



**INACTIVE HAZARDOUS WASTE DISPOSAL SITE REGISTRY INFORMATION REQUEST**

Identification Number 1

**MORSE INDUSTRIAL CORPORATION**  
**NYS ROUTE 96B**

**ITHACA, NY 14850**

Facility Id: **[REDACTED]**

ADDRESS CHANGE INFORMATION

Revised street: NO CHANGE

Revised zip code: NO CHANGE

Special Note: This site is one of 421 Inactive Hazardous Waste Disposal Sites that reportedly are being reinvestigated for chlorinated hydrocarbons that may pose soil gas vapor intrusion hazards. Prior to 2003, many of these sites were determined to be cleaned up or not to pose hazards.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF ENVIRONMENTAL REMEDIATION  
INACTIVE HAZARDOUS WASTE DISPOSAL SITE INFORMATION

CLASSIFICATION CODE: 02

REGION: 7

SITE CODE: **[REDACTED]**

DEC ID: **[REDACTED]**

CLASSIFICATION CODE DESCRIPTION:

Significant threat to the public health or environment - action required.

NAME OF SITE: Morse Industrial Corporation

STREET ADDRESS: NYS Route 96B

CITY: Ithaca

ZIP: 14850

TOWN: Ithaca

COUNTY: Tompkins

ESTIMATED SIZE: 60 Acres

SITE TYPE: Dump- Structure-X Lagoon- Landfill- Treatment Pond-

INSTITUTIONAL/ENGINEERING CONTROLS:

None reported

CROSS REFERENCES:

IDENTIFIER

SOURCE

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**[REDACTED]**  
**[REDACTED]**  
**[REDACTED]**

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HW Site ID  
BCP Site ID  
EPA Site ID

SITE OWNER/OPERATOR/REPOSITORY INFORMATION:

CURRENT OWNER(S):

NAME: Emerson Electric Co.

Owner Type: Corporate or Commercial

Steve Clarke

ADDRESS: 8000 West Florissant Avenue

St. Louis, MO 63136

## OWNER(S) DURING DISPOSAL:

NAME: BORG/WARNER CORPORATION  
ADDRESS: 200 S. MICHIGAN AVE.  
CHICAGO, IL 60604

Owner Type: Corporate or Commercial

## OPERATOR(S) DURING DISPOSAL:

## APPLICANT REQUESTOR(S):

## DOCUMENT REPOSITORY(S):

NAME: Tompkins County Public Library  
ADDRESS: 101 East Green Street  
Ithaca, NY 14850

NAME: NYSDEC Region 7  
Karen Cahill  
ADDRESS: 615 Erie Blvd West  
Syracuse, NY 13204

HAZARDOUS WASTE DISPOSAL PERIOD: from unknown to unknown

## SITE DESCRIPTION:

Location: The Morse Industrial Corporation site is located at [REDACTED] South Aurora Street along the west side of South Aurora Street/Danby Road (Route 96B) in the South Hill portion of the Town of Ithaca, Tompkins County, New York. The site is 60 acres and is comprised of two tax parcels. The northern parcel (31 acres) resides in the City of Ithaca, and the southern parcel (29 acres) resides in the Town of Ithaca. A former manufacturing plant complex and surrounding access road and parking lots encompass most of the site. The site is bounded by Aurora Street to the east; undeveloped, steep woodlands to the south and southwest; and residential neighborhoods to the north and northwest.

Site Features: The site is positioned on the side of a hill with surface elevations ranging from 450 to 720 feet above mean sea level (amsl). Manufacturing plant buildings are situated on the western side of the site along the bedrock slope. The main plant building consists of a series of interconnected buildings constructed on manmade terraces developed into and along the bedrock slope. There is one free-standing building (Building 24) located immediately north of the main building, and a small oil shed located immediately south of the main building. The buildings are flanked by a series of access roads and parking lots that terrace the hillside above the plant to the east. There is a former rail spur and two drainage ditches that run north-south along the western side of the site. A sanitary sewer line originating from the former National Cash Register facility runs along the eastern portion of the site parallel to South Aurora Street.

Current Zoning/Use: The site is currently zoned for industrial use by both the City and the Town of Ithaca. Land uses surrounding the site are predominantly residential to the north and northwest, a mix of commercial and residential to east and south. South Hill Elementary School and the Ithaca College campus are located approximately 500 feet northeast, and a half-mile east of the site, respectively. The South Hill Business Campus is located adjacent to the site to the south.

Past Use of the Site: The original buildings at the site were built in 1906 by Morse Industrial Corporation, which manufactured steel roller chain for the automobile industry. Morse operated the facility until approximately 1928 when the company was bought by Borg-Warner Corporation who manufactured automotive components and power transmission equipment. In 1983, Emerson acquired Morse Industrial Corporation from Borg-Warner Corporation and the Ithaca facility became part of the former Emerson Power Transmission (EPT). The former EPT entity continued to manufacture industrial roller chain, bearings, and clutching for the power transmission industry until operations were ceased in 2009. The facility was subsequently decommissioned and has been vacant since 2011.

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. Additional operations included metal finishing, plating, pickling, and salt bath quenching utilizing barium chloride and cyanide salts.

Investigations in 1987 revealed groundwater contamination at the Site that reportedly emanated from the fire water reservoir (FWR) located on the western portion of the property. Due to this contamination, the site was added to the New York State Inactive Hazardous Waste Disposal Site Registry in July 1987 as a Class 2 site.

In July 1988, EPT entered into a Consent Order with the Department to perform a Remedial Investigation/Feasibility Study (RI/FS). The order was modified in May 1991 to require Emerson to install a groundwater treatment system as an interim remedial measure (IRM) and to conduct soil gas and indoor air testing in select residential properties adjacent to the site.

The Record of Decision for the site was issued by NYSDEC in December 1994 and required EPT to convert the existing groundwater treatment system to include vacuum extraction. The ROD also required removal of petroleum impacted soils at the site and continuance of soil vapor monitoring in the residential neighborhood. The dual-phase groundwater extraction (DPE) system was placed into operation in July 1996.

Supplemental investigations conducted by Emerson between 2003 and 2008 identified several other areas of concern (AOCs), including the Former Department 507 Degreaser area in Building 4, which was designated as AOC-1. The investigations also determined that solvents historically discharged to the onsite municipal sewer system had leaked into the fractured bedrock below the lines in the vicinity of the residential neighborhood to the north and west of the plant.

Subsequently, NYSDEC issued a ROD Amendment in June 2009 which required upgrades to the existing groundwater treatment system associated with the FWR, addressed specific AOCs associated with the remainder of the site, and required implementation of mitigative measures to address soil vapor intrusion into plant buildings and migration of soil vapor from the site into the surrounding residential neighborhood.

Between 2004 and 2010, Emerson conducted soil vapor intrusion testing in over 100 residential properties, and based on these results, voluntarily installed soil vapor mitigation systems in 59 homes. In October 2010, NYSDEC issued a ROD for the offsite area.

**Operable Units:** The site was divided into three operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate, or mitigate a release, threat of release, or exposure pathway resulting from the site contamination. Operable Unit 01 (OU1) is the FWR and associated groundwater plume and DPE system. OU2 is the remainder of the site (i.e. former manufacturing plant complex). OU3 consists of the offsite soil vapor plume in the surrounding South Hill neighborhood to the north.

**Geology and Hydrogeology:** The site buildings were constructed on partially excavated and backfilled terraces along the bedrock slope above Cayuga Valley. Underlying the site is glacial till and manmade fill (overburden) ranging in thickness between 2.3 and 33 feet. The till consists of silty or clayey gravel and is thin and discontinuous. Overburden is thickest to the west, behind the retaining walls and is comprised primarily of fill. North of the plant, the topography drops off at a 40% grade (approximately 80 feet) to a residential area.

Beneath the overburden is a siltstone bedrock formation with a series of regular vertical joints and outcrops. The shallowest bedrock (less than 1 foot below ground surface) is encountered on the undeveloped hillsides and below the buildings and roadways located on excavated bedrock terraces. The bedrock can be classified into three zones: the upper weathered "B" zone ranging from 8 to 10 feet in thickness, the transitional "C" zone which extends up to 55 feet below the B zone, and the "D" zone (competent rock) extending to a minimum depth of 145 feet below ground surface.

Groundwater flow direction within the overburden and underlying shallow bedrock zone generally mimics surface topography, which slopes to the northwest. Depth to groundwater within the "B", "C" and "D" zones ranges from approximately 9 to 20 feet below ground surface (bgs), 24 to 71 feet bgs, and 75 to 94 feet bgs, respectively. Corresponding average groundwater elevations within these zones are 560 ft amsl, 525 ft amsl, and 475 ft amsl.

CONFIRMED HAZARDOUS WASTE DISPOSED:

| TYPE                            | QUANTITY |
|---------------------------------|----------|
| tetrachloroethene (PCE)         | UNKNOWN  |
| TRICHLOROETHENE (TCE)           | UNKNOWN  |
| TETRACHLOROETHYLENE (PCE)       | UNKNOWN  |
| cyanides(soluble cyanide salts) | UNKNOWN  |
| barium                          | UNKNOWN  |
| cis-1,2-dichloroethene          | UNKNOWN  |
| vinyl chloride                  | UNKNOWN  |

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Nature and Extent of Contamination:

Based on the investigations conducted to date, the primary contaminants of concern that are site-related include chlorinated volatile organic compounds (CVOCs), including TCE, tetrachloroethene (PCE), cis-1,2-dichloroethene (DCE), and vinyl chloride in soil and groundwater; polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals, specifically barium, cyanide, and arsenic in soil; and petroleum hydrocarbons as NAPL. The PAHs and metals in soils appear to be associated with historic fill material present over much of the site. TCE soil and CVOC groundwater contamination present in AOC-1 and the FWR area appear to be the result of historic discharges of solvents to the sanitary sewers and/or ground surface within these areas.

Soil - Remedial actions completed in 2019 as IRMs at 10 AOCs on the site have successfully achieved soil cleanup objectives (SCOs) for the various intended uses consistent with site redevelopment plans. Removal of contaminated soil from these 10 areas, plus placement of a low permeability cover over AOC-1 and within the drainage ditch (AOC-32) has reduced potential source areas and allowed for construction a cover system. Figure 3 shows the location of each AOC along with the areas in which the respective SCOs were achieved.

Remaining subsurface soil contamination exists beneath the cover system constructed over AOC-1. Excavation in this area was limited to a depth of 3.5 feet due to the presence of active utilities. TCE concentrations (58 parts per million (ppm) and 24.8 ppm) from two documentation samples collected at the bottom of the excavation exceeded the protection of groundwater SCOs (PGWSCOs) and restricted residential use (RRSCOs) of 0.47 ppm and 21 ppm, respectively. The IRM description below for AOC-1 provides information regarding the low permeability cover material used to prevent migration of remaining soil contaminants from the soil to the groundwater.

Soil inside a former foundation wall could not be accessed during an IRM that included removal of a sanitary sewer line in Building 13A. The soil sample on the east side of the former foundation wall contained 12,100 ppm of barium which significantly exceeds the PGWSCO and the RRSCO of 820 ppm and 400 ppm, respectively. The soil sample on the west side of the former foundation wall contained 1,330 ppm barium which also exceeded SCOs, but at much lower levels, indicating that the foundation wall may have acted as a hydraulic barrier to control migration of contaminants. The IRM description below provides details for the low permeability backfill used in this area to prevent migration of remaining contamination from soil to groundwater.

Soil samples from Test Pit 7 in Building 15 and Test Pit 9 in Building 16 contained cyanide at 79 ppm and 89 ppm, respectively, which is above the RRSCO and the PGWSCO for cyanide of 27 ppm and 40 ppm. While fragments of clay pipes were found in the trench fill, the steel pipes in these two pits were found to be intact with no water present at the inverts of the pipes in the bottoms

of the pits. With no water in the pits and no continuing source of process water discharge to the sewers, there is no transport mechanism for contamination to migrate from soil to groundwater. In addition, the area is covered with a concrete slab and the limits of cyanide impact to groundwater have been defined onsite (i.e. no offsite migration).

Soil contaminants above SCOs below the cover systems in the other 8 AOCs are primarily PAHs and metals, including arsenic and barium. The PAH, benzo(a)pyrene, was the most prevalent contaminant in soil at the site, based on frequency of occurrence and concentrations detected. PCBs are also present beneath the cover system constructed over AOC-32 in two locations at 3.5 ppm and 3.3 ppm, slightly above the RRSCO of 1 ppm.

Waste Residuals - IRMs completed in 2019 successfully removed crystallized barium salt wastes that were present in AOC-27 (the former Barium Salt Pot Area in Building 14) and residual waste in several sanitary sewer manways and trench drains originating in the upper level of the facility (Buildings 13A, 14, 15 and 35). Beneath the Controlled Density Fill (CDF) used as backfill in AOC-27, remaining barium contamination exists within the final post-excavation bedrock surface and along the perimeter concrete wall that was below the original pre-excavation floor elevation. X-ray fluorescence (XRF) screening results from the bedrock surface show elevated concentrations of barium, and concrete core samples from the perimeter wall show barium concentrations ranging from 558 to 10,200 ppm.

Groundwater - the primary contaminants of concern in groundwater in OU1 are TCE, cis-1,2-dichloroethene (DCE) and vinyl chloride. Remedial actions have hydraulically controlled offsite migration of groundwater contamination and continue to reduce the contaminant mass.

Within OU2, groundwater dissolved phase contaminant levels exceed the groundwater standards for barium, cyanide, and CVOCs, specifically TCE and its breakdown products, DCE and vinyl chloride. The CVOC, 1,1,1-trichloroethane (TCA), was also detected in one location above groundwater standards.

CVOCs were detected above groundwater standards in OU2 in the following areas: AOC-1, AOC-26, AOC-28, below Building 2, downgradient of Building 5, and downgradient of historic well 1 (HISTWELL-1). The maximum concentrations of CVOCs in OU2 were detected in AOC-1. DCE and vinyl chloride were detected up to 19,700 parts per billion (ppb) and 2,040 ppb, respectively, as compared to their respective groundwater standards of 5 ppb and 1 ppb. Total CVOCs in the other five areas were generally less than 3,000 ppb.

CVOCs were also detected slightly above groundwater standards in three groundwater seeps; a discharge pipe on the western side of Building 24; a bedrock seep upgradient of the weir box for Outfall 001; and within the Retaining Wall Sump near the footbridge east of Outfall 001. Discharges from these seeps are currently being collected and treated using granular activated carbon.

Barium was detected above the groundwater standard of 1,000 ppb in two predominant areas: within the C-zone downgradient of the Former Salt Bath Area in Building 14 (AOC-27), and within the weathered B-zone on the northern end of the site. The maximum concentrations of barium in groundwater were detected approximately 200 feet downgradient and west of AOC-27 (6,510 ppb) and below Building 2 on the north end of the plant (8,110 ppb). Barium was not detected above standards in downgradient offsite wells.

Cyanide was detected above the groundwater standard of 0.2 ppb in wells located in the central portion of the plant in the vicinity of the former cyanide trench drain. The primary source of cyanide to groundwater in this area was likely the historical storage of cyanide salts in Building 15 and case hardening of products in cyanide salts in the former Building 16. Cyanide in this area was detected predominantly in the weathered B-zone, at concentrations ranging from 0.22 to 12.2 ppb. Cyanide was also detected above the standard in B zone groundwater in the southwestern portion of the site (AOCs 28 and 30) at a maximum concentration of 1.6 ppb. Cyanide was not detected above standards in downgradient offsite wells.

Petroleum - Non-aqueous phase liquid (NAPL) identified as floating quenching oil has also been observed at thicknesses ranging from 0.1 to 0.45 feet on the groundwater surface in three on-site wells (MW-8B, LBA-MW-35 and LBA-MW-39) and in a former piezometer in AOC-1. After completion of a soil IRM in AOC-1, three new wells were installed in AOC-1 to further evaluate the presence of NAPL, however, no NAPL has been observed in the new AOC-1 wells.

NAPL staining is also present at the juncture of the east wall of Building 4 (lower level of facility) and the concrete floor. Four of six wall borings installed in Building 4 indicated NAPL was present behind the wall at approximately 2 feet above the floor. The source of this NAPL is believed to be historical use of the metal quenching system in Building 9, which consists of a concrete-lined pit containing three quench oil tanks approximately 5.5 feet in diameter and 14 feet in height.

Soil Vapor - Soil vapor intrusion testing was not conducted as part of 2017 SRI, however results from previous sampling events showed TCE, DCE and/or 1,1,1 trichloroethane in subslab and indoor air at concentrations greater than the NYSDOH indoor air guidelines in many of the plant buildings. This information, combined with presence of CVOCs in soil and groundwater beneath on-site buildings, indicate that soil vapor intrusion is occurring or has the potential to occur.

#### ASSESSMENT OF HEALTH PROBLEMS:

The site is fenced, security personnel restrict access to the site, therefore, people are not expected to come into contact with site-related soil contamination unless they dig below the surface. People are not drinking contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site redevelopment and occupancy. Sampling has shown that multiple off-site buildings have been impacted by soil vapor intrusion. Sub-slab depressurization systems (systems that ventilate/remove the air beneath the building) have been installed in all identified impacted off-site buildings to prevent the indoor air quality from being affected by the contamination in soil vapor beneath the buildings.

#### PROJECT COMPLETIONS:

| OPERABLE UNIT  | PROJECT                | DESCRIPTION | END DATE   | STATUS |
|--|------------------------|-------------|------------|--------|
| Operable Unit 01 - Fire Water Reservoir Groundwater                | PROJECT                | DESCRIPTION | END DATE   | STATUS |
|  | Remedial Investigation |             | 12/01/1994 | Actual |
|  | Remedial Design        |             | 07/01/1995 | Actual |
|  | Remedial Action        |             | 12/01/1996 | Actual |
| Operable Unit 02 - Remedial Program - Former Manufacturing Complex | PROJECT                | DESCRIPTION | END DATE   | STATUS |
|  | Remedial Investigation |             | 06/18/2009 | Actual |
| Operable Unit 02A - IRM - Groundwater Collection & Treatment       | PROJECT                | DESCRIPTION | END DATE   | STATUS |
|  | Remedial Action        |             | 04/01/2009 | Actual |
| Operable Unit 02B - IRM - On-Site Soil Vapor Intrusion Mitigation  | PROJECT                | DESCRIPTION | END DATE   | STATUS |
|  | Remedial Action        |             | 02/03/2010 | Actual |
| Operable Unit 02C - IRM - Soil Excavation and Cover                | PROJECT                | DESCRIPTION | END DATE   | STATUS |
|  | Remedial Action        | IRM         | 11/30/2020 | Actual |

|   |             |            |        |
|---|-------------|------------|--------|
| Operable Unit 02D - IRM - AOC-27 Barium Residuals and Backfill                  |             |            |        |
| PROJECT   | DESCRIPTION | END DATE   | STATUS |
| Remedial Action   | IRM         | 11/30/2020 | Actual |
| Operable Unit 02E - IRM - Contaminated Sanitary Sewer Line Removal and Backfill |             |            |        |
| PROJECT   | DESCRIPTION | END DATE   | STATUS |
| Remedial Action   | IRM         | 11/30/2020 | Actual |
| Operable Unit 02F - IRM - Historic Well NAPL and Quench Oil Pit Removal         |             |            |        |
| PROJECT   | DESCRIPTION | END DATE   | STATUS |
| Remedial Action   | IRM         | 11/30/2020 | Actual |
| Operable Unit 03 - Off-Site Soil Vapor Migration                                |             |            |        |
| PROJECT   | DESCRIPTION | END DATE   | STATUS |
| Remedial Investigation  |             | 10/15/2010 | Actual |
| Remedial Design   |             | 07/12/2011 | Actual |

The New York State Department of Environmental Conservation has not publicly updated the following fields since 2003:

|                                   |               |                 |                |        |            |
|-----------------------------------|---------------|-----------------|----------------|--------|------------|
| ANALYTICAL DATA AVAILABLE FOR:    | Air-X         | Surface Water-X | Groundwater-X  | Soil-X | Sediment-X |
| APPLICABLE STANDARDS EXCEEDED IN: | Groundwater-X | Drinking Water- | Surface Water- | Air-   |            |

GEOTECHNICAL INFORMATION:

SOIL/ROCK TYPE: Fill and till over interbedded shale and siltstone.  
 GROUNDWATER DEPTH: Range: 5 to 10 feet.

|                   |  |                |            |
|-------------------|--|----------------|------------|
| LEGAL ACTION:     | Type: Consent Order                          | State-X        | Federal-   |
| STATUS:           | Negotiation in Progress-                     | Order Signed-X |            |
| REMEDIAL ACTION:  | Proposed- Under Design-                      | In Progress-X  | Completed- |
| NATURE OF ACTION: | RI/FS + IRM-Groundwater pump & treat system. |                |            |