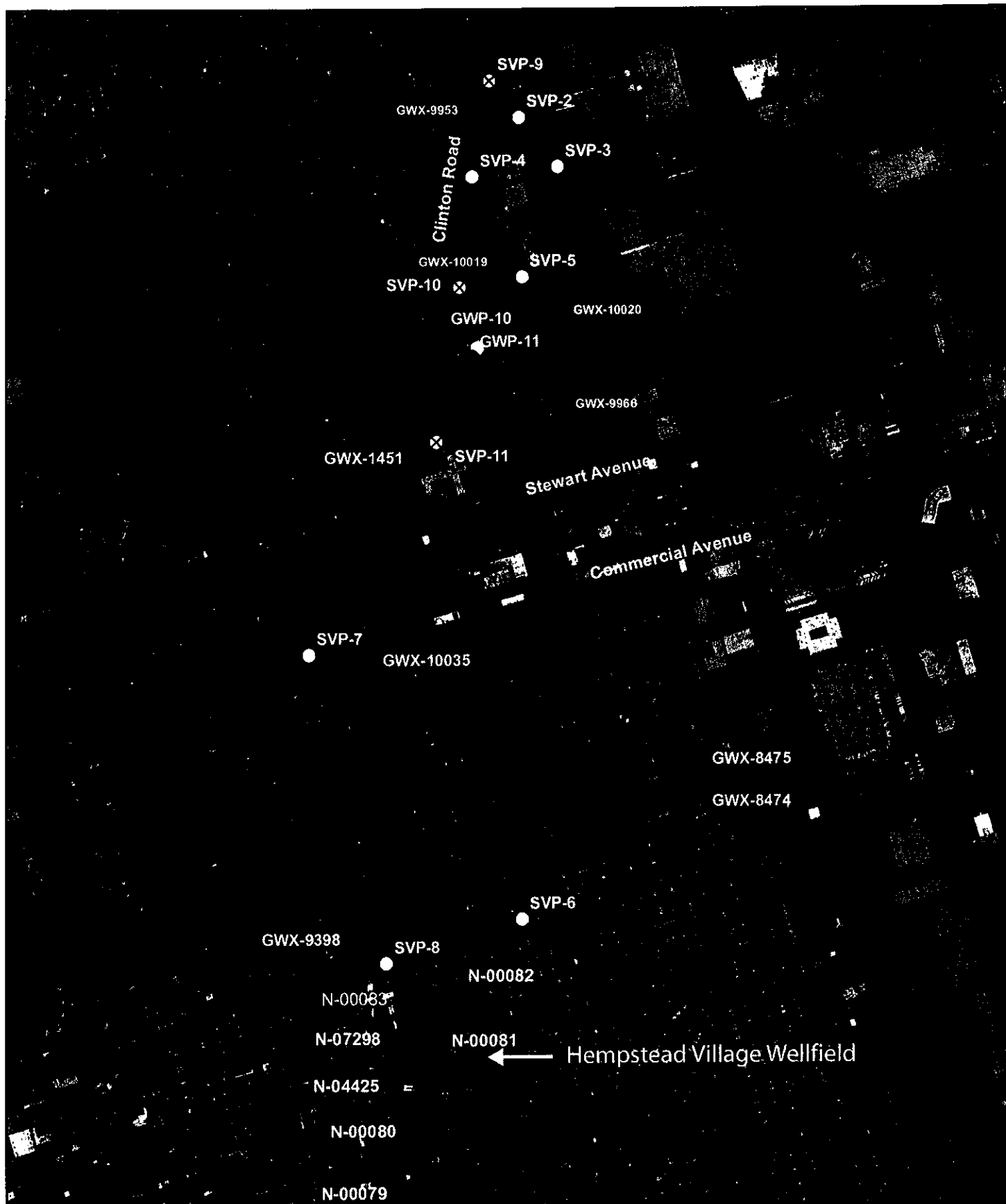


Figure 12
Proposed Location for Treatment System
Pump and Treat Alternative
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York
CDM

- Pumping Well
- Multiport Well
- Existing Well
- ⊕ Extraction Well
- ⊗ Proposed Multiport Well





- Public Supply Well
- Multiport Well
- Existing Well
- ⊗ Proposed Multiport Well

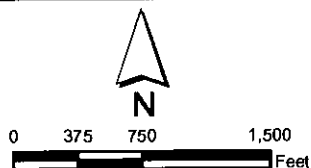


Figure 13
 Proposed Locations for New Multi-port Wells
 Old Roosevelt Field Contaminated Groundwater Site
 Garden City, New York

**OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
SUPERFUND SITE
RECORD OF DECISION**

APPENDIX II

TABLES

SUMMARY OF TABLES

- Table 1: Maximum Contaminant Levels for Contaminants of Concern
- Table 2: Multi-Port Well COC Results - Round 1
- Table 3: Multi-Port Well COC Results - Round 2
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- Table 7: Summary of Contaminants of Concern and Medium-Specific Exposure Point Concentrations
- Table 8: Selection of Exposure Pathways
- Table 9: Non-Cancer Toxicity Data Summary
- Table 10: Cancer Toxicity Data Summary
- Table 11: Risk Characterization Summary - Non-carcinogens
- Table 12: Risk characterization Summary - Carcinogens
- Table 13: Alternative 3: Pump and Treat - Cost Estimate Summary

Table 1
Maximum Contaminant Levels for Contaminants of Concern

Chemical	Groundwater MCL ($\mu\text{g/L}$) ¹
Tetrachloroethene	5
Trichloroethene	5
1,1-Dichloroethene	5
cis-1,2-Dichloroethene	5
Carbon tetrachloride	5

$\mu\text{g/L}$ = microgram per liter

¹ New York State Department of Health Drinking Water Standards, NYCRR Title 10, Part 5, Subpart 5-1 Public Water Systems, Effective November 23, 2005 (Statutory authority: Public Health Law 225, Effective May 26, 2004).

(<http://www.health.state.ny.us/environmental/water/drinking/part5/subpart5.htm>)

Table 2
Multi-Port Well COC Results - Round 1

Chemical	SVP/GWM-7					
	Port 1 445-450 ft	Port 2 425-430 ft	Port 3 310-315 ft	Port 4, 205-210 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	0.5 U	0.11 J	2.2	0.21 J	0.45 J	0.5 U
Trichloroethene	0.18 J	0.66	9.4	0.38 J	1.2	0.5 U
1,1-Dichloroethene	0.18 J	1.4	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.5 U	1	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chemical	SVP/GWM-8					
	Port 1 435-440 ft	Port 2 370-375 ft	Port 3 235-240 ft	Port 4 155-160 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	1.9	1.9	15	17	34	0.92
Trichloroethene	1.9	1.5	1.2	1	1.6	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.21 J	0.18 J	0.5 U	0.5 U	0.18 J	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (µg/L)

ft = feet

U = Not detected

J = Result is estimated due to exceeded quality control criteria

Table 3
Multi-Port Well COC Results - Round 2

SVP/GWM-1										
Chemical	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	
	400-405 ft	370-375 ft	315-320 ft	290-295 ft	250-255 ft	200-205 ft	150-155 ft	100-105 ft	50-55 ft	
Tetrachloroethene	0.7	0.8	0.8	0.21 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
Trichloroethene	0.99	2.4	0.92	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
1,1-Dichloroethene	0.5 U	4	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
cis-1,2-Dichloroethene	0.13 J	0.22 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
Carbon tetrachloride	0.5 U	0.49 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
SVP/GWM-2										
Chemical	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10
	450-455 ft	410-415 ft	370-375 ft	330-335 ft	290-295 ft	250-255 ft	190-195 ft	150-155 ft	100-105 ft	50-55 ft
Tetrachloroethene	1.8	2.3	4.4	2.6	2.2	4.3	2.3	2.3	0.38 J	0.14 J
Trichloroethene	15	17	38 J	21	23 J	17	12	18	18	1
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.74	4.1	10	5.8	5.7	10	0.34 J	0.48 J	0.76	0.14 J
Carbon tetrachloride	0.03 J	0.5 U	0.5 U	0.06 J	0.07 J	0.13 J	0.1 J	0.06 J	0.5 U	0.5 U
SVP/GWM-3										
Chemical	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 9	Port 10	
	450-455 ft	390-395 ft	370-375 ft	290-295 ft	170-175 ft	100-105 ft	50-55 ft	50-55 ft	50-55 ft	
Tetrachloroethene	0.5 U	0.5 U	0.3 J	0.24 J	0.46 J	0.64	0.54	0.54	0.54	
Trichloroethene	6.1	14	13	0.51	1	0.5 U	0.5 U	0.5 U	0.5 U	
1,1-Dichloroethene	0.5 U	1	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
cis-1,2-Dichloroethene	0.12 J	0.8	0.61	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	
Carbon tetrachloride	0.5 U	0.21 J	0.5 U	0.5 U	0.5 U	0.12 J	0.07 J	0.07 J	0.07 J	

**Table 3
Multi-Port Well COC Results - Round 2**

SVP/GWM-4										
Chemical	Port 1 420-425 ft	Port 2 400-405 ft	Port 3 350-355 ft	Port 4 305-310 ft	Port 5 285-290 ft	Port 6 245-250 ft	Port 7 185-190 ft	Port 8 145-150 ft	Port 9 100-105 ft	Port 10 45-50 ft
Tetrachloroethene	21 J	29	210	200	100	94	25	16	14	0.31 J
Trichloroethene	21 J	22	180	200	130	94	120	16	2.9	1.6
1,1-Dichloroethene	5.8	4	9.7	4.8	3.4	2	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	2.2 J	2.9	11 J	5	4.7	7.8	2.7	1.4	0.62	0.13 J
Carbon tetrachloride	1.8	2.9	0.29 J	0.12 J	0.08 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SVP/GWM-5										
Chemical	Port 1 430-435 ft	Port 2 405-410 ft	Port 3 355-360 ft	Port 4 310-315 ft	Port 5 290-295 ft	Port 6 250-255 ft	Port 7 190-195 ft	Port 8 150-155 ft	Port 9 95-100 ft	Port 10 45-50 ft
Tetrachloroethene	0.35 J	0.92	0.63	0.73	0.6	0.72	0.4 J	0.49 J	0.11 J	0.37 J
Trichloroethene	9.3	28	14	18	18	12	2.1	1.7	0.19 J	1.6
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.4	0.5 U	0.5 U
cis-1,2-Dichloroethene	1.1	2.9	1.8	2	2	1.8	0.26 J	0.25 J	0.5 U	0.18 J
Carbon tetrachloride	0.43 J	0.87	0.19 J	0.11 J	0.12 J	0.5 U	0.12 J	0.16 J	0.5 U	0.5 U
SVP/GWM-6										
Chemical	Port 1 445-450 ft	Port 2 365-370 ft	Port 3 245-250 ft	Port 4 175-180 ft	Port 5 100-105 ft	Port 6 45-50 ft				
Tetrachloroethene	0.5 U	0.5 U	0.29 J	0.24 J	0.54	0.087 J				
Trichloroethene	1.4	0.5 U	2.3	1	2.5	0.5 U				
1,1-Dichloroethene	0.5 U	0.5 U	9.7	6.7	16	0.5 U				
cis-1,2-Dichloroethene	0.67	0.19 J	5.9 J	3.7 J	17 J	0.5 U				
Carbon tetrachloride	0.06 J	0.5 U	0.5 U	0.29 J	1	0.5 U				

Table 3
Multi-Port Well COC Results - Round 2

Chemical	SVP/GWM-7					
	Port 1 445-450 ft	Port 2 425-430 ft	Port 3 310-315 ft	Port 4 205-210 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	0.5 U	0.5 U	7.7	0.56	0.69	0.5 U
Trichloroethene	0.24 J	6.2	20	0.81	1.8	0.5 U
1,1-Dichloroethene	0.5 U	5.2	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.76	3.9	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chemical	SVP/GWM-8					
	Port 1 435-440 ft	Port 2 370-375 ft	Port 3 235-240 ft	Port 4 155-160 ft	Port 5 100-105 ft	Port 6 45-50 ft
Tetrachloroethene	6.7	13	23	23	57	0.35 J
Trichloroethene	1.4	3.2	1.1	1.6	2	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.5 U	0.46 J	0.5 U	0.5 U	0.3 J	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (µg/L)

ft = feet

U = Not detected

J = Result is estimated due to exceeded quality control criteria

Table 4
Existing Well and Supply Well Results - Round 1

Well	GWP-10	GWP-11	10019	10020	10035	8474	8475	9398	9966	9953
Chemical/Depth	377-417 ft	370-410 ft	223-228 ft	185-190 ft	48-53 ft	485-556 ft	409-481 ft	21-22 ft	38-51 ft	35-40 ft
Tetrachloroethene	270	50	2	1.3	0.5 U	5.8	5.5	0.16 J	0.5 U	0.5 U
Trichloroethene	170	160	260	1.6	1.2	29	24	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	5.5	4	0.5 U	0.5 U	0.5 U	0.5 U	17	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	13	13	21	0.19 J	0.5 U	0.76	1.2	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.85	0.42 J	0.2 J	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (µg/L)

ft = feet

U = Not detected

J = Result is estimated due to exceeded quality control criteria

Table 5
Existing Well and Supply Well Results - Round 2

Well	GWP-10	GWP-11	10019	10020	10035	8086	8474	8475	9398	9966	9953
Chemical/Depth	377-417 ft	370-410 ft	223-228 ft	185-190 ft	48-53 ft	265-291 ft	485-556 ft	409-481 ft	21-22 ft	38-51 ft	35-40 ft
Tetrachloroethene	230	58	2.2	0.5 U	0.5 U	170	6.3	3.7	0.5 U	0.5 U	0.5 U
Trichloroethene	220	160	170	0.14 J	0.31 J	54	25	16	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	12	3.7	0.5 U	0.5 U	0.5 U	17	7.4	20 J	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	26 J	10	23	0.5 U	0.5 U	5.3 J	1.4 J	0.79 J	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	1.2	0.46 J	0.28 J	0.5 U	0.5 U	0.44 J	0.42 J	0.5 U	0.5 U	0.5 U	0.5 U

All results in micrograms per liter (µg/L)

ft = feet

U = Not detected

J = Result is estimated due to exceeded quality control criteria

Table 6
Soil Gas Screening Criteria for Chemicals of Concern¹

Chemical	Screening Criteria ($\mu\text{g}/\text{m}^3$)
Tetrachloroethene	81
Trichloroethene	2.2
1,1-Dichloroethene	20,000
cis-1,2-Dichloroethene	3,500
Carbon tetrachloride	16

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter
¹ Target Deep Soil Gas Concentrations from Table 2c of the EPA 2002, Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (EPA 530-D-02-04).

Table 7
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Exposure Point	Chemical of Concern ²	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Tap Water ¹	Tetrachloroethene	0.09	350	µg/L	108/127	60	µg/L	99% Cheb
	Trichloroethene	0.11	280	µg/L	110/127	77	µg/L	99% Cheb

¹ Exposure to volatilizing chemicals during showering was evaluated using the Andelman shower model, as modified by Shaum, et al. The modeled EPCs for the adult resident were 900 µg/m³ for PCE and 1,200 µg/m³ for TCE. The modeled EPCs for the child resident were 1,600 µg/m³ for PCE and 2,200 µg/m³ for TCE.

² 1,1-dichloroethene, cis-1,2-dichloroethene and carbon tetrachloride are site-related contaminants that are considered COCs because they exceed or have the potential to exceed their MCLs.
 99% Chebyshev UCL (99% Cheb)

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in groundwater (i.e., the concentration that will be used to estimate the exposure and risk from each COC in groundwater). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

**Table 8
Selection of Exposure Pathways**

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site /Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway			
Current	Ground-water	Groundwater	Tap Water	Resident	Adult	Dermal	Off-Site	None	Current nearby residents are connected to the public water supply.			
					Child (0-6 yrs)	Ingestion	Off-Site	None	Current nearby residents are connected to the public water supply.			
						Dermal	Off-Site	None	Current nearby residents are connected to the public water supply.			
					Adult	Ingestion	Off-Site	None	Current nearby residents are connected to the public water supply.			
						Ingestion	On-Site	None	Current nearby residents are connected to the public water supply.			
					Resident	Air	Water Vapors at Shower-head	Adult	Inhalation	Off-Site	None	Current nearby residents are connected to the public water supply.
								Child (0-6 yrs)	Inhalation	Off-Site	None	Current nearby residents are connected to the public water supply.
					Resident	Air	Indoor Air Vapors from Subsurface	Adult	Inhalation	Off-Site	None	Nearby residents could be exposed via inhalation of vapors from subsurface intrusion. More information about the vapor intrusion investigation at the site can be found in a separate report in the administrative record.
								Child (0-6 yrs)	Inhalation	Off-Site	None	Nearby residents could be exposed via inhalation of vapors from subsurface intrusion. More information about the vapor intrusion investigation at the site can be found in a separate report in the administrative record.
					Future	Ground-water	Groundwater	Tap Water	Resident	Adult	Dermal	On-Site
Child (0-6 yrs)	Ingestion	On-Site	Quant	Private wells could be installed in the future for residents.								
	Dermal	On-Site	Quant	Private wells could be installed in the future for residents.								
Adult	Ingestion	On-Site	Quant	Private wells could be installed in the future for residents.								
	Ingestion	On-Site	Quant	Private wells could be installed in the future for residents.								
Resident	Air	Water Vapors at Shower-head	Adult	Inhalation						On-Site	Quant	Private wells could be installed in the future for residents.
			Child (0-6 yrs)	Inhalation						On-Site	Quant	Private wells could be installed in the future for residents.
Resident	Air	Indoor Air Vapors from Subsurface	Adult	Inhalation						On-Site	Quant	Residential homes could be located on the site in the future and residents could be exposed via inhalation of vapors from subsurface intrusion. More information about the vapor intrusion investigation at the site can be found in a separate report in the administrative record.
			Child (0-6 yrs)	Inhalation						On-Site	Quant	Residential homes could be located on the site in the future and residents could be exposed via inhalation of vapors from subsurface intrusion. More information about the vapor intrusion investigation at the site can be found in a separate report in the administrative record.
Site Worker	Adult	Inhalation	On-Site	None						None		

**Table 8
Selection of Exposure Pathways**

Quant = Quantitative risk analysis performed.

Summary of Selection of Exposure Pathways

The table describes the exposure pathways associated with the groundwater that were evaluated for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and the characteristics of receptor populations are included.

**Table 9
Non-Cancer Toxicity Data Summary**

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adjusted Dermal RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD Target Organ	Dates of RfD
Tetrachloroethene	Chronic	1.0E-2	mg/kg-day	NA	1.0E-2	mg/kg-day	Liver	1000	IRIS	11/01/06
Trichloroethene	Chronic	3.0E-4	mg/kg-day	NA	3.0E-4	mg/kg-day	Liver, kidney, fetus	3000	NCEA	4/15/03

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty Modifying Factors	Sources of RfD Target Organ	Dates
Tetrachloroethene	NA	NA	mg/m3	NA	mg/kg-day	NA	NA	NA	11/17/07
Trichloroethene	Chronic	4.0E-2	mg/m3	1.1E-2	mg/kg-day	CNS	1000	NCEA	04/14/03

Key

NA: No information available

IRIS: Integrated Risk Information System, U.S. EPA

NCEA: National Center for Environmental Assessment

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in groundwater. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

Table 10
Cancer Toxicity Data Summary

Pathway: Oral/Dermal									
Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/Cancer Guideline Description	Source	Date		
Tetrachloroethene	5.4E-1	(mg/kg/day) ⁻¹	5.4E-1	(mg/kg/day) ⁻¹	2B	CalEPA	03/03/07		
Trichloroethene	4.0E-1	(mg/kg/day) ⁻¹	4.0E-1	(mg/kg/day) ⁻¹	B2-C	NCEA	01/22/03		
Pathway: Inhalation									
Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date		
Tetrachloroethene	5.9E-6	(mg/m ³) ⁻¹	2.1E-2	(mg/kg-day) ⁻¹	2B	CalEPA	12/13/04		
Trichloroethene	1.1E-4	(mg/m ³) ⁻¹	4.0E-1	(mg/kg-day) ⁻¹	B2-C	NCEA	01/17/07		

EPA Weight of Evidence:

- A - Human carcinogen
 - B1 - Probable Human Carcinogen-Indicates that limited human data are available
 - B2 - Probable Human Carcinogen-Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
 - C - Possible human carcinogen
 - D - Not classifiable as a human carcinogen
 - E- Evidence of noncarcinogenicity
- California Weight of Evidence:**
- 2B - The agent is possibly carcinogenic to humans

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure.

Table 11

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future Receptor Population: Site Worker Receptor Age: Adult									
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			Exposure Routes Total	
					Ingestion	Inhalation	Dermal		
Groundwater	Groundwater	Tap Water	Tetrachloroethene	Liver	0.06			0.06	
			Trichloroethene	Liver, Kidney, Fetus, CNS	2.5			2.5	
Groundwater Hazard Index Total ¹ =								3.0	
					Total Liver HI =			3.0	
					Total Kidney HI =			3.0	
					Total Fetus HI =			3.0	
					Total CNS HI =			3.0	
Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Adult									
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non Carcinogenic Risk			Exposure Routes Total	
					Ingestion	Inhalation	Dermal		
Groundwater	Groundwater	Tap Water	Tetrachloroethene	Liver	0.2		0.01	0.2	
			Trichloroethene	Liver, Kidney, Fetus, CNS	7.0	0.9	0.2	8.0	
Groundwater Hazard Index Total ¹ =								10	
					Total Liver HI =			9.0	
					Total Kidney HI =			8.0	
					Total Fetus HI =			8.0	
					Total CNS HI =			8.0	
Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Child									

**Table 11
Risk Characterization Summary - Noncarcinogens**

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	
Groundwater	Groundwater	Tap Water	Tetrachloroethene	Liver	0.4		0.04	0.4
			Trichloroethene	Liver, Kidney, Fetus, CNS	16	12	0.6	29
Groundwater Hazard Index Total¹ =								35
Total Liver HI =								32
Total Kidney HI =								29
Total Fetus =								29
Total CNS HI =								29

¹ The HI represents the summed HQs for all chemicals of potential concern at the site, not just those chemicals requiring remedial action which are shown here.
CNS = Central Nervous System

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

**Table 12
Risk Characterization Summary - Carcinogens**

Scenario Timeframe: Future Receptor Population: Worker Receptor Age: Adult									
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			Exposure Routes Total		
				Ingestion	Inhalation	Dermal			
Groundwater	Groundwater	Tap Water	Tetrachloroethene	1E-04			1E-04		
			Trichloroethene	1E-04			1E-04		
Total Risk =							2E-04		
Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Adult									
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			Exposure Routes Total		
				Ingestion	Inhalation	Dermal			
Groundwater	Groundwater	Tap Water	Tetrachloroethene	3E-04	5E-05	2E-05	4E-04		
			Trichloroethene	3E-04	1E-03	8E-06	2E-03		
Total Risk =							2E-03		
Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Child									
Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			Exposure Routes Total		
				Ingestion	Inhalation	Dermal			
Groundwater	Groundwater	Tap Water	Tetrachloroethene	2E-04	2E-04	2E-05	4E-04		
			Trichloroethene	2E-04	5E-03	2E-06	5E-03		
Total Risk =							6E-03		
Summary of Risk Characterization - Carcinogens The table presents cancer risks for each route of exposure and for all routes of exposure combined. As stated in the National Contingency Plan, the acceptable risk range for site-related exposure is 10 ⁻⁶ to 10 ⁻⁴ .									

Table 13
Alternative 3: Pump and Treat - Cost Estimate Summary

Item Description	Extended Cost
CAPITAL COSTS	
1. Pre-Design Investigation	\$1,110,440
2. Work Plan for Long-term Monitoring Program and Site Management Plan	\$69,120
3. Baseline Groundwater Sampling	\$174,756
4. Groundwater Modeling	\$72,000
5. Engineering Design	\$750,000
6. Groundwater Pump and Treat System Construction	\$3,203,963
7. Evaluation and Replacement of Supply Well Air Strippers	\$799,700
8. Soil Vapor Sampling	\$84,114
TOTAL CAPITAL COSTS	\$6,239,000
OPERATION & MAINTENANCE (O&M) COSTS	
Annual O&M Costs	
9. Groundwater Treatment Plant O&M	\$675,152
10. Long-term Monitoring (Annual Groundwater Sampling (Year 1 to Year 25))	\$174,756
11. Reduced Long-term Monitoring (Annual Groundwater Sampling (Year 26 to Year 35))	\$111,000
PRESENT WORTH OF 35 YEAR COSTS (with discounting)	
12. Total Capital Costs	\$6,239,000
13. Pump-and-Treat O&M Costs (for 10 years)	\$4,741,998
14. Long-term Monitoring Costs (for 35 years)	\$2,180,142

Table 13

Alternative 3: Pump and Treat - Cost Estimate Summary

Item Description	Extended Cost
TOTAL PRESENT WORTH COST	\$13,160,000
<p>Present worth cost calculations assume no inflation. The pump-and-treat system downgradient of SVP/GWM-4 will operate for 10 years. It will take 35 years for contaminant concentrations in the plume to be reduced below MCLs. However, because the size of the plume would be reduced after 25 years, the scale of long-term monitoring will be reduced after 25 years.</p>	

**OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
SUPERFUND SITE
RECORD OF DECISION**

APPENDIX III

ADMINISTRATIVE RECORD INDEX

**OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
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APPENDIX III

ADMINISTRATIVE RECORD INDEX

Data are summarized in several of the documents that comprise the Administrative Record. The actual data, quality assurance/quality control, chain of custody, etc. are compiled at various EPA offices and can be made available at the record repository upon request. Bibliographies in the documents and in the references cited in this Record of Decision are incorporated by reference in the Administrative Record. Many of the documents referenced in the bibliographies and cited in this Record of Decision are publically available and readily accessible. Most of the referenced guidance documents are available on the EPA website (www.epa.gov). If copies of the documents cannot be located, contact the EPA Project Manager Caroline Kwan at (212) 637-4275. Copies of the Administrative Record documents that are not available in the Administrative Record repository file at the Village of Garden City Library or Village of Hempstead Library can be made available at this location upon request.

OLD ROOSEVELT FIELD CONTAMINATED GW AREA
ADMINISTRATIVE RECORD FILE
INDEX OF DOCUMENTS

1.0 SITE IDENTIFICATION

1.3 Preliminary Assessment Reports

- P. 100001 - Report: Hazard Ranking System Documentation Package,
100528 Old Roosevelt Field Contaminated GW Area, Garden
City, Nassau County, New York, CERCLIS ID No.
NYSFNO204234, Volume 1 of 1, prepared by Region II
Superfund Technical Assessment and Response Team,
Roy F. Weston, Inc., Federal Programs Division,
prepared for United States Environmental Protection
Agency, January 2000.

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

- P. 300001 - Letter to Ms. Amelia Jackson, EPA QA Officer for RAC
300017 II, U.S. Environmental Protection Agency, from
Ms. Jeniffer Oxford, RAC II QA Coordinator, CDM
Federal Programs Corporation, re: QA Field
Technical Systems Audit Report, Old Roosevelt Field
Contaminated Groundwater Superfund Site, Remedial
Investigation/Feasibility Study, Nassau County,
New York, October 19, 2005.
- P. 300018 - Letter to Mr. Adly Michael, US EPA Region 2, from
300065 Mr. Scott Kirchner, RAC II Analytical Services
Coordinator, CDM Federal Programs Corporation, re:
Sampling Trip Report for RAS Case Number 35187, Old
Roosevelt Field Groundwater Contamination Site,
Groundwater Sampling Event-Round One, prepared by
CDM Federal Programs Corporation, prepared for U.S.
Environmental Protection Agency, Region II, April
20, 2006.

County, New York, prepared by John Milner Associates, Inc., prepared for CDM Federal Programs Corporation, May 2005.

- P. 300799 - Report: Final Remedial Investigation Report, Old
300995 Roosevelt Field Contaminated Groundwater Site,
Remedial Investigation/Feasibility Study, Garden
City, New York, Volume 1, prepared by CDM Federal
Programs Corporation, prepared for U.S.
Environmental Protection Agency, July 24, 2007.
- P. 300996 - Report: Final Remedial Investigation Report, Old
301929 Roosevelt Field Contaminated Groundwater Site,
Remedial Investigation/Feasibility Study, Garden
City, New York, Volume 2, prepared by CDM Federal
Programs Corporation, prepared for U.S.
Environmental Protection Agency, July 24, 2007.
- P. 301930 - Report: Final Human Health Risk Assessment, Old
302160 Roosevelt Field Contaminated Groundwater Site,
Remedial Investigation/Feasibility Study, Garden
City, New York, prepared by CDM Federal Programs
Corporation, prepared for U.S. Environmental
Protection Agency, July 24, 2007.

8.0 HEALTH ASSESSMENTS

8.1 ATSDR Health Assessments

- P. 800001 - Report: Public Health Assessment for Old Roosevelt
800045 Field Contaminated Groundwater Area, Garden City,
Nassau County, New York, EPA Facility ID:
NYSFN0204234, Final Release, prepared by New York
State Department of Health Under a Cooperative
Agreement with the Agency for Toxic Substances and
Disease Registry, July 13, 2004.

9.0 NATURAL RESOURCE TRUSTEES

9.3 Reports

- P. 900001 - Report: Chlorinated Organic Compounds in Ground
900070 Water at Roosevelt Field, Nassau County, Long
Island, New York, prepared by U.S. Geological
Survey, Water-Resources Investigations, Report 86-
4333, prepared in cooperation with the Nassau County
Department of Public Works, Syosset, New York, 1989.

OLD ROOSEVELT FIELD CONTAMINATED GW AREA
ADMINISTRATIVE RECORD FILE UPDATE
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

- P. 302161 - Report: Analytical Report, Roosevelt Field
302194 Ground Water Contamination Superfund Site, Garden
City, NY, prepared by Lockheed Martin, Inc.,
prepared for U.S. EPA, Region 2, August 9, 2007.
- P. 302195 - Memorandum to Mr. Jeff Catanzarita, U.S. EPA,
302233 Region 2, from Mr. Tim Macaluso, REAC Geologist,
Lockheed Martin Technology Services, re: Roosevelt
Field Soil Boring Event July 2007, Work Assignment
No. 0-254.1 - Trip Report, August 10, 2007.
- P. 302234 - Memorandum (with attachment) to R. Singhvi,
302283 EPA/ERT Analytical Work Assignment Manager, from
V. Kansal, REAC Analytical Section Leader,
Lockheed Martin Technology Services, re: Document
transmittal under Work Assignment #0-254, August
20, 2007.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

- P. 400001 - Report: Final Feasibility Study Report, Old
400218 Roosevelt Field Contaminated Groundwater Site,
Garden City, New York, prepared by CDM Federal
Programs Corporation, prepared for U.S. EPA,
Region 2, August 20, 2007.

**OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
SUPERFUND SITE
RECORD OF DECISION**

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation

Division of Environmental Remediation, 12th Floor

625 Broadway, Albany, New York 12233-7011

Phone: (518) 402-9706 • FAX: (518) 402-9020

Website: www.dec.ny.gov



Alexander B. Grannis
Commissioner

September 28, 2007

Mr. George Pavlou, Director
United States Environmental Protection Agency
Emergency & Remedial Response Division
Floor 19-No. E-38
290 Broadway
New York, New York 10007-1866

RE: Old Roosevelt Field, Site # 130051
Contaminated Groundwater Area Superfund Site
Record of Decision (ROD)

Dear Mr. Pavlou:

The New York State Department of Environmental Conservation (Department) does not concur with the Old Roosevelt Field site Record of Decision at this time while the Department reviews the environmental easement requirements.

If you have any questions, please contact Dr. Chittibabu Vasudevan at (518) 402-9625.

Sincerely,

Dale A. Desnoyers

Director

Division of Environmental Remediation

cc: J. LaPadula, USEPA
A. Carpenter, USEPA
K. Willis, USEPA

**OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
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APPENDIX V

RESPONSIVENESS SUMMARY

SUMMARY OF DOCUMENTS

Section V-A: August 2007 Proposed Plan

Section V-B: Public Notice

Section V-C: September 11, 2007 Public Meeting Sign-In Sheet

Section V-D: September 11, 2007 Public Meeting Transcript

Section V-E: Letters Received During the Comment Period

**RESPONSIVENESS SUMMARY
FOR THE
RECORD OF DECISION
OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA
SUPERFUND SITE
GARDEN CITY, NASSAU COUNTY, NEW YORK**

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Old Roosevelt Field Contaminated Groundwater Area Superfund site (Site) Proposed Plan and provides the U.S. Environmental Protection Agency's (EPA's) responses to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision in the selection of a remedy to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

EPA conducted an remedial investigation and feasibility study (RI/FS) at the Site from 2001-2006. The findings are presented in an RI report⁴ and FS report⁵. EPA and NYSDEC's preferred remedy and the basis for that preference was identified in a Proposed Plan. These documents were made available to the public in information repositories maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan, at the Village of Garden City Public Library located at 60 Seventh Street, Garden City, New York, and at the Village of Hempstead Public Library, 115 Nichols Court, Hempstead, New York. Notices of the commencement of the public comment period, the public meeting date, a summary of the preferred remedy, EPA contact information, and the availability of the above-referenced documents were published in Garden City Life and Garden City News on August 17, 2007 and in Garden City News on August 24, 2007 and in Garden City Life on August 31, 2007. The public comment period ran from August 22, 2006 to September 20, 2007. EPA held a public meeting on September 11, 2007 at 7:00 P.M. at the Village of Garden City Village Hall to present the findings of the RI/FS and to answer questions from the public about the Site and the remedial alternatives under consideration. Approximately 25 people, including residents, local business people, and state and local government officials, attended the public meeting. On the basis of comments received during the public comment period, the public generally supports the selected remedy.

⁴ *Final Remedial Investigation Report, Old Roosevelt Field Contaminated Groundwater Site, Remedial Investigation/Feasibility Study, Garden City, New York, Volumes I and II, CDM Federal Programs Corporation, July 24, 2007.*

⁵ *Final Feasibility Study Report, Old Roosevelt Field Contaminated Groundwater Site, Remedial Investigation/Feasibility Study, Garden City, New York, CDM Federal Programs Corporation, August 20, 2007.*

RESPONSIVENESS SUMMARY

APPENDIX V-a

AUGUST 2007 PROPOSED PLAN

Old Roosevelt Field Contaminated Groundwater Area Superfund Site

Garden City, New York

August 2007

PURPOSE OF THIS DOCUMENT

This document describes the remedial alternatives considered for the Old Roosevelt Field Contaminated Groundwater Area Superfund site and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA) and EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the site and the remedial alternatives summarized in this Proposed Plan are described in the July 2007 Remedial Investigation (RI) report, August 2007 Feasibility Study (FS) report, and the soil vapor intrusion investigation report. EPA encourages the public to review these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted at the site.

This Proposed Plan is being provided as a supplement to the RI/FS reports to inform the public of EPA's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred groundwater alternative. EPA's preferred remedy includes the installation of a groundwater extraction well to capture and treat the contaminant plume. The extraction well will be located near multi-port well SVP-4 and would capture and treat the contaminated groundwater with elevated concentrations of trichloroethene (TCE) and tetrachloroethene (PCE) to prevent further migration of the contaminant plume towards Garden City supply wells GWP-10 and GWP-11. Contaminated groundwater extracted from the new well will be treated using either air-strippers or carbon adsorption units. The treated groundwater will be discharged to a nearby recharge basin.

The remedy described in this Proposed Plan is the preferred remedy for the site. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in the Proposed Plan and in the detailed analysis section of the RI/FS report because EPA may select a remedy other than the preferred remedy.



MARK YOUR CALENDAR

August 22, 2007 - September 20, 2007: Public comment period related to this Proposed Plan.

September 11, 2007 at 7:00 P.M.: Public meeting at the Village of Garden City Village Hall, 351 Stewart Avenue, Garden City, NY.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period which begins on August 22, 2007 and concludes on September 20, 2007.

A public meeting will be held during the public comment period at the Village of Garden City Village Hall on September 11, 2007 at 7:00 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedy, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

SITE BACKGROUND**INFORMATION REPOSITORIES**

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Garden City Public Library
60 Seventh Street
Garden City, New York 11530
(516) 742-8405
www.nassaulibrary.org/gardenc/

Hours: Call or see website for summer hours.

Hempstead Public Library
115 Nichols Court
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Site Description

The Old Roosevelt Field Contaminated Groundwater Area Site (site) is an area of groundwater contamination within Garden City, in central Nassau County, New York. The site is located on the eastern side of Clinton Road at the intersection with Old Country Road. The site includes a thin strip of open space along Clinton Road (known as Hazelhurst Park), a large retail shopping mall with a number of restaurants, and a movie theater. Several office buildings (including Garden City Plaza) which share parking space with the shopping mall are situated around its perimeter. Public supply wells GWP-10 and GWP-11 are east of Clinton Road on the southwestern corner of the site. Two recharge basins are directly east and south of the public water supply wells. The eastern basin is known as Pembroke Basin and is on property owned by the shopping mall. The basin situated to the south is Nassau County Storm Water Basin number 124.

Site History

The site was used for aviation activities from 1911 to 1951. The original airfield encompassed 900 to 1,000 acres east of Clinton Road and south of Old Country Road. By the time the field opened in July 1912, there were 5 cement and 30 wooden hangars along Old Country Road, 4 grandstands along Clinton Road, and several flying schools.

The United States (U. S.) military began using the field prior to World War I. The New York National Guard First Aero Company began training at the airfield in 1915, and in 1916, the U.S. Army used the field to train Army and Navy officers. The Army removed the grandstands, built barracks along Clinton Road, and built larger hangars along Old Country Road. In 1918, the Army changed the name of the airfield to Roosevelt Field in honor of Quentin Roosevelt, a son of Theodore Roosevelt who had trained there and was killed during the war.

After World War I, the U. S. Air Service authorized aviation-related companies to operate from Roosevelt Field, but maintained control until July 1, 1920, at which time the Government relinquished control of the field. Subsequently, the property owners sold portions along the southern edge of the field and split the remainder of the property into two flying fields. The eastern half, with sod runways and only two hangars, continued as Roosevelt Field. The western half, which had many hangars, flying schools, and aviation maintenance shops, became known as Curtiss Field.

By 1929, the eastern field (Roosevelt) had served as the starting point or terminus of many notable flights, including Lindbergh's takeoff for his historic trans-Atlantic flight in May 1927. The western field (Curtiss) was used for flying circuses, a flying school, aircraft sales and service, and flight tests. Both fields were bought in 1929 by Roosevelt Field,

Written comments on the Proposed Plan should be addressed to:

Caroline Kwan
 Remedial Project Manager
 New York Remediation Section
 U.S. Environmental Protection Agency
 290 Broadway, 20th Floor
 New York, New York 10007-1866

Telefax: (212) 637-4284
 email: kwane.caroline@epa.gov

SCOPE AND ROLE OF ACTION

Site remedial activities are sometimes segregated into different phases, or operable units, so that remediation of different environmental media or areas of a site can proceed separately in an appropriate manner. For the Old Roosevelt Field Contaminated Groundwater Area site, EPA decided to address all site contamination as one operable unit.

Inc., and the entire property was once again called Roosevelt Field. Improvements were made, including the installation of several large steel and concrete buildings for hangars, shops, and office space along Old Country Road. As of November 1929, numerous aviation-related businesses operated in the hangars and other buildings surrounding the western field. By 1932, paved runways and 50 buildings made Roosevelt Field the country's largest and busiest civil airfield. While the western field developed into the large aviation center, the eastern field remained unpaved, with few buildings, until it was leased in 1935 and became a racetrack.

Roosevelt Field was used by the Navy and Army during World War II. In July 1939, the Army Air Corps contracted Roosevelt Field, Inc. to provide airplane and engine mechanics training to Army personnel at their school. In early 1941, there were more than 200 Army students and approximately 600 other students at the Roosevelt Aviation School. At the beginning of 1942, after the U.S. had entered the war, civilian flying and private hangar rental ceased at Roosevelt Field due to a ban on private flying in defense areas.

As of March 1942, there were 6 steel/concrete hangars, 14 wooden hangars, and several other buildings at Roosevelt Field. The Army training school was concentrated in the buildings located along Clinton Road. In addition to the training activities, the Roosevelt Field facilities were used to receive, refuel, crate, and ship Army aircraft.

In November 1942, the Navy Bureau of Aeronautics established a modification center at Roosevelt Field to install British equipment into U.S. aircraft for the British Royal Navy. The Navy leased five steel/concrete hangars along Old Country Road; built a barracks, mess hall, and sick bay; and commissioned the U.S. Naval Air Facility (NAF) Roosevelt Field by February 1943. By September 1943, the Navy had built wooden buildings between four of the hangars, and in October 1943 leased six additional hangars. NAF Roosevelt Field was responsible for aircraft repair and maintenance, equipment installation, preparation and flight delivery of lend-lease aircraft, and metal work required for the installation of British modifications. The metal work constituted a substantial portion of the facility's work load. The facility also performed salvage work of crashed Royal Navy planes. The Navy vacated all but six hangars shortly after the war ended, and removed their temporary buildings by the time their lease expired on June 30, 1946. Restoration of buildings and grounds was completed by August 1946, and Roosevelt Field operated as a commercial airport until it closed in May 1951.

After the airfield closed, the large Roosevelt Field Shopping Center was constructed at the site and opened in 1957. The old field is currently the site of the shopping mall and office building complexes and is surrounded by commercial areas and light industry. Three of the old Navy hangars remained standing until some time after June 1971, with various

occupants, including a moving/storage firm, discotheque, amusement center, and bus garage.

It is likely that chlorinated solvents were used at Roosevelt Field during and after World War II. Chlorinated solvents such as tetrachloroethene (PCE) and trichloroethene (TCE) have been widely used for aircraft manufacturing, maintenance, and repair operations since about the 1940s. By May 1938, the Bureau of Aeronautics had a specification covering TCE and had approved at least one company to supply TCE. The finish specifications for at least one type of plane that the Navy modified at Roosevelt (eight of which were on site in April 1943) called for aluminum alloy to be cleaned with TCE. An aircraft engine overhaul manual issued in January 1945 specified TCE as a degreasing agent.

In addition to the Village of Garden City supply wells, seven cooling water wells pumped groundwater from the Magothy for use in building air conditioning systems. Cooling water wells pumped variable amounts of water, with greater extraction rates during the hot summer months. These wells operated from approximately 1960 to 1985. After extracted groundwater was used in air conditioning systems, the untreated water was returned to the aquifer system via surface recharge in the Pembroke recharge basin or, after minimal treatment, to a drain field west of Buildings 100 and 200.

The discharge of contaminated water into the recharge basin and drain field continued until the mid-1980s when the cooling water wells were taken out of service. Surface discharge of contaminated groundwater spread contamination through the Upper Glacial and Magothy aquifers. The recharge basin and drain field also created localized groundwater mounding, which may have spread contamination at the water table. However, the sandy nature of the recharge basin soils likely did not result in retention of VOCs within the unsaturated zone. In addition, the zone below the recharge basin has been flushed with stormwater runoff for 20 years; residual contamination from Roosevelt Field is not likely to remain in the area. The Pembroke recharge basin currently only receives surficial stormwater runoff from parking lots surrounding the mall and the office buildings. The drain field/diffusion wells near Building 100 are under the paved parking lot west of Building 100 and 200 and are not currently identifiable in the field. Significant groundwater contamination is present at depth at SVP-4, which is located near the general area of the diffusion wells/drain field.

Supply wells 10 and 11 were installed by the Village of Garden City in 1952 and were put into service in 1953. Well 10 is screened from 377 to 417 feet below the ground surface (bgs) and well 11 is screened from 370 to 410 feet bgs. Both wells have shown the presence of PCE and TCE since they were first sampled in the late 1970s and early 1980s, and concentrations increased significantly until 1987, when an air-stripping treatment system was installed at the

wells. Sample results of treated well water from May 1993, September 1995, and June/July 1999 indicated that breakthrough of the treatment system had occurred, and as a result, modifications to the air-stripping treatment system were made to improve its operation. The highest levels of volatile organic compound (VOC) contamination were noted in untreated groundwater during the mid-to late 1990s, and levels have steadily declined since, although the levels remain above EPA and NYS drinking water standards.

SITE HYDROLOGY/HYDROGEOLOGY

Site Hydrology

No naturally-occurring surface water bodies are present in the vicinity of the Roosevelt site. The closest stream is East Meadow Brook, which is about 1.5 miles southeast of the site and flows south towards Great South Bay and the Atlantic Ocean. The largest body of freshwater near the site is Hempstead Lake, located at the head of Millbrook Creek, approximately four miles southwest of the site. Overflow from Nassau County Recharge Basin #124 is directed to the Horse Brook Drain, which flows south to Hempstead Lake, and ultimately to tidal waters to the south.

In general, the sandy nature of natural soils on Long Island promotes fast infiltration of precipitation (rainwater) from the ground surface. Almost the entire area of the site, with the exception of Hazelhurst Park, is paved or is occupied by buildings; therefore, surface rainwater runoff is routed into storm water collection systems and commonly is discharged directly to either dry wells or recharge basins.

The Pembroke recharge basin and two Nassau County recharge basins are man-made water table recharge basins located on or near the site. One of the Nassau County basins is located immediately south of the Pembroke Basin, approximately 1,500 feet southwest of the Roosevelt Field Shopping Center; the other county recharge basin is located about 1,000 feet southeast of the shopping center. The privately-owned Pembroke Basin receives surface water runoff during storm events. The Nassau County basins receive storm water runoff from the municipal storm water collection system.

Site Geology

The site is located within the Atlantic Coastal Plain Physiographic Province. The geology of Long Island is characterized by a southeastward-thickening wedge of unconsolidated sediments unconformably overlying a gently-dipping basement bedrock surface.

The Upper Glacial deposits and the Magothy Formation are the geologic units of interest for the site.

Site Hydrogeology

Groundwater on Long Island is derived from precipitation. The volume of water that percolates down to the water table and recharges the groundwater is the residual of the total precipitation not returned to the atmosphere by evapotranspiration or lost by runoff. Due to the permeable nature of the soils and the generally gentle slope of the land surface, infiltration is high. At the Roosevelt site, which is mostly covered by impervious surfaces such as buildings, paved parking lots, and roads, surface runoff is directed to dry wells or the nearby recharge basins.

The aquifers of concern at the Roosevelt site are the Magothy aquifer and the Upper Glacial aquifer, which form a single, unconfined aquifer, although with different properties. They are the most productive and heavily utilized groundwater resource on Long Island. The depth to the water table ranges from 25 to 50 feet bgs (below ground surface).

Based on measurements in the 8 multi-port wells and 10 existing wells made as part of the Remedial Investigation, groundwater flow is to the south/southwest. Pressure measurements in the ports indicate the vertical groundwater flow is downward. The five multi-port wells in the mall area have similar vertical gradients, with the differences between water levels in the shallow and deep ports within each well ranging from 1.8 to 2.9 feet. Further to the south, the vertical gradients become larger: 3.2 feet in SVP-7; 8.2 feet in SVP-8, and 9.7 in SVP-6. The higher vertical gradients in SVP-8 and SVP-6 are most likely caused by pumping at the Village of Hempstead public supply wells, about a block from multi-port wells SVP-6 and SVP-8.

RESULTS OF THE REMEDIAL INVESTIGATION

The first step in evaluating the nature and extent of contamination at and emanating from the site was to identify regulatory standards and criteria to assess and screen detected constituents in groundwater and soil gas.

Groundwater

EPA and New York State Department of Health have promulgated health-based protective Maximum Contaminant Levels (MCLs), which are enforceable standards for various drinking water contaminants. MCLs, which ensure that drinking water does not pose either a short- or long-term health risk, were used as screening criteria for the groundwater. Table 1 summarizes the MCLs for the contaminants of concern (COCs).

Table 1	
Chemical	Groundwater MCL ⁽¹⁾
PCE	5
TCE	5

1,1-Dichloroethene	5
cis-1,2-Dichloroethene	5
Carbon tetrachloride	5

Units: (1) micrograms/liter ($\mu\text{g/L}$)

Groundwater

Eight multi-port monitoring wells were drilled during the remedial investigation (see Figure 1). Four wells, each with 10 ports, were installed in the Roosevelt Field mall area. One upgradient (background) well with 10 ports is located on the north side of Old Country Road and three wells, each with six ports, are located in the downgradient area, south of two Village of Garden City supply wells. Ten existing monitoring wells were also sampled (see Figure 1).

Site-related VOCs were selected based on historical data, since sampling of the Garden City supply wells has occurred on a regular basis for more than 20 years. The site-related VOCs are TCE, PCE, 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), and carbon tetrachloride.

Two rounds of VOC samples were collected from the eight multi-port monitoring wells and the 10 existing wells. The highest levels of PCE and TCE (350 and 280 $\mu\text{g/L}$, respectively) are concentrated at SVP/GWM-4 at approximately 250 to 310 feet deep. It should be noted that the SVP-4 location was selected for monitoring because a distilling well/drain field was operated in the area during the 1980s, to dispose of cooling water contaminated with the site-related VOCs. The next highest levels occur downgradient (to the south) of SVP/GWM-4 in existing well GWX-10019, at a slightly shallower depth at approximately 223 to 228 feet bgs, and at the two supply wells GWP-10 and GWP-11, at approximately 370 to 417 feet deep. Multi-port well SVP/GWM-7, located southwest of the supply wells, showed 20 $\mu\text{g/L}$ of TCE and 7.7 $\mu\text{g/L}$ of PCE at approximately 310 to 315 feet. Further downgradient, monitoring well SVP/GWM-8, installed during the RI, showed 34 $\mu\text{g/L}$ of PCE at approximately 100 to 105 feet and 57 $\mu\text{g/L}$ of PCE at the same depth from round 1 and round 2 sampling, respectively. TCE was detected at levels below the MCL in both rounds. Monitoring well SVP/GWM-6 showed a detection of 8.2 $\mu\text{g/L}$ of TCE at 245 to 250 feet in round 1 and 2.3 $\mu\text{g/L}$ in round 2 at the same depth. PCE was detected in several depths during both sampling rounds, but at levels below the MCL.

GWP-10 and GWP-11 each have a capacity to pump approximately one million gallons per day (mgd) of groundwater from the Magothy aquifer. Groundwater flow and contaminant movement is downward and south from the mall area to the Garden City supply wells. Contamination was observed south (downgradient) of the Garden City supply wells, as observed in the wells sampled.

Further downgradient of the supply wells, PCE and TCE contaminant levels in the most downgradient multi-port well (SVP/GWM-8) are seen at shallower depths than at the plume core in the mall area. Other sources of VOC contamination in the area south of the site may have contributed contamination.

The Village of Hempstead Water Supply Wellfield approximately one block south (downgradient) of multi-port monitoring wells SVP-6 and SVP-8, has been contaminated with VOCs since 1980s. Two of the wells in the Village of Hempstead Wellfield showed detections of 10.1 $\mu\text{g/L}$ of TCE and 9.2 $\mu\text{g/L}$ early this year through their routine monitoring. The source of this contamination is currently unknown since several potential sources are located in the vicinity of the Hempstead Wellfield.

Soil Gas

Two types of soil gas samples were collected: a screening survey on a 100-foot grid on the northern and western sides of the mall parking lot (see Figure 2) and laboratory samples collected around 100 and 200 Garden City Plaza and in Hazelhurst Park (see Figure 3). A total of 34 samples were collected for laboratory analysis. Based on the results of the soil gas screening, EPA conducted an investigation of vapor intrusion into structures within the area that could potentially be affected by the groundwater contamination plume. More information about the vapor intrusion investigation can be found in a separate report in the information repository for the site.

Soil gas screening results from approximately 15 feet bgs and 35 feet bgs are summarized below. The soil gas screening samples were measured in the field with an instrument called a ppbRAE meter. The results are in parts per billion per volume (ppbv).

15 Feet bgs: Five of the samples collected at approximately 15 feet bgs had total VOC readings above 100 ppbv: Location A0 at the corner of Old Country Road and Clinton Road (106 ppbv); location A11 in Hazelhurst Park east of Clinton Road (136 ppbv); location D17 west of Garden City Plaza Building 100 (531 ppbv); location D19 west of Garden City Plaza Building 200 (534 ppbv); and location F20 south of Garden City Plaza Building 200 (163 ppbv). Of all the soil gas readings collected at approximately 15 feet bgs, 85 percent were at or below 10 ppbv; 8 percent were between 11 and 50 ppbv, and 4 percent were between 51 and 100 ppbv.

35 Feet bgs: Nine of the samples collected at approximately 35 feet bgs had total VOC readings above 100 ppbv: Locations A9, A10, and A11 in Hazelhurst Park east of Clinton Road (245 ppbv, 233 ppbv, and 148 ppbv, respectively); location B15 west of the northwest corner of Garden City Plaza Building 100 (368 ppbv); location C20 one of the southern-most samples (112 ppbv); location D17 west of Garden City Plaza Building 100 (494 ppbv); location E14

north of the northeast corner of Garden City Plaza Building 100 (211 ppbv); location H1 southeast of the Citibank building, near the entrance road to the mall (152 ppbv); and location K0 on the eastern side of the mall entrance road (185 ppbv). Of all the soil gas readings collected at approximately 35 feet bgs, 83 percent were at or below 10 ppbv; 9 percent were between 11 and 50 ppbv, and 2.5 percent were between 51 and 100 ppbv.

Soil gas samples collected in canisters for laboratory analysis were compared to the soil gas screening criteria in Table 2c in the EPA 2002 document titled "*Draft Document for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil*". TCE detections exceeded the screening criterion of $2.2 \mu\text{g}/\text{m}^3$ in one sample near Garden City Plaza building 200 (SGRF-25 at $23 \mu\text{g}/\text{m}^3$). Three samples collected along Hazelhurst Park (adjacent to Clinton Road) had TCE detections that exceeded the criterion (SGHP-2 at approximately 3.9, SGHP-3 at 12, and SGHP-4 at approximately $3 \mu\text{g}/\text{m}^3$). No other results exceeded the screening criteria.

Soil

To complete the evaluation of potential residual source areas in the area of the old airfield, EPA collected 41 soil samples at locations with soil gas screening survey results above 100 ppbv and at selected additional locations in Hazelhurst Park along Clinton Road. Soil samples were generally collected at 2 depths, 15 and 40 feet bgs. The actual depths of samples were adjusted slightly because the drilling rig occasionally encountered obstacles in the subsurface. No VOCs were detected in any of the soil samples collected. While it is believed that airfield activities were the source of the groundwater contamination identified in the RI, based on the results of the soil gas and soil borings, there do not appear to be any continuing sources in the soil in the areas that were sampled.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land and groundwater uses. The baseline risk assessment includes a human health risk assessment (HHRA) and an ecological risk assessment.

The cancer risk and noncancer health hazard estimates in the HHRA are based on current reasonable maximum exposure scenarios and were developed by taking into account various health protective estimates about the frequency and duration of an individual's exposure to chemicals selected as chemicals of potential concern

(COPCs), as well as the toxicity of these contaminants. Cancer risks and non-cancer health hazard indexes (HIs) are summarized below (please see the text box on the following page for an explanation of these terms).

A screening level ecological risk assessment (SLERA) was not conducted to assess the risk posed to ecological receptors because contaminated groundwater does not discharge to any surface water bodies within the area of the site. Since no groundwater discharges to surface water, exposure pathways are not complete and ecological receptors are not exposed to contaminants from the site. Therefore, ecological risks are negligible.

Human Health Risk Assessment

Current site land use is primarily commercial, including office buildings and a shopping mall. The neighboring properties are mixed-use (commercial and residential) in nature. Future land use is expected to remain the same, although the unlikely possibility that the mall and office buildings would be developed into a residential area was considered in the HHRA. The baseline risk assessment began by selecting COPCs in groundwater that would be representative of site risks. The COCs for the site are PCE and TCE in groundwater.

The baseline risk assessment evaluated health effects that could result from exposure to contaminated groundwater through ingestion of, dermal contact with, and inhalation of volatile organic compounds. Although residents and businesses in the area are served by municipal water, groundwater is designated by the State as a potable water supply, meaning it could be used for drinking in the future. Therefore, potential exposure to groundwater was evaluated.

Based on the current zoning and anticipated future use, the risk assessment focused on a variety of possible receptors, including current and future site workers and potential future residents (adult and child). A complete discussion of the exposure pathways and estimates of risk can be found in the *Human Health Risk Assessment* for the site in the information repository.

In the unlikely event that untreated site groundwater were to be used as drinking water, exposure to groundwater contaminated with PCE and TCE would be associated with combined excess lifetime cancer risks and noncancer health hazard indices of 2×10^{-3} and 10 for the future adult resident, 6×10^{-3} and 35 for the future child resident, and 2×10^{-4} and 3 for the future on-site worker.

These cancer risks and noncancer health hazards indicate that there is significant potential risk from direct exposure to groundwater to potentially exposed populations. For these receptors, exposure to PCE and TCE in groundwater results in either an excess lifetime cancer risk that exceeds EPA's target risk range of 10^{-4} to 10^{-6} or an HI above the threshold of 1, or both. Concentrations of PCE and TCE are also in

WHAT IS RISK AND HOW IS IT CALCULATED?**Human Health Risk Assessment:**

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6} , corresponding to a one in ten thousand to a one in a million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or Record of Decision.

excess of the Federal and State MCLs of 5 µg/l for both PCE and TCE.

EPA is currently planning a further investigation of vapor intrusion into structures within the area that could be potentially affected by the groundwater contamination plume. More information about the vapor intrusion investigation can be found in a separate report in the information repository for the site. If the results of the investigations indicate that there is concern with site-related vapors migrating into buildings, EPA would perform mitigation as necessary.

It is the lead agency's current judgment that the Preferred Alternative identified in the Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered guidance, and site-specific risk-based levels. The remediation goals for the site are the groundwater MCLs.

The following remedial action objectives were established for the site:

- Prevent or minimize potential, current, and future human exposures including inhalation, ingestion and dermal contact with VOC-contaminated groundwater that exceeds the MCLs;
- Minimize the potential for off-site migration of groundwater with VOC contaminant concentrations greater than MCLs;
- Restore groundwater to beneficial use levels as specified in the National Contingency Plan (NCP) and
- Mitigate site-related vapor migrating into the commercial buildings, if necessary.

Table 1 summarizes the groundwater cleanup standards.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA Section 121(b)(1) of 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also

establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d) of 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4) of 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the site can be found in the FS report. The FS report presents three groundwater alternatives described below.

The duration time for each alternative reflects the estimated time required for the entire groundwater contaminant plume associated with the site to be reduced to levels below the MCLs.

The remedial alternatives are:

Alternative 1: No Action

Capital Cost:	\$0
Annual Operation & Maintenance (O&M) Cost:	\$0
Present-Worth Cost:	\$0
Duration:	46 years

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative would not include any physical remedial measures to address the contamination at the site. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the site be reviewed at least once every five years.

Alternative 2: Monitoring and Institutional Controls

Capital Cost:	\$300,000
Annual O&M Cost ⁽²⁾ :	\$150,000/\$110,000 ⁽³⁾
Present-Worth Cost:	\$2,290,000
Duration:	46 years

(2) Includes long-term monitoring costs only

(3) The long-term monitoring program would be reduced after 25 years due to the reduction in the size of the plume.

Alternative 2 includes long-term monitoring of the contaminant plume through annual sampling and analysis of 7 existing multi-port wells and 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020).

The results of the long-term monitoring program would be used to evaluate the migration and changes in the contaminant plume over time to ensure attainment of the MCLs. The preliminary groundwater model predicted it would take 46 years for the contaminant concentrations in the plume to decrease below the MCLs via natural attenuation processes. This alternative would also include future vapor intrusion sampling, if deemed necessary to determine if there is a concern with site-related vapor migrating into the buildings.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change.

A site management plan (SMP) would also be developed and would provide for the proper management of all site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Because MCLs will take longer than five years to achieve, a review of site conditions will be conducted no less often than once every five years.

Alternative 3: Groundwater Extraction and Ex-situ Treatment (Pump and Treat)

Capital Cost:	\$6,240,000
Annual O&M Cost:	\$850,000/\$790,000 ⁽⁴⁾
Present-Worth Cost:	\$13,160,000
Duration:	35 years

(4) The long-term monitoring program would be reduced after 25 years due to the reduction in the size of the plume.

Alternative 3 includes a groundwater extraction well(s) which would be installed downgradient from monitoring well SVP-4, to capture the portion of the contaminant plume with high PCE and TCE concentrations without impacting the pumping capacity of supply wells GWP-10 and GWP-11, which have a pumping zone of influence radius of approximately 1,000 feet. The number of extraction wells needed would be determined after the completion of the pre-design investigation described below. Extracted groundwater would be treated via air strippers for approximately 10 years, with the treated water discharged to Nassau County recharge basin #124. Based on the preliminary groundwater model, it is estimated that MCLs would be achieved in the zone of influence of the new pumping well in approximately 10 years, at which time the contamination in the extracted groundwater would have reached drinking water standards (MCLs). It is also noted that at the end of the same 10-year period, the supply wells GWP-10 and 11 would withdraw groundwater, before wellhead treatment, with contamination at or close to MCLs. It would take another 25 years for contaminant residuals in the aquifer to reach MCLs through natural attenuation processes. In summary, the preliminary model estimated that complete restoration of the aquifer to levels below the MCLs would require a total of 35 (10 + 25) years.

Alternative 3 includes a pre-design investigation which would include installation of at least 3 new multi-port wells: one well to the north of existing well GWX-9953 to confirm the northern boundary of the plume, a second well to the west of GWX-9953 to confirm the total depth of the plume, and a third well to the south of the Village of Garden City supply wells to better define the leading edge of the plume. Figure 1 shows the locations of existing wells.

Alternative 3 would also include evaluation and future upgrading, if necessary, of the wellhead treatment at the Garden City supply wells 10 and 11, which have been impacted by site-related contamination. This wellhead treatment system would be needed until it has been determined that these public supply wells are no longer being impacted by the site-related contaminants above health-based standards.

In addition, if future vapor intrusion investigations indicate that there is a concern with site-related vapors migrating into the commercial buildings, EPA would perform mitigation, as necessary.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the area including and surrounding the mall to restrict the land use to commercial industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change.

A site management plan (SMP) would also be developed and would provide for the proper management of all site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of site groundwater to ensure that, following remedy implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Alternative 3 would also include long-term monitoring of the contaminant plume through annual sampling and analysis. For cost estimating purposes, 7 existing multi-port wells, 2 existing single-screen monitoring wells (GWX-10019 and GWX-10020), and the new multi-port wells to be installed as part of the pre-design investigation would be monitored. The results of the long-term monitoring program would be used to evaluate changes in the contaminant plume over time and to ensure achievement of MCLs.

Because MCLs will take longer than five years to achieve, a review of site conditions will be conducted no less often than once every five years.

Contingency Plan

Capital Cost:	\$5,660,000
Annual O&M Cost:	\$680,000

In the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance.

The evaluation criteria are described below.

- Overall protection of human health and the environment addresses whether or not a remedy

provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and requirements or provide grounds for invoking a waiver.
- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital and O&M costs, and net present-worth costs.
- State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the state concurs with the preferred remedy at the present time.
- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

A summary of the comparative analysis of these alternatives based upon the evaluation criteria noted above follows.

Overall Protection of Human Health and the Environment

Alternative 1 would not include any monitoring or remedial measures, and as such, would not be protective of public health and the environment. Alternative 2 would only require long-term monitoring of the groundwater plume, institutional

controls and would provide for future vapor intrusion investigation(s). As such, Alternative 2 would only be marginally protective of human health and the environment. Alternative 3 would provide overall protection of human health and the environment through implementation of a remedial pump and treat system to extract and treat the groundwater contamination and vapor intrusion mitigation in the commercial buildings, if deemed necessary.

Compliance with ARARs

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141, and 10 NYCRR, Chapter 1), which are enforceable standards for various drinking water contaminants. Only Alternative 3 would meet drinking water standards.

Long-Term Effectiveness and Permanence

Alternatives 1 and 2 would not provide any long-term effectiveness and permanence. Alternative 2 would provide a small degree of long-term effectiveness and permanence through institutional controls. Alternative 3 would provide long-term effectiveness and permanence by extracting contaminated groundwater from the aquifer and treating it to remove the contaminants and provide for vapor intrusion mitigation in the commercial buildings, if deemed necessary.

Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternatives 1 and 2 would not reduce Toxicity/Mobility/Volume through treatment since no treatment would be implemented. Alternative 3 would reduce the mobility and volume of the contaminant plume through groundwater extraction and reduce the toxicity of water through ex-situ treatment using air strippers. Alternative 3 would prevent the contaminant plume with concentrations above the MCLs from migrating downgradient. Alternative 3 would also provide for mitigation due to vapor intrusion in the commercial buildings, if deemed necessary.

Short-Term Effectiveness

Alternative 1 would not have any short-term impact. Alternative 2 would have minimal short-term impact to the community and the environment due to the sampling of wells. Alternative 3 would have some additional impact to the community due to the drilling of wells and the construction of the groundwater extraction well(s) and treatment systems, but the duration would be short and the disturbance would be minimal.

Implementability

All three alternatives are implementable. Alternative 1 would be the easiest to implement, since it involves no action. Alternative 2 would be the next easiest to implement, since it only involves annual sampling of monitoring wells and

would not have any ground intrusion activities. Alternative 3 would be also be easy to implement. Access for installation of extraction well(s) and construction of a treatment facility would be required and various contractors would need to be procured. Construction activities could be conducted using standard equipment and procedures.

Cost

Alternative 1 would not involve any costs. Alternative 2 would have relatively low costs since it only includes annual sampling of monitoring wells and vapor intrusion investigation of the commercial buildings. The costs associated with Alternative 3 primarily reflect the installation and operation of a groundwater extraction and treatment system and vapor intrusion mitigation systems in the commercial buildings, if deemed necessary.

that the pumping capacity of supply wells GWP-10 and GWP-11 is not affected. Extracted groundwater would be treated to remove contaminants. Under this alternative, a low profile air stripper would be envisioned as the representative process option to remove the VOC contaminants. During the remedial design, other treatment technologies would be considered as more information becomes available. Based on the maximum concentrations of PCE and TCE detected in SVP-4 during the RI, the maximum combined amount of VOCs (PCE and TCE) generated in the off-gas from the air stripper is estimated to be 1.5 pounds per day. As a result, off-gas treatment should not be necessary. The treated water would meet the discharge standards for groundwater. The treated groundwater would be discharged to Nassau County recharge basin #124. This alternative assumes that the supply wells GWP-10 and GWP-11 continue pumping at the same rate as the past five years.

Evaluation of the current air strippers at supply wells GWP-10 and GWP-11 would be performed, if necessary. The upgrade or replacement costs of the air strippers would be estimated and upgrading or replacement of the strippers would be performed, as necessary.

A pre-design investigation to better define the contaminant plume would be conducted. The areal and the vertical extent of the contaminant plume in the areas of monitoring wells SVP-2 and SVP-4 would be better defined. As part of this effort, it is estimated that at least three new multiport monitoring wells would need to be installed.

Groundwater modeling would be conducted after the pre-design investigation and before the remedial design. The groundwater model used in the FS would be refined based on the new data. During the remedial design, the most recently available pumping data would be incorporated into the model and the optimal location and number of extraction wells would be determined.

If future vapor intrusion investigations indicate that there is concern with site-related vapor migrating into the commercial buildings, EPA would perform mitigation, as necessary.

In addition, this alternative would include institutional controls that restrict future use of groundwater at the site. Specifically, the New York State Department of Health State Sanitary Code regulates installation of private potable water supply wells in Nassau County. In addition, EPA would rely on the current zoning in the mall-complex area to restrict the land use to commercial/industrial uses. If a change in land use is proposed, additional investigation of soils in this area would be necessary to support the land use change.

A site management plan (SMP) would also be developed and would provide for the proper management of all site remedy components post-construction, such as institutional controls, and shall also include: (a) monitoring of site groundwater to ensure that, following remedy

<u>Alternative</u>	<u>Capital Cost</u>	<u>Annual O&M</u>	<u>Total Present-Worth</u>
1	\$0	\$0	\$0
2	\$300,000	\$150,000/ \$110,000 ⁽⁵⁾	\$2,290,000
3	\$6,240,000 ⁽⁶⁾	\$850,000/ \$790,000 ⁽⁷⁾	\$13,160,000

(5) Includes long-term monitoring costs only. The monitoring program would be reduced after 25 years.

(6) If the contingency plan is necessary, the capital costs would increase by \$5,660,000.

(7) The monitoring program would be reduced after 25 years.

State Acceptance

The New York State Department of Environmental Conservation is currently reviewing this Proposed Plan.

Community Acceptance

Community acceptance of the preferred alternative will be assessed in the ROD following review of the public comments received on the Proposed Plan.

PROPOSED REMEDY

Based upon an evaluation of the various alternatives, EPA recommends Alternative 3 (Groundwater Extraction and Ex-situ Treatment [Pump and Treat]) as the preferred remedy for groundwater and installation of vapor intrusion mitigation systems, if deemed necessary. Specifically, the proposed remedy would include the following:

To reduce the contaminant concentrations reaching the two Garden City supply wells GWP-10 and GWP-11, a groundwater extraction well(s) would be installed south of SVP-4. This well(s) would capture and treat the portion of the contaminant plume identified at SVP-4, while ensuring

implementation, the groundwater quality improves; (b) conducting an evaluation of the potential for vapor intrusion, and mitigation, if necessary, in the event of future construction; (c) provision for any operation and maintenance required of the components of the remedy; and (d) periodic certifications by the owner/operator or other person implementing the remedy that any institutional and engineering controls are in place.

Long-term monitoring would be conducted which would involve annual groundwater sample collection and analysis from 12 monitoring wells (9 existing wells and 3 new wells), and preparation of annual groundwater sampling reports. The results from the long-term monitoring program would be used to evaluate the migration and changes in the contaminant plume over time.

In the event that public supply wells GWP-10 and GWP-11 were to be taken out of service permanently or were to be operated at a significant reduction of their current pumping rates, a contingency plan would be implemented to capture and treat the contaminant plume in that area. The contingency plan would include the installation of a new well or wells in the vicinity of supply wells GWP-10 and GWP-11 and an ex-situ treatment system.

Because MCLs will take longer than five years to achieve, a review of site conditions will be conducted no less often than once every five years using data obtained from the long-term monitoring program until the groundwater is restored to drinking water quality. The site review will typically include an evaluation of the extent of contamination and an assessment of contaminant migration and attenuation over time.

Basis for the Remedy Preference

EPA has identified Alternative 3 as the preferred alternative, since it would effectuate the groundwater cleanup while providing the best balance of tradeoffs among the alternatives with respect to the evaluation criteria. Alternative 3, which would include extraction and treatment of contaminated groundwater, would result in the restoration of water quality in the aquifer more quickly than natural processes alone and provide for vapor intrusion mitigation, if deemed necessary.

EPA believes that the preferred remedy would remove contaminated groundwater from the aquifer, be protective of human health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions to the maximum extent practicable. The preferred remedy also would meet the statutory preference for the use of treatment as a principal element.



- Existing Monitoring Wells
- Multi-port Wells
- Village of Garden City
- Supply Wells
- N-8050 - A former cooling water well in which the highest concentrations were historically detected; the well is no longer active

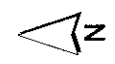
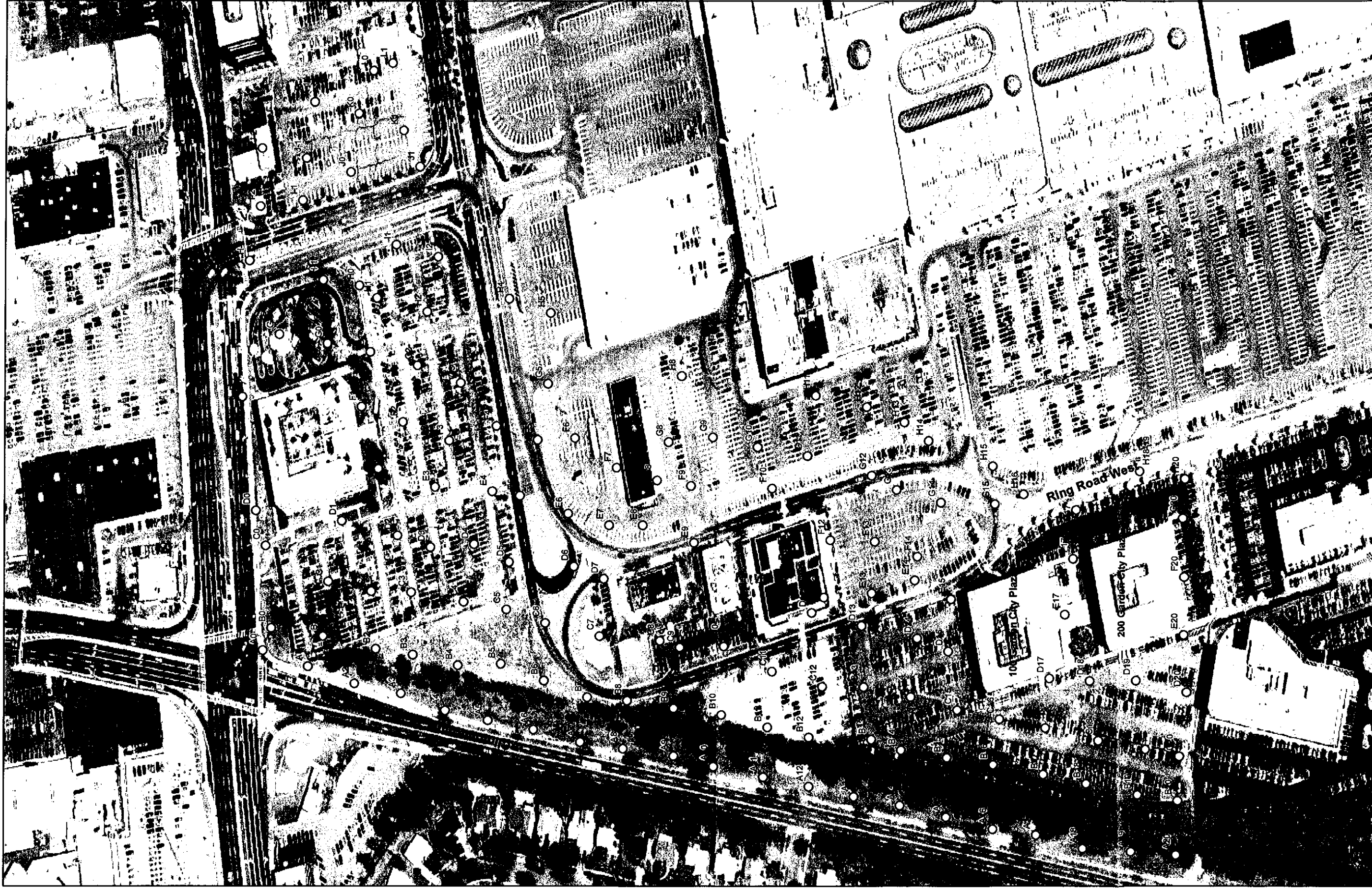


Figure 1
Multi-port Well, Existing Monitoring Well, and Supply Well Locations

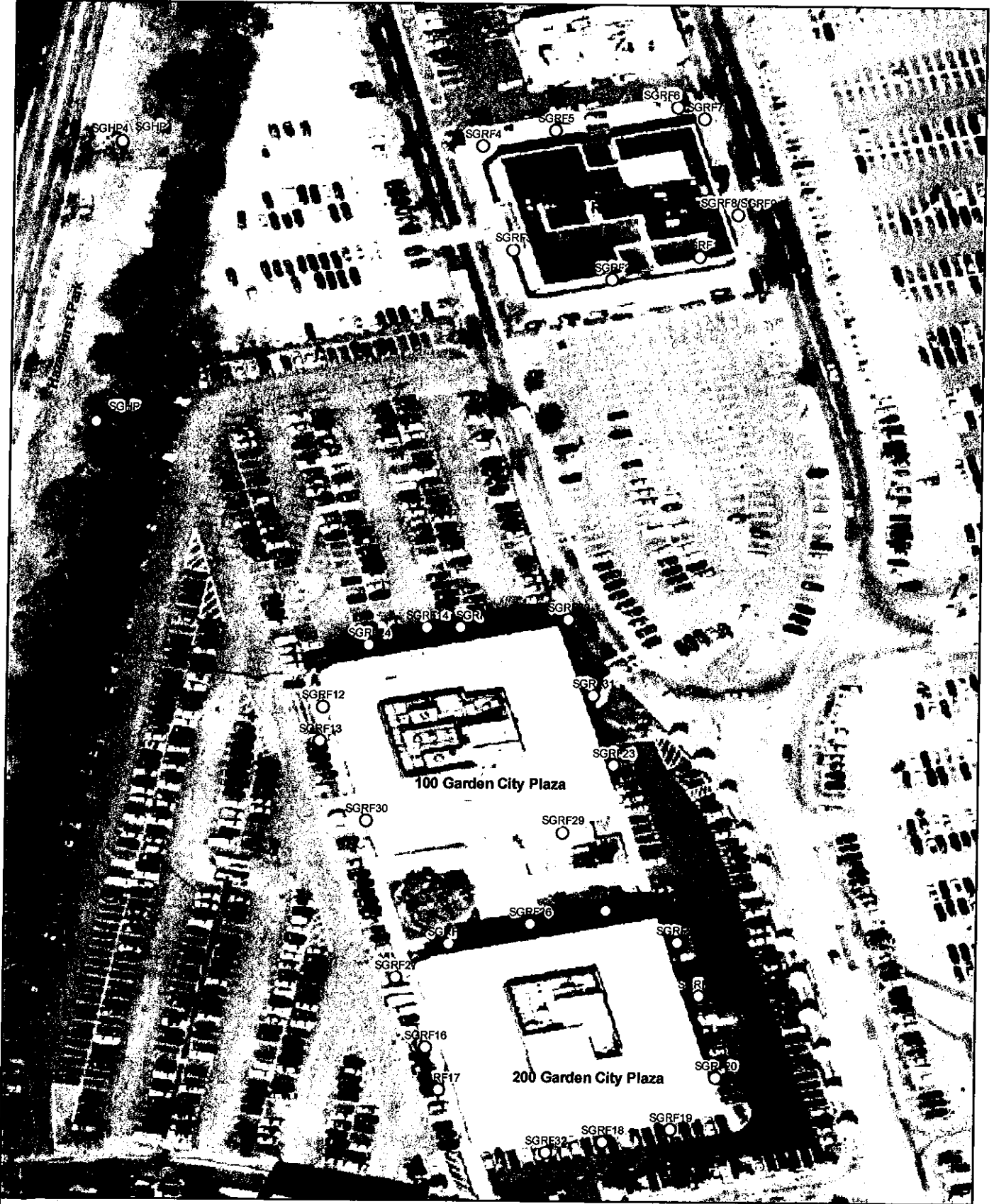
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York



○ Soil Gas Screening Grid Point Location



Figure 2
Soil Gas Screening Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York



○ Soil Gas Boring Location
for VOC Analysis via method TO-15

Note: SGRF10 and SGRF11 were not
collected due to underground utilities.



0 30 60 120 Feet

Figure 3
Soil Gas Analytical Sample Locations
Old Roosevelt Field Contaminated Groundwater Site
Garden City, New York

RESPONSIVENESS SUMMARY

APPENDIX V-b

**PUBLIC NOTICE PUBLISHED IN THE
GARDEN CITY NEWS AND GARDEN CITY LIFE
ON AUGUST 17, 2007, AUGUST 24, 2007 AND AUGUST 31, 2007**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
INVITES PUBLIC COMMENT ON THE
PROPOSED PLAN FOR THE
OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER SITE
VILLAGE OF GARDEN CITY, NASSAU COUNTY, NEW YORK

NOTICE FOR CHANGE OF MEETING DATE AND LOCATION

September 11, 2007

7:00 PM

Village Hall Board Room

351 Stewart Avenue

Garden City, NY 11530

The U.S. Environmental Protection Agency (EPA) announces the opening of a **30-day comment period** on the Proposed Plan and preferred alternative to address contamination at the Old Roosevelt Field Contaminated Groundwater site in Garden City, New York. The comment period begins on **August 22, 2007** and ends on **September 20, 2007**. As part of the public comment period, EPA will hold a public meeting on **September 11, 2007** at 7:00 PM at the **Garden City Village Hall Board Room, 351 Stewart Avenue, Garden City, NY 11530**. To learn more about the meeting you can contact Ms. Cecilia Echols, EPA's Community Involvement Coordinator, at 212-637-3678 or 1-800-346-5009 or visit our website to receive a copy of the Proposed Plan at www.epa.gov/region02/superfund/npl/oldroosevelt.

The site is listed on the Superfund National Priorities List. EPA recently concluded a remedial investigation/feasibility study (RI/FS) for the site to assess the nature and extent of contamination in site media and to evaluate alternatives to cleanup the groundwater. Based upon the results of the RI/FS, EPA has prepared a Proposed Plan which describes the findings of the remedial investigation and potential remedy evaluations detailed in the feasibility study and provides the rationale for recommending the preferred remedy.

The preferred remedy is pump and treat of the contaminated groundwater in the area west of Garden City Plaza in the Roosevelt Field mall area. A groundwater extraction well would be installed to capture the portion of the contaminant plume with high tetrachloroethene (PCE) and trichloroethene (TCE) concentrations without impacting the pumping capacity of two nearby public water supply wells. In addition, a pre-design investigation would be conducted to better define several areas of the groundwater plume. The air strippers used to treat the water pumped at the two supply wells would be evaluated and upgraded, if deemed necessary. EPA would also put in place a contingency plan if for any reason the two supply wells are shut down or experience significant reduction in pumping rates. The contingency plan would be implemented to prevent downgradient migration of contaminants. Institutional controls, monitoring, vapor sampling and periodic reviews would also be part of the remedy to ensure that the remedy remains protective of public health and the environment. During the **September 10, 2007 public meeting**, EPA representatives will be available to further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

The RI Report, FS Report, Risk Assessment, Proposed Plan and other site-related documents are available for public review at the information repositories established for the site at the following locations:

Garden City Public Library: 60 Seventh Street, Garden City, New York 11530 (516) 742-8405
Hours: Mon.- Thu. 9:30 AM - 9 PM; Fri. 9:30 AM - 5:30 PM; Sat. 9 AM - 5 PM; Sun. closed.

Hempstead Public Library: 116 Nichols Court, Hempstead, New York 11550 (516) 481-6990
Hours: Mon.- Thu. 10 AM - 9 PM; Fri. 10 AM - 6 PM; Sat., Sun. closed.

USEPA Region II: Superfund Records Center, 290 Broadway, 18th Floor, New York, NY 10007-1866, (212) 637-4308
Hours: Mon. - Fri. 9 AM - 5 PM

EPA relies on public input to ensure that the selected remedy for each Superfund site meets the needs and concerns of the local community. It is important to note that although EPA has identified a preferred remedy for the site, no final decision will be made until EPA has considered all public comments received during the public comment period. EPA will summarize these comments along with EPA's responses in a Responsiveness Summary, which will be included in the Administrative Record file as part of the Record of Decision. **Written comments and questions regarding the Old Roosevelt Field Contaminated Groundwater site, postmarked no later than September 20, 2007, may be sent to:**

Caroline Kwan, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telefax: (212) 637-4284
email: kwan.caroline@epa.gov



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
INVITES PUBLIC COMMENT ON THE
PROPOSED PLAN FOR THE
OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER SITE
VILLAGE OF GARDEN CITY, NASSAU COUNTY, NEW YORK**

The U.S. Environmental Protection Agency (EPA) announces the opening of a **30-day comment period** on the Proposed Plan and preferred alternative to address contamination at the Old Roosevelt Field Contaminated Groundwater site in Garden City, New York. The comment period **begins on August 22, 2007 and ends on September 20, 2007**. As part of the public comment period, EPA will hold a public meeting on **September 10, 2007** at 7:00 PM at the Garden City Public Library, 60 Seventh Street, Garden City, NY 11530. Please contact Ms. Cecilia Echols, EPA's Community Involvement Specialist, at 212-637-3678 for more information.

The site is listed on the Superfund National Priorities List. EPA recently concluded a remedial investigation/feasibility study (RI/FS) for the site to assess the nature and extent of contamination in site media and to evaluate alternatives to cleanup the groundwater. Based upon the results of the RI/FS, EPA has prepared a Proposed Plan which describes the findings of the remedial investigation and potential remedy evaluations detailed in the feasibility study and provides the rationale for recommending the preferred remedy.

The preferred remedy is pump and treat of the contaminated groundwater in the area west of Garden City Plaza in the Roosevelt Field mall area. A groundwater extraction well would be installed to capture the portion of the contaminant plume with high tetrachloroethene (PCE) and trichloroethene (TCE) concentrations without impacting the pumping capacity of two nearby public water supply wells. In addition, a pre-design investigation would be conducted to better define several areas of the groundwater plume. The air strippers used to treat the water pumped at the two supply wells would be evaluated and upgraded, if deemed necessary. EPA would also put in place a contingency plan if for any reason the two supply wells are shut down or experience significant reduction in pumping rates. The contingency plan would be implemented to prevent downgradient migration of contaminants. Institutional controls, monitoring, vapor sampling and periodic reviews would also be part of the remedy to ensure that the remedy remains protective of public health and the environment. During the **September 10, 2007 public meeting**, EPA representatives will be available to further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

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Caroline Kwan, Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telefax: (212) 637-4284
email: kwan.caroline@epa.gov

**LEGAL NOTICE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY INVITES PUBLIC COMMENT ON THE PROPOSED PLAN FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER SITE VILLAGE OF GARDEN CITY, NASSAU COUNTY, NEW YORK
NOTICE FOR CHANGE OF MEETING DATE AND LOCATION**

September 11, 2007
7:00 PM

Village Hall Board Room
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Garden City, NY 11530

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The site is listed on the Superfund National Priorities List. EPA recently concluded a remedial investigation/feasibility study (RI/FS) for the site to assess the nature and extent of contamination in site media and to evaluate alternatives to

remedial investigation and potential remedy evaluations detailed in the feasibility study and provides the rationale for recommending the preferred remedy.

The preferred remedy is pump and treat of the contaminated groundwater in the area west of Garden City Plaza in the Roosevelt Field mall area. A groundwater extraction well would be installed to capture the portion of the contaminant plume with high tetrachloroethene (PCE) and trichloroethene (TCE) concentrations without impacting the pumping capacity of two nearby public water supply wells. In addition, a pre-design investigation would be conducted to better define several areas of the groundwater plume. The air strippers used to treat the water pumped at the two supply wells would be evaluated and upgraded, if deemed necessary. EPA would also put in place a contingency plan if for any reason the two supply wells are shut down or experience significant reduction in pumping rates. The contingency plan would be implemented to prevent downgradient migration of contaminants. Institutional controls, monitoring, vapor sampling and periodic reviews would also be part of the remedy to ensure that the remedy remains protective of public health and the environment. During the September 10, 2007 public meeting, EPA representatives will be available to further elaborate on the reasons for recommending the preferred remedy and public comments will be received.

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LEGAL NOTICE

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Hours: Mon. - Fri. 9 AM - 5 PM

EPA relies on public input to ensure that the selected remedy for each Superfund site meets the needs and concerns of the local community. It is important to note that although EPA has identified a preferred remedy for the site, no final decision will be made until EPA has considered all public comments received during the public comment period. EPA will summarize these comments along with EPA's responses in a Responsiveness Summary which will be included in

RESPONSIVENESS SUMMARY

APPENDIX V-c

SEPTEMBER 11, 2007 PUBLIC MEETING SIGN-IN SHEET



Old Roosevelt Contaminated Groundwater Area Superfund site
Garden City, New York
Garden City Village Hall Board Room

Tuesday, September 11, 2007 @ 7:00PM
ATTENDEES
(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	Are you currently on the mailing list?
Don Miles		Troy		518 402-7380	State Dept Health	
Kathleen Auro	4 Merillon Ave,	Garden City, NY	11530			
Heather Bishop		Albany	625 Broadway	(518) 402 9692	NYSDEC	Congresswoman Carolyn McLain
Simone Solz	370 200 Garden City Plaza	Garden City		320 Garden City		
Carisa Giardino				(516) 747-8282	ext 164	

739-3008



Old Roosevelt Contaminated Groundwater Area Superfund site
Garden City, New York
Garden City Village Hall Board Room

Tuesday, September 11, 2007 @ 7:00PM
ATTENDEES
(Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	Are you currently on the mailing list?
Scarlett Messier	547 River Street	Troy	12180	Stak DOH		
Stephanie Petrucci	82 Bayberry La	Levittown	11756	(516) 731-2235	GC News	
Jim Bongoley	1360 117 th St	Rockaway			Plk 11094	No
Claire Bardakian	100 Hilton Ave	205E	GC			No
John Swartwout	111 625 Broadway	Albany	NY 12233		NYSD&C	No
Richard H. Drenvitz	40 Adams St	Garden City	New York	11530		No
Barbara Ruggiero	176 Pine Street	Garden City	NY	11530		No



Old Roosevelt Contaminated Groundwater Area Superfund site
Garden City, New York
Garden City Village Hall Board Room

Tuesday, September 11, 2007 @ 7:00PM
ATTENDEES
 (Please Print Clearly)

NAME	STREET	CITY	ZIP	PHONE	REPRESENTING	Are you currently on the mailing list?
KOCH, FRANK	351 STEWART AVE	GARDEN CITY	11530	516 465 4014	VIC. OF GARDEN CITY	YES
Alpman, Sean	645 W. PARK AVE	Long Beach	NY	11561 516 242 6347	Clear House	NO
Rae Downing	100 Hilton Ave	E 403	GARDEN CITY	NY	11530	NO
Wulfa Parisk	M5DEC	SUCCORP Mtd	Stuy	Bunk NY	11790-3409	NO
MULLER, ROBERT	76 RUSSELL ROAD	GARDEN CITY	NY	11530		NO
ROGER FEGAN	117 SECOND ST	GC	11530			NO
William Bellmar	156 Poplar St	GC	11530			NO

RESPONSIVENESS SUMMARY

APPENDIX V-d

SEPTEMBER 11, 2007 PUBLIC MEETING TRANSCRIPT

OLD ROOSEVELT FIELD CONTAMINATED
GROUNDWATER SUPERFUND SITE
Public Meeting

September 11, 2007

Garden City, New York

Reporter:

Jeffrey Benz, RMR, CRR

A P P E A R A N C E S:

Cecilia Echols, EPA

Angela Carpenter, EPA

Susan E. Schofield, CDM

Lisa Campbell, CDM

Michael Sivak, EPA

Caroline Kwan-Appelman, EPA

Elizabeth Leilani Davis, EPA

Thomas Matthew, CDM

Peter Bee, Mayor, Garden City

Frank Koch, Superintendent, Garden City Water

District

Dennis Kelleher, H2M Group

Donald Miles, Department of Health

Scarlett Messier, Department of Health

Joe DeFranco, Department of Health

John Swartwout, DEC

Heather Bishop, DEC

Walter Parish, DEC

1 MS. ECHOLS: Hello, everyone. Good
2 evening. We are ready to begin our
3 presentation regarding the Old Roosevelt
4 Field contaminated groundwater Superfund
5 site. We are here to discuss how the EPA
6 plans on cleaning up the site.

7 There are -- I'm going to introduce
8 everyone here. And so bear with me, there's
9 a lot of different people who have some, you
10 know, stake in helping to clean up this site.

11 As I said, I'm Cecilia Echols. I'm the
12 community-involving coordinator with the
13 site. We have with us Angela Carpenter. She
14 is the chief of the Eastern New York section
15 for EPA. We have Susan Schofield. She is
16 our contractor with CDM. Lisa Campbell,
17 contractor with CDM. Michael Sivak, EPA's
18 risk assessor. Caroline Kwan, remedial
19 project manager. Leilani Davis, assistant
20 regional counsel. And we also have Thomas
21 Matthew from CDM. Okay.

22 We also have with us Don Miles, DOH;
23 Scarlett Messier, with DOH.

24 John Swartwout, DEC; Heather Bishop,
25 DEC; Joe DeFranco, Nassau County Department

1 of Health.

2 MS. CARPENTER: And Walter Parish with
3 DEC.

4 MS. ECHOLS: Representing you all in
5 your community is the mayor, Peter Bee.

6 Frank Koch, superintendent, Village of
7 Garden City Water District, and their
8 consultant, Dennis Kelleher.

9 Just wanted to let you know that
10 community involvement is a very important
11 part of the process for cleaning up Superfund
12 sites. We look for the community's input in
13 the decision-making process.

14 Before we get into the presentation, the
15 mayor will speak. However, I just wanted to
16 let you know that the public comment period
17 began on August 22 and it ends on
18 September 20. You have -- there are three
19 information repositories related to this
20 site, if you ever want information on this
21 site. One is at the Garden City Public
22 Library, the Hempstead Public Library, and
23 our EPA office in New York City.

24 We do have a stenographer to the right
25 of me. At the end of the presentation, for

1 questions and answers, would you please
2 stand, state your name clearly, so he can
3 record it properly.

4 I hope everyone has the handouts.
5 There's a lot of handouts. So as you can
6 see, I hope everyone has had an opportunity
7 to browse through them.

8 And on that note, I will let the mayor
9 speak for a moment.

10 MAYOR BEE: Thank you very much. Thank
11 you very much, and good evening to you all.
12 My name is Peter Bee, and I'm the mayor of
13 the Village of Garden City. As was already
14 mentioned, the superintendent of our water
15 district, Frank Koch, is here with us
16 tonight, as is our consulting engineers, H2M
17 Corporation, and they later this evening will
18 be making brief comments as well.

19 We appreciate the opportunity to speak
20 to the EPA this evening. Garden City prides
21 itself in being able to deliver the highest
22 quality water to our residents. As I have
23 observed in the past, if we can't get clean
24 water to the residents, we aren't worth a
25 darn, no matter what else we do.

1 We've been monitoring the water quality
2 at Well 10 and 11 at Clinton Road plant since
3 the early 1970s. We've noted the presence of
4 some level of contamination in the water for
5 over 30 years. That contamination has
6 unquestionably arisen outside of Garden City.

7 The Village has been providing water
8 quality treatment to remove that outside
9 contamination for well over 20 years.

10 Because of that, the water delivered to
11 the public by us inside Garden City continues
12 to meet all of the U.S. Environmental
13 Protection Agency standards, as well as all
14 New York State Health Department drinking
15 water standards.

16 Over the past 20 years the Village has
17 spent over \$3.8 million in capital costs and
18 O&M costs to treat the outside contaminants
19 in Well 10 and 11. The mayor and board of
20 trustees are tired of having the residents
21 continue to pay that cost to clean up the
22 outside contaminants. The Superfund program
23 has been set up to protect the public health
24 and the environment, and to provide a revenue
25 source for exactly this kind of situation.

1 We need your agency's help in providing
2 funding for the moneys that we have already
3 expended and the moneys that will be needed
4 for the Village to continue to provide
5 wellhead treatment for the next 46 years, as
6 projected in the report.

7 We have cooperated with the U.S.
8 Environmental Protection Agency and their
9 consultant in the preparation of this study.
10 Now we suggest it is time for the agency to
11 cooperate with the Village, and we are
12 formally requesting that cooperation in the
13 form of funding for wellhead treatment,
14 either from the Superfund program, or the
15 potentially responsible party, the U.S. Navy.

16 The Village is prepared to take legal
17 action against the potentially responsible
18 party, if necessary, to get the appropriate
19 funds, and we look forward to your agency's
20 cooperation in that venture. Thank you for
21 that cooperation, and the ongoing
22 cooperation, which I know you will give us in
23 the time to come. Thank you very much,
24 everyone.

25 MS. ECHOLS: Thank you, Mayor.

1 MS. CARPENTER: Thank you, Mayor.

2 Can I just ask, can you hear us without
3 the microphone?

4 ATTENDEES: Yes, we can.

5 MS. CARPENTER: Okay. So that will make
6 it a little easier.

7 Briefly, what we are going to be going
8 over tonight, I'll do a brief introduction.
9 The site description, the background, how we
10 got to this point. Some of the technical
11 information. It's not a lot. Geologic,
12 hydrogeologic setting that we are working
13 within.

14 The various aspects of the work that the
15 EPA has been conducting out here; the
16 remedial investigation, which is the actual
17 collection of data; the feasibility study,
18 where we look at that data and try to come up
19 with alternatives to address that
20 contamination, what we are proposing as the
21 remedy tonight, and what we are here to get
22 your feedback on.

23 We're also fortunate in that the Village
24 of Garden City Water Department has agreed to
25 give a bit of a presentation on what is the

1 status of the water quality in this area, and
2 at that point that we're going to open it up
3 to general questions and comments from you
4 folks. So our presentation is really quite
5 short, because I know everyone wants to get
6 to what's the remedy and your questions.

7 Briefly, very briefly, the statute that
8 we operate under is the Comprehensive
9 Environmental Response Compensation Liability
10 Act. That's quite a mouthful, more commonly
11 known as Superfund.

12 So when we say Superfund here, we are
13 actual talking about a statute. There's an
14 act by congress in 1980 to respond to such
15 sites as the Love Canal. It provides federal
16 funding to respond to hazardous waste site
17 cleanup. We can also respond on an emergency
18 basis.

19 We coordinate these activities with our
20 state counterparts, and as everyone knows,
21 this is a fairly mature program at this
22 point. Superfund has been around now for
23 nearly 30 years.

24 The statute does have a couple of things
25 that it allows us to do in addition to taking

1 actions. We can also compel the potentially
2 responsible parties to pay for the cleanup
3 actions and for our investigation course.

4 There are two types of actions that can
5 be taken: Emergency actions and remedial
6 actions. The actions that we're going to be
7 taking here at this site come under the
8 heading of remedial action. We're going to
9 be here for a while. We've done the study
10 necessary to support that.

11 The actual remedial process, it's
12 long-winded, but very briefly there's a site
13 discovery and a ranking. The sites are
14 referred to EPA usually by our state or local
15 counterparts. We look at all the information
16 they've gathered. It goes through a formal
17 scoring process and public notice, and the
18 sites that score high enough are placed on
19 the national priorities list, which is a
20 national list of hazardous sites that are now
21 under federal jurisdiction.

22 The next step for us is to actually go
23 out and collect data. We collect data from
24 various media, soil, air, water. It depends
25 on the site. And that is what we call our

1 remedial investigation. Once we finish
2 collecting all of that data, it's evaluated.
3 And we evaluate it as we go, but we formalize
4 that in something called a feasibility study.
5 That is where we take a look at all the
6 information we have, the contaminated media
7 that we're dealing with, is it air, is it
8 soil, is it water, and we come up with
9 potential alternatives to address that
10 contamination.

11 So the feasibility study is a fairly
12 large document. It is available, as Cecilia
13 mentioned, in the libraries, and the proposed
14 plan that we are discussing with you tonight
15 is the summary of the information that you
16 could get in the Roosevelt Field information
17 and feasibility study.

18 What we are here for tonight is to
19 comment on the proposed plan, which is not on
20 that slide, but it comes between RI/FS -- you
21 will hear us abbreviate that -- and the
22 record of decision. After we get public
23 comments, we will prepare a record of
24 decision for the site, where we specify what
25 the remedy is, the response to the public

1 comments, and it will give a bit more detail
2 on how we envision that remedy being enacted.

3 Like all things, if you do any major
4 projects around your house, there's a little
5 planning involved for us. That's called a
6 remedial design. We know conceptually what
7 we want to do, but now we actually give it to
8 engineers and various specialties that are
9 needed to come up with how are we actually
10 physically going to do this. They provide a
11 remedial design.

12 It is -- in often cases, it is actually
13 drawings and specifications and lots of
14 detailed information, which we will make
15 available to the Village. And then we move
16 forwarded with the remedial action.

17 So what we can do to keep this going
18 forward, clearly there's a number of steps we
19 have to get through. But tonight is a very
20 important step for us because it's when we
21 get to hear from all of you.

22 So at this point, I would like to turn
23 this over to Susan Schofield from CDM, who is
24 a contractor to EPA, and they were the folks
25 who prepared the remedial investigation and

1 the feasibility study for this site.

2 And Susan's going to go over the
3 remedial investigation components.

4 MS. SCHOFIELD: Actually, I'm going to
5 talk about the site, the site description and
6 how the background of how the site got to be
7 known and how it got listed on the NPL.

8 First of all, I'm sure you're all pretty
9 familiar with the strategic parts of the
10 site, and I'll show a figure in the -- in a
11 few minutes that will show all that. The
12 site that we're looking at, as the Old
13 Roosevelt Field contaminated groundwater
14 site, is bordered by Old Country Road on the
15 north and Clinton Road to the west. And
16 basically it's in the Roosevelt Field Mall
17 area.

18 And it includes -- the site also
19 includes several office buildings in the
20 complex, and also Hazelhurst Park, which is
21 the grassy strip that's along Clinton Road.
22 To the south of the site are a couple of
23 recharge basins, and also the -- the two
24 Garden City supply wells that the mayor also
25 mentioned.

1 The site background. The site was
2 originally an air field, and it was an air
3 field from approximately 1911, in the very
4 early days of airplane flight, to 1951. And
5 the site included a fairly large number of
6 buildings over the years that were used as --
7 for various operations related to the air
8 field: Flight schools, service places,
9 hangars for the airplanes to be parked in.

10 And during the two world wars, World
11 War I and World War II, the U.S. military
12 used the site, and they did various
13 operations with cleaning engines, repairing
14 engines, maintenance of airplanes that were
15 used during the war.

16 And following the war, especially World
17 War II, but actually following each war, the
18 airport area reverted to commercial use, and
19 that lasted up until 1951. And at that point
20 the area was developed, as it is currently
21 now, with the office complexes and the mall.

22 Now, here is the figure that -- this is
23 an air photo, and this is Old Country Road
24 and this is Clinton Road. And the main
25 hangar buildings for the air field days were

1 along the two roads. So they were just
2 adjacent in these areas that you see the
3 yellow boxes around, and that's about the
4 limits of where the buildings were in the air
5 field days.

6 These two features right here are the
7 two supply wells that we talked about and the
8 recharge basins. This is one of the recharge
9 basins. And the other recharge basin is
10 right here, that I described. And of course
11 this is the mall area, which I'm sure you're
12 all familiar with that area.

13 Now, the contaminants that we see in the
14 groundwater are called TCE, or
15 trichloroethene, and tetrachloroethylene,
16 which is known as PCE. And you'll be hearing
17 these two terms for the rest of the
18 presentation on and off. So they're terms
19 that you should get used to hearing, TCE and
20 PCE.

21 And those are chlorinated solvents that
22 were created and invented for use in about
23 the 1940s, maybe 1938, '39, they came into
24 use, and they were very commonly used for
25 things like degreasing and cleaning metal

1 parts before they were painted or before they
2 were put into -- for instance, probably in
3 the air field, when they maintained the
4 aircraft or they repaired them, they would
5 clean the parts with some of these solvents.

6 And one of the interesting things is
7 that we have no real idea where the solvents
8 may have been used or disposed of from the
9 air field days. We've not been able to
10 pinpoint any source of those, but we'll talk
11 about that a little bit more later.

12 So until 1951, we think the solvents
13 were probably used, at least to a small
14 extent -- we don't know exactly how much,
15 because it's not really in the records, but
16 we -- since the contaminants are in the
17 groundwater, we have to presume that there
18 was some disposal of them somewhere in the
19 area.

20 From about 1960 to 1985, when these --
21 the office complexes and the mall were
22 developed, they used what were called cooling
23 water wells that extracted groundwater that
24 was then put through their cooling systems
25 that they used mainly in the summer to cool

1 the buildings, and then this water that
2 happened to be contaminated was then
3 recharged in a couple of different places in
4 the area, that actually we think spread the
5 contamination somewhat.

6 So that was a factor, these cooling
7 water wells, and they were used from about
8 the mid 1960s until about 1985, when those
9 wells were shut down and no longer used. As
10 I said, we're not sure exactly where disposal
11 of the chemicals happened or what the exact
12 routes of transport of these chemicals were.

13 Next slide.

14 There were several previous
15 investigations that we had evidence and data
16 from when we started the remedial
17 investigation, and those are at the bottom of
18 the slide. There were a couple of
19 significant studies that were done in the
20 1980s by both Nassau County Department of
21 Health and the U.S. Geological Survey, and
22 these studies confirm that there was these
23 two chemicals, TCE and PCE, in the
24 groundwater.

25 So we use the results from those studies

1 in the basis to plan the investigation that
2 Lisa will talk about in a couple minutes.

3 The Garden City supply wells that we
4 talk about, they were put into service in
5 1953. So they were pumping, I think, pretty
6 continuously since 1953, and they each had a
7 capacity of about a million gallons a day.
8 So they're large pumping wells. They pump a
9 lot of water, and they have a big influence
10 on how the groundwater flows within the area
11 of where those wells are, which again we'll
12 talk about in a few minutes.

13 And now Lisa is going to talk a little
14 bit about the detail of the remedial
15 investigation that we conducted and the
16 specific work that we did out here, and I'm
17 sure a lot of you probably saw the drilling
18 rigs that we had out here for quite a while
19 when we were doing the work.

20 MS. CAMPBELL: This slide -- going to
21 have a couple slides showing the geology of
22 the area. And this slide shows basically
23 it's a cross-section of the site area with
24 the north area being up by the Toys R Us, if
25 you guys are familiar with that, and then the

1 south section is down by Meadow Avenue.

2 And then the two Garden City pumping
3 wells are right here in the middle.

4 So we -- there's three geologic units
5 that are in this area: The upper glacial
6 aquifer, which is approximately zero to
7 150 feet below-ground surface; the Magothy
8 aquifer is approximately 150 to 450 feet
9 below ground surface, and then the Raritan
10 clay, which is what we are considering a
11 hydrologic barrier.

12 And in the Magothy aquifer, we split up
13 into two zones, the shallow, or the
14 intermediate Magothy aquifer, and the deep
15 Magothy aquifer.

16 These two figures show groundwater flow
17 that was developed using a groundwater
18 modeling program.

19 MS. CARPENTER: Just as a note, if you
20 can't see these, these are actually in the
21 handouts that were on your seats.

22 MS. CAMPBELL: There are a few of these
23 that were in the handouts and some of them
24 were in the proposed plan as well. So this
25 first one over to the left shows the site,

1 and it's basically north is to the top, and
2 shows groundwater flow in the shallow aquifer
3 flowing to the south.

4 And the one on the right, it shows that
5 the groundwater flow in the Magothy aquifer,
6 which is the deeper aquifer, and this --
7 where you see the bull's eye right in the
8 middle, these are the two Garden City wells,
9 10 and 11.

10 So what this shows is that groundwater
11 is flowing south, and then being pulled into
12 this area over here, where the -- due to the
13 heavy pumping in those areas.

14 The purpose of the remedial
15 investigation was twofold. One was to look
16 at the groundwater and do a groundwater
17 investigation that determined the current
18 atrium extent of contaminants within the
19 groundwater aquifers. And the second reason
20 was to look at whether there were any
21 residual source of contaminants in the areas
22 of those -- the hangars that we were showing
23 earlier along Clinton Avenue and Old Country
24 Road.

25 We did three types of activities during

1 that remedial investigation. The first one
2 was what we call groundwater screening, where
3 we collected discrete depth samples at
4 approximately -- several intervals within
5 each well zone, and those were collected
6 anywhere from 30 feet below ground surface to
7 450 feet below ground surface. And we used
8 these results to try to target where we were
9 going to put our well zones.

10 And then the second part was to put in
11 multi-port monitoring wells. And just a
12 brief note on multi-port monitoring wells.
13 It's basically a well that's installed and
14 it's able to sample several different zones
15 within one bore hole, without installing
16 several different wells.

17 So, for instance, we have a total of 64
18 ports that we're able to sample with a total
19 of eight wells, rather than 64 wells. So
20 that was a significant cost savings. And
21 then once we put the multi-port wells in, we
22 did several rounds of groundwater sampling
23 from those multi-port wells. We also sampled
24 ten existing wells that belong to Nassau
25 County. They were in the shallow zone, and

1 also the two Garden City Wells 10 and 11.

2 And this is proposed plan figure Number
3 1. It's kind of hard to see up here, but
4 it's -- it's in your proposed plan.

5 This is the mall area, again.

6 And we put in a background well up here,
7 here, here, here, here, here -- oops, down
8 there, and over here.

9 And so the extent is down. Up here is
10 Old Country Road, and the background well is
11 up above that, and then this down here is
12 Old -- I'm sorry, Meadow Road.

13 For the source area of soil gas
14 investigation, we made a grid throughout the
15 whole site for the 158 screening locations.
16 At each location we took samples, soil gas
17 samples, at two depths: One at 15 feet and
18 one at 35 feet. And that was in the area
19 above the water table. And so that's a -- a
20 total of 316 samples total.

21 And then we also collected soil gas
22 sampling around the perimeter of two Garden
23 City Plaza buildings, and also the building
24 at 100 Ring Road, and also a couple in
25 Hazelhurst Park.

1 And this is also in your proposed plan,
2 Figures 2 and 3, these two figures. So
3 they're kind of -- this shows the sampling.
4 Each one of these dots is a sampling location
5 where we took two different samples. And
6 then the second one shows the locations
7 around the -- the building. This is 100 Ring
8 Road. And then these are the two Garden City
9 Plaza buildings.

10 Once we got our results back, we looked
11 at them and came up with some -- some contour
12 maps, which I'll show in a minute. But
13 basically for PCE, which is the
14 tetrachloroethylene, concentrations range
15 from non-detect, which is -- means that it --
16 there was none found at a certain level, up
17 until -- up to 350 micrograms per liter.

18 And the TCE concentrations ranged from
19 non-detect to 260 micrograms per liter.

20 And in general, the highest
21 concentrations were found in one area. It's
22 in what we call -- we're calling SVP/GWM 4,
23 and that is located in between Hazelhurst
24 Park and the -- the -- the office buildings.
25 And I'll show that in the next slide.

1 Basically, the area of contamination
2 that was the highest was in the intermediate
3 aquifer zone, and that was anywhere from 250
4 to 310 feet deep. And this area was the area
5 that was used as a drain field and the
6 distilling well for disposal of the
7 contaminated cooling water that Susan
8 mentioned earlier.

9 Okay. This -- I've got to two slides,
10 one that shows PCE and one that shows TCE.
11 The EPA maximum contaminant level for both of
12 these contaminants is 5 micrograms per liter.
13 So what this also shows, and this is also in
14 the handouts, it's kind of divided into three
15 different areas. This is the shallow zone,
16 the intermediate, Magothy zone, and the deep
17 Magothy zone.

18 So these lines are -- the outer line is
19 the 5 microgram per liter contour, so
20 everything inside that line is above that
21 reading. So this shows that the highest
22 concentrations are in this Well 4. This is
23 the mall area. And these are the Garden City
24 Plaza area office buildings. This is Well 4.

25 So this right here is the highest

1 concentration of PCE of 350 micrograms per
2 liter, and in the shallow zone the highest
3 was 15 micrograms per liter, and in the
4 deeper zone was 230 micrograms per liter.
5 And that's in the deeper -- I'm sorry, in the
6 wells. The Garden City supply wells.

7 This next figure shows the same thing,
8 but it's showing the TCE concentrations.
9 Again shows the shallow zone, the highest
10 concentration was 20 micrograms per liter.
11 The highest concentration, again, was in that
12 intermediate zone. There are some high
13 concentrations in 4, but the highest
14 concentration was actually in one of the
15 Garden City wells at 260 micrograms per
16 liter. And in the deeper zone the highest
17 concentration was at 170 micrograms per
18 liter.

19 For the soil and gas screening results,
20 again, of the 158 locations that we sampled,
21 five of them exceeded the screen criteria,
22 and that's at the 15-foot level, and seven of
23 the locations exceeded screening criteria at
24 the 35-foot level.

25 And if you can go to the next slide,

1 this is also a handout that's better seen in
2 the handouts. There are -- again, this shows
3 all the sampling grids, and all of the blue
4 dots that you see are the locations that
5 exceed the screening criteria.

6 So the -- the conclusions from the
7 groundwater investigation that we did are
8 that PCE and TCE and its related compounds
9 are the site-related compounds of concern.

10 The majority of the plume core -- when I
11 say the plume core, I mean the highest levels
12 of concentration are located near Well
13 SVP/GWM 4 at approximately 250 to 310 feet
14 below ground surface. Again, this is the
15 area that was formally used as drain field
16 and distilling well.

17 The southern -- the natural southerly
18 flow of groundwater and contaminants is to
19 the south. And in the deep zone it's
20 interrupted by the large-scale pumping at the
21 two Garden City supply wells, 10 and 11.

22 And it basically, the -- also, the VOC
23 contamination is shallower south of the
24 Garden City supply wells, and this is likely
25 related to contaminant sources located south

1 of this area.

2 The conclusions for the source area
3 investigation, again, as you can see from
4 that figure with the blue dots, there is
5 little evidence of residual sources left in
6 the -- the subsurface. And basically, in
7 order to look into that further, EPA
8 conducted some additional samples at some of
9 these select locations to confirm that the
10 soil vapors were not indicative of a
11 contaminant source.

12 And Michael Sivak is going to talk about
13 that.

14 MR. SIVAK: Okay, I'm going to stand
15 over here. Just to shift everybody's focus a
16 little bit. I'm -- as Cecilia introduced me
17 earlier, I'm EPA's risk assessor, who's
18 helping out on this project.

19 So I'm going to talk about sort of some
20 of the other sampling that we've done and how
21 that sort of affects human health or what our
22 conclusions from that might be. This slide
23 here talks about the soil vapor sampling that
24 we conducted.

25 As Lisa mentioned, we did do a lot of

1 soil gas sampling, and those are soil gas
2 samples that are collected in sort of open
3 areas that may not have buildings over them.

4 Once we -- incurred with that sort of
5 investigation, we also started on an
6 investigation to determine whether or not
7 vapors were collecting in buildings, because
8 that's an important factor as to whether or
9 not these vapors could actually collect
10 beneath buildings, percolate up through
11 cracks in the building and the foundation,
12 and then get into the indoor air environment
13 in concentrations that we would be concerned
14 about.

15 So EPA started its vapor intrusion
16 sampling by collecting soil vapors. We
17 collected soil vapors both from underneath
18 several commercial buildings and then also
19 across a number of residential properties to
20 the west side of Clinton Road.

21 The soil vapor samplings on the
22 commercial properties involved two phases.
23 The first phase began with collecting just
24 the vapors beneath the buildings. We got
25 those results back, and down here you can see

1 that we looked for both TCE and PCE. The TCE
2 concentrations ranged from about 3.9 up to
3 about 51 micrograms per cubic meter
4 underneath these building slabs.

5 Some of these concentrations did exceed
6 our screening criteria. In fact, all those
7 results exceeded our screening criteria. And
8 so that then prompted us to look at these
9 data and say, what this means is that vapors
10 are collecting beneath the slabs.

11 We don't really know what that means as
12 far as the indoor air goes, but we know that
13 the situations are such that the vapors are
14 migrating up from beneath -- from a
15 contaminated aquifer, and they are beginning
16 to collect beneath the building at levels
17 where we need to look at that a little more
18 closely, and I'll get to that in second.

19 We also looked at PCE results,
20 tetrachloroethylene, in this slab, and none
21 of those concentrations exceeded screening
22 criteria. So what we saw underneath the
23 Garden City Plaza office buildings were just
24 the TCE that was starting to collect beneath
25 the slabs. That then triggered us to go into

1 sort of this round 2, this second -- this
2 second round of sub-slab vapor, where we then
3 collected sub-slab and indoor air
4 concentrations at the same time.

5 We wanted to see what was going on in
6 the building at the same time that we could
7 see what was going on beneath the building as
8 well. So that's this result right here. The
9 indoor air samples exceed the New York State
10 Department of Health indoor air criteria for
11 TCE or PCE.

12 So that's a very, very good piece of
13 information for us to take away, which is,
14 even though we're starting to see some vapors
15 collect beneath the slab, we are not seeing
16 any impact to indoor air at all. We are not
17 even seeing detections of these chemicals in
18 the indoor air in the commercial buildings.

19 As I said previously, we can also
20 collect sub-slab soil gas samples from
21 beneath some residential properties on the
22 west side of Clinton Road.

23 In fact, some of you may remember
24 Caroline from walking around the neighborhood
25 in that area trying to get folks to volunteer

1 for this effort. So we did collect some PCE
2 and TCE samples. We did not have any
3 exceeds, especially of TCE or PCE, above our
4 screening values in the sub-slab.

5 Next slide.

6 So while we are collecting the soil gas
7 samples and the sub-slab soil gas samples, we
8 were also collecting soils from the
9 commercial area as well. We collected 41
10 subsurface soil samples. The reason we did
11 this was, Lisa mentioned before that we
12 are -- we were at this point in the process,
13 we were still trying to figure out, could
14 there be residual source material that could
15 continually be leaching some contamination to
16 the groundwater.

17 We collected the soil gas samples. Some
18 of these Lisa talked about. Some of those
19 did suggest that we have -- we had some
20 vapors that were above our screening
21 concentrations.

22 We then went out and collected more soil
23 gas samples that we actually analyzed in
24 laboratories. We got those results back. We
25 also collected 41 subsurface soil samples on

1 the commercial property. And in those 41
2 subsurface soil samples, no VOCs were
3 detected in any of the samples.

4 The results of this investigation, the
5 results of the sub -- excuse me, the soil gas
6 sample, the screen samples, the soil gas
7 samples that we set out for analysis, and the
8 subsurface soil samples, all lead us to
9 believe that there is no residual sources
10 left on the property that will continue to
11 leach contaminant to groundwater.

12 As part of the remedial investigation,
13 we also conducted a human health risk
14 assessment.

15 The purpose of the human health risk
16 assessment is to look at the data that we
17 generated at the site, the groundwater data,
18 primarily the groundwater data, because we
19 didn't find it in the soil data -- primarily
20 the groundwater data to look at this, to
21 determine -- basically we are trying to
22 answer two questions with this process.

23 Those questions are: What are the risks
24 to people now if they're exposed to
25 contamination, and what are the risks to

1 people in the future, in the absence of any
2 remediation, in the absence of any kind of
3 controls.

4 Well, the good news is that there are no
5 current exposures to contaminated
6 groundwater. Nobody is currently drinking
7 the contaminated groundwater. So under the
8 way the site currently exists, there are no
9 current exposures to groundwater.

10 The next question that we try to answer
11 is what are the -- what might the risks be
12 under potential future conditions if people
13 would be exposed to groundwater. Well, what
14 we -- what we are trying to do is, we're
15 trying to look at how people would be exposed
16 to the contamination under what we call
17 really maximum exposures, and what's the
18 highest exposure that someone is likely to
19 get if they were to have an exposure.

20 So that's what we call a reasonable
21 maximum exposure. For example, we can look
22 at residential exposure to be every day of
23 the year for approximately 30 years.

24 So you're drinking about two liters of
25 water every day for 30 years. That is sort

1 of our reasonable maximum exposure. For
2 drinking groundwater. For drinking water.

3 So we look at ingestion. We also look
4 at inhalation of these chemicals while we're
5 showering, because that -- that may be a
6 pathway that we need to look at. We also
7 look at dermal contact with site groundwater.
8 Your skin is exposed to this, what might the
9 risks be for these chemicals upon dermal
10 contact.

11 Basically, the conclusions of this was
12 that under potential future exposures to TCE
13 and PCE in the groundwater, these risks
14 exceed EPA guidelines for acceptable levels
15 of risk. So that then leads us to the next
16 step in the process, which is the feasibility
17 study, which Caroline will talk about.

18 MS. KWAN: Take all these back together
19 with the remedial investigations that Lisa
20 mentioned, the risk assessment that Mike and
21 his staff have prepared, conducted. Next
22 step is developing feasibility study, which
23 Angela has mentioned before.

24 And the purpose of it is to come up with
25 some cleanup alternative to meet some of

1 the -- some of the action objectives that we
2 have set aside, and these remedial action
3 objectives is to prevent and minimize
4 potential and current and future human
5 exposure, including inhalation, ingestion,
6 dermal contact with the contaminated
7 groundwater that exceed the maximum
8 contaminant level, minimize the potential for
9 off-site migration of groundwater with the
10 VOC contamination greater than that the
11 drinking water and MCLs; to restore the
12 groundwater to beneficial use within a
13 reasonable time frame as specified by our
14 law, and mitigate site-related vapor
15 migrating into commercial buildings, if
16 necessary.

17 The maximum contaminant level for these
18 four chemicals, PCE, TCE, 1,1-dichloroethene,
19 and cis-1,2-dichloroethene, are all 5
20 micrograms per liter.

21 Now, with this -- from the alternative
22 that we're developing, the cleaner
23 alternatives, we use criteria that's mandated
24 by Superfund law, and these criteria are,
25 first and foremost, overall protection of

1 human health and the environment, compliance
2 with applicable and relevant and appropriate
3 requirements, ARARs. Long-term effectiveness
4 and permanence, reduction of toxicity, and
5 mobility and volume of waste and hazards --
6 and hazard.

7 Short-term effectiveness. How
8 implementable this remedy is. The cost is a
9 factor. The state concurrence, and of course
10 the community acceptance of this remedy.

11 Now, EPA also mandated that we evaluate
12 a no-action alternative. Under this
13 no-action alternative is a baseline for
14 comparison with other alternatives that we
15 were -- we will, you know, present later on.
16 And this is -- for this no-action
17 alternative, no action is to be taken to
18 prevent exposure to the contamination at the
19 site.

20 As part of this no-action alternative,
21 we will also conduct a five-year review,
22 because contaminant is left on site for more
23 than five years.

24 Now, under Alternative 2, we were
25 monitoring institutional control. We will do

1 some sort of long-term monitoring program to
2 sample and to perform any new sampling of the
3 seven existing multi-port wells that we
4 install, and two of the Nassau County single
5 screen well, to track the contaminated water
6 over time, to make sure that the drinking
7 water standards numbers are being met.

8 We will also institute a -- to restrict
9 some future groundwater use for the site.
10 And we will also prepare a site management
11 plan to ensure that we have proper management
12 of the monitoring programs, and the
13 institutional controls and component of this
14 remedy, of this alternative.

15 Again, five-year review will also be
16 conducted at the end of five years, because
17 contaminant will be left over, in or on site,
18 for over five years.

19 Now, for Alternative 3, we have
20 groundwater extraction and ex-situ treatment,
21 pump and treat. First, a pre-design
22 investigation to include at least -- to
23 install three new multi-port wells and do
24 some sort of groundwater modeling.

25 We will also, based on the result of

1 this design investigation for this new
2 multi-port well -- we will also install,
3 could be one extraction well, could be a
4 number of extraction wells and a treatment
5 system to treat the contaminant groundwater
6 and discharge the recharge basin.

7 As part of this alternative, we will
8 also evaluate the wellhead treatment at
9 Garden City supply wells, 10 and 11. Again,
10 we will conduct a -- we will institute
11 control to restrict future groundwater use of
12 this site.

13 Again, a site management plan will be
14 prepared to manage all the components of this
15 alternative.

16 Again, a long-term monitoring. We will
17 also conduct sampling of the existing well
18 and the newer -- newer wells. The
19 monitoring -- the plume movement. Again,
20 five-year review will also be conducted
21 because contaminant will be left at site for
22 over five years.

23 As part of this alternative, we will
24 also continue to monitor for vapor intrusion
25 by going back to commercial building, and do

1 some -- a sub-slab and indoor air sampling.

2 As part of this Alternative 3, the pump
3 and treat, we will also prepare a contingency
4 plan. This contingency plan will be
5 implemented in the event that Garden City
6 Well 10 and 11 pumping rates are reduced or
7 are permanently taken out of service. This
8 contingency plan will include installation of
9 a new well in the vicinity of Garden City
10 wells, and an ex-situ treatment, treating
11 contaminated water.

12 Now, the cost. With Alternative 1,
13 which is of course no action, which we have
14 zero cost, zero annual O&M cost, operation
15 and maintenance cost.

16 For Alternative 2, our capital cost for
17 the monitoring, the annual monitoring, is
18 \$300,000. And the annual operation and
19 maintenance of this monitoring program for
20 the first 25 years will be \$150,000. After
21 25 years, since the plume -- based on our
22 current modeling effort, plume size will be
23 reduced, so our monitoring network will be
24 reduced, so we got reduced to \$110,000.

25 Alternative 3, the capital cost will be

1 \$6.2 million. Again, the annual monitoring
2 cost is increased to \$850,000 from
3 Alternative 2, because we have more
4 monitoring wells that we are going to
5 monitor, plus we will do a forced operation
6 of the existing extraction well that we put
7 in place in the treatment plant.

8 Again, monitoring network will be
9 reduced after seven years to \$790,000,
10 because the plume size will be reduced after
11 25 years. Again, if we are going to do a
12 contingency plan, \$5.6 million will be added
13 onto Alternative 3 if we need to implement
14 the contingency plan. Another \$5.6 million
15 will be added to this 6.2 capital cost.

16 Again, like we explained, through the
17 criteria evaluations and the assessments of
18 the risk assessments and the inclusion of the
19 remedial actions, remedial investigations, we
20 have proposed, EPA proposed, we would -- you
21 know, Alternative 3 will treat the
22 contaminated water and pump it to the
23 recharge basin. I mean, pump, you know, pump
24 the discharge, the clean water to the
25 recharge basin.

1 This alternative -- again, let me
2 reiterate. We would start with a pre-design
3 specification to include at least three new
4 multi-port wells and do some sort of
5 groundwater modeling to fine-tune the common
6 influence of this extraction well that we're
7 going to install to treat the contaminated
8 groundwater.

9 Again, we're going to evaluate the
10 wellhead treatment at two Garden City supply
11 wells, and we will also institute control to
12 restrict the future of groundwater use at the
13 site. Again, the site management plan will
14 be prepared to take -- to make sure we
15 properly manage all the components of this a
16 alternative.

17 Again, this long-term monitoring again
18 is the annual monitoring of these wells
19 that -- in the area, to assure that the plume
20 is actually shrinking. Again, five-year
21 review will be performed. At the end of five
22 years, because the contaminant is still --
23 will be left, you know, still after five
24 years.

25 Again, we will continue to monitor for

1 vapor intrusion at the commercial building,
2 like doing an indoor air commercial
3 buildings.

4 I would like to turn this over to the
5 Garden City Water District for their
6 presentation.

7 SUPERINTENDENT KOCH: Thank you,
8 Caroline. Just want to see if anyone can see
9 this picture right here. It's actually --
10 I'm Frank Koch, by the way, superintendent of
11 water in the Village of Garden City. I'll be
12 talking about treatment systems. And when we
13 do, just want to emphasize -- the water, the
14 tap water is safe to drink. Okay?

15 Now, we have provided safe drinking
16 water to the people. We've tested it for 30
17 years. We've taken several samples, those
18 collected for lab analysis thousands of
19 gallons of water to make sure that the water
20 meets our drinking standards.

21 We tested monthly. Several times we
22 have tested weekly. For two years we tested
23 daily, just to ensure that we provide a safe
24 water.

25 Should any time the water exceed any

1 limit, the protocol would be to actually take
2 the well as a system, provide proper
3 treatment, and put it back in the system.

4 So, as the mayor stated, we've removed
5 contaminants since 1987, 20 years, using our
6 first VOC removal treatment. It's the tower
7 on the left -- not that it matters, they both
8 look the same -- to remove the VOCs, volatile
9 organic compounds, the PCEs and the TCEs that
10 these guys were talking about.

11 As levels slowly climbed, we had to
12 upgrade our systems. We actually had to do
13 three major upgrades in the '90s alone.
14 Capital costs spent by the Village at Clinton
15 Road is 2.24 million. Operation maintenance
16 including lab analysis and plant monitorings
17 and filter replacements, among power
18 replacements, 1.5 million.

19 So you can see, even past 20 years,
20 we've had -- we spent a lot of money already.
21 Future looks very similar. We have 46 years,
22 according to the report. We would have to
23 replace our current system; our current
24 treatment system, three more times, okay, and
25 those capital costs will be \$5.4 million, in

1 today's present world, and the O&M would be
2 \$8.6 million.

3 The Village is committed to provide safe
4 water to the public, but we need the USPA's
5 help and we need the responsible party of the
6 U.S. Navy to help us as well. Thank you.

7 MS. CARPENTER: I think we have got one
8 more speaker. You? So this is Dennis
9 Kelleher, who is consultant to the Water
10 District.

11 MR. KELLEHER: Good evening. Dennis
12 Kelleher, from H2M Corporation, vice
13 president. We've been the consulting
14 engineers for the Village Water Department
15 for probably about 25 years. We reviewed the
16 feasibility study, and we would like to make
17 a couple comments tonight and maybe raise a
18 couple questions that we would like the EPA
19 to respond to, either tonight or in the
20 future.

21 Each of the three alternatives that have
22 been presented have assumed that the
23 Village's water supply wells 10 and 11 and
24 the stripping facility will be part of the
25 remedial solution. In the past, New York

1 State DTC and New York State Health
2 Department have stated that public water
3 supplies cannot be part of the remedial
4 strategy for cleaning up the groundwater
5 contamination.

6 The Village disagrees, and we disagree
7 with the EPA's approach at this point, and we
8 would like the EPA to explain how they can
9 allow the water supply to really be part of
10 the remedial action.

11 The report also states that the EPA is
12 requesting the Village to provide at least
13 two years' advanced notice before the wells
14 are shut down or the pumpage is reduced.

15 This will allow EPA to put in a pump and
16 treat the system. The Village cannot do
17 that. They're running a water treatment
18 system. They have to provide public water to
19 the community on a daily basis. They do not
20 have the luxury of having a notice where they
21 can say, Oh, we're going to have a problem
22 two years from now. A problem may occur
23 today and they will have to shut those wells
24 down immediately. So there is no way they
25 can give the EPA two years' notice.

1 We feel that the solution is that the
2 EPA has to assume that those wells will not
3 be used in the future. Again, the Village's
4 main purpose is to provide a safe and
5 reliable source of drinking water and water
6 for firefighting to the community.

7 The report also included an evaluation
8 of the three alternatives, and part of that
9 evaluation included a cost effective
10 analysis. The first alternative, which was
11 just discussed, is the no-action alternative,
12 and it -- in the report it's stated that this
13 cost -- excuse me, this alternative will have
14 no cost.

15 Well, that's no cost to the EPA.
16 However, it's a significant cost to the
17 Village of Garden City taxpayers, as Frank
18 Koch has already explained.

19 So in addition to the money that has
20 already been spent in the last 20 years,
21 providing treatment at the wellhead, the
22 report states that additional treatment will
23 be needed for the next 46 years, and we
24 estimate that the total cost to be over
25 \$14 million.

1 The question we're asking EPA is, who is
2 going to reimburse the Village for the moneys
3 that have already been spent? And the second
4 part of the question is, who is going to pay
5 for the cost of future treatment? So I just
6 want that to be clarified.

7 Our firm has had the experience in
8 dealing with projects where the U.S. Navy has
9 contaminated the groundwater on Long Island,
10 and there has been situations where the
11 Department of Defense has paid for treatment.
12 So the question is, you know, will the
13 federal government reimburse the Village for
14 their expenses.

15 And our final comment is, the report
16 really had no schedule for implementation,
17 and if a schedule for implementation could be
18 provided to the Village. Thank you.

19 MS. ECHOLS: Thank you.

20 MS. CARPENTER: Is that everybody from
21 the Village that wanted to speak?

22 MR. KELLEHER: Yes.

23 MS. CARPENTER: Before we get into the
24 questions and answers, just so you know how
25 you can contact us, on this slide, which will

1 remain up, and information is always
2 available in the proposed plan on how you can
3 send us comments.

4 Caroline Kwan, who is the project
5 manager, her phone number and her e-mail
6 address is on this slide, as is Cecilia's.
7 And we also have a Web site and the address
8 is in the proposed plan that were part of the
9 handouts, where we can get copies of
10 tonight's presentation and the proposed plan.

11 And that Web address is at the bottom of
12 the slide and it's also in the proposed plan.

13 So at this point I'd like to open up for
14 any questions that you may have.

15 MS. ECHOLS: Please state your name
16 again.

17 MR. KOCH: Frank Koch. Can you start
18 with some of the questions that Ed has asked
19 about providing funds?

20 MS. CARPENTER: The water system -- one
21 of the comments that you made was that the
22 water system is being used as part of the
23 remedy. What we had to do was look at the
24 current existing conditions, and currently,
25 the fact of the matter is, the Village of

1 Garden City is pumping these two wells at
2 somewhere between 800,000 to
3 2 million gallons a day, given seasonal
4 variations. That is a -- that's a fact.

5 So we've had to look at that and try to
6 see what we could do working around that
7 fact, and not introduce anything that could
8 negatively impact the water supply in this
9 area.

10 If the Village were to take these two
11 wells off line permanently, that would
12 certainly allow us to extract water at a
13 higher rate, potentially to other remedial
14 alternatives, but we are looking at a site
15 where groundwater contamination and the two
16 supply wells are -- they're hand and glove.

17 And the remediation system that we put
18 in, we don't want to negatively impact the
19 Village's ability to use that groundwater as
20 part of their distribution system.

21 So there's a careful balancing act that
22 has to be accounted for.

23 We will be working very closely with the
24 Village and their consultants during this
25 process to assure that we are not causing a

1 problem to the public water supply.

2 I understand the issue of not being able
3 to provide two-year notice, a timely notice.

4 Sometimes that is not possible on the
5 shutdown. Where we envision that kind of
6 notice is if the Village is considering
7 taking these wells out of service on a
8 permanent basis, it would be very helpful to
9 us to have that information as early in the
10 process as is possible, to try and accelerate
11 our normal, somewhat lengthy design process.

12 We are looking at designing our
13 contingency remedy concurrently with our
14 proposed remedy, so that we have the design
15 available and we do not have to go out and do
16 that at the 11th hour, should it become
17 necessary. So we will have that design
18 available to us.

19 Reimbursement.

20 Under the Superfund statute, it was
21 never envisioned -- that actually is in the
22 preamble to the national contingency plan,
23 and I know Leilani, who is our counsel,
24 probably knows the statute, certainly knows
25 the statute better than I do. The -- the

1 Superfund program was never intended to be a
2 drinking water program. We are a hazardous
3 waste site cleanup program.

4 As such, we have been unable to provide
5 reimbursement to towns for costs that they
6 have incurred in the past. What we can do is
7 provide some assistance with, for example,
8 upgrades to the wellhead treatment.

9 So we will be working, again, with the
10 Village to identify what those needs are,
11 what the capital costs are of those needs as
12 they relate to the site contamination.

13 So for example, if there is a fuel oil
14 spill, that is precluded from Superfund. But
15 the TCE contamination and PCE contamination
16 that we've identified as site related and of
17 concern will certainly be a basis for EPA
18 being able to work with the Village for
19 future -- I don't know what the proper word
20 is, upgrades, for lack of a better word, to
21 the existing treatment system. So I think I
22 covered the three major points.

23 Yes? No?

24 Oh, the schedule. Yes, as soon as --
25 we -- the next -- once we get a record of

1 decision and we put together a remedial
2 design work plan for our contractors, we'll
3 be happy to provide sort of a schedule and
4 set up meetings to discuss where we're going,
5 because your input is going to be necessary
6 for us to successfully put the remedial in
7 place and have it operate with minimal impact
8 to the community.

9 MR. KELLEHER: So you're saying that if
10 the Village wants to be reimbursed for costs
11 they've already outlaid, plus operational
12 cost in the future, they have to sue the
13 Department of Defense.

14 MS. CARPENTER: What I'm sort of saying
15 is that EPA Superfund program cannot
16 reimburse those costs, but I will turn it
17 over to Leilani to add to that.

18 MS. DAVIS: There's an ongoing potential
19 party -- responsible party search currently
20 for the site, and I have been looking at some
21 historical documents related to the air
22 field. And if you certainly uncovered any
23 documents that show evidence of the Navy
24 using any of these contaminants of concern,
25 TCE or PCE, at the air field, please give me

1 your card, because I definitely would like to
2 take a look at whatever documents you have.
3 But we are still currently investigating and
4 trying to do a responsible party search right
5 now, but we have not officially named anyone
6 yet at the site.

7 MR. KELLEHER: I'm just surprised, just
8 with that last statement, just with some of
9 the stuff. So you're saying that the
10 Department of Defense --

11 MS. DAVIS: No, has not yet been
12 notified, no. But if you have any, as I
13 said, historical documents that show actual
14 usage of those chemicals at the air field,
15 please, I'll give you my card at the end of
16 this meeting, and you can make copies and
17 send them to me. That would -- I would be
18 very interested in that.

19 SUPERINTENDENT KOCH: That might be the
20 first place to look after the description of
21 what they did there, and the cleaning.

22 MS. CARPENTER: We've been looking at
23 all the existing --

24 MS. DAVIS: The problem is, there is
25 circumstantial evidence and there is actual

1 evidence, and the problem is a lot of what's
2 out there is pretty circumstantial. And
3 also, as anyone who knows any history of the
4 Air Force -- excuse me, of the air field, it
5 wasn't just the military. There were lots of
6 private companies that did aircraft repair
7 and maintenance all along the air strip. It
8 operated between 1911 and 1951. There were
9 several years when the military wasn't
10 involved at all.

11 So if you have any information about
12 those companies, too, we would absolutely
13 love to look at it, and make copies and
14 please send them to me.

15 MS. CARPENTER: Yes.

16 MR. SMITH: This request for
17 information --

18 MS. ECHOLS: Would you state your name,
19 please?

20 MR. SMITH: Cyril Smith, resident of
21 Garden City. Does this information from the
22 attorney deal with only going back to the
23 1920s and '30s as the air field and aviation
24 situations existed?

25 MS. DAVIS: No. I mean, if you have any

1 information in your possession regarding
2 operations of the air field at all, I
3 would --

4 MR. SMITH: Well, this is prior to that.
5 During the Spanish American War, that was a
6 military base, and an enormous amount of
7 munitions was put there before the troops
8 left for Cuba. I don't know precisely where.

9 MS. DAVIS: The problem with that is,
10 that might be very interesting, but PCE and
11 TCE were not in usage during the Spanish
12 American War. The earliest usage, I believe,
13 is the '30s. The '30s.

14 MR. SMITH: Have there been any other
15 contaminants been tested there on the ground?
16 I don't know what happens with burnt
17 gunpowder after the rain has passed into the
18 soil.

19 MS. CARPENTER: The -- this site was
20 listed on the national priorities list on the
21 basis of the groundwater contamination that
22 was being detected in the drinking water
23 supply wells, and through the Nassau County
24 Department of Health investigations into
25 groundwater.

1 Now, these contaminants are volatile
2 organic compounds, and those were tested for,
3 including their degradation products. The
4 other complicating factor at this site, and
5 one of the reasons we suspect we have not
6 found a distinct source area, is the amount
7 of demolition and regrading, construction,
8 that has occurred in this area, between
9 taking down the old airfield barracks,
10 turning those -- draining that area, turning
11 it back into a mall or into an office
12 building complex.

13 So this is not like some of our
14 industrial sites, that if you've been to some
15 our other meetings here where we have a dry
16 well or an acid-leaching pit or cesspool, and
17 we know the exact location.

18 So the odds of finding anything distinct
19 in that soil is -- is pretty slim. What we
20 would probably be able to find are the
21 contaminants normally found with tarmac. You
22 will find some of the fuel components from
23 cars sitting on the parking lots.

24 So again, these -- groundwater
25 contamination is the focus of this site. It

1 is a groundwater contamination site. We did
2 not see anything really untoward in the
3 information we have on this site, and
4 certainly nothing that -- that's news to us
5 about the Spanish American War, but I'm not
6 sure what would be left from that time
7 period.

8 MR. SMITH: You're saying the spectrum
9 of the testing dealt only with the chemical
10 related?

11 MS. CARPENTER: The testing at this site
12 predominantly dealt with the chlorinated
13 solvents, because that is what got this site
14 listed on the national priorities list. This
15 is a groundwater contamination area site that
16 we suspect is associated with the activities
17 of the Old Roosevelt Field site.

18 MR. SMITH: I understand that. So the
19 spectrum covered just the ranges you're
20 discussing rather than outside of those
21 parameters?

22 MR. MILES: Just as a side note, the
23 public wells are tested for a large range of
24 chemicals. It's a very large range of
25 different chemicals and different times. So

1 you would have seen -- if it was something
2 that was really getting into the drinking
3 water, we would have seen it.

4 MS. CARPENTER: Yes, sir.

5 MR. BELLMER: Bill Bellmer, Garden City
6 resident.

7 50 years ago they stopped using the
8 solvents, 1951, roughly, and for the last 50
9 years the Garden City wells have pumped a
10 million gallons a day, possibly, not from the
11 beginning, but now, and yet the contamination
12 doesn't seem to be down, it seems to go up.

13 Can you explain that in a little more
14 detail?

15 MS. CARPENTER: Actually, if you looked
16 at the remedial investigation, the
17 groundwater contamination in the -- say in
18 the north end of the site back in the '80s
19 was as high as, I believe, 28,000 parts per
20 billion, or micrograms per liter.

21 And that migrated southward toward the
22 Garden City supply wells, which is why you
23 saw that the contaminant levels at the supply
24 wells started to elevate. So as that water
25 moved from that point down toward the wells,

1 you will see that increase when you're
2 testing the wells, which is why the Village
3 has had to do these repeated upgrades.

4 So that was the natural progression, as
5 Lisa pointed out, is in a southerly
6 direction. But then when you come into the
7 area of influence of those two pumping wells,
8 because they are withdrawing so much water,
9 they will attract, so to speak. They're
10 going to pull that water in. So that's why
11 you saw the numbers go up.

12 At the same time those numbers are going
13 up, they're going down elsewhere.

14 MR. BELLMER: How much more water
15 besides the million gallons a day that the
16 Village is pumping would the remediation pump
17 on top of that?

18 MS. CARPENTER: I'm going to turn that
19 over to -- Susan?

20 MS. SCHOFIELD: 150.

21 MR. MATTHEW: 150 gallons per minute.

22 MR. BELLMER: What does that translate
23 to? Just from portion of what we are
24 pumping, what percent was that?

25 MR. KELLEHER: They would probably only

1 pump 10 percent.

2 MR. BELLMER: Then why bother even doing
3 it, instead of letting the Village keep on
4 pumping --

5 MS. CARPENTER: What we are trying to do
6 is keep that one area that Lisa was pointing
7 out in that Area 4 from impacting the Village
8 wells. So it will -- it's a very valid point
9 you're making. If we did nothing, that
10 no-action, while the Village would continue
11 to incur costs -- and I'm sensitive to
12 that -- if we did nothing, it would
13 eventually be drawn into those wells and it
14 would be dealt with, because they have a
15 really good track record in this village of
16 dealing with this.

17 But that isn't the point of the
18 Superfund program. We don't think that the
19 drinking water supply wells should be used in
20 this manner. So this remedy is trying to
21 balance the need to withdraw the water for
22 public use and not have that additional
23 contamination get there.

24 So we are trying to draw that, create a
25 sort of low flow zone in that area, and treat

1 that water, and then put it back into the
2 recharge basin, so that it isn't just lost to
3 waste.

4 MR. BELLMER: Would you create another
5 recharge basin or use one of the existing
6 ones?

7 MS. CARPENTER: At the present time we
8 are looking at using one of the existing
9 ones.

10 MR. BELLMER: Lastly, one more thing,
11 the cost of it. Is the cost of the
12 electricity for pumping at all significant?

13 MS. CARPENTER: I believe it is pretty
14 significant out here in Long Island.

15 It's in that O&M cost. It's part of
16 that.

17 MR. BELLMER: Thank you.

18 MS. CARPENTER: Yes, sir.

19 MR. QUIGLEY: Can I talk about my
20 product? Inappropriate?

21 MS. CARPENTER: You can -- no, you
22 can --

23 MR. QUIGLEY: -- public record?

24 MS. CARPENTER: Absolutely.

25 MR. QUIGLEY: Do you mind? Briefly?

1 MS. CARPENTER: Yeah, because it might
2 be a little more technical.

3 MR. QUIGLEY: It's not.

4 My names is James Quigley, and I'm with
5 Barnes Environmental (phonetic), and we were
6 chatting before about our technology. And I
7 think the door is closed on the opportunity
8 for this particular site, but I thought it
9 would be good if everybody in the room know a
10 little about how technology for future -- or
11 perhaps to remediate some of the problems at
12 this particular site, because it sounds like
13 there's some need for some seamless operation
14 between water and soil. And I think we may
15 have a product that would be a solution.

16 I spoke to some people in the Water
17 Department, may be avoiding me. I don't
18 know.

19 SUPERINTENDENT KOCH: No, Jim, not at
20 all.

21 MR. QUIGLEY: Our technology is now a
22 technology that migrates to the soil and
23 breaks down the VOCs that we discussed. Not
24 by brand, but all. One of the issues that we
25 might have is how do we get it to the

1 contaminant, 400 feet below.

2 Well, I don't know, but it sounds like
3 you have a hot spot. I think we could treat
4 the hot spot. Our product, unlike the
5 five-year review, when our product hits the
6 contaminant, it remediates it. That might be
7 interesting to you folks who are concerned
8 about the contaminant and the treating. It
9 sounds a little like something that was done
10 a long time ago, going very far down in soil,
11 trying to treat stuff and bring it up and do
12 it every five years.

13 Just seems to me that utilizing
14 nanotechnology, which sounds a little more
15 what folks are going to do remediating, is
16 more practical and more in line with what you
17 might want to do on future sites, or maybe
18 even treat part of the existing site that you
19 haven't gotten with your pump-and-treat
20 system, with our technology, which will treat
21 the PCE and TCE, all the VOCs.

22 So I thought that might be interesting
23 for whatever is here.

24 By the way, we have contracts with the
25 army. We have contracts with the navy. We

1 have contracts with TPA. And I'll refer that
2 contact to you folks.

3 Thanks. My name is Jim Quigley.

4 MS. CARPENTER: Thank you, Mr. Quigley.

5 We will be in touch with -- Mr. Quigley is
6 going to give us some contact information.

7 Yes, ma'am.

8 MS. RUGGIERO: Hi. Barbara Ruggiero,
9 Garden City resident, and as I'm looking at
10 the handout in terms of a time frame --
11 because I noticed that you were [inaudible]
12 but it's listing ten years from water
13 extraction.

14 MS. SCHOFIELD: Yes. What we did to
15 create that alternative was use the
16 groundwater model, and the groundwater model
17 was used to look at the contamination that we
18 had mapped, that were from the figures that
19 Lisa talked about. And the model then looked
20 at what would happen if we put in extraction
21 wells in different parts of the contamination
22 and extracted water at different rates, and
23 how long it would take to extract the water
24 so that it was below EPA's MCL, or maximum
25 contaminant level.

1 And the preliminary groundwater model
2 showed that it would be about ten years of
3 pumping of the extraction well that EPA would
4 put in to bring the water in that area near
5 that SVP 4 location near the Garden City
6 Plaza parking lot, to bring that level down
7 to within the MCL.

8 So that -- so that the -- the
9 alternative was envisioned that pumping would
10 occur at the extraction well for about ten
11 years.

12 MS. RUGGIERO: Is there any way to
13 shorten that time frame, out of curiosity?

14 MS. SCHOFIELD: That's what would be
15 done as part of the design, part of the
16 pre-design investigation that Caroline
17 described, that we would put in a couple more
18 wells so that we would have a little bit
19 firmer idea of exactly where the
20 contamination is, and then the groundwater
21 model would be used again to determine what
22 the best setup would be for extraction wells.

23 And one of the primary concerns that we
24 had looked at this alternative was that we
25 not put in an extraction well for the remedy

1 that EPA's looking at that would impact the
2 two supply wells.

3 So we were really constrained with where
4 we could put wells and at what rate we could
5 pump them so that we would not impact the
6 water that was being extracted for the -- the
7 use by the Village residents for their
8 drinking water.

9 But that's one thing that would be
10 really refined in the design stage, would be
11 to determine what was the best arrangement of
12 the number of extraction wells that EPA would
13 use and whether they would be placed and how
14 much they would pump.

15 MS. RUGGIERO: Would they only be placed
16 on public land or anybody's private land, out
17 of curiosity?

18 MS. CARPENTER: I think right now they
19 have -- well, all those parcels are owned
20 by -- by private entities, probably with the
21 exception of Hazelhurst Park, which might be
22 a municipal.

23 MS. KWAN: Village.

24 MS. CARPENTER: So it's more than likely
25 that we will be putting at least some of this

1 treatment system on privately owned property.

2 MS. RUGGIERO: How long does the design
3 phase last? Did you do a study on that?

4 MS. KWAN: A year. Could be a year to
5 do the -- to do the pre-design investigation
6 and come up with a -- you know, a -- a
7 design.

8 MS. RUGGIERO: Right.

9 MS. KWAN: A year, a year time frame.

10 MS. RUGGIERO: I noticed on the
11 feasibility study cost analysis there was a
12 contingency plan noted with an asterisk, and
13 that made the numbers jump up another five.
14 What is the contingency plan?

15 MS. CARPENTER: That was -- as Caroline
16 was explaining, the contingency is should the
17 two wells be taken out of service. That
18 would be sort of a trigger.

19 And that would be to actually increase
20 the extraction and the treatment system to
21 kind of compensate as much as is possible for
22 taking something that large out of. So
23 that's why the costs jump drastically.

24 MS. RUGGIERO: If we take the wells out
25 of service, where do they get the water from?

1 SUPERINTENDENT KOCH: It would be very
2 difficult. You guys look at the map of the
3 Village of Garden City, two dots all the way
4 to the east, that's the wells we're talking
5 about. Just in case not everyone knows..

6 The -- those two are kind of in an
7 island of their own. If you look at how much
8 they can -- it's one system, but let's face
9 it, the water from those wells supply that
10 eastern section. If we were to lose those
11 wells, put two more wells somewhere else.

12 So, I guess the answer is, I guess maybe
13 this can't be Superfund either, but if you
14 really want those wells, we have no problem
15 moving those wells down further.

16 Of course --

17 MS. CARPENTER: The difficulty in
18 placing any wells is going to be ensuring
19 that you're not in another area with a
20 problem.

21 SUPERINTENDENT KOCH: Of course.

22 MS. CARPENTER: So there's a lot of
23 homework to be done on that, but if
24 there's -- if the Village decides that they
25 are going to move those wells elsewhere, then

1 yes, we would certainly like to talk to you
2 about --

3 MR. KELLEHER: You can take that money
4 and just give it to the Village.

5 MS. CARPENTER: Are you going to bake me
6 that cake?

7 MR. KELLEHER: For five and a half
8 million, I will.

9 MR. BELLMER: One more question. I
10 always thought that the contaminants sort of
11 floated on top of the groundwater. When the
12 presentation for the Hempstead gas plant was
13 given, the coal tar was said to ride on top
14 of the groundwater, 35 feet. Do you know how
15 this stuff ever got so deep?

16 MS. CARPENTER: Some ground contaminants
17 are what you call floaters. They sit on top
18 of the water. Some are sinkers. They go to
19 the bottom. But the easiest explanation in
20 this case is, they got so deep because the
21 wells that are pumping, 10 and 11, are quite
22 deep. They're drawing. So what happens is
23 it pulls it down. So that's --

24 MS. SCHOFIELD: In addition, keeping in
25 mind that throughout the '60s, '70s and half

1 of the '80s, there were a lot of cooling
2 water wells. I think we were about eight or
3 nine cooling water wells in that office
4 complex area that drew a lot of water. In
5 fact, probably comparable amounts of water
6 during the summer to what the supply wells
7 pump, and they really pulled the
8 contamination down.

9 MS. CARPENTER: Any other questions?
10 For anybody who did not want to ask a
11 question in this type of forum tonight,
12 again, there are alternative ways of
13 providing us with your comments. The public
14 comment period does end September 20. So if
15 you can get us your comments, we would
16 greatly appreciate it.

17 And I would like to thank all of you for
18 coming out tonight, and we appreciate your
19 input. And we will be here for another few
20 minutes, for a little bit, in case anybody
21 has questions. Please feel free to come up
22 and ask us. Thank you all for coming.

23 (Time noted: 8:45 p.m.)

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C E R T I F I C A T E

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STATE OF NEW YORK)
) ss.:
COUNTY OF NEW YORK)

I, JEFFREY BENZ, a Certified Realtime Reporter and Notary Public within the State of New York, do hereby certify that the foregoing transcription, taken at the time and place aforesaid, is a true and correct transcription of my shorthand notes.

IN WITNESS WHEREOF, I have hereunto set my hand this 15th day of September, 2007.

Jeffrey Benz

JEFFREY BENZ, CRR, RMR

RESPONSIVENESS SUMMARY

APPENDIX V-e

LETTERS RECEIVED DURING THE COMMENT PERIOD

September 18, 2007

100 Hilton Avenue E403
Garden City, NY 11530

Ms. Caroline Kwan
Remedial Project Manager
NY Remediation Section
US Environmental Protection Agency
290 Broadway 20th Floor
New York, New York 10007-1866

Dear Ms. Kwan,

I attended the meeting at the Garden City Village Hall on Tuesday, September 11th, but had to leave after your excellent presentation and before the comment period.

However, any type of contamination to our ground water is very serious and not only impacts the health of many people but also endangers our precious water supply.

Since we, the residents of Garden City, did not cause this serious problem, we implore the EPA to clean this mess up for us. The owners of this property that is causing the contamination from the US Navy to the present owners should be held responsible. However, this should not stop immediate funding from the EPA to help your taxpayers in serious need.

Thank you for your kind attention to this matter.

Sincerely,


Rochelle Dowling