EXPLANATION OF SIGNIFICANT DIFFERENCES
WEST SIDE CORPORATION SITE

Jamaica / Queens County / Registry No. 2-41-026 / September 2002

Prepared by the New York State Department of Environmental Conservation
Division of Environmental Remediation

1.0 INTRODUCTION

The purpose of this notice is to describe the progress of the cleanup at the West Side Corporation Site, located at 107-10 180th Street in Jamaica, New York and to inform you about a change in the Site remedy. On July 31, 2000, the New York State Department of Environmental Conservation signed a Record of Decision (ROD) which selected a remedy to cleanup the soil and groundwater on the Site itself ("Operable Unit No. 1, OU-1"). A second ROD was signed in February 2002 that addresses contaminated groundwater that has moved from the site to the south-southwest ("Operable Unit No. 2, OU-2"). One component of the remedy for OU-1 was to perform a pilot-scale study to assess the effectiveness of injecting a chemical oxidizer to reduce the amount of the contaminant perchloroethene (PCE) in the most heavily contaminated portion of the site (Source Area No. 1).

During the fall and winter of 2001, a pilot-scale study was performed by the Department's consultant as part of the remedial design. Although some reduction in contamination was noted, the Department concluded that the reduction was not great enough to move ahead with the full-scale application of this in-situ chemical oxidation (ISCO) technique. The consultant was asked to evaluate other technologies that could be used in Source Area No. 1. This evaluation was completed during May/June 2002 and the conclusion was a recommendation to use a technology called electrical resistive heating (ERH, described below). Although the technology to be used in Source Area No. 1 will be different, the approach will be the same. Specifically, contamination will be treated in-place ("in-situ" to a depth of approximately 55 feet below the ground surface) to greatly reduce the amount of PCE in soil and groundwater.

This Explanation of Significant Differences (ESD) will become part of the Administrative Record for this Site. The information here is a summary of what can be found in greater detail in documents that have been placed in the following repositories:

Queens Borough Public Library, 89-11 Merrick Boulevard, Jamaica, NY 11432; (718) 990-0778; or

documents are also available for review (by appointment) at the NYSDEC's Region 2 Headquarters, 1 Hunters Point Plaza, 47-40 21st Street, Long Island City, NY 11101 (Tel: 718-482-4995).

You may also contact Mr. Shive R. Mittal, Project Manager, NYSDEC Division of Environmental Remediation, 625 Broadway, Albany, New York 12233-7017 (Tel. 518-402-9671).

Although this is not a request for comments, interested persons are invited to contact the Department's Project Manager for this site to obtain more information or have questions answered.

2.0 SITE DESCRIPTION AND ORIGINAL REMEDY

2.1 Site History, Contamination, and Selected Remedy

This 4.5 acre site is located at 107-10 180th Street in Jamaica, Queens in a mixed commercial/residential area (See Figure). The West Side Corporation property was used as a storage and distribution center for chemicals used in the dry cleaning industry from approximately 1969 to 1990. PCE was unloaded from trucks (and sometimes from railroad tank cars) into an on-site tank farm, where it was stored until it was transferred into 55-gallon drums for distribution to dry cleaning establishments. Groundwater and subsurface soils have been contaminated by spills of PCE. The concentrations of PCE were as high as 5,900 parts per million (ppm) in shallow soils and as high as 7,100 ppm in deep soils in the area where the storage tanks were located. The concentration of PCE in shallow groundwater in that area was found up to 210,000 parts per billion (ppb). Concentrations decrease in the direction of groundwater flow (south-southwest). The depth to groundwater around the site is 10-15 feet below the ground surface. The facility is currently leased by a bus company (Atlantic Express) and is used for servicing, storage, and dispatch of school buses.

Up until 1982, several groundwater production wells (formally owned and operated by the Jamaica Water Supply Company) were located to the north, west, and southwest of the site. These wells were used to supplement the local public water drinking system during periods of high demand, particularly during summer months. Historical data indicate that contaminated groundwater from the site was drawn toward these production wells when they were in operation. Analytical data from that time is not available but current and historical information suggests that the concentration of PCE that may have been introduced to the water distribution system was likely low due to dilution.

The components of the OU-1 remedy were as follows:

- A soil vapor extraction and treatment system will be installed to treat the contaminated soils above the water table in Source Areas 1, 2, and 3. The remedy will include asphalt pavement in Source Areas 1, 2, and 3 to prevent short-circuiting and enhance the effectiveness of the Soil Vapor Extraction and Treatment (SVET) system.

- A pilot-scale study to assess the effectiveness of the application of Fenton's reagent (or other chemical oxidant, e.g., potassium permanganate) to reduce the volume of highly contaminated PCE saturated soil and groundwater in Source Area 1 will be performed. This study will be expanded to full scale operation if feasible.

- The installation of a groundwater extraction and treatment system. The extraction wells located at the downgradient site boundary will remove contaminated groundwater for treatment and provide for the containment of the groundwater on site.

- Implementation of a long-term monitoring program to evaluate the effectiveness of the system will be instituted as a component of the O&M Plan for the site.

- To prevent future exposures to subsurface contaminants, the Department will seek to have restrictions placed upon the use of the site.

3.0 CURRENT STATUS

The Potentially Responsible Parties (PRP) for the site, documented to date, include: West Side Corporation. The site is currently owned by West Side Corporation and was operated by West Side Corporation during the time that PCE was handled at the Site. The PRP declined to implement the RI/FS and any subsequent remedial action at the site as requested by the NYSDEC. Therefore, the remediation of the site is being conducted under the State Superfund program. Testing needed to design the SVET system has been completed and the design itself is underway. The results of the ISCO pilot test are described below. As noted in the OU-2 ROD, the remedy selected for off-site groundwater will also address on-site groundwater. Therefore, the element of the OU-1 remedy that included groundwater collection and treatment has been deleted in favor of the off-site remedy.

4.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES

4.1 New Information

A pilot-scale study to assess the effectiveness of ISCO was performed during the fall-winter of 2001. The pilot study showed that although ISCO resulted in some reduction in the amount of PCE in the subsurface, the likely presence of PCE in the form of dense non-aqueous phase liquid (DNAPL) evidently inhibits the ability of ISCO to achieve the objectives of the ROD. To achieve the objectives of the ROD, it would likely require multiple injections to obtain the project goals. Therefore, a decision was made in accordance with the ROD that expanding ISCO to full-scale application would not be feasible. In response, other technologies for cleanup of Source Area No. 1 were considered. The Department's consultant was asked to evaluate two in-situ thermal treatment techniques: steam injection and electrical resistance heating (ERH). This evaluation was completed during May/June 2002. The result was a decision to use ERH to reduce the mass PCE in Source Area No. 1.

ERH is a remediation technology that involves use of electricity to heat saturated soil up to the boiling point of water (ERH can also be applied to unsaturated soil that has sufficient moisture content). ERH speeds the removal of contaminants by converting both the dissolved phase and DNAPL components to the vapor phase. The technology is similar to that used in some household room vaporizers. Electrodes (vertical, angled or horizontal) are placed in wells installed by standard drilling techniques and the surrounding borehole annulus is packed with a conductive material, such as graphite or steel shot, to increase the effective diameter of the electrode. In those portions of the subsurface where electrical resistance heating is not desired, the electrodes are insulated and the surrounding annulus is filled with relatively non-conductive materials such as sand, bentonite, or cement. At this site, the ERH system would consist of approximately 15 electrodes, installed to a total depth of about 55 feet to treat the 60 x 60 foot area of high level contamination in Source Area No. 1.

An ERH Power Control Unit (PCU) is used to supply power for subsurface heating. The PCU includes isolation transformers that force ERH current to flow between the electrodes only. The ERH technique creates a uniform heating pattern by utilizing the electrical resistance of soil and groundwater within the target treatment volume to heat the volume internally. Initially, the ERH current cause the soil and groundwater to heat to the boiling point of water. Steam is then generated throughout the heated volume and moves up towards the groundwater surface. Heating causes the DNAPL to volatilize and partition into the vapor phase, enabling a high degree of removal over a relatively brief treatment period. The vaporized contaminants generated by the heating are captured in the soil above the water table (vadose zone) by a soil

vapor extraction system. The same wells used for electrodes can be screened in the vadose zone to remove soil gas and moisture for treatment. The operation can be automated through computer control after initial startup. The ERH technology has been successfully used at a number of sites throughout the country. A number of case studies exist indicating good results with conditions similar to this site.

4.2 Comparison of Changes with Original Remedy

The original remedy called for the remediation of Source Area No. 1 using ISCO. With ISCO, chemicals (oxidants) are injected into the soil below the ground surface. The oxidants chemically break down organic compounds such as PCE upon contact to inert materials such as carbon dioxide, chloride, and water. Because of the very high concentration of PCE in subsurface soils, ISCO was not effective in reducing the PCE in soil mass, although some reduction of PCE concentration in groundwater was observed. In the revised remedy, ERH will be used to reduce the mass of PCE in Source Area No .1. With ERH, electrodes are installed below the ground surface in specially-constructed wells to heat subsurface soil and groundwater. As the subsurface is resistively heated, contaminants are volatilized and soil moisture and groundwater are converted to steam. The steam and water vapor are collected and treated by the SVET. This provides for the in-situ removal of VOC contaminations from the soil matrix. ERH has been demonstrated as an effective technology for the removal of VOCs and SVOCs from soil and groundwater. The performance of the ERH can be measured during operation of the system by monitoring decreases in contaminant concentrations in recovered vapors and extracted fluids, as well as monitoring groundwater concentrations downgradient of the treatment zone. After the system is shut down and the subsurface has cooled somewhat, sampling of soil and groundwater within the source zone can be performed to confirm the success of the cleanup. The estimated time for the active ERH operation is about three months.

The use of ERH is estimated to cost $1,039,000 as compared to a cost of $712,500 for ISCO. However, the total cost of the cleanup is likely to decrease somewhat from the estimate in the OU-1 ROD due to the deletion of groundwater extraction and treatment system in favor of the system selected in the OU-2 ROD. The changed remedy will still be protective of human health and environment. Thermal treatment will remediate DNAPL, groundwater, and highly contaminated soil in Source Area No. 1. Any residual DNAPL and contaminated groundwater is expected to be captured by the OU-2 (off-site) groundwater extraction system and/or subject to natural attenuation.

5.0 SCHEDULE AND MORE INFORMATION

The design of the OU-1 remedy is underway and is expected to be complete by spring 2003. The full-scale design of the off-site remedy should be completed by winter/spring 2003. Construction of both the on-site and off-site remedies will begin in spring 2003, assuming reauthorization and refinancing of the State Superfund.

If you have questions or need additional information you may contact any of the following:

Mr. Shive R. Mittal, P.E.
Project Manager
NYSDEC
625 Broadway
Albany, New York 12233-7017
(518) 402-9671 or

Mr. Hari Agrawal, P.E.
Regional Project Manager
NYSDEC Region 2 Headquarters
1 Hunters Point Plaza
47-40 21st Street
Long Island City, NY 11101
(718) 482-4995

For site related health questions, please contact the following Health Department representative:

Ms. Stephanie Selmer
NYSDOH
547 River Street
Troy, NY 12180
1 (800) 458-1158, Ext. 27880

9-12-02
Date

Shive R. Mittal, Project Manager
Bureau of Western Remedial Action

9-12-02
Date

Andrew J. English, Section Chief
Bureau of Western Remedial Action

9/16/02
Date

Edward Belmore, Director
Bureau of Western Remedial Action

9/17/02
Date

Dale A. Desnoyers, Acting Director
Division of Environmental Remediation