



Department of Environmental Conservation

Division of Environmental Remediation

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# **Record of Decision Amendment**

**Morse Industrial Corporation  
Town of Ithaca, Tompkins County, New York  
Site Number 755010**

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**June 2009**

# **DECLARATION STATEMENT RECORD OF DECISION AMENDMENT**

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## **Morse Industrial Corporation Inactive Hazardous Waste Disposal Site Town of Ithaca, Tompkins County, New York Site No. 755010**

### **Statement of Purpose and Basis**

The Record of Decision (ROD) Amendment presents the selected remedy for the Morse Industrial Corporation site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the Morse Industrial Corporation inactive hazardous waste disposal site, and the public's input to the proposed ROD Amendment presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD Amendment.

### **Assessment of the Site**

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD Amendment, present a current or potential significant threat to public health and/or the environment.

### **Description of Selected Remedy**

Based on the results of the Supplemental Remedial Program and Alternatives Analysis (SRP/AA) for the Morse Industrial Corporation site and the criteria identified for evaluation of alternatives, the Department has selected a combination of source removal and in situ treatment. The components of the remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.
2. Upgrades to the existing groundwater extraction and treatment system, currently being completed as an Interim Remedial Measure (IRM), to provide greater hydraulic control of the groundwater plume within the bedrock subsurface and to increase the removal rate of volatile organic compounds (VOCs) in the dissolved phase and the vapor phase.

3. In situ treatment of groundwater in the vicinity of the fire water reservoir to supplement the upgraded groundwater extraction and treatment system.
4. Repair and maintenance of the concrete slab in the former Department 507 degreaser area within Building 4 to address the potential for soil vapor intrusion. Construction and maintenance of a low-permeability cap over the area of associated groundwater contamination outside Building 4 to limit recharge. In situ treatment of the groundwater will also be provided.
5. Sealing/repair of cracks and penetrations in on-site buildings to be completed as an IRM to eliminate the potential for plant employees to be exposed to VOC vapors via soil vapor intrusion.
6. Removal and off-site disposal of free product from Areas of Concern (AOCs) 4, 15, and 24 to eliminate potential sources of soil and/or groundwater contamination.
7. Completion of an alternatives analysis and selection of remedial actions to address the migration of VOC vapors into the surrounding neighborhood and to mitigate the potential for residents to be exposed via soil vapor intrusion into homes. The Department will prepare a Proposed Remedial Action Plan (PRAP) for public review and comment, and subsequently will issue a Record of Decision (ROD) to identify the remedy selected for implementation.
8. Development of a Site Management Plan to identify and implement all required institutional and engineering controls, including all necessary operation, maintenance, and monitoring activities.
9. Imposition of an institutional control in the form of an environmental easement that will require: (a) limiting the use and development of the property to industrial use; (b) compliance with the approved Site Management Plan; (c) restricting the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.
10. The property owner will provide periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or other such expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: a) contain certification that the institutional controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; b) allow the Department access to the site; and c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute failure to comply with the Site Management Plan unless otherwise approved by the Department.

#### **New York State Department of Health Acceptance**

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

### **Declaration**

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

Date

6/18/09

  
Dale A. Desnoyers, Director  
Division of Environmental Remediation



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# **RECORD OF DECISION AMENDMENT**

**Morse Industrial Corporation  
Town of Ithaca, Tompkins County, New York  
Site No. 755010  
May 2009**

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## **1.0 INTRODUCTION**

On December 12, 1994, the New York State Department of Environmental Conservation (the Department) signed a Record of Decision (ROD) to select a remedy for the cleanup of the Morse Industrial Corporation site (the site). The major component of the remedy was a two-phase vacuum extraction system that was installed to intercept and treat contaminated groundwater and soil vapor emanating from the site. However, performance monitoring indicates that the system has only been partially effective. Elevated levels of groundwater contamination persist on site, while soil vapor has adversely impacted the indoor air quality in a number of on-site buildings and in several nearby structures. In addition, investigations conducted subsequent to implementation of the ROD revealed the presence of a weathered petroleum product in the subsurface in three discrete locations at the plant, including a former open stone reservoir inside Building 6A, the former location of a 500-gallon aboveground gasoline storage tank, and the area between the fire water reservoir and the main plant building.

This ROD Amendment includes an upgrade to the existing extraction system to provide more effective hydraulic control of the groundwater plume and to enhance removal of the contaminant mass. This will be combined with in situ treatment of the portion of the plume where natural degradation processes have stagnated (i.e., in the vicinity of the fire water reservoir).

Additional provisions of this ROD Amendment include the removal of weathered petroleum product, the implementation of mitigative measures to address soil vapor intrusion into the plant buildings, and the evaluation of remedial alternatives to control and/or mitigate the migration of soil vapor into the surrounding neighborhood.

A public comment period was held from February 19 to March 20, 2009 to provide an opportunity for the public to comment on the proposed amendment. In addition, an availability session and a public meeting regarding the proposed amendment were held on March 5, 2009.

## **2.0 SITE INFORMATION**

### **2.1 Site Description**

The Morse Industrial Corporation site occupies 100 acres along the west side of South Aurora Street/Danby Road (Route 96B) in the South Hill portion of the Town of Ithaca (Figure 1). The site's surface elevation ranges from 450 to 720 feet above mean sea level, resulting in a very hilly topography. The site consists of three main buildings flanked by a number of smaller buildings to the southwest and a series of access roads and parking lots that terrace the hillside above the plant to the east. Undeveloped woodland borders the site to the southwest along the steep embankments of South Hill. North of the plant, the topography drops off at a 40% grade (approximately 80 feet) to a residential area. This is bordered by Six Mile Creek to the west, which flows north along the base of South Hill and eventually empties into Cayuga Lake approximately two miles northwest of the site. Access to the site is restricted by a fence and guardhouse. The layout of the site is depicted on Figure 2.

### **2.2 Site History**

The original plant building was constructed in 1906 by Morse Industrial Corporation, which manufactured steel roller chain for the automobile industry. From approximately 1928 to 1983, Borg-Warner Corporation owned the property and manufactured automotive components and power transmission equipment. Up until the late 1970s, Borg-Warner used trichloroethene (TCE), a common solvent at the time, for cleaning and degreasing metal parts. An estimated sixty metal piercing and blanking machines were in operation from the early 1950s to 1977. These machines reportedly operated without drip pans in the 1950s, and solvents used to clean the residual oil from the floors appear to have been flushed into the plant's sanitary sewer system. In addition, solvents were discharged to the facility's fire water reservoir, which is constructed of concrete and extends approximately 19 feet below ground surface (bgs). Groundwater is encountered at a depth of 12 feet bgs in the vicinity of the reservoir at the soil/bedrock interface. It is believed that the solvents migrated through cold joint cracks in the sidewalls and base of the reservoir and into the surrounding bedrock, which is highly jointed and fractured.

In 1983, Morse Industrial Corporation was purchased from Borg-Warner by Emerson Electric Company, and in the late 1980s the facility became known as Emerson Power Transmission (EPT). EPT currently manufactures industrial roller chain, bearings, and clutching for the power transmission industry. Under Emerson's ownership, TCE has not been used at the facility.

In February 1987, EPT notified the Department of the discovery of TCE in oil skimmed from the surface of the fire water reservoir. An environmental assessment was initiated at that time to address TCE contamination in the reservoir and to determine whether TCE had impacted groundwater. As part of this work, the reservoir was emptied and cleaned using high pressure water, and monitoring wells were installed around its perimeter. Samples collected from the wells confirmed that the local groundwater had been impacted, and that the reservoir was likely the source. As a consequence, in July 1987 the site was added to the New York State Registry of Inactive Hazardous Waste Disposal Sites.



In July 1988, EPT entered into a Consent Order with the Department to perform a Remedial Investigation/Feasibility Study (RI/FS). The RI Report was submitted in February 1990. Based on the results of the investigation, and given the schedule length of the RI/FS, the Department requested that EPT take immediate steps to address the groundwater contamination associated with the reservoir. Accordingly, in May 1991 the existing Order was amended to require implementation of an Interim Remedial Measure (IRM), and in August of that year EPT finished construction of a groundwater pump and treat system to operate until such time as the FS was completed.

Also as part of the amended Order, EPT was required to implement a monitoring program to assess the potential for contaminated soil vapor to migrate from the site to adjacent properties.

In August 1992, the reservoir was rehabilitated and put back into service. This entailed patching cracks in the concrete and installing a liner.

From October 1993 through February 1994, as part of the FS, EPT conducted a pilot test utilizing a two-phase vacuum extraction system. The results of the pilot test indicated that the two-phase system would outperform the existing pump and treat system. The FS Report was submitted in August 1994. Following issuance of the ROD in December 1994, the pump and treat system was modified to accommodate vacuum extraction, and the two-phase system was placed into operation in July 1996.

### **2.3 Nature and Extent of Site Contamination**

As described in the original ROD and other documents, many soil, groundwater, product, soil vapor, and indoor air samples have been collected to characterize the nature and extent of contamination, both on site and off site. The primary contaminants of concern are volatile organic compounds (VOCs) including TCE, tetrachloroethylene ("perc" or PCE), and their degradation products. Groundwater and soil vapor are the media that have experienced the most adverse impact.

Historically, the highest concentrations of VOCs in groundwater have been detected downgradient of the fire water reservoir. A TCE concentration of 43,000 parts per billion (ppb) was detected in a sample collected from this area as recently as July 2007. (The corresponding groundwater quality standard for TCE is 5 ppb.) In general, the concentration of TCE and other VOCs declines northwest of the plant in the direction of groundwater flow. VOC concentrations in wells located in the neighborhood north of the site have been very low to non-detect.

With respect to soil vapor, VOC concentrations have been detected at levels high enough to warrant sub-slab, basement, and indoor air testing in several plant buildings and off-site structures. The results of this testing, when compared to the New York State Department of Health (NYSDOH) guidance for soil vapor intrusion, prompted the installation of vapor mitigation systems on some nearby homes. Mitigation measures are also planned for on-site buildings, while the off-site study/mitigation area continues to be expanded by the Department and the NYSDOH.



In addition to VOCs, a weathered petroleum product has been encountered in three discrete locations at the plant, including a former open stone reservoir inside Building 6A, the former location of a 500-gallon aboveground gasoline storage tank, and the area between the fire water reservoir and the main plant building. These areas of concern (AOCs) are referred to as AOC 4, AOC 15, and AOC 24, respectively. Whenever product was observed in a boring completed within one of these AOCs, a soil sample was collected from the saturated zone immediately below the product layer for VOC analysis. All of the sample results were either non-detect, or were below the Department's soil cleanup objectives for restricted industrial use settings.

## **2.4 Summary of Human Exposure Pathways**

This section describes the types of human exposures that may present added health risks to persons at or around the site. An exposure pathway describes the means by which an individual may come into contact with a contaminant. An exposure pathway has five elements: 1) a contaminant source; 2) contaminant release and transport mechanisms; 3) a point of exposure; 4) a route of exposure; and 5) a receptor population.

The source of contamination is the location where contaminants were released to the environment (i.e., any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure. An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

Pathways which are known to, or may exist at the site include:

- Direct contact with contaminated soil or groundwater by construction or utility workers as a result of digging in areas where contamination has been identified.
- Inhalation of contaminated vapors by plant personnel or off-site residents or building occupants as a result of soil vapor intrusion into on-site buildings and nearby structures.

## **2.5 Summary of Environmental Assessment**

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

Site contamination has impacted the shallow and intermediate bedrock groundwater (i.e., the B-zone and C-zone, respectively) underlying the site.

However, the only potential pathway for environmental exposure would be from a groundwater discharge or site runoff into Six Mile Creek, and the extent of affected groundwater in the bedrock has been defined and is not a concern relative to the creek. In addition, three drainage swales that empty into the creek were sampled and the results indicate that surface water is not contributing detectable concentrations of VOCs to the creek. Very low levels of petroleum hydrocarbons were detected, but the most likely source is surface runoff from parking lots and roads.

## **2.6 Original Remedy**

The elements of the remedy selected in the original ROD included the following:

- Installation and operation of a two-phase vacuum extraction system to remove and treat contaminated groundwater and soil vapor associated with historical releases of VOCs from the fire water reservoir.
- Sampling of select monitoring wells to track the progress of remediation and to check for any changes in the contaminant plume.
- Excavation of petroleum-contaminated soil from the scrap metal conveyor/loading area.
- Continuation of the soil vapor monitoring program.

## **3.0 DESCRIPTION OF ROD CHANGES AND ADDITIONAL REMEDIAL ACTIONS**

### **3.1 New Information**

#### On-site

- A series of investigations was conducted in the area of the fire water reservoir in August 2003, June 2006 and the fall of 2007 to further evaluate the hydraulic characteristics of the B-zone and C-zone aquifers. In general, the investigations found that dissolved contaminants are migrating horizontally within the highly fractured B-zone, and vertically through open joint sets that intersect a horizontal bedding plane fracture at the base of the C-zone. This fracture represents a significant migration pathway for contaminated groundwater. In addition, the investigations identified the presence of a substantial amount of VOC mass within the upper portion of the B-zone, and a weathered petroleum product in a well located east of the reservoir.

In the spring of 2008, a pre-design investigation was completed to further characterize the C-zone bedding plane fracture, and to delineate the extent of affected groundwater within the fracture. An exploratory boring was also completed in the deeper D-zone to confirm previous observations that the lower section of the bedrock remains unaffected by historical releases of contamination from the reservoir.



The original groundwater extraction system only extracted groundwater from a portion of the C-zone. The system is in the process of being upgraded by the incorporation of additional extraction wells to address the contaminant mass in both the C-zone bedding plane fracture and in the highly fractured and jointed B-zone.

From the start of operations in July 1996 through December 2007, the existing system had removed approximately 417 pounds of aqueous-phase and vapor-phase VOCs, combined. In comparison, the removal rate of the upgraded system has been estimated at just over three pounds per day for the aqueous phase based upon pre-design activities. The system enhancements are being completed as an Interim Remedial Measure (IRM) pursuant to the existing Order and a NYSDEC-approved work plan. An Operations, Maintenance, and Monitoring (OM&M) Plan is also being prepared and will be implemented to evaluate the system's effectiveness.

One of the areas of concern evaluated as part of the 2007 Supplemental Remedial Investigation (SRI) was the former Department 507 degreaser (i.e., AOC 1). Historical operations included two conveyor-type vapor degreasers located in a depressed floor area within Building 4. Solvents used in the degreasing process included TCE and Safe-Tee-Solvent, a mixture of PCE and methylene chloride. During drilling activities a solvent odor was noted in three of four borings completed in this area, and elevated levels of VOCs were detected in soil and/or groundwater samples collected from both the interior and exterior of the building.

A weathered petroleum product was identified in three areas of concern during the installation of soil borings and monitoring wells as part of the SRI. As discussed in Section 2.3, these areas include a former open stone reservoir, the former location of a 500-gallon aboveground gasoline tank, and the area between the fire water reservoir and the main plant building.

The results of an indoor air assessment performed in the EPT facility in December 2005 and February 2006 identified several locations within the plant buildings where mitigative measures are necessary to address soil vapor intrusion.

#### Off-site

Between August 2003 and July 2008, a series of supplemental investigations was completed by EPT to better define the nature and extent of contamination on and off site, and to understand the relationship between the contaminants of concern, transport pathways, routes of exposure, and receptors. These investigations found that during Borg-Warner's ownership, solvents were discharged into the municipal sewers that service the plant from Turner Place and South Cayuga Street to the northwest (Figure 2). The sewer lines are trenched directly into fractured, unsaturated bedrock. Historically, wastewater containing dissolved VOCs leaked through joints and cracks in the sewer lines into sediment-filled fractures in the bedrock. Residual contamination remains in the pore spaces of the sediment, held by capillary forces.

The VOCs subsequently volatilize and are transported by diffusion along one or more preferential pathways: the sewer lines themselves, residential sewer laterals, and/or the bedrock fractures.

The indoor air quality in several homes in the vicinity of the sewer lines has been adversely impacted by soil vapor intrusion, resulting in the installation of sub-slab depressurization systems to mitigate exposure to VOC vapors.

Remedial actions to address the off-site migration of contaminated soil vapor will be selected by the NYSDEC following EPT's evaluation of the investigation results and completion of an alternatives analysis. In accordance with the September 2008 approved SRP/AA Report, alternatives to be evaluated include no action, potentially applicable treatment technologies, and continued operation of sub-slab ventilation systems and monitoring. Following review of the alternatives analysis, the Department will identify a remedy that will be subject to public review and comment prior to implementation.

### **3.2 ROD Changes and Additional Remedial Actions**

#### On-site Groundwater

##### *Fire Water Reservoir*

The selected remedy is in situ treatment to be utilized in conjunction with the upgraded groundwater extraction system to enhance VOC mass reduction in groundwater in the area below the reservoir. The estimated present worth cost to upgrade the existing groundwater extraction system is \$1,365,000 based on a conservative, five-year period of operation. The actual cost could be higher if the system needs to remain in service for a longer period of time, or if long-term groundwater monitoring is required. The estimated capital cost for the system upgrade is \$607,000 and the estimated annual OM&M cost is \$175,000. With respect to in situ treatment, bench- and/or pilot-scale testing will be required in order for an appropriate technology to be selected. A work plan for the testing will be submitted for Department review.

##### *Former Department 507 Degreaser*

The selected remedial alternative to address VOC-contaminated groundwater in the former degreaser area is in situ chemical oxidation (ISCO) followed by monitored natural attenuation (MNA). Pilot testing will be performed to select an appropriate oxidant, application procedure and optimal rate of application. It is anticipated that persulfate will be tested because it has the capability of oxidizing all of the VOCs present and is less likely to inhibit the natural biodegradation process as compared to other oxidants such as permanganate. As part of the selected alternative, two monitoring wells will be installed downgradient of the former degreaser area to determine the extent, if any, of affected groundwater in the shallow B-zone. The scope of the remedial approach will then be adjusted depending upon the results of groundwater samples collected from these wells. The estimated present worth costs for ISCO and MNA are \$687,000 and \$541,000, respectively.



In addition, a low-permeability asphalt cap will be installed over the area of groundwater contamination outside Building 4 to minimize surface water infiltration. The existing asphalt will be saw cut and removed along with the gravel subbase to accommodate construction of a new cap. This cap will include a vapor barrier, a layer of gravel fill, and a layer of low-permeability asphalt (or concrete). The surface will be finished to match the existing grade of the surrounding asphalt.

#### On-site Soils

The selected remedy for addressing the VOC-contaminated soils in the former degreaser area is containment/institutional controls. This will involve repair and maintenance of the existing concrete floor within Building 4 as necessary to mitigate the potential for plant employees or other building occupants to be exposed to contaminated vapors via soil vapor intrusion.

Because this remedy will result in contamination remaining in place above soil cleanup objectives, a Site Management Plan will be implemented to insure that the remedy remains protective of human health and the environment. This will include provisions for inspection and maintenance of the concrete floor, a Soils Management Plan to address the potential for future disturbance of the contaminated soil, groundwater monitoring, and use restrictions in the form of an environmental easement. Further, EPT will be required to submit periodic certification that the engineering and institutional controls (ICs/ECs) remain in effect. The estimated present worth cost for this alternative is \$127,000.

#### Weathered Petroleum Product

The selected alternative for addressing the presence of weathered petroleum product in AOCs 4, 15, and 24 is removal and off-site disposal. Further evaluation will be conducted to determine the product thickness at each AOC and the most appropriate means of removal (i.e., wells versus collection sumps). The estimated present worth cost for this alternative is \$586,000.

#### On-site Soil Vapor Intrusion

The following described actions will be conducted as IRMs pursuant to the existing Order and a NYSDEC-approved work plan.

Basement Level (Buildings 3, 4, 6A, 33 and 34): The interior surfaces of the buildings will be inspected for the presence of cracks and pipe and wire penetrations. Cracks and penetrations will be sealed using elastomeric joint sealant, compatible caulks, non-shrink mortar, grouts, expanding foam, drain seals, or airtight gaskets. The specific type of material used and the appropriate method of sealing will depend on the size and orientation of the crack/penetration. Repairs to cracks and penetrations that cannot be properly sealed will involve the removal and replacement of a section of the surrounding floor or wall. Upon completion of the work, an OM&M Plan will be implemented to provide regular inspections of the integrity of the repairs, and to monitor indoor air quality. The results of the inspections and monitoring will be reported to the NYSDEC and NYSDOH for evaluation.

Although Building 3 is not currently in use, it is accessed on occasion by maintenance personnel. Therefore, in addition to the above, a Health and Safety Plan (HASP) will be prepared for staff needing access to the building to perform maintenance activities. Further, within Building 4 is a quality assurance laboratory that operates on an independent air handling system. Indoor air sampling will be performed to evaluate the potential for exposure to VOC vapors. If a concern is identified, then the lab will either be moved to another location, or an evaluation of the air handling system will be conducted to determine if enhancements could be made to improve air flow. The floor of the lab will also be assessed for cracks or penetrations and sealed in the same manner as described above, and an OM&M Plan will be implemented.

- Main Level (Buildings 8 and 10): The interior surfaces of these buildings will be assessed and repaired in the same manner as described above for the basement level buildings, and an OM&M Plan will be implemented.

- Building 24: Building 24 is a five-story, free-standing building located off the northeast corner of the main plant building. Portions of the building were historically leased by EPT to the Paleontological Research Institute (PRI) and a non-profit organization for storage space. PRI and the non-profit have vacated the building, and it will remain unoccupied. Access will be restricted to maintenance and security personnel, and a HASP will be prepared in the event maintenance activities need to be performed.

#### **4.0 EVALUATION OF ROD CHANGES AND ADDITIONAL REMEDIAL ACTIONS**

##### **4.1 Remedial Goals**

Goals for the cleanup of the site were established in the original ROD, and have been modified as necessary to account for the results of subsequent investigations. At a minimum, the remedial actions selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remedial goals for this site are to eliminate or reduce to the extent practicable:

- impacts to human health resulting from soil vapor intrusion into buildings at the site and nearby structures;
- the potential for ingestion/direct contact with contaminated soil;
- the presence of weathered petroleum product, which represents a potential source of soil and groundwater contamination; and
- the migration of VOC-contaminated groundwater from the site.



Further, the remedial goals for the site include attaining, to the extent practicable:

- ambient water quality standards and guidance values; and
- soil cleanup objectives for the protection of human health and the environment.

## **4.2 Evaluation Criteria**

The criteria used to compare the remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each criterion, a brief description is provided. A detailed discussion of the evaluation criteria and comparative analysis is contained in the September 2008 SRP/AA Report and the December 2008 Pre-Design Investigation and Alternatives Analysis Report.

**The first two evaluation criteria are called threshold criteria and must be satisfied in order for an alternative to be considered for selection.**

**1. Protection of Human Health and the Environment.** This criterion is an overall evaluation of each alternative's ability to protect human health and the environment.

**2. Compliance with New York State Standards, Criteria, and Guidance (SCGs).** Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

**The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.**

**3. Short-term Effectiveness.** The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

**4. Long-term Effectiveness and Permanence.** This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

**5. Reduction of Toxicity, Mobility or Volume.** Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

**6. Implementability.** The technical feasibility and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

**7. Cost-Effectiveness.** Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

**This final criterion is considered a modifying criterion and is considered after evaluating those above. It is focused upon after public comments on the proposed ROD Amendment have been received.**

**8. Community Acceptance.** Concerns of the community regarding the proposed changes were evaluated. A Responsiveness Summary has been prepared that describes public comments received and the manner in which the Department addressed the concerns raised. The Responsiveness Summary can be found as Appendix A to this document.

#### **4.3 Evaluation of Alternatives**

##### On-site Groundwater

###### *Fire Water Reservoir*

The original groundwater extraction and treatment system only addressed a limited portion of the plume, which has resulted in a substantial amount of contamination remaining in the environment. The upgraded system has been designed to address the plume and its migration pathways comprehensively (i.e., within the highly fractured and jointed B-zone and within the horizontal bedding plane fracture at the base of the C-zone), thereby providing a significant increase in the rate of contaminant removal.

The primary SCG considered by the NYSDEC in developing the ROD Amendment for the VOC-contaminated groundwater was TOGS 1.1.1 (Ambient Water Quality Standards and Guidance Values). Since the original groundwater extraction and treatment system was placed into operation, monitoring has shown that contaminant levels have not decreased over time and, in fact, remain at several orders of magnitude above the corresponding standards and guidance values. Accordingly, in addition to the upgraded extraction system, the use of in situ treatment in the vicinity of the fire water reservoir is intended to destroy VOCs in the most highly contaminated portion of the plume.

The only potential short-term risk associated with this remedy is exposure to contaminated media by the remediation contractor and subcontractors during construction/implementation. However, all field activities associated with the remedy are routine in nature, and will be conducted in accordance with a project-specific HASP.



In terms of the length of time needed to achieve the remedial objectives, the original groundwater extraction and treatment system had been in operation for seventeen years, and its success in attaining compliance with applicable groundwater quality standards and guidance values was negligible. Operation of the upgraded system, in conjunction with in situ treatment has the potential to achieve the remedial goals in a much shorter time frame.

The original groundwater extraction and treatment system has not proven to be effective in removing the VOC mass, since only a small portion of the contaminant plume has been targeted. In contrast, the upgraded extraction and treatment system combined with the use of in situ treatment is expected to have much greater long-term effectiveness since the plume is being addressed comprehensively.

Although the original groundwater extraction and treatment system did achieve some degree of reduction in the contaminant mass in both groundwater and soil vapor in the area downgradient of the fire water reservoir, expansion of the system will provide a greater rate of mass reduction in both the aqueous phase and the vapor phase. A reduction in contaminant toxicity will also be accomplished through the in situ treatment of contaminated groundwater in the vicinity of the reservoir.

#### *Former Department 507 Degreaser*

With respect to VOC-contaminated groundwater in the former degreaser area, a number of remedial alternatives were considered, including MNA, air sparging with soil vapor extraction (SVE), in situ treatment, and groundwater extraction and treatment. Potential in situ treatment technologies that were evaluated included chemical oxidation, bioremediation, and installation of a permeable reactive barrier.

MNA was not considered viable as a stand-alone remedy because it would not hydraulically contain the dissolved VOCs, and the source areas and "hot spots" would not be specifically targeted.

Air sparging with SVE was eliminated because the overlying building would prevent direct application of air sparging to the groundwater beneath. In addition, the low permeability and heterogeneity of the subsurface soil would prevent the uniform distribution of air throughout the saturated zone and the transfer of stripped VOCs to the vadose zone.

A permeable reactive barrier (PRB) is a linear zone of reactive materials that either transects or intersects a plume of contaminated groundwater. This technology was not considered feasible because the presence of the building would preclude installation of a PRB along the entire width of the contaminant plume. Further, groundwater treatment would likely need to be extended into the B-zone, and installation of a PRB into bedrock would be cost prohibitive.

Groundwater extraction and treatment was eliminated because this type of system can require a large network of extraction points to insure adequate capture in low-permeability formations such as in the case of the former degreaser area. This can result in a significant increase in equipment and energy costs over the operating life of the system.

While both ISCO and in situ bioremediation satisfied all of the evaluation criteria utilized in the analysis of alternatives, the estimated time frame for ISCO to achieve the remedial goals, including compliance with ambient water quality standards and guidance values is five years, whereas in situ bioremediation is expected to require ten years.

#### On-site Soils

Remedial alternatives that were evaluated to address VOC-contaminated soils in the former degreaser area included containment/institutional controls, SVE, and excavation.

SVE was eliminated as a viable alternative due to the presence of low-permeability soils and existing structures, which would limit the effectiveness of the technology.

Excavation was not considered feasible because source removal inside an active manufacturing facility (at a depth of ten feet or greater in this instance) would be very difficult, and soils beneath building walls would be inaccessible. In addition, the area is located adjacent to the main wall of Building 4, where excavation of soils at depth could compromise the integrity of the structure.

#### Weathered Petroleum Product

Remedial alternatives that were evaluated to address the presence of the weathered petroleum product included MNA, ISCO, in situ bioremediation, and removal and off-site disposal.

With regard to MNA, there is no evidence that natural processes are actively degrading the product, and MNA was not considered a viable alternative.

ISCO was eliminated because oxidation is not effective in treating a significant thickness of product.

In situ bioremediation was not retained as a viable alternative because there is no evidence that natural processes are actively degrading the product, injection is difficult in low-permeability, heterogeneous soils, and its application would be complicated by the presence of buildings and structures.

Therefore, the selected alternative for addressing the presence of weathered petroleum product in AOCs 4, 15, and 24 is removal and off-site disposal.

### **5.0 SUMMARY OF ROD CHANGES AND ADDITIONAL REMEDIAL ACTIONS**

The Department has amended the Record of Decision (ROD) for the Morse Industrial Corporation site. The elements of the Amendment, to be implemented pursuant to the existing Order, are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program.



2. Upgrades to the existing groundwater extraction and treatment system, currently being completed as an IRM, to provide greater hydraulic control of the groundwater plume within the bedrock subsurface and to increase the removal rate of dissolved-phase and vapor-phase VOC contamination.
3. In situ treatment of groundwater in the vicinity of the fire water reservoir to supplement the upgraded groundwater extraction and treatment system.
4. Repair and maintenance of the concrete slab in the former Department 507 degreaser area within Building 4 to address the potential for soil vapor intrusion. Construction and maintenance of a low-permeability cap over the area of associated groundwater contamination outside Building 4 to limit recharge. In situ treatment of the groundwater will also be provided.
5. Sealing/repair of cracks and penetrations in on-site buildings to be completed as an IRM to eliminate the potential for plant employees to be exposed to VOC vapors via soil vapor intrusion.
6. Removal and off-site disposal of free product from AOCs 4, 15, and 24 to eliminate potential sources of soil and/or groundwater contamination.
7. Completion of an alternatives analysis and selection of remedial actions to address the migration of VOC vapors into the surrounding neighborhood and to mitigate the potential for residents to be exposed via soil vapor intrusion into homes. The Department will prepare a Proposed Remedial Action Plan (PRAP) for public review and comment, and subsequently will issue a Record of Decision (ROD) to identify the remedy selected for implementation.
8. Development of a Site Management Plan to identify and implement all required institutional and engineering controls, including all necessary operation, maintenance, and monitoring activities.
9. Imposition of an institutional control in the form of an environmental easement that will require: (a) limiting the use and development of the property to industrial use; (b) compliance with the approved Site Management Plan; (c) restricting the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.
10. The property owner will provide periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or other such expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed.

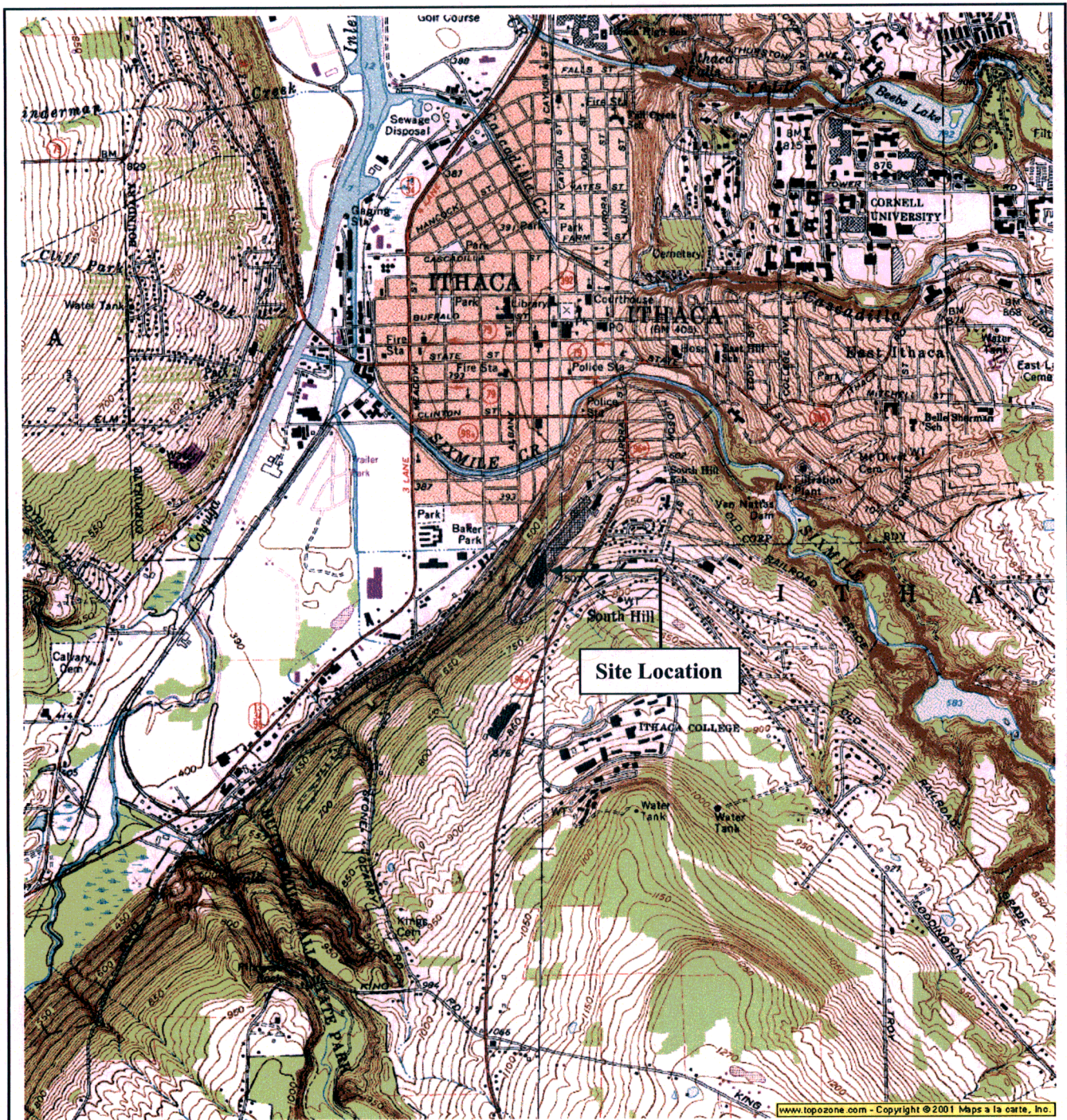
This submittal will: a) contain certification that the institutional controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; b) allow the Department access to the site; and c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute failure to comply with the Site Management Plan unless otherwise approved by the Department.

## **6.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION**

As part of the Morse Industrial Corporation environmental remediation process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

1. A repository for documents pertaining to the site was established.
2. A site contact list was established which included nearby property owners, local elected officials, local media and other interested parties.
3. A Fact Sheet was mailed to those on the contact list announcing the availability of the proposed ROD Amendment and the public meeting.
4. A public comment period for the proposed ROD Amendment was established, beginning on February 19, 2009 and ending on March 20, 2009.
5. An availability session and a public meeting were held on March 5, 2009 at the Ithaca Town Hall.
6. A Responsiveness Summary was prepared and has been included as part of this document (Appendix A) to address comments received during the public comment period.





#### Reference

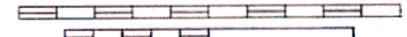
7.5 Minute Series Topographic Quadrangle  
Ithaca East, New York  
Photorevised 1976 Scale 1:25,000 Metric



Quadrangle Location

Scale in Meters

0 500 1000



0 1000 2000

Scale in Feet




11190 SUNRISE VALLEY DRIVE,  
SUITE 300  
RESTON, VA 20191  
(703) 709-6500

**Figure 1**  
**Site Location**  
**Emerson Power Transmission**  
**Ithaca, New York**





 <p><b>WSP ENGINEERING OF NEW YORK, P.C.</b></p> <p>11190 SUNRISE VALLEY DRIVE SUITE 300 RESTON, VIRGINIA 20191 (703) 709-6500</p>	FIGURE 2	EMERSON POWER TRANSMISSION ITHACA, NEW YORK  PREPARED FOR EMERSON POWER TRANSMISSION	Drawn By: EGC
	SITE LAYOUT		Checked:
			Approved:
			DWG Name: 127491326



# **APPENDIX A**

## **Responsiveness Summary**



# **Responsiveness Summary**

## **Morse Industrial Corporation Town of Ithaca, Tompkins County, New York Site No. 755010**

The proposed Record of Decision (ROD) Amendment for the Morse Industrial Corporation site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repository on February 13, 2009. The proposed ROD Amendment outlined the preferred remedial measures proposed for the contaminated soil, groundwater, soil vapor, and free product at the Morse Industrial Corporation site.

The release of the proposed ROD Amendment was announced by sending a notice to the site contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 5, 2009, which included a presentation of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the proposed ROD Amendment ended on March 20, 2009.

This Responsiveness Summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's and NYSDOH's responses:

Verónica Morales submitted a letter dated March 9, 2009 which included the following comments:

**COMMENT 1:** Although the best apparent solution to protect South Hill residents from further exposure to TCE vapors is digging up the entire hill, this is neither a physically viable nor safe remediation strategy, as excavation could incur the risk of uncontrollably mobilizing or re-mobilizing contaminants.

**RESPONSE 1:** For this reason and those discussed in Response #3 below, the Department agrees that excavation is not a viable option in this particular instance.

**COMMENT 2:** Cornell University conducted an independent, year-long indoor air study in 2007 in three South Hill homes. A basement air sample collected on October 24, 2007 exhibited a TCE concentration of 0.16 ppbv, helping to confirm that the un-reproducible concentrations of TCE detected by Emerson in ambient air samples in November 2007 were not an artifact of laboratory error or equipment malfunction.

**RESPONSE 2:** The TCE value of 0.16 ppbv is equivalent to  $0.859 \mu\text{g}/\text{m}^3$ , which is far below the levels detected by Emerson in ambient air in November 2007. In addition, in response to the November 2007 ambient air sample results, the Department required Emerson to undertake a series of investigations to attempt to explain the data. This included an evaluation of the exhaust vents on select mitigation systems, an assessment of vapors within the sanitary sewer system manholes, and an evaluation of the potential for an off-site source of VOCs to be affecting ambient air within the South Hill neighborhood. None of these investigations resulted in the identification of a VOC source. Monitoring of the ambient air will continue as part of the ongoing SVI work.

John Graves submitted a letter dated March 10, 2009 which included the following comment:

**COMMENT 3:** With respect to the TCE contamination around the fire water reservoir, complete removal (i.e., excavation) on South Hill is an unworkable solution. It is recommended that the proposed pump and treat approach [for groundwater] be used, but that the DEC also come up with a solution that will clean up the contamination completely.

**RESPONSE 3:** Given the steep topography of South Hill and the fact that the contamination resides in the subsurface within a highly fractured bedrock matrix rather than as a localized mass, the Department agrees that excavation is not a feasible remedial alternative. However, it is still the Department's goal to achieve complete cleanup of the contamination. Accordingly, in addition to the upgraded groundwater pump and treat system (which has been designed to target the most prominent fracture zones in the bedrock), removal of free product from the surface of the groundwater and in situ (in-place) treatment of the contaminant plume have been included as part of the overall remedy for the fire water reservoir.

Ken and Regina Deschere submitted a letter dated March 17, 2009 with the following comments:

**COMMENT 4:** The groundwater pump and treat system at the fire water reservoir has done little to change toxin levels.

**RESPONSE 4:** The bedrock stratigraphy in the vicinity of the fire water reservoir includes a shallow, highly-fractured "B-zone" and an intermediate "C-zone" that is characterized by open vertical joints. At the base of the C-zone is a prominent horizontal bedding plane fracture. The original pump and treat system that was installed in the 1990s was designed to remove contaminated groundwater from the joints within the C-zone. Subsequent monitoring has shown this system to be highly ineffective. In comparison, the system upgrades currently in progress target the B-zone and the horizontal bedding plane fracture at the base of the C-zone. The groundwater contamination is concentrated in these areas due to their relatively higher permeabilities, which should also allow for much greater removal efficiency.

**COMMENT 5:** The proposed use of in situ chemical oxidation (ISCO) may address some of the toxins in the glacial till around the fire water reservoir, but it is a largely unproven technology in fractured bedrock. The results of the ISCO program implemented at the Axiohm site up the hill have yet to be released, and the permanent effect will not be known for some time.



**RESPONSE 5:** ISCO is recognized by the Department as a presumptive/proven remedial technology for the treatment of VOC-contaminated groundwater. Oxidizing compounds permanently destroy the VOCs on contact through a chemical reaction that produces carbon dioxide, water and other innocuous compounds. Full-scale treatment was implemented at the Axiohm facility in the summer of 2008, where the geologic setting is very similar to that at Emerson. Subsequent groundwater monitoring confirmed that the oxidant had been successfully distributed throughout the contaminant plume. Monitoring will continue for the next several years to track the rate of contaminant destruction and to determine if additional treatment applications are necessary.

**COMMENT 6:** Mitigating the basements of the on-site buildings does little to keep the toxins from migrating off-site, nor does such mitigation actually remediate the site. Sooner or later, these toxins must be removed.

**RESPONSE 6:** At a minimum, the selected remedial actions must eliminate or mitigate all significant threats to human health and/or the environment. The sealing and/or repair of cracks and penetrations in the buildings is intended to eliminate the potential for plant employees to be exposed to contaminated soil vapor. Additional remedial measures (e.g., groundwater extraction and treatment, in situ groundwater treatment, free product removal) will be implemented throughout the plant to directly address the suspected sources of the vapors. Still other measures are being evaluated to address the off-site migration issue.

**COMMENT 7:** The Amendment does nothing to address the many problems of toxins which continue to migrate from the site into the surrounding neighborhoods. We understand that additional steps will be announced soon, and we hope that they will include real remediation of the toxins migrating through the sewers and moving through the networks of fissures and fractures in the bedrock and soil.

**RESPONSE 7:** The Department is working with Emerson and its consultant to identify a technology (or combination of technologies) to be implemented to permanently remove the contaminated vapors from the environment to the extent practicable. The Department will prepare a Proposed Remedial Action Plan (PRAP) for public review and comment, and subsequently will issue a Record of Decision (ROD) to identify the remedy selected for implementation.

**COMMENT 8:** Some of the chemicals found here [South Hill] are from sources other than Emerson. We expect that the NYSDEC will continue to monitor the area and continue to push the responsible parties to provide real remediation of the messes to which they have contributed.

**RESPONSE 8:** In its investigation of the South Hill area, the Department has formally sought (and continues to seek) cooperation from each of the parties it considers to be a contributor to the contamination. To the extent that these parties have not been willing to assist, the Department has utilized a stand-by contractor to perform the necessary work. The Department will continue to use this approach until such time as investigation and remediation activities have been completed.



Walter Hang submitted a letter dated March 20, 2009 which included the following comments:

**COMMENT 9:** The list of site-related contaminants is inadequate and should be expanded. A total of 42 chemical contaminants have been identified in the vicinity of the factory in groundwater, soil gas vapor, indoor air or ambient air. DEC has designated only seven of those contaminants as site-related.

**RESPONSE 9:** As discussed in Section 2.3 of the Amendment (Nature and Extent of Contamination), the primary contaminants of concern associated with the Emerson site are volatile organic compounds (VOCs) in general. The remedial actions selected by the Department are intended to address all VOCs in all impacted media.

**COMMENT 10:** The DEC should require comprehensive source removal cleanup of the site as well as all off-site contamination wherever practicable. Identified contamination sources should be removed to the fullest extent technically feasible in order to provide a comprehensive, permanent solution to the site's hazards.

**RESPONSE 10:** The selected remedial actions include source removal wherever technically feasible (e.g., groundwater collection and treatment, free product removal). As discussed previously, excavating the entire hillside is not practicable.

**COMMENT 11:** Capping contaminated soils with asphalt at the former degreaser area should not be accepted. The asphalt cover will ultimately fail and volatile organic compounds will not be eliminated by the proposed remedy. High-level contamination under the factory near load-bearing walls could be removed if the structure is properly braced and supported to prevent structural failure.

**RESPONSE 11:** The impacted soil in the former degreaser area is located entirely beneath the concrete slab of Building 4 and is limited in extent. Accordingly, excavation is not warranted, particularly in view of the difficulties associated with preserving the structural integrity of the building. The soil does, however represent a potential source of soil vapor contamination as well as an ongoing source of groundwater contamination. Remedial actions therefore include repair and maintenance of the slab and in situ treatment of the groundwater. The Amendment will clarify the intent of the asphalt cap, which is not to cover contaminated soil but to limit groundwater recharge.

**COMMENT 12:** Abandonment of buildings does not eliminate underlying contamination hazards. The pollution should be removed.

**RESPONSE 12:** The abandonment of Building 24 is an initial step to insure the protection of human health. As discussed earlier, additional remedial measures (e.g., groundwater extraction and treatment, in situ groundwater treatment, free product removal) will be implemented throughout the plant to directly address contaminant sources.

**COMMENT 13:** In situ bioremediation and chemical oxidation have very limited track records of success in highly fractured bedrock environments. Given that almost all of the high-level contamination identified at the site is relatively shallow, it should be removed once and for all.

**RESPONSE 13:** The Amendment includes direct removal actions (e.g., groundwater extraction and treatment, free product removal). The application of an in situ treatment technology is intended to supplement these actions, in recognition of the complexity of the bedrock environment. It should also be noted that an oxidizing agent has been successfully distributed throughout the contaminant plume at the nearby Axiohm facility in similar geologic/hydrogeologic conditions.

**COMMENT 14:** The site involves a geologic and hydrogeologic setting that will be exceedingly challenging to remediate. The failure to require disclosure of past dumping practices has resulted in an incomplete assessment of the site's environmental and public health threats.

**RESPONSE 14:** In 2005, an on-site assessment was performed by Emerson that included a review of all available plant records related to historic operations and practices. Twenty-five areas of concern were identified throughout the plant that were subsequently evaluated as part of the 2007 Supplemental Remedial Investigation. Based on the results of this work, as well as the results of numerous other investigations performed both on and off site beginning in 1987, the Department believes that the nature and extent of contamination has been adequately defined, and that appropriate remedial actions have been identified for implementation.

WSP Environment & Energy, on behalf of Emerson, submitted a letter dated March 20, 2009 which included the following comments:

**COMMENT 15:**

1.0 Introduction

Paragraph 2: The first sentence describing the upgrade to the existing extraction system is correct, however, stating, "This would be combined with *in situ* treatment of the plume," is not fully accurate. The approved Revised Supplemental Remedial Program/Alternatives Analysis (SRP/AA) report dated September 23, 2008, states that a preliminary screening will be conducted of six possible treatment technologies and that one or more will be selected for bench and/or pilot testing to ascertain their technical feasibility and efficacy for addressing groundwater beneath the fire water reservoir, not the entire plume. A work plan for a pilot test will be prepared and submitted to the NYSDEC following an evaluation of the performance of the Interim Remedial Measure (IRM). In addition, product removal and offsite disposal was selected as the remedial option for AOC 24 (Fire Water Reservoir area), which will be implemented in the wells located between the reservoir and the EPT building. Thus, we believe the sentence in the proposed ROD amendment should be modified to state, "This will be combined with a feasibility evaluation of *in situ* remedial technologies followed by pilot testing of one or more technologies, as well as with product removal and offsite disposal from wells within the source area."



**RESPONSE 15:** Given the complexity of the bedrock formation, the Department does not believe that extraction and treatment alone is sufficient to address the groundwater plume. Some manner of in situ treatment will also be required. The Department agrees that such treatment is intended to address the portion of the plume in the immediate vicinity of the fire water reservoir. It should be noted that full-scale in situ treatment of VOC-contaminated groundwater has been successfully implemented in similar bedrock conditions at the nearby former Axiohm facility. The text has been modified.

**COMMENT 16:**

2.3 Nature and Extent of Contamination

Paragraph 3: The last sentence states that the offsite study/mitigation area continues to be expanded. We note that NYSDOH is expanding the testing beyond that conducted by Emerson in the Phase I through Phase VI testing events.

**RESPONSE 16:** Acknowledged. The text has been modified.

**COMMENT 17:**

2.3 Nature and Extent of Contamination

Paragraph 4: In the first sentence it is more accurate to state, "In addition to VOCs, a weathered petroleum product has been encountered in three discrete locations [instead of in several locations] at the plant including near the former open stone reservoir [inside Building 6A], near the former 500-gallon aboveground tank, and between the fire water reservoir and the main EPT building."

**RESPONSE 17:** Acknowledged. The text has been modified.

**COMMENT 18:**

2.4 Summary of Human Exposure Pathways

Paragraph 3: The description of exposure pathways does not reflect actual site conditions. We believe the description of exposure pathways should be clarified relative to potential exposure pathways as follows.

Potential exposure pathways include:

- inhalation of contaminated vapors by plant personnel or off-site residents or building occupants as a result of soil vapor intrusion into on-site buildings and nearby structures
- direct contact with contaminated soil and groundwater as a result of digging in areas where contamination has been identified



- direct contact with contaminated groundwater that may discharge to the surface along the hillside downgradient of the plant

**RESPONSE 18:** Historical samples of groundwater seeps from the hillside have revealed trace to non-detect levels of VOCs. Accordingly, the NYSDOH does not believe that the potential for exposure exists via the identified pathway.

**COMMENT 19:**

2.5 Summary of Environmental Assessment

Paragraph 2: The third sentence in this paragraph, "Groundwater samples indicate that the contaminant plume has not traveled far enough to affect Six Mile Creek," is very misleading and should be either revised or eliminated. The extent of affected groundwater in bedrock downgradient of the firewater reservoir has been defined and is not a concern relative to Six Mile Creek.

**RESPONSE 19:** Acknowledged. The text has been modified.

**COMMENT 20:**

3.1 New Information/Interim Remedial Actions

Onsite

Paragraph 4: The second and fourth sentences are misleading. The second sentence states, "In comparison, the removal rate of the upgraded system has been estimated at just over three pounds per day for the aqueous phase alone." The removal rate of the upgraded system (just over 3 pounds per day) is an estimate based on groundwater data collected as part of the pre-design activities. It would be more accurate to state, "In comparison, the treatment design removal rate of the upgraded system has been estimated at just over 3 pounds per day for the aqueous phase." The fourth sentence, which states, "An OM&M Plan is being implemented to evaluate the system's effectiveness," should be modified to state that "an OM&M plan for the upgraded system is being prepared and will be implemented to evaluate the system's effectiveness."

**RESPONSE 20:** Acknowledged. The text has been modified.

**COMMENT 21:**

3.1 New Information/Interim Remedial Actions

Offsite

Paragraph 2: The second sentence states, "Alternatives to be evaluated must include soil vapor extraction (SVE) and *in situ* treatment (e.g., granular activated carbon) along the confirmed migration pathways, as well as in situ treatment of the VOC-contaminated bedrock."

This is not consistent with the approved SRP/AA report (September 2008), which states in Section 12.0, "Following completion of the additional investigations, an alternatives analysis will be prepared that will include:

- No action alternative,
- Potentially applicable treatment technologies,
- Operation of sub-slab ventilation systems and monitoring."

The ROD should reflect what is in the approved SRP/AA report (September 2008). As for specific treatment technologies, SVE will be included in the evaluation. However, it is unclear what technology NYSDEC is referring to in the following statement: "*in situ* treatment (e.g., granular activated carbon) along the confirmed migration pathways (i.e., sanitary sewer lines, residential sanitary sewer laterals, and fractured bedrock surrounding the sewer lines)." We intend to consider proven and effective technologies and know of no application of granular activated carbon for *in situ* remediation.

**RESPONSE 21:** Acknowledged. The text has been revised to reflect the language in the SRP/AAR. With respect to the *in situ* application of GAC, the Department envisioned the placement of carbon-filled "collars" or dams along the sewer lines at regular intervals. Based on our April 14, 2009 meeting, this concept is no longer considered viable.

**COMMENT 22:**

3.2 Proposed Changes

Onsite Groundwater

Fire Water Reservoir

Paragraph 1: The first sentence states, "The proposed remedy is *in situ* treatment to be utilized in conjunction with the upgraded groundwater extraction system to enhance VOC mass reduction in groundwater in the area below the reservoir." This does not accurately describe the approved remedy approach for groundwater in the fire water reservoir area as presented in the approved SRP/AA report (September 2008). The approved approach involves a preliminary screening of technologies with respect to feasibility, implementability, and effectiveness in achieving remedial objectives for groundwater to narrow the technology list. This screening will be followed by selection of one or more technologies for bench scale and/or pilot testing (as stated in the fifth sentence of the proposed ROD amendment). The work plan for the bench scale and/or pilot testing will also include results from initial performance tests of the IRM (as stated in the SRP/AA report). Implementation of a technology beneath the fire water reservoir will be dependent on the results of pilot testing.

**RESPONSE 22:** Please refer to Response 15.

**COMMENT 23:**

4.1 Remedial Goals

Bullet #2: This bullet states that one of the “remedial goals for this site is to eliminate or reduce to the extent practicable - ingestion/direct contact with contaminated soils.” It would be more accurate to state, “...the potential for ingestion/direct contact with contaminated soil.”

**RESPONSE 23:** Acknowledged. The text has been modified.

**COMMENT 24:**

4.3 Evaluation of Alternatives

Onsite Groundwater

Fire Water Reservoir

Paragraph 4: The last sentence in this paragraph states, “Operation of the upgraded system, in conjunction with *in situ* treatment, could achieve the remedial goals in as little as 2 years.” No estimate of time has been put forth for achieving the remedial goals. In addition, the six *in situ* technologies for treating groundwater beneath the fire water reservoir have not been evaluated to date; therefore, an estimate of time to achieve the remedial goals using an *in situ* technology has not been determined. The last sentence of paragraph 4 in the ROD amendment should be revised to state that no time estimate for reaching the remedial goals has been established.

**RESPONSE 24:** Acknowledged. The text has been modified.

**COMMENT 25:**

5.0 Summary of Proposed Changes and Additional Remedial Actions

2. It would be more accurate to state, “Upgrades to the existing groundwater extraction and treatment system, currently being completed as an IRM, to provide greater hydraulic control of the groundwater plume within the bedrock subsurface and to increase the removal rate of dissolved-phase and vapor-phase VOC contamination.”

**RESPONSE 25:** Acknowledged. The text has been modified.



**COMMENT 26:**

5.0 Summary of Proposed Changes and Additional Remedial Actions

3. The six *in situ* treatment technologies for treating groundwater beneath the fire water reservoir have not been evaluated to date. It would be more accurate to state, "An evaluation of six *in situ* treatment technologies and selection of a remedial action for groundwater below the fire water reservoir to supplement the upgraded groundwater extraction and treatment system."

**RESPONSE 26:** Please refer to Response 15.

## **APPENDIX B**

### **Administrative Record**



## **Administrative Record**

**Morse Industrial Corporation  
Town of Ithaca, Tompkins County, New York  
Site No. 755010**

1. Proposed Record of Decision (ROD) Amendment for the Morse Industrial Corporation site, dated February 2009, prepared by the Department.
2. Order on Consent, Index No. A7-0125-87-09, between the Department and Emerson Power Transmission Company, executed on July 13, 1988.
3. Modification of Order on Consent, Index No. A7-0125-87-09, between the Department and Emerson Power Transmission Company, executed on May 22, 1991.
4. Record of Decision (ROD) for the Morse Industrial Corporation site, dated December 1994, prepared by the Department.
5. Supplemental Remedial Investigation Report, April 4, 2008, prepared by WSP Environmental Strategies, LLC.
6. Revised Supplemental Remedial Program/Alternatives Analysis, September 23, 2008, prepared by WSP Engineering of New York, PC.
7. Pre-Design Investigation and Alternatives Analysis Report, December 5, 2008, prepared by WSP Engineering of New York, PC.