

Final Close Out Report
Smithtown Groundwater Contamination Site
Suffolk County, New York

I. Introduction

The United States Environmental Protection Agency (EPA) has determined that all appropriate response actions for the Smithtown Groundwater Contamination Superfund Site (Site) have been successfully implemented in accordance with the *Close-Out Procedures for National Priorities List Sites (OSWER Directive 9320.2-22, May 2011)*.

All appropriate response actions at the Site have been successfully implemented. Specifically, based upon field observations and the results of three five-year reviews, it has been determined that the remedy has been constructed in accordance with the 2004 Record of Decision (ROD). All groundwater monitoring data collected from the groundwater monitoring well network since 2019 indicate that the groundwater restoration cleanup levels identified in the ROD have been achieved.

II. Summary of Site Conditions

Site Location and Description

The Site includes an area of contaminated groundwater within the Village of Nissequogue, Village of Head of the Harbor and the Hamlet of St. James, in the Town of Smithtown, Suffolk County, New York. The Site is bounded to the north by Stony Brook Harbor, to the south by Edgewood Avenue and Route 25 A, to the west by Nissequogue River, and to the east by Hitherbrook Road. The contamination of residential wells in the area was documented by extensive residential well sampling performed by the Suffolk County Department of Health Services (SCDHS) in 1997 and by EPA in 1998.

While commercial and or residential septic systems were suspected to have been the source of the groundwater contamination, no specific facility was identified as the source of Site contamination at the time of the listing. The site was proposed to the National Priorities List (NPL) on September 29, 1998 (63 FR 51882) and final on the NPL on January 19, 1999 (64 FR 2942). -The Site was listed as an area-wide groundwater contamination Site.

Prior to the discovery of contaminated groundwater, residents of both villages used private wells for both drinking and irrigation. Currently, the majority of the residences within the Site are connected to the public water supply. Water is provided by the Suffolk County Water Authority (SCWA) and the St. James Water Authority.

The wells at the Site are within the unconfined Upper Glacial/Magothy aquifer unit. The aquifer is approximately 500 feet thick; the depth to the water table ranges from less than five feet to 200 feet below ground surface. The regional flow is toward the north from the business/retail area

towards the predominantly residential area; however, the two major bodies of water, the Nissequogue River and Stony Brook Harbor induce flow to the west and east, respectively.

Background

In October 1997, EPA received a written request from the New York State Department of Environmental Conservation (NYSDEC) requesting assistance in funding alternative water supplies for residences affected by contaminated groundwater. Attached to NYSDEC's request for assistance was a private well sampling survey, prepared by SCDHS, which presented drinking water results from 35 private wells in the area (SCDHS 1997). Analytical data from this survey indicated that several wells were contaminated with volatile organic compounds (VOCs), primarily tetrachloroethylene (PCE).

In a second sampling effort, SCDHS collected samples from approximately 150 homes throughout the area of the Site. Analytical results from these samples indicated that 23 residences were contaminated with PCE at concentrations exceeding the State and Federal maximum contaminant level (MCL) of 5 micrograms per liter ($\mu\text{g/L}$). Four of these residences had PCE concentrations exceeding EPA's Removal Action Level (RAL) of 70 $\mu\text{g/L}$. As a follow-up to the SCDHS sampling, in April 1998, EPA collected 330 samples from 295 private wells to further delineate the extent of PCE contamination. Based on the SCDHS and EPA analytical data, a total of 35 residential wells were identified as contaminated with PCE (or its breakdown products) at concentrations above the Federal MCLs. The RAL for PCE was exceeded in six homes. The SCDHS advised all affected residents not to use the well water for drinking or cooking purposes and to limit exposure through direct contact.

EPA began the delivery of bottled water on an emergency basis in April 1998 to the affected homes where the RAL was exceeded. EPA expanded its delivery of bottled water in June 1998 to all residences where the MCLs for PCE or its breakdown products were exceeded.

Removal Action

On July 23, 1998, an EPA Action Memorandum was signed that authorized Removal Action activities to be conducted at the Site. EPA provided the service connection to the public supply from the SCWA distribution system to the household at residences where the MCLs were exceeded and where public water was available. Existing wells were disconnected. At residences where the MCLs were exceeded and public water was not available, EPA installed individual household granular activated carbon treatment systems or upgraded the existing treatment systems installed independently by the residents.

Between 1998 and 2004, EPA collected samples from several hundred private wells in the Smithtown area. As a result, EPA provided hookup to the existing public water supply or treatment at the tap for 39 residences with PCE levels in private wells above or equal to 5 $\mu\text{g/L}$.

NPL Listing

A Hazard Ranking System (HRS) Report was prepared for the Site in August 1998. On January 19, 1999, the Site was placed on the NPL.

Remedial Investigation/Feasibility Study

Following the listing of the Site on the NPL, EPA performed a remedial investigation (RI) at the Site from 1999 through 2004.

The Remedial Investigation (RI) was performed in order to define nature and extent of groundwater contamination and to attempt, to pinpoint the source(s) of the contamination. Groundwater, surface water and sediments were sampled and analyzed. EPA observed sporadic and isolated pockets of groundwater contaminated with VOCs, particularly, PCE. No contiguous groundwater plume was detected. The RI was not able to determine the source(s) of the VOC contamination detected in the groundwater.

Based upon the results of the RI, a risk assessment was performed, that concluded that groundwater at the Site posed an unacceptable risk to human health. EPA completed the RI report in June 2004.

Enforcement Activities

To identify potential sources of the contaminated groundwater, SCDHS sampled 11 current and former commercial facilities, located south/southeast of the contaminated wells from November 1997 through April 1998. These investigations included the installation and subsequent sampling of test wells in the area of these facilities. Each facility utilizes a private sanitary sewerage disposal system consisting of septic tanks, cesspools/leaching pits, and/or other on-site wastewater disposal. Sample results showed detections of a number of VOCs, suggesting that several of the suspected source facilities were discharging hazardous wastes to the subsurface through their septic systems. Concentrations of PCE in liquid samples ranged from nondetect to 65,000,000 ppb. PCE in sludge samples ranged from nondetect to 160,000 ppb. At the direction of SCDHS, the septic systems in all 11 facilities were cleaned out. SCDHS issued letters to each property owner that clean outs were adequate and that no further action was necessary.

In 1999, EPA sent requests for information to the owner/operators of the 11 suspected source areas seeking, among other things, information regarding historical disposal practices at these locations. Despite the resulting documentary evidence collected by EPA and the data previously generated by the SCDHS, EPA's RI field work did not confirm that any suspected source area was contributing to the groundwater contamination.

To identify potential source areas, in Spring 2003, initial groundwater screening using vertical profile wells (VPW) was performed at the 11 potential source area locations. Twenty-five VPW groundwater screening samples were collected. The groundwater MCL screening criteria for Site-related chlorinated VOCs were exceeded at only one location, at which a monitoring well was installed. Septic system sludge and wastewater samples were also collected. The resulting data indicated that waste handling practices were improved at the 11 facilities since septic systems were

cleaned out in the late 1990s as directed by SCDHS and that these facilities were not currently contributing contamination to the groundwater.

After the RI, EPA conducted a Feasibility Study (FS) at the Site. In June 2004, EPA issued a Proposed Plan soliciting public comments on the preferred alternative.

Remedy Selection

On September 30, 2004, EPA issued a ROD identifying the selected remedy for the Site. The major components of the remedy were as follows:

- Approximately 270 homes within the affected area of the Site will be connected to either the SCWA or St. James Water District for their future potable water needs. This action will provide the physical connection from the houses to the water mains near the houses. After hookup to the water mains, the residential wells will be properly abandoned (in accordance with New York State requirements) to eliminate possible risk to human health.
- No active groundwater remedy is being utilized. However, aquifer restoration is anticipated to occur within a reasonable time frame based on natural processes such as dispersion, dilution and volatilization of contaminants. Long-term monitoring to ensure aquifer restoration will include groundwater and surface water sampling. Surface water samples will be collected in select locations along the Nissequogue River and Stony Brook Harbor. Groundwater will be sampled from selected monitoring wells to monitor the contaminant concentrations and migration over time. Additional monitoring wells will be installed as necessary to allow for effective monitoring of the contamination.
- Institutional controls such as groundwater use restrictions (through well drilling permit restrictions) will be utilized to prevent future use of contaminated groundwater.

The RAOs established in the ROD are as follows:

- Prevent or minimize potential current and future human exposures including ingestion and dermal contact with VOC-contaminated groundwater that exceeds Federal and State drinking water standards, and,
- Restore groundwater to levels which meet Federal and State drinking water standards within a reasonable time frame.

A RAO for surface water was also developed to verify that no significant impact on surface water quality will occur from VOC contamination reaching the Nissequogue River and Stony Brook Harbor.

Remedial Construction Activities

The remedial action was initiated on September 15, 2005. EPA's removal contractor, WRS Infrastructure and Environment, Inc. (WRS), mobilized for remedial construction at the Site on November 15, 2005. The ROD estimated that there were 270 homes within the area of remediation.

EPA subsequently determined that there were 692 residences within the remedial area. In addition, EPA determined that 581 of these residences were already connected to the public-water supply. This was accomplished through consultation with the SCWA, by confirmation through physical inspection (presence of water meter), by consultation with homeowners (either by telephone or in person) and through responses to EPA mailings to homeowners.

EPA provided lateral water lines and service connections to 79 homes within the remedial area. The lateral water lines and service connections were installed by subcontractors to WRS, including Suffolk Water Connections, We Dig Long Island and Asplundh. These water lines were installed either by directional drilling, air missile boring or trenching.

In addition, EPA entered into a contract through WRS with SCWA to extend the water main on Smith Lane in order to connect several homes that were not serviced by the existing main. SCWA extended the existing main to the end of Smith Lane and WRS subcontracted the installation of the lateral water lines and service connections. Most residences were connected to the public water supply provided by SCWA and just a few homes were connected to the St. James Water District. Overall, 32 residences declined to be connected by EPA to the public water supply. These residents informed EPA of their intent to decline either through a form supplied by EPA, by telephone or personal interview with EPA personnel. Residents declined to be connected to the public water supply for various reasons, including having a preference for well water. EPA issued a Preliminary Close-out Report that documented the completion of the residential hookups in September 2006 and the Remedial Action (RA) report was issued in September 2009.

Subsequent to the September 2006 Preliminary Close-out Report, several residents that had previously rejected hookups, requested connection to the public-water supply. In addition, property ownership changed at several residences and some of these new owners requested a connection to the public-water supply. As a result, EPA connected ten additional residences to the public-water supply. A total of 89 of the 111 eligible homes have been connected, and only 22 are not connected to a public water supply. Any additional connections will need to be performed by the property owner in coordination with the water purveyor.

Institutional Controls

The ROD indicated that institutional Controls (ICs) in the form of existing state and local regulations will be relied upon to restrict future groundwater use at the Site. While ICs were necessary during the implementation of the remedy, now that cleanup levels have been achieved, ICs no longer need to be maintained or enforced as part of the CERCLA remedy. Nonetheless, the SCDHS regulations provide an added control measure to minimize potential exposure to residual levels of contaminants that may remain in the groundwater. SCDHS regulations require new residences and businesses to hook up to public water supplies whenever public water mains are reasonably available. Where such mains are not available, the SCDHS regulations require proposed wells for new residences and businesses to be tested for water quality prior to use. For certain contaminant ranges, appropriate treatment is required.

III. Monitoring Results

A long-term groundwater and surface water monitoring program was instituted by EPA in April 2009 to collect data on contaminant concentrations and movement at the Site. Groundwater samples were collected from eleven existing monitoring wells. The monitoring well network consisted of: MW-4I, MW-4S, MW-4D, MW-6I, MW-6S, MW-5I, MW-5S, MW-1S, MW-1I, MW-E, and MW-C (refer to Figure 1). Sampling was conducted by EPA's Laboratory Services and Applied Sciences Division (LSASD). Because Stony Brook Harbor and the Nissequogue River act as groundwater discharge points, up to two samples are collected from each location (NR-1, NR-2, SBH-1, SBH-2).

Groundwater

From 2009 to 2015, groundwater samples were collected on a biennial basis (2009, 2011, 2013 and 2015) from each of the wells in the groundwater monitoring network. Groundwater data collected in 2009 and 2011 detected PCE concentrations above cleanup levels in MW-1S, MW-4I, MW-4D and MW-6S. While *cis*-1,2-dichloroethene (*cis*-1,2-DCE), a degradation product of PCE, was detected above cleanup levels in MW-1S in 2009, *cis*-1,2-DCE was not detected above cleanup levels in 2011. Monitoring data collected in 2013 detected PCE concentrations above cleanup levels in MW-4D, MW-5S and MW-6S. In 2015, PCE concentrations were below the cleanup level in each of the monitoring wells.

Based on the reduction in concentrations reported in the 2015 sampling event, the groundwater sampling frequency was changed to an annual basis. Although the 2015 sampling event did not reveal PCE concentrations above the cleanup level, in 2016, PCE was detected above the cleanup level in monitoring wells MW-4D, MW-5S and MW-6S. In 2017, PCE was only detected above the cleanup level in monitoring wells MW-4D and MW-5S. In 2018, PCE was detected above the cleanup level in a single well (MW-6S). In 2019, PCE was not detected in any monitoring wells above the cleanup level.

In 2019, as documented in the third five-year review, a statistical analysis was conducted on the data from MW-4D, MW-5S and MW-6S to determine if there were statistically significant increasing trends in PCE concentrations and if the cleanup levels were achieved. The analysis indicated that PCE concentrations in MW-4D and MW-5S showed a decreasing trend and those in MW-6S showed no trend. Therefore, based on the statistical analysis and the historical groundwater sampling results, it was determined that at least two additional rounds of groundwater sampling were needed from the three monitoring wells (MW-4D, MW-5S and MW-6S) to demonstrate whether concentrations at these wells would remain below the cleanup level. Based on the analysis, in 2020, the monitoring program was reduced to these three wells. The results from the 2020 and 2021 sampling events indicated that the PCE concentration in MW-4D, MW-5S and MW-6S were below the cleanup level and the updated statistical analysis also indicated that cleanup levels had been achieved at MW-4D and MW-5S. However, the statistical analysis of the 2020 and 2021 data indicated that further sampling was necessary to support the trend analysis for MW-6S. As a result, MW-6S was sampled again in 2022. The 2022 sampling results continued to demonstrate PCE concentrations below the cleanup level in MW-6S and the updated statistical analysis indicated that cleanup levels had been achieved.

Surface water

Surface water data from Stony Brook Harbor and Nissequogue River have consistently shown no detections of contaminants above the reporting levels.

IV. Attainment of Groundwater Cleanup Levels

Aquifer restoration was anticipated to occur based on natural processes such as dispersion, dilution and volatilization. As described above, long-term monitoring to ensure aquifer restoration included a comprehensive groundwater sampling program. Groundwater was sampled from a network monitoring wells to monitor contaminant concentrations and migration over time. Data collected after 2018 have confirmed that the RAOs set in the ROD have been achieved. For a summary of the data collected from 2009 to 2022 see Table 1.

The contaminants of concern identified at the Site were arsenic, and PCE and its degradation products. Prior to 2009, *cis*-1,2-DCE was the only degradation product found to exceed the cleanup level of 5 µg/L in monitoring well MW-1S in May and November of 2009 (5.6 µg/L and 6.4 µg/L, respectively). Since 2009, *cis*-1,2-DCE concentrations have been below 5 µg/L in all monitoring wells including MW-1S. In 2009, arsenic was determined to be associated with background concentrations and was no longer included in the sampling analysis. For this reason, samples have been strictly analyzed for VOCs since 2009. No other degradation product of PCE has shown exceedances of the MCLs. Groundwater data collected from 2011 through 2018 indicates that VOCs were either not detected (nondetect) or detected at levels below their respective cleanup levels at monitoring well locations sampled, except for PCE in three monitoring wells (MW-4D, MW-5S and 6S). Beginning in 2019, PCE was not detected above the cleanup level in any of the monitoring well locations sampled, including these three wells.

V. Summary of Operation and Maintenance

Since no waste is being left on Site, there will be no ongoing monitoring activities for any media at the Site. The monitoring that was performed at the Site documented that the RAOs selected in the ROD have been achieved. The operation and maintenance in the form of groundwater and surface water monitoring have ceased.

Institutional controls were required by the remedy. However, since the ICs were in the form of existing state and local regulations, and since groundwater restoration has been achieved, no maintenance or enforcement activities associated with ICs are required by EPA.

VI. Demonstration of Cleanup Activity QA/QC

Activities at the Site were performed consistent with the ROD. The Quality Assurance Project Plan dated May 6, 2015, incorporated all EPA and NYSDEC quality assurance and quality control (*QA/QC*) procedures and protocols. EPA analytical methods were used for all validation and monitoring samples during the groundwater and surface water monitoring program conducted from 2009 to 2022. All procedures and protocols followed for groundwater and surface water sampling were conducted through the EPA Contract Laboratory Program. The QA/QC program used throughout the RA was rigorous and in conformance with EPA and State standards; therefore,

EPA and the State determined that all analytical results are accurate to the degree needed to assure satisfactory execution of the remedy selected in the ROD.

VII. Five-Year Review

The remedy selected for the Site will not leave hazardous substances, pollutants, or contaminants above levels that would not allow for unlimited use and unrestricted exposure. In the ROD, however, EPA recognized that the groundwater portion of the remedy would take more than five years to complete. Therefore, in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, EPA performed policy five-year reviews for the Site on September 29, 2011, June 23, 2016, and November 20, 2020. The third five-year review determined that the implemented actions at the Site protect human health and the environment. The November 20, 2020 FYR had no Issues or Recommendations. Furthermore, the results of the long-term monitoring of groundwater and surface water demonstrated that the groundwater aquifer has been restored to meet State and Federal drinking water standards. Therefore, no additional five-year reviews will be required. In accordance with Section 1.2.4 of the Comprehensive Five-Year Review Guidance, Region 2 will submit a cessation memorandum signed by the Regional Administrator or his/her designee to Headquarters documenting the reason for discontinuing five-year reviews.

VIII. Site Completion Criteria

This Site meets all the Site completion requirements as specified in OSWER Directive 9320.2-22, *Close Out Procedures for National Priorities List Sites*. Specifically:

- All remedial decision documents have been completed and the selected remedies are consistent with CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan, and EPA policy and guidance.
- All response actions documented in the ROD have been completed and appropriately documented in the Site file. The implemented remedies have achieved the RAOs specified in the ROD for all pathways of exposure and associated cleanup goals are consistent with agency policy and guidance.

No further Superfund response is needed to protect human health and the environment.

Pat Evangelista, Director
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Date

IX. Bibliography

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United States Environmental Protection Agency, *Quality Assurance Project Plan for the Groundwater Contamination Superfund Site*, May 2015.

United States Environmental Protection Agency, *Five-Year Review Report for the Smithtown Groundwater Contamination Superfund Site*, September 2016.

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Figure 1: Monitoring Well Network

Smithtown Groundwater Contamination Site



Table 1: Smithtown Groundwater Sampling PCE Results								
Monitoring Wells	2015 $\mu\text{g/L}$	2016 $\mu\text{g/L}$	2017 $\mu\text{g/L}$	2018 $\mu\text{g/L}$	2019 $\mu\text{g/L}$	2020 $\mu\text{g/L}$	2021 $\mu\text{g/L}$	2022 $\mu\text{g/L}$
MW-1S	0.22	0.28	ND	ND	ND	NS	NS	NS
MW-1I	ND	0.45	ND	ND	ND	NS	NS	NS
MW-4S	ND	ND	ND	ND	ND	NS	NS	NS
MW-4I	0.37	0.45	0.52	ND	ND	NS	NS	NS
MW-4D	4.4	6.0	5.30	4.20	3.02	3.24	0.53	NS
MW-5S	3.2	6.80	5.30	4.10	1.85	4.29	2.54	NS
MW-5I	0.34	0.53	ND	ND	ND	NS	NS	NS
MW-6S	4.3	7.0	4.90	5.4	4.63	0.92	1.83	2.6
MW-6I	ND	ND	ND	ND	ND	NS	NS	NS
MW-C	ND	ND	ND	ND	ND	NS	NS	NS
MW-E	0.38	ND	0.68	ND	ND	NS	NS	NS

ND=not detected

NS=not sampled

Bolded values indicate exceedance of the State and Federal drinking water standard of 5 $\mu\text{g/L}$.