RECORD OF DECISION

Operable Unit Two
Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Nassau County, New York

United States Environmental Protection Agency
Region 2
New York, New York
March 2018

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PART 1 DECLARATION

SITE NAME AND LOCATION

Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Nassau County, New York
Superfund Site Identification Number: NYSFN0204234
Operable Unit: 02

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for Operable Unit 2 (OU2) of the Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site), in Nassau County, New York, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the OU2 remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record, upon which the selected remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the planned remedy in accordance with Section 121(f) of CERCLA, 42 U.S.C. § 9621(f), and concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site, if not addressed by the implementation of 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

A previous ROD for Operable Unit 1 (OU1), signed in September 2007, selected a remedy to address groundwater contamination predominantly in the western portion of the Site. The selected remedy described in this document addresses additional contaminated groundwater in the eastern portion of the Site. This is the second remedial phase, or operable unit, for the Site, identified as OU2. For purposes of this OU2 ROD, the additional groundwater contamination in the eastern portion of the Site includes an area of the former Roosevelt Field airfield east of Clinton Road, south of Old Country Road, and extends beyond the Meadowbrook Parkway to the east.

The major components of the selected remedy for OU2 of the Site include the following:

− Extraction of groundwater via pumping and ex-situ treatment of extracted groundwater prior to discharge to a recharge basin or reinjection to the aquifer (to be determined during the remedial design phase). The purpose is to establish containment and effectuate removal of contaminant mass where concentrations of total volatile organic compound in the groundwater are greater than 100 micrograms per liter (μg/L). Natural processes, predominately dilution and dispersion, will be relied upon to achieve the maximum contaminant levels (MCLs) for areas not targeted for active remediation;

− Implementation of long-term monitoring in conjunction with OU1 to track and monitor changes in groundwater contamination to ensure the remedial action objectives (RAOs) are attained;

− Institutional controls to ensure that the remedy remains protective until RAOs are achieved for protection of human health over the long term. Institutional controls are anticipated to include existing governmental controls in the form of state and county well use laws prohibiting the use of groundwater for drinking purposes; and

− Development of a Site Management Plan to ensure proper management of the Site remedy for OU2 post-construction. The Site Management Plan will include provisions for operation and maintenance, long-term groundwater monitoring, institutional controls, periodic reviews, and certifications, as applicable.

To potentially enhance the environmental benefits of the preferred remedy, consideration will be given, during the design, to technologies and practices that are sustainable, in accordance with EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy.[1] This will include consideration of green remediation technologies and practices.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in Section 121 of CERCLA, 42 U.S.C. § 9621, because it meets the following requirements: 1) it is protective of human health and the environment; 2) it meets a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains the legally applicable or relevant and appropriate requirements under federal and state laws unless a statutory waiver is justified; 3) it is cost-effective; and 4) it utilizes permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. In addition, Section 121 of CERCLA, 42 U.S.C. § 9621, includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances as a principal element. The selected remedy satisfies the preference for treatment, as it will result in the extraction and ex-situ treatment of contaminated groundwater from the aquifer prior to discharge to a recharge basin or reinjection back to the aquifer.

While this alternative would ultimately result in reduction of contaminant levels in groundwater such that levels would allow for unlimited use and unrestricted exposure, it is anticipated that it would take longer than five years to achieve these levels. As a result, in accordance with CERCLA, the Site remedy is to be reviewed at least once every five years until remediation goals are achieved and unrestricted use is achieved.

[1] See https://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy, and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for this action.

- ✓ A discussion of the current nature and extent of contamination is included in the "Summary of Site Characteristics" section.
- ✓ Chemicals of concern and their respective concentrations may be found in the "Summary of Site Characteristics" section.
- ✓ Potential adverse effects associated with exposure to Site contaminants may be found in the "Summary of Site Risks" section.
- ✓ A discussion of groundwater cleanup levels for chemicals of concern may be found in the "Remedial Action Objectives" section and in Table 7, in Appendix II.
- ✓ A discussion of principle threat waste is contained in the "Principle Threat Wastes" section.
- ✓ Current and reasonably anticipated future land use assumptions are presented in the "Current and Potential Future Land and Resources Uses" section.
- ✓ Estimated capital, operation and maintenance, and total present-worth costs are discussed in the "Description of Remedial Alternatives" section.
- ✓ Key factors that led to 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) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

AUTHORIZING SIGNATURE

John Prince
Acting Director
Emergency and Remedial Response Division

3/30/2018
Date

PART 2 DECISION SUMMARY

1. SITE NAME, LOCATION, AND DESCRIPTION

The Site includes an area of groundwater contamination in the Village of Garden City, in central Nassau County, New York. The groundwater contamination is associated with the former Roosevelt Field airfield (Airfield) which is generally east of Clinton Road, south of Old Country Road, north of the Long Island Railroad tracks, and extends beyond the Meadowbrook Parkway to the east. A Site location map is provided as Figure 1, which can be found in Appendix I.

The former Airfield currently includes a large retail shopping mall and other shopping centers. Office building complexes (including Garden City Plaza) are situated on the western perimeter of the shopping mall and the Meadowbrook Parkway is located on the eastern perimeter of the shopping mall. A thin strip of open space along Clinton Road (known as Hazelhurst Park) serves as designated parkland and a buffer between a residential community and the mall complex. Two recharge basins, the Pembrook Basin and Nassau County Storm Water Basin number 124, are located directly east and south, respectively, of the mall complex. Two municipal supply well fields are located south (downgradient) of the former Airfield hangers. The Village of Garden City public supply wells (designated as Wells 10 and 11) are located just south of the former hanger area along Clinton Road. The Village of Hempstead Wellfield is located approximately 1 mile south of the Village of Garden City Wells 10 and 11.

The Site is in a densely developed portion of Nassau County. The area consists of a mix of commercial and residential properties.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Airfield was used for aviation activities from approximately 1911 to 1951. Prior to World War I, the U.S. military used the Airfield as a training center for Army and Navy officers and military pilots. After World War I, the U.S. Air Service maintained control of the Airfield but authorized aviation-related companies to operate from the Airfield. On July 1, 1920, the U.S. Government sold the buildings and relinquished control of the Airfield for commercial aviation uses.

During World War II, the Airfield was again used by the Army and the Navy. The Army used the field to train personnel on airplane and engine mechanics. As of March 1942, the Airfield accommodated six steel/concrete hangars, 14 wooden hangars, and several other buildings used to receive, refuel, crate, and ship Army aircraft. In November 1942, the Navy Bureau of Aeronautics established a modification center at the Airfield to install British equipment into U.S. aircraft for the British Royal Navy under the Lend/Lease Program. The U.S. Navy was responsible for aircraft repair and maintenance, equipment installation, preparation and flight delivery of aircrafts, and metalwork required for the installation of British modifications. The facility also performed salvage work on crashed British Royal Navy planes.

The U.S. Navy vacated all but six hangars shortly after the war ended, and vacated the remaining six hangars by 1946. The Airfield resumed operations as a commercial airport from August 1946 until its closure in May 1951. In 1952, the Village of Garden City installed two public supply wells (Wells 10 and 11) just south of the former hangar area along Clinton Road. These supply wells were put into service in 1953. Over the subsequent years, several other private supply and cooling water wells were installed and operated on the former Airfield. The Roosevelt Field Mall was constructed and opened in 1957.

The former Avis headquarters property, located at 900 Old Country Road, (south side of Old Country Road and west of Zeckendorf Boulevard) is in the northeastern portion of the former Airfield. Avis leased the property from approximately 1962 until 2001. Prior to that period, the property was used for various defense and civilian related manufacturing. Previous investigations conducted at this property under NYSDEC oversight revealed the presence of significant soil and groundwater contamination. As a result, various cleanup activities were conducted from May 2011 to August 2011 at this property under NYSDEC's Brownfield program.

In the late 1970s and early 1980s, investigations conducted by Nassau County discovered tetrachloroethene (PCE) and trichloroethene (TCE) contamination in Wells 10 and 11, and concentrations continued to increase requiring the installation of air-stripping treatment system to treat the water from the supply wells in 1987. Elevated levels of contamination were also found in cooling water wells used in building air conditioning systems at the Site.

The Site was listed on the National Priorities List (NPL) on May 11, 2000. The United States (U.S.) Environmental Protection Agency (EPA) conducted a remedial investigation/feasibility study (RI/FS) at the Site from 2001 to 2007. A number of Site-related contaminants were identified in groundwater on the western portion of the former Airfield during the RI, including PCE, TCE, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), 1,1-DCE, and carbon tetrachloride. It is likely that chlorinated solvents were used at the former Airfield during and after World War II. Chlorinated solvents such as PCE and 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 the 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 Field (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 degreaser agent.

In 2007, EPA issued a ROD to address the identified groundwater contamination (OU1) which called for the extraction of contaminated groundwater, ex-situ treatment, discharge of the treated groundwater to a nearby recharge basin, and institutional controls.

EPA completed construction of the treatment plant and three groundwater extraction wells (EW-1S, EW-1I, and EW-1D) as part of the remedy selected in 2007 and operation of the treatment system started in 2012. Subsequent to the startup of the treatment system, elevated concentrations of Site-related contaminants were detected in a groundwater monitoring well located to the south of the former Airfield, and outside the influence, of the treatment system. To address the contamination, three additional groundwater extraction wells (SEW-1S, SEW-1I, and SEW-1D) were installed immediately south of Stewart Avenue and piped to the same groundwater treatment plant. These extraction wells are referred to as the southern groundwater extraction wells. To accommodate the additional volume of groundwater requiring treatment, modifications to components of the treatment system within the plant were made in 2015.

As part of the long-term monitoring program for the 2007 remedy, groundwater samples are collected from a network of wells to track and monitor changes in groundwater contamination. In addition, a capture zone analysis was conducted for the groundwater extraction well network to verify remedy effectiveness and to monitor remedial progress. This analysis revealed elevated concentration of Site-related contamination in a cluster of monitoring wells installed in the eastern area of the Site. This contamination, which is adjacent to the area addressed by OU1, resulted in the need for further investigation of groundwater contamination in the eastern area of the former Airfield, identified as OU2.

Enforcement Activities

EPA's search for potentially responsible parties (PRPs) is ongoing. EPA has not yet issued notice letters to any parties that would be responsible under Section 107 of CERCLA, 42 U.S.C. § 9607, for the Site.

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

On February 23, 2018, EPA released the Proposed Plan for the cleanup of OU2 to the public for comment. Supporting documentation comprising the administrative record was made available to the public at the information repositories maintained at the Garden City Public Library, located at 60 Seventh Street in Garden City, New York, Hempstead Public Library, located at 115 Nichols Court, Hempstead, New York; the EPA Region 2 Office in New York City; and EPA's website for the Site at https://www.epa.gov/superfund/roosevelt-field-groundwater.

EPA published notice of the start of the public comment period and the availability of the above-referenced documents in the *Garden City News* on February 23, 2018. A news release announcing the Proposed Plan, which included the public meeting date, time, and location, was issued to various media outlets and posted on EPA's Region 2 website on February 24, 2018.

Due to an impending winter storm, the public meeting originally scheduled for March 7, 2018 was rescheduled to March 13, 2018. To inform the public of the rescheduled date for the public meeting a flyer was posted on: EPA's Region 2 website; social media; and the Village of Garden City's website. A notice of the rescheduled public meeting date was published in the *Garden City News* on March 9, 2018. EPA held the public meeting on March 13, 2018 at the Village of Garden City Village Hall, located at 351 Stewart Avenue, Garden City, New York, to inform officials and interested citizens about the Superfund process; to present the Proposed Plan for OU2 of the Site, including the preferred remedial alternative; and to respond to questions and comments from the attendees.

The public comment period, originally scheduled from February 23, 2018 to March 26, 2018, was extended after EPA received a request for an extension of time from a representative of the Village of Garden City. The representative informed EPA that an extension of the comment period would allow the Village to prepare written submissions. To inform the public of the extension of the public comment period a flyer was posted on: EPA's Region 2 website; social media; and on the Village of Garden City's website. In addition, the flyer was sent electronically to everyone on the Site-mailing list and a news advisory was sent to the media.

Approximately 35 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, public health concerns, location of the treatment system components, and the schedule for implementation of the remedy. A copy of both public notices published in the *Garden City News* along with responses to the questions and comments received at the public meeting and in writing during the public comment period can be found in the attached Responsiveness Summary (See Appendix V).

4. SCOPE AND ROLE OF RESPONSE ACTION

Section 300.5 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.5, defines an OU as a discrete action that comprises an incremental step toward comprehensively addressing a site's problems. A discrete portion of a remedial response eliminates or mitigates a release, a threat of release, or a pathway of exposure. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with a site.

As noted above, EPA has designated two OUs for the Site. OU1 addressed groundwater contamination predominantly in the western portion of the Site; a remedy for OU1 was selected in September 2007. OU2, which is the subject of this ROD, is the final planned phase of response activities at the Site, and addresses that portion of the contaminated groundwater that is in the eastern portion of the Site.

The primary objectives of the actions set forth in this ROD are to address the OU2 groundwater contamination, reduce the migration of the contaminants in groundwater, and minimize any potential future health impacts. The effectiveness of the remedy selected in this OU2 ROD presumes that this action, in conjunction with the OU1 remedy, will restore the aquifer to its most beneficial use (a source of drinking water). The effectiveness of the remedy also presumes that there is no ongoing contamination from the former Avis property. If, during implementation of the EPA remedy, EPA determines that the property is a continuing source, then EPA may elect to evaluate additional options pursuant to CERCLA to ensure the effectiveness of any remedy selected by EPA for this Site.

5. SUMMARY OF SITE CHARACTERISITCS

5.1 Hydrogeology

No naturally occurring surface water bodies are present in the vicinity of the Site. Most of the Site area is paved or occupied by buildings. Runoff is routed into stormwater collection systems and is generally discharged directly to dry wells or recharge/retention basins. There are three man-made water table recharge basins located at or near the Site, including the privately owned Pembrook recharge basin and a Nassau County recharge basin. In approximately 1960, the Pembrook Basin began receiving untreated cooling water discharge from air conditioning systems of the mall building and the office buildings west of the mall. Seven cooling water wells pumped contaminated groundwater from the Magothy Aquifer for use in the air conditioning systems. The untreated cooling water was later discharged to a drain field west of 100 Garden City Plaza and 200 Garden City Plaza until approximately 1985. Currently, the Pembrook recharge basin receives surface water runoff from an area near Garden City Plaza during storm events. The Nassau County recharge basin receives stormwater runoff from the municipal stormwater collection system and treated groundwater from the OU1 treatment plant, as described above.

The principal hydrogeologic units underlying the Site are the Upper Pleistocene Deposits, which form the Upper Glacial Aquifer (UGA) hydrogeologic unit, and the underlying Magothy Formation, which forms the Magothy Aquifer hydrogeologic unit. Beneath these two units are the clay member and the Lloyd Sand member of the Raritan Formation.

The UGA is estimated to be 80 to 100 feet thick and consists predominantly of coarse-grained sands and gravels which are fairly uniform in grain size distribution and lithology. The depth of the water table ranges from approximately 17 to 35 feet below ground surface (bgs). At the majority of the Site, the top of the Magothy Formation is at an average depth range of 80 to 100 feet bgs and is approximately 525 feet thick. Gravel-rich zones were encountered at the boreholes located south of the Roosevelt Field Mall.

Groundwater flow is downward and horizontal groundwater flow in the UGA and the Magothy is generally to the south/southwest. Groundwater flow in the immediate vicinity of the Site is influenced by multiple pumping wells in the area including supply wells for the Villages of Garden City and Uniondale. The Village of Hempstead Wellfield to the south has the greatest impact on groundwater flow.

5.2 Summary of the Remedial Investigation

The RI Report, dated February 2018, provides the analytical results of sampling conducted from 2014 to 2016 to delineate the extent of groundwater contamination in the eastern portion of the Site. The investigation, conducted in two phases, included drilling vertical profile boreholes, installing monitoring well clusters, and sampling groundwater. As part of the OU2 RI, a total of six vertical profile boreholes were drilled. The purpose of drilling the vertical profile boreholes was to aid in the selection of the depths and screen intervals for permanent monitoring well installation. Based on the data collected during the installation of these vertical profile boreholes, 12 clustered monitoring wells were subsequently installed. Each monitoring well cluster is comprised of three depth zones, the shallow zone (<250 feet bgs), the intermediate zone (250-400 feet bgs), and the deep zone (>400 feet bgs).

Site-related contaminants identified for OU2 include PCE, TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride. Based on analytical data, PCE and TCE were the most persistent contaminants and were detected at the highest concentrations therefore, PCE and TCE will be the focus of discussions in this section. 1,1-DCE, cis-1,2-DCE, and vinyl chloride were detected only in a few wells, at low concentrations and were co-mingled with TCE and PCE.

As mentioned previously, EPA completed an RI for OU1 in 2007. As part of the OU1 RI, EPA collected soil gas, soil, and groundwater samples for analysis. The results are contained in the Administrative Record for OU1.

Groundwater Sampling Results

Shallow Zone (<250 feet bgs)

Groundwater samples collected from the shallow zone revealed PCE and TCE at concentrations up to 210 micrograms per liter (µg/L) and 41 µg/L, respectively. The PCE and TCE contamination have a similar shape and trajectory in the shallow zone and move downward as they travel south/southwest with groundwater flow.

The contamination in the shallow zone extends approximately 3,100 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 1,000 feet wide near Ring Road South.

Intermediate Zone (250-400 feet bgs)

The highest concentrations of PCE and TCE were found within the intermediate zone. Groundwater samples collected from the intermediate zone revealed PCE and TCE at concentrations up to 600 μg/L and 120 μg/L, respectively. The PCE and TCE contamination have a similar shape and trajectory and migrate downward as they travel south/southwest with groundwater flow.

The contamination in the intermediate zone extends approximately 7,100 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 1,900 feet wide.

Deep Zone (>400 feet bgs)

The lowest total concentrations of PCE and TCE were found within the deep zone. Groundwater samples collected from the deep zone revealed PCE and TCE at concentrations up to 15 μg/L and 7 μg/L, respectively.

The contamination in the deep zone extends approximately 1,900 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 3,100 feet wide.

Vapor Intrusion Sampling Results

Volatile organic compound (VOC) vapors released from contaminated groundwater and/or soil have the potential to move through the soil and seep through cracks in basements, foundations, sewer lines, and other openings. As part of OU1, EPA conducted a vapor intrusion evaluation at the Site. In April and June 2007, EPA collected two rounds of vapor samples. The first round of sampling in April included sub-slab samples collected underneath the concrete slabs at four commercial buildings on the west side of the Roosevelt Field Mall.

Based on the first round of results, in June 2007 EPA collected a second round of sub-slab and indoor air samples at six commercial buildings at the Site. Also in June 2007, EPA collected sub-slab samples at seven homes located west of Clinton Road adjacent to the Roosevelt Field Mall.

The OU1 ROD called for additional evaluation of residential and commercial buildings to determine the extent of the vapor intrusion impacts. To address this component of the OU1 ROD, in December 2007, EPA collected sub-slab and indoor air samples at four commercial properties. At two additional commercial properties, only indoor air samples were collected. In addition, sub-slab and indoor air samples were collected at seven residential locations; five previously sampled and two new locations, with a collocated sub-slab sample collected in one of these two residential properties. Based upon EPA and New York State Department of Health (NYSDOH) guidance in existence at that time, none of the indoor air samples in any of the structures were above levels of concern. In 2017, NYSDOH issued revised vapor intrusion guidance for both TCE and PCE, however this did not change the determination that soil vapor intrusion has not resulted in impacts to indoor air.

6. CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Land Use

The property at the Site is highly developed, with large areas of impervious surfaces and little remaining natural area. Current land use for the area surrounding the Site is mixed commercial and residential. The Village of Garden City lies south and west of the Site. Approximately 21,672 people live within one mile of the center of the Site according to the 2010 Census.

The former Roosevelt Field airfield currently includes a large retail shopping mall and other shopping centers. Office building complexes (including Garden City Plaza) are situated on the western perimeter of the shopping mall and the Meadowbrook Parkway is located on the eastern perimeter of the shopping mall. A thin strip of open space along Clinton Road (known as Hazelhurst Park) serves as designated parkland and a buffer between a residential community and the mall complex. Immediately south of the Site is an area of retail strip development, commercial, and light industrial development. Farther south and south-southwest, land use is predominantly single-family residential.

There are multiple supply wellfields near the Site, including supply wellfields for Uniondale, and the Villages of Garden City and Hempstead. All residences and commercial buildings within the Site are connected to public-water supplies.

EPA does not anticipate that the land-use pattern at the Site will change.

Groundwater Use

The potable water supply on Long Island is dependent upon the aquifers underlying the island. These aquifers, including the UGA, Jameco, Magothy, and Lloyd, comprise a system of sole or principal source aquifers that are defined by EPA as supplying at least 50% (and in actuality providing 100%) of drinking water consumed in the area overlying the aquifers. The aquifers underlying Long Island are composed primarily of sand and gravel, mixed with lesser amounts of silt and clay.

The Village of Garden City maintains 10 water supply wells that provide water to over 21,000 residents. The Village utilizes the deep Magothy as their source aquifer. Water supplied to the residences and businesses at the Site is a blend of water provided through a complex, integrated system of wells and water treatment and storage plants.

7. SUMMARY OF SITE RISKS

As part of the CERCLA remedy selection process, EPA conducted a baseline risk assessment at OU2 to estimate current and future effects of contaminants on human health and the environment.

The baseline risk assessment includes a human health risk assessment (HHRA) and an ecological risk assessment. A HHRA is an analysis of the potential adverse human health effects of releases of hazardous substances from a site or OU in the absence of any actions or controls to mitigate such releases, under current and future land and resource uses. The baseline risk assessment provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed if remedial action is determined to be necessary.

7.1 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 National Contingency Plan (NCP) as an excess lifetime cancer risk greater than 1×10^{-6} – 1×10^{-4}, an excess of lifetime cancer risk greater than 1×10^{-6} (i.e., point of departure) combined with site-specific circumstances, or a Hazard Index greater than 1.0; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the site. Also included in this section is a discussion of the uncertainties associated with these risks.

7.1.1 Hazard Identification

In this step, the chemicals of potential concern (COPCs) 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. The risk assessment for OU2 focused on groundwater related to the eastern portion of the Site which may pose significant risk to human health. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of VOCs in groundwater at concentrations of potential concern.

Although residents and businesses in the area are served by municipal water, the aquifer at the Site is classified as Class GA (6 NYCRR § 701.18), meaning that it is designated as a potable drinking water supply. Therefore, potential future exposure to groundwater was evaluated. Based on the current zoning and anticipated future use, the risk assessment focused on future site workers and residents. A comprehensive list of all COCs can be found in the HHRA in the Administrative Record. Only the COCs, or the chemicals requiring remediation at the Site, are listed in Appendix II, Table 1.

7.1.2 Exposure Assessment

Consistent with Superfund policy and guidance, the HHRA 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 were 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.

The primary land use in the OU2 study area is mixed commercial and residential. It is anticipated that the future land use for this area will remain consistent with current use.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for exposure to groundwater. Exposure pathways assessed in the HHRA are presented in Appendix II, Table 2 and include exposure of residents to groundwater ingestion, dermal contact with groundwater and inhalation of volatiles while showering. Future residents (adult and child) and site workers have been identified as potentially exposed populations. Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper-bound 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 Site-related COCs in groundwater can be found in Appendix II, Table 1, while a comprehensive list of the exposure point concentrations for all COCs can be found in the OU2 HHRA.

7.1.3 Toxicity Assessment

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

Under current EPA guidelines, the likelihood of carcinogenic risks and noncarcinogenic hazards because of 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 are provided in the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information is presented in Appendix II - Table 3 (noncarcinogenic toxicity data summary) and Appendix II - Table 4 (cancer toxicity data summary).

7.1.4 Risk Characterization

Noncarcinogenic 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, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) that 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 ingested from contaminated drinking water) is compared to the RfD or the RfC to derive the HQ for the contaminant in the particular medium. The HI is obtained by adding the HQs for all compounds within a particular medium that impacts a particular receptor population.

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

HQ = Intake/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 will 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 media. A summary of the noncarcinogenic hazards associated with these chemicals for each exposure pathway is contained in Appendix II, Table 5.

Table 5 shows that the HI for noncancer effects is 65 for the future resident (based on the child exposure scenario) and 7 for the future site worker from exposure to tetrachloroethylene and trichloroethylene 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:

Risk = LADD x 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/(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. Again, as stated in the NCP, the acceptable risk range for site-related exposure is 1×10^{-6} (i.e., one additional incidence of a cancer may occur in a population of 1,000,000 who are exposed under the conditions) to 1×10^{-4}.

A summary of the estimated cancer risks is presented in Appendix II, Table 6. The results indicated that the cancer risk exceeded the acceptable risk range at 4×10^{-4} for future residential exposure to tap water/shower vapors. The cancer risk to future site workers from exposure to tap water was within the acceptable risk range at 1×10^{-4}. Cancer risks are primarily due to groundwater concentrations of TCE.

7.1.5 Uncertainties in the Risk Assessment

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.

7.2 Ecological Risk Assessment

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 contaminated groundwater discharges to surface water, exposure pathways are not complete and ecological receptors are not exposed to contamination.

7.3 Risk Characterization Conclusion

In summary, TCE and PCE contributed to unacceptable risks and hazards to future residents and site workers from exposure to contaminated groundwater at OU2 of the Site. Future exposure to site groundwater results in an unacceptable cancer risk and noncancer hazard index of 4×10^{-4} and 65 respectively for a site resident and a cancer risk of 1×10^{-4} and a hazard index of 7 for a future site worker (Appendix II, Table 5).

7.4 Basis for Taking Action

Based on the results of the OU2 RI/FS and the risk assessment analysis, EPA has determined that a response action is necessary and that the response action selected in this ROD is necessary to be protective of the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

8. REMEDIAL ACTION OBJECTIVES

RAOs 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 (TBC) guidance, and site-specific, risk-based levels established using the risk assessments described above.

The following RAOs have been established for contaminated groundwater for OU2:

- Prevent or minimize potential future human exposure to VOCs in groundwater through ingestion, dermal contact, and inhalation above levels that are protective of beneficial use (i.e. drinking water use);
- Restore the impacted aquifer to its most beneficial use as a source of drinking water; and,
- Minimize the potential for further migration of groundwater containing VOC concentrations above levels that are protective of beneficial use (i.e. drinking water use).

The cleanup levels for groundwater are identified in Appendix II, Table 7.

Note that these RAOs are not intended to modify those RAOs identified in the OU1 ROD.

9. DESCRIPTION OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. § 9121(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, 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) further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least meets ARARs under federal and state laws, unless a waiver can be justified pursuant to Section 121(d)(4) CERCLA, 42 U.S.C. § 9621(d)(4). Detailed descriptions of the remedial alternatives presented in this ROD can be found in EPA's Feasibility Study Report, dated February 2018.

The construction time provided for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction, or operation and maintenance.

9.1 Description of Common Elements among Remedial Alternatives

All of the alternatives, with the exception of the no action alternative, include the following common components:

Long-Term Monitoring:

Long-term monitoring to ensure that groundwater quality improves following implementation of these alternatives until the cleanup levels are achieved.

Institutional Controls:

Implementation of institutional controls that will rely on current groundwater use restrictions in the form of state and local laws. Specifically, Article IV of the Nassau County Public Health Ordinance prohibits the use of private wells where public water systems are available. The Site is serviced by public water systems. In addition, New York State Environmental Conservation Law Section 15-1527 prohibits the installation and use of public drinking water wells in Nassau County without a State permit. To ensure the remedy remains protective, the above State and County well restrictions will be relied upon until RAO's are achieved.

Site Management Plan:

Development of a Site management plan (SMP) to provide for the proper operation and maintenance (O&M) of the Site remedy post-construction, and would include long-term groundwater monitoring, institutional controls, periodic reviews, and certifications as applicable.

Five-Year Review:

Because it will take longer than five years to achieve cleanup levels under any of the alternatives, CERCLA requires that a review of conditions at the site be conducted no less often than once every five years until such time as cleanup levels are achieved. These reviews are not considered part of the remedy; they are an independent requirement required by the Superfund law.

9.2 Description of the Remedial Alternatives

Alternative 1: No Action

Capital Cost:	$0
Annual O&M Costs:	$0

Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be developed and considered as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial action conducted at the Site. This alternative does not include any monitoring or institutional controls. As mentioned above, because this alternative would result in contaminants remaining at the Site that are above levels that would otherwise allow for unrestricted use and unlimited exposure, CERCLA requires that if hazardous substances, pollutants, or contaminants remain on the Site post-remedy, the Site be reviewed at least once every five years. If justified by the review, additional response actions may be implemented.

Alternative 2: Groundwater Extraction and Ex-Situ Treatment (Pump and Treat)

Capital Cost:	$5,080,000
Annual O&M Costs:	$650,000
Present-Worth Cost:	$13,140,000
Construction Time:	*1 to 2* years

This remedial alternative consists of the extraction of groundwater via pumping wells and treatment prior to discharge. Groundwater is pumped and treated to remove contaminant mass from OU2 areas of the aquifer with elevated concentrations of VOCs.

For the conceptual design, it is estimated that one extraction well would be installed in the intermediate (250-400 feet bgs) interval, downgradient of the highest contaminant concentrations identified in the OU2 RI. The extraction well would target active treatment of groundwater contaminated with levels of total VOCs in excess of 100 μg/L.

Extracted groundwater with VOC contamination is typically treated with either liquid phase granular activated carbon (GAC) or air stripping, or both. During the remedial design the treatment processes necessary to treat Site-related contaminants would be evaluated further. Extracted groundwater would be pumped from the extraction well to a new treatment plant constructed near Grove Street with a capacity of approximately 300 gallons per minute (gpm). Treated groundwater would then be discharged to a nearby recharge basin or reinjected to groundwater.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the maximum contaminant level (MCL) for each of the COCs is attained within the targeted treatment area. Natural processes, predominately dilution and dispersion, would be relied upon to achieve the MCLs for areas not targeted for active remediation.

The conceptual design would be refined during the remedial design phase if this alternative is selected.

Alternative 3: In-Well Vapor Stripping

Capital Cost:	$5,260,000
Annual O&M Costs:	$678,000
Present-Worth Cost:	$13,670,000
Construction Time:	*1 to 2* years

This remedial alternative includes the installation of in-well vapor stripping systems in groundwater to provide contaminant mass removal and containment at OU2.

In-well stripping, also known as *in-situ* vapor or *in-situ* air stripping, is a technology for the *in-situ* remediation of groundwater contaminated by VOCs. In-well vapor stripping uses the principles of phase separation to transfer VOCs from the liquid to gas phase by aerating the contaminated water in the wellhead. Aeration can be accomplished by either injecting air into the water table or by using an air stripper mounted at the well head. Typically, extracted vapors are treated (if necessary) above grade and discharged to the atmosphere. Vapor treatment, if required, generally consists of vapor-phase granular activated carbon.

The in-well vapor stripping is a closed system where the contaminated groundwater is never exposed at the ground surface or the atmosphere. Typically impacted groundwater is pumped to the well head where it is treated and discharged or directly discharged back into the well. Once treated, the groundwater flows back into the aquifer through screens in the well that are typically located at the water table (unsaturated zone). In some in-well vapor stripping well configurations, the extraction and re-injection of groundwater from the aquifer induces a hydraulic circulation pattern that allows continuous cycling of groundwater through the treatment well. As groundwater circulates through the treatment system vapor is extracted and contaminant concentrations are reduced.

In-well vapor stripping can be implemented in different system configurations. For the purposes of developing a conceptual design and cost estimate for comparison with other technologies in the OU2 FS, a line of wells was configured at various depths along the median of Garden Street between Tremont Street and Grove Street, with a well spacing of approximately 400 feet to target groundwater contaminated with levels of total VOCs greater than 100 μg/L.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COCs is attained within the targeted treatment area. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation.

The conceptual design would require further evaluation during the remedial design phase if this alternative is selected.

Alternative 4: In-Situ Adsorption

Capital Cost:	$10,700,000
Annual O&M Costs:	$232,800
Present-Worth Cost:	$14,560,000
Construction Time:	*1 to 3* years

This remedial alternative utilizes micron-size activated carbon injected through a series of injection wells to form permeable treatment barriers. The use of micron-size or colloidal activated carbon for *in-situ* adsorption is an innovative technology.

Under the conceptual design, micron-size activated carbon would be injected through a series of approximately 47 injection wells to intercept the contaminant plume along the open space south of Commercial Avenue and along the median of Garden Street between Tremont Street and Grove Street. Injection wells would be spaced approximately 35 feet apart and would target groundwater contaminated with levels of total VOCs greater than 100 µg/L. The injected activated carbon would form two permeable treatment barriers. As VOC-contaminated groundwater flows through the treatment barrier it would be adsorbed onto the activated carbon, which would minimize the migration of the OU2 contaminated groundwater. Other reagents, such as iron-based chemical reductant or slow release organic carbon could be injected with the micron-size activated carbon; promoting *in-situ* chemical or biological reaction within the treatment zone to regenerate the activated carbon.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COCs is attained within the targeted treatment area. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation.

During the remedial design further evaluation would be conducted to determine the long-term adsorption capacity of the activated carbon.

10. COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy for a site, EPA considers the factors set forth in Section 121 of CERCLA, 42 U.S.C. § 9621, and conducts a detailed analysis of the viable remedial alternatives in accordance with the NCP, 40 C.F.R Section 300.430(e)(9), the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies*, OSWER Directive 9355.3-01, and the EPA's *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision*

Documents, OSWER 9200.1-23.P. The detailed analysis consists of an assessment of the individual alternatives set forth in the FS against each of the nine evaluation criteria set forth at Section 300.430(e)(9)(iii) of the NCP and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

A comparative analysis of these alternatives, based upon the nine evaluation criteria noted below, follows.

Threshold Criteria *- The first two remedy selection criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

10.1 Overall Protection of Human Health and the Environment

"Overall Protection of Human Health and the Environment" determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Overall Protection of Human Health and the Environment

Alternative 1 (No Action) would not meet the RAOs and would not be protective of human health and the environment since no action would be taken. Alternatives 2 through 4 include active remedies that address the most highly contaminated groundwater and would, in conjunction with the OU1 remedy, restore groundwater quality over the long-term. Alternatives 2 through 4, would also rely on certain natural processes to achieve the cleanup levels for areas not targeted for active remediation.

Protectiveness under Alternatives 2 through 4 would be achieved through a combination of actively reducing contaminant concentrations in groundwater and limiting exposure to residual contaminants through existing institutional controls until RAOs are met.

10.2 Compliance with ARARs, to be Considered (TBCs) and other Guidance

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), and Section 300.430(f)(1)(ii)(B) of the NCP, 40 C.F.R. § 300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria, and limitations, collectively referred to as "ARARs," unless such ARARs are waived under Section 121(d)(4) of CERCLA. "Compliance with ARARs" addresses whether a remedy will meet all ARARs or whether there is a basis for invoking a waiver.

EPA and NYSDOH have promulgated maximum contaminant levels (MCLs) (40 C.F.R. Part 141 and 10 NYCRR § 5-1.51, respectively), which are enforceable standards for various drinking water contaminants. The aquifer at the Site is classified as Class GA (6 NYCRR §§ 701.15, 701.18), meaning that it is designated as a potable drinking water supply. As groundwater within OU2 is a potential source of drinking water, federal and state MCLs are considered to be chemical-specific ARARs. If any state standard is more stringent than the federal standard, then compliance with the more stringent ARAR is required.

Alternative 1 would not comply with ARARs. Action-specific ARARs do not apply to this alternative since no remedial action would be conducted. Alternative 2 would achieve chemical-specific ARARs through extraction and *ex-situ* treatment of contaminated groundwater. Alternative 3 could achieve chemical-specific ARARs through in-well stripping of contaminants but would need to be demonstrated as successful in a pilot study. Alternative 4 would achieve chemical-specific ARARs through *in-situ* adsorption and potentially *in-situ* degradation processes; however, its long-term effectiveness needs to be verified in the field since it utilizes an innovative technology. For Alternatives 2 through 4, location and action-specific ARARs would be met through compliance with local construction codes, health and safety requirements, off-gas treatment requirements, if applicable, and water discharge criteria when applicable. It is expected that the RAOs would be achieved in a time frame comparable to OU1 (35 years as identified in the OU1 ROD). Active remediation under Alternatives 2 through 4 would be employed in the targeted treatment areas until the MCL for each of the COCs is attained.

Primary Balancing Criteria - *The next five remedy selection criteria, 3 through 7, are known as "primary balancing criteria." These five criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions.*

10.3 Long-Term Effectiveness and Permanence

"Long-term Effectiveness and Permanence" considers the ability of an alternative to maintain protection of human health and the environment over time.

Alternative 1 would not provide long-term effectiveness and permanence since groundwater contamination would not be addressed. Alternatives 2 through 3 are considered effective technologies for treatment and/or containment of contaminated groundwater, if designed and constructed properly.

In conjunction with OU1, Alternatives 2 through 4 rely on a combination of treatment and institutional controls to achieve long-term effectiveness and permanence.

Alternative 2 would be more reliable than either Alternatives 3 or 4 as there is uncertainty whether in-well vapor stripping and *in-situ* adsorption could effectively remove contamination in areas where the contamination is at depths greater than 250 feet. Alternative 2 has been proven to be an effective technology in reducing the concentrations of VOC contaminated groundwater in the area addressed as part of OU1 based on EPA's sampling results.

Alternative 3, in-well stripping, is expected to be effective and reliable in significantly removing the VOC contamination in groundwater. However, the effectiveness of applying this technology at depths greater than 250 feet has not been demonstrated. The effectiveness of this alternative is limited by the radius of influence (ROI) of the treatment system. The ROI will depend on the pumping capacity of each stripping well and hydrogeologic characteristics of the aquifer in the OU2 area. The effectiveness of this alternative could also be limited due to the possibility that creation of a circulation cell may not be possible because of the potential influence from pumping of nearby public supply wells. Therefore, additional measures would be needed to provide multiple passes through the OU2 treatment system. A pilot study would be conducted to evaluate the ROI, to determine the effectiveness of in-well stripping and to obtain Site-specific design parameters prior to full-scale implementation.

The use of micron-size or colloidal activated carbon (Alternative 4) is an innovative technology that has the potential to significantly reduce contaminant concentrations in the *in-situ* treatment zones but has only limited application in the field. A pilot study would be conducted to collect site-specific implementation parameters. The distribution of activated carbon in the subsurface and the long-term adsorption capacity would have to be verified in the field through groundwater sampling and monitoring. Its permanence would need to be monitored and verified over time.

The effectiveness of each of the technologies under Alternatives 3 through 4 is contingent upon design, including the placement of infrastructure such as electrodes, injection wells and, extraction wells, in the most appropriate locations to treat the contamination. Because the groundwater contamination requiring remediation is located in a densely populated area with little or no available space for construction, adjustments that could impact the effectiveness of the technology required for Alternatives 2 through 4 may need to be taken into consideration. Among the alternatives, the challenges posed by the densely populated area to the effectiveness of the technology are greatest for Alternative 4 and would require further evaluation during the remedial design.

Alternatives 2 through 4 would provide adequate control of risk to human health through the implementation of institutional controls until the cleanup levels are achieved.

10.4 Reduction in Toxicity, Mobility, or Volume Through Treatment

"Reduction in Toxicity, Mobility, or Volume of Contaminants through Treatment" evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Alternative 1, No Action, does not address the contamination through treatment, so there would be no reduction in Toxicity, Mobility, or Volume (TMV) of contaminants and the alternative does not include long-term monitoring of groundwater conditions. Alternative 2 would provide the greatest reduction of toxicity, mobility, and volume of contaminants through treatment of contaminated groundwater. Alternatives 3 and 4 would also reduce the toxicity and volume of contaminants through treatment, however would provide less reduction of mobility through treatment.

Alternative 2 removes contaminated groundwater via extraction and treats the contamination via air stripping at a treatment plant and is anticipated to be the most reliable at reducing TMV because it is a proven technology. Alternative 3 uses a system to remove the contaminants from groundwater *in-situ*, and provides chemical treatment for the collected vapor-phase contamination and is anticipated to be the next most reliable at reducing TMV because its effectiveness must be demonstrated and verified in a pilot study. Alternative 4 uses *in-situ* carbon adsorption to remove the contaminants from groundwater. Alternative 4 would be the least reliable at reducing TMV because it is less proven than even Alternative 3, the long-term adsorption capacity of the activated carbon is unknown and would have to be verified by long-term groundwater monitoring.

10.5 Short-Term Effectiveness

"Short-term Effectiveness" considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

Alternative 1 would not have short-term impacts since no action would be implemented.

Alternatives 2 through 4 may have short-term impacts to remediation workers, the public, and the environment during implementation. Remedy-related construction (e.g., trench excavation) under Alternatives 2 (estimated construction timeframe of 1-2 years) and 4 (estimated construction timeframe of 2-3 years) would require disruptions in traffic and potential street closure. In addition, Alternative 2 and Alternative 3 (estimated construction timeframe of 1-2 years) have aboveground treatment components and infrastructure that may create a minor noise nuisance and inconvenience for local residents during construction.

Exposure of workers, the surrounding community, and the local environment to contaminants during the implementation of Alternatives 2, 3, and 4 is minimal. Drilling activities, including the installation of wells for monitoring, extraction, and treatment for Alternatives 2, 3, and 4 could produce contaminated liquids that present some risk to remediation workers at the Site. The potential for remediation workers to have direct contact with contaminants in groundwater could also occur when groundwater remediation systems are operating under Alternative 2. Alternative 2 could increase the risks of exposure through ingestion, inhalation, and dermal contact of contaminants by workers because contaminated groundwater would be extracted to the surface for treatment. However, occupational health and safety controls would be implemented to mitigate exposure risks.

Among the active alternatives, Alternative 2 would have the lowest short-term impact to the community. Alternative 3 would have more short-term impacts to the community than Alternative 2 since more wells would be installed and the in-well stripping system would require more space for the installation of multiple well vaults to hold necessary equipment, valves, and fittings. Operation of the in-well stripping system might generate noise that could be harder to mitigate. Alternative 4 would have the greatest short-term impacts to the local community during construction due to the significant number of injection wells (47) to be installed; requiring traffic control over a longer period of time compared to Alternatives 2 and 3.

For Alternatives 2, 3, and 4, implementation of a health and safety plan, traffic controls, noise control and managing the hours of construction operation could minimize the impacts to the community. Health and safety measures would also be implemented during operation and maintenance activities to protect Site workers.

Drilling activities, including the installation of monitoring, extraction, and injection wells, under Alternatives 2 through 4 could produce contaminated liquids that present some risk to remediation workers and the community during implementation of the OU2 remedy at the Site. However, measures would be implemented to mitigate exposure risks, including health and safety precautions and the installation of fencing to restrict access to above-grade treatment components.

10.6 Implementability

"Implementability" addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternative 1 is no action, and therefore would be the easiest of all the alternatives to implement. Alternatives 2 through 4 are all implementable, although each present different challenges.

Groundwater extraction and treatment is a well-established technology that has commercially available equipment and is implementable. Because of the densely populated area there are limited locations for placement of a treatment plant. The conceptual design considered Town-owned property for the construction of the treatment plant and a nearby County-owned recharge basin for the discharge of the treated water.

Of the three active remediation alternatives, Alternative 2 would be the easiest alternative to construct since this technology has been implemented under OU1 and would require less disruption in residential areas. Because of the densely populated area there are limited options for the placement of the in-well stripping well network. The conceptual design considered installation of the wells in the median along Garden Street and curbside right-of-ways in the surrounding area. The final configuration of the in-well vapor stripping well network would be determined during the design.

The large hydraulic influence from public supply wells present in the area could potentially impact the ability to establish the necessary groundwater circulation cell across the treatment zone to successfully implement Alternative 3. Furthermore, under Alternative 3, at the depth of the deepest contamination (400 feet bgs) effective operation of in-well stripping systems has not been previously documented. Additionally, under Alternative 3, the depth of the contamination (estimated to be between approximately 250 to 400 feet bgs) increases the design challenges of the in-well vapor system. There are practical limitations to the depth that the compressed air can be injected into the aquifer which would result in vapor stripping being conducted effectively.

Alternative 4 would be the most difficult to implement as the technology is the least proven and construction activities would result in the greatest disruption in residential areas since this alternative would require installation of a significant number of wells (47) and associated infrastructures within roadway right-of-ways.

Alternatives 2 through 4 would require routine groundwater quality, performance and administrative monitoring including five-year CERCLA reviews.

10.7 Cost

"Cost" includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent. This is a standard assumption in accordance with EPA guidance.

The estimated capital costs, operation and maintenance (O&M) costs, and present worth costs for the alternatives are discussed in detail in EPA's FS Report. The cost estimates are based on the best available information. Alternative 1 has no cost because no activities are proposed. The present worth cost, using a discount rate of 7%, for Alternatives 2 through 4 are as follows:

Alternative	Capital Cost ($)	Total O&M Cost ($)	Present Worth ($)
1.No Action	0	0	0
2. Pump & Treat	**5,080,000**	**650,000**	**13,140,000**
3. In-well Vapor Stripping	5,260,000	678,000	13,670,000
4. *In-situ* Adsorption	10,700,000	232,800	14,560,000

Note: The selected remedy is shown in bold.

Modifying Criteria *- The final two remedy selection criteria, 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.*

10.8 State/Support Agency Acceptance

"State/Support Agency Acceptance" considers whether the State and/or Support Agency agrees with the EPA's analyses and recommendations.

NYSDEC has consulted with the NYSDOH and concurs with the selected remedy. A letter of concurrence is attached in Appendix IV.

10.9 Community Acceptance

"Community Acceptance" considers whether the local community agrees with the EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

EPA solicited input from the community on the remedial alternatives proposed for OU2 at the Site. Verbal comments received from community members at the March 13, 2018, public meeting did not support or oppose the preferred alternative. Public comments were related to remedy details, public health concerns, location of the treatment system components, and the schedule for implementation of the remedy. The public comment period, originally scheduled from February 23, 2018 to March 26, 2018, was extended after EPA received a request for an extension of time from a representative of the Village of Garden City. The representative informed EPA that an extension of the comment period would allow the Village to prepare written submissions. Responses to the questions and comments received at the public meeting and in writing during the public comment period are included in the Responsiveness Summary (See Appendix V).

11. PRINCIPAL THREAT WASTES

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a Site whenever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment in the event exposure should occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described above. The manner in which principal threat wastes are addressed provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Contaminated groundwater is generally not considered to be source material; however, nonaqueous phase liquid (NAPL) in groundwater may be viewed as potential source material. Analytical results from the OU1 and OU2 investigations did not reveal concentrations of contaminants in groundwater indicative of the presence of NAPL.

12. SELECTED REMEDY

12.1 Description of the Selected Remedy

The selected remedy for OU2 is Alternative 2, Groundwater Extraction and Ex-Situ Treatment (Pump and Treat). The conceptual design for the selected remedy is provided as Figure 2 in Appendix I.

The major components of the Selected Remedy include the following:

- Extraction of groundwater via pumping and ex-situ treatment of extracted groundwater prior to discharge to a recharge basin or re-injection to the aquifer (to be determined during design). The purpose is to establish containment and effectuate removal of contaminant mass where concentrations of total volatile organic compound concentrations are greater than 100 μg/L. Natural processes, predominately dilution and dispersion, will be relied upon to achieve the MCLs for areas not targeted for active remediation;

- Implementation of long-term monitoring in conjunction with OU1 to track and monitor changes in groundwater contamination to ensure that RAOs are attained;

- Institutional controls to ensure that the remedy remains protective until RAOs are achieved for protection of human health over the long term. Institutional controls are anticipated to include existing governmental controls in the form of state and county well use laws prohibiting the use of groundwater for drinking purposes; and

- Development of a Site Management Plan to ensure proper management of the Site remedy for OU2 post-construction. The Site Management Plan will include provisions for operation and maintenance, long-term groundwater monitoring, institutional controls, periodic reviews, and certifications, as applicable.

In an effort to potentially enhance the environmental benefits of the selected remedy, consideration will be given, during the design, to technologies and practices that are sustainable, in accordance with EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy.[2] This will include consideration of green remediation technologies and practices.

12.2 Summary of the Rationale for the Selected Remedy

Based upon the requirements of CERCLA, the results of the OU2 investigation, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative 2 (Groundwater Extraction and Ex-Situ Treatment (Pump and Treat)) best satisfies the requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, as set forth in Section 300.430(e)(9) of the NCP.

Alternative 1 (No Action) was not selected because it is not protective of human health and the environment. While Alternative 3, in-well vapor stripping, is a proven technology to actively remediate VOC-contaminated groundwater, the depths of the groundwater contamination targeted for remediation increase the design challenges of any in-well vapor stripping system. Alternative 4, *in-situ* adsorption, is an innovative technology that would require greater testing and evaluation to determine the long-term adsorption capacity of the activated carbon to treat the VOC-contaminated groundwater.

Although the densely populated residential area poses some logistical challenges to the implementation of each active remedial alternative, EPA believes that Alternative 2, which would require access to install extraction wells, construct a treatment plant, and discharge the treated water to a recharge basin, would be the least disruptive to local residents.

[2] See https://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy, and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf.

12.3 Summary of the Estimated Selected Remedy Costs

The estimated capital, annual O&M, and total present-worth costs for the selected remedy are $5,080,000, $650,000, and $13,140,000, respectively. The costs estimates are based on available information and are order-of-magnitude engineering cost estimates that are expected between +50 to -30 percent of the actual project cost. Changes to the cost estimate can occur as a result of new information and data collected during the design of the remedy.

A cost estimate summary for the selected remedy is presented in Appendix II, Table 8. Individual cost estimates for each remedial alternative are provided in the EPA's OU2 February 2018 FS Report, Appendix B.

12.4 Expected Outcomes of the Selected Remedy

The selected remedy actively addresses areas of VOC contamination at OU2 of the Site. The results of the risk assessment indicate excess cancer risk and noncancer health hazards associated with future human ingestion of groundwater above acceptable levels under baseline conditions. The response action selected in this ROD will eliminate risks associated with this pathway. The selected remedy, in conjunction with the OU1 remedy, will restore the impacted aquifer at the Site to its most beneficial use as a source of drinking water.

Groundwater cleanup levels for the COCs at OU2 of the Site are presented in Appendix II, Table 7.

13 STATUTORY DETERMINATIONS

The EPA and the State of New York believe that the selected remedy complies with the CERCLA and NCP provisions for remedy selection, meets the threshold criteria, and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. These provisions require the selection of remedies that are protective of human health and the environment, comply with ARARs (or justify a waiver from such requirements), are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the TMV of hazardous substances as a principal element (or justifies not satisfying the preference). The following sections discuss how the selected remedy meets these statutory requirements.

13.1 Protection of Human Health and the Environment

The selected remedy, in conjunction with the OU1 remedy, will protect human health and the environment because it will over the long-term restore groundwater at the Site to drinking water standards. Institutional controls will also assist in protecting human health over both the short- and long-term by helping to control and limit exposure to hazardous substances until RAOs are achieved.

13.2 Compliance with ARARs

The selected remedy is expected to achieve federal MCLs or more stringent state standards for the COCs in the groundwater. The COCs and the relevant MCLs are as provided in Table 7, which can be found in Appendix II.

A full list of the ARARs, TBCs, and other guidance related to implementation of the selected remedy is presented in Tables 9, 10, and 11 which can be found in Appendix II.

13.3 Cost Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (40 C.F.R. § 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. Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness.

Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and annual O&M costs were 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 each alternative. The total estimated present worth cost for implementing the selected remedy is $13,140,000.

Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (40 C.F.R. § 300.430(f)(1)(ii)(D)) and is the least-cost action which will achieve groundwater standards within a reasonable time frame. A 30-year timeframe was used for planning and estimating purposes to remediate groundwater, although remediation timeframes could exceed this estimate.

13.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to Maximum Extent Practicable

The selected remedy complies with the statutory mandate to utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable because it represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for this OU. The selected remedy satisfies the criteria for long-term effectiveness and permanence by permanently reducing the mass of contaminants in the groundwater at the Site, thereby reducing the toxicity, mobility, and volume of contamination.

13.5 Preference for Treatment as a Principal Element

Through the use of ex-situ groundwater extraction and treatment technology, the selected remedy satisfies the statutory preference for remedies that employ treatment as a principal element.

13.6 Five-Year Review Requirements

While this alternative would ultimately result in reduction of contaminant levels in groundwater such that levels would allow for unlimited use and unrestricted exposure, it is anticipated that it would take longer than five years to achieve these levels. As a result, in accordance with CERCLA, the Site remedy is to be reviewed at least once every five years until remediation goals are achieved and unrestricted use is achieved.

14 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU2 of the Site was released on February 23, 2018. The Proposed Plan identified Alternative 2 as the preferred alternative for remediating the contaminated groundwater.

EPA considered all comments at the public meeting on March 13, 2018, and reviewed all written (including electronic formats, such as e-mail) during the public comment period, which was extended and has determined that no significant changes to the remedy, as originally identified in the Proposed Plan, are necessary or appropriate.

Appendix I

FIGURES

Legend

- Railroad
- Former Avis Headquarters Site
- Former Hangars
- Former Boundary of Roosevelt Field Airfield
- Public Supply Well
- Existing Extraction Well

CDM Smith

Source: Nassau County Geographic Information System

0 80160 320 480 640 800 Feet

Figure 1
Site Location Map
Old Roosevelt Field
Contaminated Groundwater Area Site, Operable Unit 2
Garden City, Nassau County, New York

Legend

- Monitoring Well
- Extraction Well
- Nassau County Monitoring Well
- Multi-port Well
- Municipal Supply Well
- PCE OU2 Isocontour Inferred
- TCE OU2 Isocontour Inferred

N

0 100 200 400 Feet

Figure 2
Conceptual Design for Alternative 2
Pump and Treat
Old Roosevelt Field Contaminated Groundwater
Area Site, Operable Unit 2
Garden City, Nassau County, New York

CDM Smith

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Appendix II

TABLES

TABLE 1
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Groundwater	Tetrachloroethylene	0.59 J	600	ug/L	9/13	407	ug/L	95% KM Bootstrap t UCL
	Trichloroethylene	1.3 J	150	ug/L	10/13	125	ug/L	97.5% KM (Chebyshev) UCL

J – qualifier for estimated value

95% KM Bootstrap t UCL – 95% upper confidence limit, Kaplan Meier Bootstrap t statistic (mean, STD)

97.5% KM (Chebyshev) UCL – 97.5% upper confidence limit, Kaplan Meier Chebyshev statistic (mean, STD)

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 the COCs 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 2. Selection of Exposure Scenarios

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis
Future	Groundwater	Tap Water	Tap Water/Shower Head	Resident	Adult and Child (birth to <6 years)	Ing/Der/Inh	Quantitative
Future	Groundwater	Tap Water	Tap Water	Site Worker	Adult	Ing	Quantitative

Ing – Ingestion
Der – Dermal
Inh – Inhalation

Summary of Selection of Exposure Pathways

This table describes the exposure pathways that were evaluated for the risk assessment. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3

Noncancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Date of RfD:
Tetrachloroethylene	Chronic	6.0E-03	mg/kg-day	1	6.0E-03	mg/kg-day	Nervous System/Liver/ Kidney	1,000	IRIS	3/14/2017
Trichloroethylene	Chronic	5.0E-04	mg/kg-day	1	5.0E-04	mg/kg-day	Heart/Immune System/ Developmental /Kidney	10 to 1,000	IRIS	3/14/2017

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfC: Target Organ	Date of RfC:
Tetrachloroethylene	Chronic	4.0E-02	mg/m^3	Nervous System/Liver/ Kidney	1,000	IRIS	3/14/2017
Trichloroethylene	Chronic	2.0E-03	mg/m^3	Heart, Immune System, Liver	10 to 100	IRIS	3/14/2017

Key

IRIS: Integrated Risk Information System

Summary of Toxicity Assessment

This table provides noncarcinogenic risk information which is relevant to the contaminants of concern. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference concentrations (RfCs).

TABLE 4

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
Tetrachloroethylene	2.1E-03	mg/kg-day	2.1E-03	mg/kg-day	Likely to be carcinogenic to humans	IRIS	3/14/2017
Trichloroethylene	4.6E-02	mg/kg-day	4.6E-02	mg/kg-day	Carcinogenic to humans	IRIS	3/14/2017

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Tetrachloroethylene	2.6E-07	$(ug/m^3)^{-1}$	Likely to be carcinogenic to humans	IRIS	3/14/2017
Trichloroethylene	4.1E-06	$(ug/m^3)^{-1}$	Carcinogenic to humans	IRIS	3/14/2017

Key:

IRIS: Integrated Risk Information System

Summary of Toxicity Assessment

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

TABLE 5

Risk Characterization Summary – Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Site Resident
Receptor Age: Lifetime[1]

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Noncancer Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water/shower head	Tetrachloroethylene	Nervous System/Liver/Kidney	3.4	2.0	6.0	11.4
			Trichloroethylene	Heart/Immune System/ Developmental/Kidney	12.5	2.1	38.8	53.4
							Hazard Index Total=	**65**

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary/Target Organ	Noncancer Hazard Quotient			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water	Tetrachloroethylene	Nervous System/Liver/Kidney	1.5	NA	NA	1.5
			Trichloroethylene	Heart/Immune System/ Developmental/Kidney	5.4	NA	NA	5.4
							Hazard Index Total	**7**

Summary of Risk Characterization - Noncarcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for exposure to groundwater containing site-related chemicals. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse noncancer effects.

[1] – Noncancer hazard index for the site resident is based on the child exposure scenario

TABLE 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Site Resident
Receptor Age: Lifetime (Adult/child)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water/shower head	Tetrachloroethylene	1E-05	6E-06	3E-05	5E-05
			Trichloroethylene	1E-04	2E-05	2E-04	3E-04
						Total Risk =	**4E-04**

Scenario Timeframe: Future
Receptor Population: Site Worker
Receptor Age: Lifetime (Adult)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Groundwater	Groundwater	Tap water	Tetrachloroethylene	7E-06	NA	NA	7E-06
			Trichloroethylene	1E-04	NA	NA	1E-04
						Total Risk =	**1E-04**

Summary of Risk Characterization – Carcinogens

The table presents site-related cancer risks for groundwater exposure. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}. A cancer risk that exceeds the acceptable risk range indicates an unacceptable risk from exposure to site groundwater.

TABLE 7 Cleanup Levels for Groundwater		
Contaminants of Concern	**Remediation Goals (µg/L)**	**Maximum Detected Concentrations (µg/L)**
Trichloroethene	5	150
Tetrachloroethene	5	730
cis-1,2-dichloroethene	5	24 J+
1,1-dichloroethene	5	57 J+
Vinyl Chloride	2	49 J

Notes:
µg/L – microgram per liter
J – estimated value
J+ - estimated value bias high

TABLE 8
Cost Estimate Summary for Selected Remedy

Item No.		Item Description	Extended Cost	
CAPITAL COSTS				
	1.	General Conditions (including temporary facilities)	$	1,784,000
	2.	Yard Piping, Survey and Access Road	$	335,000
	3.	Extraction Well System Installation	$	366,000
	4.	Groundwater Treatment Plant Construction	$	1,177,000
		Subtotal	$	3,662,000
		General Contractor Markup (profit - 10%)	$	366,200
		Subtotal	$	4,028,200
		General Contractor Bond and Insurance (5%)	$	201,410
		Subtotal	$	4,229,610
		Contingency (20%)	$	845,922
		TOTAL CAPITAL COSTS	$	5,076,000
OPERATION, MAINTENANCE & MONITORING COSTS				
	5.	Annual O&M and Sampling	$	591,000
		Contingency (10%)	$	59,100
		TOTAL OPERATION, MAINTENANCE & MONITORING COSTS	$	650,100
PRESENT WORTH				
		Total Capital Costs	$	5,076,000
		Operations and Maintenance for P&T System (for 30 years)	$	8,068,000
		TOTAL PRESENT WORTH OF 30 YEAR COSTS	$	13,144,000

Notes:

1. Present worth calculation assumes 7% discount rate after inflation is considered.

2.The project costs presented herein are prepared to facilitate alternative comparison. Expected accuracy range of the cost estimate is -30% to +50%.

TABLE 8
Cost Estimate Summary for Selected Remedy

Description: Cost Estimate for Alternative 2 - Groundwater Extraction and Ex Situ Treatment

No. 1 General Conditions

General conditions to include the project-dedicated site supervisory staff, development of work plans, site photographs/videos, project signs, mobilization/demobilization, and costs not covered elsewhere. Estimate assumes that following the remedial design, the RA Contractor will mobilize to the site and complete the remedial action.

Project Schedule

Assume the following project schedule:

Pre-Construction Work Plans and Meetings (RA Work), procurement		60	days
Construction			
Mobilization - Permits and Field Trailer Compound Establishment		5	days
Site Preparation (Decon areas, stockpile areas, clearing)		5	days
Access Road Construction		5	days
Well Installation (Well construction including Vaults)		20	days
Influent Force main		5	days
Groundwater Treatment Plant Construction		90	days
Effluent Force main		5	days
Final Site Restoration and Demobilization		10	days
Total Construction Duration		145	days
Project Closeout		90	days
Total Project Duration	=	**295**	**work days**
	=	**59**	**work weeks**
	=	**14**	**months**

General Conditions

A) Project Management and office support					
Assume the following Staff for the duration of project:					
Project Manager (40 hours per month)	545	hr	$160	=	$87,138
Project Engineer (80 hours per month)	1,089	hr	$110	=	$119,815
Project Engineer - Cost & Scheduling (20 hours per week during construction)	580	hr	$110	=	$63,800
General office support (160 hours per month)	2,178	hr	$75	=	$163,385
Total management and office support				**=**	**$435,000**
B) Work Plan Preparation					
Estimated # of Pre-Construction Work Plans Required:					5 work plans
Estimated # of Hours Required:					
Project Engineer	500	hr	$110	=	$55,000
Project Manager	150	hr	$160	=	$24,000
Total Work Plan Preparation Cost				**=**	**$395,000**
C) Permits					
Permit Specialist	500	hr	$110	=	$55,000
Project Manager	20	hr	$160	=	$3,200
Total Permitting Cost				**=**	**$58,200**
D) Procurement					
Assume procurement of subcontractors for drilling, IDW, laboratory analysis, and construction services					
Project Manager	100	hr	$160	=	$16,000
Environmental Engineer	500	hr	$110	=	$55,000
Procurement staff	500	hr	$110	=	$55,000
Total procurement and office support				**=**	**$110,000**

TABLE 8
Cost Estimate Summary for Selected Remedy

Description: Cost Estimate for Alternative 2 - Groundwater Extraction and Ex Situ Treatment

	E) Onsite supervisory					
	Assume the following full time site supervisory staff for the duration of construction:					
	Superintendent (8 hours per day)	1160	hr	$130	=	$150,800
	Resident engineer (8 hours per day)	1160	hr	$110	=	$127,600
	Total Onsite Supervisory Staff for Construction Duration				**=**	**$278,400**
	F) Remedial Construction Report					
	Project Manager	40	hr	$160	=	$6,400
	Project Engineer	300	hr	$110	=	$33,000
	Project Chemist	60	hr	$110	=	$6,600
	Reviewers	40	hr	$110	=	$4,400
	Total Remedial Construction Report Preparation Cost					**$50,400**
	G) Site Photographs/Videos	1	LS	$10,000	=	$10,000
	H) Project Signs	1	LS	$3,000	=	$3,000
	I) Other Direct Costs	1	LS	$100,000	=	$100,000
	Safety and Health Requirements					
	SHSO	145	days	$1,000	=	$145,000
	Level D PPE for all onsite staff	145	days	$100	=	$14,500
	TOTAL H&S COSTS					**$159,500**
	Temporary Facilities					
	Temporary Facilities to include the field trailers, utilities, cleaning services, and office equipment and supplies.					
	Security guard	29	weeks	$3,240	=	$93,960
	Assume 12 hours on work day and 24 hours on weekend at $30/hour.					
	Mobilization/Demobilization	1	LS	$10,000	=	$10,000
	Temporary Facilities and Utilities	1	LS	$79,910	=	$79,910
	TOTAL TEMPORARY FACILITY COSTS					**$183,900**
	TOTAL COST FOR GENERAL CONDITIONS					**$1,784,000**
No. 2	**Yard Piping, Survey, and Access Road**					
	Survey	Quantity	Unit	Unit Cost		Extended Cost
	Survey	1	LS	$ 40,000	=	$40,000
	Access Road Construction					
	Road Construction	80	LF	$ 40	=	$3,200
	Yard Piping					
	Assume that the soil excavated will be put back after the pipe is installed.					
	4" HDPE Pipe	1600	LF	$61		$97,600
	4' x 4' trench	947.2	BCY	$13		$12,124
	Back fill	947.2	BCY	$9		$8,383
	Cut and Restore pavement	6400	SF	$26		$166,400
	Landscaping	1	LS	$7,000		$7,000
	Sub Total					$291,507
	TOTAL					**$335,000**

TABLE 8
Cost Estimate Summary for Selected Remedy

Description: Individual Cost Item for Alternative 2 - Groundwater Extraction and Ex Situ Treatment

		Quantity	Unit	Unit Cost		Extended Cost
No. 3	**Well Installation and Development**					
	Assume the well installation requires 15 days					
3a	**Extraction Well and Pump Installation**					
	Mobilization and Demobilization	1	LS	$48,000		$48,000
	Test Borehole	450	ft	$34	=	$15,300
	Steam Cleaning	8	Hours	$395	=	$3,160
	55-Gallon Drums	2	Drum	$95	=	$190
	Standby Time	1	Hours	$395	=	$395
	Crew Per Diem	20	Crew Day	$425	=	$8,500
	Clearing/Grading	3	Hours	$395	=	$1,185
	Temporary Fencing/Gates at Each Drilling Location	1	LS	$15,000	=	$15,000
	Mud Tub Setup/Breakdown	4	EA	$450	=	$1,800
	Mud Rotary Drilling: 12" borehole, 0-100 ft bgs	100	Feet	$50	=	$5,000
	12-inch Carbon Steel Surface casing, 0-100 feet bgs	100	Feet	$50	=	$5,000
	Mud Rotary drilling, 8-inch borehole, 100-450 ft bgs	350	Feet	$50	=	$17,500
	6-inch Stainless Steel Well Screen	60	Foot	$142	=	$8,520
	6-inch Stainless Steel Well Casing	390	Foot	$110	=	$42,900
	Plumbness and Alignment Testing	1	LS	$1,500	=	$1,500
	Bulk Transport: Cuttings and Drilling Mud	8	Hours	$400	=	$3,200
	Flush Mount Completion	1	each	$750	=	$750
	Well Development	24	Hours	$400	=	$9,600
	Bulk Transport: Development Water	8	Hours	$400	=	$3,200
	Extraction well installation and well head completion	1	per well	$35,000	=	$35,000
	Sub Total					$225,700
3b.	**Aquifer Testing**					
	Assume one step test and a 72-hour yield test and water will be treated and discharged to a recharge basin					
	Step Testing	1	Days	$2,800	=	$2,800
	Yield Testing	3	Days	$5,600	=	$16,800
	Temporary Groundwater Treatment Plant	1	LS	$85,000	=	$85,000
	Sub Total					$104,600
3c.	**IDW**					
	Assume that the water generated could be treated and discharged to a local recharge basin					
	Delivery of 20-cy rolloff	1	EA	$1,000	=	$1,000
	20-cy rolloff rental	2	Mo	$775	=	$1,550
	Waste characterization	1	Mo	$1,600	=	$1,600
	Soil Disposal	11	Tons	$75	=	$825
	Delivery of 21,000 gal frac tank	1	EA	$1,350	=	$1,350
	21,000 gal frac tank rental	1	Month	$1,000	=	$1,000
	21,000 gal frac tank cleanout	1	EA	$1,800	=	$1,800
	Sub Total					$9,125
3d.	**Geologist oversight**					
	Assume days would be 10-hour days. 15 days for well installation and 5 days for testing					
	Geologist	20	days	$1,000	=	$20,000
	Per diem and car rental	20	days	$320	=	$6,400
						$26,400
	TOTAL					**$366,000**

TABLE 8
Cost Estimate Summary for Selected Remedy

Description: Individual Cost Item for Alternative 2 - Groundwater Extraction and Ex Situ Treatment

		Quantity	Unit	Unit Cost			Extended Cost
No. 4	**Groundwater Treatment Plant Construction**						
	Groundwater treatment system design						
	Foundation design	200	Hr	$69		$	13,790
	Building Plans	200	Hr	$69		$	13,790
	Treatment System Plans	1000	Hr	$69		$	68,948
	Instrumentation/Electrical Plan	500	Hr	$69		$	34,474
	QA/QC of Design	100	Hr	$58		$	5,787
	O&M Manual	300	Hr	$69		$	20,684
	Sub Total					$	157,472
	Site Work						
	Site clearing and grading	1	LS	$1,850	=	$	1,850
	Landscaping and lighting	1	LS	$4,000	=	$	4,000
	Power drop off	1	LS	$5,000	=	$	5,000
	Building						
	Treatment Building	1	LS	$514,286	=	$	515,000
	Fencing						
	6' Chain-link fence	360	LF	$21		$	7,560
	6' Chain-link Gate	1	EA	$405		$	405
	Sub Total					$	7,965
	Treatment Processes						
	Air Stripper, Pump and Panel	1	LS	$159,594	=	$	159,594
	Air Heater and Panel	1	LS	$24,000	=	$	24,000
	2 GPC 120 vessels with carbon	1	LS	$104,225	=	$	104,225
	Bag filters	2	LS	$3,668	=	$	7,336
	Stage tank (2,000 gallons)	1	LS	$1,000	=	$	1,000
	Installation (50% of equipment)					$	148,078
	Sub Total					$	444,233
	Discharge Piping						
	PVC Pipe	100	LF	$86		$	8,600
	System Start Up						
	GWTP Commissioning and Startup	1	LS	$36,440		$	36,440
	TOTAL						**$1,177,000**

TABLE 8
Cost Estimate Summary for Selected Remedy

Description: Individual Cost Item for Alternative 2 - Groundwater Extraction and Ex Situ Treatment

The extraction well system and lines will have to be cleaned on an as needed basis depending on operation conditions. The cost estimate assumes annual well and line cleaning. Treatment facility O&M costs include labor, chemical additives, sludge disposal and filter replacement.

		Quantity	Unit	Unit Cost		Extended Cost
No. 5	**Annual O&M**					
5a.	**Project Management**					
	Project Manager	312	hr	$160	=	$ 49,920
	Engineering support	120	hr	$110	=	$ 13,200
	Procurement Specialist	96	hr	$100	=	$ 9,600
5b	**Annual O&M for Extraction Wells**					
	Engineer & Geologist - Oversight (5 Day)	40	hrs	$110	=	$ 4,400
	Materials and subcontractor	1	per year	$12,500	=	$ 12,500
5c	**Annual O&M for GWTP Plant**					
	Labor Cost					
	Project Manager (4 hour/month)	12	mo	$640	=	$ 7,680
	Engineer - Reporting (24 hours/month)	12	mo	$2,640	=	$ 31,680
	Technician (12 hours per week)	52	wk	$1,080	=	$ 56,160
	Equipment maintenance	1	LS	$40,000	=	$ 40,000
	Annual Report	1	per year	$30,000		$ 30,000
	Capital Costs					
	GAC					
	Annual activated carbon replacement (Effluent)	1	LS	$10,000	=	$ 10,000
	Other Maintenance Costs					
	Well pump electricity	12	mo	$2,712	=	$ 32,544
	Utility (other electricity + Phone and Internet)	12	mo	$1,900	=	$ 22,800
	Materials	12	mo	$500	=	$ 6,000
	Waste Hauling	1	LS	$825	=	$ 825
	Monthly System Samples					
	Number of extraction well	1 well				
	Number of treatment system samples	1 samples				
	Vapor samples	1 samples				
	Sampling					
	Equipment & PPE	1	LS	$150	=	$ 150
	Shipping	1	day	$100	=	$ 100
	Misc	1	day	$100	=	$ 100
	Sampling Analysis (includes QC samples)					
	Vapor VOCs	2	ea	$250	=	$ 500
	Aqueous VOCs	4	ea	$150	=	$ 600
	Aqueous Metals	1	ea	$106	=	$ 106
	Aqueous Other parameters for compliance	1	ea	$120	=	$ 120
	Monthly Data Summary					
	Database management	1	month	$440	=	$ 440
	Data validation	3.5	hr	$150	=	$ 525
	Data visualization	1	LS	$3,000	=	$ 3,000
	Prepare the data report	1	LS	$7,000	=	$ 7,000
	Subtotal per monthly event					$ 12,700
	Subtotal sampling and analysis for 12 months					$ 152,400

TABLE 8
Cost Estimate Summary for Selected Remedy

Description: Individual Cost Item for Alternative 2 - Groundwater Extraction and Ex Situ Treatment

5d **Annual Well Sampling for Performance Evaluation and Long-Term Monitoring**

Number of monitoring wells	26 wells/ports					
Number of samplers	4 people					
Number of 11 hour workdays	5 days					
Mob/demob						
Project Manager	4	hr	$160	=	$	640
Engineer	8	hr	$110	=	$	880
Field Scientist	40	hr	$100	=	$	4,000
Sampling						
Field Scientist	55	hour	$100	=	$	5,500
Field Scientist	55	hour	$100	=	$	5,500
Field Scientist	55	hour	$100	=	$	5,500
Field Scientist	55	hour	$100	=	$	5,500
Per diem	20	day	$220	=	$	4,400
Car rental	20	day	$95	=	$	1,900
Equipment & PPE	1	LS	$6,000	=	$	6,000
Shipping	5	day	$300	=	$	1,500
Misc	5	day	$250	=	$	1,250
Sampling Analysis (includes QC samples)						
Aqueous VOCs	38	ea	$150	=	$	5,700
wet chemistry	27	ea	$106	=	$	2,862
Data Summary						
Data validation	20	hr	$150	=	$	3,000
Tabulate the data and prepare figures	1	LS	$6,000	=	$	6,000
Data usability	24	hr	$110	=	$	2,640
Prepare the data report	300	hr	$120	=	$	36,000
Groundwater model update	80	hr	$150	=	$	12,000
Sub Total					$	110,772
Total Annual O&M Costs					**$**	**591,000**

8. Present Worth Calculation

Assume discount rate is 7%:

This is a recurring cost every year for n years.

Find (P given A, i, n) or (P/A,i,n)

P = Present Worth

A= Annual amount

i = interest rate

$$P = A \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

Operations and Maintenance of GWTP and Extraction - Year 1 - 30

n = 30

i = 7%

The multiplier for $(P/A)_{30}$ = **12.409**

Table 9

Chemical-Specific ARARs, TBCs, and Other Guidance

ARAR Identification	Requirement Synopsis	Feasibility Study Consideration
National Primary Drinking Water Standards (40 CFR 141)	Establishes health-based standards for public drinking water systems. Also establishes drinking water quality goals set at levels at which no adverse health effects are anticipated, with an adequate margin of safety.	The MCLs and MCLGs will be considered in the development of the PRGs if there are no applicable standards.
New York Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (NYCRR Part 703)	Establish numerical standards for groundwater and surface water cleanups.	The standards will be used to develop the PRGs.
New York State Department of Health Drinking Water Standards (10NYCRR Part 5)	Sets maximum contaminant levels (MCLs) for public drinking water supplies.	The standards will be considered in the development of the PRGs if there are no applicable standards and if action involves future use of groundwater as a public supply source.

TABLE 10
Location-Specific ARARs, TBCs, and Other Guidance

Regulation/Authority	Citation	Requirement Synopsis
No Location-Specific ARARs, TBC, and Other Guidance Identified		
N/A	N/A	N/A

TABLE 11
Action-Specific ARARs, TBCs, and Other Guidance

Regulation/Authority	CITATION	Requirement Synopsis
General Requirement for Site Remediation		
RCRA Identification and Listing of Hazardous Wastes	42 U.S.C. §6925; 40 CFR Part 261	Describes methods for identifying hazardous wastes and lists known hazardous wastes.
RCRA Standards Applicable to Generators of Hazardous Wastes	42 U.S.C.§§ 6906, 6912, 6922-6925, 6937, and 6938; 40 CFR Part 262	Describes standards applicable to generators of hazardous wastes.
RCRA—Standards for Owners/Operators of Treatment, Storage, and Disposal Facilities	42 U.S.C. §§6905, 6912(a), 6924, and 6925; 40 CFR Part 264	This regulation lists general facility requirements including general waste analysis, security measures, inspections, and training requirements.
New York Hazardous Waste Management System – General	6 NYCRR Part 370	This regulation provides definition of terms and general standards applicable to hazardous wastes management system.
New York Solid Waste Management Regulations	Part 360	This regulation provides requirements for solid waste management facilities
New York Identification and Listing of Hazardous Waste	ECL, Article 27; 6 NYCRR Part 370	Outlines criteria for determining if a solid waste is a hazardous waste and is subject to regulation under 6 NYCRR Parts 371-376.
Waste Transportation		
Hazardous Materials Transportation Regulations	49 CFR Parts 107, 171, 172, 177 to 179)	This regulation outlines procedures for the packaging, labeling, manifesting, and transporting hazardous materials.
RCRA Standards Applicable to Transporters of Hazardous Waste	42 U.S.C.§§ 6906, 6912, 6922-6925, 6937, and 6938; 40 CFR Part 263	Establishes the responsibility of off-site transporters of hazardous waste in the handling, transportation and management of the waste. Requires manifesting, recordkeeping and immediate action in the event of a discharge.
New York Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities	6 NYCRR Part 372	Establishes record keeping requirements and standards related to the manifest system for hazardous wastes.

TABLE 11
Action-Specific ARARs, TBCs, and Other Guidance

Regulation/Authority	CITATION	Requirement Synopsis
New York Waste Transporter Permit Program	6 NYCRR Part 364	Establishes permit requirements for transportations of regulated waste.
Waste Disposal		
RCRA Land Disposal Restrictions	40 CFR 268	This regulation identifies hazardous wastes restricted for land disposal and provides treatment standards for land disposal.
New York Standards for Universal Waste (6 NYCRR Part 374-3) and Land Disposal Restrictions (6 NYCRR Part 376)	ECL, Article 27; 6 NYCRR Part 374-3 6 NYCRR Part 376	These regulations establish standards for treatment and disposal of hazardous wastes.
Groundwater Discharge		
Clean Water Act Effluent Guidelines and Standards for the Point Source Category	40 CFR 414	Establishes criteria for discharge quality of wastewater that contains organic chemicals, plastics and/or synthetic fibers
Clean Water Act (Federal Ambient Water Quality Criteria [FAWQC] and Guidance Values	40 CFR 131.36	Establishes criteria for surface water quality based on toxicity to aquatic organisms and human health.
Safe Drinking Water Act – Underground Injection Control Program	40 CFR 144, 146	Establish performance standards, well requirements, and permitting requirements for groundwater re-injection wells
New York Regulations on State Pollution Discharge Elimination System (SPDES	6 NYCRR parts 750-757	This permit governs the discharge of any wastes into or adjacent to State waters that may alter the physical, chemical, or biological properties of State waters, except as authorized pursuant to a NPDES or State permit.
New York Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations	6NYCRR Part 703	Establish numerical criteria for groundwater treatment before discharge.

TABLE 11
Action-Specific ARARs, TBCs, and Other Guidance

Regulation/Authority	CITATION	Requirement Synopsis
New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations	TOGS 1.1.1	Provides groundwater effluent limitations for use where there are no standards.
Off-Gas Management		
Clean Air Act (CAA)—National Ambient Air Quality Standards (NAAQs)	40 CFR 50	These provide air quality standards for particulate matter, lead, NO_2, SO_2, CO, and volatile organic matter.
Federal Directive – Control of Air Emissions from Superfund Air Strippers	OSWER Directive 9355.0-28	These provide guidance on the use of controls for superfund site air strippers as well as other vapor extraction techniques in attainment and non-attainment areas for ozone.
New York General Prohibitions	6 NYCRR Part 211	Prohibition applies to any particulate, fume, gas, mist, odor, smoke, vapor, pollen, toxic or deleterious emissions.
New York Air Quality Standards	DER-10 6 NYCRR Part 257	This regulation requires that maximum 24-hour concentrations for particulate matter not be exceeded more than once per year. Fugitive dust emissions from site excavation activities must be maintained below 250 micrograms per cubic meter ($\mu g/m^3$).
New York State Department of Environmental Conservation Guidelines for the Control of Toxic Ambient Contaminants	DAR-1 Air Guide 1	These guidelines outline procedures for evaluating emissions of criteria and non-criteria air contaminants.

Appendix III

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

02/22/2018

REGION ID: 02

Site Name: OLD ROOSEVELT FIELD CONTAMINATED GW AREA
EPA ID: NYSFN0204234
OUID: 02
SSID: 02PE
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
537600	02/22/2018	ADMINISTRATIVE RECORD INDEX FOR OU2 FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	3	List/Index		
346205	04/18/2008	TRIP REPORT - SOIL VAPOR INTRUSION STUDY FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	148	Report	CATANZARITA,JEFF (US ENVIRONMENTAL PROTECTION AGENCY)	BRADSTREET,JEFFREY (LOCKHEED MARTIN/REAC)|FRY,JESSICA (LOCKHEED MARTIN TECHNOLOGY SERVICES)
537601	01/21/2011	REVISED REMEDIAL INVESTIGATION WORK PLAN FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	918	Work Plan		(ROUX ASSOCIATES INCORPORATED)
537602	11/01/2011	DECISION DOCUMENT FOR THE FORMER AVIS HEADQUARTERS PROPERTY BROWNFIELD CLEANUP PROGRAM FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	15	Report		(NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION)
537613	06/21/2012	FINAL ENGINEERING REPORT FOR THE FORMER AVIS HEADQUARTERS PROPERTY (PART 1 OF 4) FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	1507	Report		(NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION)
537614	06/21/2012	FINAL ENGINEERING REPORT FOR THE FORMER AVIS HEADQUARTERS PROPERTY (PART 2 OF 4) FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	1108	Report		(NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION)
537615	06/21/2012	FINAL ENGINEERING REPORT FOR THE FORMER AVIS HEADQUARTERS PROPERTY (PART 3 OF 4) FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	854	Report		(NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

02/22/2018

REGION ID: 02

Site Name: OLD ROOSEVELT FIELD CONTAMINATED GW AREA
EPA ID: NYSFN0204234
OUID: 02
SSID: 02PE
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
537616	06/21/2012	FINAL ENGINEERING REPORT FOR THE FORMER AVIS HEADQUARTERS PROPERTY (PART 4 OF 4) FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	5129	Report		(NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION)
537617	09/25/2012	CORRESPONDENCE REGARDING THE SECOND QUARTER GROUNDWATER MONITORING RESULTS FOR THE FORMER AVIS HEADQUARTERS PROPERTY FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	4	Letter	(NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION)	(ROUX ASSOCIATES INCORPORATED)
537618	04/24/2013	CORRESPONDENCE REGARDING THE FOURTH QUARTER GROUNDWATER MONITORING RESULTS FOR THE FORMER AVIS HEADQUARTERS PROPERTY FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	7	Letter	(NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION)	(ROUX ASSOCIATES INCORPORATED)
537611	09/12/2013	FINAL WORK PLAN, VOLUME 1 FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	88	Work Plan		(CDM SMITH)
537603	04/24/2014	FINAL QUALITY ASSURANCE PROJECT PLAN FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	122	Work Plan		(CDM SMITH)
537607	10/30/2015	TECHNICAL MEMORANDUM FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	477	Memorandum		(CDM SMITH)
537605	05/04/2016	SUPPLEMENTAL DRAFT WORK PLAN, VOLUME 1 FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	30	Work Plan		(CDM SMITH)

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

02/22/2018

REGION ID: 02

Site Name: OLD ROOSEVELT FIELD CONTAMINATED GW AREA
EPA ID: NYSFN0204234
OUID: 02
SSID: 02PE
Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
537609	02/21/2017	TECHNICAL MEMORANDUM - SUPPLEMENTAL RI INVESTIGATION FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	577	Memorandum		(CDM SMITH)
537619	02/21/2018	FINAL REMEDIAL INVESTIGATION REPORT FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	1044	Report		(CDM SMITH)
537623	02/21/2018	FINAL HUMAN HEALTH RISK ASSESSMENT FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	121	Report		(CDM SMITH)
537621	02/22/2018	FINAL FEASIBILITY STUDY REPORT FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	133	Report		(CDM SMITH)
533920	02/22/2018	PROPOSED PLAN FOR OU2 FOR THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE	16	Report		(US ENVIRONMENTAL PROTECTION AGENCY)

Appendix IV

STATE CONCURRENCE LETTER

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Office of the Director
625 Broadway, 12th Floor, Albany, New York 12233-7011
P: (518) 402-9706 | F: (518) 402-9020
www.dec.ny.gov

March 30, 2018

Mr. John Prince, Acting Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region 2
290 Broadway
New York, NY 10007-1866

Dear Mr. Prince:

Re: Record of Decision for Operable Unit No. 2
Old Roosevelt Field Contaminated Groundwater Area
Town Hempstead, Nassau County
Site ID No. 130051

The New York State Department of Environmental Conservation and the New York State Department of Health have reviewed the Record of Decision (ROD) for Operable Unit No. 2 (OU 2) at the Old Roosevelt Field Contaminated Groundwater Area Superfund Site, in the Town of Hempstead, Nassau County.

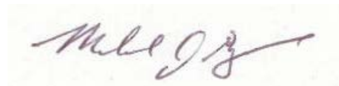
The ROD calls for groundwater extraction and ex-situ treatment as the remedy for OU2, and has the following key components:

- extraction of groundwater via pumping and ex-situ treatment of extracted groundwater prior to discharge to a recharge basin or re-injection to the aquifer;
- implementation of institutional controls;
- long-term groundwater monitoring;
- a Site Management Plan (SMP) will also be developed and will provide for the proper management of the site remedy for OU2 post-construction, and will include periodic reviews and certifications, as applicable; and
- a review of the site conditions will be conducted as part of the regularly scheduled five (5) year review.

The State concurs with the United States Environmental Protection Agency's selected remedy for this operable unit.

If you have any questions regarding this agreement, please contact John Swartwout at john.swartwout@dec.ny.gov or (518) 402-9620.

Sincerely,



Michael J. Ryan, P.E.
Director
Division of Environmental Remediation

ec:
E. Obrecht
J. Swartwout, NYSDEC
H. Bishop, NYSDEC
S. Berninger, NYSDOH
S. Karpinski, NYSDOH
C. Bethoney, NYSDOH
S. Henry, USEPA
P. Mannino, USEPA
D. Garbarini USEPA

Appendix V

RESPONSIVENESS SUMMARY

APPENDIX V

RESPONSIVENESS SUMMARY

Table of Contents

Appendix V:	Introduction Summary of Community Relations Activities Summary of Comments and EPA Responses
Appendix V - Attachment A	Proposed Plan
Appendix V - Attachment B	Public Notices: Commencement of Public Comment Period Rescheduled Public Meeting
Appendix V - Attachment C	March 13, 2018 Public Meeting Transcript
Appendix V - Attachment D	Written Comments Submitted During Public Comment Period

INTRODUCTION

This Responsiveness Summary provides a summary of the significant comments submitted by the public on the U.S. Environmental Protection Agency's (EPA's) February 2018 Proposed Plan (Proposed Plan) for the Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site), Operable Unit 2 (OU2), and EPA's responses to those comments. All comments summarized in this Responsiveness Summary were considered by EPA in making a final decision on the remedy for OU2 at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The Proposed Plan for OU2 was released to the public on February 23, 2018, along with the Remedial Investigation, the Feasibility Study, and the Human Health Risk Assessment reports for OU2. These documents were made available to the public at information repositories maintained at the Garden City Public Library, located at 60 Seventh Street in Garden City, New York, the Hempstead Public Library, located at 115 Nichols Court, Hempstead, New York; the EPA Region 2 Office in New York City; and EPA's website for the Site at https://www.epa.gov/superfund/roosevelt-field-groundwater.

On February 23, 2018, EPA published a notice in the *Garden City News* to announce the start of the public comment period and the availability of the above-referenced documents. A news release announcing the Proposed Plan, which included the public meeting date, time, and location, was issued to various media outlets and posted on EPA's Region 2 website on February 24, 2018.

Due to an impending winter storm, the public meeting originally scheduled for March 7, 2018 was rescheduled to March 13, 2018. To inform the public of the rescheduled date for the public meeting a flyer was posted on: EPA's Region 2 website; social media; and the Village of Garden City's website. A notice of the rescheduled public meeting date was published in the *Garden City News* on March 9, 2018. EPA held the public meeting on March 13, 2018 at the Village of Garden City Village Hall, located at 351 Stewart Avenue, Garden City, New York, to inform officials and interested citizens about the Superfund process; to present the Proposed Plan for OU2 of the Site, including the preferred remedial alternative; and to respond to questions and comments.

The public meeting was attended by approximately 35 people, including residents, local business people, and state and local government officials.

The public comment period, originally scheduled from February 23, 2018 to March 26, 2018 was extended after EPA received a request for an extension of time from a representative of the Village of Garden City. To inform the public of the extension of the public comment period, a flyer was posted on EPA's Region 2 website, social media, and the Village of Garden City's website. In addition, EPA sent the flyer electronically to individuals on the Site-mailing list and issued a news advisory to the media.

Attachment A of this Responsiveness Summary is the proposed plan. Attachment B contains copies of the February 23 and March 9, 2018 public notices published in the *Garden City News*.

Attachment C is the transcript of the March 13, 2018 public meeting. Attachment D contains copies of all the written comments submitted during the public comment period.

SUMMARY OF COMMENTS AND EPA RESPONSES

Based on the comments received, the public generally supports the selected remedy. The majority of comments were received at the public meeting and pertained to the location of the treatment system components. Twenty-two comment letters were received and were related to remedy details, public health concerns, and the schedule for implementation of the remedy. A summary of the comments is provided below:

- **Public Health Concerns**
- **Nature and Extent of Contamination**
- **Site Cleanup**
- **Other Issues**

PUBLIC HEALTH CONCERNS

Comment # 1: Several commenters asked whether the public supply wells for the Village of Garden City are located in the same area as the contaminated groundwater. Commenters also asked about the screen depths of the Village of Garden City public supply Well 10 and Well 11 that were referenced in the Proposed Plan and whether these two wells provide drinking water to a specific section of Garden City.

Response to Comment # 1: The Village of Garden City's public supply Wells 10 and Well 11 are located immediately south (downgradient) of the former Roosevelt airfield hangers and the three groundwater extraction wells (EW-1S, EW-1I, and EW-1D) installed as part of EPA's remedy selected in 2007. The Village of Garden City Well 10 has a 40-foot screen that extends from 377 to 417 feet below ground surface and Well 11 has a 40-foot screen from 370 to 410 below ground surface. Both wells have shown the presence of trichloroethene (TCE) and tetrachloroethene (PCE) since they were first sampled in the late 1970s and early 1980s. EPA's extraction wells EW-1S, EW-1I, and EW-1D are screened from 210 to 270 feet below ground surface (bgs), 280 to 340 feet bgs and 350 to 410 feet bgs, respectively.

It is EPA's understanding that the public supply system of the Village of Garden City comprises a network of 10 supply wells, including Well 10 and Well 11 with engineered treatment systems installed at all of the public supply wells.

Comment # 2: A commenter wanted to know whether it is safe to water a vegetable garden with water from the garden hose or from the sprinklers.

Response to Comment # 2: The public supply Well 10 and Well 11 have an air stripping treatment system. The Village of Garden City's sample results indicate that the system is effective in treating the groundwater prior to public distribution.

Comment # 3: Another commenter wanted to know whether the soil and air were tested and whether it was safe for her children and pets to walk on and play on the grass. This commenter asked how the contamination and the cleanup would affect the health of her family.

Response to Comment # 3: The focus of this decision document is groundwater contamination in OU2 of the Site. Potential exposures to soil and soil gas were evaluated as part of EPA's investigation of OU1. Based on the results of the OU1 and OU2 investigations, the risks identified in the human health risk assessments are related to the potential future consumption of the contaminated groundwater. Since all the residences in the area of the Site are currently connected to the public water supply, exposure to contaminated groundwater is not expected under current conditions. There are no other exposure pathways. The cleanup will prevent potential future exposure to the contaminated groundwater.

Comment # 4: A commenter had concerns about the effectiveness of the Village's treatment system and inquired whether EPA could recommend a household water filtration system.

Response to Comment # 4: As stated in Response to Comment # 1, engineered treatment systems have been installed by the Village. These systems are effective in reducing volatile organic compound (VOC) levels in the raw water to comply with drinking water standards. EPA is prohibited from recommending a particular manufacturer or vendor.

NATURE AND EXTENT OF CONTAMINATION

Comment # 5: A commenter expressed concern that EPA had not yet performed groundwater modeling to determine the optimum location of recovery wells and the impact of these wells on groundwater flow and contaminant transport. This commenter requested that the location of the extraction well be deferred until such modeling is completed.

Response to Comment # 5: The location of the extraction well will be finalized in the upcoming remedial design phase. During the RI, the highest concentrations of groundwater contamination were found between Commercial Avenue and Garden Street. As part of the FS, a 3-D finite element groundwater model was used to identify a location for the groundwater extraction well under Alternative 2. The model development and simulation for Alternative 2 (Pump and Treat) is included as Appendix A of the FS Report. EPA expects the groundwater model will be updated with additional data collected during the remedial design, as appropriate.

Comment # 6: A commenter stated that EPA should evaluate well-head treatment at the public supply wells rather than continuing ineffective attempts to recover and treat contaminated groundwater extracted from various points in the aquifer.

Response to Comment #6: Treatment at the well head would provide potable drinking water but would not be designed to restore the groundwater in the aquifer. Consistent with the NCP, a remedial action under CERCLA should seek to restore the aquifer to its beneficial use wherever practicable. The aquifer underlying OU2 has been designated a Class GA (fresh) groundwater by the NYSDEC and the best usage of Class GA waters is as a source of potable water supply. While pumping via water supply well and treating groundwater at the well head primarily to provide drinking water may, over time, result in some localized improvement in groundwater quality, the effect is tangential to, but not designed to address aquifer restoration.

Comment # 7: A commenter quoted the following statement from the proposed plan: “EPA assumes there is no ongoing contamination from the former Avis property” and expressed concern that the sources of contamination have not yet been identified or remediated, and that these unidentified sources of contributing to ongoing contaminant migration in the area.

Response to Comment # 7: EPA has not identified ongoing sources of contamination that may be contributing to the Site related groundwater contamination. Contamination at the former Avis headquarters property was addressed under NYSDEC’s Brownfield program. NYSDEC has indicated that the source has been adequately addressed. If during implementation of the EPA remedy, EPA determines that the property is a continuing source, then EPA may elect to evaluate additional options pursuant to CERCLA to ensure the effectiveness of any remedy selected by EPA for this Site.

Comment # 8: A commenter remarked that a more effective remedy for the Site would be a combination of source control, well-head treatment, and ongoing monitoring.

Response to Comment # 8: Remedial investigations conducted by EPA for OU1 and OU2 did not reveal soil contamination acting as a residual source of groundwater contamination. As such, source control for soil is not warranted. As indicated in Response to Comment # 6, a remedial action objective for the Site is to restore the aquifer to its beneficial use, which in this case is a source of potable water; well-head treatment would not be designed to address aquifer restoration. EPA's selected remedy for groundwater contamination at OU1, addressing contaminated groundwater in the western portion of the Site, in combination with this selected remedy for OU2 to address groundwater contamination in the eastern portion of the Site, will restore the aquifer to its beneficial use. Long-term monitoring of groundwater is a component of the selected remedy.

Comment # 9: A representative from Nassau County Department of Public Works expressed general agreement with both the conceptual model proposed for the Site and the identification in the RI Report of the historic source area located in the intermediate zone (250 to 400 feet below ground surface). The representative requested that EPA consider modifications to the conceptual site model and interpretation of the intermediate and deep zones of contamination based on construction and operation details provided for public supply and cooling wells in the area.

In addition, the representative recommended:

- Development of a 3-D finite element groundwater model for the Roosevelt Field Area, to simulate contaminant transport and to better determine the impacts of both the expanded zones of intermediate contamination and especially the basal zone of deep Magothy contamination located just above the Raritan Clay on active Hempstead Village and Uniondale Water District Public Supply wells and on the length of time required to remediate the wells;

- Conduct synoptic water level rounds with Nassau County Department of Public Works during high stress summer and fall conditions with the Uniondale Public Supply wells (N-8474 and B-8475) in operation; and

- Measurement conducted during these high stress periods would better define the interaction of public supply wells at both well fields and how they might affect the proposed recovery well locations and screen intervals.

Response to Comment # 9: The comments in support of the conceptual model and the historic source location are noted. Updating the 3-D finite element groundwater model for conditions in the 1970s to simulate contaminant fate and transport would be challenging, as EPA is not aware of data from the 1970s on the extent of the contamination in the vicinity of the supply and cooling wells identified, or on the level of contamination between the historical sources and the wells. In addition, investigating and compiling pumping data from the public supply and cooling wells during that period would require a significant effort, with uncertainty as to the usefulness or limitations of the simulation without representative data, and is not necessary for purposes of the selected remedy.

EPA recognizes the usefulness of conducting synoptic water level measurements during high stress summer and fall conditions with Uniondale Public Supply Wells, N-8474 and N-8475, in operation in calibrating and updating the existing groundwater flow model to support the design of the location and screen interval of the groundwater extraction wells for the OU2 selected remedy. EPA expects to coordinate with the Nassau County Department of Public Works during the remedial design when the Agency develops the sampling plans and the long-term groundwater monitoring program for OU2.

SITE CLEANUP

Comment # 10: A commenter asked when does EPA anticipate beginning the remedial cleanup?

Response to Comment # 10: Following issuance of the Record of Decision, EPA will begin the remedial design of the remedy. During the remedial design phase, the plans and specifications for the remedy will be developed. EPA anticipates that the remedial design phase for OU2 could take two to three years to complete. To date, EPA has not issued notices of potential liability for the Site and has used federal and state funds to perform remedial activities at the Site. Pending the availability of funds for construction of the remedy, the remedy could be implemented shortly after completion of the remedial design.

Comment # 11: A commenter wanted to know who pays the capital and operation and maintenance costs for the remedy.

Response to Comment # 11: Generally, EPA attempts to require PRPs to pay for or implement the selected remedy. Absent a potentially responsible party willing to perform or fund the remedy, federal and state funds will be used to construct and operate the treatment system.

Comment # 12: A commenter asked whether the extraction well would draw water from the north or the south area or both. This commenter also asked how the extraction well would draw contaminated groundwater downgradient and past the extraction point.

Response to Comment # 12: The conceptual design calls for the installation of the extraction well downgradient of the highest contaminant concentrations. Depending on the pumping rate of the extraction well and the hydrogeologic conditions of the aquifer, some influence on groundwater immediately downgradient of the extraction well may be possible. The extraction wells will target active treatment of volatile organic compounds concentrations greater than 100 parts per billion. Natural processes, predominantly dilution and dispersion, are expected to achieve the maximum contaminant levels in areas not targeted for active remediation.

Comment # 13: A commenter expressed concern about contaminant concentrations near his home and requested clarification on what is being represented by the dotted line depicted on Figure 2 of the proposed plan.

Response to Comment # 13: Figure 2 of the proposed plan shows the current extent of groundwater contamination based on the RI. The lines are contours of equal concentration level, for example 5 parts per billion of PCE. The lines are dotted where they have been inferred, typically based on groundwater modeling or other hydrogeologic data because it is not feasible to collect and analyze ground water samples everywhere.

Comment # 14: A commenter inquired about the concentration of contaminants that were detected in monitoring well MW-18I, drilled at Garden Street and Boylston Avenue during the remedial investigation.

Response to Comment # 14: PCE was detected at 400 parts per billion and TCE was detected at 110 parts per billion, at a depth of 200 feet or more below ground surface.

Comment # 15: A commenter noted that the Village public supply Wells 10 and 11 are on the footprint of the former Roosevelt Field airfield and questioned why the Village was still using the wells.

Response to Comment # 15: As indicated in Response to Comment #2 above, the Village installed an engineered treatment system at Well 10 and Well 11 that is designed to effectively treat VOCs in groundwater prior to public distribution. Questions regarding the use of specific wells should be directed to the Village, which operates the water supply system.

Comment # 16: A commenter asked about the proposed location of the extraction well in comparison to the location of the Village public supply Wells 10 and 11**.** The same commenter asked about the depth of the proposed extraction well and the depth of the public supply wells.

Response to Comment # 16: The location of the proposed extraction well is in the median of Garden Street between Tremont Street and Boylston Street. The conceptual design estimated that the screened interval of the proposed extraction would be at a depth of 400 feet below ground surface. Extracted groundwater would be pumped from the extraction well to a new treatment plant constructed near Grove Street by piping placed underground and along the median of Garden Street to Grove Street. As stated previously, the exact location of the extraction well will be finalized during the remedial design.

The Village public supply Wells 10 and 11 are located along Clinton Street, approximately 4,000 feet upgradient of the proposed location of the extraction well. The information on the depth of the two public supply wells is available from the Village of Garden City Department of Public Works.

Comment # 17: A commenter asked whether EPA would hold another meeting to inform the public of EPA's final decision for the location of the treatment system.

Response to Comment # 17: EPA does not currently intend to conduct another public meeting to inform the public of EPA's final decision for the location of the treatment system. However, EPA expects to conduct additional community outreach prior to the commencement of construction activities including communicating with the Village with respect to the location of the treatment system. If it is determined that another meeting would be an appropriate mechanism for updating the public on site activities, another meeting can be held.

Comment # 18: Several commenters expressed concerns about the locations identified in the proposed plan for the installation of extraction wells, installation of piping to pump extracted groundwater, construction of a treatment plant, and discharge of the treated water. The commenters noted that the area is densely populated with residential homes, a public school, and a park. Citing safety, quality of life, and property value concerns, the commenters requested that EPA find other locations to place the system.

Response to Comment # 18: For cost-estimating and planning purposes, the conceptual design for the selected remedy estimated that the treatment system would comprise of the following major components: installation of one extraction well along the median on Garden Street between Tremont Street and Boylston Street; pumping (via piping placed underground and along the median of Garden Street) of extracted groundwater to a new treatment plant near Grove Street with a capacity of approximately 300 gallons per minute; and discharge of treated groundwater to a nearby recharge basin or reinjection to groundwater. During the remedial design, EPA expects to collect additional data to refine the conceptual design. Based on the results of the additional data, EPA will determine the most suitable location for the installation of the treatment system and finalize the configuration of the treatment system. Consideration will be given to reconfiguring locations for the treatment system components; however, modifications to location configurations will need to be balanced with considerations regarding any potential impacts, such as effectiveness.

For example, in order to properly effectuate removal of contaminated groundwater, extraction wells will need to be installed downgradient of the highest OU2 contaminant concentrations. Based on the information collected as part of the OU2 remedial investigation, the installation of extraction wells near Garden Street would achieve this objective.

Due to the densely populated area, limited space exists for the construction of the treatment plant. While it is advantageous to construct the treatment plant in close proximity to extraction wells, the treatment plant could be constructed at a distance greater than identified in Figure 2 of the Proposed Plan. While EPA does not expect to construct the treatment plant on property zoned residential, EPA recognizes the densely populated residential area poses logistical challenges.

Similarly, the discharge options will also be evaluated further to determine whether treated groundwater will be reinjected or discharged to a recharge basin near the treatment plant. Among other things, the remedial design will take into consideration potential impacts that treated water may have if reinjected back into the groundwater.

Similar to the construction of the treatment system along Clinton Street for OU1, EPA will seek to coordinate with the impacted local governments and property owners to obtain access to construct the OU2 treatment system as additional information becomes available.

While there will be some short-term impacts to the community during the construction of the selected remedy, there will not be any unacceptable short-term health risks that result from the construction activities or operation of the treatment system. EPA will address impacts such as minor noise and traffic disruption, as well as other potential quality of life related concerns will be addressed through mitigation plans. EPA will endeavor to minimize disruption to the local community when undertaking activities related to the construction and implementation of the selected remedy.

With regard to the commenter's property value concerns, in EPA's experience the type of equipment contemplated by this remedy does not have a measurable effect on property values.

Comment # 19: A commenter asked about the timeframe for each component of the remedy (extraction well, trenching for piping and treatment plant).

Response to Comment # 19: EPA must first complete the remedial design of the remedy. During the remedial design phase, the plans and specifications for the remedy will be developed. EPA anticipates that the remedial design phase for OU2 could take two to three years to complete. EPA will likely need to use federal funds to pay for the construction of the remedy. Assuming the availability of funds for construction of the remedy, the remedy could be implemented shortly after completion of the remedial design. Typically, an extraction well at the proposed depth of 400 feet below ground surface can take approximately four to six weeks to construct. The trenching for the underground piping can take from six to eight weeks. EPA estimates that it will take one to two years to construct the remedy, as noted in the proposed plan for Alternative 2.

Comment # 20: A representative for the Village of Garden City stated that the use of the Village park and recreational area for the location of the treatment plant is unacceptable. The Village requests to be involved in the process leading to the selection of final locations for all of the remedial facilities, their design and the scheduling and methods of construction.

Response to Comment # 20: EPA will collect additional data during the remedial design to refine the conceptual site model, identify the most appropriate locations, and develop the plans and specifications for the treatment system. EPA will seek to coordinate with the local governments, however, EPA will make the final decisions regarding the locations, and design of, the treatment system.

Comment # 21: A representative for the Village of Garden City expressed support for the shared goal with EPA of selecting a remedy that is protective and considers community acceptance pursuant to 40 CFR section 300.430(d)(9)(iii)(I). The Village representative stated that as part of community support, EPA should consider determining which components of the alternatives the community support, have reservation about or opposes.

Response to Comment # 21: EPA has taken into consideration the significant comments submitted by the public during the comment period.

Comment # 22: The Village's representative stated that due to the well-documented groundwater contamination in the surrounding area and the potential for the new extraction well to affect groundwater flow and movements of contaminants, EPA must analyze the hydrological impacts of the remedial alternatives and their effects on the Village's drinking water supply prior to selecting a remedy. In addition, the representative requested that EPA work closely with the Village and its engineer in the review and finalization of the operational aspects of the OU2 remedy to ensure that there are no adverse impacts on the Village's public water supply.

Response to Comment # 22: As indicated in Response to Comment # 3, a 3-D finite element groundwater model was used as part of the FS to identify the location of the groundwater extraction well under Alternative 2. EPA considered hydrological impacts and based on the results, EPA does not expect the selected remedy to adversely impact the Village of Garden City public water supply. However, EPA expects the groundwater model will be updated with additional data collected during the remedial design, as appropriate. As part of that effort, EPA intends to work with the Village of Garden City, in addition to the Villages of Uniondale and Hempstead, to ensure that the selected remedy does not adversely impact the public water supply.

Comment # 23: The Village's representative stated that although the Village understands that the location of the proposed extraction well on Garden Street was chosen because the street contains a landscaped median, the specific location, design, means of installation and maintenance of the well are critically important to the Village and its residents. The representative requested that EPA select the final location for the extraction well to both minimize any disturbance or nuisances during construction and ensure that there are no community impacts after construction.

Response to Comment # 23: While the installation of a groundwater extraction well in the median along Garden Street would result in fewer street closure and less disruptions in traffic, Garden Street was identified as the location of the extraction well because the conceptual design calls for the extraction well to be installed downgradient of the highest contaminant concentrations.

Comment # 24: The loss of green recreational space is not a feasible alternative and will not be accepted by the Village. Available space on Oak Street or at the Uniondale supply well property should be considered as the only viable places for placement of the treatment plant. Any construction must avoid impact usage of Grove Street Park.

Response to Comment # 24: See Response to Comment # 18.

Comment # 25: The Village of Garden City representative requested that EPA work with the Village to ensure the location and design of the treatment plant are consistent with the neighborhood character, are as visually unobtrusive as possible, and are constructed with state of the art noise attenuation measures so that there is no audible evidence of its operation once it is online.

Response to Comment # 25: EPA expects to work with the Village of Garden City during the remedial design phase as the Agency finalizes the details of the treatment plant.

OTHER ISSUES

Comment # 26: Several commenters wanted an update/clarification on the status of the remedial action at operable unit 1. Another commenter asked if there were plans to perform additional work at OU1.

R**esponse to Comment # 26:** EPA completed construction of the treatment plant and three groundwater extraction wells (EW-1S, EW-1I, and EW-1D) as part of the remedy selected in 2007 and operation of the treatment system started in 2012. Subsequent to the startup of the treatment system, elevated concentrations of Site-related contaminants were detected in a groundwater monitoring well located to the south of the former Airfield, and outside the influence, of the treatment system. To address the contamination, three additional groundwater extraction wells (SEW-1S, SEW-1I, and SEW-1D) were installed immediately south of Stewart Avenue and piped to the same groundwater treatment plant. These extraction wells are referred to as the southern groundwater extraction wells. To accommodate the additional volume of groundwater requiring treatment, modifications to components of the treatment system within the plant were made in 2015.

With respect to future work at OU1, the operation of the treatment system that was constructed beginning in 2012 and long-term groundwater monitoring will continue until the remedial action objectives are achieved.

Comment # 27: A commenter noted that there are several projects underway in the area of the former Roosevelt Field airfield involving the construction of hotels, restaurants, and apartment buildings whereby soil is disturbed. The commenter asked whether the construction activities could result in exposures to construction workers from soil excavation during the installation of sewer lines or nearby residents due to exposure to wind born dust.

R**esponse to Comment # 27:** Soil sampling conducted at the former Roosevelt Field airfield as part of the OU1 remedial investigation did not reveal soil contamination in shallow soils (up to a depth of 40 feet below ground surface). As a result, exposure to volatile organic compound-contaminated soil or dust under the scenarios described by the commenter are not expected.

Comment # 28: A commenter inquired if construction crews are required to report any sort of finding if they should see something while in the process of, for example, excavating.

Response to Comment # 28: Similar to OU1, the remedy for OU2 will include a site management plan for the proper management during construction of the remedy.

Comment # 29: A commenter stated that EPA was unable to identify the original source of the material and therefore, there is no source control.at the Site. The same commenter stated that the source of the original groundwater contamination is unknown. Another commenter stated that he was surprised that EPA was unable to use old maps to pinpoint the source of the contamination from the former airfield.

Response to Comment # 29: EPA believes that the source of the contamination to the groundwater includes the area of the former hangars and airfield where solvents such as trichloroethene (TCE) and tetrachloroethene (PCE) were mostly likely used for cleaning, degreasing, and deicing of aircraft. The contamination identified for the Site likely occurred over a long period of time. The initial release likely occurred during World War II (75-80 years ago). It is presumed that solvents would likely have been dissolved in wastewater/washwater and disposed to the ground close to hangars where aircraft maintenance was performed, although numerous discharge areas may have been used while the airfield was active. Because of the sandy nature of the aquifer, dissolved chlorinated solvents such as TCE and PCE discharged directly to the ground surface would be expected to migrate downward through the soil and into the groundwater in a relatively linear pattern, with minimal dispersion from the discharge location. During the OU2 investigation, no evidence of nonaqueous phase liquid (NAPL) was identified. Based on a source area investigation conducted during the OU1 RI and the distribution of contamination in the OU2 RI, the former hangars and airfield areas are presumed to no longer be sources of contamination to groundwater, but this will be confirmed.

Comment # 30: A commenter asked why was the intersection of Garden and Boylston Avenue chosen for installation of the Monitoring Well 18 cluster during the remedial investigation.

Response to Comment # 30: The location for monitoring well 18 was selected based on the data needs to evaluate the contaminant migration pathway and to locate the well at the leading edge of the plume to define the extent of contamination, the practical considerations of accessibility for the drill rig and support vehicles, and the desire to avoid locating a well on private residential property.

Comment # 31: A commenter asked about the direction of groundwater flow and the flow rate.

Response to Comment # 31: There are multiple pumping wells near the Site, including supply wells for the Villages of Garden City, Village of Hempstead and Uniondale that can influence the direction of groundwater flow. Typically, groundwater flow direction is to the south-southwest in the three depth zones studied during the OU2 RI (shallow greater than 250 feet below ground surface (bgs), intermediate between 250 to 400 feet bgs, and deep greater than 400 feet bgs. Based on site-specific and literature values, the average site-specific horizontal groundwater flow rate ranges from 0.25 to 1.15 feet/day; literature values are within this range at approximately 0.3 feet/day.

Comment # 32: A commenter noted that there was a similar site in Bethpage, New York and inquired about the treatment system being used and whether it was effective.

Response to Comment # 32: This technology has been used successfully for OU1 and at other sites in Bethpage and elsewhere on Long Island.

Comment # 33: A commenter asked whether the monitoring well (MW-18I) installed as part of the OU2 remedial investigation could be used as the proposed extraction well.

Response to Comment # 33: It is not possible to use monitoring well MW-18I as an extraction well. The groundwater monitoring wells installed as part of the remedial investigation were constructed with a diameter of four inches. The conceptual design currently estimates an extraction well with an eight-inch diameter to accommodate the pump required to obtain the desired yield and other downhole instruments.

ATTACHMENT A

PROPOSED PLAN

Old Roosevelt Field Contaminated Groundwater Area Superfund Site Operable Unit 2 Nassau County, New York

February 2018

EPA ANNOUNCES PROPOSED PLAN FOR REMEDY FOR OPERABLE UNIT TWO AT THE OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE

This Proposed Plan describes the remedial alternatives considered to address the groundwater contamination for Operable Unit Two (OU2) at the Old Roosevelt Field Contaminated Groundwater Area Superfund Site (Site), identifies the preferred remedial alternative, and provides the rationale for this preference.

This Proposed Plan was developed by the United States (U.S.) Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities in accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §117(a) (CERCLA) (also known as Superfund), 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 for OU2 at the Site and the remedial alternatives summarized in this Proposed Plan are described in EPA's Remedial Investigation (RI) Report, dated February 2018; EPA's Feasibility Study (FS) Report, dated February 2018; as well as other documents that are contained in the Administrative Record for this action. EPA encourages the public to review these reports to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

The purpose of this Proposed Plan is 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 remedy. Based on EPA's investigation, EPA has identified an additional area of groundwater contamination in the eastern portion of the former Roosevelt Field airfield[1]. This area of the Site is referred to herein as OU2. The preferred remedy for OU2 consists of extraction and on-Site treatment of additional contaminated groundwater, long-term monitoring, and institutional controls. The treated groundwater effluent would be discharged to a recharge basin or re-injected to the aquifer.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
February 23, 2018 – March 26, 2018
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: March 7, 2018 at 7:00 pm
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Village of Garden City Village Hall, 351 Stewart Avenue, Garden City, New York.

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, this Proposed Plan is available to the public for a public comment period that begins on February 23, 2018 and concludes on March 26, 2018.

Changes to the preferred remedial alternative, or a change from the preferred remedial alternative to another remedial alternative 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 EPA's FS Report because EPA may select a remedy other than the preferred alternative in this Proposed Plan.

A public meeting will be held during the public comment period at the Village of Garden City Village Hall, Garden

[1] The area of the former Roosevelt Field airfield that is the subject of this Proposed Plan, includes an area east of Clinton Road, south of Old Country Road, and extends beyond the Meadowbrook Parkway to the east. This area currently includes the Roosevelt Field Mall, office building complexes, and other small shopping centers.

City on March 7, 2018 at 7 pm to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments received during the public comment period, will be documented in the Responsiveness Summary section of a Record of Decision (ROD), the document that formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

Sherrel Henry
Remedial Project Manager
Western New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
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e-mail: henry.sherrel@epa.gov

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
(516) 374-1967
www.gardencitypl.org
Hours of operation:
Mon-Thurs 9:30 am – 9:00 pm
Fri-Sat 9:30 am – 5:00 pm, Sun 1:00 pm – 5 pm

Hempstead Public Library
115 Nichols Court
Hempstead, New York 11550
(516) 481-6990
www.nassaulibrary.org/hempstd/
Hours of operation:
Mon-Thurs 10 am – 9 pm
Fri 10:00 am – 5:00 pm, Sat 9:00 am-5:00 pm

USEPA – Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday – Friday: 9 am to 5 pm

EPA's website for the Old Roosevelt Contaminated Groundwater Area Site:
https://www.epa.gov/superfund/roosevelt-field-groundwater

SCOPE AND ROLE OF ACTION

EPA is addressing the Site in discrete phases, or operable units (OUs). An operable unit represents a portion of the site remedy that for technical or administrative purposes can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from site contamination.

EPA has designated two OUs for the Site. OU1 addressed groundwater contamination predominantly in the western portion of the Site, while OU2, the subject of this Proposed Plan, is the final planned phase of response activities at the Site, and addresses that portion of the contaminated groundwater that is in the eastern portion of the Site.

A remedy for OU1 was selected in 2007, and consisted of extraction of contaminated groundwater, ex-situ treatment, discharge of the treated groundwater to a nearby recharge basin, and institutional controls. The primary objectives of this action are to remediate the additional groundwater contamination, minimize the migration of the contaminants in groundwater, and minimize any potential future health impacts. This action, in conjunction with the OU1 remedy, will restore the aquifer to its most beneficial use (a source of drinking water).

SITE BACKGROUND

Site Description

The Site includes an area of groundwater contamination in the Village of Garden City, in central Nassau County, New York. The area of groundwater contamination is associated with the former Roosevelt Field airfield which includes an area east of Clinton Road, south of Old Country Road, and extends beyond the Meadowbrook Parkway to the east. A Site location map is provided as Figure 1.

The former Roosevelt Field airfield currently includes a large retail shopping mall and other shopping centers. Office building complexes (including Garden City Plaza) are situated on the western perimeter of the shopping mall and the Meadowbrook Parkway is located on the eastern perimeter of the shopping mall. A thin strip of open space along Clinton Road (known as Hazelhurst Park) serves as designated parkland and a buffer between a residential community and the mall complex. Two recharge basins, the Pembrook Basin and Nassau County Storm Water Basin number 124, are located directly east and south, respectively, of the mall complex. Two municipal supply well fields are located south (downgradient) of the former Roosevelt Field airfield hangers. The Village of Garden City public supply wells (designated as Wells 10 and 11) are located just south of the former hanger area along Clinton Road. The Village of Hempstead Wellfield is located approximately 1 mile south of the Village of Garden City Wells 10 and 11.

Site History

Roosevelt Field was used for aviation activities from approximately 1911 to 1951.

Prior to World War I, the U.S. military used the airfield as a training center for Army and Navy officers and military pilots. After World War I, the U.S. Air Service maintained control of the airfield but authorized aviation-related companies to operate from Roosevelt Field. On July 1, 1920, the U.S. Government sold the buildings and relinquished control of the air field for commercial aviation uses.

During World War II, Roosevelt Field was again used by the Army and the Navy. The Army used the field to train personnel on airplane and engine mechanics. As of March 1942, Roosevelt Field accommodated six steel/concrete hangars, 14 wooden hangars, and several other buildings 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 under the Lend/Lease Program. The U.S. Navy was responsible for aircraft repair and maintenance, equipment installation, preparation and flight delivery of aircrafts, and metalwork required for the installation of British modifications. The facility also performed salvage work on crashed British Royal Navy planes.

The U.S. Navy vacated all but six hangars shortly after the war ended. Roosevelt Field resumed operations as a commercial airport from August 1946 until its closure in May 1951. In 1952, the Village of Garden City installed two public supply wells (Wells 10 and 11) just south of the former hangar area along Clinton Road. These supply wells were put into service in 1953. Over the subsequent years, several other private supply and cooling water wells were installed and operated on the former Roosevelt Field airfield. The Roosevelt Field Mall was constructed and opened in 1957.

The former Avis headquarters property, located at 900 Old Country Road, (south side of Old Country Road west of Zeckendorf Boulevard) is in the northeastern portion of the former Roosevelt Field airfield. Avis leased the property from 1980 until 2001. Prior to that period, the property was used for various defense and civilian related manufacturing. Previous investigations conducted at this property under NYSDEC oversight revealed the presence of soil and groundwater contamination. As a result, this property was addressed under NYSDEC's Brownfield program. This Proposed Plan assumes there is no ongoing contamination from the former Avis property. If, during implementation of the EPA remedy, EPA determines that the property is a continuing source, then EPA may elect to evaluate additional options pursuant to CERCLA to ensure the effectiveness of any remedy selected by EPA for this Site.

In the late 1970s and early 1980s, investigations conducted by Nassau County discovered tetrachloroethene (PCE) and trichloroethene (TCE) contamination in Wells 10 and 11, and concentrations increased significantly until 1987, when an air-stripping treatment system was installed to treat the water from the supply wells. Elevated levels of contamination were also found in cooling water wells used in building air conditioning systems at the Site.

The Site was listed on the National Priorities List (NPL) on May 11, 2000. EPA conducted an RI/FS at the Site from 2001 to 2007. A number of Site-related contaminants were identified in groundwater on the western portion of the former Roosevelt Field airfield during the RI, including PCE, TCE, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), 1,1-DCE, and carbon tetrachloride. It is likely that chlorinated solvents were used at Roosevelt Field during and after World War II. Chlorinated solvents such as PCE and 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 the 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 Field (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 degreaser agent.

In 2007, EPA issued a ROD to address the identified groundwater contamination (OU1) which called for the extraction of contaminated groundwater, ex-situ treatment, discharge of the treated groundwater to a nearby recharge basin, and institutional controls.

EPA completed construction of the treatment plant and three groundwater extraction wells (EW-1S, EW-1I, and EW-1D) as part of the remedy selected in 2007 and operation of the treatment system started in 2012. Subsequent to startup of the treatment system, elevated concentrations of Site-related contaminants were detected in a groundwater monitoring well located to the south of the former Roosevelt Field airfield, and outside the influence, of the treatment system. To address the contamination, three additional groundwater extraction wells (SEW-1S, SEW-1I, and SEW-1D) were installed immediately south of Stewart Avenue and piped to the same groundwater treatment plant. These extraction wells are referred to as the southern groundwater extraction wells. To accommodate the additional volume of groundwater requiring treatment, modifications to components of the treatment system within the plant were made in 2015.

As part of the long-term monitoring program for the 2007 remedy, groundwater samples are collected from a network of wells to track and monitor changes in groundwater contamination. In addition, a capture zone analysis was conducted for the groundwater extraction well network to verify remedy effectiveness and to monitor remedial progress. This analysis revealed elevated concentration of Site-related contamination in a cluster of monitoring wells installed in the eastern area of the Site. This contamination, which is adjacent to the area addressed by OU1, resulted in the need for further investigation of groundwater contamination in the eastern area of the former Roosevelt Field airfield, identified as OU2.

The results of the OU2 RI are discussed below.

Site Hydrogeology

No naturally occurring surface water bodies are present in the vicinity of the Site. Most of the Site area is paved or occupied by buildings. Runoff is routed into stormwater collection systems and is generally discharged directly to dry wells or recharge/retention basins. There are three man-made water table recharge basins located at or near the Site, including the privately owned Pembrook recharge basin and a Nassau County recharge basin. In approximately 1960, the Pembrook Basin began receiving untreated cooling water discharge from air conditioning systems of the mall building and the office buildings west of the mall. Seven cooling water wells pumped contaminated groundwater from the Magothy Aquifer for use in the air conditioning systems. The untreated cooling water was later discharged to a drain field west of 100 Garden City Plaza and 200 Garden City Plaza until approximately 1985. Currently, the Pembrook recharge basin receives surface water runoff from an area near Garden City Plaza during storm events. The Nassau County recharge basin receives stormwater runoff from the municipal stormwater collection system and treated groundwater from the OU1 treatment plant, as described above.

The principal hydrogeologic units underlying the Site are the Upper Pleistocene Deposits, which form the Upper Glacial Aquifer (UGA) hydrogeologic unit, and the underlying Magothy Formation, which forms the Magothy Aquifer hydrogeologic unit. Beneath these two units are the clay member and the Lloyd Sand member of the Raritan Formation.

The UGA is estimated to be 80 to 100 feet thick and consists predominantly of coarse-grained sands and gravels which are fairly uniform in grain size distribution and lithology. The depth of the water table ranges from approximately 17 to 35 feet below ground surface (bgs).

At the majority of the Site, the top of the Magothy Formation is at an average depth range of 80 to 100 feet bgs and is approximately 525 feet thick. Gravel-rich zones were encountered at the boreholes located south of the Roosevelt Field Mall.

Groundwater flow is downward and horizontal groundwater flow in the UGA and the Magothy is generally to the south/southwest. Groundwater flow in the immediate vicinity of the Site is influenced by multiple pumping wells in the area including supply wells for the Villages of Garden City and Uniondale. The Village of Hempstead Wellfield to the south has the greatest impact on groundwater flow.

RESULTS OF THE REMEDIAL INVESTIGATION

The RI Report, dated February 2018, provides the analytical results of sampling conducted from 2014 to 2016 to delineate the extent of groundwater contamination in the eastern portion of the Site. The investigation, conducted in two phases, included drilling vertical profile boreholes, installing monitoring well clusters, and sampling groundwater. As part of the OU2 RI, a total of six vertical profile boreholes were drilled. The purpose of drilling the vertical profile boreholes was to aid in the selection of the depths and screen intervals for permanent monitoring well installation. Based on the data collected during the installation of these vertical profile boreholes, 12 clustered monitoring wells were subsequently installed. Each monitoring well cluster is comprised of three depth zones, the shallow zone (<250 feet bgs), the intermediate zone (250-400 feet bgs), and the deep zone (>400 feet bgs).

Site-related contaminants identified for OU2 include PCE, TCE, *cis*-1,2-DCE, 1,1-DCE, and vinyl chloride. Based on analytical data, PCE and TCE were the most persistent contaminants and were detected at the highest concentrations; therefore, PCE and TCE will be the focus of the discussions in this section.

As mentioned previously, EPA completed an RI for OU1 in 2007. As part of the OU1 RI, EPA collected soil gas, soil, and groundwater samples for analysis. The results are contained in the Administrative Record for OU1.

Groundwater Sampling Results

Shallow Zone (<250 feet bgs)

Groundwater samples collected from the shallow zone revealed PCE and TCE at concentrations up to 210 micrograms per liter (µg/L) and 41 µg/L, respectively. The PCE and TCE contamination have a similar shape and trajectory in the shallow zone and move downward as they travel south/southwest with groundwater flow.

The contamination in the shallow zone extends approximately 3,100 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 1,000 feet wide near Ring Road South.

Intermediate Zone (250-400 feet bgs)

The highest concentrations of PCE and TCE were found within the intermediate zone. Groundwater samples collected from the intermediate zone revealed PCE and TCE at concentrations up to 600 µg/L and 120 µg/L, respectively. The PCE and TCE contamination have a similar shape and trajectory and migrate downward as they travel south/southwest with groundwater flow.

The contamination in the intermediate zone extends approximately 7,100 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 1,900 feet wide.

Deep Zone (>400 feet bgs)

The lowest total concentrations of PCE and TCE were found within the deep zone. Groundwater samples collected from the deep zone revealed PCE and TCE at concentrations up to 15 µg/L and 7 µg/L, respectively.

The contamination in the deep zone extends approximately 1,900 feet to the south/southwest. The widest area of the contamination is estimated to be approximately 3,100 feet wide.

Principal Threat Wastes

Principal threat wastes are considered source materials, i.e., materials that include or contain hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or as a source for direct exposure. Contaminated groundwater is generally not considered to be source material; however, nonaqueous phase liquid (NAPL) in groundwater may be viewed as potential source material. Analytical results from the OU1 and OU2 investigations did not reveal concentrations of contaminants in groundwater indicative of the presence of NAPL.

Vapor Intrusion

VOC vapors released from contaminated groundwater and/or soil have the potential to move through the soil and seep through cracks in basements, foundations, sewer lines, and other openings. As part of OU1, EPA conducted a vapor intrusion evaluation at the Site. In April and June 2007, EPA collected two rounds of vapor samples. The first round of sampling in April included sub-slab samples collected underneath the concrete slabs at four commercial buildings on the west side of the Roosevelt Field Mall.

Based on the first round of results, in June 2007 EPA collected a second round of sub-slab and indoor air samples at six commercial buildings at the Site. Also in June 2007, EPA collected sub-slab samples at seven homes located west of Clinton Road adjacent to the Roosevelt Field Mall.

The OU1 ROD called for additional evaluation of residential and commercial buildings to determine the extent of the vapor intrusion impacts. To address this component of the OU1 ROD, in December 2007, EPA collected sub-slab and indoor air samples at four commercial properties. At two additional commercial properties, only indoor air samples were collected. In addition, sub-slab and indoor air samples were collected at seven residential locations; five previously sampled and two new locations, with a collocated sub-slab sample collected in one of these two residential properties. Based upon EPA and New York State Department of Health (NYSDOH) guidance in existence at that time, none of the indoor air samples in any of the structures were above levels of concern. In 2017, NYSDOH issued revised vapor intrusion guidance for both TCE and PCE, however this did not change the determination that soil vapor intrusion has not resulted in impacts to indoor air.

Human Health Risk Assessment

EPA conducted a four-step baseline human health risk assessment (HHRA) as part of OU2 to assess Site-related cancer risks and non-cancer health hazards in the absence of any remedial action. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (refer to the text box on the next page “What is Risk and How is it Calculated”).

WHAT IS RISK AND HOW IS IT CALCULATED?

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 releases under current- and anticipated 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 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 that 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 non-cancer 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 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 a site and are referred to as chemicals of concern, or COCs, in the final remedial decision document or Record of Decision.

The HHRA began with selecting chemicals of potential concern (COPCs) in groundwater that could potentially cause adverse health effects in exposed populations. The baseline risk assessment evaluated health effects that could result from exposure to contaminated groundwater through the ingestion of, dermal contact with, and inhalation of volatile contaminants while showering/bathing. Although residents and businesses in the area are served by municipal water, the aquifer at the Site is classified as Class GA (6 NYCRR § 701.18), meaning that it is designated as a potable drinking water supply that could be used for drinking in the future. Therefore, potential future exposure to groundwater was evaluated. Based on the current zoning and anticipated future use, the risk assessment focused on future Site workers and residents. In the unlikely event that untreated Site groundwater is used as drinking water, exposure to groundwater contaminated with TCE and PCE from ingestion, dermal contact, and inhalation would be associated with combined excess lifetime cancer risks that exceed EPA's target risk range of 10^{-4} to 10^{-6} and noncancer health hazard indices above the threshold of 1 as summarized in the table below. These cancer risks and noncancer health hazards indicate that there is significant potential risk from direct exposure to groundwater for future residents and Site workers. A more detailed discussion of the exposure pathways and estimates of risk can be found in the HHRA for OU2 in the Administrative Record of this action.

Future receptor	Cancer Risk*	Noncancer Hazard*
Resident (Adult/Child)	4E-04	65
Site Worker (Adult)	1E-04	7

*Cancer risks and noncancer hazards are the sum of TCE and PCE.

Ecological Risk Assessment

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 contaminated groundwater discharges to surface water, exposure pathways are not complete and ecological receptors are not exposed to contamination.

Conclusion

The results of the HHRA indicate that the contaminated groundwater presents an unacceptable exposure risk. Based on the results of the RI and the HHRA, EPA has determined that the actual or threatened releases of hazardous substances from the Site, if not addressed by the preferred remedy or one of the other active measures considered, may present a threat to human health or welfare or the environment. It is EPA's judgment that the Preferred Alternative identified in this Proposed Plan is necessary to limit potential human health risks from exposure to hazardous substances in the future.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) 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 RAOs have been established for contaminated groundwater for OU2:

- Prevent or minimize potential future human exposure to VOCs in groundwater through ingestion, dermal contact, and inhalation above levels that are protective of beneficial use (i.e. drinking water use);
- Restore the impacted aquifer to its most beneficial use as a source of drinking water; and,
- Minimize the potential for further migration of groundwater containing VOC concentrations above levels that are protective of beneficial use (i.e. drinking water use).

The preliminary remediation goals (PRGs) for groundwater are identified in Table 1.

Table 1: PRGs for Groundwater

Chemicals of Potential Concern (COPCs)	NYS Groundwater Quality Standards* (µg/L)	NYS Drinking Water Quality Standards **(µg/L)	National Primary Drinking Water Standards*** (µg/L)	**PRG** (µg/L)
cis-1,2-DCE	5	5	70	**5**
1,1-DCE	5	5	7	**5**
PCE	5	5	5	**5**
TCE	5	5	5	**5**
Vinyl Chloride	2	2	7	**2**

* 6 NYCRR § 703
** 6 NYCRR Part 5
*** 40 CFR 141

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) of CERCLA also establishes a preference for remedial actions that employ, as a principal element, treatment to reduce permanently and significantly 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 that 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 presented in this Proposed Plan for addressing the OU2 groundwater contamination are provided in the FS Report, dated February 2018.

The construction time for each alternative reflects only the actual time required to construct or implement the action and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, and procure the contracts for design and construction.

Common Elements

All of the alternatives, with the exception of the no action alternative, include common components.

Alternatives 2 through 4 include long-term monitoring to ensure that groundwater quality improves following implementation of these alternatives until clean up levels are achieved.

Alternatives 2 through 4 also include institutional controls that will rely on current groundwater use restrictions in the form of state and local laws. Specifically, Article IV of the Nassau County Public Health Ordinance prohibits the use of private wells where public water systems are available. The Site is serviced by public water systems. In addition, New York State Environmental Conservation Law Section 15-1527 prohibits the installation and use of public drinking water wells in Nassau County without a State permit. To ensure the remedy remains protective, the above State and County well restrictions will be relied upon until RAO's are achieved.

A Site management plan (SMP) would be developed to provide for the proper operation and maintenance (O & M) of the Site remedy post-construction, and would include long-term groundwater monitoring, institutional controls, periodic reviews, and certifications as applicable.

Additionally, because it will take longer than five years to achieve cleanup levels under any of the alternatives, CERCLA requires that a review of conditions at the site be conducted no less often than once every five years until such time as cleanup levels are achieved. Alternatives 2 through 4 will be subject to these five year reviews. These reviews are not considered part of the remedy; they are an independent requirement required by the Superfund law.

Alternative 1: No Action

Capital Cost:	$0
O&M Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

The NCP requires that a "No Action" alternative be developed and considered as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial action conducted at the Site. This alternative does not include any monitoring or institutional controls.

Because this alternative would result in contaminants remaining at the Site that are above levels that would otherwise allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, additional response actions may be implemented.

Alternative 2: Groundwater Extraction and Ex-Situ Treatment (Pump and Treat)

Capital Cost:	$5,080,000
Annual O&M Costs:	$650,000
Present-Worth Cost:	$13,140,000
Construction Time:	*1 to 2* years

This remedial alternative consists of the extraction of groundwater via pumping wells and treatment prior to discharge. Groundwater is pumped and treated to remove contaminant mass from OU2 areas of the aquifer with elevated concentrations of VOCs.

For the conceptual design, it is estimated that one extraction well would be installed in the intermediate (250-400 feet bgs) interval, downgradient of the highest contaminant concentrations identified in the OU2 RI. The extraction well would target active treatment of groundwater contaminated with levels of total VOCs in excess of 100 μg/L.

Extracted groundwater with VOC contamination is typically treated with either liquid phase granular activated carbon (GAC) or air stripping, or both. During the remedial design the treatment processes necessary to treat Site-related contaminants would be evaluated further. Extracted groundwater would be pumped from the extraction well to a new treatment plant constructed near Grove Street with a capacity of approximately 300 gallons per minute (gpm). Treated groundwater would then be discharged to a nearby recharge basin or reinjected to groundwater.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area. Natural processes, predominately dilution and dispersion, would be relied upon to achieve the maximum contaminant levels (MCLs) for areas not targeted for active remediation.

The conceptual design would be refined during the remedial design phase if this alternative is selected.

Alternative 3: In-Well Vapor Stripping

Capital Cost:	$5,260,000
Annual O&M Costs:	$678,000
Present-Worth Cost:	$13,670,000
Construction Time:	*1 to 2* years

This remedial alternative includes the installation of in-well vapor stripping systems in groundwater to provide contaminant mass removal and containment at OU2.

In-well stripping, also known as *in-situ* vapor or *in-situ* air stripping, is a technology for the *in-situ* remediation of groundwater contaminated by VOCs. In-well vapor stripping uses the principles of phase separation to transfer VOCs from the liquid to gas phase by aerating the contaminated water in the wellhead. Aeration can be accomplished by either injecting air into the water table or by using an air stripper mounted at the well head. Typically, extracted vapors are treated (if necessary) above grade and discharged to the atmosphere. Vapor treatment, if required, generally consists of vapor-phase granular activated carbon.

The in-well vapor stripping is a closed system where the contaminated groundwater is never exposed at the ground surface or the atmosphere. Typically impacted groundwater is pumped to the well head where it is treated and discharged or directly discharged back into the well. Once treated, the groundwater flows back into the aquifer through screens in the well that are typically located at the water table (unsaturated zone). In some in-well vapor stripping well configurations, the extraction and re-injection of groundwater from the aquifer induces a hydraulic circulation pattern that allows continuous cycling of groundwater through the treatment well. As groundwater circulates through the treatment system vapor is extracted and contaminant concentrations are reduced.

In-well vapor stripping can be implemented in different system configurations. For the purposes of developing a conceptual design and cost estimate for comparison with other technologies in the OU2 FS, a line of wells were configured at various depths along the median of Garden Street between Tremont Street and Grove Street, with a well spacing of approximately 400 feet to target groundwater contaminated with levels of total VOCs greater than 100 μg/L.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation.

The conceptual design would require further evaluation during the remedial design phase if this alternative is selected.

Alternative 4: In-Situ Adsorption

Capital Cost:	$10,700,000
Annual O&M Costs:	$232,800
Present-Worth Cost:	$14,560,000
Construction Time:	*1 to 3* years

This remedial alternative utilizes micron-size activated carbon injected through a series of injection wells to form permeable treatment barriers. The use of micron-size or colloidal activated carbon for *in-situ* adsorption is an innovative technology.

Under the conceptual design, micron-size activated carbon would be injected through a series of approximately 47 injection wells to intercept the contaminant plume along the open space south of Commercial Avenue and along the median of Garden Street between Tremont Street and Grove Street. Injection wells would be spaced approximately 35 feet apart and would target groundwater contaminated with levels of total VOCs greater than 100 μg/L. The injected activated carbon would form two permeable treatment barriers. As VOC-contaminated groundwater flows through the treatment barrier it would be adsorbed onto the activated carbon, which would minimize the migration of the OU2 contaminated groundwater. Other reagents, such as iron-based chemical reductant or slow release organic carbon could be injected with the micron-size activated carbon; promoting *in-situ* chemical or biological reaction within the treatment zone to regenerate the activated carbon.

For cost-estimating and planning purposes, an estimated remediation time frame of 30 years is used for developing costs associated with O&M activities. It is assumed that active remediation would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation.

During the remedial design further evaluations would be conducted to determine the long-term adsorption capacity of the activated carbon.

EVALUATION OF ALTERNATIVES

In evaluating the remedial alternatives, each alternative is assessed against nine evaluation criteria set forth in the NCP, namely overall protection of human health and the environment; compliance with ARARs; long-term effectiveness and permanence; reduction of toxicity; mobility, or volume through treatment; short-term effectiveness; implementability; cost; and state and community acceptance. Refer to the text box on the next page for a more detailed description of these evaluation criteria.

This section of the Proposed Plan evaluates the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. A detailed analysis of alternatives can be found in EPA’s FS Report, dated February 2018.

Overall Protection of Human Health and the Environment

Alternative 1 (No Action) would not meet the RAOs and would not be protective of human health and the environment since no action would be taken. Alternatives 2 through 4 are the active remedies that address groundwater contamination and would, in conjunction with the OU1 remedy, restore groundwater quality over the long-term. Alternatives 2 through 4, would also rely on certain natural processes to achieve the cleanup levels for areas not targeted for active remediation.

Protectiveness under Alternatives 2 through 4 requires a combination of actively reducing contaminant concentrations in groundwater and limiting exposure to residual contaminants through existing institutional controls for groundwater use restrictions until RAOs are met. Protectiveness under Alternatives 2 through 4 also relies upon the continued effective wellhead treatment at the supply wells impacted by the contamination to ensure that the water distributed by these wells continues to meet state and federal drinking water standards.

Institutional controls are anticipated to include existing governmental controls in the form of state and county well use laws prohibiting the use of groundwater for drinking purposes.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

EPA and NYSDOH have promulgated MCLs (40 CFR Part 141 and 10 NYCRR § 5-1.51, respectively), which are enforceable standards for various drinking water contaminants (and are chemical-specific ARARs). If any state standard is more stringent than the federal standard, then compliance with the more stringent ARAR is required.

The aquifer at the Site is classified as Class GA (6 NYCRR § 701.18), meaning that it is designated as a potable drinking water supply. As groundwater within OU2 is a source of drinking water, achieving MCLs in the groundwater is an ARAR.

Alternative 1 would not comply with ARARs. Action-specific ARARs do not apply to this alternative since no remedial action would be conducted.

Alternative 2 would achieve chemical-specific ARARs through extraction and *ex-situ* treatment of contaminated groundwater. Alternative 3 could achieve chemical-specific ARARs through in-well stripping of contaminants but would need to be demonstrated as successful in a pilot study. Alternative 4 would achieve chemical-specific ARARs through *in-situ* adsorption and potentially *in-situ* degradation processes; however, its long-term effectiveness needs to be verified in the field since it utilizes an innovative technology.

For Alternatives 2 to 4, location- and action-specific ARARs would be met through compliance with local construction codes, health and safety requirements, off-gas treatment requirements, if applicable, and water discharge criteria when applicable.

It is expected that the RAOs would be achieved in a time frame comparable to OU1 (35 years as identified in the OU1 ROD). Active remediation under Alternatives 2 through 4 would be employed in the targeted treatment areas until the MCL for each of the COPCs is attained within the targeted treatment area.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.

Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State/Support Agency Acceptance considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

Long-Term Effectiveness and Permanence

Alternative 1 would not provide long-term effectiveness and permanence since groundwater contamination would not be addressed. Alternatives 2 through 3 are considered effective technologies for treatment and/or containment of contaminated groundwater, if designed and constructed properly.

In conjunction with OU1, Alternatives 2 through 4 rely on a combination of treatment and institutional controls to achieve long-term effectiveness and permanence.

Alternative 2 would be more reliable than either Alternatives 3 or 4 as there is uncertainty whether in-well vapor stripping and *in-situ* adsorption could effectively remove contamination in areas where the contamination is at depths greater than 250 feet. Alternative 2 has been proven to be an effective technology in reducing the concentrations of VOC contaminated groundwater in the area addressed as part of OU1 based on EPA's sampling results.

Alternative 3, in-well stripping, is expected to be effective and reliable in significantly removing the VOC contamination in groundwater. However, the effectiveness of applying this technology at depths greater than 250 feet has not been demonstrated. The effectiveness of this alternative is limited by the radius of influence (ROI) of the treatment system. The ROI will depend on the pumping capacity of each stripping well and hydrogeologic characteristics of the aquifer in the OU2 area. The effectiveness of this alternative could also be limited due to the possibility that creation of a circulation cell may not be possible because of the potential influence from pumping of nearby public supply wells. Therefore, additional measures would be needed to provide multiple passes through the OU2 treatment system. A pilot study would be conducted to evaluate the ROI, to determine the effectiveness of in-well stripping and to obtain Site-specific design parameters prior to full-scale implementation.

The use of micron-size or colloidal activated carbon (Alternative 4) is an innovative technology that has the potential to significantly reduce contaminant concentrations in the *in-situ* treatment zones but has only limited application in the field. A pilot study would be conducted to collect site-specific implementation parameters. The distribution of activated carbon in the subsurface and the long-term adsorption capacity would have to be verified in the field through groundwater sampling and monitoring. Its permanence would need to be monitored and verified over time.

Alternatives 2 through 4 would control risk to human health through the implementation of institutional controls until RAOs are achieved.

Reduction of Toxicity, Mobility, or Volume (TMV) Through Treatment

Alternative 1, No Action, does not address the contamination through treatment, so there would be no reduction in TMV and the alternative does not include long-term monitoring of groundwater conditions. Alternative 2 would provide the greatest reduction of toxicity, mobility, and volume of contaminants through treatment of contaminated groundwater. Alternatives 3 and 4 would also reduce the toxicity and volume of contaminants through treatment, however would provide less reduction of mobility through treatment.

Alternative 2 removes contaminated groundwater via extraction and treats the contamination via air stripping at a treatment plant and is anticipated to be the most reliable at reducing TMV because it is a proven technology. Alternative 3 uses a system to remove the contaminants from groundwater *in-situ*, and provides chemical treatment for the collected vapor-phase contamination and is anticipated to be the next most reliable at reducing TMV because its effectiveness must be demonstrated and verified in a pilot study. Alternative 4 uses *in-situ* carbon adsorption to remove the contaminants from groundwater. Alternative 4 would be the least reliable at reducing TMV because it is less proven than even Alternative 3, the long-term adsorption capacity of the activated carbon is unknown and would have to be verified by long-term groundwater monitoring.

Short-Term Effectiveness

Alternative 1 would not have short-term impacts since no action would be implemented.

Alternatives 2 through 4 may have short-term impacts to remediation workers, the public, and the environment during implementation. Remedy-related construction (e.g., trench excavation) under Alternatives 2 (estimated construction timeframe of 1-2 years) and 4 (estimated construction timeframe of 2-3 years) would require disruptions in traffic and street closure permits. In addition, Alternative 2 and Alternative 3 (estimated construction timeframe of 1-2 years) have aboveground treatment components and infrastructure that may create a minor noise nuisance and inconvenience for local residents during construction.

Exposure of workers, the surrounding community, and the local environment to contaminants during the implementation of Alternatives 2, 3, and 4 is minimal.

Drilling activities, including the installation of wells for monitoring, extraction, and treatment for Alternatives 2, 3, and 4 could produce contaminated liquids that present some risk to remediation workers at the Site. The potential for remediation workers to have direct contact with contaminants in groundwater could also occur when groundwater remediation systems are operating under Alternative 2. Alternative 2 could increase the risks of exposure through ingestion, inhalation, and dermal contact of contaminants by workers because contaminated groundwater would be extracted to the surface for treatment. However, occupational health and safety controls would be implemented to mitigate exposure risks.

Among the active alternatives, Alternative 2 would have the lowest short-term impact to the community. Alternative 3 would have more short-term impacts to the community than Alternative 2 since more wells would be installed and the in-well stripping system would require more space for the installation of multiple well vaults to hold necessary equipment, valves, and fittings. Operation of the in-well stripping system might generate noise that could be harder to mitigate. Alternative 4 would have the greatest short-term impacts to the local community during construction due to the significant number of injection wells (47) to be installed; requiring traffic control over a longer period of time compared to Alternatives 2 and 3.

For Alternatives 2, 3, and 4, implementation of a health and safety plan, traffic controls, noise control and managing the hours of construction operation could minimize the impacts to the community. Health and safety measures would also be implemented during operation and maintenance activities to protect Site workers.

Implementability

Alternative 1 is no action, and therefore would be the easiest of all the alternatives to implement. Alternatives 2 through 4 are all implementable, although each present different challenges.

Groundwater extraction and treatment is a well-established technology that has commercially available equipment and is implementable. Because of the densely populated area there are limited locations for placement of a treatment plant. The conceptual design considered Town-owned property for the construction of the treatment plant and a nearby County-owned recharge basin for the discharge of the treated water.

Of the three active remediation alternatives, Alternative 2 would be the easiest alternative to construct since this technology has been implemented under OU1 and would require less disruption in residential areas. Because of the densely populated area there are limited options for the placement of the in-well stripping well network. The conceptual design considered installation of the wells in the median along Garden Street and curbside right-of-ways in the surrounding area. The final configuration of the in-well vapor stripping well network would be determined during the design.

The large hydraulic influence from public supply wells present in the area could potentially impact the ability to establish the necessary groundwater circulation cell across the treatment zone to successfully implement this alternative. Furthermore, under Alternative 3, at the depth of the deepest contamination (400 feet bgs) effective operation of in-well stripping systems has not been previously documented. Additionally, under Alternative 3, the depth of the contamination (estimated to be between approximately 250 to 400 feet bgs) increases the design challenges of the in-well vapor system. There are practical limitations to the depth that the compressed air can be injected into the aquifer which would result in vapor stripping being conducted effectively.

Alternative 4 would be the most difficult to implement as the technology is the least proven and construction activities would result in the greatest disruption in residential areas since this alternative would require installation of a significant number of wells (47) and associated infrastructures within roadway right-of-ways.

Alternatives 2 through 4 would require routine groundwater quality, performance and administrative monitoring including five-year CERCLA reviews.

Cost

The estimated capital cost, O&M, and present worth cost are discussed in detail in the February 2018 OU2 FS Report. For cost estimating and planning purposes, a 30-year time frame and a discount rate of 7% was used for developing present worth costs under Alternatives 2, 3, and 4. The cost estimates are based on the available information. Alternative 1 (No Action) has no cost because no activities would be implemented. The highest present worth cost is Alternative 4 at $14.56 million. Of the three alternatives with active remedial components, Alternative 2 is the least expensive at $13.14 million. The estimated capital, O&M, and present-worth costs for each of the alternatives are as follows:

Alternative	Capital Cost ($)	Annual O&M Cost ($)	Present Worth Cost ($)
1 No Action	0	0	0
2 Pump & Treat	5,080,000	650,000	13,140,000
3 In-well Vapor Stripping	5,260,000	678,000	13,670,000
4 *In-situ* Adsorption	10,700,000	232,800	14,560,000

State/Support Agency Acceptance

NYSDEC has consulted with NYSDOH and concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and all comments are reviewed. Comments received during the public comment period will be addressed in the Responsiveness Summary section of the ROD for OU2. The ROD is the document that will formalize the selection of the OU2 remedy for the Site.

PREFERRED REMEDY

Based upon an evaluation of the remedial alternatives, EPA, with the concurrence of NYSDEC, proposes Alternative 2 (Groundwater Extraction and Ex-situ Treatment (Pump and Treat)) as the preferred remedial alternative for OU2. Alternative 2 has the following key components:

- Extraction of groundwater via pumping and ex-situ treatment of extracted groundwater prior to discharge to a recharge basin or re-injection to the aquifer;
- Implementation of institutional controls; and
- Long-term groundwater monitoring.

Active remediation elements would be designed to achieve the RAOs in conjunction with OU1, by establishing containment and effectuate removal of contaminant mass where concentrations of total VOCs are greater than 100 µg/L. The extraction and treatment system would operate until remediation goals are attained in OU2. Natural processes would be relied upon to achieve the MCLs for areas not targeted for active remediation. Figure 2 provides the conceptual locations of the treatment plant, extraction wells, and discharge of the treated groundwater. The exact number and placement of extraction wells, the treatment processes, as well as the location of the treatment plant and discharge of the treated groundwater would be determined during the remedial design.

A long-term groundwater monitoring program would be implemented in conjunction with OU1, to track and monitor changes in the groundwater contamination to ensure the RAOs are attained. The results from the long-term monitoring program would be used to evaluate the migration and changes in VOC contaminants over time.

Institutional controls to ensure that the remedy remains protective until RAOs are achieved for protection of human health over the long term. Institutional controls are anticipated to include existing governmental controls in the form of state and county well use laws prohibiting the use of groundwater for drinking purposes.

A SMP would also be developed and would provide for the proper management of the Site remedy for OU2 post-construction, and would include long-term groundwater monitoring, institutional controls, periodic reviews, and certifications, as applicable.

The environmental benefits of the preferred alternative may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.[2] This would include consideration of green remediation technologies and practices.

The total estimated, present-worth cost for the selected remedy is $13,140,000. Further detail of the cost is presented in Appendix A of the FS Report. This is an engineering cost estimate that is expected to be within the range of plus 50 percent to minus 30 percent of the actual project cost.

While this alternative would ultimately result in reduction of contaminant levels in groundwater such that levels would allow for unlimited use and unrestricted exposure, it is anticipated that it would take longer than five years to achieve these levels. As a result, in accordance with CERCLA, the Site remedy is to be reviewed at least once every five years until remediation goals are achieved and unrestricted use is achieved.

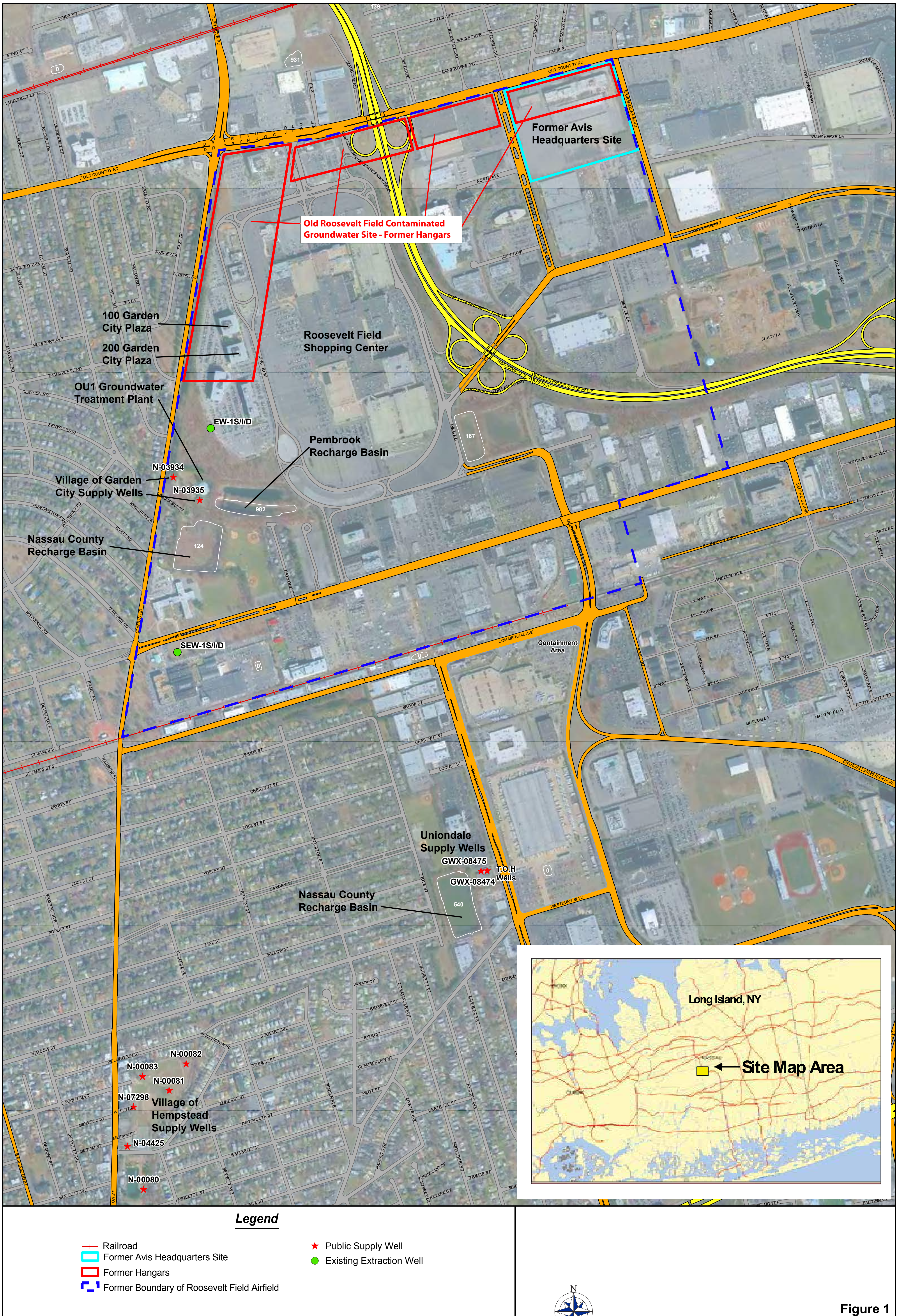
[2] See http://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf.

Basis for the Remedy Preference

Alternative 2, extraction and treatment, is a proven technology which has demonstrated effectiveness at reducing contaminant mass and providing containment to achieve cleanup standards for VOC-contaminated groundwater. While Alternative 3, in-well vapor stripping, is also a proven technology to actively remediate VOC-contaminated groundwater, the depths of the groundwater contamination targeted for remediation increase the design challenges of any in-well vapor stripping system. Alternative 4, *in-situ* adsorption, is an innovative technology that would require greater testing and evaluation to determine the long-term adsorption capacity 0f the activated carbon to treat the VOC-contaminated groundwater.

Although the densely populated residential area poses some logistical challenges to the implementation of each active remedial alternative, EPA believes that Alternative 2, which would require access to install extraction wells, construct a treatment plant, and discharge the treated water to a recharge basin, would be the least disruptive to local residents.

Based upon the information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. The preferred alternative satisfies the following statutory requirements of Section 121(b) of CERCLA: 1) the proposed remedy is protective of human health and the environment; 2) it complies with ARARs; 3) it is cost effective; 4) it utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) it satisfies the preference for treatment. Long-term monitoring would be performed to assure the protectiveness of the remedy. With respect to the two modifying criteria of the comparative analysis, state acceptance and community acceptance, NYSDEC concurs with the preferred alternative, and community acceptance will be evaluated upon the close of the public comment period.



CDM Smith

Source: Nassau County Geographic Information System

Figure 1
Site Location Map
Old Roosevelt Field
Contaminated Groundwater Area Site, Operable Unit 2
Garden City, Nassau County, New York

Legend

- Monitoring Well
- Extraction Well
- Nassau County Monitoring Well
- Multi-port Well
- Municipal Supply Well
- PCE OU2 Isocontour Inferred
- TCE OU2 Isocontour Inferred

Figure 2
Conceptual Design for Alternative 2
Pump and Treat
Old Roosevelt Field Contaminated Groundwater
Area Site, Operable Unit 2
Garden City, Nassau County, New York

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ATTACHMENT B

PUBLIC NOTICES:

Commencement of Public Comment Period
Rescheduled Public Meeting

EPA Invites Public Comment on Proposed Plan for Cleanup of the Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Nassau County, NY

The U.S. Environmental Protection Agency has issued a Proposed Plan for the Old Roosevelt Field Contaminated Groundwater Area Superfund Site in Garden City, New York. A 30-day public comment period on the Proposed Plan, which identifies the EPA's preferred cleanup plan and other cleanup options that were considered by EPA, begins on February 23, 2018 and ends on March 26, 2018.

EPA's preferred cleanup plan consists of extraction and on-Site treatment of contaminated groundwater, long-term monitoring and institutional controls. The treated groundwater effluent either would be discharged to a recharge basin or re-injected to groundwater.

During the public comment period, EPA will hold a public meeting to receive comments on the preferred cleanup plan and other options that were considered. The meeting will be held on Wednesday, March 7, 2018, at 7:00 PM at the Village of Garden City Village Hall, 351 Stewart Avenue, Garden City, NY.

The Proposed Plan is available at www.epa.gov/superfund/roosevelt-field-groundwater or by calling Cecilia Echols, EPA's Community Involvement Coordinator, at (212) 637-3678 and requesting a copy by mail.

Written comments on the Proposed Plan, postmarked no later than March 26, 2018, may be mailed to Sherrel Henry, EPA Project Manager, USEPA, 290 Broadway, 20th floor, New York, NY 10007-1866 or emailed no later than March 26, 2018 to henry.sherrel@epa.gov.

The Administrative Record file containing the documents used or relied on in developing the alternatives and preferred cleanup plan is available for public review at the following information repositories:

Garden City Public Library, 60 Seventh Street, Garden City, NY 11530, Hempstead Public Library, 115 Nichols Court Hempstead, New York 11550 and EPA Region 2 Superfund Records Center, 290 Broadway, 18th Floor, New York, NY 10007

Public Meeting Rescheduled for EPA's Proposed Cleanup of the Old Roosevelt Field Contaminated Groundwater Area Superfund Site
Garden City, Nassau County, NY

The U.S. Environmental Protection Agency has issued a Proposed Plan for the Old Roosevelt Field Contaminated Groundwater Area Superfund Site in Garden City, New York. A 30-day public comment period on the Proposed Plan, which identifies the EPA's preferred cleanup plan and other cleanup options that were considered by EPA, began on February 23, 2018 and ends on March 26, 2018.

EPA's preferred cleanup plan consists of extraction and on-Site treatment of contaminated groundwater, long-term monitoring and institutional controls. The treated groundwater effluent either would be discharged to a recharge basin or re-injected to groundwater.

During the public comment period, EPA will hold a public meeting to receive comments on the preferred cleanup plan and other options that were considered. Due to the winter storm, the meeting originally scheduled for Wednesday, March 7, 2018 has been rescheduled for Tuesday, March 13, 2018, at 7:00 PM at the Village of Garden City Village Hall, 351 Stewart Avenue, Garden City, NY.

The Proposed Plan is available at www.epa.gov/superfund/roosevelt-field-groundwater or by calling Cecilia Echols, EPA's Community Involvement Coordinator, at (212) 637-3678 and requesting a copy by mail.

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ATTACHMENT C

MARCH 13, 2018 PUBLIC MEETING TRANSCRIPT

ENVIRONMENTAL PROTECTION AGENCY

Proposed Cleanup of the Old Roosevelt Field Contaminated Groundwater Area Superfund Site

Public Hearing

Village of Garden City
Village Hall
351 Stewart Avenue
Garden City, New York

Wednesday, March 13, 2018
7:00 p.m.

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

SHERREL HENRY, Remedial Project Manager
PETER MANNINO, Chief, Western New York Remediation Section
CECILIA ECHOLS, Community Involvement Coordinator

RALPH V. SUOZZI, Village Administrator

ALSO PRESENT:

Abbey States, Physical Scientist
Environmental Protection Agency
Elizabeth Leilani Davis, Asst. Regional Counsel

Heather Bishop, DEC
John Swartwout, DEC

* * *

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MR. SUOZZI: Good evening, everyone, and welcome to Garden City Village. I am Ralph Suozzi, the Village Administrator.

I just want say thank you for being here this evening. I want to let you know that while Garden City is happy to host this meeting in our Village Hall, this is the meeting that is a public meeting for the Environmental Protection Agency, with various questions at a public meeting, for your education. So I will turn it over to them.

Thank you.

MS. ECHOLS: Good evening, everyone. I am Cecilia Echols and I am Community Involvement Coordinator for the Old Roosevelt Field contaminated groundwater area Superfund site. I want to thank you all for coming this evening.

Tonight's meeting is to address the groundwater contamination which is part of the Operable Unit 2. This meeting was originally scheduled for March 7th, but due

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to the weather we rescheduled for tonight. So that's why the meeting is tonight, and it was also advertised in the Garden City News for the March 7th meeting and for the March 13th, and there was also an article written in the Newsday newspaper about this meeting tonight.

Community Involvement is a program designed for communities to be engaged and involved in the decision-making process. During this public comment period, which ends on March 26th, there is an opportunity for you to read through the documents that we are going to present tonight, for you to weigh in on how we would like to clean up the area, and hear from you all about your proposals and maybe you are in agreement with us on that.

As I said, the public comment period ends on the 26th of this month. It started on February 23rd. There are three information repositories where you can receive information about this site: One is the Garden City Public Library; the second

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is the Hempstead Public Library; and the EPA office in Manhattan.

Tonight we have several people here who may or may not speak, but I will introduce you to each person. As I said, I am Cecilia Echols.

This is Sherrel Henry. She is the Project Manager.

Pete Mannino, he is also with EPA. He is the Western New York Remediation Section Chief.

We have Abbey States. She is the EPA Risk Assessor.

Leilani Davis, she is the Region 2 Attorney.

Heather Bishop, she is with New York State DEC, she is a Project Manager.

And John Swartwout, he is with New York State DEC, and he's a section chief. He is sitting in the back.

EPA will present the conclusions of the remedial investigation feasibility study. EPA will present and discuss the proposed plan. There are several in the

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back on the table, but there is also a website you can go to, to retrieve it at your leisure. We will take all of the public comments until March 26th.

We will hold all of the questions until the end of Sherrel's presentation and when you do want to ask a question, please stand up and state your name. Everything is being recorded by the stenographer, Monique tonight.

Thank you.

MS. HENRY: Good evening, Ladies and Gentlemen. Like Cecilia said, I am Sherrel Henry and I am the Project Manager for the Roosevelt Field contaminated groundwater area Superfund site.

The meeting agenda: We can give an overview of the Superfund program and then I will give you a site background and the work that was conducted at the site. I will go over that, and a feasibility study, the alternatives that EPA considered will be discussed. Then, the preferred remedy, EPA's preferred remedy will be presented.

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Then, as Cecilia said, at the end we will take questions and comments.

First, Superfund's overview: Years ago people did not really understand how certain waste could affect our own health and the environment. So what happened, that many wastes were dumped underground in the rivers or were left out in the open. This resulted in thousands of uncontrolled hazardous waste sites. So in response to that, and because of all of this toxic waste disposal disaster, Congress passed the Superfund law in 1980.

What this law does is provide federal funding so that EPA could clean up hazardous waste sites. It also allows the EPA to respond emergencies involving hazardous substances, and it allows EPA to compel potential responsible parties, parties that may have been responsible for causing the problem, it allows us to compel them to pay for the cleanup.

So I will go to the Superfund cleanup process: So the first -- Superfund begins

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when a site is discovered. How can a site be discovered? It can be discovered by state or local agencies like EPA, like businesses, or even by citizens like yourself.

So once it's discovered, EPA makes an assessment to determine, you know, are we going to do early action, which if there is imminent danger then EPA will take an early action to mitigate that danger; or if it is going to be long term, a long-term action -- a long-term action, they're longer and they are done in phases.

So once a site is discovered, there is a scoring system that EPA uses to find out -- you know, if a site scores high enough, then it gets placed on the National Priorities List. Basically the National Priorities List is just a list of hazardous waste sites all across the country. So for long-term actions, long-term actions is, you know, an extensive process.

The first step would be a remedial investigation. That's where, well, you have to determine where the contamination is located. So groundwater samples are taken, soil samples, samples of the air, just to determine what the contamination is in the various medias.

So once that is done, EPA, based on the information that we find, EPA assesses the risk that may be -- you know, that the chemicals that we found may be causing. That's called the "risk assessment." And then, you know, once you find the problem, now we have to figure out how we are going to address that problem. So that portion is called the "feasibility study," where you look at different alternatives based on the contamination that you find. You find an alternative that can address that contamination. That is the feasibility study.

So the information that EPA gathers from the remedial investigation, the risk assessment and the feasibility study, we then develop a proposed plan, which is why we are here tonight. We develop a proposed

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plan to let you guys know of all the alternatives that were evaluated and tell you about EPA's preferred alternative. Once the comment period -- and the comment period is usually 30 days -- once that is done and we address the community's comments, then a record of the decision or a cleanup document, the document that documents the cleanup option that we are getting to, to clean up the site, that's the record of decision.

Once the cleanup option is chosen, then, now we have to design that remedy and then, which is the remedial, it's called the remedial design. When you design -- whatever cleanup option that we choose, you have to design it, and construction of that remedy is called the "remedial action." And for remedies, once it's constructed, we have to make sure that, you know, you have to monitor it until whatever cleanup goals are set. You monitor it until those are met.

Five-years reviews are also conducted. Every five years if there is

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still, if we haven't met the cleanup goals, you want to assess and make sure that the remedy is still protective of human health and the environment. The ultimate goal is to be able to delete the site from the National Priorities List, so that it can be reused.

So I am going to give you a little site background. I apologize that you can't really -- so the Old Roosevelt Field Contaminated Groundwater Area Site is located in the Village of Garden City and it's an area of groundwater contamination in the Village of Garden City. This groundwater contamination is associated with the former Roosevelt Field Airfield and this area in blue, that's the outline of where the former airfield used to be.

These are hangers that were located at the site where repairs of the various planes were conducted. The former airfield is now the location of the Roosevelt Field Mall, which is located here (indicating), and there are office buildings located right

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near Clinton Road.

Let me back up a little. I know in this direction, this is Clinton Road, this is to the west. Going in this direction is east, this is south, and that's north. So the border of the site is located just east of Clinton Road, south of Old Country Road and it extends to the east, beyond the Meadowbrook Parkway.

There are two recharge basins located in the area of the old Roosevelt Field Airfield. This is the Pembrook 1, this is a private recharge basin, and this is Nassau County Basin 124. In addition, there are various public supply wells located within the vicinity of the site.

These are the Garden City, Village of Garden City public supply wells 10 and 11. Hempstead wells are located to the south of the site and the Uniondale supply wells are located just south and east of the site.

I would like to point out, since this map is out I would like to point out the features on this site: So EPA is

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conducting, is addressing this site in two different phases. The first phrase is what we are referring to as Upper Unit 1. Upper Unit 1, the investigation is centered in this area going down, and what we are here to discuss tonight is Upper Unit 2. Upper Unit 2 is located just east of the Upper Unit 1 area.

Upper Unit 1, a remedy was selected for that Upper Unit, which was extraction, treatment and discharge to recharge basin 124 that I mentioned before. There are six extraction wells. I will go into a little more detail in my next presentation on Upper Unit 1.

MS. RYDZEWSKI: I am having a very hard time reading it.

MS. HENRY: Do you have a copy of the proposed plan? If you look at the back of the proposed plan. This is Old Country Road. So the site is located just south of Old Country Road, right here. This is Clinton Road, and the site is located just to the east of Clinton Road. This is

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Stewart Avenue, right? This is located right here. And the Old Roosevelt Field extends as far as Commercial, Commercial Avenue.

MS. RYDZEWSKI: I am curious about how far the --

MS. HENRY: I will get to that. This is just to give you an idea of the layout of the site. I will give you a brief history of the site.

So from 1911 to 1946, U.S. military, that is Navy, Army and Navy, used the Roosevelt Field for aviation activity. The field was also used as a commercial airport until 1951. So from 1951 to 1980, the area, that area that was outlined in blue, was also used for various defense and civilian-related manufacturing.

These slides are going to be made available on the EPA website. So you will be able to see it tomorrow. So you probably don't have to take a picture.

So tetrachloroethylene, which is referred to as PCE and trichloroethylene,

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which is referred to as TCE, these are volatile organic compounds and these are the contaminants of concern at the Old Roosevelt Field site. We believe that these chemicals were likely used during and after World War II, as part of the maintenance of the aircraft.

In 1987, the Village of Garden City installed an air stripping system to treat water from two public supply wells, which is wells 10 and 11. The more recent history, in May of 2000, the site was listed on the National Priorities List -- which I discussed that earlier -- and from 2001 to 2007, EPA conducted an investigation of soil, groundwater and soil gas in the western portion of the site. That's the area that is closest to Clinton Road, that area which is what is we are referring to as Upper Unit 1.

So in September of 2007, EPA selected the cleanup option for Upper Unit 1, and that was groundwater extraction and treatment to restore the groundwater, and

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then, when the water was treated it was recharged to recharge basin 124, that I showed you in the previous picture. So once the rider was signed, then we did the design and remedial action.

To assess what was going on at the site, we put in some additional monitoring wells. Those monitoring wells were installed to the eastern portion of the Old Roosevelt Field Mall area. The result from that study showed that there was additional contamination that wasn't being addressed by the Upper Unit 1 remedy; so that's why we came up with Upper Unit 2, which is contamination associated to the eastern portion of the Old Roosevelt Field airfield, former Roosevelt Field airfield.

Like I said, the remedy for Upper Unit 1 was selected and it's been installed, and they're extraction wells. Extraction wells, basically what happens with that is that you have to extract the water from the ground, so that you can pipe it, underground piping to a treatment plant. So this was

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done in 2010. So there are six extraction wells located by the Garden City Mall. There are three extraction wells located here. Those, they are underground and people park, actually park on these extraction wells because they're in the ground, so no one really sees them.

The treatment plant has been in operation since 2012, and that's located right near the Village of Garden City wells 10 and 11. Like I said, the remedy for the site has been in operation since 2012, and there are also three additional extraction wells located in this area. I am not sure if when you drive by you would notice them, but they are just to the east of the Chase Bank. That work was completed in 2012. So what happened is that the extraction well in this area wasn't addressing contamination that we found in this area, so in 2012 EPA installed additional extraction wells and the extraction wells, the piping was installed and it went under Stewart Avenue and piped back to the treatment plant

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located on the Old Roosevelt Field property.

So six extraction wells were installed to remove and treat contamination. As part of the monitoring -- we have to monitor what is going on -- so there are 13 multiport wells being used to monitor contamination at the site, and multiport wells are basically -- you put one well in and then you could sample at different locations at different depths. So there are 13 multiport wells and nine single-screen wells that are being sampled to monitor what is going on with the remedy.

So now we'll talk about the OU2 remedial investigation: Like I said before, the OU2 study area is located east of the OU1 study area, and RI activities involve evaluating existing wells to be used as part of this investigation, and groundwater screening was performed so that we could determine the location of permanent wells. So 12 additional monitoring wells, in addition to the ones that were installed for the first Upper Unit; the first additional

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wells were installed and two rounds of groundwater sampling was collected.

So the results of the sampling: So samples were taken in different zones, what we call shallow zones, which is anything above 250 feet below-ground surface, and then intermediate zones and deep zones. So results for the shallow zones, and this is PCE, tetrachloroethylene contamination, that is one of the contaminate concerns for the site. So concentrations were detected up to 210 micrograms per liter and the cleanup goal for PCE's would be 5 micrograms per liter, and the area of contamination is going towards the south, which is moving with the groundwater flow.

So we plotted the TC's and PC's separately, but this is also from the shallow zone, and TCE was detected up to 41 micrograms per liter and for TCE, the cleanup goal is also 5.

The intermediate zone, which is where we found the bulk of the contamination for OU2, that zone is between 250 and 400 feet

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below ground surface. Like I said, this is where we found the highest concentration. PC was detected at concentrations up to 600 micrograms per liter. And, again, contamination is flowing in the groundwater which flows to the south.

TC, of all the Zones, the TC concentration was also higher in intermediate zones than in the other zones, but TC was not as high as the PC's and it was detected at concentration up to 120 micrograms per liter and, again, the cleanup goal is 5.

Contamination that was detected in the deep zone, which is just a little bit above the cleanup standards and the deep zone is anything greater than 400 feet below ground surface, and PC was detected at 50 micrograms per liter. TC was detected at a lower concentration, close to the cleanup goal of 5. So it was detected at 7.1 micrograms per liter.

So once we collected that data, a risk assessment was done to evaluate the

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threat to human health and the environment and currently there is no one drinking the water that we sampled as part of this study. No one is currently drinking that water, so we evaluated future residents and site workers and if they were drinking contaminated groundwater, then this would present a risk, but like I said, currently no one is drinking that water that we sampled.

The cancer risk and non-cancer hazard for both the future residents and site workers exceeded EPA threshold values. That's if someone -- if you drink, if someone came in contact with the water that we sampled in the ground, then it would present a risk, but currently there is no one drinking that water.

MR. COLASUENO: Daniel Colasueno, C O L A S U E N O.

At what level are we pumping the water to the wells? These are wells that service the residential areas in that neighborhood. At what elevation or what

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depth?

MS. HENRY: Are you talking about for your drinking water?

MR. COLASUENO: For homeowners.

MS. HENRY: For your drinking water, I am not really sure, but I think it's below --

MR. COLASUENO: Below the 400 feet.

MS. HENRY: I'm not sure. I think that information would probably be on the website, but at this time I don't know.

MR. FLAHERTY: Mike Flaherty, Nassau County Department of Public Works.

The wells that are in that area are greater than 450 feet for the most part. There are two wells in Uniondale, I think they're 457 to 525, something like that. Down in Hempstead you also have wells that are deeper. So for the most part they are below the intermediate zone and they are down in the deep zone.

MS. HENRY: Keep in mind that for your drinking water there is a treatment system and the water that is coming out of

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the well that is distributed to people for drinking, there is a treatment system, and that treatment system, if there is contamination, it takes care of it, and the water that is actually being distributed meets all EPA and state guidelines.

MR. MANNINO: Could I just say, could we just hold off the comments until the presentation is complete, I would appreciate it. Thank you.

MS. HENRY: I am almost done. Feasibility study and one more to go.

The feasibility study actually looks at different methods to clean up. Since volatile organic compounds, that's the containment concern, we looked at alternatives that would be able to clean up, strip the volatile organic compounds. So we looked at four alternatives. No action alternative is required by law and it's just that we have a baseline of comparison for the other alternatives.

So I will turn to the groundwater extraction and ex situ treatment which is

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referred to as "pump and treat." This was selected for Upper Unit 1. Upper Unit 3, in-well vapor stripping, which is air stripping, but it's in the well; the water does not come above ground. And in-situ absorption, contamination is absorbed along carbon.

So there are common elements to alternatives 2, 3 and 4, there are common elements, like they each should include institution of control and this control would restrict anyone from putting in a private well that would come in contact with contaminated groundwater, and long-term monitoring, just to ensure that cleanup levels are being achieved.

I will turn to alternative 2, which is pump and treat: Groundwater extraction well would be installed at 410 feet depth, which is where we found the bulk of the contamination. This extraction well will be flush mount; flush mount so that at grade, if you drive by, you wouldn't be able to see it, and yard piping, which would be

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underground piping, would then lead from the extraction well, to go to a treatment plant and then the discharge. Once the water gets to the treatment plant and it's treated, it will be discharged to a recharge basin, which would be located near the extraction well. System operation and maintenance would be required just to ensure that there are no problems, and if there are problems, we could fix them.

Alternative 3, in-well stripping: It's envisioned as part of the conceptual design, that we will have three injection wells, each at 450 feet deep, and then there would be piping back to a treatment system to treat the vapors that will be stripped from this contaminated water. This remedy would also require system operation and maintenance.

Upper Unit 4 -- Alternative 4, in-situ absorption: For this you would have injection wells in this area, so there would be like a curtain of injection wells and groundwater would flow. As groundwater

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flows past these curtains, the contamination the DOT would be there to deactivate the carbon, and this is also done in-situ. It's envisioned that there would be approximately 47 injection wells, from the conceptual design.

So once you come up with a set of alternatives that can clean up the contamination that we find, then we have to compare these alternatives against EPA's nine cleanup -- nine criteria for selecting a cleanup plan. EPA uses these nine criteria to evaluate the various remedial alternatives which were presented in the feasibility study.

So the first two criteria are what we call threshold criteria. What this means is that EPA will not select a remedy that does not meet these two requirements and for overall protection of human health and environment, it just answers the question: Will this remedy protect you, the plants and animal life on or near the site? EPA will not choose a remedy that does not satisfy

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this criteria.

Compliance with applicable or relevant and appropriate requirements -- that's a lot of words, but all it means is: Does the alternative meet all federal and state environmental statutes, regulations and requirements. Again, unless the alternative meets this criteria, then EPA would not select it.

The next five criteria is what we call the balancing criteria. Basically, this is a trade off of the alternatives, like you compare pros and cons to each alternative and determine which one is best. So alternative 3, long-term effectiveness and permanence, will the effect of the cleanup last or could contamination cause future risk?

Criteria 4, reduction in toxicity, mobility and volume through treatment, which is -- that's a mouthful, but basically you're answering the question: User's treatment, does the alternative reduce the harmful effects of the contaminant? Does it reduce the spread of the contaminant, and the amount of the contaminant in the same material?

Short-term effectiveness: How soon will the site risk be adequately reduced? Could the cleanup cause short-term hazards to workers, residents, or the environment? Implementability is the alternative, is it technically feasible? Do you have the goods and services necessary for implementing the cleanup plan? Can you implement it? That's a very important criteria? And the cost, what is the total cost of an alternative over time.

The next two criteria are what we call the modifying criteria, which are basically -- you know, based on input from the community and from the state, the EPA proposal could be changed or modified, and for state acceptance, do state environmental agencies agree with the EPA proposal. For this site, the state does agree with EPA's proposed remedy.

Community acceptance, which is the

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last criteria: Acceptance of the preferred alternative will be assessed after the close of the comment period, which is March 26th.

So the cost of each of the alternatives are:

There is no action. There is no action so there is no cost for that one.

Alternative to pump and treat: Capital cost, the capital cost for these sites, if you notice that alternative 4, the up-front cost is high, 10.7 million; whereas for the other two alternatives they are comparable.

And the total cost of the remedy, alternative is 13.1, they are all in range. Just the one that stands out is the capital cost alternative for 10.7 million.

EPA -- we are almost done with the agenda -- EPA preferred remedy: So based on an evaluation of the nine criteria, EPA's preferred remedy is alternative 2. It's a proven technology, with a demonstrated effectiveness. Like I said, that was the remedy that was selected for Upper Unit 1,

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for the cleanup plan from 2007, and levels of contamination, based on sampling that was done, they are decreasing. This remedy would be the least disruptive to the community. There may be temporary road closures in areas of high traffic density, but EPA would work with the community to mitigate these impacts during the remedial design.

Like I said, alternative 2, with the comparison of the alternatives, EPA felt that it met the threshold criteria and provided the best balance and trade off among the other alternatives, with respect to the five balancing criteria. So this is why EPA's preferred alternative is alternative 2.

So like I said before, the comment period, comments should be submitted to EPA no later than March 26th, and they can be sent to, addressed to me or you could send the comments by e-mail to: Henry.sherrel@epa.gov.

Thank you.

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MS. ECHOLS: Thank you, Sherrel.

We are going to open up for questions and we are going to pass the mike around. Is there anyone who has a question?

Would you please state your name?

MS. OWEN: Melissa Owen. I actually have two questions. The first one is: I live in the area, the containment area, and I do grow vegetables in my backyard. Should I be concerned about watering them with contaminated water?

MS. HENRY: I don't think there's contaminated water. It's not coming from the ground. Your water is coming from the Village.

MS. OWEN: Even the sprinklers?

MS. HENRY: Yes.

MS. OWEN: The second question is: Who pays the capital cost and the containment cost.

MS. HENRY: Normally what happens is, you try to find potentially responsible parties, right? So far we haven't been able to. We are still, that process is still

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ongoing. We are trying to locate potentially responsible parties that could possibly pay for this site.

If we don't find them, then the Superfund, that law gives us the ability to use fund money to clean up the site. So it's either PRP's if we find anyone or if not, the EPA would pay for it, which is what was done at the Upper Unit 1.

MR. MANNINO: Sherrel, if I can just add to that: On funding projects, typically EPA pays 90 percent of the construction costs and New York State pays 10 percent under the agreement they have with the EPA.

MS. RYDZEWSKI: I'm Margie Rydzewski.

I understand that you tested the water at various depths.

MS. HENRY: Yes.

MS. RYDZEWSKI: How was the soil? How was the air? Can I walk on the grass comfortably with my children running around barefoot? Can my pets do the same? Those are some of my questions.

MS. HENRY: The site is an area of

groundwater contamination. So for Upper Unit 1, the soil at the former airfield, that was tested and there was nothing, we didn't find anything in the soil. But the soil in your yard, like I said, the site is where the mall is, that area that was outlined in blue, and the contamination is deep, so it wouldn't affect your walking in the grass.

MR. MANNINO: I would like to just like to add something to what Sherrel mentioned.

So, as she discussed, we do a comprehensive risk assessment, that is potential exposure pathways where people or the environment can be impacted by the site. The only potential completed exposure pathway for this site is for future consumption of water. So currently that exposure pathway is not complete. The Village provides, has an engineered treatment system for the distribution of water and there are no other exposure pathways.

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So what we are talking about today, and I recognize your concern, is for the future potential for consumption of drinking water. That's the only completed exposure pathway that is at this site.

MS. RYDZEWSKI: So you are telling me that everything else is safe, is still safe.

MR. MANNINO: From this site.

MS. RYDZEWSKI: From this site, okay.

Now you also show areas in Garden City that concern me, that are very close to the park. I would assume that that would be no worry as well then, if you are saying that we don't have to worry about the air quality, we don't have to the worry about the soil? I mean, it's much deeper feet that we are to be concerned with and the concern is the drinking water?

MS. HENRY: Drinking up the groundwater and currently no one is drinking that water, but when we do the risk assessment, we have to, you know, could someone put a well in? You know, you have to, you're concerned --

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MS. RYDZEWSKI: That would not happen in this town because of all of our codes.

MS. HENRY: Exactly.

MS. HANLEY: My name is Christine Manley, H A N L E Y. I live across the street from the park.

My question is that you are talking about testing the water over the Roosevelt Field Mall area, has any testing been done in the area that you have outlined, going from Commercial over to Grove Street? Has the water been tested in that area?

MS. HENRY: The water is -- what happened, we put in groundwater monitoring wells, so as part of the reinvestigation sampling, you know, we took samples and that's why, you know, the slide that I pointed out, we did find some contamination, but again, no one -- the water, the groundwater is different from your drinking water. The groundwater we tested just to find out where the contamination is and where it's going, right? That's the groundwater.

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Your drinking water is supplied by the Village of Garden City and that water -- there is a treatment system on the wells so that water, it doesn't have anything to do with the groundwater -- the drinking water -- that we tested as part of this investigation.

MS. HANLEY: The other thing, you are talking about all the fixes that you are going to do. Can you outline -- Garden Street, are all of those underground pipes, is the piping going to go down Garden Street.

MS. HENRY: So what happened is that you have to come up -- for cost estimate interests, you have to come up with a conceptual design. So as part of the conceptual design, we look for areas where you maybe could place a well, and Garden Street, as a median -- like I said, this is conceptually. This could change once we get additional information. So we need to come up with a cost estimate, so we have to place the well someplace and it's can be placed

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somewhere within, you know, where the contamination was found.

MS. HANLEY: I saw an equipment building.

MS. HENRY: It's a treatment, we are calling it a treatment building, and similar to what was done for Upper Unit 1. The treatment plant, there is a treatment plant located right next to Garden City Supply Wells, and that treatment system blends in. Like if you drove by you wouldn't say, "Oh my goodness, look at that building in my neighborhood." It blends in with the architecture of the area.

I am trying to show a picture. Basically, I am having problems. If you actually Google -- Cecelia, what could you Google?

MS. ECHOLS: Just Google the site name and put in "treatment plant" and you will see it.

MS. HENRY: It looks like a house from the outside and the treatment system is inside the building.

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MR. SMITH: Frank Smith, resident.

Where are these treatment plants, the new ones going to go?

MR. MANNINO: I think the simple answer to that question is, as Sherrel explained, the next phase of the project is called a remedial design phase and it's during that phase of the project that we will develop all of the specifications on how the remedy will be implemented. It's at that time that we are going to work to identify the exact location of the treatment plant, the exact location of any extraction wells and the routing of the underground piping.

As Sherrel mentioned, for planning purposes and for cost estimating purposes, the feasibility study in the plan talks about a treatment plant being constructed to the east of the residential neighborhood, near the intersection of Grove and Garden.

MR. SMITH: Again, the park?

MR. MANNINO: Correct, in that general area.

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So, again, no final decisions have been made. Once we are in the design phase, we are going to determine where the most suitable location is for a treatment plant and work with the Village or the entity that owns the property, to construct the treatment plant there.

So the back of this plan, which is available online also, shows a proposed location. Again, no final decisions have been made; it's conceptual, for planning purposes.

MR SMITH: The extraction wells, Garden Street was chosen as a median, that's probably why you chose that.

MR. MANNINO: In part. Right now the conceptual design calls for one extraction well. That extraction well, whether it's one or more than one, needs to be installed where the contamination is. So based on the data that we have, that is the most appropriate location to extract the contaminated groundwater.

As I said before, during the remedial

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design phase we are going to collect additional data and that location may move in one direction or another.

MR. SMITH: Does it draw from north and south areas, so if the extraction well is here and it's in the middle of it, does it draw from both ways?

MR. MANNINO: Typically you want your extraction well downgrading of where your contamination is. There is some influence upgrading, but it's not as much as it would be downgrading, pulling water in the opposite direction than it is actually going to flow.

Getting back to the other part of your comment or question, Garden Street has that median which provides additional room to work and that would minimize the potential impact to the installation of a well while it's been constructed. So that is an advantage of Garden Street, but that's not the sole reason why it's selected.

MR. SMITH: This area to the south of Garden Street, that's down stream or down --

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MR. MANNINO: Downgrading.

MR. SMITH: How will you extract there if it's past the extraction point?

MR. MANNINO: So the extraction well won't pull all of the water. The idea is that it will pull contamination where the volatile organic compound concentrations are greater than 100 parts per billion. So once again, once we are in the design phase, we will figure out where it's most suited to be installed, but the goal of the well is not to extract all of the water out of the area. It targets certain areas with the higher concentration of contamination.

MR. SMITH: In other words, if I am not in the outskirts of the outlined area, how am I supposed to know how much contaminant I have?

MR. MANNINO: Those dotted lines, it's not contamination that you have.

MR. SMITH: We all have.

MR. MANNINO: That depicts the contamination as we know it today, where concentrations are greater than the MCL's that Sherrel described, which are 5 parts per billion. Some of that is modelled because we don't have points on every single block. So it's estimated, based on inputs to the model.

MR. SMITH: Do you have the exact amount of contamination that was -- the drill was at Garden and Boylston and I assume that was your drill. I wondered what type of contamination they had like there, at that well?

MR. MANNINO: I don't have that on my fingertips.

Tom, would you know?

MR. MATHEWS: 400 to 500 parts per billion. Right, at Boyleston and Garden.

MR. MANNINO: Keep in mind also that we are talking about contamination at significant depths, so questions earlier folks had about potential exposures, high water tables, you dig in the ground you see water, that's not the water that we are talking about here. We are talking about contamination at 200 feet or deeper beneath

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the ground.

MR SMITH: Also, wells 10 and 11, which are on the Superfund site itself, Garden City Village wells 10 and 11, why haven't they been abandoned? Why are we still using those wells?

MR. MANNINO: So I am not in a position to answer the question as to why the Village is still using those wells. What I can say is that there is an engineered treatment system on those wells, in addition to other wells within the system and scattered throughout the Island that effectively treat the contamination.

Does that answer your answer?

MR. SMITH: Yes. Thank you.

MR. SNIPAS: I'm Eric Snipas, S N I P A S.

You mentioned that the remediation already took place on Upper Unit 1. Is that complete or is there more work that has to be done and will it have to be done in the future?

MS. HENRY: The treatment system was

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constructed in -- it has been operating since 2012. We are monitoring it and it's going to be there until the remediation goal, which is 5 for TC and PC is achieved. So basically it's in the long-term monitoring phase.

So we collect samples annually to assess, make sure that the remedy is working, and those results will be placed on EPA's website.

MR. SNIPAS: As of right now there are no plans to go back in to --

MS. HENRY: No, no. It's long-term monitoring.

MR. HANLEY: William Hanley.

My question is regarding pretty much Ground Zero, Roosevelt Field. With all the development that is going on there, with new businesses being built there and hotels and restaurants and apartment buildings, with the stirring up and the constant construction and tearing up and so forth, are you monitoring that consistently with regards to you said things flow downstream.

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MS. HENRY: To the south, yes.

MR. HANLEY: With everything there that is being stirred up, is that being monitored so if it's flowing downstream, is it coming down towards the southern part of Garden City? Is this going to get progressively worse? He is worried about soil and growing and walking and playing and so forth; is this going to be like a problem that is going to persist from the development over there.

MR. MANNINO: I think the simple answer is no. As Sherrel mentioned, after the site was listed on the NPL we discussed it in an investigation for what we called Operable Unit 1, and as part of that investigation we looked at whether or not there was a potential for soil contamination on the -- we'll bring up the former Roosevelt Field Airfield, right? We did not find any shallow soil contamination.

So typically construction, you are dealing with depths of up to 10 to 12 feet, give or take, so there isn't contaminated

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soil present that has the potential to impact either workers or anyone else that is downwind of that area.

MR. HANLEY: Even if when you are digging the sewer lines and waste disposal lines?

MR. MANNINO: Correct.

MR. HANLEY: You are going down more than 12 feet though?

MR. MANNINO: Correct. So I used that as an estimate, right? Keep in mind the contamination that we are talking about is at depths of over 200 feet. So, based on the investigation that we have conducted prior to this second operable unit, we did not find the presence of that VOC contamination in any of the shallow soils.

I would have to go back to the records to see how deeply we went, but we did not stop at 10 feet, 12 feet; I use that generally for construction on the Island when someone is constructing something. I recognize it can go deeper than that.

MR. HANLEY: Are construction crews

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required to report any sort of finding if they should see something while in the process of, let's say, excavating?

MR. MANNINO: Not pursuant to any of the controls that we have in place from the Operable Unit 1 remedy, nor what we are proposing on Operable Unit 2. Under the OU 1 remedy, I apologize, he's not going to shut it off tomorrow, Operable Unit 1.

There are some additional institutional controls with respect to some of the property, which I believe, and Leilani, correct me if I am incorrect, that if the use were to change, that would require further actions. However, with respect to property use, for example, going from commercial to residential, rather than any disturbance, and I think for folks who have driven down Clinton Street, you will see that there is some construction activity going on, there have been activities going on for some period of time. Again, there are no restrictions based on the work that we are doing here.

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MR. FOXEN: Robert Foxen.

As a follow up to this question there is another question: I think you are saying in terms of source control, that you didn't identify the original source of the material so that there's no source control.

MR. MANNINO: That is correct.

MR. FOXEN: I'm surprised that from old maps or whatever you really weren't able to pinpoint where the source was.

MR. MANNINO: So with respect to pinpointing the source, I believe Sherrel mentioned earlier that the former airfield, that the activities at those former airfields that are no longer present, we believe are the source of the contamination, and as I mentioned, the data that we collected as part of the Operable Unit 1 remedial investigation did not reveal soil contamination above levels that pose any kind of concern.

I don't have that data at my fingertips. We outlined, we have all of the remedial investigation reports where it will

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show exactly where each of the sampling points were and all the work that was done in order to try to identify any sources of material that may be remaining in the soil.

MR. FOXEN: Right. Because you would think that if you identify the right source, there would be residual material in the soil if you drilled, if you sampled the right spots. So it's sound to me that nobody really knows where it's coming from originally.

MR. MANNINO: I would disagree with that statement. We believe and as we have documented in the proposed plan, we believe the former airfield hangers are the source of that contamination and the data does not reveal any shallow soil contamination beyond that.

MR. FLAHERTY: Mike Flaherty.

The nature of the sites, you have to take into account how many years have evolved. So when the sources originated in the 40's and 50's and even the late 30's, these things, these compounds migrate down

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to the soils they are on; that's why they are in the groundwater now.

So those sources are, the original sources created the problems we are dealing with today, but they have actually migrated through the soil. One of the things about Long Island sources, they are really sound. So they will make their way down relatively easily and then once they are gone, they are not --

MR. FOXEN: I see what you are saying. You said there is some residual DNAPL. That are the soil particles. Even over time so --

The other question I had was could you just explain the location, the relationship of the location between the recovery wells and the water supply wells?

MR. MANNINO: So you're asking about the existing recovery wells that have been installed as part of the --

MR. FOXEN: No, the proposed as part of the remedy versus where they are located in comparison to the water supply wells.

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MR. MANNINO: Okay.

Sherrel, could you put up the figure that had the preferred alternative.

I don't have my glasses on, but this is Garden Street, along the green line, and I believe this is the -- I believe that is currently where the proposed extraction location would be. Again, that is based on current data and that position may change as we go through the remedial design phase.

With respect to your question --

MR. FOXEN: What depth is that?

MR. MANNINO: Excuse me?

MR. FOXEN: What is the depth of that?

MR. MANNINO: We are estimating it currently around, we will have a screen around a depth of around 400, 410 feet. Again, that will be determined during the remedial design phase.

So with respect to your question, the Town of Hempstead operates a well field down in this area. Uniondale has a well field. If I am not mistaken, this is it, there.

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And then the Village of Garden City wells 10 and 11 would be along Clinton Street up in this area, up here.

MR. FOXEN: What are the depths of the water supply wells?

MR. MANNINO: I don't have that information.

I think they're somewhere approximately 400 feet, give or take.

MS. COURTNEY: Judy Courtney.

Related to this picture as well: I know that this is a proposal, so I understand from a design perspective, just give me some perspective on this.

I am looking at the piping and I look at the Garden Street piece of the pipe and I have a couple of questions. Where is that beginning? It's hard for me to see if that is going to come up three blocks of Garden, two blocks or one block.

MR. SMITH: Between Tremont, going up the park to Grove.

MS. COURTNEY: And the well that you would dig directly in the Island, that is

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completely underground. There is nothing
here?

MS. HENRY: Flush.

MS. COURTNEY: And the Island can
continue to exist as it is.

MS. HENRY: Yes.

MS. COURTNEY: My final question is:
For the treatment facility itself, once you
make that final selection, how is the
public's opinion about that choice made? Is
there another hearing that we can have some
input into where that selection is or do you
just make that selection and it's final?

MR. MANNINO: So we would work with
the owner of the property in order to
construct that treatment plant. Under the
Superfund process, we would not come back to
the community and identify that location.
However, we would work with the Village and
the immediate residents in the area as we
start to firm up those plans.

MS. COURTNEY: You would make the
selection and then work with the Village or
the residents about how to build it, but the

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site selection is yours?

MR. MANNINO: Correct. Ultimately, we will identify the preferred location for the construction of the treatment plant. We would then coordinate with the appropriate entities on that location in order to obtain the necessary access to construct it.

MS. COURTNEY: How much flexibility in yard-type piping, for example, 1600 feet, if that means it winds up right next to the tennis courts -- I am making that up, right -- can that 1600 become 2600? It's a piping issue so you could put it further back if needed to?

MS. HENRY: We weren't planning on going into the park. The location is outside of that park and we have no plan to bring it into the park.

MS. COURTNEY: Right. But it could be next to it or it could be far from it, that's a choice.

MR. MANNINO: The plant could be further away.

MS. COURTNEY: That's my question.

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MR. MANNINO: As you move the plant further away from the extraction well there are engineering hurdles that need to be overcome. So in an ideal situation you would want the treatment plant close to your extraction well and then your discharge base to be in close proximity.

However, there is the flexibility to have them further apart and there needs to be, then, additional engineering methods put in place to address that, but it is workable.

MS. COURTNEY: Thank you.

MS. DUVEEN: My name is Judy Duveen, D U V E E N.

Just with regards to the treatment plant, what kind of things will be going on? Is it noisy? Is it like dangerous? Are there possible risks to it?

MS. HENRY: Based on the treatment system that we constructed at Operable Unit 1, once you get outside of the building, you don't hear anything. Inside the building, you can, but outside you don't hear

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anything.

MS. DUVEEN: Are there chemicals with it? What happens there to counteract the VOC?

MS. HENRY: Air stripping. When we're involved in the organic phase, it evaporates quickly. So if you put air in there, it's going to leave water and go up into the air. Then, depending on what the result of that is, you know, you could treat it. And the water, once you get the VOC's out of the water, then you would recharge it back into the ground.

So volatile organics, they volatilize very easily. Once it comes time for the air stripper, it strips the volatiles from the groundwater.

MS. ECHOLS: If I could just show everyone, this is the picture of the treatment plant on Clinton. It's a house. You wouldn't know it's there. It's behind the woods. Have you ever seen it? It would be something similar to this.

MS. BARDEN: Agnus Barden. I have a

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question: Just where the house is going to be? I actually live on Garden Street, so my concern is that the house is going to be on the side of the street where the park is, on the other side of the street closer to Garden.

The other question I have: Why was Garden Street chosen? Is it the most specific area of where the contaminant lies or is it more convenient just for the workers?

MR. MANNINO: So the location of the extraction well is proposed based on the location of the groundwater contamination, based on the data that we have today. As we collect additional information, as we go through the design phase, we will determine the most appropriate location for the extraction well. But again, the extraction well needs to be installed where the ground contamination is present.

There is flexibility on the selection of the location of the treatment plant, because the extracted water would be piped to that plant. So, again, no decision has been made, so I can't answer your question as to what side of the street.

I am sorry, you are shaking your head.

MS. BARDEN: Well, I am shaking my head because the well that you put on the corner of Grove and Garden was put in because -- and was there for quite some time; so why was that chosen there initially to do the testing? Was it due to the location of the island in the space or is it just that you know that that area of Garden is contaminated.

MR. MANNINO: We all recognize this is a densely residential neighborhood. My preference is not to ask anyone in this room for permission to enter their property and install a well, whether a monitoring or extraction well, on your front lawn or your backyard.

So we, as a team, look at, when installing monitoring wells, where we think we will gain the best data. We then overlay

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that with a lot of real conditions and say: Okay, how do we get the data in this area? Because we need to install and have a drill rig present for several weeks and we want to minimize disruption to the local community.

And, so, based on that, then we move that ideal pinpoint location to the street or to a meeting or over a block. But we don't want to move it too far, to the point that we aren't getting information or data that is representative of what is present. So, that is how we go about determining where we want to install a monitoring well and an extraction well.

Before we go to someone else, does that answer your question or are you still --

MS. BARDEN: I am just a little bit leery because I know you did the testing well on the corner of Garden and Boyleston, and in that case, I can say that is how you got your data. I am curious, again, living on my street, where again you want to put the same piping through, it's the same area

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that you are going to be doing this through and I am just curious as to why any other areas weren't thought of other than this street as a median.

MR. MANNINO: So I am trying to figure out the best way to answer your question.

If during the design phase we collect additional data and we see that the extraction well needs to be installed either further south, west or east, potentially north, if that street does not have a median, we would try to figure out how to install a well in that location absent the median.

We have done this at other sites. We will do it on the curb side; we will do it in the street; we will work with folks to find the most suitable location.

So I think the answer to your question is the street was not selected because of the median. It was selected based on what we know with respect to the extent of contamination. And as we go

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through this process, the extraction well could be installed on a street that does not have a median.

Does that get you further clarity on the process that we work with?

MS. BARDEN: I still have more questions, just in terms of because it was on Boylston and Garden and I didn't see it any other place.

MR. MANNINO: Sure.

Can you put up the figure that shows each of the monitoring wells or the well network?

MR. COLASUENO: Daniel Colasueno.

Does the water travel, like in a river?

MR. MANNINO: Generally in the map of the aquifer, groundwater travels in the south-southwest direction.

So I recognize this figure is difficult to see and it's not clear, but at each of these points, where these black dots or these green dots with values on them, those are locations where monitoring wells

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have been installed. I think Sherrel mentioned there was a total of 12 monitoring wells installed as part of this effort. Although you don't see them, although you didn't see them being installed and although as you drive down some of these blocks they don't stand out, they are there, and I think that's hits our point home, that when our work is done, we usually try to do it in a manner that is the least disruptive to the community.

MR. MANNINO: If you don't mind I'd like to go to the fellow in the back who had not asked any questions yet.

MR. BARDEN: I'm Tom Barden, B A R D E N.

Based upon previous similar projects, what is the length of time for the construction.

MR. MANNINO: Typically, an extraction well at this depth can take approximately four to six weeks to construct; that's having the drill rig present, drilling to that depth and

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development. The overall timeframe for the construction project we're estimating to be between one to two years. That involves installing an extraction well, the piping and construction of the treatment plant.

Now, work wouldn't be occurring for that full two-year period. Work would be sequenced and that schedule would be borne out in the design phase, but right now, based on our experience, you are looking at a construction timeframe of between one to two years.

MR. BARDEN: Okay. I think the most invasive part of that would be the trenching along Garden Street. In terms of that part of the phase, we are not talking about the treatment center, but the well and then the trenching, how long would that take?

MR. MANNINO: I don't have that information.

MR BARDEN: I'm trying to get an idea, is it one to two years or --

MR. MANNINO: Oh, no, no. Trenching, that typically is work that would occur over

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weeks, up to a month, month-and-a-half timeframe. It also depends how that piping is installed.

Just as an example, for the work that Sherrel did for the first operable unit, for those wells that were extraction wells that were installed along Stewart Avenue, in this area right here (indicating), we drilled from the southern side of Stewart Avenue, under Stewart Avenue, and installed piping back to the treatment plant. We were able to do that without any lane closures on Stewart Avenue by using directional drilling.

So there's different ways that this work can be done. We are going to look at that in the design phase, but I think the plan is clear and we have made it very clear, there will be, we expect that there will be disruptions, based on this construction rig activity. We are going to try to minimize those impacts to the extent that we can.

MR. MARCHELOS: Peter Marchelos, M A

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R C H E L O S.

Just a quick question that is relevant: There is a Superfund site in Bethpage; what method are you using for that? It's kind of relevant. It's relevant because that was an airfield too, where they were building, cleaning the planes. What method are they using and how effective is that?

MR. MANNINO: You are referring to the Navy Grumman site in Bethpage.

MR. MARCHELOS: Right.

MR. MANNINO: So there is a treatment plant that I believe uses a combination of air stripping and granular activated carbon to treat similar contaminates there. Here we believe that we can treat with simply the air stripping. However, as we go through the design phase, that's when we'll know whether or not we will need any additional treatment capabilities within that existing plan to address the contamination, but it's similar.

MR. FOXEN: This is kind of a

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detailed question. I am not trying to gotcha or anything. Just in case, do you have any idea what the groundwater flow velocity is?

MR. MANNINO: At this site, I apologize, our hydro-geologist is not here. But generally it's 1 to 2 feet a day. Basically that's in Nassau County, somewhere around there, keep in mind groundwater flow rate is different than the rate that contamination moves. They are not the same thing.

MR. BELLMER: Bill B E L L M E R.

Could you put up the slide that shows the pipe and the treatment plant location.

The monitoring well at Boylston and Garden is just east of where you are talking about the proposed extraction well, and that appears to be in the center of the plume as opposed to -- and the edge of the plume where you show the extraction well on the chart there. Why couldn't you use the monitoring well as an extraction well, maybe with modifications.

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MR. MANNINO: So typically I would expect that the extraction well would probably be a diameter of about 12 inches. The monitoring well, I believe is -- I know it's smaller than that. I am not sure if it's a 4-inch well or 6 going down to 4, but it is though a smaller diameter and would not be able to be retrofitted in order to become an extraction well.

MR. BELLMER: And then if the extraction well was 12 inches in diameter, is that then the diameter of the pipe that goes to the treatment plant?

MR. MANNINO: Tom?

MR. MATHEWS: The diameter of the extraction in the piping, as goes into the treatment plant is between 4 to 6 inches.

MR. MANNINO: So this gentleman here had a question?

MR. COLASUENO: The EPA, everybody's known about this for quite some time, from the 80's and 90's, I believe?

MS. HENRY: It was listed in 2000, that's on the National Priorities List.

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MR. COLASUENO: Common sense would just say it has affected the ground water, drinking water, because it's got to be. If we are drinking, let's say, 420 and it says 400, this might not be a question for you, but what is the town purification process doing? Because I personally looked up, I have a house system, a purification system in my house and it does not address these VOC's in the filtration system that I have.

Are there things, products out there that we can buy to assure that our family and our health is okay?

MR. MANNINO: I am not able to recommend a product to you and I am not going to speak for the Village. However, what I can say is that on the Village's website is a copy of the annual report that distributors of drinking water are required to publish, that show the results of periodic sampling that is done on those wells. Right?

There is a series of wells that comprise the network and there's different

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treatment systems on different wells, and I believe that information is contained in that annual report, but what I want to stress is that the water distributed through that system gets treated by an engineered system that is effective and there is data in those annual reports to support that.

MR. SCHOELLE: My name is Robert Schoelle, S C H O E L L E. My question is for Mr. Suozzi.

Ralph, I don't mean to put you on the spot, but does village engage a consulting engineer to work with the Village on this proposed site project?

MR. SUOZZI: We have engaged -- we have HTM under contract for consultation, but we have not, they are not assigned -- this came up last week.

I have already called upon them for information. So we will use them as we need to. We will be working closely with EPA. HTM is our work consultant, and they will be working with us as needed, certainly.

MR. SCHOELLE: They are an

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outstanding firm. I just wanted to be sure they are on board.

MR. SUOZZI: We also work with DMD. We work with them, with multiple engineering firms in the environmental area.

MR. SCHOELLE: Equally outstanding.

MR. HANLEY: I have a question that people have not asked you, but it's on their mind: Is there a possibility that someone is going to lose their house on Grove or Garden Street?

MR. MANNINO: The answer is no, but could you elaborate on why you think someone is going to --

MR. HANLEY: With the treatment plant that's proposed that's going to go there, I see the area in question of where it's possibly going to go. You have houses running up and down Grove and Garden Street. The treatment plant that you want to put up, it's got to take up space, so it's got to go somewhere on Garden Street.

MR. MANNINO: So let me provide a little further context there in an effort to

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help address that.

In a situation like this, we would now want to site the treatment plant within the residential community. We recognize that there are not residential properties to the east and during the design phase we are going to work with the appropriate entities to figure out the best location for that treatment plant.

In the past, so, for example, on OU1, Operable Unit 1, we sited the treatment plant in a non-residential area, but we designed the plant so that it would blend in with the surrounding community. It has a brick facade, a pitch on the roof, matches some of the tutors that I believe are across the street, so my expectation is that we are going to be east of the residential community.

Today, I can't tell you exactly which parcel we would do that on, simply because we don't have -- we have not made a decision and we don't have the information. So at this point, I don't see how that would

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impact a resident on either Garden or Grove.

MR. HANLEY: I understand what you are talking about, but east of where Grove street there's a park.

MR. MANNINO: Correct.

MR, HANLEY: There is the recharge basin and then residences going north. To the south of it is a buffer zone between the street and the recharge basin, but the way you were speaking before, with regard to the piping from the extraction well to the treatment plant, you were trying to keep it relatively -- almost in a straight line, if not at a 45 degree angle, even more so to where it's at. Also, there's no other eastern property there.

MR. MANNINO: So I would not look at this with respect to turns or degrees. So while we would prefer to use a gravity-fed system to have the water go from the pump that's in the extraction well up and once it's out of the extraction well gravity fed to the treatment plant, we can, as I was talking about earlier, engineer a system

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with additional pumps to pull that water further, if we had to.

So this is not intended to be a straight line and if an extraction well were to be installed on Garden Street, that treatment plant would need to be in a straight line with that, that's not how it works.

MR. HANLEY: I get that.

MR. MANNINO: If I can just for a second, Sherrel, I think this would be helpful, if you could put up the original slide with the site overview that shows Stewart Avenue and the extraction wells and where the treatment plant is?

So, as Sherrel mentioned, we have installed three extraction wells south of Stewart Avenue, in this general area here; correct?

MS. HENRY: Yes.

MR. MANNINO: We also have two extraction wells -- three extraction wells, excuse me, I believe, right about here, and the treatment plan is just immediately south

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of that, around here. I apologize, I think it's right about there.

These wells get piped generally in this configuration. They head across the -- they head down, across, up and over. So it's almost an upside down U, right, or it's a backyard C, almost. So there is an example of we didn't have a straight line from an extraction well to a treatment plant and it shows you the distances we can travel in order to successfully pipe this material back. Okay?

So I recognize the concerns that are being raised about the location of the extraction well and the treatment plant, and I hope this helps alleviate, to some degree, to show the flexibility that we have with respect to the network to address this contamination, because here we went across, up and over to get there, okay? Those specifics about the size of the pipe, the depth, how many turns, how it gets from point A to point B gets borne out later in the process.

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We are making efforts to minimize the impact to the community and we are not limited by the number of feet or some of these other restrictions that we are talking about. So I wish I could provide further clarity to exactly where the treatment plant, the final selection is going to be, but that is some time off and there is going to be process to work through it.

MR. BARDEN: Tom Barden.

When you state in the future, is there an approximate timeframe you have in mind?

MR. MANNINO: As was mentioned, after a record of decision is issued, the remedial design can take approximately one to two years to complete, as an estimate. Once that is done, we will work to secure the funding that is necessary to construct the treatment plant and then we go through the construction phase.

Just as a reference, at Operable Unit 1, the record of decision was issued in 2007 and a treatment plant construction was

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started --

MS. HENRY: It started in 2010 and it began operation in 2012.

MR. MANNINO: Just to give you a better handle of the overall timeframe that we are looking at.

MR. SMITH: C. J. Smith.

What are the electrical requirements to the plan?

MR. MANNINO: That will be determined in the real design, how much power needs to be brought in and what kind of transformers need to be brought in, but there's ample electric supply in the area that would suffice for the treatment plant.

MR. SMITH: You do not need any new transmission lines.

MR. MANNINO: No. I mean --

MR. MATHEWS: So for Upper Unit 1 you need a 3 phase 4A demorgas system to come down from the existing transmission line. From the street, from Clinton Street, it was brought into the treatment where Garden City grounds stands in that location. We are

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assuming it would be the same for this 3 phase 4A voltage.

MR SMITH: Thank you.

The other question was: Has been there any failure incidents, pipes breaking in any of your plants.

MS. HENRY: No.

MR. F. SMITH: Frank Smith.

I just wondered, with the sample wells, is there a place you could find the amount of chemicals in each well.

MS. HENRY: Yes. It's for what we did in Upper Unit 2, it's in the remedial investigation report, which is available online.

MR. F. SMITH: Right now?

MS. HENRY: Yes.

MR. F. SMITH: Remedial investigation report that tells you each location?

MS. HENRY: Yes. It tells you where we drill the wells and where they are located and the results that we got from each well.

MR. F. SMITH: From each well?

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MS. HENRY: From each well, yes.

MR. MANNINO: I believe you have a copy of the proposed plan on page 2 on our website. It is on the text box to the left and that is where you can find all the of the support documentation on that link.

MR. F. SMITH: What would that be called, like a technical name?

MS. HENRY: Remedial Investigation Report.

MR. F. SMITH: Which well, what is the name of, the technical name for the sample well?

MS. HENRY: It's different numbers, it's 16, 17, 18.

MR. F. SMITH: It's called a sample well?

MS. HENRY: Monitoring wells.

Like MW 16.

MR SMITH: It has numbers at a location, how do you find that? It says that in here?

MS. HENRY: It says its figure in the report that tells you the location of each

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of the wells.

MR. F. SMITH: And there's a map?

MS. HENRY: Yes. And then there is a table that will tell you what was found.

The website where you can find most of this information is located on that.

MS. TIMMINS: Mary Timmins.

I just wanted to ask a couple of things: The first thing is in the Newsday article they talk about it will take up to two years to put this plan together and then they talk about taking 35 years to achieve the groundwater cleanup goals. So Mr. Foxen, in front of me, had mentioned the water and how fast will it go down with the chemicals, and then you mentioned the chemicals stay above the groundwater flow, the water actually going down.

So how many years are we in front of endangering the wells with chemicals that are up above where you're testing.

MR. MANNINO: So the intent of what I was trying to explain before is when groundwater moves, it has a horizontal and a

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vertical component to it. So what I was trying to explain is that the groundwater flow of one to two feet per day is different than the rate that the contamination, the contamination that is present, will move at. Contamination typically moves at a slower rate and different contaminates may move at different rates within itself, but the contaminates are already in the groundwater they are not above the groundwater, they are within the groundwater.

MS. TIMMINS: So, with this taking 35 years to clean up, is the water that we are drinking, is it already in that and being filtered out or is it on its way into our drinking water and that's what you are working to protect.

MR. MANNINO: So with respect to Garden City wells 10 and 11, as an example, there is VOC contamination present in the raw water and that's why there's an engineered treatment system that effectively addresses that contamination prior to distribution to the community.

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MS. TIMMINS: Then, you talked about the VOC's, that as you're treating in the treatment plants, they go kind of airborne? They come out of the water and they rise above into the air as you are treating it, right, the air stripping?

MS. HENRY: Into the top of the air stripping, not into the air.

MS. TIMMINS: They don't actually --

MS. HENRY: It's based on the levels that are coming off, and if additional treatment is required, then we do that, but whatever is coming off of the air strippers is safe.

MS. TIMMINS: It's safe to those residents, okay.

I don't happen to live in that Garden, Grove Street area, but I think it's imperative to be very considerate to the people that live there because I know I wouldn't want to be part of it and I just think that as you enter their lives, please be considerate of them, okay?

MS. HENRY: That's always our

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priority.

MR. FOXEN: A couple of things.

Will you be doing groundwater bottling during the design phase to optimize where you put the covered wells?

MS. HENRY: Yes, we will be.

MR. FOXEN: The other question is: You mentioned that the remissions are safe. How do you know that?

MS. HENRY: Based on what was done at Upper Unit 1, there is no carbon treatment.

MR. FOXEN: That was my question. How do you know that?

MS. HENRY: It was tested and it didn't require carbon.

MR. FOXEN: If I could just ask: That would depend on the nature of the contamination. It might be different in one location verses another.

MS. HENRY: The contamination concern for both areas is PCE and TCE.

MR. FOXEN: Right, but the concentrations would affect whether you need activated carbon --

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MS. HENRY: You know that will be determined.

What I am saying is based on what you had in Upper Unit 1, we may need it for this one and that would be determined during the --

MR. FOXEN: You are pretty close to houses. I mean, my house is in that location so that would make me feel a lot better. Although technically you might be right, but that would concern me.

MR. MANNINO: If I can just add: Sherrel mentioned earlier, she outlined those nine evaluation criteria and the first was protective of human health in the environment and the second was compliance with -- I will use the acronym ARARs -- it's getting late for me, I would rather not say the complete term.

As part of that, when we design -- and I'll put this chart -- these types of treatment plants, we work with our counterparts at New York State to ensure that the treatment plant, any omissions from

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the treatment plant are in compliance with the Clean Air Act and discharges of the treated depth flow into the recharge basin or reinjected into the ground meet the Clean Water Act. So we ensure that we are in compliance with federal and state laws with respect to the operation of that treatment plant.

So, I think what Sherrel was saying was that for the process we went through at Operable Unit 1, treatment of that air phase was not necessary at that location based on the concentrations. I believe that the concentrations of the contaminates, which are similar to the ones -- the same, actually, as the ones we are treating at OU1, are generally at a lower concentration in OU2 as compared to OU1. So one would expect that additional treatment of the air phase is not needed, but we will go through the process to ensure that based on the location, once it's determined, has a maximum potential concentration for contaminates that will get treated by the

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plant; we are running that plant in compliance with all federal and state standards.

MR. FOXEN: Just another thing to keep in mind about that location is it's near a playground where the structures are different than the other locations.

MR. MANNINO: Correct. Again, once we determine the location for construction of the treatment plant, we will be able to have the information to determine who is in the area and how we input that information in the calculations that goes into determining whether or not any additional treatment is warranted.

MS. TIMMINS: I just want to, again, I am just going to ask that you recognize there is also a, I think it's a K-1 school, a kindergarten, first grade school, very close to that. I believe in protecting humans first and if it means that it's going to cost extra to protect the humans first, then put in that extra barrier of the truck hole, activated truck hole barrier and the playgrounds, the residents. It's so close to homes, it's close to the little schools. That's it, if you can just make note of that.

MS. HENRY: Anymore questions?

We are at the end of the meeting now, and we just want to thank each and every one of you for coming out this evening. We will take all of your questions into concern. They will be part of the public record. We will have a responsive summary to your questions and they become part of the record of decision that is signed by the regional administrator.

If you need to send in any questions, you can e-mail Sherrel and they will be addressed and become part of the record, the response of the summary. You have up until March 26th.

Thank you very much for coming out this evening. Good night.

(Whereupon, at 8:50 p.m., the meeting was adjourned.)

C E R T I F I C A T E

STATE OF NEW YORK)
) ss.
COUNTY OF SUFFOLK)

I, MONIQUE CABRERA, a Shorthand (Stenotype) Reporter and Notary Public of the State of New York, do hereby certify that the foregoing Proceedings taken at the time and place aforesaid, are a true and correct transcription of my shorthand notes.

I further certify that I am neither counsel for nor related to any party to said action, nor in any wise interested in the result or outcome thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this 22nd day of March, 2018.

____
Monique Cabrera,
Shorthand Reporter

ATTACHMENT D

WRITTEN COMMENTS

From: Barden, Agnes
To: Henry, Sherrel
Subject: super fund clean up
Date: Monday, March 26, 2018 9:13:24 AM

Good Morning:

I do support the clean up efforts of the EPA. However, I am writing to state that as a longtime resident of Garden Street in Garden City, New York, I am vehemently opposed to placing the pipes on the last block Garden Street and the pump house near Grove Park. Our street is constantly packed with cars, parents and children who utilize the park. Construction on the street would be very chaotic and unsafe.

Additionally Locust Scholl is right on the next corner.

Please do not chose Garden Street because of "convenience" for workers with the "island".. The work should be done up by Commercial Street or down past Meadow Street avoiding residential areas.

Please feel free to reach out to me if you have any questions.

Thank you

Agnes M. Barden
516-306-0565

March 28, 2018

Ms. Sherri Henry
Remedial Project Manager
Western NY Remediation Section
USEPA
290 Broadway-20th Floor
New York, New York, 10007-1866

Sent via email: Henry.Sherrel@epa.gov

Dear Ms. Henry,

The purpose of this letter is to express my strong concern regarding the proposed water treatment/discharge facility in the immediate vicinity of Garden Street and Grove Street in Garden City, New York.

For the past 25 years, I have been a resident of Garden Street in Garden City. As you know, there is a playground on the corner of Garden Street and Grove Street (Grove Park). This is the exact location for the proposed water treatment facility

I attended the March 13th meeting at Village Hall in Garden City and listened to the presenters discuss the options to install underground piping and the treatment facility. One of the primary reasons for the proposed site was "convenience" due to the median on Garden Street. The median, as I understood it, would be the location to install underground piping which would lead to the treatment facility. During the presentation on March 13th, there was an illustration of previous installed treatment plants in Garden City and a variety of different paths used to connect the piping to the treatment plant. I don't understand why the EPA wouldn't consider different paths and locations. Please understand, the proposed site is within feet of a dense residential area, a playground (Grove Park) used by hundreds of children and young adults and a Kindergarten through 2nd grade community school.

I respectfully request that you and your team consider different options for the construction and installation of this treatment plant. There are obvious alternate locations to the North, South and East of Grove Street that could be used with minimal interruption to the residential area, very active playground and grammar school. I encourage you and your team to consider other options to install this facility in lieu of convenience. Please feel free to contact me at tgbarden1@gmail.com.

Sincerely,

Thomas G. Barden

From: judy courtney
To: Henry, Sherrel
Subject: EPA Proposal for Garden City SIte
Date: Thursday, March 29, 2018 3:39:07 PM

March 29, 2018

Ms Sherri Henry
Remedial Project Manager
Western NY Remediation Section
USEPA
290 Broadway
New York, NY 10007

Dear Ms. Henry,

I am writing regarding the current EPA proposal to build a well, piping and air stripping facility in Garden City, potentially in Garden Street and near by Grove Street Park. I attended your recent presentation and have also read the information you have made available.
After reviewing the information, I feel very concerned about the proposal for many reasons.

While I do support the overall intent on continued development of our water quality, I cannot support the building of any type of treatment plant at or near one of our Village playgrounds. WIth the extensive use of the entire park, including playgrounds, soccer fields, baseball fields and bar-b-que areas, this park is in constant use by residents of the Village. The construction of a 40" x 50" plant, running 24/7 would be disruptive to the park, encroach on the environment there, and disrupt the quality of life I would think the EPA would be most concerned about preserving.

The additional disruption of digging a well and laying 1600' of pipe along the streets where the park is located is another concern.

I am certain other locations, less residential and intrusive, can be found for this project.

Thank you for your consideration

Judy Courtney
3 Tremont St
Garden City NY 11530

LAURA CURRAN
NASSAU COUNTY EXECUTIVE

KENNETH G. ARNOLD, P.E.
COMMISSIONER

COUNTY OF NASSAU
DEPARTMENT OF PUBLIC WORKS
1194 PROSPECT AVENUE
WESTBURY, NEW YORK 11590-2723

March 19, 2018

Sherrel Henry, Remedial Project Manager
U.S. Environmental Protection Agency – Region 2
290 Broadway, 20th Floor
New York, New York 10007-1866

Re: Old Roosevelt Field (ORF)
OU2 Remedial Investigation Report – Technical Comments

Dear Ms. Henry:

The Nassau County Department of Public Works would like to thank you for providing the Old Roosevelt Field Contaminated Groundwater Area Site, Operable Unit 2 Remedial Investigation / Feasibility Study Report, Garden City, Nassau County, New York – February 21, 2018, for review and comment. The Department is in general agreement with both the conceptual model proposed for the area and with the identification of the Historic Source Area described in the RI report which is located in the intermediate Zone (250-400 ft. BGS), created in part by the operation of Heating / Cooling wells (N-5507, N-8050, N-8068 and N-8458). The NCDPW would like the EPA to consider the following modifications to the conceptual model and the interpretation of the intermediate and deep zones of contamination.

Intermediate Zone Contamination

The intermediate source area should be expanded in areal extent and include the screen intervals of abandoned public supply wells N-5484 (287-306 ft./Bgs), N-5485 (279-326 ft./Bgs) and N-5486 (263-290 ft./Bgs) (SEE MAP). These wells operated from ***1956 to 1973,*** with well screen intervals which were coincidental with some of the highest levels of VOC contamination observed during the OU2 RI. During this seventeen (17) year period of operation, these wells would likely have moved volatile organic compounds including PCE and TCE from the OU-1 Intermediate Zone Source area to locations further to the East, including N-5485. Abandoned Public Supply Wells N-5484 and N-5486 each operated at this horizon, approximately 500 feet from cooling wells N-8050 and N-5507, which had well head TVOC concentrations measured by the USGS in 1984 of 14,000 ppb and 840 ppb respectively.

Deep Zone Contamination

The expansion of the intermediate zone of VOC contamination is problematic, because each of the three (3) public supply wells which operated in the highly contaminated intermediate zone were deepened in 1972 – 73 due to screen failure. Review of available well construction records indicates that all three (3) wells were deepened using the reverse-rotary drilling method, with casings set *within the original 20-inch diameter well casings* and in cement rather than a cement/bentonite grout mixture; construction procedures which could have allowed VOC contamination to migrate deeper into the aquifer. The deepened screen intervals for these three (3) former public supply wells were 500–572 ft., 473–554 ft. and 450 – 556 ft. BGS respectively. VOC's were subsequently detected in all three (3) wells after they were deepened (see attached graphs). As a result, N-5486 (the closest well to the source area described by USGS (1989) and CDM (2018) was abandoned in 1980 only 7 years after deepening. N-5484 and N-5485 followed and were abandoned in 1991. Historic VOC data strongly suggests that these three (3) supply wells brought VOC contamination to greater depths when deepened and continued to act as conduits to lower portions of the aquifer.

Based on these observations and the presence of the compounds of interest (TCE, PCE) in water samples previously collected from wells N-5484, N-5485 with total measured depths of 572, 554 feet Bgs, and VOC concentrations of 13, 26 ppb along with the results of the last water sample collected from N-5486 (200 ppb) in 1980 the USGS concluded that VOC's were present in the Basal portion of the Magothy Aquifer in ***1984***, "*This movement and dispersion has caused TCE and DCE to reach the base of the Magothy Aquifer at Roosevelt Field in less than 40 years of transit, which indicates that natural flow patterns in this area have been significantly altered by pumping.*" (USGS, 1989) The two remaining Public supply wells then continued to pump for an additional seven (7) years drawing VOC's to this deep zone until Wellhead concentrations exceeded 50 ppb in ***1991***, leading to their abandonment.

The documented presence of Volatile Organic compounds in the Basal portion of the Magothy Aquifer from 1977 through 1991 coupled with the potential for the continued migration of contaminants along the borehole(s) of the deepened wells within the expanded intermediate source area described in the revised conceptual model may require additional analysis, the NCDPW would recommend the following:

- Development of a 3-D finite element groundwater model for the Roosevelt Field Area, to simulate contaminant transport and to better determine the impacts of both the expanded zone of intermediate contamination and especially the Basal zone of Deep Magothy contamination located just above the Raritan Clay on active Hempstead Village and Uniondale Water District Public supply wells and on the length of time required to remediate same.

- Conduct synoptic water level rounds with NCDPW during High Stress Summer and Fall conditions with Uniondale Public Supply Wells N-8474 and N-8475 in operation. Previous measurements collected during these periods have shown drawdown in excess of twelve (12) feet in the EW-200 cluster, during periods of Public Supply Well operation.

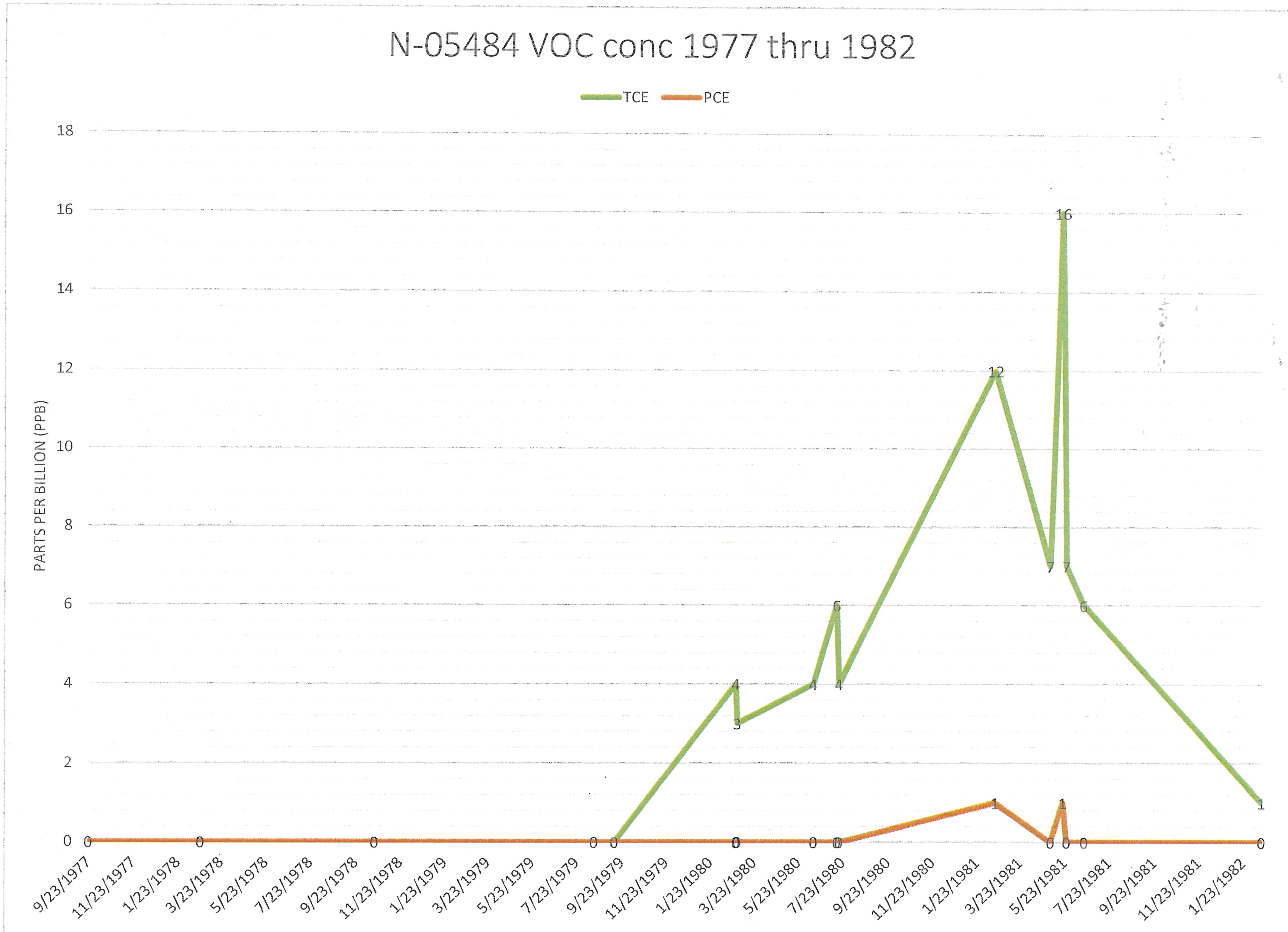
- Measurements conducted during these high stress periods would better define the interaction of public supply wells at both well fields and how they might affect the proposed recover system, including the creation of potential stagnation points and the final selection of proposed recovery well locations and screen intervals.

The Department appreciates the opportunity to review the Remedial Investigation Report, and will continue to coordinate with the EPA in its remedial efforts in the Old Roosevelt Field Area. If you have any questions regarding the enclosed map or technical suggestions, please contact Mr. Michael Flaherty, Hydrogeologist III, at (516) 571-7514.

Very truly yours,

Kenneth G. Arnold, P.E.
Commissioner of Public Works

KGA:VF:rp
Attachments
c: Brian J. Schneider, Deputy County Executive, Parks and Public Works
Vincent Falkowski, Assistant Commissioner of Sanitary Construction
Jane Houdek, Attorney for Public Works Michael Flaherty, Hydrogeologist III
Donald Irwin, Director of Environmental Programs
Walter J. Parish, P.E., Regional Hazardous Waste Engineer, NYSDEC
Carrie Meek-Gallagher, PE, Director NYSDEC Region 1


N-05484 VOC conc 1977 thru 1982
TCE
PCE
PARTS PER BILLION (PPB)
18
16
14
12
10
8
6
4
2
0
9/23/1977
11/23/1977
1/23/1978
3/23/1978
5/23/1978
7/23/1978
9/23/1978
11/23/1978
1/23/1979
3/23/1979
5/23/1979
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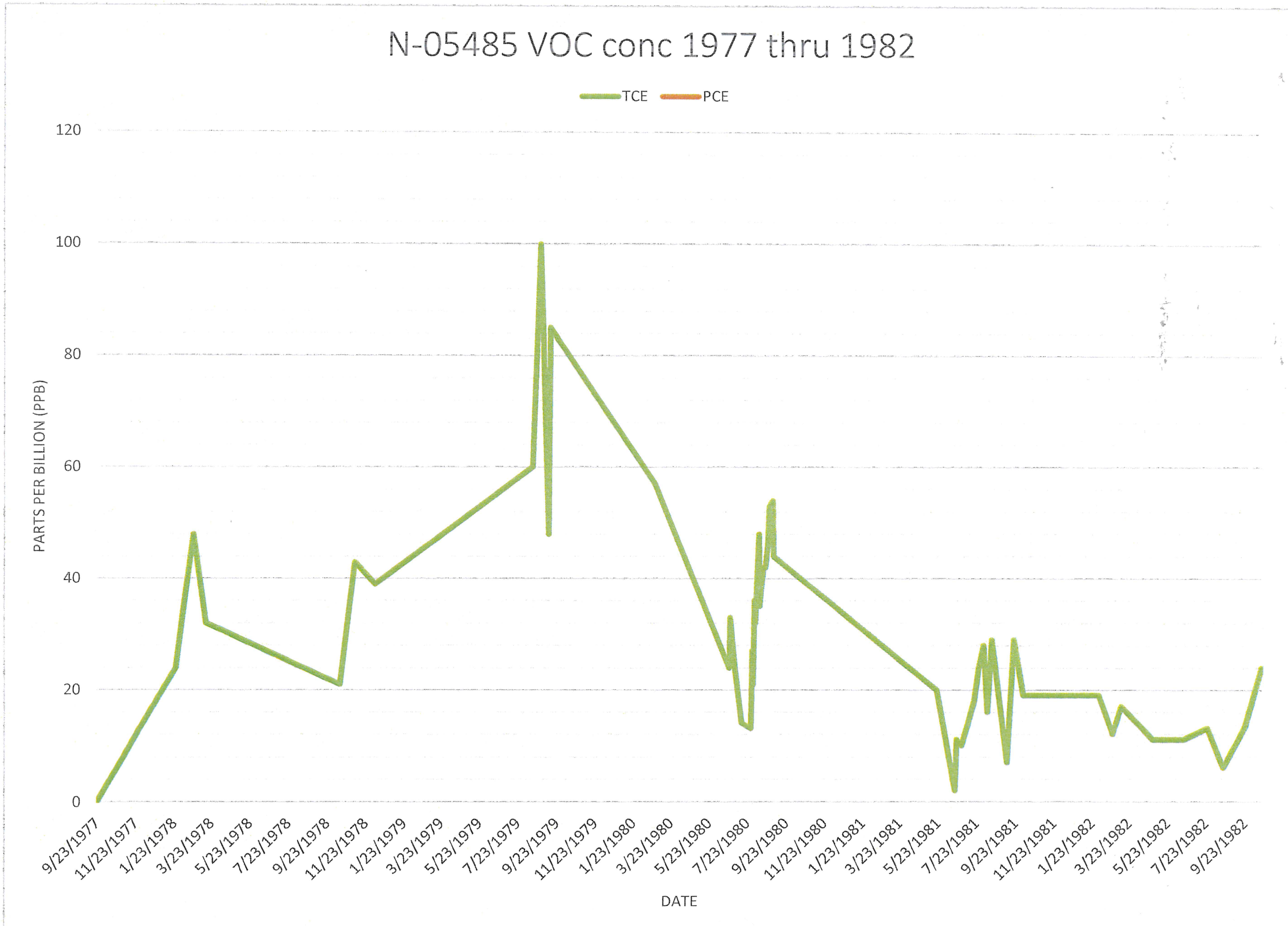
11/23/1981
1/23/1982



N-05485 VOC conc 1977 thru 1982
TCE
PCE
120
100
80
60
40
20
0
PARTS PER BILLION (PPB)
9/23/1977
11/23/1977
1/23/1978
3/23/1978
5/23/1978
7/23/1978
9/23/1978
11/23/1978
1/23/1979
3/23/1979
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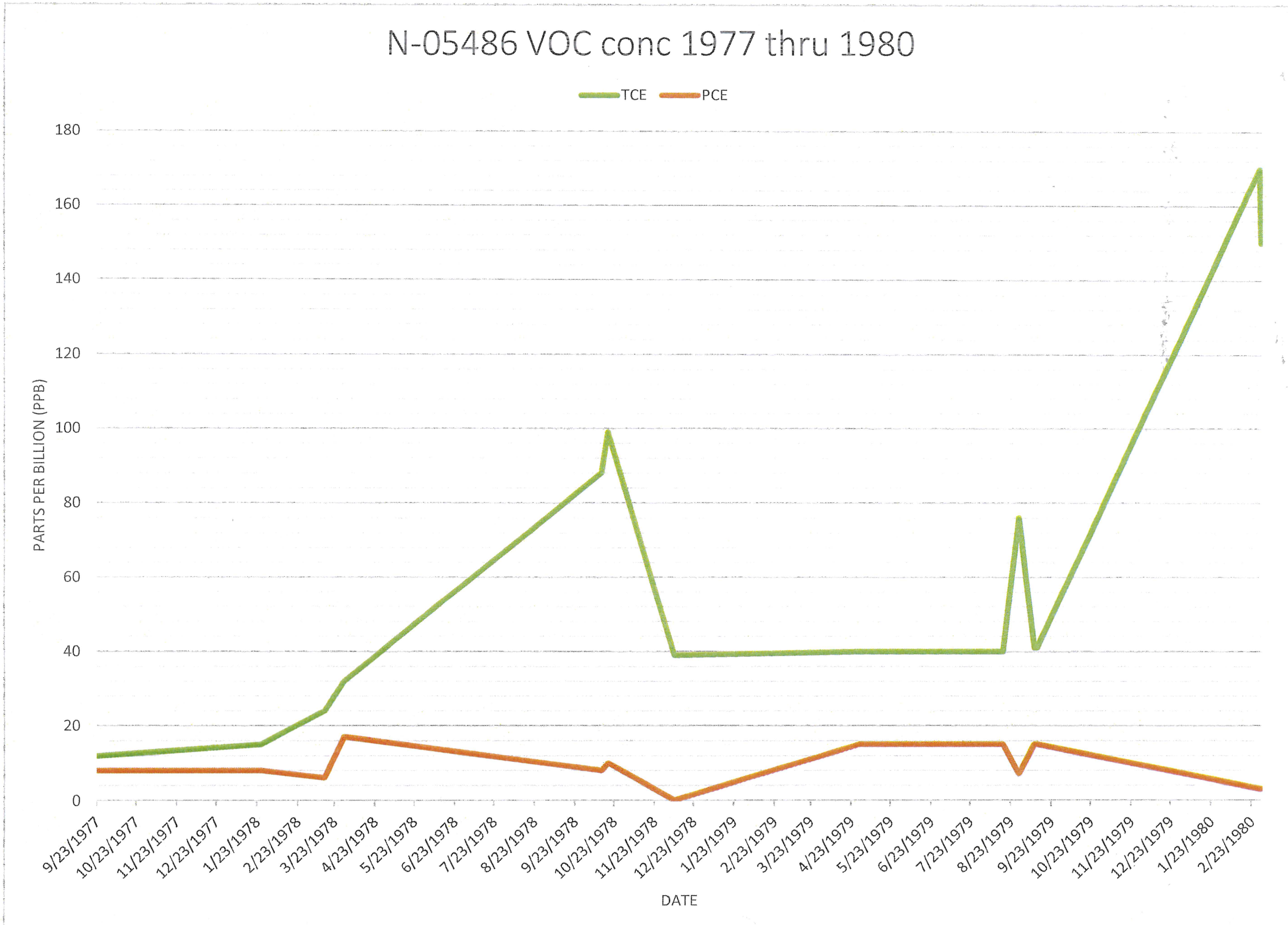
7/23/1982
9/23/1982
DATE



N-05486 VOC conc 1977 thru 1980
TCE
PCE
PARTS PER BILLION (PPB)
180
160
140
120
100
80
60
40
20
0
9/23/1977
10/23/1977
11/23/1977
12/23/1977
1/23/1978
2/23/1978
3/23/1978
4/23/1978
5/23/1978
6/23/1978
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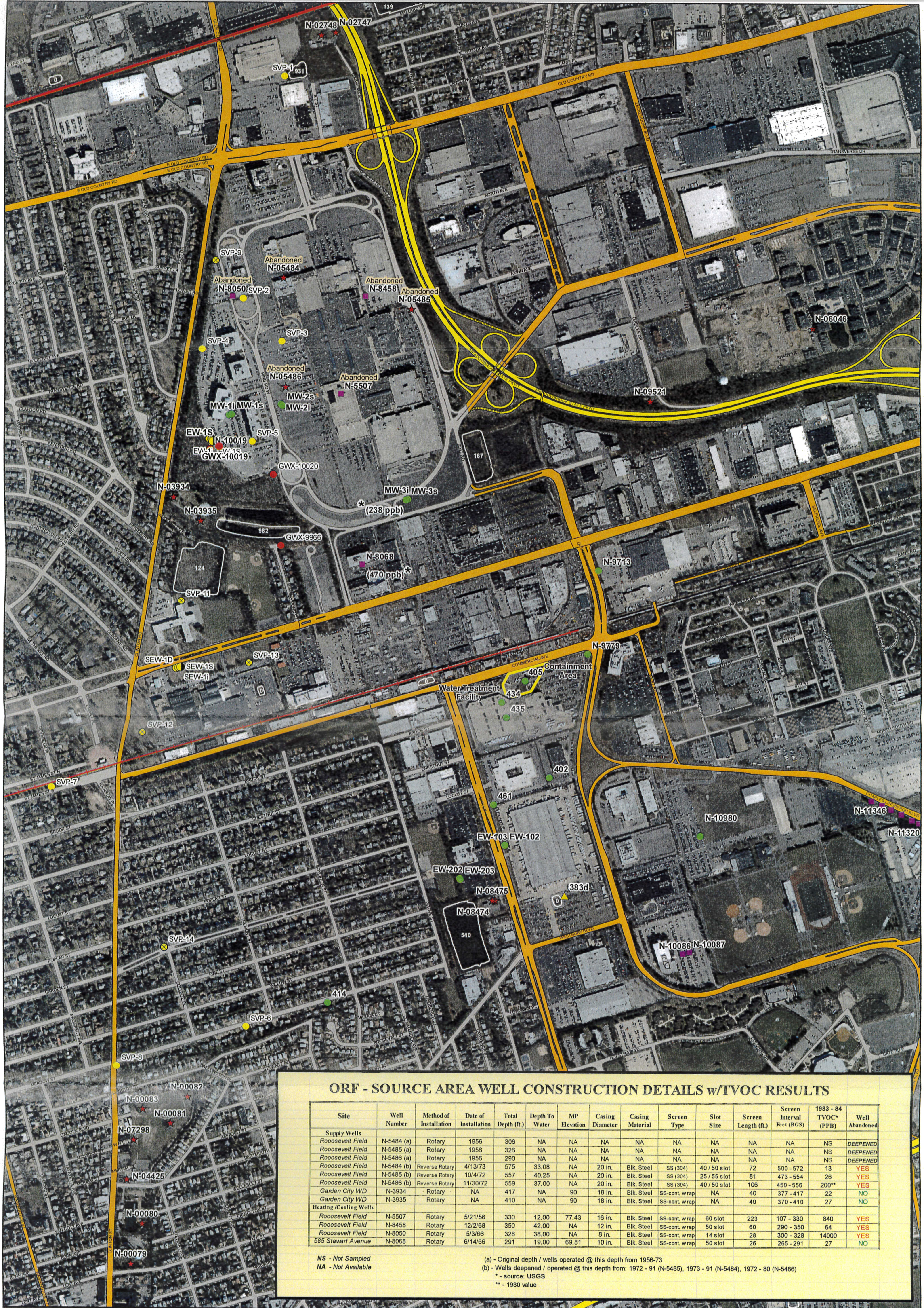
1/23/1980
2/23/1980
DATE



ORF - SOURCE AREA WELL CONSTRUCTION DETAILS w/TVOC RESULTS

Site	Well Number	Method of Installation	Date of Installation	Total Depth (ft.)	Depth To Water	MP Elevation	Casing Diameter	Casing Material	Screen Type	Slot Size	Screen Length (ft.)	Screen Interval Feet (BGS)	1983 - 84 TVOC* (PPB)	Well Abandoned
Supply Wells														
Rooosevelt Field	N-5484 (a)	Rotary	1956	306	NA	NA	NA	NA	NA	NA	NA	NA	NS	*DEEPENED*
Rooosevelt Field	N-5485 (a)	Rotary	1956	326	NA	NA	NA	NA	NA	NA	NA	NA	NS	*DEEPENED*
Rooosevelt Field	N-5486 (a)	Rotary	1956	290	NA	NA	NA	NA	NA	NA	NA	NA	NS	*DEEPENED*
Rooosevelt Field	N-5484 (b)	Reverse Rotary	4/13/73	575	33.08	NA	20 in.	Blk. Steel	SS (304)	40 / 50 slot	72	500 - 572	13	YES
Rooosevelt Field	N-5485 (b)	Reverse Rotary	10/4/72	557	40.25	NA	20 in.	Blk. Steel	SS (304)	25 / 55 slot	81	473 - 554	26	YES
Rooosevelt Field	N-5486 (b)	Reverse Rotary	11/30/72	559	37.00	NA	20 in.	Blk. Steel	SS (304)	40 / 50 slot	106	450 - 556	200**	YES
Garden City WD	N-3934	Rotary	NA	417	NA	90	18 in.	Blk. Steel	SS-cont. wrap	NA	40	377 - 417	22	NO
Garden City WD	N-3935	Rotary	NA	410	NA	90	18 in.	Blk. Steel	SS-cont. wrap	NA	40	370 - 410	27	NO
Heating /Cooling Wells														
Rooosevelt Field	N-5507	Rotary	5/21/56	330	12.00	77.43	16 in.	Blk. Steel	SS-cont. wrap	60 slot	223	107 - 330	840	YES
Rooosevelt Field	N-8458	Rotary	12/2/68	350	42.00	NA	12 in.	Blk. Steel	SS-cont. wrap	50 slot	60	290 - 350	64	YES
Rooosevelt Field	N-8050	Rotary	5/3/66	328	38.00	NA	8 in.	Blk. Steel	SS-cont. wrap	14 slot	28	300 - 328	14000	YES
585 Stewart Avenue	N-8068	Rotary	6/14/66	291	19.00	69.81	10 in.	Blk. Steel	SS-cont. wrap	50 slot	26	265 - 291	27	NO

***NS** - Not Sampled*
***NA** - Not Available*

(a) - Original depth / wells operated @ this depth from 1956-73
(b) - Wells deepened / operated @ this depth from: 1972 - 91 (N-5485), 1973 - 91 (N-5484), 1972 - 80 (N-5486)
* - source: **USGS**
** - 1980 value

Legend

- Public Supply Wells
- Heating-Cooling Wells
- Purex Recovery Wells (Lower Magothy)
- Monitoring Wells(Lower Magothy)
- Railroad
- NASSAU.RechargeBasins
- Containment Area(Purex)

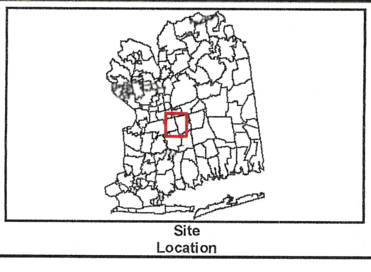
Purex New RD Mulit-Port Wells

- Existing RI Multi-port Well
- Existing Conventional Well
- Existing RD Multi-port Well
- Extraction Well

Roadway

- Other
- County
- Federal
- State

*TCE/PCE Concentration(ppb) Sept.2011



Site Location

PUREX SITE & VICINITY

Old Roosevelt Field Well Location Map January 2013

Mitchel Field, NY

Prepared By: - NCDPW - Water/Wastewater Engineering Unit

N W E S

0 80 160 320 480 640 800 Feet

Nassau County

Geographic Information System

Date: 01/21/2013

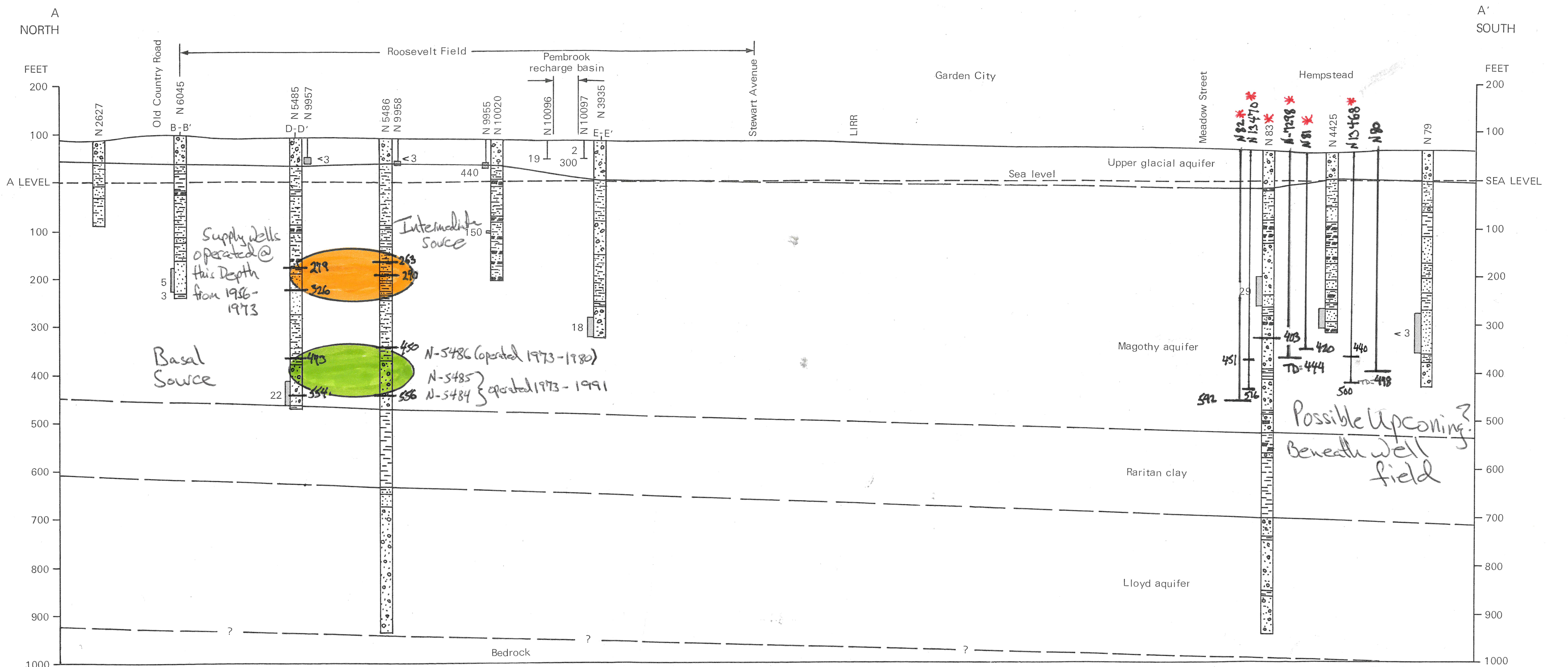
H:/Water-Wastewater Engineering/Purex/Old Roosevelt Field Well Location Map January 2013 Port 11x17 (012113)

'ARTMENT OF THE INTERIOR
. GEOLOGICAL SURVEY

Modified USGS Roosevelt Field X-Section

w/ intermediate & Basal Source Areas

PREPARED IN COOPERATION WITH THE
NASSAU COUNTY DEPARTMENT OF PUBLIC WORKS



USGS - 1989

* - Treating for VOC's

March 28, 2018

20 Cedar Place
Garden City, NY 11530

Ms. Sherrel Henry
Remedial Project Manager
Western New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Dear Ms. Henry:

I am sending this letter to express my concerns regarding the proposed "Plan for Remedy for Operable Unit Two at the Old Roosevelt Field Contaminated Groundwater Area Site."

I am an environmental engineer, a certified professional engineer, and a former EPA employee. I was the CEO of ERM-New England, a prominent environmental consulting firm, and I have personally designed and managed numerous hazardous waste site investigations and clean ups, including Superfund sites.

I have not yet had an opportunity to review the technical merits of EPA's Plan in detail. However, it is not clear why EPA intends to install the proposed "pump and treat" system on Garden and Grove streets, in a densely populated residential area, and near a playground, rather than in other more suitable nearby locations. EPA has apparently not yet performed groundwater modeling that would be needed to determine the optimum location of recovery wells, and the impact of these wells on flow and transport of groundwater and contaminants. For example, would the zone of influence of the proposed extraction well cause other nearby contamination plumes to migrate toward Garden City or Hempstead? Therefore, the locations of the recovery wells, if needed, should be deferred until such modeling is completed.

If ground water modeling analyses indicate that groundwater recovery and treatment would be effective and is the preferred alternative, the system should be located in commercial areas to the north of Garden Street, possibly along Commercial Avenue (about 1,600 feet north) or Stewart Avenue, and not on Garden and Grove streets. In addition to avoiding residential areas and the Grove Street playground, locating the pump and treat system in one of these other locations to the north would prevent or diminish further migration of additional contaminants from their point of origin in Roosevelt Field into residential areas of Garden City and Hempstead. In this scenario, the existing contamination underlying the eastern part of Garden City and Hempstead would naturally attenuate over time (probably much faster than the 35 year lifetime assumed for the proposed pump and treat system.)

It is also not clear why EPA has not evaluated treatment of contaminated ground water at the Points of Use (i.e. at the water supply wells), rather than continuing demonstrably ineffective attempts to recover and treat contaminated ground water extracted from various points in the aquifer. The current approach seems to be a futile effort, given the extent and limited definition of the plumes and their origins, and the continued elevated contamination levels.

I am also concerned that the sources of contamination have not been identified or remediated, and that these sources are contributing to ongoing contaminant migration in the area. The Plan states that EPA "***assumes*** there is no ongoing contamination from the former Avis property. If, during implementation of the EPA remedy, EPA determines that the property is a continuing source, then EPA may elect to evaluate additional options."

I question the basis and logic of this assumption and approach. It seems plausible if not likely that there are ongoing sources of contamination in the northern areas of Roosevelt Field that have enabled the groundwater contamination to have persisted for over 50 years or more. Otherwise, the ground water contamination would have already attenuated naturally to background levels.

The potential sources of contamination, including contaminated soils near the original areas of industrial activity, should be evaluated and if feasible, remediated or controlled, to prevent further contaminant migration. We request that EPA provide further justification for the assumption that there is no ongoing contamination source prior to proceeding with the Plan. If appropriate, EPA should perform additional investigations to identify and if feasible remediate and/or contain, such sources, prior to implementing a pump and treat system. If there is such a continuing source, and it is not addressed, the pump and treat system will not be effective and would need to operate in perpetuity.

In summary, a more effective strategy than the proposed Plan that apparently has not been evaluated would be a combination of source control, Point of Use treatment, and ongoing monitoring, rather than further attempts to recover illusive and undefined contaminant plumes from within the aquifers.

As stated previously, I have not yet had an opportunity to review the Plan or the RI/FS in detail, so I recognize that EPA may be able to provide defensible responses to these concerns and suggestions. However, I strongly recommend that EPA work with the Village of Garden City and its consultants to address these and other issues, prior to execution of a Record of Decision (ROD).

Thank you for your consideration.

Regards

Robert Foxen, P.E.

From:	Anne Griffin
To:	Henry, Sherrel
Cc:	megriffin.4@gmail.com
Subject:	Project on Garden Street, Garden City, NY
Date:	Sunday, March 18, 2018 10:04:52 PM

Dear Ms. Henry,

My husband and I are pleased to hear steps will be taken to remediate the contaminated water in our area. We live at 166 Garden Street (between Grove and Boyleston) which is a half a block from the park. As parents of three young children, we have major concerns about the little houses being at the corner of Boyleston and Grove and right next to a playground, along with the pipe work being done on Garden Street. Our block gets very crowded with cars because of the many sports games scheduled at Grove Park. On our block alone, we have close to 35 children. Many of these children play in front of their homes, in the street and at the park. Grove Park is the largest park in G.C. with the highest number of visitors. The programs provided at Grove Park are so popular that there's often traffic on Grove because parents are dropping off and picking up children who visit Grove Park even though it's not their home park.

I realize steps need to be taken for this contamination project to be successful. I beg of you to shift the project if possible. It doesn't seem like a good decision to have all this work done with kids truly underfoot.

At your convenience, please let me know if there's anyone else I can reach out to, so I can express my concerns about the project bring done at the proposed location. Thank you.

Sincerely,
Anne and Michael Griffin

Sent from my iPhone

From: Christine Hanley
To: Henry, Sherrel
Subject: Plan for Remedy for Operable Unit Two at the Old Roosevelt Field Contaminated Groundwater Area Site."
Date: Thursday, March 29, 2018 10:52:20 AM

Sherrel Henry
Project Manager
New York Remediation Branch
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866
(212) 637-4273
henry.sherrel@epa.gov

Dear Ms. Henry:

We are sending this letter to express our concerns regarding the proposed "Plan for Remedy for Operable Unit Two at the Old Roosevelt Field Contaminated Groundwater Area Site." The Plan proposes to install a groundwater recovery well on Garden Street, which is in a densely populated residential area, and treat and discharge the contaminated waste water adjacent to a playground and homes on Grove Street.

We have not yet had an opportunity to review the technical merits of EPA's Plan in detail. However, it is not clear why EPA intends to install the "pump and treat" system on Garden and Grove streets, rather than other more suitable nearby locations. EPA has apparently not yet performed groundwater modeling that would be needed to determine the optimum location of recovery wells, and the impact of these wells on flow and transport of groundwater and contaminants.

It is also not clear why EPA has not evaluated treatment of contaminated ground water at the Points of Use (i.e. at the production wells), rather than continuing demonstrably ineffective attempts to recover and treat contaminated ground water extracted from various points in the aquifer. This approach seems to be a futile effort, given the extent and limited definition of the plumes and their origins.

If ground water modeling analyses indicate that groundwater recovery and treatment could be effective and is the preferred alternative, the system should be located in commercial areas to the north of Garden Street, possibly along Commercial Avenue (about 1,600 feet north) or Stewart Avenue, and not on Garden and Grove streets. **Since my home is located in this area, I am deeply concerned about its impact on our neighborhood. A very busy park and baseball/soccer fields are adjacent to the proposed site. The commercial areas mentioned above would be a more suitable site.** In addition to avoiding residential areas, locating the pump and treat system in one of these other locations would prevent migration of additional contaminants from their point of origin in Roosevelt Field into residential areas of Garden City. In this scenario, the existing contamination underlying the eastern part of Garden City and Hempstead would naturally attenuate over time (probably much faster than the 35 year lifetime assumed for the proposed pump and treat system.)

We are also concerned that the sources of contamination have not been identified or remediated, and that this in part has contributed to ongoing contaminant migration in the area. The Plan states that EPA "***assumes*** there is no ongoing contamination from the former Avis property. If, during implementation of the EPA remedy, EPA determines that the property is a continuing source, then EPA may elect to evaluate additional options."

We question the basis and logic of this assumption and approach. It seems plausible if not likely that there must be an ongoing source of contamination that has enabled the groundwater contamination in this area to have persisted for over 50 years or more. Otherwise, the ground water contamination would have already attenuated naturally to background levels.

The potential sources of contamination, including contaminated soils near the original areas of industrial activity, should be evaluated and if feasible, remediated, ***prior to*** implementing any pump and treat system, not afterwards. We request that EPA provide further justification for the assumption that there is no ongoing contamination source prior to proceeding with the Plan. If appropriate, EPA should perform additional investigations to identify and if feasible remediate and/or contain, such sources, prior to implementing a pump and treat system. If there is such a continuing source, and it is not addressed, the pump and treat system will not be effective and would need to operate in perpetuity.

As stated previously, we have not yet had an opportunity to review the Plan in detail. In view of this, we are requesting that EPA work with the Village of Garden City and its consultants to address these and other issues, prior to moving forward with the Plan, or execution of a Record of Decision (ROD).

Thank you for your assistance.
Christine Hanley

From: Thomas M. Hogan
To: Henry, Sherrel
Subject: EPA Superfund Proposed Plan Meeting Garden City March 7
Date: Monday, March 05, 2018 2:45:51 PM
Attachments: EPA Superfund Proposed Plan Feb 2018.pdf

Ms. Henry --

Per my prior e-mail, I am the current Eastern Property Owners' Association President and would like to take the opportunity to comment on the EPA's Proposed Plan regarding a treatment facility (Proposed Plan attached). The EPOA promotes property interests on behalf of the 2800 households in Garden City East. Please find our contact information below.

Below are my comments based on feedback that I have received from residents that live in the area.

- As noted in the attached plan, the EPA is soliciting public comment on all of the alternatives considered in the Proposed Plan. Although a groundwater extraction well and a treatment plant near Garden and Grove streets seems to be a positive development in terms of water quality, residents are concerned about the location of this facility. For example, in the past, the EPA has done testing near resident houses on Garden Street and that caused a lot of disruption. We would ask that the Proposed Plan not be pursued near residential homes. There may be availability for land near Grove Park, but that is subject to review and comment by the village of Garden City.
- Notwithstanding the location of the Superfund, we understand that our drinking water meets EPA standards, but I would appreciate any other information you can provide me regarding water quality.
- In the future, can you please keep me abreast of any meetings or updates on the Proposed Plan? The EPOA found out about this plan through News 12 rather than directly from the EPA. We would appreciate fair notice so we can properly notify residents.

Thank you,

Tom Hogan
EPOA President

917-843-6360
hoganthomas@gmail.com

--
Garden City Eastern Property Owners' Association
Progress through Participation
gcepoa.org / Facebook @GardenCityEPOA / Twitter @GC_EPOA / Venmo @GCEPOA

From:	Thomas M. Hogan
To:	Henry, Sherrel
Cc:	Joseph Moody
Subject:	Fwd: FW: Roosevelt Field Superfund
Date:	Monday, February 26, 2018 12:37:02 PM

Hi Ms. Henry --

Joe Moody (cc'd), former President of the Eastern Property Owners' Association provided me with your contact information. I understand you have spoken with Joe in the past about the Roosevelt Field Superfund. I took over as President last year and I received some questions from residents in East Garden City due to the recent News 12 coverage of this (available at http://longisland.news12.com/story/37579618/epa-expands-cleanup-plan-for-garden-city-superfund-site).

Can you let me know what the March 7 EPA meeting will cover so I can notify residents? Also, any details about the planned treatment center near Grove Park (where it is located, etc.), and any feedback on providing some comfort to residents regarding the quality of the drinking water would be helpful as we are getting some concerned feedback from residents.

Email is the best way to reach me -- hoganthomas@gmail.com and I have included my other contact information below.

Thank you for your time. I look forward to speaking with you.

Regards,

Tom Hogan
EPOA President
hoganthomas@gmail.com
917-843-6360

--
Garden City Eastern Property Owners' Association
Progress through Participation
gcepoa.org / Facebook @GardenCityEPOA / Twitter @GC_EPOA / Venmo @GCEPOA

Garden City Eastern Property Owners' Association

March 28, 2018

VIA EMAIL (HENRY.SHERREL@EPA.GOV) AND REGULAR MAIL

Ms. Sherrel Henry, Remedial Project Manager
Western New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Dear Ms. Henry:

On behalf of the Board of Directors for the Garden City Eastern Property Owners' Association (the "EPOA"), which promotes property interests for the 2,800 households in the Eastern Section of Garden City, I thank you for the opportunity to comment to the Environmental Protection Agency (the "EPA") regarding the Proposed Plan for Remedy for Operable Unit Two at the Old Roosevelt Field Contaminated Groundwater Area Site (the "Proposed Plan"). Although the installation of water treatment facilities seems to be a positive development in terms of water quality, nearby residents are concerned about installation locations and therefore, the EPOA requests that the EPA: (i) work closely with the Village of Garden City and EPOA regarding the details and progress of this project; (ii) utilize the EPOA as a partner in discussing the location of the treatment facility installations; and (iii) is respectful and mindful of nearby residents.

The Proposed Plan describes three alternatives in addition to no action by the EPA. Alternative 2 concerns the installation of an extraction well on the median of Garden Street and a new treatment plant near Grove Street. Alternatives 3 and 4 concern the installation of in-well vapor stripping systems and approximately 47 injection wells, respectively, along the median of Garden Street. With respect to these 3 alternatives, Grove Street is a densely populated area and we ask that the EPA limit the negative impact on resident homes in terms of the duration and scope of any necessary construction related to this project. Further, in Alternative 2, due to the size and potential resulting noise from the treatment plant, we recommend that this plant be built in a place that is least impactful to nearby residents as well as to patrons of Grove Park.

Due to the timing of the comment period and information provided to date, the EPOA has not had an opportunity to review the Proposed Plan in detail and therefore, as noted above, we ask that the EPA continue to work closely with the village and EPOA on this project.

Sincerely,

Thomas M. Hogan, EPOA President
PO Box 7525
Garden City, NY 11530
Email: hoganthomas@gmail.com

Cc via email:
Mr. John Delany, Garden City East Trustee
Mr. Mark Hyer, Garden City East Trustee
Mr. Ralph Suozzi, Village of Garden City Administrator

From: Peter Marchelos
To: Henry, Sherrel
Cc: Me Office
Subject: Old Roosevelt Field Contaminated GW Area Superfund Site
Date: Sunday, March 18, 2018 12:00:01 PM

Good morning Ms. Henry:

I attended the March 13 meeting at the Garden City Village Hall and have a pretty good grasp and understanding as to why and how remediation needs to be done.

I will try to keep my comments and concerns brief:

1) I have real concerns about the proposed groundwater treatment plant's (TP) proposed location. I understand from the meeting that placement is not finalized but the proposed location of just south of the tennis courts (between the tennis court and recharge basin) is unacceptable and concerning to me as well as many residents that I have spoken too. I saw the rendering of what the TP looks like and while similar to what a recreation or parks department might build I do have concerns of what surrounds it. I drove by the existing EW on Clinton and I believe what I saw was the TP. Next to it were these large cylinder like steel wells among other industrial looking apparatus. My concern along with neighbors that I have spoken to are 1) an attractive nuisance to our children (young and old) that play in that park 2) loss of property value (people are already saying whats wrong with the water on Garden/Grove (and nearby streets). When people drive around the area when they look at homes, they will see this structure and ask what it is. 3) Overall quality of life with 18month + construction (which I have a feeling will take longer) and having to look at the Treatment plant for the next possible 30 years.

2) It's my understanding that the logistics of the proposed remediation plan is not finalized, ie: where the GW Extraction well (EW) and Treatment plants (TP) will be situated. Couldn't another possible site be Pine and Boylston for the EW with a trench running to the Southside of the Recharge Basin and virtually out of site. The side where the Uniondale Supply Wells are located. No residences are affected.
It is also consistent with keeping the EW near the 110 g/L border.

Thank you for your anticipated time in reading my comments. I just hope that the EPA will consider my comments as well as others when they make their final decisions.

Peter Marchelos
Garden City Resident.

From:	Smcand1
To:	Henry, Sherrel
Subject:	Water Treatment Plan
Date:	Wednesday, March 28, 2018 6:22:38 PM

I am writing on behalf of my many neighbors on Chestnut St in Garden City.
We have great concerns over the proposed plans for the remedy for operable
unit two at the Old Roosevelt Field Contaminated Groundwater Area Site. As you are
aware this area is located within a densely populated area of residential homes, a K2 school and a playground.
We respectfully encourage you to honor our concerns for safety, quality of life/ property values and select an alternative such as Commercial Ave or Oak St.
Thank you for your consideration.
Sincerely,
Sharon McAndrews
1 Chestnut St
Garden City, N.Y.
11530

From:	Joseph Moody
To:	Henry, Sherrel
Subject:	Old Roosevelt Field Groundwater Contamination Area Superfund - Garden City Project
Date:	Wednesday, March 28, 2018 2:08:27 PM

Hello Ms. Henry,

Writing on behalf of Garden City Residents and myself. We are very concerned about the installation of a recovery well on Garden Street and construction and operation of a treatment/ discharge facility in or around Grove Park. As you are aware this area is located within a densely populated established residential area of single family homes, a public school and a heavily utilized at Grove Street Park.

I ask you to consider our concerns for safety, quality of life and property values and find a suitable site away from residential property, our schools and our parks. Please make this email part of the public response to the project.

Thank you,

Joe Moody

Patriot Supply
20 West Mall
Plainview, NY 11803
Tel# 516-249-3100
Fax#516-249-3108

Donna and Tom O'Brien
28 Chestnut Street
Garden City, NY 11530

March 28, 2018

Ms Sherri Henry
Remedial Project Manager
Western NY Remediation Section
USEPA
290 Broadway 20th floor
NY, NY 10007-1866

Dear Ms. Henry,

I am writing on behalf of my many neighbors on Chestnut Street in Garden City and myself. We have great concerns over the proposed plan to remedy operable unit two at the Old Roosevelt Field Contaminated Groundwater Area Site. There is a proposed installation of a recovery well on Garden Street and construction and operation of a treatment/ discharge facility on Grove Street.

This area is located within a densely populated established residential area of single family homes, a K to 2 school, and a heavily utilized municipal playground/ playing fields at Grove Street Park.

We respectfully encourage you to honor our concerns for safety, quality of life, and property values and **WE URGE YOU TO SELECT ALTERNATIVES SUCH AS COMMERCIAL AVE OR OAK STREET**.

Thank you for your consideration of alternatives which will provide the desired results while being less intrusive to this neighborhood in Garden City.

Sincerely,

Donna M O'Brien

Thomas J O'Brien

Donna and Tom O'Brien
28 Chestnut Street
Garden City, NY 11530

March 28, 2018

Ms Sherri Henry
Remedial Project Manager
Western NY Remediation Section
USEPA
290 Broadway 20th floor
NY, NY 10007-1866

Dear Ms. Henry,

I am writing on behalf of my many neighbors on Chestnut Street in Garden City and myself. We have great concerns over the proposed plan to remedy operable unit two at the Old Roosevelt Field Contaminated Groundwater Area Site. There is a proposed installation of a recovery well on Garden Street and construction and operation of a treatment/ discharge facility on Grove Street.

This area is located within a densely populated established residential area of single family homes, a K to 2 school, and a heavily utilized municipal playground/ playing fields at Grove Street Park.

We respectfully encourage you to honor our concerns for safety, quality of life, and property values and **WE URGE YOU TO SELECT ALTERNATIVES SUCH AS COMMERCIAL AVE OR OAK STREET**.

Thank you for your consideration of alternatives which will provide the desired results while being less intrusive to this neighborhood in Garden City.

Sincerely,

Donna M O'Brien

Thomas J O'Brien

From: Neil O"Malley
To: Henry, Sherrel
Subject: Garden City NY water
Date: Wednesday, March 28, 2018 11:41:04 AM

Dear Ms. Henry.
I applaud the EPA's intentions to clean up the toxic plume that is killing Garden City, Long Island. I would hope that care will be taken when considering where to place the facility that strips the contaminated water. Garden street, Grove park and surrounding areas are densely populated with young children. The plant that operates off of Clinton st. is ominously loud and scary. I trust that all public curtesy issues and concerns will be considered when making plans and while constructing this project. Thank you
Neil O'Malley
55 Commander Ave
Garden City NY 11530

From: Peg Rogers
To: Henry, Sherrel; Rodriguez, Elias
Subject: Garden City Water Contamination (Supply Wells GWP-10 and GWP-11)
Date: Sunday, February 25, 2018 10:56:57 AM

Is Garden City drawing their drinking water from these contaminated areas?

Do these two contaminated supply wells provide drinking water to a specific section of Garden City?

Another words are the houses located near the contaminated wells the ones most likely to be affected by the contamination?

If so, what is the specific area/section of Garden City where the drinking water is affected?

Routine monitoring of groundwater at the site is being performed by EPA as part of a long-term monitoring program to verify remedy effectiveness and to monitor remedial progress. The results from the most recent annual groundwater sampling event performed in November 2015 (Round 7) indicate that TCE and PCE concentrations in Garden City supply wells GWP-10 and GWP-11 decreased by over 50 percent between 2011 and 2015, although they continue to exceed the EPA Maximum Contaminant Level (MCL) and New York State drinking water standard of 5 micrograms/liter for TCE and PCE. Institutional controls are in place to restrict groundwater use at the site

EPA Proposes Plan to Expand Cleanup of Contaminated Groundwater at the Old Roosevelt Field Contaminated Groundwater Area Superfund Site | US EPA

EPA Proposes Plan to Expand Cleanup of Contaminated Groundwater at the O...

EPA News Release: EPA Proposes Plan to Expand Cleanup of Contaminated Groundwater at the Old Roosevelt Field Con...

Thank you,

Peg Rogers

From:	Donaldroe9
To:	Henry, Sherrel
Subject:	Garden City Water
Date:	Saturday, March 24, 2018 4:09:38 PM

I am writing to let you know my concerns surrounding the remediation plans that are being proposed for the south east section of Garden City. They are unacceptable and acceptable alternative plans need to be put forward. I have lived in my home for almost twenty three years now and have never written a protest letter in all those years.

I look forward to hearing new solutions being reviewed by the community.

Yours truly,
Donald Roe
175 Garden Street
Garden City
Sent from my iPad

From: Mari Shea
To: Henry, Sherrel
Subject: Water Treatment Well and Air Stripping Facility in Garden City
Date: Thursday, March 29, 2018 8:35:10 AM

March 29, 2018

Ms Sherri Henry
Remedial Project Manager
Western NY Remediation Section
USEPA
290 Broadway
New York, NY 10007

Dear Ms. Henry,

I am writing on behalf of my neighbors on Chestnut Street in Garden City and myself. We wish to express our major concerns over the site being explored for the proposed installation of a recovery well on Garden Street and the construction and operation of a treatment/discharge facility on Grove Street. You must be aware that this area is a densely populated established residential area of single family homes, a primary school and a heavily used municipal playground/sports fields at Grove Park.

I don't know how you can consider this quiet residential area for a facility of this kind. It just doesn't make sense in light of the above mentioned facts. It would seem to be a much smarter decision to place this facility in the industrial zones that border our neighborhood possibly near Oak Street or the Coliseum or Commercial Avenue. These alternative sites are large areas that we are sure could house this facility and not have a negative impact on a quiet residential area.

We encourage you to honor our concerns for safety, quality of life and property values and select an alternative site for this facility.

Thank you for your consideration of alternatives which will provide the desired results while being less intrusive to this section of Garden City.

Thank you.

Mari Shea
106 Chestnut Street
Garden City, NY 11530

Sent from my iPad

Martin M. Shea
106 Chestnut Street
Garden City, New York 11530
(516) 248-9689 (h)
(917) 273-0052 (c)

March 29, 2018

Ms. Sherri Henry
Remedial Project Manager
Western NY Remediation Section
USEPA
290 Broadway 20th Floor
NY NY. 10007

Dear Ms. Henry;
Writing on behalf of my many neighbors on Chestnut Street in Garden City and myself, we have great concerns over the site being explored for the proposed plan for the remedy for operable Unit #2. The placement of this unit on Grove Street is dramatically wrong. The construction and operation of a treatment/discharge facility in the middle of a residential area is a mistake. As you are probably aware this area is located in a densely populated residential area, a K2 school and a heavily utilized municipal playground. It would be a smart decision to move the placement of this site to either Oak Street or along Commercial Ave., which are both industrial zones.

Thanking you for your consideration of alternatives which will provide the desired results and leave us living in the eastern section of Garden City with our quality of life, I remain

Sincerely,

Martin. M. Shea

From: m stemp
To: Henry, Sherrel
Subject: Public Comment: Old Roosevelt Field Contaminated Groundwater OU2
Date: Wednesday, March 28, 2018 5:41:42 PM

Hi-
I am writing in regards to the Old Roosevelt Field Contaminated Groundwater Area Superfund Site Operable Unit 2 proposal.

I agree with the preferred EPA remedy, option 2 Pump & Treat.

I do live in the affected Garden City neighborhood on Garden Street. As much as possible, I would like to be informed on the decisions on where to install the pumping well, location of the treatment center and timeline of construction and operation start date.

If you have any further questions, please do not hesitate to let me know.

Thank you
Melissa Owen
108 Garden Street
908-334-7678

From:	Jennifer Sullivan
To:	Henry, Sherrel
Cc:	Tim Sullivan
Subject:	EPA Clean Up Plan on Garden Street
Date:	Wednesday, March 14, 2018 9:57:38 PM

Hello Sherrel.

I am a resident at 157 Garden Street and unfortunately I was unable to attend the public meeting last night regarding the EPA proposed clean up plan of contaminated groundwater in the East. I apologize as I really wanted to be there to hear everything first hand.

While I certainly appreciate the clean up effort and put the health of my family first, **I have a few questions/ concerns please:**

(1) How was Garden Street selected as the street to put this extraction well? I understand that there will be a trench from a location on Garden all the way down to Grove Park?

(2) Is my drinking water affected by this contaminated groundwater with these TCE and PCE chemicals?

(3) when will the construction begin as I am thinking of selling my home later this year. This construction and stigma will negatively impact my family as we put our house on the market. Not sure what to tell prospective buyers?

(4) I was unaware that back in 2007 the EPA did a similar cleanup plan for area groundwater contamination which included extraction of groundwater contamination in the western portion of the site? Was this also in a residential neighborhood??? Are you saying that there are extraction wells all over the place in the East?

(5) Where will the pump and treat site/ structure be built? I heard it might be put in Grove Park??? How large will this structure be as it will be
a big eye sore for all residents in the area. Is there a way to hide it closer to the sump???

I appreciate your insight. Thank you very much.

- Jennifer Sullivan
(516) 361-7190

numbers, or other similar personal data. If you receive an email that appears to be from our company and requests that you wire funds or reveal confidential information, email fraud may be involved. Please do not respond to the message, and contact us immediately at: fraudalerts@danielgale.com or 800.942.5334.

David Yudelson
Direct: 646-378-7219
dyudelson@sprlaw.com

March 29, 2018

Via Email
Sherrel Henry
Remedial Project Manager
Western New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866

Re: Proposed Plan: Old Roosevelt Field Contaminated Groundwater Area Superfund Site Operable Unit 2

Dear Ms. Henry:

On behalf of the Incorporated Village of Garden City (the "Village") and its residents, we submit these comments on the Proposed Plan for the remediation of Operable Unit 2 ("OU2") at the Old Roosevelt Field Contaminated Groundwater Site. As described in the Proposed Plan, the OU2 remedy will pump and treat a contaminated groundwater plume within Garden City, emanating from the former Roosevelt Field airfield. In particular, the remedy proposes the construction of an extraction well on a residential street within the Village, with groundwater transported through pipes to be installed beneath the Village's streets to a water treatment plant that appears to be located in a Village park and recreational area. This is an unacceptable location for the treatment plant. As the Village has an undeniable and direct interest in the proposed remedy, we respectfully request that the Village be involved in the process leading to the selection of final locations for all the remedial facilities, their design and the scheduling and methods of construction.

Due to the well-documented groundwater contamination in the surrounding area and the potential for the new extraction well to affect groundwater flow and movement of documented contaminants, the Environmental Protection Agency ("EPA") must analyze the hydrological impacts of all remedial alternatives and their effects on the Village's drinking water supply prior to selecting a remedy. The Village's engineers are in the process of reviewing the proposed remedial system and its potential impacts on the potable water supply wells. Given their particularized knowledge of the Village's drinking water treatment needs and the impacts of not only this plume, but regional groundwater contamination, we respectfully request that the Village and its engineers be involved in the review and finalization of the operational aspects of OU2 remedy to ensure there is no adverse impact on the Village's potable water supply.

In evaluating remedial alternatives, EPA is required to consider not only the cost and efficacy of the remedy, but also its "community acceptance." 40 C.F.R. § 300.430(d)(9)(iii)(I). Community acceptance "includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose." *Id.* The Village and its residents share an interest in a fully protective remedy that minimizes adverse impacts to the surrounding community and its recreational spaces.

The proposed remedy includes the installation of an extraction well on Garden Street, a tree-lined, residential road. We understand that this location was proposed because Garden Street contains a landscaped median, allowing the well to be located in the middle of the street and further from the neighboring homes. The specific location, design, means of installation and maintenance of this well are critically important to the Village and its residents, and must be carefully selected both to minimize any disturbance or nuisance during construction and to ensure there are no community impacts after construction. We trust that EPA shares these objectives.

The new treatment plant is currently proposed to be constructed in the Village's recreational greenspace immediately east of Grove Street, near a Nassau County recharge basin. The loss of green recreational space is not a feasible alternative and will not be accepted by the Village. Grove Street is also the only residential street bordering the basin, and thus is the most likely to be adversely affected by the construction and operation of the new plant. An alternative location for the treatment plant must be identified. Available space on Oak Street or at the Uniondale supply well site should be considered as the only viable areas for placement. This is consistent with past Agency practice, such as the other ORF treatment facility on Clinton Road. Further, any construction must avoid impacting usage of the Grove Street Park.

We request that the Agency work with the Village to ensure that the location and design of the treatment plant are consistent with the neighborhood character, are as visually unobtrusive as possible, and are constructed with state of art noise attenuation measures so that there is no audible evidence of its operation once it is online. We reiterate that the loss of green recreational space is not a possibility, and that the Village must be involved in the siting of the remedial facilities.

The Village shares EPA's objective of a protective remedy that is cognizant and respectful of the surrounding community, and we look forward to working with EPA to realize that goal.

Sincerely,

David S. Yudelson