



FIVE-YEAR REVIEW REPORT

GE MOREAU SUPERFUND SITE
SARATOGA COUNTY, NEW YORK

U.S. Environmental Protection Agency
Region II
New York, New York

September 2008

EXECUTIVE SUMMARY

This is the fourth five-year review for the GE Moreau Superfund site, located in the Town of Moreau, Saratoga County, New York. While the assessment of this five-year review is that the implemented actions at the site protect human health and the environment, should downgradient areas be developed, the vapor intrusion pathway should be evaluated.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name (from WasteLAN): GE Moreau site

EPA ID (from WasteLAN): NYD980528335

Region: 2

State: NY

City/County: Town of Moreau/Saratoga

SITE STATUS

NPL Status: Final Deleted Other (specify) _____

Remediation Status (choose all that apply): Under Construction Operating Complete

Multiple OUs? YES NO

Construction completion date: 3/31/1997

Has site been put into reuse? YES NO N/A (site involves groundwater plume and not real property)

REVIEW STATUS

Lead agency: EPA State Tribe Other Federal Agency _____

Author name: Jack O'Dell

Author title: Remedial Project Manager

Author affiliation: EPA

Review period:** 9/26/2003 to 9/26/2008

Date(s) of site inspection:

Type of review:

- Post-SARA Pre-SARA NPL-Removal only
 Non-NPL Remedial Action Site NPL State/Tribe-lead
 Regional Discretion Policy Statutory

Review number: 1 (first) 2 (second) 3 (third) 4 (fourth) _____

Triggering action:

- Actual RA Onsite Construction at OU # _____ Actual RA Start at OU# _____
 Construction Completion Previous Five-Year Review Report
 Other (specify) _____

Triggering action date (from WasteLAN): 9/28/1998

Due date (five years after triggering action date): 9/26/2003

Does the report include recommendation(s) and follow-up action(s)? yes no

Is human exposure under control? yes no

Is migration of contaminated groundwater stabilized? yes no not yet determined

Is the remedy protective of the environment? yes no not yet determined

Acres in use or suitable for use: restricted: 10 unrestricted: 16

Five-Year Review Summary Form (continued)

Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls

The selected remedy has been fully implemented. This site has ongoing operation, maintenance, and monitoring activities as part of the selected remedy. As was anticipated by the decision documents, these activities are subject to routine modification and adjustment. This report includes a suggestion for improving, modifying and/or adjusting these activities.

In addition, confirmation of the downgradient plume (subject to the technical impracticability waiver) should be verified with additional monitoring wells, if necessary.

Issues, Recommendations, and Follow-Up Actions

Should downgradient areas be developed, the vapor intrusion pathway should be evaluated.

Protectiveness Statement

The implemented remedial actions protect human health and the environment in the short-term. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected, as long as the site use does not change and the implemented engineering and institutional controls are properly maintained. In order for the site to be protective in the long-term, if off-property development in the path of the plume occurs, the vapor intrusion pathway should be evaluated.

I. Introduction

This five-year review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii) and in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of a five-year review is to assure that implemented remedies protect public health and the environment and that they function as intended by the decision documents. This report will become part of the site file.

This is the fourth five-year review for the GE Moreau site. After the completion of the remedial action, contaminants remained on-site; therefore, a statutory five-year review is required. In accordance with Section 1.3.3 of the five-year review guidance, a subsequent five-year review is triggered by the signature date of the previous five-year review report. The trigger for this five-year review is the date of the previous five-year review report, which is September 26, 2003.

II. Site Chronology

Table 1 (attached) summarizes the significant site-related events from discovery to the present.

III. Background

Physical Characteristics

The 26-acre GE Moreau site is located just west of Fort Edward Road in the Town of Moreau, Saratoga County, New York, approximately 40 miles north of Albany and less than one mile from the Hudson River. The site is in a semi-rural setting with single-family residences nearby. Reardon Brook runs within 5,000 feet of the site. The site consists of a 10-acre fenced hazardous waste containment/ treatment system area on the western end of a 26-acre property owned by the General Electric Company (GE). The containment system is bordered on the west by a former sand pit with a small ponded area and to the north by both undeveloped and developed land (with a new housing development under construction). To the east, the remainder of the GE property (16 acres) is undeveloped and extends approximately 1,200 feet to the entrance on Fort Edward Road. To the south, a utility right of way (power lines) runs adjacent to the southern border of the property, and beyond there is some vacant land between the power lines and residences along Bluebird Road.

Site Geology/Hydrogeology

Unconsolidated deposits of glacial origin, reaching an observed thickness in excess of 120 feet, overlie bedrock of the Snake Hill Formation throughout the site. Three major types of unconsolidated deposits were found at the site—glacial till; fine glaciolacustrine sediments; and deltaic sand deposits. The geologic materials underlying the site are grouped into three hydrogeologic units—the Moreau aquifer; a bedrock aquifer; and an intervening low conductivity

unit. The low conductivity unit is composed of the lower glaciolacustrine sediments (gray, soft, varved silt and clays) that vary in thickness from approximately three to 25 feet.

The Moreau aquifer is the uppermost hydrogeologic unit at the site. The thickness of the aquifer averages about 60 feet, but varies significantly and, based on observed vertical heterogeneity, was divided into an upper and lower portion. The upper, glaciodeltaic portion of the aquifer comprises about 75% of the Moreau aquifer's thickness, and is generally described as a mixture of fine-, medium-, and coarse-grained sands with a trace of silt. The lower, glaciolacustrine portion of the Moreau aquifer comprises the remaining 25 percent of the aquifer's thickness and is generally described as a mixture of fine- to medium-grained sands and silts, with frequent seams of silt, silty clay and clay. An escarpment caused by the erosive action of a glacial lake on the previously deposited glaciodeltaic deposits exists as a north-south trending terrace near the southeastern edge of the site.

Groundwater within the Moreau aquifer occurs under unconfined, or water table, conditions. The elevation of the top of the Moreau aquifer ranges from about 325 feet above mean sea level (amsl) near the containment system to about 285 feet amsl at the erosional escarpment. Groundwater flows in a southerly direction. At the base of the escarpment is a groundwater discharge area where surface streams that feed the Village of Fort Edward public water supply system reservoirs along Reservoir Road are recharged by groundwater.

A 4,800-foot long by 2,000-foot wide groundwater contaminant plume extends from the containment system southward under Bluebird Road and, thereafter, under mostly undeveloped land and parts of athletic fields on property owned primarily by the Town of Moreau (mostly parkland). The plume also underlies part of the Village of Fort Edward's watershed property before discharging into Reardon Brook.

Land and Resource Use

The area surrounding the site is characterized as semirural/residential. In general, residential development around the site continues to increase with several housing tracts in the planning stages. The 10-acre containment system/treatment area includes a 3.6-acre capped landfill, which could be utilized only with severe restrictions. Since contaminated soils were removed from the remainder of the site, approximately 16 acres could be used for residential development, however, GE has no announced plans for this area. The site is also located within a public water supply water district with restrictions on groundwater withdrawals because of the groundwater plume. The plume extends southward from the containment area and underlies 1) residences along Bluebird Road, 2) parkland of the Town of Moreau, 3) parts of two proposed subdivisions (both of which extend eastward from the plume to Fort Edward Road) and 4) the Village of Fort Edward watershed property. The parkland on the west side of the plume has been extensively developed with recreation fields, however, the watershed property to the south and southeast remains mostly undeveloped.

History of Contamination

From 1958 to 1968, the site was used by GE for the disposal of industrial waste. A 30 x 40-foot evaporative pit at the site received approximately 452 tons of waste material, including trichloroethylene (TCE), polychlorinated biphenyls (PCBs), spent solvents, oils, sludge, and other miscellaneous waste. The dirt roads at the site leading to the pit were treated with PCB-contaminated oil as a dust suppressant.

Investigations at the site began in 1977, when the New York State Department of Environmental Conservation (NYSDEC) engaged Roy F. Weston, Inc. (Weston) to investigate several disposal sites known to have received PCB wastes.

Initial Response

Following Weston's investigation, the Town of Moreau removed approximately 100 cubic yards of soil from within and immediately adjacent to the evaporation pit for off-site disposal. In June 1979, the Town, under an agreement with the New York State Department of Transportation and NYSDEC, covered the evaporation pit with soils to reduce potential volatilization. The area was subsequently fenced and posted. NYSDEC also engaged Wehran Engineering to further investigate several of the PCB disposal sites that had been investigated by Weston.

On September 23, 1980, GE entered into an agreement with NYSDEC related to seven GE sites to perform investigative activities and to develop and implement remedial programs for the sites. The remedial actions that were ultimately implemented at the GE Moreau site included removal of drums from the former disposal area, installation of a soil-bentonite cutoff wall around the former waste disposal area (keyed at depth into low permeability glaciolacustrine clays), installation of a low-permeability clay cap around the former waste disposal area (keyed into the soil-bentonite cutoff wall), and installation of new security fencing around the former waste disposal area. GE also installed an air stripper on Reardon Brook to treat contaminated groundwater after it discharges to surface water (natural gradient flushing).

In 1982, it was determined that there were elevated concentrations of TCE in the groundwater near the site, which was used for drinking water by local residents. Subsequently, activated carbon filters were installed in approximately 70 homes within the downgradient contaminant area.

Basis for Taking Action

In September 1983, the site was added to the Superfund National Priorities List. In November 1983, EPA issued an Administrative Order on Consent (Index No. II CERCLA-30201), in which GE agreed to, among other things: 1) conduct a remedial investigation/feasibility study (RI/FS) at the site; 2) design and construct the remedy selected by EPA; and 3) conduct post-remediation monitoring and operation and maintenance (O&M).

The RI/FS was conducted by GE to determine the nature and extent of contaminants in soil, surface water, and groundwater at the site and to evaluate remedial alternatives. The environmental

characterization is described in the October 1984 RI Report and the March 1985 RI Addendum Report for the site. The evaluation of remedial alternatives is contained in the August 1985 FS Report.

The RI Report identified a plume of volatile organic compounds (VOCs), primarily TCE, emanating from the former waste disposal area to the erosional escarpment at the southern boundary of the Moreau aquifer. The upper portion of the Moreau aquifer (a glaciodeltaic unit) had a maximum concentration of TCE in groundwater of 81,000 micrograms/liter ($\mu\text{g/l}$). The lower portion of the Moreau aquifer (an upper glaciolacustrine unit) had a maximum reported concentration of TCE in groundwater of 1,800 $\mu\text{g/l}$. The TCE plume has a maximum width of 2,000 feet and a length of approximately 4,800 feet. At the downgradient edge of the plume, the contaminated groundwater discharges to surface water streams that converge to form Reardon Brook.

TCE and 1,2-dichloroethylene (1,2-DCE) were also detected in Reardon Brook, which feeds New Reservoir, one of the Village of Fort Edward's public water supply reservoirs along Reservoir Road. The reservoirs are approximately 2,500 feet from where the contaminated groundwater emerges from the escarpment. The highest level of TCE detected in Reardon Brook was 900 $\mu\text{g/l}$, at its origin. Sampling has not detected TCE or 1,2-DCE in the Village's reservoirs.

The RI identified PCB-contaminated soils along the dirt roads leading to the former waste disposal area from Fort Edward Road. The highest level of PCBs detected was 3,000 milligrams per kilogram (mg/kg) at the ground surface. Lower levels (up to 42 mg/kg) were detected to a depth of 6 inches. Pursuant to an Administrative Order on Consent (Index No. II CERCLA-50202) issued by EPA in July 1985, GE removed these contaminated soils and placed them under the clay cap noted above.

IV. Remedial Actions

Remedy Selection

EPA signed a Record of Decision (ROD) for the site on July 13, 1987. The major components of the selected remedy included the following:

- Utilization of the existing containment system constructed around the former waste disposal area to contain the source of groundwater contamination;
- Continued natural gradient flushing of the groundwater plume into Reardon Brook and continued surface water collection and treatment;
- Monitoring of groundwater;
- Provision of a public water supply system to approximately 100 residences affected or potentially affected by the plume of contaminated groundwater; and

- Institutional controls were recommended to restrict the withdrawal of groundwater from the aquifer in the vicinity of the groundwater plume until the groundwater standards are met

In February 1994, an Explanation of Significant Differences (ESD) was issued that required an enhancement of the containment system to change its performance criteria to include maintaining an inward hydraulic gradient across the soil-bentonite cutoff wall. Specifically, the objective of the enhancement was to lower and maintain the water level elevation inside the containment system to be at least 0.5ft lower than the elevation of the aquifer outside the system

A second ESD was issued in October 1994 that addressed a reevaluation of the selected remedy for groundwater restoration. This ESD documented EPA's decision to waive applicable or relevant and appropriate requirements (ARARs) for groundwater cleanup based upon the technical impracticability of restoring contaminated groundwater in the Moreau aquifer within a reasonable time frame.

Remedy Implementation

Excavation of PCB-Contaminated Soils

In 1985, approximately 8,600 cubic yards of PCB-contaminated soils located along the dirt roads leading to the former waste disposal area were excavated and were placed under the clay cap at the site prior to the issuance of the ROD.

Containment System

The containment system, constructed in 1984 and 1985 around the former waste disposal area, consists of a soil-bentonite cutoff wall and a clay cap. The cutoff wall encompasses an area of about 3.6 acres and extends vertically downward approximately 95 feet deep to key into low-permeability glaciolacustrine clays. A multilayered cap, consisting of 3.5 feet of low-permeability clay, 12 inches of silty sand, and 4 inches of topsoil, was installed over and extends 8 feet beyond the perimeter of the cutoff wall. A relief well was installed within the containment system to provide an access point for groundwater elevation monitoring and to allow for the removal of groundwater that might accumulate within the containment system. NYSDEC certified construction of the containment system on February 20, 1986.

Based on maintenance and monitoring data collected following the installation of the containment system, in 1991, it was determined that an estimated 55,000 to 65,000 gallons of water were being lost through the cutoff wall annually. EPA determined that the containment system should be enhanced to reduce exfiltration by lowering the water level inside the cutoff wall to a level below that of the surrounding aquifer, thereby creating an inward hydraulic gradient across the cutoff wall. These findings were documented in the February 1994 ESD.

Subsequently, an extraction and treatment system (*i.e.*, a dewatering system) was constructed from April to September 1994. It operated on a seasonal basis over a three-year period from September 1994 to August 1996, reducing the water level inside the cutoff wall by 11.73 feet. Approximately 4,350,320 gallons of water was removed from the containment system and transported to the wastewater treatment facility at GE's plant in Fort Edward, New York, where it was treated and discharged to surface water pursuant to a State Pollutant Discharge Elimination System permit. In 2003, in anticipation of the need for additional future dewatering events, an infiltration gallery was installed adjacent to the treatment system to facilitate on-site disposal of the treated water. A second dewatering of the containment system was performed during 2003 and 2004, when 1,107,140 gallons of water was removed from the containment system, treated, and disposed of on-site.

Groundwater and Surface Water Treatment

The ROD called for restoration of contaminated groundwater by allowing it to flow under natural gradient conditions to Reardon Brook, where it would be treated by an air stripping treatment system previously constructed on Reardon Brook.

The air stripping treatment system, which became operational in November 1985, was designed for flows of up to 400 gallons per minute and is located approximately 2,000 feet downstream from the escarpment and about 700 feet upstream of the Fort Edward Water Supply Treatment Plant on Reservoir Road.

As the result of containment, it was estimated that the aquifer could be cleaned up in decades.

In 1989, EPA began a reevaluation of the selected remedy for groundwater restoration. Developments in the field of groundwater remediation, based on laboratory and field-scale demonstrations and case studies of sites, had led to the identification of hydrogeologic and contaminant-related factors that are responsible for increased time frames for restoration of aquifers. These factors include variations in hydraulic conductivity, variations in sorption capacity of aquifer materials and nonequilibrium desorption. With the technical assistance of the Robert S. Kerr Environmental Research Laboratory, EPA's center for groundwater research, EPA evaluated the two groundwater restoration alternatives considered in the ROD natural gradient flushing with treatment and groundwater extraction with treatment. Based upon this evaluation, EPA determined that variations in hydraulic conductivity, variations in sorption capacity of the aquifer material, and nonequilibrium desorption are in effect at the site, and would lead to long aquifer cleanup times for either remedial alternative (*i.e.*, pumping with treatment or natural gradient flushing with treatment). EPA's reevaluation included numerical modeling, which provided estimates that cleanup of groundwater at the site, may take 200 years or more regardless of the remedial method employed. In light of these constraints, EPA determined that it was necessary to waive the groundwater ARARs for the area of the plume, based on the technical impracticability of attaining cleanup standards within a reasonable time period given the site-specific circumstances. The area of the plume within the Moreau aquifer was defined as being approximately 4,800 feet long and about 2,000 feet wide at its widest point with an average depth of approximately 60 feet. The waiver, issued pursuant to §121(d)(4)(c) of CERCLA and §300.430(f)(1)(ii)(C)(3) of the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, was documented in an October 1994 ESD.

Notwithstanding the waiver, the natural gradient flushing with treatment continues so as to protect potential surface water receptors.

Alternative Water Supply

The ROD called for the extension of the Village of South Glens Falls public water supply to residences located along Bluebird Road that were affected or potentially affected by the groundwater plume and along Myron Road and Terry and Cheryl Drives that might be affected by the plume in the future.

EPA approved GE's final design documents for the extension of the public water supply and distribution facilities in September 1987. The distribution piping along Bluebird and Myron Roads and Terry and Cheryl Drives was installed from September to December 1988. The transmission piping along Gansevoort Road was installed from September to December 1989. By June 1990, 93 single-family residences, one school, and one trailer park were connected to the alternative water supply.

In 2001, the Town of Moreau extended public water supply lines to include all the houses located in the vicinity of the plume. This included the installation of new water lines along Fort Edward Road, Williams Street, Castle Road and Jan Avenue, and extension of the existing water line on Bluebird Road to the west. Water service in the new lines began in early November 2001. Subsequently, the water lines were connected to the Town of Queensbury regional water supply system.

Institutional Controls Implementation

In May 1986, pursuant to Section 3-0305 of the Environmental Conservation Law and Eminent Domain Procedure Law, NYSDEC issued a Permanent Easement by Appropriation to GE and two adjacent property owners to permanently appropriate and restrict the use of parts of four parcels constituting the site. The permanent easement is on file at NYSDEC's Albany office.

In the ROD, EPA recommended that the Town of Moreau establish institutional controls for restricting the withdrawal of groundwater from the Moreau aquifer in the vicinity of the plume until the ARARs are met in groundwater. On May 8, 2001, the Town adopted Local Law No.1 of 2001, Chapter 145, Article IV, Water District No. 4 Rules and Regulations, which contains restrictions on groundwater usage in the plume area

System Operations/Operation and Maintenance

GE developed a maintenance and monitoring program for use at the site during the post-closure period. This program includes monthly inspection of the physical security of the site, including checking the perimeter of the fence and all locks on gates and monitoring wells; monthly inspection of the capped area and nearby embankments for desiccation cracks, erosion, slumps or slides, with repair as necessary; monthly measurement of the depth to groundwater in the relief well and several monitoring wells; periodic mowing of the grass cover on the capped area; quarterly evaluation and

measurement of any accumulated water in the two pan lysimeters; semiannual water elevation measurements; semiannual groundwater sampling with analysis for VOCs and PCBs; acquisition of weather data during the period of sample collection; and quarterly reporting. The original maintenance and monitoring program called for annual air sampling at four locations around the perimeter of the capped area. In 1996, the sampling had been reduced to once every five years with sampling performed during 2000 and 2005; however, this sampling was discontinued, with NYSDEC approval on September 4, 2007, because of the successful performance of the cap.

To monitor the cutoff wall's inward gradient, water level measurements are obtained from within and outside the containment system on a monthly basis. To maintain the inward gradient, the water level in the relief well inside the containment system is required to be at least 0.5 feet lower than the groundwater level in an observation well located outside the containment system. If the performance criterion is not achieved for two consecutive months, an evaluation of the need for enhancement (*i.e.*, dewatering) is performed. The initial dewatering of the containment system was performed during 1994-96, with a second dewatering event performed during 2003-2004.

The annual O&M costs are approximately \$180,000.

V. Progress Since Last Five-Year Review

The third five-year review for the site was conducted in September 2003 pursuant to OSWER Directive 9355.7-03B-P. This five-year review concluded that the implemented remedy continued to provide adequate protection of public health and the environment. While no recommendations were made in the prior five-year review, this review stated that it was anticipated that additional dewatering activities would be needed for the containment system, given the gradual accumulation of water in the system. Dewatering was performed from September 2003 through early December 2003 and from mid-May 2004 through late August 2004. Prior to the dewatering, an infiltration gallery was constructed adjacent to the treatment system to facilitate disposing of the treated groundwater on-site (and upgradient of the containment system). As a result of the dewatering, a total of 1,107,140 gallons of contaminated groundwater was removed from the containment system and was treated and disposed of on-site, resulting in a water level reduction of 5.12 feet across the containment system. Historical monitoring indicates that an additional dewatering of the containment system will be needed during the next 5-year review period.

VI. Five-Year Review Process

Administrative Components

The five-year review team consisted of Jack O'Dell (RPM), Diana Cutt (hydrogeologist), Marian Olsen (human health risk assessor), and Mindy Pensak (ecological risk assessor) of EPA.

Community Involvement

The EPA Community Involvement Coordinator for the G.E. Moreau site, Kristin Skopec, published a notice in the *Glens Falls Post Star* on April 20, 2008, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review of the remedy for the site to ensure that the implemented remedy remains protective of public health and the environment and is functioning as designed. It was also indicated that once the five-year review is completed, the results will be made available in the local site repository. In addition, the notice included the RPM's address and telephone number for questions related to the five-year review process for the G.E. Moreau site. A similar notice will be sent when the review is completed and the results of the five-year review will be made available at the repository and on the internet.

Document Review

The documents, data, and information which were reviewed in completing this five-year review are summarized in Table 2.

Data Review

Based on a review of the results of the groundwater quality and water-level elevation monitoring, it has been concluded that the direction of groundwater flow and the concentrations within the VOC plume have not changed significantly during the last five years. During this review period, there were decreases in the historical concentrations of TCE and 1,2-DCE in some of the shallow wells across the groundwater plume.

EPA has calculated that the surface water concentration of TCE at an upstream location from the air stripper would need to exceed 450 µg/l before warranting concern regarding the effectiveness of the air stripper. During this five-year period, TCE concentrations were below 100 µg/l. In addition, 1,2-DCE concentrations have been below 20 µg/l. By comparison, since 1985, historical TCE concentrations have likewise been consistently below 100 µg/l and 1,2-DCE less than 20 µg/l. The current data indicate that the air stripping treatment system continues to treat VOCs in Reardon Brook to safe levels. Also, the past twenty-three years of monitoring have indicated that it is unlikely that future VOC concentrations will reach a level of concern relative to the design capacity of the air stripping system.

Surface water monitoring has also indicated that, with the exception of one anomalous data event in 2007 and periodic trace residuals of chloroform and bromodichloromethane (associated with the chlorination process in the Village of Fort Edward's water treatment facility), no VOCs related to the groundwater plume have been detected in any of the Village of Fort Edward's water supply collection boxes and reservoirs. In the case of the anomalous result, 1,2-dichloroethane (1,2-DCA) was detected on both May 22 and June 10, 2007 in samples from a clear well; the concentrations were, however, below state and federal drinking water standards. Extensive follow up testing has failed to find further detections or identify the source.

To monitor the soil-bentonite cutoff wall's inward gradient, water level measurements are obtained from within and outside the containment system on a monthly basis. To maintain the inward gradient, the 1994 ESD requires the water level in the relief well inside the containment system to be at least 0.5 feet lower than the groundwater level in an observation well located outside the containment system. If the performance criterion is not achieved for two consecutive months, the ESD requires that the implementation of additional enhancement alternatives (*e.g.*, dewatering) be evaluated. The performance criterion was not met for two periods during 2001 and 2002. As a result, a Containment System Dewatering Plan was developed by GE and was approved by EPA and NYSDEC in June 2003. A dewatering operation was conducted from September 2003 to December 2003 and from May 2004 through August 2004, which resulted in the removal of 1,107,140 gallons of contaminated groundwater from the containment system. The removal resulted in achieving a difference of 5.12 feet across the containment system wall, surpassing the performance criteria by a significant amount. Except for brief periods of exfiltration prior to dewatering operations, the most contaminated part of the plume (*i.e.*, its source) has been fully contained.

Site Inspection

A site inspection was conducted by EPA on August 26, 2008. The inspection was conducted by Jack O'Dell, the RPM, as well as Greg Handly of NYSDEC and Wendy Kuehner of the New York State Department of Health.

Interviews

Prior to the inspection of the site, a telephone conversation was held with Joe Patricke, Code Enforcement Official/Building Inspector for the Town of Moreau, with regard to changes in land use and residential development in the area surrounding the site. Mr. Patricke indicated that residential development had been increasing in the area surrounding the Site during the past five years. He also indicated that there was a new local requirement that vapor mitigation systems be installed with the construction of any building on the property overlying or near the groundwater plume. It is possible that this would discourage the development of property over the plume in the near future. A telephone conversation was also held with Arvid O'Connell, the Superintendent of the Village of Fort Edward Water Department, regarding the detections of 1,2-DCA in the Village of Fort Edward's water supply in 2007. A follow up, in person, discussion on the same matter was held with Ray LeQue (the former Superintendent of the Water Department) during an August 26, 2008 visit to the Fort Edward Water Treatment Plant. Mr. LeQue was in office at the time of the 2007 detections. Both Mr. O'Connell and Mr. LeQue agreed the detections were anomalous results. Lastly, a discussion with Paul Hare, GE Regional Manager, confirmed earlier indications that GE has no current plans to develop the uncontaminated 16 acres of the 26-acre GE Moreau site property.

Institutional Controls Verification

Local Law No.1 of 2001, Chapter 145, Article IV, Water District No. 4 Rules and Regulations, which contains restrictions on groundwater usage in the plume area, remains in effect. Likewise, the permanent easement is still on file at NYSDEC's office and in effect.

Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls

Table 3 (attached) presents one comment.

VII. Technical Assessment

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

The primary objectives of the implemented remedy are to control the source of contamination at the site, to reduce and minimize the migration of contaminants into the groundwater and surface water, and to minimize any potential human health and ecological impacts resulting from the exposure to contamination at the site. These objectives were accomplished by, among other things, the installation of a containment system, removal of the PCB-contaminated surface soils and placement in the containment system, treatment of the groundwater plume after it discharges into Reardon Brook, provision of a public water supply system to residences affected or potentially affected by the plume of contaminated groundwater, and institutional controls to restrict the withdrawal and use of contaminated groundwater. Regarding the latter, the Town of Moreau adopted Local Law No.1 of 2001, which established Water District No.4 and prohibited and restricted the use of groundwater in the water district and the permanent easement restricts the uses of the site.

In addition, the long-term monitoring program continues to indicate that the implemented remedy remains protective. The current groundwater monitoring program includes 32 wells to monitor changes in the size and direction of the plume in the unconsolidated aquifer. During the last five years, the data indicates that the concentrations in the plume are stable. No VOCs have been detected in the Village of Fort Edward reservoirs along Reservoir Road and surface water concentrations exiting the air stripper continue to indicate there are no VOCs entering New Reservoir (Village of Fort Edward) from Reardon Brook. In addition, the contaminant levels in Reardon Brook remain below ecological concern. Although residential development has been occurring near the site in recent years, the measures taken by the Town of Moreau Planning Board make it unlikely that any residential or commercial construction will occur over, or near, the groundwater plume in the short-term.

The remedy continues to operate as intended by the ROD and as amended by the ESDs.

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

There are no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

Exposures to on-site contaminated soils were interrupted through their removal and the placement of a cap on the landfill in 1985.

During the review period, the maximum concentration of TCE in the groundwater plume was 11,000 µg/l, cis-1,2-DCE was 2,800 µg/l, and vinyl chloride was 310 µg/l. The noted values exceed the Maximum Contaminant Levels for these chemicals of 5 µg/l for TCE, 70 µg/l for cis-1,2-DCE, and 2 µg/l for vinyl chloride.

Exposures to groundwater contamination were interrupted through providing the public water supply system to approximately 100 residences affected or potentially affected by the plume of contaminated groundwater. In addition, in 2001, the Town of Moreau extended public water supply lines to include all the houses located in the vicinity of the plume (see the section on Alternative Water Supply). Furthermore, on May 8, 2001, the Town adopted Local Law No. 1 of 2001, Chapter 145, Article IV, Water District No. 4 Rules and Regulations, which contains restrictions on groundwater usage in the plume area.

The chemical-specific ARARs identified for surface water are 5 µg/l for TCE and 50 µg/l for 1,2-DCE. Surface water samples are collected from Reardon Brook and the Village of Fort Edward's water supply reservoirs located along Reservoir Road on a semiannual basis. The TCE and 1,2-DCE concentrations have been relatively consistent over the last five years, averaging 77 µg/l and 16 µg/l, respectively, with slight evidence of an upward trend but still within the historical range. Further, concentrations of the Reardon Brook air stripper influent and effluent samples are obtained on a monthly basis and analyzed for VOCs. TCE and 1,2-DCE were not detected in the effluent samples, thus meeting the chemical-specific ARARs.

During the previous review period, soil vapor intrusion sampling was conducted at the Moreau Elementary School and at twelve residences on Bluebird Road. Since the concentrations did not exceed the risk range, further sampling during the current review period was not warranted. Should downgradient areas be developed, the vapor intrusion pathway should be evaluated.

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 a review of the data, relevant documents, and a site inspection, the following site conditions relating to the implementation of the remedy have been achieved:

- The cap is intact and in good condition;
- Concentrations in the plume within the unconsolidated aquifer remain stable;
- The fence around the former waste disposal area and treatment system is intact, in good repair and site security is satisfactory;
- The air stripping treatment system is operating successfully;
- The groundwater monitoring wells are functional; and
- There is no evidence of trespassing, vandalism or damage (to the cap, monitoring wells, fencing, or any other site-related facility).

VIII. Recommendations and Follow-Up Actions

Table 4 (attached) contains a recommendation and follow-up action which should ensure long-term protectiveness.

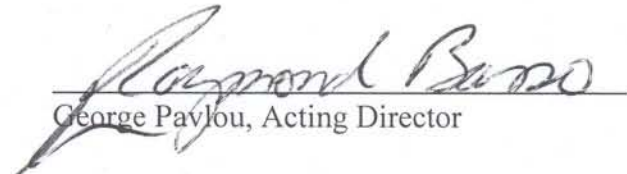
IX. Protectiveness Statement

The implemented remedial actions protect human health and the environment in the short-term. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected, as long as the site use does not change and the implemented engineering and institutional controls are properly maintained. In order for the site to be protective in the long-term, if off-property development in the path of the plume occurs, the vapor intrusion pathway should be evaluated.

X. Next Review

Since hazardous substances, pollutants or contaminants remain at the site which do not allow for unlimited use or unrestricted exposure, in accordance with 40 CFR 300.430 (f) (4) (ii), the remedial action for the site shall be reviewed no less often than every five years. The next five-year review for the site will be completed before September 2013, five years from the date of this review.

Approved:


George Pavlou, Acting Director


Date

Table 1: Chronology of Site Events	
Event	Date(s)
Disposal of industrial waste from the General Electric Company into an evaporation pit	1958-1968
Investigation of site by NYSDEC	1977
Removal of contaminated soil by Town of Moreau	1978
Pit covered and site fenced and posted by Town of Moreau	1979
Agreement between GE and NYSDEC results in removal of drums, installation of cutoff wall and clay cap (containment system), fencing, and monitoring wells	1980-86
Site placed on National Priorities List	1983
AOC with EPA to supply water treatment systems for local wells, and conduct RI/FS, RD/RA, O&M, and Monitoring	1983
Remedial Investigation and Feasibility Study completed	1985
Installation of VOC Stripping system on Reardon Brook	1985
AOC with EPA resulting in removal of PCB-contaminated soil and disposal into the Containment System	1985-86
Record of Decision	1987
Installation of Alternative Water System to 100 residences	1988-90
First Five-Year Review	1994
Explanation of Significant Differences - Enhancement to Containment System	1994
Initial Dewatering of the Containment System	1994-96
Explanation of Significant Differences - Technical Impracticability Waiver for Groundwater Cleanup Standards	1994
Preliminary Closeout Report	1997
Second Five-Year Review	1998
Town of Moreau - Local Law No. 1 of 2001 - Water District Rules and Regulations	2001
Indoor Air and Sub-slab Sampling of Nearby Residences and School	2003
Third Five-Year Review	2003
Second Dewatering of the Containment System	2003-04

Table 2: Documents, Data, and Information Reviewed in Completing the Five-Year Review

• Remedial Investigation Report, Dunn Geoscience Corp., October 1984
• Addendum, Remedial Investigation Report, Dunn Geoscience Corp., March 1985
• Feasibility Study of Remedial Alternatives, Dunn Geoscience Corp., August 1985
• Record of Decision, EPA, July 1987
• Five-Year Review Report, EPA, February 1994
• Explanation of Significant Differences: Enhancement to Containment System, EPA, February 1994
• Explanation of Significant Differences: Technical Impracticability Waiver of Groundwater Cleanup Standards, EPA, October 1994
• Superfund Preliminary Site Close-Out Report, EPA, March 1997
• Second Five-Year Review Report, EPA, September 1998
• Comprehensive Five-Year Review Guidance (and Appendices a-g), EPA, OSWER Directive 9355.7-03B-P, June 2001
• Five-Year Review Process in the Superfund Program - Quick References Fact Sheet, EPA, OSWER Directive 9355.7-08FS, April 2003
• Third Five-Year Review Report, EPA, September 2003
• Semi-Annual Water-Level Measurements, O'Brien & Gere Engineers, 2003-2007
• Surface Water Analytical Data, O'Brien & Gere Engineers, 2003-2007
• Semi-Annual Groundwater Analytical Data, O'Brien & Gere Engineers, 2003-2007
• Maintenance and Monitoring Program Quarterly Report, 2003-2008
• Quarterly Report - Hydraulic Performance of Containment System, O'Brien & Gere Engineers, 2003-2008
• Summary of Site Activities - 2003 through 2008, O'Brien & Gere Engineers, April 2008

Table 3: Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls

Comment	Suggestion
New York State now requires annual certifications that institutional controls that are required by RODs are in place and that remedy-related operation and maintenance (O&M) is being performed.	The last quarter's Maintenance and Monitoring Program Reports should include a certification that remedy-related O&M is being performed and that the permanent easement and Local Law No.1 of 2001, Chapter 145, Article IV, Water District No. 4 Rules and Regulations, are still in place.
The boundaries of the downgradient plume (subject to the technical impracticability waiver) need to be verified.	Confirmation of the downgradient plume should be verified. This may require the installation of additional monitoring wells.

Table 4: Recommendations and Follow-Up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Off-property groundwater concentrations exceed soil vapor screening values.	If off-site development in the path of the plume were to occur, the vapor intrusion pathway should be evaluated.	PRP	EPA	To be determined	N	Y

Table 5: Acronyms Used in this Document	
Amsl	above mean sea level
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DCA	Dichloroethane
DCE	Dichloroethylene
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
GE	General Electric Company
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operation and Maintenance
PCBs	Polychlorinated Biphenyls
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TCE	Trichloroethylene
VOCs	Volatile Organic Compounds
µg/l	micrograms per liter