APPENDIX A

Responsiveness Summary
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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 remobilizing 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 μg/m³, 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/AAA) 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 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.


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.
