SUPERFUND SITE CLOSE OUT REPORT
JACKSON STEEL SUPERFUND SITE
VILLAGE OF MINEOLA
NASSAU COUNTY, NEW YORK

I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has determined that all appropriate response actions for the Jackson Steel Superfund site have been successfully implemented in accordance with *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-22, May 2011).

Specifically, based upon field observations associated with EPA oversight and the results of a final inspection of the site on July 13, 2016, it has been determined that the remedy has been implemented in accordance with the 2004 Record of Decision (ROD), as modified by 2007 and 2016 Explanations of Significant Differences (ESDs).

It has been determined that no further response, other than the continued operation of vapor intrusion mitigation systems at a daycare center located adjacent to the former Jackson Steel building, institutional controls (ICs) verification and five-year reviews, is anticipated. Human exposures and contaminated groundwater releases are under control.

II. SUMMARY OF SITE CONDITIONS

Site Background

The 1.5-acre site contains a one-story, 43,000-square-foot building formerly used as a metal-forming facility and an approximately 10,000-square foot paved parking area. The site is bordered to the north by commercial and single-family dwellings, to the east by a two-story apartment complex, to the south by a day care center, and to the west by an office building and restaurant.

The property was used by Jackson Steel Inc. from the mid-1970s until 1991 as a "roll form metal shapes" manufacturing facility. Degreasers, including tetrachloroethylene (PCE), trichloroethylene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA), were used at the facility until 1985. Sludges from degreasing equipment were stored in drums and in an on-property 275-gallon tank.

The analytical results from samples collected by the Nassau County Department of Health (NCHD) in the early 1990s from within, around, and below three on-property dry wells indicated the presence of PCE, TCE, 1,1,1-TCA, 1,2-dichloroethylene (1,2-DCE) and 1,1-dichloroethane (1,1-DCA) at depths down to 40 feet below the ground surface. PCE, TCE, 1,1,1-TCA, 1,2-DCE and 1,1-DCA were also detected in groundwater samples collected from monitoring wells located downgradient of the dry wells.

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The contamination found at the site was likely caused by the discharge of wastes into the dry wells, and spills and leaks from drums containing various chemicals during Jackson Steel's operations.

The site was listed on EPA's Superfund National Priorities List on February 4, 2000.

Following the commencement of the remedial investigation (RI) in October 2001, NCHD performed air sampling inside the day care center's building because of its proximity to the site. The air samples detected PCE at levels below the New York State Department of Health's (NYSDOH's) guideline for indoor PCE exposure. Given the sensitivity of the population exposed (preschool children), NCHD collected additional samples in December 2001. At that time, indoor testing was also conducted inside the Jackson Steel building and at the restaurant located adjacent to the site. The results indicated that PCE levels in the indoor air of several rooms in the day care center were above NYSDOH's guideline for PCE.[1] As a result, in January 2002, a subslab depressurization system (*i.e.,* vapor intrusion mitigation system) was installed by EPA. In addition, a ventilation system was installed by the day care center's contractor. Samples collected to assess the effectiveness of the implemented measures showed that the PCE levels in the air were significantly below NYSDOH's guideline and below EPA's acceptable noncancer risk levels. Because elevated PCE levels were also detected in a billiards club that shared common walls with the site building and the daycare center, EPA installed a vapor intrusion mitigation system under the concrete slab of this building, as well. The billiards club was subsequently occupied as a retail store, and recently the daycare center expanded to occupy this space. The vapor intrusion mitigation systems were replaced by the property owner's contractor in May 2016.

Remedial Investigation and Feasibility Study Results

The results of the RI, which was completed in 2002, indicated that volatile organic compounds (VOCs), semi-volatile organic compounds (SVOC), pesticides and metals contamination were present in the surface soil and VOC contamination was present at several subsurface soil locations. In addition, contamination was found in a trench and sumps located inside the building and dry wells located under the parking lot at the site.

Groundwater from the three hydrogeologic units underlying the site—the Upper Glacial Aquifer (upper aquifer), Magothy Confining Bed (a low permeability, clay layer separating the upper and deep aquifers), and the Magothy Aquifer (deep aquifer)—were also sampled. VOC contamination above state and federal standards was detected both in the Upper Glacial Aquifer and Magothy Aquifer.

Based upon the results of the RI, a baseline human health risk assessment (HHRA) was conducted to evaluate the potential for current and future impacts of site-related contaminants on receptors using the site. Under baseline conditions, the human health risks posed by the groundwater and the surface soil at the site, as well as the contaminants on the floor of the on-property building,

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[1] NYSDOH's guideline at that time was 100 micrograms per cubic meter (ug/m^3); the current guideline is 30 ug/m^3.

were found to be unacceptable. Cancer risks exceeding the risk range were identified for a future adult inside industrial worker (7.9×10^{-3}),[2] future adult outside industrial worker (7.3×10^{-3}) and future adult/child resident (2.5×10^{-2}). The primary contributor to these risks was exposure to the groundwater. Noncancer hazards exceeding the hazard index (HI)[3] were identified for the future adult inside industrial worker (HI of 30), future adult outside industrial worker (HI of 23), future adult resident (HI of 51) and future child resident (HI of 158). The primary contributor to these HIs was exposure to the groundwater.

A screening of ecological risks was performed. Because the property includes a mostly paved industrial/commercial facility, there is minimal habitat available for ecological receptors on the property. Due to the suburban/commercial setting, the potential for exposure to receptors and ecological risk is minimal in the area surrounding the property as well.

Record of Decision Findings

Following the completion of the remedial investigation/feasibility study (RI/FS), on September 24, 2004, EPA selected a remedy for the site in a ROD. The ROD outlined the following remedial action objectives (RAOs):

- minimize or eliminate contaminant migration from contaminated soils and dry wells to the groundwater;
- minimize or eliminate any contaminant migration from contaminated soils and groundwater to indoor air;
- restore groundwater to levels which meet state and federal standards within a reasonable time frame;
- mitigate the migration of the affected groundwater; and

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[2] Cancer risk is expressed as a probability. For example, a 10^{-4} cancer risk represents a "one in 10,000 excess cancer risk," or an increased risk of an individual developing cancer of one in 10,000 as a result of exposure to Site contaminants under the conditions used in the Exposure Assessment. Under the federal Superfund program, as outlined in the NCP, EPA's goal of protection is an excess cancer risk of 10^{-6} or less for the RME individual. The NCP acceptable cancer risk range is 10^{-4} to 10^{-6} (corresponding to one in 10,000 to one in 1,000,000 excess cancer risk).

[3] The potential for noncancer health effects is evaluated by comparing an exposure level over a specified time period (*e.g.*, 7 years or more) with a reference dose (RfD) derived for a similar exposure period. An RfD represents a level that an individual may be exposed to that is not expected to cause any adverse effects. The ratio of exposure to toxicity is expressed as a Hazard Quotient (HQ). An HQ less than 1 is not of concern. An HI represents the sum of the individual hazard quotients for different chemicals and different media. A noncancer HI of less than 1 is not of concern.

- reduce or eliminate any direct contact, ingestion, or inhalation threat associated with contaminated soils, soil vapor, contaminated surfaces in the on-property building, and groundwater.

The selected remedy included the following actions:

- decontamination of the Jackson Steel building floor;
- *in-situ* soil vapor extraction (ISVE)[4] to treat the contaminated subsurface soil in on-property source areas;
- excavation and off-site disposal of the contaminated surface soil and contaminated material in on-site sumps, a trench, and dry wells contaminated with VOCs, SVOCs, metals, and pesticides;
- *in-situ* chemical oxidation[5] to treat the contaminated groundwater in the Upper Glacial Aquifer;
- extraction and treatment of the contaminated groundwater in the deep aquifer if confirmatory groundwater sampling indicates that the site is a principal source of the groundwater contamination to the aquifer underlying the site;
- if it is determined that the site is a principal source of the groundwater contamination to the deep aquifer underlying the site, the selected remedy would be expanded, as necessary, to include off-property groundwater contamination; and
- long-term groundwater monitoring.

At the time of the ROD, the daycare center and billiards club buildings were unoccupied, so the ROD indicated that if these buildings were reoccupied, monitoring to assure that no unacceptable vapor exposure takes place would be instituted, and the ventilation systems installed during the RI would be operated and appropriately maintained.

The soil cleanup objectives were established pursuant to New York State Technical and Administrative Guidance Memorandum (TAGM) No. 94-HWR-4046 objectives (Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, Division of Hazardous Waste Remediation, January 24, 1994). These levels were the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater. The groundwater cleanup goals were the more stringent of the state or federal promulgated standards.

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[4] ISVE involves drawing air through a series of wells to volatilize the solvents in the soils. The extracted vapors are then treated.

[5] Under this technology, an oxidizing agent is injected into the contaminated groundwater. An oxidizing agent uses oxygen to degrade VOCs.

Remedial Activities Performed

Building Decontamination

The design specifications for the building decontamination were completed by EPA's contractor, CH2MHill, in October 2005.

The building decontamination was performed by Environmental Waste Minimization, Inc. (EWMI). Office equipment and construction material were removed from the interior of the Jackson Steel building on October 15, 2005. The cleanup of the building floor commenced on January 6, 2006. Broom sweeping and pressure washing was used to remove residual waste. Once the initial cleaning was complete, the building floor was decontaminated using a floor scrubber. All rinse water was collected using shop vacuums and stored in 55-gallon drums. Solid debris was also stored in separate 55-gallon drums. In total, 10 drums of rinse water waste and 18 drums of solid waste were transported to a nonhazardous waste facility for disposal.

Soil Excavation and Disposal

The design specifications for the soil excavation were completed in October 2005.

The excavation and disposal of the contaminated surface soil, the contaminated material in the building sumps and trench, and the contaminated material in the dry wells was performed from October 2005 to February 2006. C&Z Construction, Inc., performed the excavation of the surface soil along the eastern boundary of the site. EWMI performed the excavation and removal of soil from all other areas and the removal and disposal of the contaminated materials from the sumps and the trench inside the building, and from the dry wells. A total of 170 cubic yards of material was excavated and disposed of at an EPA-approved off-site facility.

The analytical results from post-excavation soil samples collected from the excavation limits indicated that the residual levels of VOCs were below the ROD soil cleanup objectives.

In-Situ Soil Vapor Extraction

ISVE was implemented in two phases, a Phase 1 pilot test, and Phase 2 full-scale implementation. The design specifications for the Phase 1 and Phase 2 ISVE were completed in February 2005 and May 2005, respectively.

The pilot test was conducted in March 2005 to evaluate the effectiveness of ISVE in treating VOCs in the subsurface soil and soil gas at the site and to establish the design parameters for the full-scale system. The pilot test, which was implemented by CH2MHill, consisted of the installation of four ISVE wells and eight vapor monitoring probes. Since the results of this test showed promise, the full-scale system ISVE system was constructed in July 2005. This included the installation of a total of five additional ISVE wells and three additional vapor monitoring probes. The coverage area included a section of the parking lot and the section of the building where historic sources were located. All of the process equipment, except the granular activated carbon

(GAC) vessels, were housed in an insulated, fully enclosed trailer. The trailer and the GAC vessels were located inside of the Jackson Steel building. A discharge vent was installed along the outside wall of the building. Piping inside the building was installed above grade on the concrete floor slab. The vacuum blower operated to remove more than 1,000 cubic feet per minute of vapor from the subsurface and maintained a net negative pressure in the subsurface while operating.

The ISVE system operated from 2005 – 2008. Based on the results of the soil gas sampling, it was determined that the operation of the ISVE system had met the ROD soil cleanup objectives.

Although the soil cleanup objectives were met, because vapors continued to be recovered, it was decided that the ISVE system would continue to operate until the vapors were reduced to levels that achieved the remedial action objective of minimizing or eliminating migration to indoor air.

Based on the continued vapor recovery by the ISVE system and the persistent elevated levels of PCE and TCE in soil gas samples collected from below the concrete slab of the Jackson Steel building, from January 24, 2012 to February 15, 2012, a Membrane Interface Probe (MIP) and soil sampling investigation was performed to delineate the lateral and vertical extent of PCE and TCE in the soils as a potential source of soil gas concentrations. The MIP technology identified three potential shallow subsurface (2 to 6 feet below grade) hot spots where confirmatory soil samples were collected using conventional drilling and soil sampling methods. Details related to this effort are described in the "Monitoring Results" section, below. Based on the results of the MIP investigation and confirmatory soil samples, enhancements were made to the ISVE system. Specifically, in June 2012, nine new vapor extraction wells were installed in the three discrete hot-spot areas inside the building. EPA continued to operate the ISVE system until June 12, 2013, when the levels of vapor removal were determined to be too low for the system to continue to be effective.

The ISVE system, which operated for a total of 55,871 hours, removed an estimated 83 pounds of VOCs from the subsurface.

The ISVE system was decommissioned in April 2016.

In-Situ Chemical Oxidation

The design specifications for the *in-situ* chemical oxidation (ISCO) system were completed in June 2005.

Redox Tech, LLC, was subcontracted to perform the ISCO operation in the Upper Glacial Aquifer. A bench-scale study was performed in March 2005 to evaluate and select the oxidant media and dosage to be used in the injections. An implementation plan detailing the design of the injection system, injection locations, and specific quantities of oxidant to be used was prepared in June 2005. Between July and December 2005, approximately 15,000 gallons of iron-catalyzed sodium persulfate (with small amounts of buffering agents) and 600 gallons of hydrogen peroxide were injected in the aquifer through a network of 20 injection wells.

Oxidation with Injected Air

Upon review of the post-chemical oxidation injection data, it was determined that the concentrations of several contaminants had slightly rebounded after a significant initial drop. As a polishing step, air oxidation was implemented in order to further reduce the VOC concentrations. The design specifications for the air oxidation system were developed in May 2006 by CH2MHill. The air injection system operated from June 7 to 26, 2006 and August 18 to September 15, 2006.

Vapor Intrusion Mitigation

After issuance of the ROD in 2004, the vacated neighboring buildings where vapor intrusion concerns had previously been identified were re-occupied by a daycare center and a retail store. At present, both buildings are occupied by the daycare center. The vapor intrusion mitigation systems that were installed by EPA operated until May 2016, when the systems were replaced with new systems by the property owner's contractor.

Remedial Action Reports and Preliminary Close-Out Report

The Upper Glacial Aquifer remedy was determined to be operational and functional with the approval of a Remedial Action Report on September 29, 2006. A Remedial Action Report was approved on September 30, 2008, documenting the completion of the building decontamination and the determination that the soil excavation and ISVE system had met the cleanup objectives for the soil. A Preliminary Close-Out Report was approved on August 30, 2007.

III. MONITORING RESULTS

In-Situ Vapor Extraction System

As was noted in the "Remedial Activities Performed" section, above, based on the continued vapor recovery by the ISVE system and the persistent elevated levels of PCE and TCE in soil gas samples collected from below the concrete slab of the Jackson Steel building, a MIP and soil sampling investigation was performed. In general, the comparison of soil boring log observations, soil analytical results and MIP logs showed a general concurrence. The soil sample's analytical results showed PCE ranging in concentration from 0.0051 to 14 mg/kg (the ROD soil cleanup objective is 1.4 mg/kg) in soils just beneath the floor of the building and TCE concentrations ranging from "not detected" to 0.016 mg/kg (the ROD soil cleanup objective is 0.7 mg/kg). The MIP technology identified three potential shallow subsurface hot spots where confirmatory soil samples were collected using conventional drilling and soil sampling methods. As was noted above, based on the results of the MIP investigation and confirmatory soil samples, enhancements were made to the ISVE system.

Upper Glacial Aquifer Monitoring

Prior to the remediation of the Upper Glacial Aquifer, cis-1,2-DCE was detected at a maximum concentration of 340 micrograms per liter (μg/l) and PCE was detected at a maximum concentration of 63 μg/l (the Maximum Contaminant Levels [MCLs] for cis-1,2-DCE and PCE are both 5 μg/l).

Nine rounds of Upper Glacial Aquifer post-chemical oxidation injection groundwater performance sampling (October 2005 through August 2006) were conducted. Upon review of the post-chemical oxidation injection data, it was noted that the concentrations of several contaminants had slightly rebounded after a significant initial drop. As a polishing step, air oxidation was implemented in order to further reduce the VOC concentrations. Groundwater samples collected in March 2010 only showed cis-1,2-DCA marginally exceeding the MCL at 5.6 μg/l. During the final sampling event in September 2011, the only contaminant detected was PCE at 1.3 μg/l.

Deep Aquifer Investigation

A supplemental groundwater investigation was conducted from March 2005 to September 2006 to determine the source of the Magothy Aquifer contamination underneath the Jackson Steel Site and to establish whether there is a relationship between the contamination at the Site and the VOC contamination detected in Village of Mineola Supply Well #4. As part of this investigation, six monitoring wells were installed. Three wells were installed in the Magothy Confining Bed at the location of the on-site dry wells where the dumping of chemicals occurred. Three additional wells were installed off-site into the Magothy Aquifer (at approximately 455 feet). One well is located approximately 300 feet northwest of the site. This well is considered upgradient under regional flow conditions and sidegradient when Village of Mineola Supply Well #4 is pumping. The second monitoring well is located southwest of the site. This well is considered downgradient under regional flow conditions and sidegradient when Village of Mineola Supply Well #4 is pumping. The third well is located between the site and Village of Mineola Supply Well #4, approximately 1,200 feet southeast of the site. This well is considered sidegradient under regional flow conditions and downgradient when Village of Mineola Supply Well #4 is pumping.

The results of the investigation, which are summarized in the *Supplemental Groundwater Investigation*, CH2MHill, October 2006, and *Findings of the Supplemental Groundwater Investigation*, EPA, September 2006, indicate that multiple sources appear to contribute to the contamination in the Magothy Aquifer underneath the site. Based on the investigation, it was concluded that the site is not a current source of contamination in the Magothy Aquifer. Therefore, EPA decided not to implement the Magothy Aquifer groundwater remedy. An ESD was issued on August 28, 2007, documenting this decision.

Vapor Intrusion Monitoring

After issuance of the ROD in 2004, the vacated neighboring buildings where vapor intrusion concerns had previously been identified were re-occupied by a daycare center and a retail store. At present, both buildings are occupied by the daycare center. The existing vapor intrusion mitigation systems are currently operating in the occupied building.

The daycare center is regulated by the New York State Office of Children and Family Services (OCFS). On September 8, 2009, the facility entered into an agreement with OCFS such that it would continue to address vapor intrusion as a condition of maintaining its daycare center license.

Annual subslab and indoor air testing indicates that while vapors are still present beneath the daycare center and Jackson Steel buildings, the indoor air in the daycare center is in the acceptable range (the indoor air is not sampled at the Jackson Steel building as it is not occupied and many of the building's windows are not intact). EPA determined that various ongoing/future vapor-intrusion mitigation actions are needed to prevent current (in the case of the occupied building) and potential future (in the case of the Jackson Steel property) exposures to VOCs inside occupied building, and that these actions will be needed until the subslab vapor levels finally dissipate. A June 2016 ESD documents this determination.

IV. ATTAINMENT OF GROUNDWATER RESTORATION CLEANUP LEVELS

Sampling was conducted in the Upper Glacial Aquifer following the completion of the air injection polishing in September 2006. Groundwater samples collected in March 2010 only showed cis-1,2-DCA marginally exceeding its MCL at 5.6 μg/l. Sampling conducted in September 2011 showed only PCE at 1.3 μg/l. Sampling in the Upper Glacial Aquifer was discontinued after this sampling event.

As is discussed above, because it was concluded that the site was no longer a source of contamination in the Magothy Aquifer, groundwater monitoring was suspended.

V. OPERATION AND MAINTENANCE

No operation and maintenance (O&M) activities related to the ISCO injections were needed. O&M activities related to the ISVE system and vapor mitigation systems included:

- recording well flow rates, vacuum readings, and system performance readings
- collecting field screening data at various points of the system
- recording vapor monitoring wells and ISVE wells pressure readings
- collecting samples from the ISVE system influent and effluent for laboratory analysis for contaminants of concern to assess the need for GAC change-out
- GAC change-outs
- annual subslab, subslab vent, indoor air samples

The aboveground ISVE infrastructure was removed by CH2MHill in June 2013. From March 21, 2016 to April 19, 2016, Earth Data Northeast, Inc. removed three Westbay groundwater monitoring well systems. During that period of time, AARCO Environmental Services Corp. decommissioned 15 standard groundwater monitoring wells, 20 ISVE wells, 11 vapor monitoring wells, 20 ISCO injection wells and five ISCO monitoring wells. Each location was restored consistent with NYSDEC's decommissioning policy.

Although EPA successfully remediated the soil and the groundwater aquifer immediately underlying the site, residual levels of VOCs remain. VOCs, even at low levels, can migrate as vapors through the soil into buildings. This process, which is called vapor intrusion, can result in unacceptable human exposures to VOCs inside occupied buildings. This pathway is currently incomplete at the site, because the building on the site is currently unoccupied and subslab vapor intrusion mitigation systems prevent the migration of vapors into an adjacent occupied building.

Because the residual levels of VOCs are expected to dissipate slowly, EPA concluded that preventing human exposure to VOCs at the occupied building will be needed for a number of years to ensure the protectiveness of the remedy. Therefore, the existing vapor mitigation systems will need to continue to operate and additional actions, from monitoring to the installation of an additional vapor mitigation system, may be needed should the currently unoccupied building be occupied or replaced with another structure in the future. EPA determined that ICs requiring the continued operation of subslab vapor intrusion mitigation systems were needed. In addition, EPA determined that ICs requiring vapor intrusion sampling and/or mitigative measures were needed should the unoccupied building be occupied or replaced with another structure in the future.

EPA also determined that a Vapor Intrusion Management Plan (VIMP) to describe the necessary monitoring and maintenance associated with the existing and any future vapor intrusion mitigation systems, and an Institutional Control Implementation and Assurance Plan (ICIAP), to identify a process and schedule by which the ICs would be implemented and maintained, should be developed for the site.

EPA issued an ESD on June 20, 2016, documenting its determination to incorporate into the remedy ICs to prevent exposure through vapor intrusion, to remain in place until the residual VOCs fully dissipate in the subsurface. The ESD also noted that a VIMP and ICIAP would be prepared to ensure that the ICs were appropriately implemented and maintained. In addition, the ESD noted that EPA would communicate directly with the Village of Mineola Superintendent of Buildings, requesting that EPA and NYSDEC be notified if the existing building is to be refurbished and used for human occupancy or demolished and a new structure constructed. The correspondence would also request that the Village not issue a Certificate of Occupancy until necessary vapor intrusion-related actions identified by EPA and NYSDEC are carried out.

A VIMP and ICIAP were completed on June 20, 2016.

On June 20, 2016, EPA sent a letter to the Village of Mineola Superintendent of Buildings, requesting that EPA and NYSDEC be notified if the existing building is to be refurbished and used for human occupancy or demolished and a new structure constructed and requested the Village not issue a Certificate of Occupancy until necessary vapor intrusion-related actions identified by EPA and NYSDEC are carried out. Periodic reminders will be issued to the Village to help ensure the effectiveness of this measure.

The daycare center is regulated by OCFS. On September 8, 2009, the facility entered into an agreement with OCFS such that it would continue to address vapor intrusion as a condition of maintaining its daycare center license.

The record owner of the two parcels occupied by the daycare center (both parcels are covered by the same deed) signed a deed notice on June 23, 2016, but could not notarize his signature. With his consent, a successor in title notice was placed on the deed of the property on July 27, 2016. The notice provides perpetual notice that the subslab vapor intrusion mitigation systems must be operated as long as elevated levels of vapors remain under the buildings and said buildings are occupied.

Because the owner of the Jackson Steel property is defunct, on July 27, 2016, a successor in title notice was placed on the deed of the property to alert any potential purchaser, lessee or other user of the property that EPA and NYSDEC must be notified if and when a determination is made that the existing building will be refurbished and used for human occupancy or demolished and a new structure constructed. EPA will effect an environmental easement on the Jackson Steel property in the future once a new owner takes control of the property.

VI. DEMONSTRATION OF QA/QC FROM CLEANUP ACTIVITIES

RA activities at the site were undertaken in a manner consistent with the ROD (as modified by the ESDs) and the design specifications. All applicable EPA and State quality assurance and quality control (QA/QC) procedures and protocols were incorporated into the design specifications. EPA analytical methods were used for all validation and monitoring samples during all RA activities. All procedures and protocols followed for groundwater and soil sample collection and analyses during the RA are documented in the plans, specifications, and design reports and the sample analyses were performed at state-certified laboratories.

The QA/QC program used throughout the groundwater and source control RAs 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 RAs, consistent with the 2004 ROD, as modified by the two ESDs, and the design plans and specifications.

VIII. FIVE-YEAR REVIEW

The first five-year review, was completed in August 2012. The review concluded that the remedy was functioning as intended by the decision documents and was protecting human health and the environment.

Subsequent to the 2012 five-year review, EPA determined that ICs were necessary to ensure the protectiveness of the remedy, as discussed above. Five-year reviews will be conducted as long as residual VOC levels remain that perpetuate the vapor intrusion concerns described above. The next five-year review will be conducted by August 2017.

IX. SITE COMPLETION CRITERIA

The site meets all the completion requirements as specified in OSWER Directive 9320.2-22, *Close-Out Procedures for National Priorities List Sites*. Specifically, all areas of concern have been adequately addressed, the implemented remedy achieves the degree of cleanup specified in the ROD, as modified by the two ESDs, for all pathways of exposure, and no further Superfund response is needed to protect human health and the environment.

The only continuing efforts at the site are the ongoing operation and maintenance of the vapor intrusion mitigation systems at the daycare center, periodic vapor intrusion monitoring, insuring that the institutional controls remain in place and effective and five-year reviews to ensure the remedy remains protective.

Approved: Walter E. Mugdan — July 27, 2016

Walter E. Mugdan, Director
Emergency and Remedial Response Division

Date