

**Third Five-Year Review Report
Fulton Terminals Superfund Site
City of Fulton
Oswego County, New York**



Prepared by

**U.S. Environmental Protection Agency
Region 2
New York, New York
May 2014**

267624



Approved by:

A handwritten signature in black ink, appearing to read "Walter E. Mugdan". The signature is written over a horizontal dashed line.

**Walter E. Mugdan, Director
Emergency and Remedial Response Division**

Date:

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Executive Summary

This is the third five-year review for the Fulton Terminals Superfund site, located in the City of Fulton, Oswego County, New York. The purpose of this five-year review is to review site-related data and information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this policy five-year review was the completion of the previous five-year review.

The assessment of this five-year review is that the soils have been remediated and allow for unlimited use and unrestricted exposure and, although one volatile organic compound (VOC) is marginally above its groundwater standard and another VOC is slightly above its groundwater standard in one monitoring well located at the downgradient boundary of the site, the remedy is currently protecting human health and the environment. Sampling of this monitoring well should continue in three-year intervals until the groundwater standards for the two VOCs have been met. Once the groundwater standards for the two VOCs have been met, attainment monitoring and data evaluation will be performed to ascertain that the groundwater in the monitoring well is expected to continue to meet the cleanup levels in the future.

The City of Fulton has expressed an interest in redeveloping the site property, contingent upon the deletion of the site from the National Priorities List (NPL). The VOC exceedances in the noted monitoring well prevent the deletion of the site from the NPL at this time. To facilitate the redevelopment of the property, a partial site deletion encompassing the site soils and the groundwater upgradient of the monitoring well will be pursued.

Five-Year Review Summary Form

SITE IDENTIFICATION				
Site Name: Fulton Terminals				
EPA ID: NYD980593099				
Region: 2	State: NY	City/County: City of Fulton/Oswego		
SITE STATUS				
NPL Status: Final				
Multiple OUs? No		Has the site achieved construction completion? Yes		
REVIEW STATUS				
Lead agency: EPA				
Author name (Federal or State Project Manager): Christos Tsiamis				
Author affiliation: EPA				
Review period: 6/29/2009 - 6/29/2014				
Date of site inspection: N/A				
Type of review: Policy				
Review number: 3				
Triggering action date: 6/29/2009				
Due date (five years after triggering action date): 6/29/2014				
Issues/Recommendations				
OU(s) without Issues/Recommendations Identified in the Five-Year Review:				
OU1				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): Click here to enter text.		Issue Category: No Issue		
		Issue: Click here to enter text.		
		Recommendation: Click here to enter text.		
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
Choose an item.	Choose an item.	Choose an item.	Choose an item.	Click here to enter a date.

Protectiveness Statement(s)

Operable Unit:
OUI

Protectiveness Determination:
Protective

*Addendum Due Date
(if applicable):*
Click here to enter a date.

Protectiveness Statement:

The implemented remedy is protective of human health and the environment.

Sitewide Protectiveness Statement

Protectiveness Determination:
Protective

Addendum Due Date (if applicable):
Click here to enter a date.

Protectiveness Statement:

The site-wide remedial actions are protective of human health and the environment.

Introduction

The purpose of a five-year review is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment and is functioning as intended by the decision documents. The methods, findings and conclusions of reviews are documented in the five-year review. In addition, five-year review reports identify issues found during the review, if any, and document recommendations to address them.

This is the third five-year review for the Fulton Terminals site, located in the City of Fulton, Oswego County, New York. This five-year review was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Christos Tsiamis. The review was conducted in accordance with the *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the site file.

Although the remedial action at this site will not leave hazardous substances, pollutants or contaminants above levels that allow for unlimited use and unrestricted exposure, a policy five-year review is required due to the fact that the remedial action requires five or more years to complete. The triggering action for the first policy five-year review was the signature date of the Preliminary Close-Out Report (PCOR).

The site consists of one operable unit, which is being addressed in this five-year review.

Site Chronology

See Table 1 for the site chronology.

Background

Physical Characteristics

The site consists of an approximately 1.5-acre parcel of land situated approximately 10 miles southeast of the City of Oswego and 22 miles north-northwest of the City of Syracuse. The site is bounded on the west by First Street, on the south by Shaw Street, on the east by New York State Route 481, and on the north by a warehouse. The Oswego River lies immediately west of First Street, which is approximately fifty feet from the site. See Figure 1.

Site Geology/Hydrogeology

The site is underlain by a relatively thick section of unconsolidated deposits, primarily of glacial meltwater and alluvial origins that overlie bedrock. A layer of sand and gravel appears to be continuous over bedrock and it ranges in thickness from 25 to 58 feet. A silt and clay unit occurs above the sand and gravel throughout most of the site with a thickness of up to 25 feet. Artificial fill, consisting predominantly of sand and gravel, covers the surface of the site in thickness varying from four to 12 feet.

There are four groundwater units underneath the site. The artificial fill is the uppermost hydrologic unit and is mostly unsaturated. The water table generally coincides with the elevation of the bottom of the fill. The underlying silt and clay unit has very low hydraulic conductivity. The next lower sand and gravel unit constitutes the main discharge toward the river. The bedrock unit has relatively low conductivity.

Land and Resource Use

The site is located in an industrial section of the City of Fulton within 50 feet of the Oswego River, which is used for recreation. Residences, city and county offices and several businesses are located within a 1,500-foot radius of the site. Approximately 13,000 people live within three miles of the site.

History of Contamination

From 1936 to 1960, the primary activity at the site was the manufacturing of roofing materials, which involved the storage of asphalt in aboveground tanks and fuel oil storage in underground tanks. From 1972 to 1977, the site was used by Fulton Terminals, Inc. as a staging and storage area for solvents and other materials that were scheduled for incineration at the Pollution Abatement Services facility located in Oswego, New York. Operations at the site resulted in the contamination of the groundwater, soil, and sediments with volatile organic compounds (VOCs).

Initial Response

From 1981 to 1983, Fulton Terminals, Inc. removed several tanks as part of a voluntary cleanup program. These activities ceased in 1983, after the facility was fined by the New York State Department of Environmental Conservation (NYSDEC) for the improper disposal of polychlorinated biphenyls. The site was listed on the National Priorities List in 1983.

Removal actions were conducted in 1986 by EPA and the potentially responsible parties (PRPs), consisting of constructing a seven-foot perimeter fence around the site, posting warning signs, removing two aboveground tanks and two underground tanks, removing approximately 300 cubic yards of visibly-contaminated soil and tar-like wastes, and excavating storm drains that were acting as a conduit for contaminated runoff entering the Oswego River during storm events. An additional removal action in 1990 involved the construction of earthen barriers for the prevention of surface runoff from the contaminated portion of the site.

Basis for Taking Action

In 1983, NYSDEC commenced a remedial investigation/feasibility study (RI/FS) at the site. The RI/FS activities were conducted by NYSDEC's contractor, URS Company, Inc., from 1985 to 1987. The RI/FS report that was generated from these efforts was declared invalid by NYSDEC due to problems associated with the laboratory analyses. A revised RI/FS report, based on additional sampling, was prepared by NYSDEC's contractor in 1988. EPA concluded, however, that the revised RI/FS report did not fully characterize the site. Accordingly, EPA initiated a Supplemental RI/FS. The Supplemental RI/FS, completed by EPA's contractor, Ebasco Services, Inc., in 1989, indicated that various VOCs were present in the unsaturated soil and in the groundwater at the site. An Endangerment Assessment for the site, which was also

completed in 1989, concluded that, based on the Supplemental RI data, minimal human health risks were associated with the existing site conditions. However, the Supplemental RI/FS determined that the leaching of VOCs from the contaminated on-site soil into the groundwater posed a risk to the environment. The contaminants of concern (COCs) in the soils and groundwater included trichloroethylene (TCE), cis-1,2 dichloroethylene (DCE), benzene, vinyl chloride, benzene and chlorobenzene.

Remedial Actions

Remedy Selection

The remedial action objectives (RAOs) selected for the site include:

- prevent contact with contaminated soil;
- prevent migration of contaminated soil via surface water runoff and erosion;
- ensure protection of groundwater and surface water from the continued release of contaminants from soils; and
- restore groundwater to levels consistent with state and federal water quality standards

On September 29, 1989, a Record of Decision (ROD) was signed, selecting excavation and low-temperature thermal desorption (LTTD) to treat approximately 4,000 cubic yards (CY) of contaminated soils located above the water table, and pumping, air stripping, carbon adsorption, and reinjection for treating the contaminated groundwater. The ROD also included the implementation of institutional controls to prevent the utilization of the groundwater at the site. The remediation goal of the soil remedy was to reduce concentrations of VOCs¹ in the soils to levels which would not cause the groundwater quality to exceed groundwater standards due to percolation of precipitation through the unsaturated soils.

Remedy Implementation

A Consent Decree was signed by the PRPs in 1990, in which they agreed to design and implement the remedy called for in the ROD. The Consent Decree became effective (was entered as a final judgment by the Court) in December 1991.

Soil Remediation

The soil excavation and treatment remedial design (RD) was initiated by Blasland, Bouck & Lee, Inc., (BBL), the contractor for the PRPs, in late 1991.

Pre-RD sampling revealed the presence of a significant amount of contamination in the deep soil (from the water table down to bedrock).² Since the contaminated soil below the water table would continue to leach contaminants to the groundwater, EPA concluded that remediating this soil would be beneficial to the long-term groundwater cleanup.

¹ The COCs in the soil and their remediation goals are summarized in Table 2a.

² Including the saturated soils increased the estimated volume of contaminated soil from 4,000 CY to 13,000 CY.

Remedial alternatives to address the contaminated soils below the water table were evaluated in a focused feasibility study (FFS) completed by BBL in October 1993 (addended in January 1994). The FFS determined that specialized methods for stabilizing the deep excavation area would be required for removal of the contaminated soils because of the excavation depth, the need for control of groundwater infiltration into the excavation area, and the close proximity of the site to the Oswego River.

Based on the results of the pre-RD sampling effort and the findings of the FFS, EPA modified the soil remedy in an Explanation of Significant Differences (ESD) dated June 1994. The ESD called for the excavation of the VOC-contaminated soils below the water table, followed by treatment by LTTD.

The plans and specifications related to the soil remedy were completed in March 1995.

BBL initiated construction of the soil remedy in April 1995.

Because of the proximity of the site to the Oswego River, a "freeze wall," a construction process whereby the ground is frozen at depth to allow the dry excavation of contaminated soils below the water table, was used. The excavation, treatment, and backfilling were completed by April 1996. The total amount of contaminated source material that was remediated was 10,200 CY.

Groundwater Remediation

The groundwater remedy called for in the September 1989 ROD required the reduction of VOC concentrations to those defined in Table 2b by pumping groundwater from the saturated sand and gravel zone underlying the site, treating the groundwater by air stripping and carbon adsorption and reinjecting the water into the saturated sand and gravel zone.

The groundwater remediation RD was initiated in late 1991. The plans and specifications related to the groundwater extraction and treatment were completed in September 1994. Initiation of the groundwater remedial action (RA) was, however, postponed until all soil RA activities at the site were completed. At that time, a horizontal extraction well system consisting of a gallery of perforated piping and a collection manhole was installed at the base of the excavation.

Given the overall effectiveness of the soil remedy, it was determined that groundwater standards could be achieved within a relatively short time frame if the groundwater extraction could be effected immediately. Utilizing a mobile treatment system, an expedited pumping of the contaminated groundwater took place between February and May 1997. The operation of the groundwater extraction and treatment system (including groundwater reinjection/surface water discharge), as well as the weekly influent/effluent monitoring, was performed by Clean Harbors.

During the 12-week operation period, 8.8 million gallons of groundwater were extracted and treated. Subsequently, a groundwater monitoring program was implemented by Roux Associates to assess the effectiveness of the soil remediation in combination with the expedited groundwater remedy. Residual subsurface ice from the freeze wall precluded an accurate evaluation of the groundwater remedy performance (two downgradient monitoring wells were frozen). Following the forced thaw of the freeze wall (via steam injection) by the PRPs in May 1998, the

temperature of the groundwater and the concentrations of contaminants were monitored. Groundwater samples collected in March 1999 indicated that the freeze wall was no longer intact (*i.e.*, the two monitoring wells were free of ice) and that the contaminant concentrations in these wells were showing a decreasing trend.

Following the collection of groundwater quality samples in September 1999, EPA determined that the ROD requirements for the groundwater remedy had been substantially met and no further response, other than long-term groundwater monitoring, was anticipated.

Construction Completion

A PCOR was approved on September 27, 1999.

System Operations/Operation and Maintenance

A sampling and analysis plan to assess the effectiveness of the groundwater remedy included three years of post-remedy groundwater monitoring (March 2000 through September 2002) to verify successful performance of the groundwater remedy. The plan also included provisions for performing periodic site inspections to confirm the integrity of the groundwater monitoring wells and other site controls and to assess the general condition of the property. In addition, provisions to perform necessary site maintenance (*i.e.*, vegetation control, fence repairs, etc.) based on the results of the periodic inspections were included in the plan. Since contaminants were not detected in the source area wells located in the center of the site, these wells were abandoned in April 2004. There are five monitoring wells located on the western (downgradient) border of the site. Sampling of monitoring wells RX-5, RX-6, RX-7 and FBW-3 was terminated in 2006, since the groundwater standards defined in Table 2b were reached at that time. Since cis-1,2-DCE and vinyl chloride were detected sporadically above their respective standards in monitoring well RX-4 (see Figure 1),³ which is located at the downgradient boundary of the site, approximately 50 feet from the Oswego River, samples were collected biannually through 2009. The monitoring well was sampled again in September 2013.

Institutional Controls

The ROD included the implementation of institutional controls to prevent the utilization of the groundwater at the site. A deed restriction prohibiting the installation of wells at the site was filed with the Oswego County Clerk's office on July 31, 2009.

The annual monitoring and inspection costs are approximately \$2,000; these costs are broken down in Table 3.

Progress Since Last Five-Year Review

Groundwater samples collected from monitoring well RX-4 during the previous review period showed sporadic increases in the concentrations of cis-1,2-DCE (a maximum concentration of 70

³ Concentrations of TCE, another VOC found in monitoring well RX-4, have been below the groundwater remediation goal of 5µg/L since June 1999.

micrograms per liter [$\mu\text{g/L}$] was detected in April 2009; the groundwater standard is 5 $\mu\text{g/L}$). After peaking at 191 $\mu\text{g/L}$ in July 2007, vinyl chloride concentrations in monitoring well RX-4 during the previous review period were slightly above its groundwater standard of 2 $\mu\text{g/L}$ in April 2008, November 2008 and April 2009. Based upon the collective sample results, the assessment of the previous five-year review was that the soils have been remediated and allow for unlimited use and the groundwater has been remediated to groundwater standards with the exception of monitoring well RX-4. Since monitoring well RX-4 is located in a narrow strip of land between the site and the Oswego River, which is unlikely to be used as a source of drinking water, the site-wide remedy was determined to be protective.

While there were no recommendations or follow up actions that affected the protectiveness of the remedy presented in the previous five-year review, that five-year review recommended that groundwater samples continue to be collected until at least two consecutive rounds of samples show that groundwater ARARs have been achieved. During the current review period, monitoring well RX-4 was sampled once (September 2013). The sample results showed the presence of cis-1,2-DCE at 12.9 $\mu\text{g/L}$, which is marginally above its groundwater standard of 5 $\mu\text{g/L}$, and vinyl chloride at 2.18 $\mu\text{g/L}$, which is slightly above its groundwater standard of 2 $\mu\text{g/L}$.

Five-Year Review Process

Administrative Components

The five-year review team included Christos Tsiamis (EPA-RPM), Diana Cutt (EPA-Hydrologist), Rebecca Ofrane (EPA-Human Health Risk Assessor), Mindy Pensak (EPA-Ecological Risk Assessor) and Michael Basile (EPA-Community Involvement Coordinator [CIC]).

This is a PRP-lead site.

Community Involvement

The CIC for the site, Michael Basile, provided the clerk for the City of Fulton with a flyer for posting in the Town Hall. The flyer notified the public that the EPA would be conducting a five-year review of the site to assess whether the site is protective of public health and the environment and whether the implemented components of the remedy are functioning as designed. The flyer also indicated that once the five-year review is completed, the results will be made available in the local site repository. In addition, the flyer included the RPM's address and telephone number for questions related to the five-year review process or the site. The flyer was also displayed on the EPA webpage for the site. Following the completion of the five-year review, efforts will be made to reach out to local public officials to inform them of the results.

Document Review

The documents, data and information which were reviewed in completing this five-year review are summarized in Table 4.

Data Review

During the review period, monitoring well RX-4 was sampled in September 2013. Cis-1,2-DCE was detected at 12.9 µg/L (down from 70 µg/L in April 2009) and vinyl chloride was detected at 2.18 µg/l. Based upon sample results from the later portion of the prior review period (April 2008, November 2008 and April 2009) and September 2013, it appears that vinyl chloride production has stabilized (no rebound) at slightly above 2 µg/L. Figure 2 shows VOC contaminant trends in monitoring well RX-4 from 1997 through 2013. There are no other monitoring wells at the site that are contaminated.

Site Inspection

The need for ongoing five-years reviews stems from the presence of cis-1,2-DCE and vinyl chloride above their respective groundwater standards in one monitoring well (the soil remediation goals have been met). Therefore, a site inspection was not conducted as part of this five-year review.

Interviews

No interviews were conducted for this review.

Institutional Controls Verification

The ROD required the implementation of institutional controls to prohibit the drinking of groundwater. A deed restriction prohibiting the installation of wells was filed with the County Clerk's office on July 31, 2009.

Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The soils have been remediated and allow for unlimited use and unrestricted exposure. Prior to and after the remediation of the soil, the site was fenced and posted. The City of Fulton acquired the property and after obtaining permission from EPA, in 2009, removed the fence around the property and landscaped it as part of its redevelopment of the river bank under a New York State grant. Extraction and treatment of the contaminated groundwater took place between February and May 1997. Since that time, groundwater monitoring has been conducted. The residual groundwater contamination remains in a small area downgradient of the property. It is anticipated that this contamination, as defined by monitoring well RX-4, will reach cleanup levels in the near term.

Source Control

The 1989 ROD, as modified by the 1994 ESD, called for the cleanup of the contaminated soils at the site in order to reduce concentrations of VOCs to levels which would not cause the groundwater quality to exceed standards. The analytical results from post-excavation soil samples collected from the excavation limits indicated that the residual levels of VOCs were well

below the target levels (more than 99 percent of the pre-remedial VOC mass in the silt and clay soil layer was removed and treated during the soil remedy). The remediation has reduced the contamination of site soils in both the unsaturated and saturated zones to levels which would not cause groundwater quality standards to be exceeded due to leaching from both the unsaturated and saturated soils. Furthermore, by removing the contaminated soil, the risk of contaminants migrating from surface runoff into the Oswego River and posing a potential risk to aquatic receptors has been mitigated.

Groundwater

The 1989 ROD called for the extraction and treatment of the contaminated groundwater so as to reduce the VOC concentrations to established federal and state groundwater standards in the shallow groundwater aquifer. Extraction of the contaminated groundwater took place between February and May 1997.

Removing the source of the contamination in combination with the short-term groundwater extraction resulted in achieving the groundwater standards in the central portion of the site.

During the review period, downgradient monitoring well RX-4 was sampled in September 2013. Cis-1,2-DCE was detected at 12.9 µg/L (down from 70 µg/L in April 2009) and vinyl chloride was detected at 2.18 µg/l. Based upon sample results from the later portion of the prior review period (April 2008, November 2008 and April 2009) and September 2013, it appears that vinyl chloride production has stabilized (no rebound) at slightly above 2 µg/L.

Groundwater monitoring will continue until it has been determined that cleanup levels have been met. Once the groundwater standards for the two VOCs have been met, attainment monitoring and data evaluation will be performed to ascertain that the groundwater in the monitoring well is expected to continue to meet the cleanup levels in the future.

Institutional Controls

The ROD required the implementation of institutional controls to prohibit the drinking of groundwater. A deed restriction prohibiting the installation of wells was filed with the County Clerk's office on July 31, 2009. The deed restriction is still in place and effective.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

No changes in human health risk assessment methodology, exposure pathways or toxicity data for the COCs for the site have occurred during the review period that would affect the protectiveness of the remedy.

Although the ecological risk assessment screening and toxicity values used to support the ROD may not necessarily reflect the current values, remedial activities, specifically the soil excavation, treatment and backfilling, have eliminated exposure to ecological receptors. Therefore the remedy is protective of ecological receptors.

Source Control: The ROD, as modified by the ESD, called for the cleanup of the contaminated

soils at the site in order to reduce concentrations of VOCs to levels which would not cause the groundwater quality to exceed standards. Post-excavation soil sampling results indicated that residual levels of VOCs were well below the target levels. The remediation reduced the contamination of site soils in both the unsaturated and saturated zones to levels which would not cause groundwater quality standards to be exceeded due to leaching from soils. The source control remedy in soils remains protective.

Groundwater: The ROD called for the extraction and treatment of contaminated groundwater so as to reduce the VOC concentrations to established federal and state groundwater standards in the shallow groundwater aquifer. Extraction of the contaminated groundwater occurred during 1997. The ARARs for the groundwater include MCLs and New York State's groundwater quality standards. The action level established for the COCs cis-1,2-DCE, TCE and vinyl chloride are 5 µg/L, 5 µg/L and 2 µg/L, respectively. Source removal and the short-term groundwater extraction resulted in achieving the groundwater standards in the central portion of the site. Six source area wells were abandoned in April 2004 since contaminants were not detected for multiple sampling periods. Monitoring well RX-4 is the only well that continues to be sampled. The most recent sampling results (September 2013) show the concentration of cis-1,2-DCE (12.9 µg/L) to be marginally above its standard of 5 µg/L and the concentration of vinyl chloride (2.18 µg/L) to be slightly above its standard of 2 µg/L. Since there is only one sampling event from the review period, a groundwater trend cannot be identified, but cis-1,2-DCE has decreased from the previous review period. Since groundwater is not currently utilized for potable purposes, the ingestion of groundwater pathway is incomplete and the remedy is protective.

It is recommended that groundwater samples be collected from groundwater monitoring well RX-4 in three-year intervals until the groundwater standards for cis-1,2-DCE and vinyl chloride are met. Once the groundwater standards for the two VOCs have been met, attainment monitoring and data evaluation will be performed to ascertain that the groundwater in the monitoring well is expected to continue to meet the cleanup levels in the future.

The evaluation of the potential for vapor intrusion was based on the health-protective assumption that structures are located above the maximum detected groundwater concentrations and compared these concentrations to the health-based screening criteria available in EPA's Vapor Intrusion Screening Level Calculator. This guidance provides concentrations of chemicals in groundwater associated with indoor air concentrations at acceptable levels of cancer risk and noncancer hazard using residential exposure assumptions. The groundwater data from the period of time covered by this five-year review show that while the concentration of cis-1,2-DCE does not exceed its vapor intrusion screening value of 38 µg/l,⁴ the concentration of vinyl chloride exceeds its vapor intrusion screening value of 0.14 µg/l. The detection of vinyl chloride was from monitoring well RX-4, which is located approximately 50 feet from the Oswego River. No buildings currently exist in this area and, due to the size of the area, its location relative to the Oswego River and the City of Fulton's landscaping of the property as part of its river bank development, it is unlikely that any buildings would be constructed in the future. However, if this were to change, there may be future potential for vapor intrusion.

⁴ The screening value for cis-1,2-DCE is based on surrogate contaminant trans-1,2-DCE, since there is no inhalation toxicity information for cis-1,2-DCE.

The RAOs established for the site, to prevent contact with contaminated soil, prevent migration of contaminated soil via surface water runoff and erosion, ensure protection of groundwater and surface water from the continued release of contaminants from soils, and restore groundwater to levels consistent with state and federal water quality standards, are still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

Based upon the results of the five-year review, it has been concluded that:

- site soils have been cleaned to protective levels;
- human health, ecological and environmental risks estimated for the site are within or below acceptable levels;
- groundwater monitoring well RX-4 is functional;
- sample results from monitoring well RX-4 show cis-1,2-DCE at 12.9 µg/L which is marginally above its groundwater standard of 5 µg/L, and vinyl chloride at 2.18 µg/l, which is slightly above its groundwater standard of 2 µg/L.
- there is no evidence of trespassing, vandalism or damage to monitoring well RX-4;
- there are no drinking water wells in the vicinity of monitoring well RX-4 and none are expected to be drilled (drinking water in the area is supplied by a public water supply system).

Issues, Recommendations and Follow-Up Actions

There are no recommendations or follow-up actions that affect the protectiveness of the remedy associated with this review.

To accelerate site closeout, it is recommended that groundwater samples be collected from groundwater monitoring well RX-4 in three-year intervals until the groundwater standards for cis-1,2-DCE and vinyl chloride are met. Once the groundwater standards for the two VOCs have been met, attainment monitoring and data evaluation will be performed to ascertain that the groundwater in the monitoring well is expected to continue to meet the cleanup levels in the future.

The City of Fulton has expressed an interest in redeveloping the site property, contingent upon the deletion of the site from the National Priorities List (NPL). The VOC exceedances in groundwater monitoring well RX-4 prevent the deletion of the site from the NPL at this time. Since it is not known when groundwater standards will be met in this well, to facilitate the redevelopment of the property, a partial site deletion encompassing the site soils and the groundwater upgradient of monitoring well RX-4 will be pursued.

Protectiveness Statement

The implemented remedy is protective of human health and the environment. The site-wide remedial actions are protective of human health and the environment.

Next Review

The next five-year review report for the Fulton Terminals Superfund site is required five years from the completion date of this review.

Table 1: Chronology of Site Events	
Event	Date(s)
NYSDEC cites owner of property for not meeting standards for storage of hazardous wastes	1981
Owner initiates site cleanup including removal of four tanks	1981
Site is placed on National Priorities List	1983
NYSDEC fines owner for improper cleanup practices and cleanup is terminated	1983
NYSDEC remedial investigation/feasibility study (RI/FS)	1985-1986
EPA undertakes removal of remaining tanks and visibly-contaminated soil	1986-1987
EPA Supplemental RI/FS	1988-1989
Record of Decision	1989
Consent Decree with Settling Defendants for the site	1991
Initiation of remedial design	1991
Focused feasibility study for silt and clay remediation	1993
Explanation of Significant Differences for soil remediation	1994
Completion of remedial design for groundwater remedy	1994
Completion of remedial design for soil remediation	1995
Initiation of soil remediation	1995
Completion of soil remediation	1996
Initiation of groundwater remedy	1997
Completion of groundwater remedy	1997
Restoration of site, including complete thawing of "freeze wall"	1997-1999
Preliminary Site Close-Out Report	1999
Initiation of groundwater monitoring	2000
First Five-Year Review	2004
Second Five-Year Review	2009

Table 2a: Remediation Goals for Soil from the Record of Decision⁵

Contaminants of Concern	Remediation Goal (mg/kg)
Benzene	1.4
Chlorobenzene	5.5
cis-1,2-Dichloroethylene	1
Methyl Isobutyl Ketone	2.5
Trichloroethylene	2
Vinyl chloride	0.4
Xylene (total)	8

Table 2b: Remediation Goals for Groundwater from the Record of Decision

Contaminants of Concern	Remediation Goals (µg/L)
Acetone	50
Benzene	5
Chlorobenzene	5
1,1-Dichloroethane	5
1,1-Dichloroethene	5
cis-1,2-Dichloroethene	5
Ethylbenzene	5
Methylene chloride	5
4-Methyl-2-Pentanone	5
N-Propylbenzene	5
Tetrachloroethene	5
Toluene	5
1,1,1-Trichloroethane	5
Trichloroethene	5
Vinyl chloride	2
Xylenes	5







⁵ Soil remediation goals to achieve groundwater standards were calculated using partition coefficients and assuming that eight inches per year of rainwater percolates through the contaminated zone and mixes with the groundwater.

Table 3: Annual Costs	
Estimated Costs for Contract Performance	Cost per Year
Sampling and analysis	\$2,000
Total estimated cost	\$2,000

Table 4: Documents, Data and Information Reviewed in Completing the Five-Year Review	
Document Title, Author	Submittal Date
Revised Endangerment Assessment, Fulton Terminals, Versar Inc.	June 1989
Record of Decision, EPA	September 1989
Explanation of Significant Differences, EPA	June 1994
Project Closeout Report, Fulton Terminals site, Soil Remedy (Volumes 1 and 2), BBL Environmental Services	October 1996
Remedial Action Report (soil remedy), de maximis, inc.	September 1996
Post-Soil Remedy Groundwater Investigation Work Plan, Roux Associates	April 1997
Remedial Action Report (groundwater remedy), de maximis, inc.	September 1999
Preliminary Site Close-Out Report, EPA	September 1999
Long-Term Groundwater Monitoring Plan, Roux Associates	February 2000
Interim Closeout Report/Final Construction Completion Report-Groundwater Remedy, Roux Associates, Inc.	December 2000
First Five-Year Review Report, EPA	September 2004
Second Five-Year Review Report, EPA	June 2009
2013 Groundwater Monitoring Event Report, Roux Associates, Inc.	September 2013
EPA guidance for conducting five-year reviews and other guidance and regulations to determine if any new applicable or relevant and appropriate requirements relating to the protectiveness of the remedy have been developed since EPA issued the ROD	



LEGEND

-  PROPERTY LINE
-  HIGHWAY BOUNDARY
-  CHAIN LINK FENCE
-  SB-1 SOIL BORING LOCATION
-  FBW-10 MONITORING WELL
-  SW01-S001 SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS

RX-4 is located here.

SW04-S004

THE LOGAN - LONG CO. (M/F)
BK 701/PG. 614
BRD & SON INC. (R10)

ONE STORY METAL BLDG

OSWEGO RIVER AND CANAL

TOP OF BANK
BOTTOM OF BANK

SW02-S002

SW03-S003

SW01-S001

FULTON - OSWEGO MOTOR EXPRESS, INC. (R10)

FULTON TERMINAL INC.
TRACT 1

TRACT 2

(NEW YORK ROUTE 481)

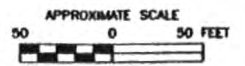
HUBBARD STREET

SECOND STREET

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E 847685.78

SURVEY BASELINE SHAW STREET

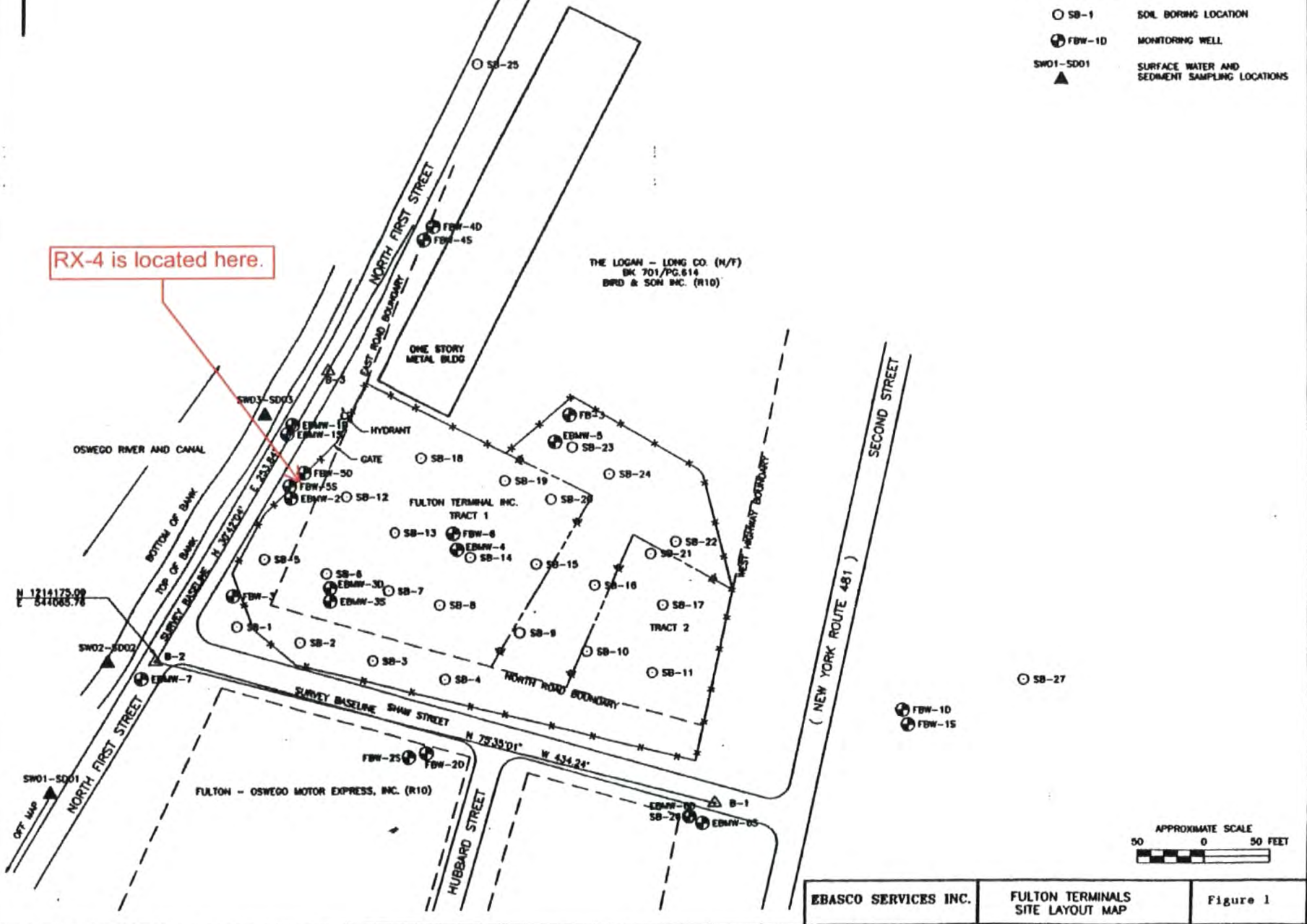
N 72°35'01" W 434.24'



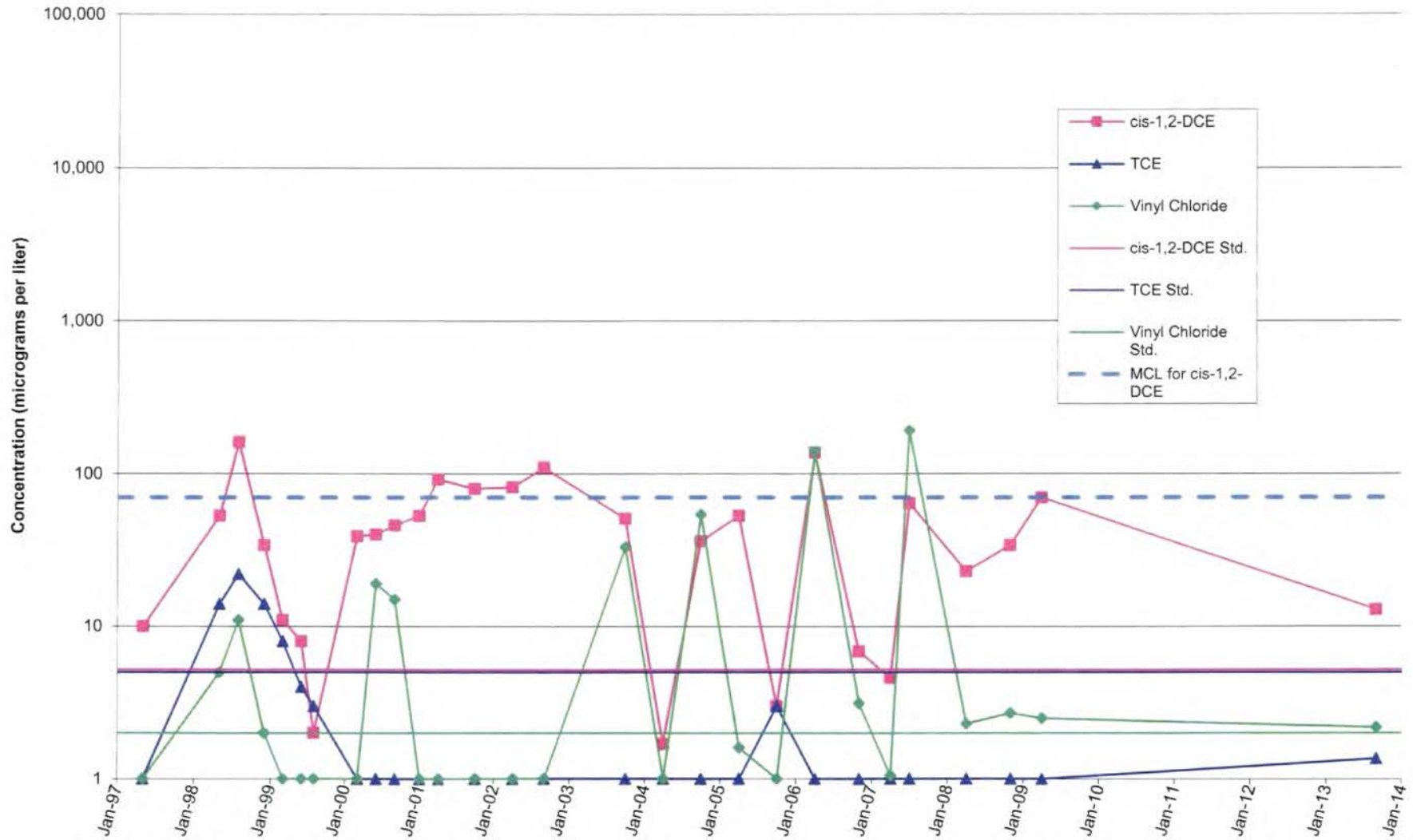
EBASCO SERVICES INC.

FULTON TERMINALS
SITE LAYOUT MAP

Figure 1



Historical Concentrations at Monitoring Well RX-4



Note: All "NDs" have been assigned a value of 1 microgram per liter (ug/L), since laboratory reporting limits have generally ranged between 0.5 and 2 ug/L; detected concentrations less than 1 ug/L have been raised to 1 ug/L for charting purposes.