PROPOSED RECORD OF DECISION AMENDMENT
OPERABLE UNITS NO. 1 AND NO. 2
MORSE INDUSTRIAL CORPORATION SITE

City of Ithaca / Tompkins County / Registry No. 755010 June 2021

Prepared by the New York State Department of Environmental Conservation
Division of Environmental Remediation

SECTION 1: PURPOSE AND SUMMARY OF THE PROPOSED RECORD OF DECISION AMENDMENT

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing an amendment to the Record of Decision (ROD) for the above referenced site. The disposal of hazardous wastes at this site, as more fully described in the original ROD document and Section 6 of this document, has caused the contamination of various environmental media. The proposed amendment is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This amendment identifies the new information which has led to this proposed amendment and discusses the reasons for the preferred remedy.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375 Environmental Remediation Programs. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

On December 23, 1994, the Department signed a ROD which selected a remedy to clean up the Morse Industrial Corporation Site. At that time, the focus of the remedy was primarily on groundwater and vapor phase extraction and treatment. Additional environmental investigation data and improved understanding of site conditions resulted in a previous amendment to the selected remedy. A ROD Amendment was issued in June 2009, which led to upgrades and an expansion of the existing groundwater treatment system, on-site and off-site soil vapor mitigation actions, and implementation of institutional controls for protection of human health and the environment. The remedial action objectives for both the 1994 ROD and the 2009 ROD Amendment allowed for continuation of the industrial use of the property.

During the time the remedial actions and additional design efforts for the on-site remedy were ongoing, a Phase I and II Environmental Site Assessment (ESA) was conducted at the site by a private developer as part of due diligence activities in support of a potential real estate transaction. Due to redevelopment plans for mixed multi-unit residential, commercial and industrial uses and more stringent soil cleanup goals associated with such reuse, additional investigation as a Phase II Supplemental Remedial Investigation (SRI) was completed by 2017. Based on the SRI, Interim Remedial Measures (IRMs) were conducted to clean up contaminated soil and waste residuals, consisting of crystallized barium salts and sanitary sewer manhole sediment, at multiple Areas of Concern (AOC). These IRMs were not a component of the original remedy and were completed in Fall 2019. A Feasibility Study (FS)

was completed in 2020 to evaluate remedial elements that could be implemented as additional remedial elements to the current site-wide remedy to achieve protection goals necessary for current redevelopment and reuse plans.

The proposed amended remedy modifies the current selected remedy by adding the following remedial elements: 1) expansion of the existing groundwater extraction and treatment system to address chlorinated volatile organic compounds (CVOCs) in groundwater in Area of Concern No. 1 (AOC-1); 2) rerouting and monitoring three groundwater seeps; 3) monitoring of groundwater for barium and cyanide; 4) construction of a collection trench for recovery of weathered petroleum product in Building 4; 5) passive product collection and removal in onsite wells; 6) replacement of historic well HISTWELL-1 in the fire water reservoir area in Operable Unit No. 1 (OU1) for passive product collection; and 7) evaluation of soil vapor intrusion into existing or future buildings. In addition, a SPDES Permit Equivalent will be implemented as part of the remedy to monitor potential discharge of site-related contaminants from groundwater to surface water.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on this proposed ROD Amendment. This is an opportunity for public participation in the remedy selection process. The information here is a summary of what can be found in greater detail in reports that have been placed in the Administrative Record for the site. The public is encouraged to review the reports and documents, which are available at the following repositories:

Tompkins County Public Library
101 East Green Street
Ithaca, NY 14850
(607) 272-4557
askalibrarian@tcpl.org

A public comment period has been set for 30 days, from June 24 to July 23, 2021, to provide an opportunity for you to comment on these proposed changes. A public meeting is scheduled for July 7, 2021 at 6:00 pm to be conducted virtually through the Webex Events online platform or via conference call.

At the meeting, a description of the original ROD and the circumstances that have led to proposed changes in the ROD will be presented. After the presentation, a question and answer period will be held, during which you can submit verbal or written comments on the proposal. We encourage you to review this summary and attend the meeting.

Written comments may also be sent to:

Karen Cahill, Project Manager
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
615 Erie Boulevard West
Syracuse, NY 13204
Karen.Cahill@dec.ny.gov

The Department may modify or reject the proposed changes based on new information or public comments. Therefore, the public is encouraged to review and comment on this proposal. Comments will be summarized and addressed in the responsiveness summary section of the final version of the ROD Amendment. This ROD Amendment is the Department's final selection of the remedy for the site.

Receive Site Citizen Participation Information By Email
Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html.

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Morse Industrial Corporation site is located at 620 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 the Department 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.

Subsequently, the Department 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, installed soil vapor mitigation systems in 59 homes. In October 2010, the Department issued a ROD for the off-site 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 dual phase extraction (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.

Operable Units 1 and 2 are the subject of this document.

A site location map is attached as Figure 1. The Operable Units are shown in Figure 2.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. The Morse Industrial Corporation site is currently zoned for industrial use and is located in an area of residential and commercial use. An institutional control has been placed on the site in the form of an environmental easement which limits use and development of the property to industrial use; and restricts the use of groundwater as a source of potable or process water. Planned changes in use, to a mix of restricted-residential to industrial uses, may require changes in zoning.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The Department and EPT entered into a Consent Order (Index #A7-0125-87-09) on July 13, 1988. The Order obligates EPT to implement a full remedial program for OU1 and OU2.

SECTION 6: SITE CONTAMINATION

6.1: Summary of Environmental Assessment

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.

Subsurface soil contamination remains 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 SCOs (RRSCOs) of 0.47 ppm and 21 ppm, respectively. The IRM discussion 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 discussion 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 on-site (i.e,. no off-site 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 off-site 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 off-site 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.

6.2: Interim Remedial Measures

An IRM is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before selection of the final site-wide remedy.

The following IRMs have been completed at this site based on conditions observed and recorded during the ESAs and SRI. IRMs were documented in a Construction Completion Report completed in 2020.

IRM Soil Excavation and Cover

Excavation and off-site disposal of contaminated soil from 10 AOCs within OU2 (AOC-32 also extends into OU1) was conducted from Fall 2018 to Fall 2019. For the IRM, different SCOs (restricted -residential, commercial, industrial or protection of groundwater) were applied based on the presence of contaminants in groundwater in each AOC and the planned future use for that area of the property, consistent with redevelopment plans. Figure 3 shows the locations of the AOCs and the areas in which restricted residential use, commercial use, and industrial use SCOs were applied. In AOC-1, contaminated soil exceeding PGWSCOs was also removed

where accessible. In AOC-26 (Building 24 Area), AOC-31 (Upper Parking Lot 6), AOC-32 (Former Spray Pond and Drainage Ditch), AOC-34 (Area East of Building 14), and AOC-35 (Isolated Areas) contaminated soil exceeding RRSCOs was removed. In AOC-28 (Oil Shed Area) and AOC-29 (Former Propane Storage Area) contaminated soil exceeding commercial use SCOs was removed. In AOC-30 (disturbed area on south end of site) contaminated soil exceeding industrial use SCOs was removed. Isolated areas of soils containing total PAH concentrations of 500 ppm or greater were removed from nine locations (three in AOC-29, two in AOC-32, three in AOC-34, and one in AOC-3).

The original limits of soil excavation in each AOC were defined through SRI sampling. Most excavations were less than 3 feet in depth, except within AOC-30. Soils impacted with PCBs in AOC-30 were excavated to a maximum depth of 10 feet. Five AOCs were excavated to bedrock, which was generally less than 3 feet below ground surface.

Most excavations were 4,000 square feet (SF) in size or less except for AOC 26, AOC 28, AOC 29, and AOC 32, which were approximately 7,900 SF, 4,400 SF, 16,000 SF, and 19,800 SF, respectively. In areas where the depth of the excavation did not encounter and terminate at bedrock, the excavation depths were determined through confirmation sampling with additional excavation performed as necessary. Documentation samples were collected at the final lateral and depth limits of the excavations. A total of 8,513 tons of non-hazardous soil and 97.6 tons of hazardous waste soil were removed from the site, and a total of 240 tons of asphalt was transported off-site for recycling.

In areas not excavated to bedrock, any remaining contaminated soil or fill at the base and sides of the excavation were covered with a demarcation layer (i.e., geotextile fabric) prior to backfilling. Two feet of clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) was brought in to complete the backfilling of the excavation and establish the designed grades in AOC-31, AOC-34 and AOC-35. One foot of clean fill was placed in AOC-28, AOC-29, and AOC-30. An asphalt cover was placed in AOC-26.

A low permeability cover consisting of a geosynthetic clay liner (GCL) and asphalt was constructed in AOC-1 to minimize rainfall infiltration, and approximately 500 linear feet of drainage ditch in AOC-32 was restored using a low permeability geosynthetic clay liner, clean gravel, and riprap to prevent erosion.

IRM AOC-27 Barium Residuals and Backfill

In Spring 2019, a total of 258 tons of sub-base material and loose weathered bedrock containing crystallized barium salt above the RRSCO was excavated in the Former Salt Bath Area in Building 14 (AOC-27) and disposed of as hazardous waste. The excavation cavity was backfilled with Controlled Density Fill (CDF) to form a more impermeable barrier to minimize the potential for leaching of barium to groundwater. A 100-psi CDF mix design was selected to provide a dense, but excavatable fill to facilitate future redevelopment. After curing, NYSDOT No. 2 stone was placed on top of the CDF to the top of the concrete grade.

IRM Contaminated Sanitary Sewer Line Removal and Backfill

In late 2018 and early 2019, 23 test pits were installed along portions of the sanitary sewer line

in Buildings 4, 5, 8, 9, 13A and 165. Based on sampling results, approximately 200 linear feet of sanitary sewer line and bedding material exceeding RRSCOs for barium were removed in Building 13A. The entire trench was backfilled with CDF to form a more impermeable barrier than backfill used in other AOCs, reducing the potential for contaminant migration.

IRM Historic Well NAPL and Quench Oil Pit Removal

A historical abandoned well (HISTWELL-1) was discovered during construction activities associated with an upgrade to the existing groundwater treatment system. The well was approximately 120 feet deep and contained an approximate 7-foot layer of viscous non-aqueous phase liquid (NAPL). A fingerprint analysis of the NAPL indicated a petroleum compound consistent with motor oil at a concentration of 560,000 ppm (56%). Elevated levels of PAHs and site-related CVOCs were also detected in the NAPL. The NAPL was removed from the well in September 2015. Product recovery is ongoing, and an additional 19.5 gallons have been removed since September 2015.

In July 2020, approximately 100 gallons of oil and 125 gallons of solids were removed from the three quench oil tanks in Building 9 as an IRM. Since the tanks were cleaned, no new oil has accumulated.

6.3: Summary of Human Exposure Pathways

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.

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SECTION 7: SUMMARY OF ORIGINAL REMEDY AND PROPOSED AMENDMENT

7.1 Original Remedy

The original remedy description includes remedial elements of the remedy selected in the June 2009 ROD Amendment and the remedial elements of the remedy selected in the December 1994 ROD that were implemented and unchanged by the ROD Amendment. The original remedy consists of the following:

1. A remedial design program implemented to provide the details necessary for construction, operation, maintenance and monitoring of the remedial program.
2. Installation and operation of a Dual-Phase Extraction (DPE) system to remove and treat contaminated groundwater and vapor phase associated with historical releases of

CVOCs from the FWR.

3. Upgrades to the DPE treatment system to provide additional hydraulic control of the groundwater plume within the bedrock and to increase the removal rate of CVOCs in the dissolved and vapor phases.
4. In-situ treatment of groundwater in the vicinity of the FWR (OU1).
5. Groundwater monitoring.
6. Excavation of petroleum-contaminated soil from the scrap metal conveyor/loading area.
7. AOC-1 (Former Degreaser Area): Repair of the concrete slab in Building 4 to address the potential for soil vapor intrusion, construction of a low-permeability cap over the area of impacted groundwater outside Building 4 to limit recharge, and in situ treatment of groundwater.
8. Continuation of the soil vapor monitoring program.
9. 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 CVOC vapors via soil vapor intrusion.
10. Removal and off-site disposal of free product from three on-site wells.
11. Completion of an alternative analysis and selection of remedial actions to address offsite migration of CVOCs in soil vapor into the surrounding neighborhood, and subsequent issuance of a ROD by the Department.
12. Development of a Site Management Plan (SMP) to identify and implement all required institutional and engineering controls (IC/ECs).
13. Imposition of an institutional control in the form of an environmental easement requiring: (a) limiting the use and development of the site to industrial use; (b) compliance with the approved SMP and periodic certification of IC/ECs; and (c) restriction of the use of groundwater as a source of potable water.
14. Periodic certification of IC/ECs by a professional engineer or other such expert acceptable to the Department.

7.2 Elements of the Remedy Already Performed

All elements of the original remedy have been implemented with exception of elements 4 and 12 through 14 listed above. The pre-design investigation for the in-situ treatment of groundwater in the vicinity of the FWR in OU1 showed that the majority of CVOC mass below the FWR was present in bedding plane fractures and not amendable to in-situ treatment. Upgrades to the DPE treatment system included expansion of the capture zone to intercept these bedding plane fractures and prevent migration of the groundwater contaminant plume in OU1. Due to changing development plans and ongoing investigation, the SMP and environmental easement have not been developed. The SMP and easement will be developed when remedial actions are near completion and all IC/ECs are known. Periodic certifications of IC/ECs will begin when the remedial program is finalized, and site management begins.

Element 11 in the listing above was implemented, which culminated in the October 2010 ROD for OU3. The sole remedial action objective for the OU3 ROD was to mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into the indoor air of buildings within OU3.

7.3 New Information

Design efforts for the original remedy were ongoing through 2013, with the objective at that time to utilize the site as an industrial complex. Concurrent with those efforts, a private developer conducted a Phase I and II ESA at the site as part of due diligence activities in support of a potential real estate transaction. The ESA Report was issued on behalf of the developer in April 2014 and identified 1) additional contaminants of concern (COCs) at the site, specifically barium and cyanide, 2) several areas of concern (AOCs) related to soil warranting further evaluation based on plans for more restrictive uses of the site; 3) impacts to groundwater associated with some AOCs; 4) the presence of free product in on-site wells/borings; and 5) soil vapor impacts in select on-site buildings. The Phase II SRI was subsequently completed in 2017 to further investigate the AOCs and to support completion of a FS for OU1 and OU2 (i.e., the 60-acre former manufacturing complex) that would address these additional AOCs and new planned uses. Additional soil, waste residuals, groundwater and surface water samples were collected to better define the AOCs, which included, but were not limited to, a former Metal Salt Pot/Cyanide Area located within Building 14 and 15; the sanitary sewer system in Building 12A; a former plating area in Building 24; the drainage ditch running along the western side of the site; and three AOCs located south of the building complex (i.e., Oil Shed, Building 30, and Disturbed Areas).

Due to more stringent soil cleanup goals aligning with the intended new reuse plan for the site, it was determined that the AOCs with soil and waste residuals could be effectively addressed as IRMs prior to an additional amendment to the site-wide remedy being issued. IRMs were completed in 2019 and the FS was completed in 2020.

7.4 Proposed Changes to the Original Remedy

A summary of the changes to the original and previously amended ROD as proposed in this document are shown in the table on the following page:

SUMMARY OF PROPOSED REMEDY CHANGES
Morse Industrial Corporation Site (No. 755010) Record of Decision Amendment

Media:	Original and Previously Amended Remedy	Amended ROD
Groundwater	(1) Installation of a DPE treatment system and subsequent expansion to address CVOCs in groundwater in the vicinity of the FWR. (2) In-situ treatment of groundwater in the vicinity of the FWR and in AOC-1. (3) Long term monitoring of CVOCs in groundwater. (4) Imposition of an institutional control in the form of an Environmental Easement restricting the use of groundwater without treatment and approval. (5) Use of a Site Management Plan to maintain the Institutional Controls and/or Engineering Controls (IC/EC) at the site.	All elements as included in the previous ROD /ROD Amendment are included except for element (2). In-situ treatment will not be implemented. The following elements will be added to the remedy: (1) DPE groundwater system expansion to include AOC-1. (2) Re-route and monitor Building 24, Retaining Wall, and Weir Box seeps. (3) Long term monitoring to also include, barium and cyanide in groundwater. (4) Implementation of a SPDES permit equivalent to monitor potential discharge of site-related contaminants from groundwater to surface water.
Soil	(1) Excavation of petroleum-contaminated soil from the scrap metal conveyor/loading area. (2) Imposition of an institutional control in the form of an Environmental Easement restricting the use and development of the property to industrial uses unless otherwise approved by the Department. (3) Use of a Site Management Plan to maintain the Institutional and Engineering Controls (IC/ECs)	(1) No further actions based on IRMs performed. IRMs are incorporated as part of the final remedy (2) Imposition of an institutional control in the form of an Environmental Easement restricting the use and development of the property to restricted residential/commercial/industrial uses consistent with the redevelopment plan (3) Development and implementation of a Site Management Plan to maintain the Institutional and Engineering Controls (IC/ECs) at the site including maintenance of the soil cover system and a Soil Excavation Work Plan.
Waste Residuals		(1) IRMs are incorporated as part of the final remedy. No further action based on barium and sanitary sewer line source material IRM removals.
Soil Vapor/Indoor Air	(1) Continuation of the soil vapor monitoring program. (1) Sealing/repair of cracks and penetrations in on-site buildings to eliminate the potential for plant employees to be exposed to CVOC vapors via soil vapor intrusion.	Current remedy is retained with the addition of: (1) Imposition of an institutional control in the form of an environmental easement which requires compliance with the SMP which will include a provision for evaluation of the potential for soil vapor intrusion into existing or new buildings developed on the site, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion.

Petroleum Recovery	(1) Passive product collection and removal in three on-site wells. (2) Use of a Site Management Plan to maintain the Institutional and Engineering Controls (IC/ECs)	Current remedy is retained with the addition of: (1) Installation and operation of a petroleum recovery french drain collection trench and oil skimmer sump pump for recovery of weathered petroleum product along the base of the eastern wall in Building 4 to remove potentially mobile petroleum from behind the wall. The dimensions of the recovery trench will be determined during the design phase of the remedy. Petroleum will be collected periodically from the trench sump; however, if wells are determined by the Department to accumulate large quantities of petroleum over extended time periods, they can be converted to automated collection. (2) Passive product collection and removal as may be found in any on-site wells. (3) Abandonment of HISTWELL-1 based on its deteriorating condition and installation of a replacement well with an active product-only recovery system.

SECTION 8: EVALUATION OF PROPOSED CHANGES

8.1 Remedial Goals

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of groundwater or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from the potential for soil vapor intrusion into existing or future buildings at a site.

No changes to these goals are proposed in this amended remedy.

8.2 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 original Feasibility Study.

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 Public Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Both the original and amended alternative are protective of public health and the environment for the proposed land uses. There are no current receptors to impacted groundwater on- or off-site, thus by imposing an institutional control to prohibit the use of on-site groundwater, both the

original and amended remedies control human exposures to impacted groundwater. However, based on the unpredictability of the performance of in-situ groundwater treatment in AOC-1 and the limited presence of water in the target zone (unconsolidated materials overlying bedrock), expansion of the DPE system to include AOC-1 groundwater is expected to provide a higher level of protection. The amended remedy also includes collection and treatment of groundwater seeps and long-term monitoring of additional groundwater contaminants (i.e., barium and cyanide). The soil and waste residual IRMs add additional protection to public health and the environment by removing potential sources of groundwater contamination and construction of a cover system. The amended remedy will also provide greater protection of public health and the environment by removal and collection of residual NAPL from beneath Building 4 and from the vicinity of the FWR (i.e., historic well area).

Both remedies rely on IC/ECs and long-term operation, maintenance and monitoring to minimize the risk of exposure to residual contamination following implementation of the remedy, however, the IC/ECs for the amended remedy include an environmental easement and Site Management Plan for soil restricting future land use; and an environmental easement for soil vapor with a provision for the evaluation of the potential for soil vapor intrusion into existing or new buildings developed on the site.

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 original and amended remedies both comply with groundwater SCGs for the site to the extent practicable. The amended remedy also satisfies storm water quality monitoring SCGs by instituting a SPDES Permit Equivalent for the exiting outfalls. The amended remedy meets more restrictive soil cleanup objectives in eight of the nine AOCs, consistent with the higher level of use associated with site redevelopment plans, and also addresses sources of contamination to soil, groundwater and soil vapor. As a result, soil cleanup objectives for soil are achieved in source areas of contamination through excavation and construction of a cover system.

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.

Potential exposures to public health and workers could occur during expansion of the DPE groundwater treatment system into AOC-1 as part of the amended remedy but will be managed and monitored by a health and safety plan and a community air monitoring program implemented during construction. The amended remedy will achieve RAOs within a shorter timeframe than the original remedy as additional source areas have been removed and a cover system is in place.

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.

Although both the original and amended remedies achieve effectiveness by providing hydraulic control and treatment of the CVOC groundwater plume in the vicinity of the FWR, they both rely on imposition of an institutional control restricting use of on-site groundwater and a long-term monitoring plan due to expected residual contamination in groundwater. The amended remedy also provides a greater level of effectiveness as monitoring for barium and cyanide in groundwater will be included in the long-term monitoring plan. Additionally, groundwater seeps will be monitored, collected, and treated. Given the complexity of the site's hydrogeology, the easement and monitoring would remain in place until site conditions change such that restrictions are no longer necessary.

The completed IRMs, along with the additional elements of the amended remedy, will result in removal of contaminated soil, source material, and NAPL from the site. The expansion of the DPE system into AOC-1 will further enhance remediation of residual contamination in groundwater. The implementation of a SPDES permit equivalent will also provide long-term effectiveness by satisfying surface water monitoring requirements for the existing outfalls. The presence of residual soil contamination below the cover will require an environmental easement and SMP for the amended remedy. The implementation of an environmental easement and long-term monitoring will ensure that the remedy remains effective in protecting human health and the environment.

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.

In combination with the excavation and removal of soil, source materials, and NAPL in multiple areas of the site during the IRMs, the amended remedy provides a higher degree of reduction in contaminant toxicity, mobility, and volume. Additionally, the expansion of the DPE system into AOC-1, and collection and treatment of the Retaining Wall and Weir Box seeps will reduce the volume of CVOC mass in groundwater.

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.

As stated and explained in Section 7.2 above, all elements of the original and previously amended remedy have been implemented with the exception of in-situ treatment of groundwater in the vicinity of the FWR, which was determined technically infeasible. Potential technical difficulties with the amended remedy include included installation of conveyance piping from AOC-1 to the DPE system given the subsurface conditions and presence of the retaining wall; installation of reroute piping for the three CVOC seeps; and construction of the NAPL recovery trench inside Building 24 given the shallow nature of bedrock below the slab.

However, engineered solutions are available and can be implemented to overcome these challenges.

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.

The amended remedy with expansion of the DPE system; measures to address groundwater seeps and NAPL; and the expanded long-term monitoring program, will be more expensive that the original remedy. However, the additional expense is justified by the increased protection of the groundwater resource and higher level of land use that will be achieved.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The amended remedy was developed in part to correspond to the specific land uses of the site's redevelopment plan. As a result, the amended remedy better achieves the land use criterion than the original remedy.

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.

9. Community Acceptance. Concerns of the community regarding the proposed changes are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the final remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 9: PROPOSED AMENDED REMEDY

The Department is proposing to amend the Record of Decision (ROD) for the Morse Industrial Corporation Site. The changes to the selected remedy are summarized in Section 7.3 above.

The estimated present worth cost to carry out the amended remedy is $5,602,190. The estimated present worth to complete the original remedy was $3,310,000. The cost to construct the amended remedy is estimated to be $860,475 and the estimated average annual cost for 30 years is $318,340.

The elements of the proposed amended remedy listed below are identified as *unchanged, modified or new* when compared to the June 2009 remedy. Figure 3 shows the general location of the remedial elements:

1. Remedial Design *(modified)*

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

Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- reducing direct and indirect greenhouse gases and other emissions;
- increasing energy efficiency and minimizing use of non-renewable energy;
- conserving and efficiently managing resources and materials;
- reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- maximizing habitat value and creating habitat when possible;
- fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings will include, at a minimum, a 20-mil vapor barrier/waterproofing membrane on the foundation to improve energy efficiency as an element of construction.

2. Dual Phase Extraction System Expansion *(modified)*

The existing DPE treatment system will be expanded to extract and treat CVOCs in groundwater and vapor phase in AOC-1. The DPE system extension will be designed and installed so that the capture zone is sufficient to intercept the CVOC groundwater plume in the AOC-1 area and stop further migration. The expansion will consist of the installation of two B-zone extraction wells and a conveyance system from AOC-1 to the DPE treatment system and will be coupled with groundwater monitoring to evaluate the stability of the plume over time, identify trends, and evaluate overall conditions resulting from groundwater extraction and the excavation of shallow TCE source area soil.

3. Groundwater Seeps Capture and Monitoring *(new)*

Groundwater discharging at three groundwater seep areas (i.e., Building 24 Seep, Retaining Wall Sump, and Weir Box Seeps) will be captured and re-routed underground via a conveyance piping/pumping system to Outfall 001. Monitoring will be conducted pursuant to compliance sampling requirements and discharge limits specified in the SPDES permit equivalent.

4. Petroleum Recovery *(modified)*

Installation and operation of a petroleum recovery collection trench and sump for recovery of weathered petroleum product along the base of the eastern wall in Building 4 to remove potentially mobile petroleum from behind the wall. The spacing of the recovery trench will be determined during the design phase of the remedy. Petroleum will be collected periodically from the trench sump; however, if wells are determined by the Department to accumulate large quantities of petroleum over extended time periods, they can be converted to automated collection. Petroleum recovery will also include passive product collection and removal in on-site wells; and abandonment of HISTWELL-1 based on its deteriorating condition and installation of a replacement well with an active product-only recovery system.

5. Institutional Controls *(modified)*

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of portions of the controlled property for restricted residential, commercial and/or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

6. Site Management Plan *(modified)*

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

   Institutional Controls: The Environmental Easement discussed in Paragraph 5 above.

   Engineering Controls: The existing cover system, the existing DPE treatment system and expansion discussed in Paragraph 2 above, Groundwater Seeps Capture/Monitor discussed in Paragraph 3 above, and Petroleum Recovery discussed in Paragraph 4 above.

   This plan includes, but may not be limited to:

   - an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
   - a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes all buildings and all known or discovered structures on the site.
   - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   - a provision that should a building foundation or building slab be removed in the

future, a cover system consistent with that described in Paragraph 2 above will be placed in any areas where the upper two feet of exposed surface soil exceed the applicable soil cleanup objectives (SCOs)
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:
   - monitoring of groundwater to assess the performance and effectiveness of the remedy; and
   - a schedule of monitoring and frequency of submittals to the Department.
   - Monitoring for vapor intrusion for any buildings on-site, may be required by the Institutional and Engineering Control Plan discussed above.

c. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any mechanical or physical components of the remedy. The plan includes, but is not limited to:
   - procedures for operating and maintaining the remedy;
   - compliance monitoring of treatment systems to ensure proper O&M as well as providing the data for any necessary permit or permit equivalent reporting;
   - maintaining site access controls and Department notification; and
   - providing the Department access to the site and O&M records.

SECTION 10: NEXT STEPS

As described above, there will be a public meeting and comment period on the proposed changes to the selected remedy. At the close of the comment period, the Department will evaluate the comments received and prepare a responsiveness summary which will be made available to the public. A notice describing the Department's final decision will be sent to all persons on the site mailing list.

If you have questions or need additional information you may contact any of the following:

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